



N5A Development

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2. Igeotest, 2019. N5A-Development-Pipeline Route and Platform Area Survey. Geotechnical Preliminary Results.
3. Fugro Geoconsulting Limited, 2016. Field operations and Preliminary results Report with Engineering Assessments – Well N5-1 (Ruby) Geotechnical Site Investigation. Project Ref. J11354-R-1(02). Prepared for Hansa Hydrocarbons Limited.
4. Oranje-Nassau Energie, 2019. N5_NGT_r1.dxf

ABBREVIATIONS

The abbreviations listed below are used within this report. Where abbreviations used in this document are not included in this table, it may be assumed that they are either equipment brand names or company names.

	Description		Description
2DHR	Two-Dimensional High Resolution Seismic	PWL	Proposed Platform Location
ASV	Assumed Seismic Velocity	RWL	Relief Platform Location
BSB	Below Seabed	SBES	Single-Beam Echosounder
CM	Central Meridian	SBP	Sub Bottom Profiler
DTU15	Technical University Denmark	SPI	Shot Point Interval
ED50	European Datum 1950	SSS	Side-Scan Sonar
km	Kilometre	TWT	Two-Way Travel Time
LAT	Lowest Astronomical Tide	UHR	Ultra-High Resolution Seismic
m	Metre	UKHO	UK Hydrographic Office
MBES	Multibeam Echosounder	USBL	Ultra-Short Base Line
MODU	Mobile Offshore Drilling Unit	UTC	Coordinated Universal Time
m/s	Metres per Second	UTM	Universal Transverse Mercator
ms	Milliseconds	UXO	Unexploded Ordnance
MSL	Mean Sea-level	WGS84	World Geodetic System 1984

1 EXECUTIVE SUMMARY

1.1 LOCATION OVERVIEW

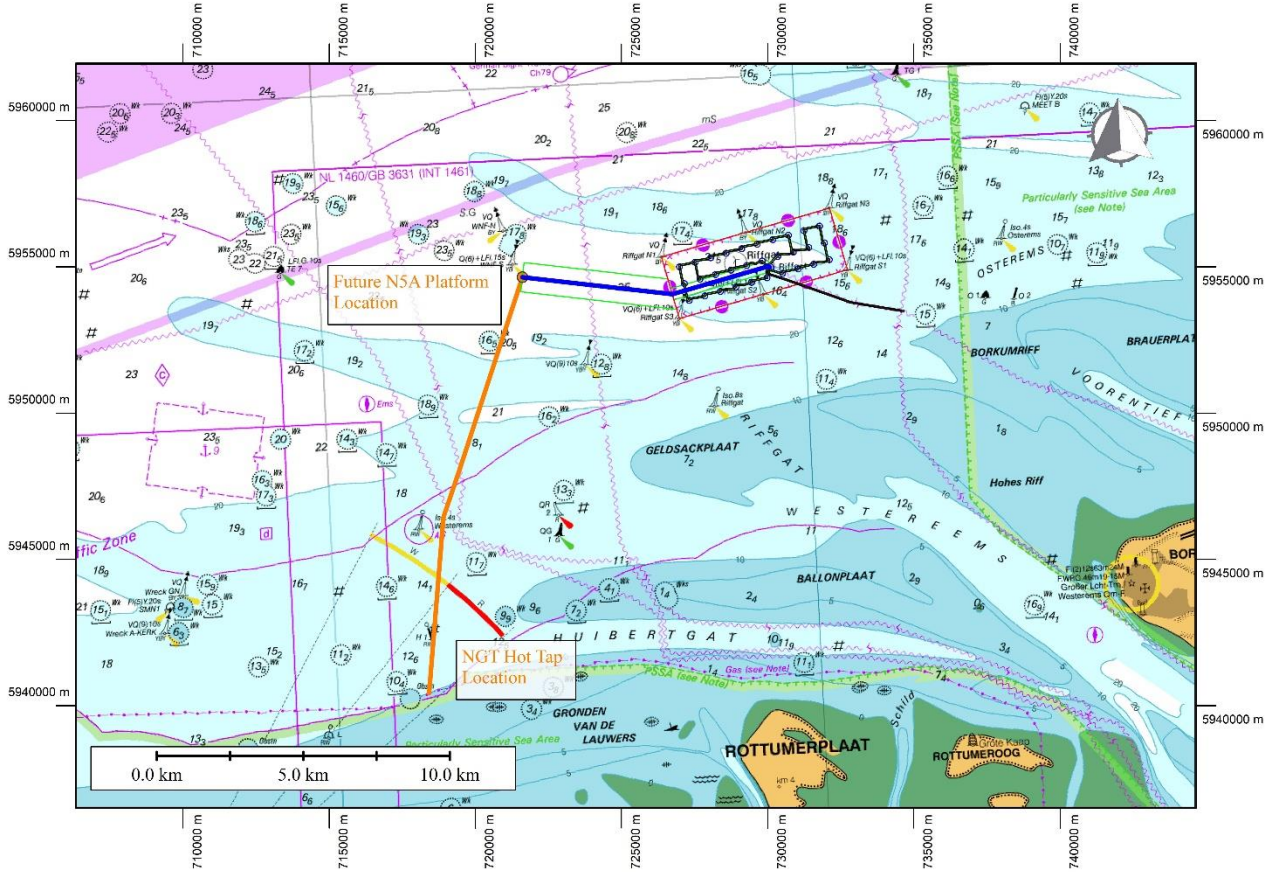


Figure 1: Project location overview

1.1 N5A TO NGT HOT TAP PIPELINE ROUTE ASSESSMENT

Proposed Pipeline Route Corridor		
Start location coordinates (N5A Platform Location)	721 607 mE 5 954 650 mN	53° 41' 32.347" N 06° 21' 23.281" E
End location coordinates (NGT hot tap Location)	718 409 mE 5 940 429 mN	53° 33' 57.806" N 06° 17' 53.314" E
Geodesy	ED50 : UTM Zone 31N : CM 3° E	
Vertical Datum	All depths are in metres below LAT unless stated otherwise	
Survey area	Route Length – 14.675 km Route Corridor width – 1000m	
Bathymetry		
Water depth along route	Maximum: 26.4m LAT; Minimum: 9.8m LAT Water depths along the proposed route range between 26.4 at KP0.000 and 9.8m at KP14.670.	

Water depths within route corridor	<p>Maximum: 26.7m LAT; Minimum: 9.4m LAT</p> <p>The seabed shoals gently towards the south of the survey area, the end of the proposed route.</p>
Seabed gradients and topography within route corridor	<p>Bedforms are not imaged on the sonar or bathymetry records. However photographs taken along the route as part of the environmental survey show the presence of ripples and small-scale dunes covering the majority of the seabed within the survey corridor area.</p> <p>A series of natural troughs trending west-north-west to east-south-east occur within the survey area crossing the proposed route, the largest is approximately 250m wide. Localised water depth variations are attributable to the relief and distribution of these troughs. Natural gradients along the proposed route are less than 1°. Maximum gradients of up to 3° are restricted to the flanks of the more prominent troughs.</p> <p>Two prominent features interpreted as shipwrecks surrounded by seabed scouring are observed on bathymetry records. The largest occurs at approximately KP2.462, 369m west-north-west of the proposed route and measures 40.1m x 12.8m x 1.1m. The other occurs at approximately KP2.373, 339m west-north-west of the proposed route with dimensions of 19.1 x 12.9 x 0.2m.</p> <p>Three semi-circular features with 1m of positive relief, interpreted as being related to previous drilling activity, are observed on bathymetry data. These are observed at the start of the proposed route between KP0.009 and KP0.089; these are offset by 90m to the east-south-east at their closest approach. They are within a 30m radius of each other exhibiting average dimensions of 30m x 30m.</p>
Seabed Features	
Seabed sediments along proposed route	<p>Seabed sediments along the proposed pipeline route are expected to comprise fine to coarse SAND, with occasional areas of coarse SAND and CLAY with gravel and shell fragments.</p>
Seabed sediments within route corridor	<p>Seabed sediments along the proposed pipeline route corridor are expected to comprise fine to coarse SAND, with occasional areas of coarse SAND and CLAY with gravel and shell fragments.</p>
Existing Infrastructure within the survey corridor and along the proposed route	<p>The buried NGT 36IN Pipeline (trending south-west to north-east) crosses the proposed route at KP14.675. This has not been observed on side scan sonar or bathymetry data. Numerous magnetic contacts correlating with the database position have been observed along with diffractions on all SBP lines, indicating the pipeline is buried between 0.2m and 0.8m below seabed.</p> <p>Three existing cables, trending north-west to south-east, are expected to cross the proposed route. These are not observed on the side scan sonar or bathymetry data. These cables are listed below:</p> <ul style="list-style-type: none"> • Buitengaats Electric cable crossing the proposed route at KP6.837.

	<ul style="list-style-type: none"> • ZeeEnergie Electric cable crossing the proposed route at KP6.907. • Tycom Telecom Cable Hunmanby GAP - Eemshaven crossing the proposed route at KP8.274. <p>Several magnetic contacts without a predominant trend have been detected near the expected positions of the cables.</p>
<p>Debris/obstructions along proposed route</p>	<p>Seven contacts are within 10m of the proposed route; one of them is interpreted as a boulder and occurs at KP0.863, 6.2m east-south-east of the proposed route measuring 0.5m x 0.3m x 0.2m. The other six are interpreted as items of debris. The closest item of debris to the proposed pipeline route occurs at KP12.516, 2.2m west measuring 4.1m x 3.3m x 0.5m.</p>
<p>Debris/obstructions within route corridor</p>	<p>Numerous objects interpreted as boulders and items of debris are observed within the proposed pipeline route corridor. Most of the objects interpreted as boulders occur towards the north of the survey corridor area and coincide with areas of clay exposure.</p> <p>An isolated 7m long piece of linear debris is observed at approximately KP6.284, 420m west-north-west of the proposed route.</p> <p>The most significant objects identified on the sonar records are interpreted as shipwrecks. The largest occurs at approximately KP2.462, 369m west-north-west of the proposed route and measures 40.1m x 12.8m x 1.1m. The other one occurs at approximately KP2.373, 339m west-north-west of the proposed pipeline route with dimensions of 19.1 x 12.9 x 0.2m.</p> <p>Numerous magnetic contacts have been detected within the corridor survey area. Several magnetic anomalies cluster near the start of the proposed route between KP0.000 and KP0.250. These are associated with three semi-circular features with no measurable height and high reflectivity that are interpreted to be related to previous drilling activity. These are observed between KP0.009 and KP0.089.</p> <p>A series of aligned magnetic contacts occurs towards the north of survey area crossing the proposed route at approximately KP2.249 trending west-south-west to east-north-east with strengths ranging between 15nT and 258nT. These anomalies terminate at a wreck and may be a debris trail.</p> <p>A large magnetic anomaly is centred 100m west of the proposed route at KP12.377. This does not correspond with any seabed feature but is coincident with the position of an infilled sediment pocket.</p>

	Other recorded magnetic anomalies are not associated with any interpreted seabed feature. They are possibly associated with buried objects.
Shallow Soils	
Expected geology along route	<p>The upper unit of fine to medium grained SAND generally thickens to the south. It is absent (or less than 0.5m thick) from KP 0.430 to KP 0.450 and KP 0.757 to KP 1.045. South of KP 5.951 the base of the mapped unit becomes indistinct to the point of being unmappable, at this point the unit is approximately 9m thick.</p> <p>The upper unit is sub-cropped by a sequence of variable composition. Vibrocore logs show that this sub-crop predominantly comprises silty fine SAND except for the area north of KP 1.246 where the subcrop is more clay prone and is interpreted to be the infill of a broad channel.</p>
Potential Hazards	
Obstructions along route	Cobbles and boulders possible within the shallow geological sequence along the proposed route or anywhere within the survey corridor.

2 INTRODUCTION

2.1 PROJECT OVERVIEW

GEOxyz was contracted to do a geophysical route survey in the Dutch Sector, Block N5A along a proposed pipeline route corridor between the N5A Platform location (see separate report ref LU0022H-553-RR-01) and the NGT hot tap location. Multibeam echosounder (MBES), side scan sonar (SSS), magnetometer and sub-bottom profiler data were acquired along a 15km by 1km survey corridor.

Seventeen environmental grab samples and five camera transects were acquired along the proposed route corridor. The results of these will be issued in a separate report volume Client document numbers N05A-7-10-0-70019-01 and N05A-7-10-0-70020-01).

Fifteen vibrocore samples were also acquired along the route and reported by Igeotest (Ref. 2).

Proposed pipeline route corridor location:

Table 1: N5A to NGT hot tap Pipeline Route

N5A to NGT Hot tap Pipeline Route – ED50, UTM 31N, CM 3° E					
Proposed Pipeline Route Location	KP	Easting (m)	Northing (m)	Latitude	Longitude
Start of Route N5A Platform Location	0.000	721 607.00	5 954 650.00	53° 41' 32.347" N	06° 21' 23.281" E
	8.630	718 906.12	5 946 454.01	53° 37' 11.690" N	06° 18' 35.507" E
End of Route – NGT hot tap Location	14.675	718 409.00	5 940 429.00	53° 33' 57.806" N	06°17' 53.314" E

The survey was carried out on the survey vessel Geo-Ocean III between the 1st and 15th May 2019.

The survey line plan is displayed in Figure 2.

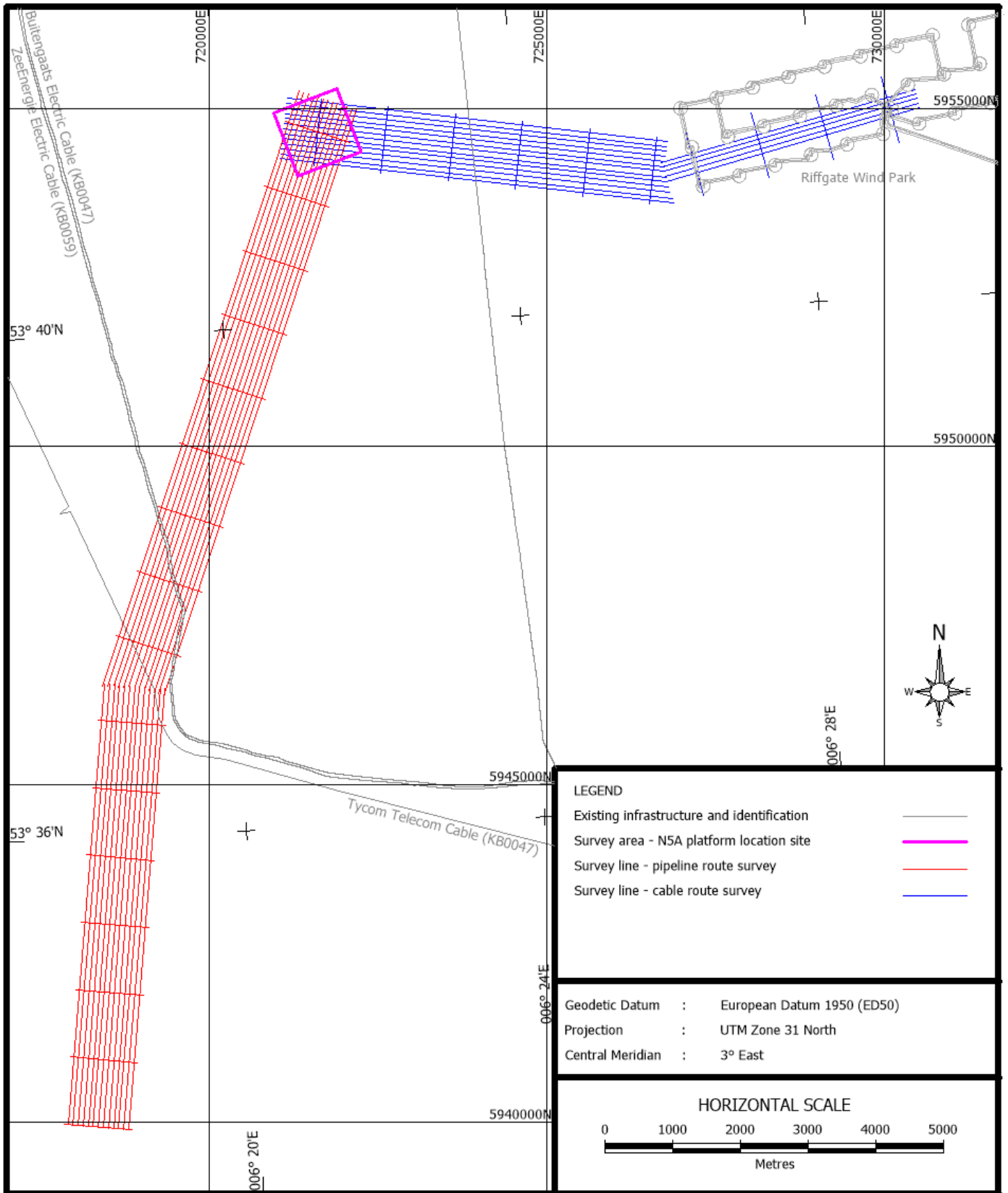


Figure 2: Survey line plan

2.2 SCOPE OF WORK

The objectives for the route survey are as follows:

- To complete all survey operations with no Health, Safety or Environmental incidents;
- To identify all geohazards and geological conditions relating to pipeline installation. This may include channelling, faulting and other geological features and variations that may be of significance;
- To identify any seabed obstructions;
- To establish water depths and seabed conditions;
- To investigate sub-seabed geological conditions to allow detailed soils classification, for assessment of trenching/pipe lay conditions.

2.3 GEODETIC PARAMETERS

2.3.1 Horizontal Reference

Table 2: Geodetic parameters

Geodetic parameters	
Spheroid	International 1924
Semi-major axis	6378388.297
Semi-minor axis	6356911.946
Datum	European Datum 1950 (ED50)
Projection	Universal Transverse Mercator (UTM)
False Easting	500000.00
False Northing	0.00
Central Meridian	3° East
Central Scale Factor	0.9996
Latitude of Origin	0°
Grid Zone	31 North
Datum Transformation WGS84 – ED50	
dx	+ 89.5m
dy	+93.8m
dz	+123.1m
Rx	0.0
Ry	0.0
Rz	-0.156
Scale	-1.2ppm

2.3.2 Vertical Reference

All water depths have been reduced to LAT using the DTU15 model. MSL is 1.6m above LAT within the survey area.

3 DATA ACQUISITION PROCESSING & LIMITATIONS

3.1 MULTI-BEAM ECHO SOUNDER

Bathymetric data were acquired using a R2Sonic 2024 multibeam echosounder. Tidal reduction was carried out using the DTU15 model. Bathymetry data were reduced to Lowest Astronomical Tide (LAT). LAT is 1.6m below MSL within the survey area.

Water depths are quoted relative to Lowest Astronomical Tide (LAT) and are considered to be accurate to $\pm 1\%$ (approximately 0.3m). The multibeam data have been processed to a 0.5m x 0.5m bin size.

Data processing was carried out using QINSy and QIMERA. Data was recorded in QINSy as raw QPD files. Multibeam data were cleaned using a combination of basic filters applied to the entire data set and then individual QPDs were manually cleaned by deleting any further outliers within the data. Once cleaned, the QPDs were tidally corrected and further minor adjustments were made to visually improve the data within QIMERA. A final grid file was exported and contoured at a 0.5m contour interval and a Geo-Tiff produced for final presentation.

3.2 SIDE-SCAN SONAR

Side Scan Sonar data were acquired using an Edgetech 4200 with a frequency of 100kHz / 400 kHz operating at ranges of 50m/150m/200m/250m.

Data were positioned using a Sonardyne Ranger 2 USBL system with the total accuracy of contacts affected by vessel positioning, the acoustic positioning of the towfish relative to the vessel and position of the contact relative to the towfish. For this survey position accuracy of the side scan sonar data set was generally between $\pm 3-5$ m. MBES data has been used to improve the positioning of contacts picked from SSS data and features such as depressions, scars etc. are generally picked from the MBES data wherever possible.

Three main factors influence resolution in the along-track direction. These are horizontal beam width, tow speed and sonar range. These parameters are summarised in the table below. Across track resolution is determined by the sonar frequency. Although the higher frequency allows smaller objects to be detected it does limit range to ~ 75 m.

Sonar Range	150m/200m per channel
Horizontal Beam Width	100 kHz 1.5° 400 kHz 0.4°
Vertical Beam Width	100 kHz/400 kHz 50°
Along Track Resolution	100 kHz 3.9m at 150m range 400 kHz 1.1m at 150m range
Across Track Resolution	100 kHz 8cm 400 kHz 2cm

The 100kHz data has been used to create the mosaic. Raw data were imported into Coda Survey Engine and the seabed position picked. Data were then scaled, and a time varying gain (TVG) and corrected navigation applied. Data were then slant range corrected and layered to create the most coherent mosaic possible. The mosaic has been exported at a resolution of 2 pixels per metre.

Target picking has generally taken place on the 400kHz data, however where coverage is less than 200% on the 400kHz data the 100kHz data were used. The same processing steps - seabed picked, scaling, TVG and corrected navigation have also been applied to the 400kHz data. Data were then examined on a line by line

basis and seabed targets were picked – objects, linear debris, scars, depressions etc. Reviewed contact positions were reconciled between lines and target lists exported.

3.3 MAGNETOMETER

Magnetometer data were acquired using a Geometrics G882 magnetometer piggybacked 10m behind the side scan sonar.

Data were positioned using a Sonardyne Ranger 2 USBL system with the accuracy of contacts identified from magnetometer data being affected by vessel positioning and the acoustic positioning of the towfish. For this survey position accuracy of the magnetometer data was generally between ± 3 -5m (based on side scan sonar positioning).

Data were recorded as text files in QINSy and then graphed in Oasis Montaj where contacts of 10nT or greater were picked due to vessel associated noise from short layback in the shallow water and a target list is exported. The Magnetometer was flown at a height of 10-20m above the seabed meaning small contacts could potentially be missed. Due to the very low data density (the minimum line spacing was 75m) the reported position of magnetic contacts is the position of the anomaly along the survey line rather than an interpretation of the exact position of the potential magnetic contact. A contact could lie on either side of the survey line up to half the distance to the adjacent line, so if the line spacing was 50m the contact could lie up to 25m either side of the line. A magnetometer used this way is of limited usefulness but remains effective for confirming the positions of seabed infrastructure and highlighting approximate positions of large magnetic contacts.

3.4 SUB-BOTTOM PROFILER

Shallow soils conditions have been interpreted from pinger data collected within the survey area. Interpretation of the pinger dataset is limited to approximately 15ms TWT below seabed (12m ASV 1600m/s).

Estimated resolution for Pinger dataset is listed below.

Pinger

Vertical Resolution	0.1m (based on an estimated dominant frequency of 4kHz and an assumed constant velocity of 1600m/s). Direct observation of the records shows that a resolution of approximately 0.2m may be the practical limit.
Horizontal Resolution	0.6m based on 250 millisecond trigger rate. 4m Fresnel zone at 20ms (based on an estimated dominant frequency of 4kHz and an assumed constant velocity of 1600m/s).

Pinger data were recorded in Coda acquisition software in cod file format. The seabed was picked, data were scaled, a TVG applied and either heave compensation or a swell filter applied. Data were then exported as a processed segy file and imported into the Kingdom 2016 software where interpretation was carried out.

Time to depth conversion has been carried out using an assumed constant seismic velocity of 1600m/s.

Lithological descriptions are interpreted from seismic character and geotechnical information (Refs. 2 and 3).

Segy data were loaded into a kingdom workstation once processing had been completed and basic QC of the data took place. Seabed position was checked against time converted MBES xyz data. Key horizons were then picked, and all data was checked for anomalies and variations by iterative visual assessment.

4 DETAILED RESULTS

4.1 BATHYMETRY

Bathymetry data were acquired using an R2Sonic 2024 multi-beam echo sounder and have been reduced to LAT. LAT is 1.6m below MSL along the route corridor. Bathymetry data were gridded at a 0.5 x 0.5m cell size. A bathymetry profile through the proposed survey route is included as Figure 3.

A series of natural troughs trending west-north-west to east-south-east occur within the survey area crossing the proposed route, the largest is approximately 250m wide. Localised water depth variations are attributable to the relief and distribution of the identified troughs. Water depths along the proposed pipeline route range between 9.8m LAT at KP0.000 and 26.4m LAT at KP14.675. The seabed shoals gently towards the south of the survey area, end of the proposed pipeline route.

Natural gradients along the proposed route are less than 1°. Maximum gradients of up to 3° are restricted to the flanks of the more prominent troughs.

Two prominent features interpreted as shipwrecks surrounded by seabed scouring are observed on bathymetry records. The largest occurs at approximately KP2.462, 369m west-north-west of the proposed route and measures 40.1m x 12.8m x 1.1m. The other occurs at approximately KP2.373, 339m west-north-west of the proposed route with dimensions of 19.1 x 12.9 x 0.2m.

Three semi-circular features with 1m of positive relief, interpreted as being related to previous drilling activity, are observed on bathymetry data. These are observed at the start of the proposed route between KP0.009 and KP0.089; these are offset by 90m to the east-south-east at their closest approach. They are within a 30m radius of each other exhibiting average dimensions of 30m x 30m.

Three existing cables and one pipeline are expected to be crossing the proposed pipeline route. These are not observed on the bathymetry. The existing infrastructure is listed below:

- Tycom telecom cable
- Buitenga ats Electric cable
- ZeeEnergie Electric cable
- NGT 36" Pipeline



Figure 3: Bathymetric profile along the proposed pipeline route N5A to NGT Hot tap

4.2 SEABED FEATURES

Side scan sonar data were acquired with an Edgetech 4200 system operating at 100kHz/400kHz (150m/200m per channel range). This was supplemented by swathe bathymetry data gridded to a 0.5m bin size. A Habitat Assessment Report (Report Ref. LU0022H-553-RR-04) and Environmental Baseline Survey Report (Report Ref. LU0022H-553-RR-05) will be issued separately.

4.2.1 Seabed Sediments

Seabed sediments along the proposed pipeline route corridor are expected to comprise fine to coarse SAND, with occasional areas of coarse SAND and CLAY with gravel and shell fragments. Seabed sediment types examples are included as Figures 4 and 5.

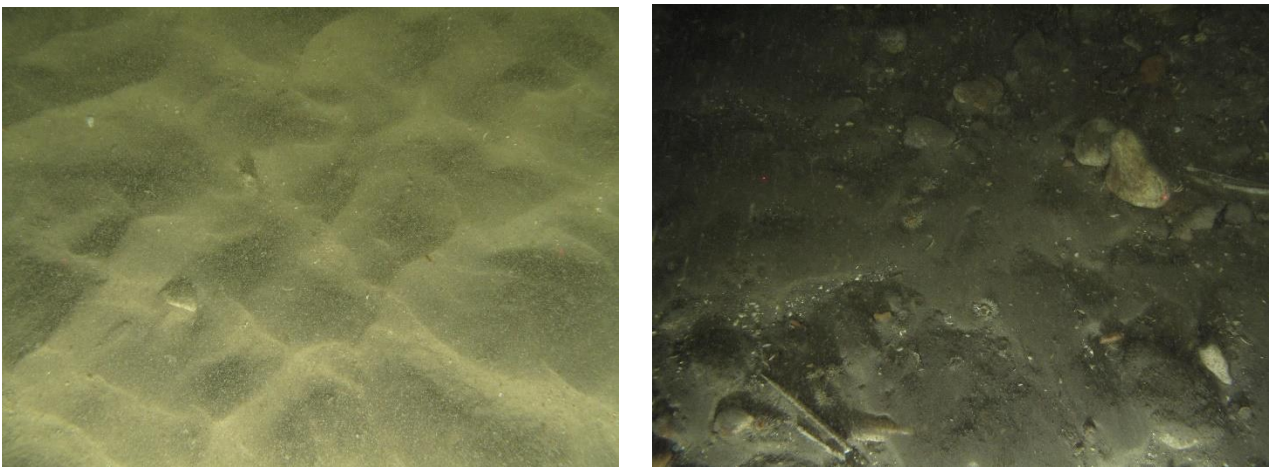


Figure 4: Environmental Images illustrating seabed sediment types within the proposed pipeline route N5A to NGT Hot tap corridor. (Left Photo - GRAB_P_6. Right Photo – GRAB_P_1)



Figure 5: Environmental Images illustrating bedforms covering the seabed within the proposed pipeline route N5A to NGT Hot tap corridor. (Left Photo - GRAB_P_8. Right Photo – GRAB_P_12)

4.2.2 Seabed Morphology

Bedforms are not imaged in the sonar or bathymetry records. However, photographs taken along the proposed route as part of the environmental survey clearly show the presence of ripples and small-scale dunes covering the majority of the seabed within the survey corridor area (ref. Figure 5).

The seabed along the proposed pipeline route corridor varies very slightly shoaling towards the end of the route, with minimum and maximum water depths along the route of 9.8m LAT and 26.4m LAT respectively.

4.2.3 Seabed Obstructions

Numerous objects interpreted as boulders and items of debris are observed within the proposed pipeline route corridor. Most of the objects interpreted as boulders occur towards the north of the survey corridor area and coincide with areas of clay exposure.

Seven contacts are within 10m of the proposed route; one of them is interpreted as a boulder and occurs at KP0.863, 6.2m east-south-east of the proposed route measuring 0.5m x 0.3m x 0.2m. The other six are interpreted as items of debris. The closest item of debris to the proposed pipeline route occurs at KP12.516, 2.2m west measuring 4.1m x 3.3m x 0.5m.

An isolated item of linear debris is observed at approximately KP6.284, 420m west-north-west of the proposed route exhibiting a length of 7m.

The most significant objects identified on the sonar records are interpreted as shipwrecks. The largest occurs at approximately KP2.462, 369m west-north-west of the proposed route and measures 40.1m x 12.8m x 1.1m. The second occurs at approximately KP2.373, 339m west-north-west of the proposed pipeline route with dimensions of 19.1 x 12.9 x 0.2m.

Sonar contacts within 200m of the proposed pipeline route are listed in the Table 5.

Numerous magnetic contacts have been detected within the corridor survey area. Several magnetic anomalies cluster near the start of the proposed route between KP0.000 and KP0.250. These are associated with three semi-circular features with no measurable height and high reflectivity that are interpreted to be related to previous drilling activity. These are observed between KP0.009 and KP0.089.

Several magnetic contacts correlate with the position of the most significant shipwreck described above. The largest of these anomalies occurs at KP2.446, 394m west-north-west of the route and measures 6757nT. In addition to the magnetic contacts around the shipwreck location there is also a trail of magnetic contacts trending ENE away from the shipwreck location for approximately 2.2km and crossing the proposed route at approximately KP2.24. No corresponding linear feature was observed on the side scan sonar data (see Figure 10).

A second set of aligned magnetic contacts is observed at the end of the proposed corridor crossing the proposed pipeline route at approximately KP14.675 trending south-west to north-east with strengths ranging between 88nT to 9291nT. These correlate with the buried NGT 36" Pipeline, which has not been observed on sonar records. A sonar data example at the pipeline position is included as Figure 15. This has been identified as a diffraction on all lines of the pinger data that cross the database position, buried between 0.2 and 0.8m below seabed (See section 4.3.3).

Three existing cables are expected to be crossing the proposed pipeline route. No features associated with these cables are observed on the side scan sonar records. A few isolated magnetic contacts were recorded close to the expected cable positions. Two sonar data examples at the database position of these cables are included as Figures 12 and 13. A list of the existing infrastructure crossing the proposed pipeline route is detailed in Table 4.

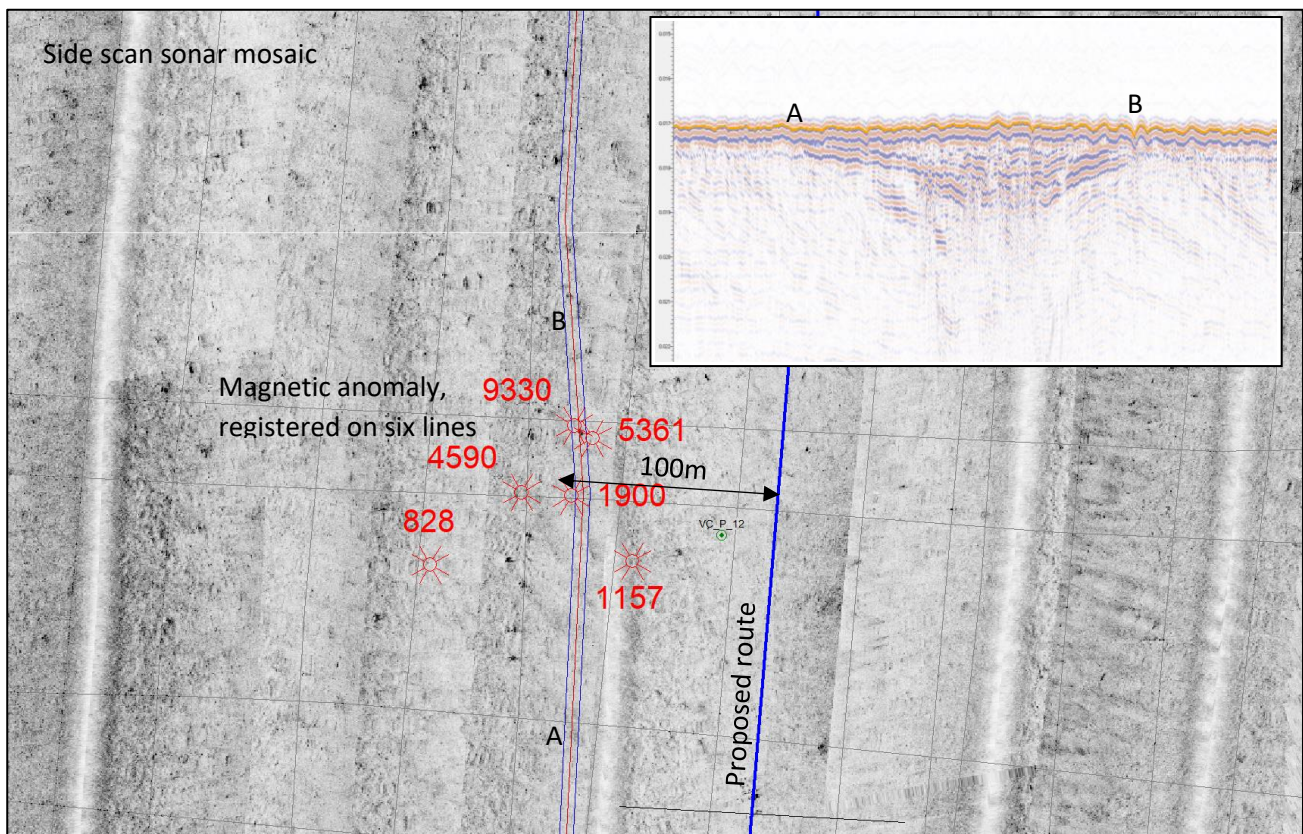
Table 3: Existing Infrastructure crossing the Proposed N5A to NGT Hot tap Pipeline Route (Ref. 4)

Infrastructure Name	KP	Easting (m)	Northing (m)
Buitengaats Electric cable	6.837	719 467.2	5 948 156.5
ZeeEnergie Electric cable	6.907	719 445.1	5 948 089.6
Tycom Telecom Cable Hunmanby GAP - Eemshaven	8.274	719 017.5	5 946 791.9
NGT 36" Pipeline	14.675	718 409.0	5 940 429.0

Large magnetic anomalies have been identified on six survey lines, centred 100m west of the proposed route at approximately KP 12.360. There are no corresponding side scan sonar or SBP contacts or diffractions. The anomalies are coincident with the position of an infilled sediment pocket. This sediment pocket is up to 1.4m deep based on SBP data.

Caution is advised in this area. It may be advisable to reroute to increase the offset from this area of potential debris.

Figure 6. Significant magnetic anomaly – KP 12.360



Other recorded magnetic anomalies are not associated with any interpreted seabed feature. They are therefore interpreted to relate to other buried objects. These are however on an order of magnitude lower than those discussed above.

Magnetic contacts within 200m of the proposed pipeline route are listed in the Table 6.

Table 4: Side Scan Sonar Contact Listing

Side Scan Sonar Contact List					
Description	KP	DCC (m)	Easting (m)	Northing (m)	Dimensions (m) L x W x H
Object	-0.151	-0.9	721 655.2	5 954 793.5	H = 0.7
Object	-0.062	-173.6	721 791.4	5 954 654.8	H = 0.5
Object	-0.046	172.1	721 458.1	5 954 747.9	H = 0.9
Object	-0.019	-162.0	721 766.6	5 954 616.9	H = 0.8
Object	-0.001	198.0	721 419.2	5 954 712.6	H = 0.7
Object	0.001	54.5	721 555.0	5 954 666.2	H = 0.8
Object	0.008	-149.7	721 746.8	5 954 595.7	H = 0.6
Object	0.067	-69.6	721 652.1	5 954 564.4	H = 0.6
Object	0.088	-38.4	721 616.0	5 954 554.5	H = 0.6
Object	0.098	-192.7	721 759.4	5 954 496.7	H = 0.6
Object	0.119	-58.0	721 625.0	5 954 519.2	H = 0.7
Object	0.177	150.7	721 408.5	5 954 529.1	H = 1.3
Object	0.251	194.4	721 343.9	5 954 472.5	H = 0.5
Object	0.255	162.0	721 373.4	5 954 458.7	H = 0.5
Object	0.410	-40.9	721 517.6	5 954 248.1	H = 0.6
Object	0.434	190.1	721 290.6	5 954 297.2	H = 0.6
Object	0.434	79.4	721 395.6	5 954 262.4	H = 0.6
Object	0.436	-106.1	721 571.5	5 954 203.1	H = 0.5
Object	0.436	-55.2	721 523.0	5 954 218.8	H = 0.7
Object	0.444	76.9	721 395.2	5 954 252.8	H = 0.7
Object	0.523	-192.8	721 626.4	5 954 092.9	H = 0.5
Object	0.538	-174.7	721 604.6	5 954 084.5	H = 0.7
Object	0.619	-44.6	721 455.7	5 954 048.1	H = 0.5
Object	0.632	-37.4	721 444.6	5 954 037.8	H = 0.6
Object	0.695	162.5	721 235.0	5 954 040.4	H = 0.6
Object	0.740	135.5	721 246.9	5 953 990.	H = 0.7
Object	0.758	183.2	721 195.8	5 953 987.5	H = 0.5
Object	0.815	-38.1	721 388.2	5 953 864.3	H = 0.6
Object	0.837	103.5	721 246.8	5 953 887.4	H = 0.6
Object	0.861	115.9	721 227.5	5 953 868.5	H = 0.7
Object	0.862	-6.2	721 343.0	5 953 829.2	H = 0.5
Object	0.882	111.7	721 224.7	5 953 846.8	H = 0.6
Object	0.886	-52.2	721 379.4	5 953 792.7	H = 0.6
Object	0.903	-71.3	721 392.0	5 953 769.8	H = 0.7
Object	0.917	62.0	721 261.2	5 953 798.9	H = 0.8
Object	0.973	-122.6	721 418.9	5 953 687.4	H = 0.6
Object	0.994	-45.2	721 338.8	5 953 691.8	H = 0.8
Object	0.997	-47.4	721 339.8	5 953 688.0	H = 0.8
Object	1.013	-64.2	721 351.	5 953 668.2	H = 0.8
Object	1.091	-97.1	721 357.9	5 953 583.8	H = 0.5
Object	1.120	-162.4	721 410.7	5 953 535.3	H = 0.6
Debris	9.186	17.1	718 843.3	5 945 900.7	5.9x1.5x0.1
Debris	11.116	5.5	718 696.2	5 943 976.4	3.0x0.3x0.1
Debris	12.352	89.7	718 510.6	5 942 751.2	1.5x1.7xnmh
Debris	12.365	-90.9	718 689.5	5 942 724.0	3.0x0.5x0.3
Debris	12.441	173.8	718 419.5	5 942 669.9	0.8x0.3x0.1
Debris	12.453	112.9	718 479.3	5 942 653.2	2.5x1.2x0.1

Debris	12.502	6.3	718 581.4	5 942 595.0	5.0x1.3x0.3
Debris	12.506	4.5	718 582.9	5 942 591.3	4.1x1.0x0.6
Debris	12.512	6.5	718 580.4	5 942 585.2	1.8x0.5x0.2
Debris	12.512	-2.3	718 589.2	5 942 584.2	5.1x2.4x0.3
Debris	12.516	2.2	718 584.4	5 942 581.4	4.1x3.3x0.5
Debris	12.560	32.9	718 550.1	5 942 539.3	1.4x0.8x0.2
Debris	12.568	-23.8	718 606.	5 942 526.9	2.9x1.0x0.6
Debris	12.569	-48.5	718 630.6	5 942 524.1	2.0x0.5x0.1
Object	12.838	56.3	718 503.9	5 942 263.9	H = 0.8
*nmh – no measurable height					

Table 5: Magnetometer Contact Listing

Magnetometer Contact List						
Description	KP	DCC (m)	Easting (m)	Northing (m)	Strength (nT)	Comments
Magnetic Contact	-0.096	68.7	721 571.7	5 954 762.5	18	
Magnetic Contact	-0.017	-61.1	721 670.5	5 954 647.5	27	
Magnetic Contact	0.009	-56.6	721 658.0	5 954 624.0	45	Correlated to semi-circular features related to previous drilling activity (ref. Figure 8)
Magnetic Contact	0.031	-98.7	721 691.2	5 954 590.0	360	
Magnetic Contact	0.042	-67.3	721 657.8	5 954 589.0	358	
Magnetic Contact	0.045	-34.1	721 625.3	5 954 596.5	53	
Magnetic Contact	0.052	-79.9	721 666.7	5 954 576.0	1100	
Magnetic Contact	0.063	-89.5	721 672.2	5 954 562.0	2733	
Magnetic Contact	0.081	-72.6	721 650.5	5 954 550.0	376	
Magnetic Contact	0.089	162.5	721 424.9	5 954 616.5	285	
Magnetic Contact	0.091	-110.6	721 683.6	5 954 529.0	252	
Magnetic Contact	0.109	-136.1	721 702.2	5 954 504.0	58	
Magnetic Contact	0.141	-153.1	721 708.2	5 954 468.0	119	
Magnetic Contact	0.162	-136.4	721 685.7	5 954 453.0	110	
Magnetic Contact	0.185	-154.3	721 695.7	5 954 426.0	35	
Magnetic Contact	0.234	-35.3	721 567.3	5 954 416.5	12	
Magnetic Contact	0.245	-40.3	721 568.5	5 954 404.5	22	
Magnetic Contact	1.172	149.9	721 097.9	5 953 584.0	8	
Magnetic Contact	2.221	-63.8	720 972.6	5 952 521.0	30	Interpreted to be related to a buried linear infrastructure (ref. Figure 10)
Magnetic Contact	2.230	-61.1	720 966.9	5 952 512.5	155	
Magnetic Contact	2.237	10.7	720 896.6	5 952 528.5	258	
Magnetic Contact	2.253	7.2	720 895.0	5 952 512.5	195	
Magnetic Contact	2.300	66.6	720 823.9	5 952 486.5	38	
Magnetic Contact	2.344	147.1	720 733.6	5 952 469.5	17	
Magnetic Contact	2.951	-4.3	720 687.5	5 951 846.0	11	
Magnetic Contact	6.907	-4.4	719 449.5	5 948 089.0	11	Correlated to unidentified ZeeEnergie Electric cable (ref. Figure 12)
Magnetic Contact	6.963	82.8	719 349.1	5 948 063.0	51	
Magnetic Contact	6.997	-75.7	719 489.0	5 947 981.0	40	Correlated to unidentified ZeeEnergie Electric cable (ref. Figure 12)
Magnetic Contact	8.233	-3.7	719 033.8	5 946 829.5	22	Correlated to unidentified Tycom

						Telecom Cable Hunmanby GAP - Eemshaven (ref. Figure 12)
Magnetic Contact	10.749	-144.5	718 875.8	5 944 329.5	23	
Magnetic Contact	12.350	92.3	718 508.2	5 942 754.0	9330	Correlated to Item of debris
Magnetic Contact	12.355	83.8	718 516.3	5 942 748.5	5361	
Magnetic Contact	12.381	91.1	718 506.9	5 942 723.0	1900	
Magnetic Contact	12.381	113.2	718 484.8	5 942 724.5	4590	
Magnetic Contact	12.407	61.7	718 534.0	5 942 694.0	1157	
Magnetic Contact	12.416	150.9	718 444.3	5 942 692.5	828	
Magnetic Contact	12.480	-6.4	718 595.9	5 942 616.0	52	Correlated to Item of debris
Magnetic Contact	13.991	2.3	718 462.9	5 941 110.5	163	Correlate with the NGT 36IN Pipeline (ref. Figure 15)
Magnetic Contact	14.610	-151.3	718 565.1	5 940 481.0	3279	
Magnetic Contact	14.640	-97.8	718 509.3	5 940 455.5	558	
Magnetic Contact	14.645	-61.2	718 472.4	5 940 453.5	1966	
Magnetic Contact	14.648	-80.9	718 491.8	5 940 449.0	962	
Magnetic Contact	14.674	-0.7	718 409.7	5 940 429.5	1254	
Magnetic Contact	14.697	60.7	718 346.7	5 940 412.0	1847	
Magnetic Contact	14.717	93.4	718 312.4	5 940 395.0	4218	
Magnetic Contact	14.752	155.4	718 247.8	5 940 365.0	878	

Table 6: Summary of Grab Operations in the N5A To NGT Hot Tap Route Area

Station	Type	Easting	Northing
GRAB_P_0	EBS/HAS	721 617.9	5 954 452
GRAB_P_1	EBS/HAS	721 324.2	5 953 792
GRAB_P_2	EBS/HAS	720 981.0	5 952 750
GRAB_P_3	EBS/HAS	720 668.1	5 951 801
GRAB_P_4	EBS/HAS	720 355.1	5 950 851
GRAB_P_5	EBS/HAS	720 042.1	5 949 901
GRAB_P_6	EBS/HAS	719 729.1	5 948 951
GRAB_P_7A	EBS/HAS	719 345.7	5 948 025
GRAB_P_8	EBS/HAS	719 103.2	5 947 052
GRAB_P_9	EBS/HAS	718 861.3	5 945 910
GRAB_P_10	EBS/HAS	718 779.0	5 944 914
GRAB_P_11	EBS/HAS	718 696.8	5 943 917
GRAB_P_12	EBS/HAS	718 614.6	5 942 921
GRAB_P_13	EBS/HAS	718 532.3	5 941 924
GRAB_P_14	EBS/HAS	718 450.1	5 940 927
GRAB_P_15	EBS/HAS	718 367.9	5 939 931
GRAB_C_0	EBS/HAS	721 607.0	5 954 650

Table 7: Summary of Completed Camera Transects

Geodetics: ED50 UTM31N 3°E							
Transect		Date and Time	Depth (m)	Easting	Northing	No. Stills	Video footage (mm:ss)
Grab P_0	SOL	02/05/2019 17:15:11	30	721 647	5 954 430	27	07:13
	EOL	02/05/2019 17:22:21	31	721 591	5954 476		
North Transect 1	SOL	11/05/2019 00:49:10	28.9	721 486	5 954 680	30	10:11
	EOL	11/05/2019 00:59:10	28.6	721 363	5 954 634		
North Transect 3	SOL	11/05.2019 02:04:48	28.9	721 902	5 954 407	50	12:29
	EOL	11/05/2019 02:17:13	28.8	721 802	5 954 550		
N5a Transect 1	SOL	11/05/2019 01:38:05	28.71	721 585	5 954 588	35	08:37
	EOL	11/05/2019 01:46:38	28.63	721 626	5 954 708		
N5a Transect 2	SOL	11/05/2019 01:16:28	28.44	721 668	5 954 631	39	09:13
	EOL	11/05/2019 01:25:35	28.64	721 544	5 954 667		

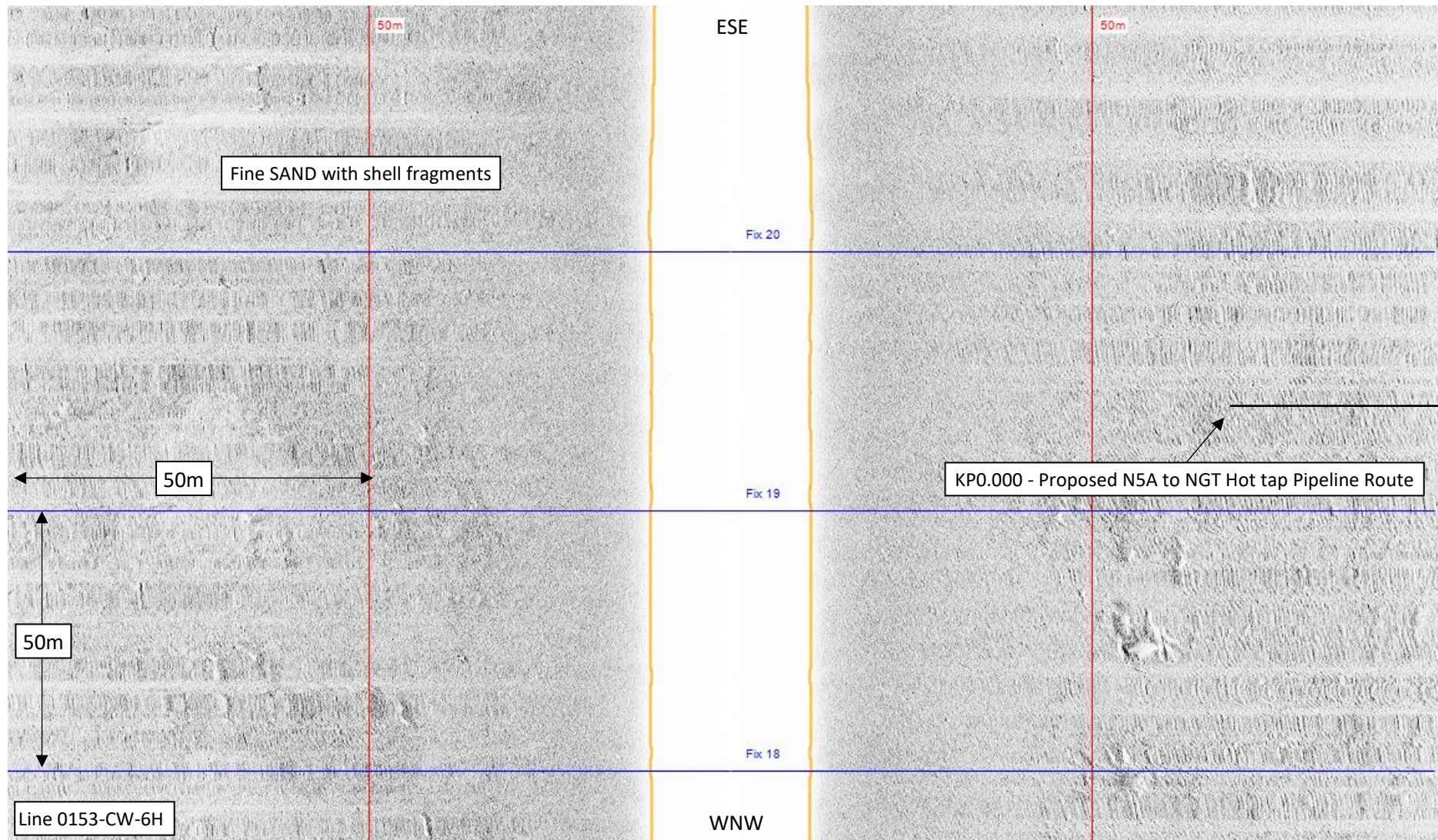


Figure 7. Side scan sonar data example illustrating seabed sediments at KP0.000 of the Proposed N5A to NGT Hot tap pipeline route

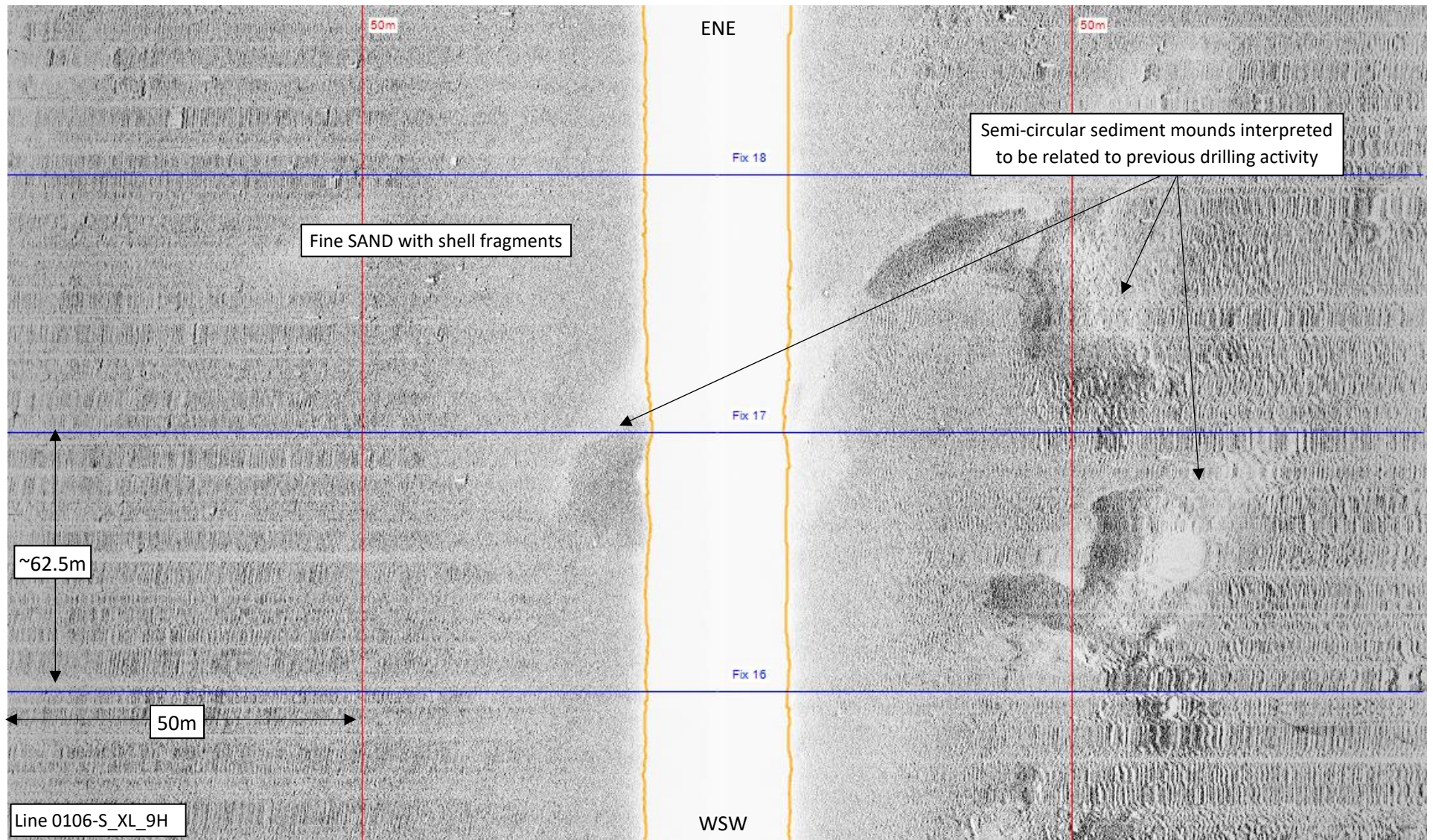


Figure 8. Side scan sonar data example illustrating semi-circular sediment mounds associated to previous drilling activity

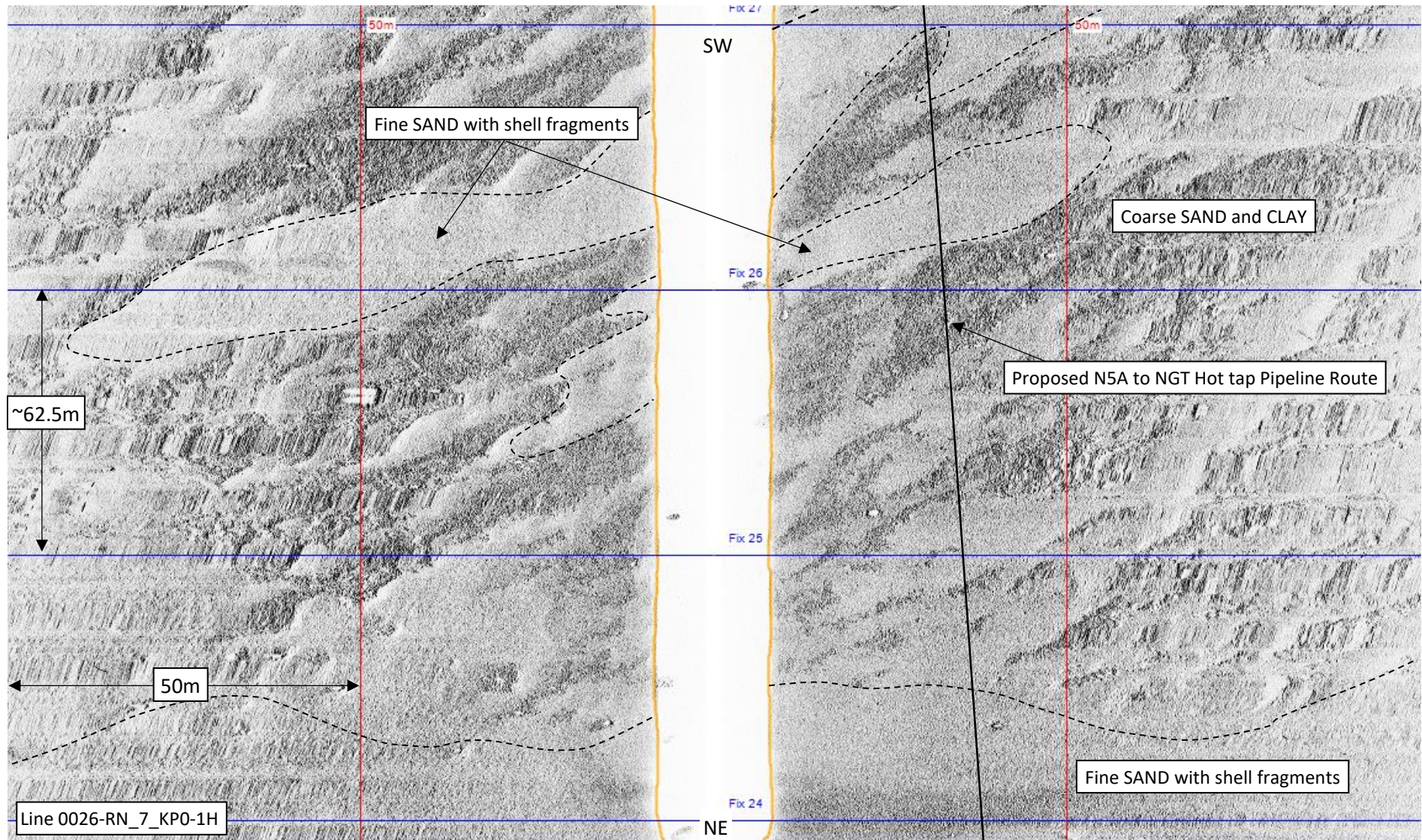


Figure 9. Side scan sonar data example illustrating sediment boundaries within the Proposed N5A to NGT Hot tap pipeline corridor

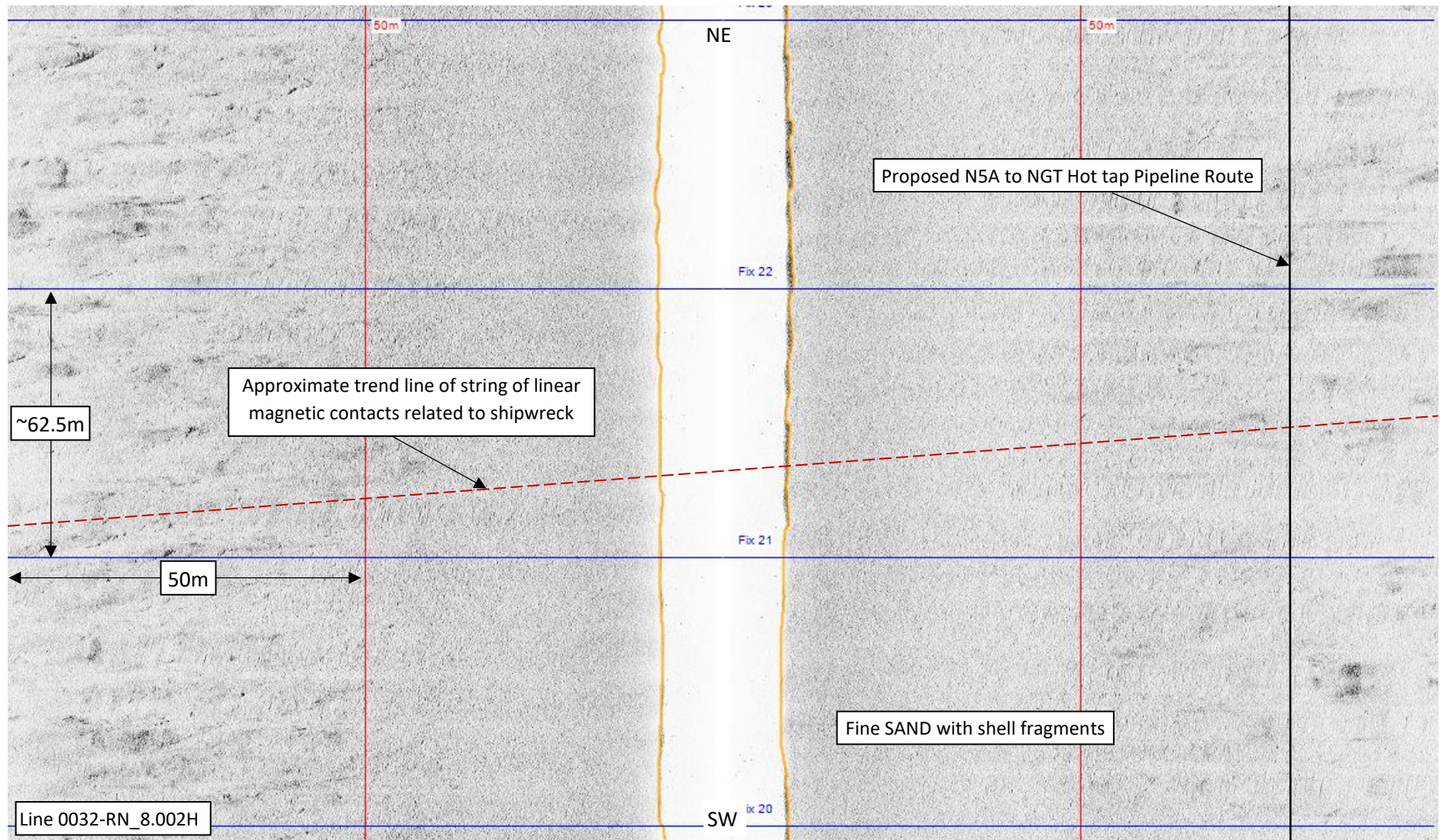


Figure 10. Side scan sonar data example illustrating the position of an expected buried linear infrastructure (Interpreted from magnetometer anomalies detected at this position)

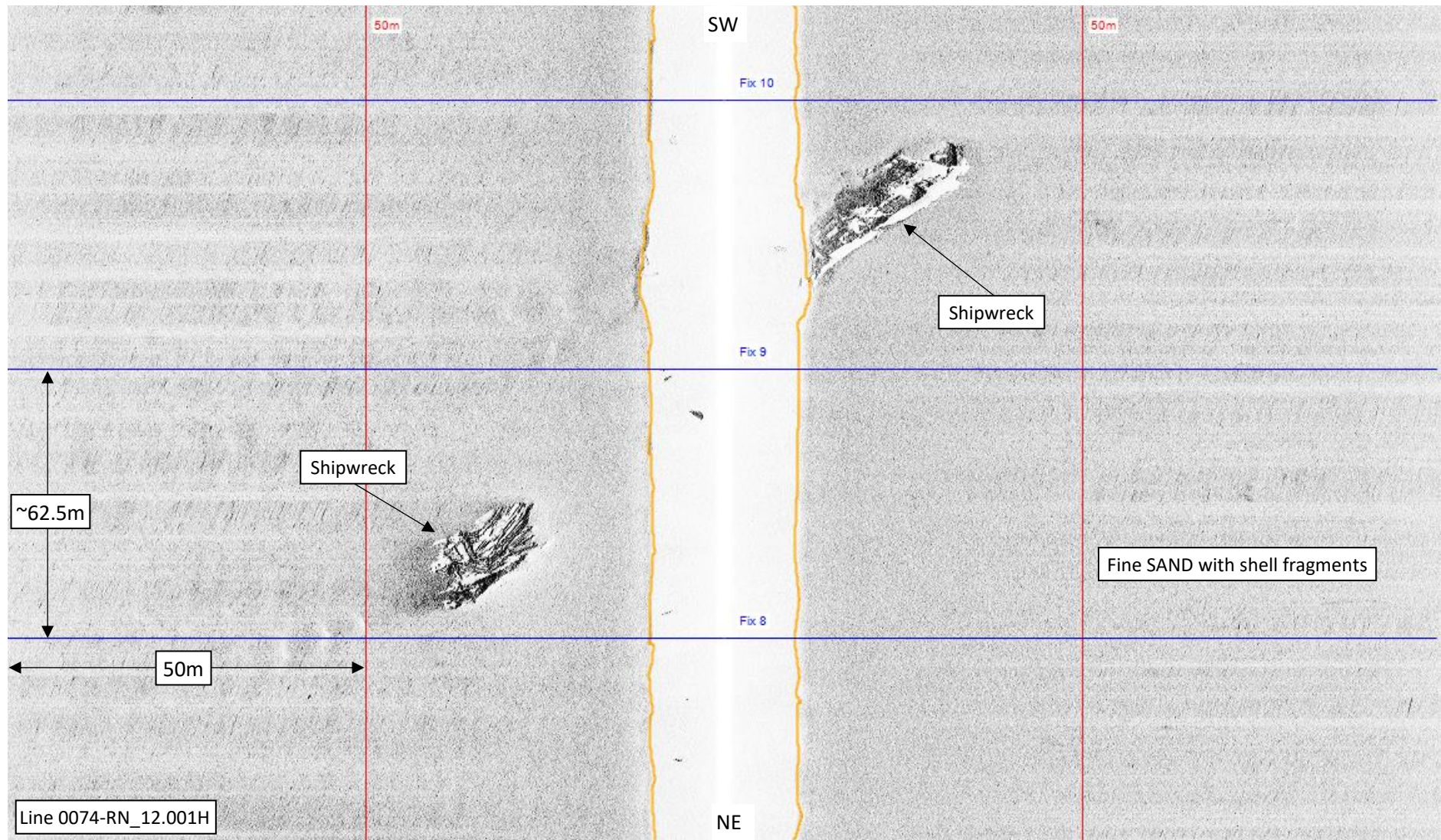


Figure 11. Side scan sonar data example illustrating a ship wreck within the Proposed N5A to NGT Hot tap pipeline corridor

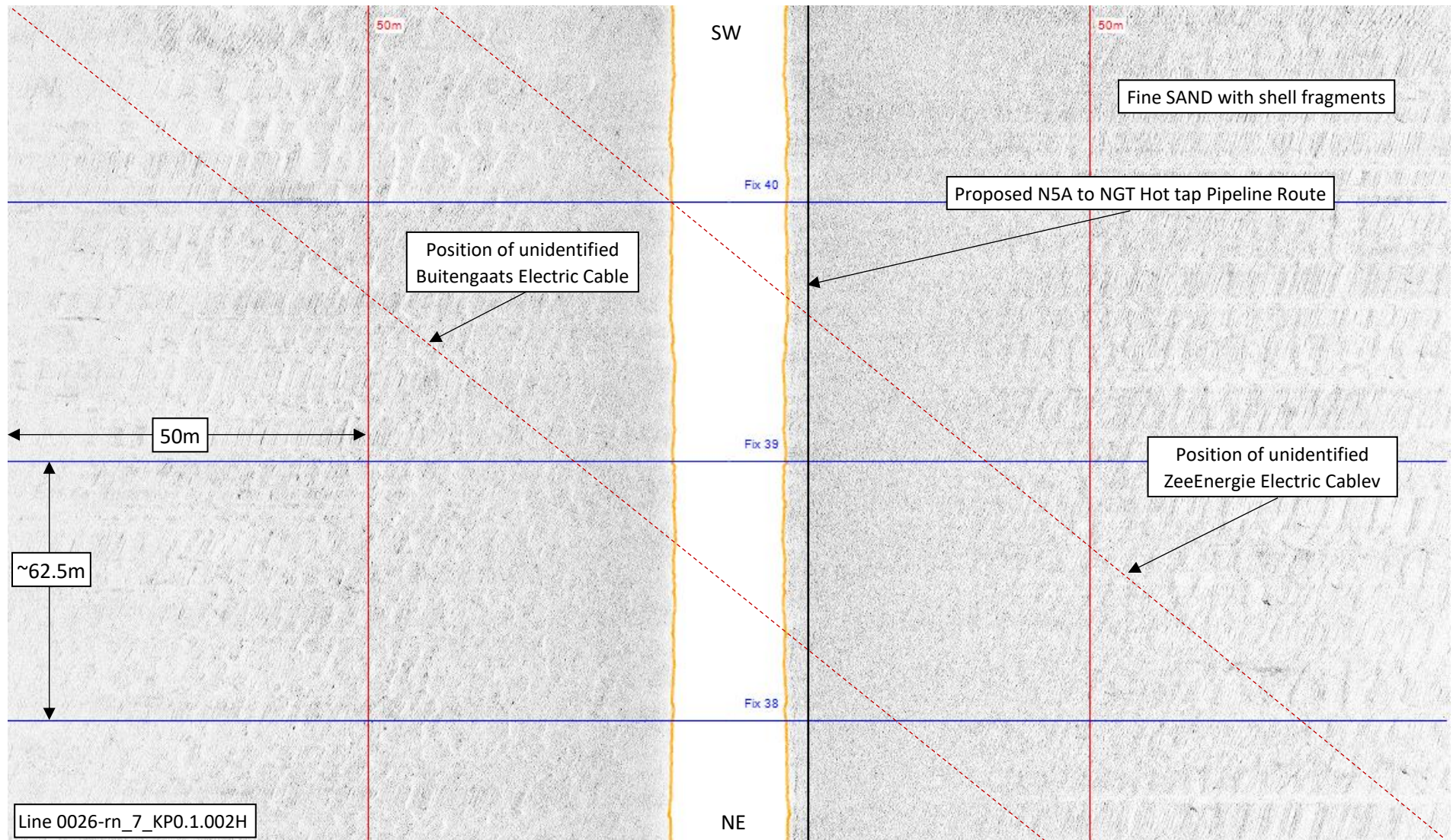


Figure 12. Side scan sonar data example illustrating the position of the existing and unidentified on sonar records Buitengaats and ZeeEnergie Electric cables

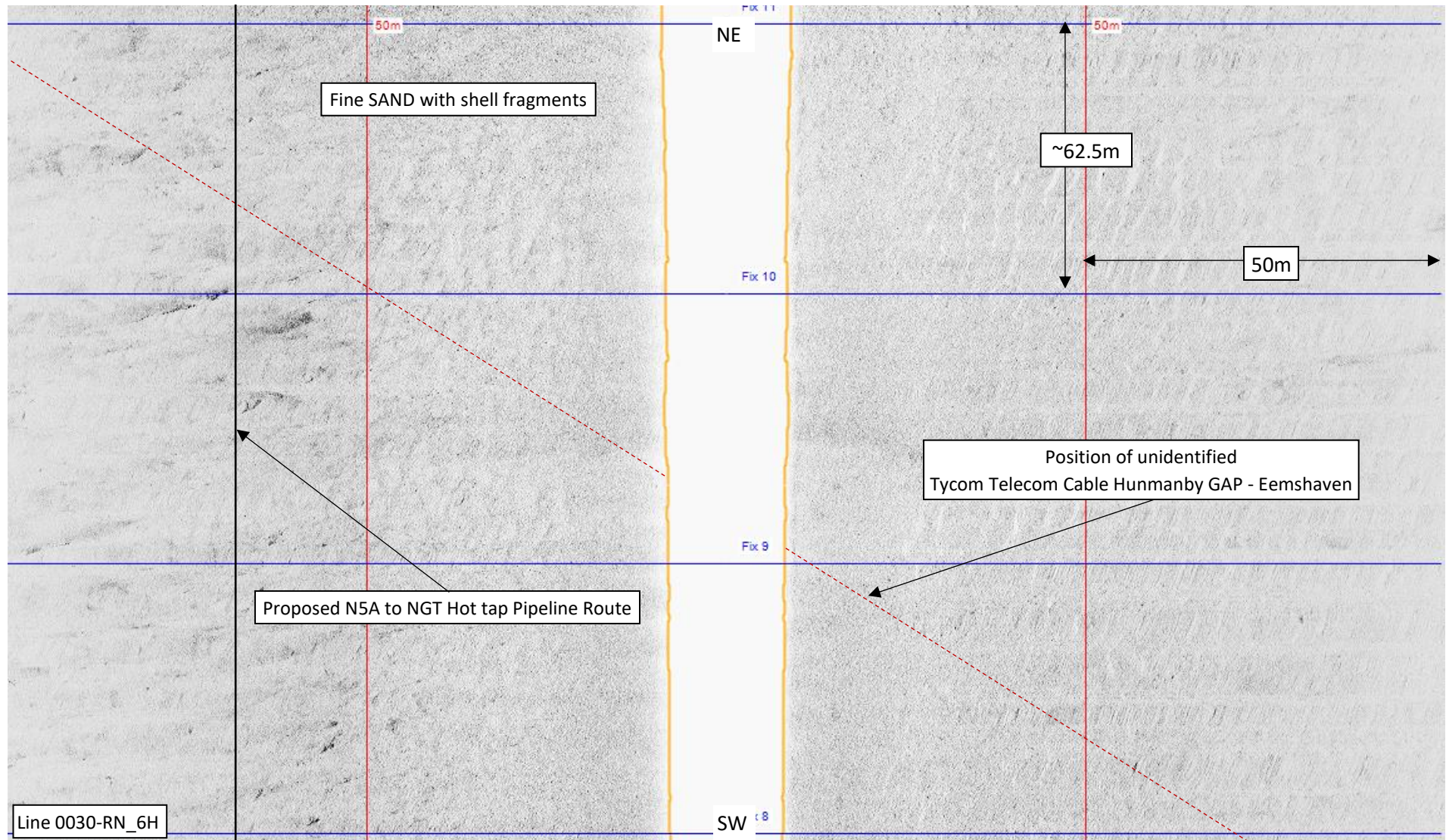


Figure 13. Side scan sonar data example illustrating the position of the existing and unidentified on sonar records Tycom-Telecom Cable Hunmanby GAP-Eemshaven

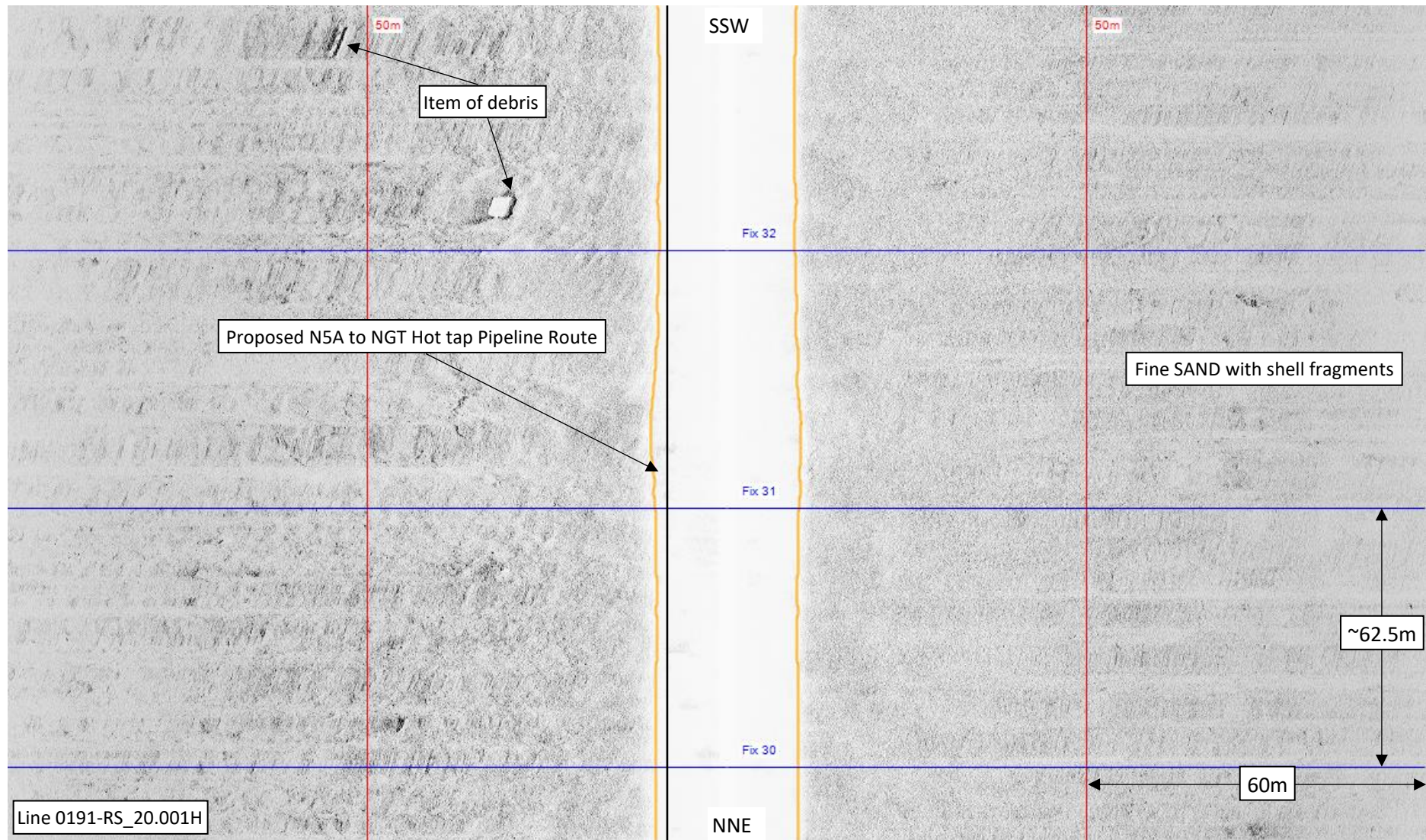


Figure 14. Side scan sonar data example illustrating an area of identified items of debris within the Proposed N5A to NGT Hot tap pipeline corridor

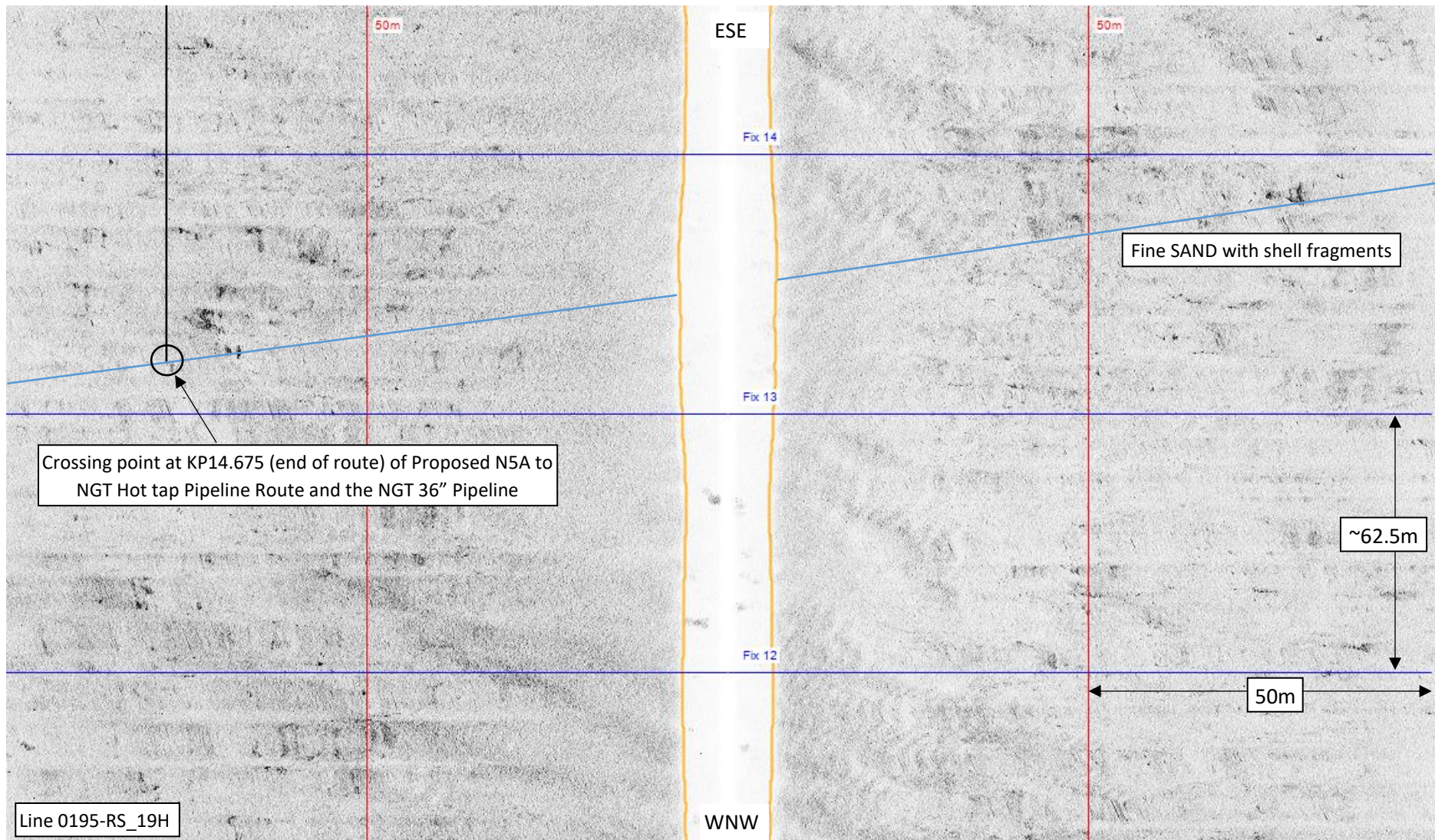


Figure 15. Side scan sonar data example illustrating seabed sediments at KP14.675 of the proposed route and crossing NGT 36" pipeline

4.3 SHALLOW SOILS

Interpretation of the shallow soils is based upon sub-bottom profiler dataset in conjunction with borehole and route-specific vibrocore data, Refs. 2 and 3. A pinger data example illustrating a section of the proposed route is included as Figure 16.

Appendix A shows route specific core logs (Ref. 2).

4.3.1 Surficial SAND (Seabed-H01, 0->10m BSB)

This unit of fine to medium grained SAND generally thickens to the south. It is absent (or less than 0.5m thick) from KP 0.430 to KP 0.450 and KP 0.757 to KP 1.045. South of KP 5.951 the base of the mapped unit becomes indistinct to the point of being unmappable, at this point the unit is approximately 9m thick.

The unit is of greater internal complexity south of KP 2.996, especially from this point to KP 4.611 where the mapped unit forms a bank containing numerous sub-units.

4.3.2 Sub-crop (Seabed/H01 -, 0->10m BSB)

The mapped unit is sub-cropped by a sequence of variable composition. Vibrocore logs show that this sub-crop predominantly comprises silty fine SAND except for the area north of KP 1.246 where the subcrop is more clay prone and is interpreted to be the infill of a broad channel.

Table 8: Summary of vibrocore locations

No.	Vibrocore ID	Easting (m)	Northing (m)	Penetration (m)	Recovery (m)
1	VC_P_0	721 606.6	5 954 650.1	2.2	2.1
2	VC_P_0BIS	721 615.3	5 954 649.3	5.6	5.5
3	VC_P_1	721 299.8	5 953 697.6	2.6	2.6
4	VC_P_1BIS	721 297.5	5 953 699.0	2.8	2.8
5	VC_P_2	720 978.8	5 952 750.1	5.6	5.6
6	VC_P_3	720 664.0	5 951 802.0	5.6	5.4
7	VC_P_4	720 354.2	5 950 851.2	5.8	5.6
8	VC_P_5	720 042.6	5 949 899.0	6.0	5.6
9	VC_P_6	719729.89	5948953.64	5.5	5.5
10	VC_P_7	719415.30	5947998.56	5.7	5.7
11	VC_P_8	719103.52	5947050.26	5.7	5.7
12	VC_P_9	718 856.7	5 945 904.0	5.8	5.5
13	VC_P_10	718 774.4	5 944 909.6	5.8	4.3
14	VC_P_11	718 699.7	5 943 915.2	2.8	2.3
15	VC_P_11BIS	718 697.0	5 943 918.3	5.8	4.7
16	VC_P_12	718 573.6	5 942 705.6	3.5	3.4
17	VC_P_13	718 525.1	5 941 924.0	6.0	5.3
18	VC_P_14	718 448.9	5 940 923.8	5.4	5.4
19	VC_P_15	718 363.9	5 939 924.5	5.5	4.5

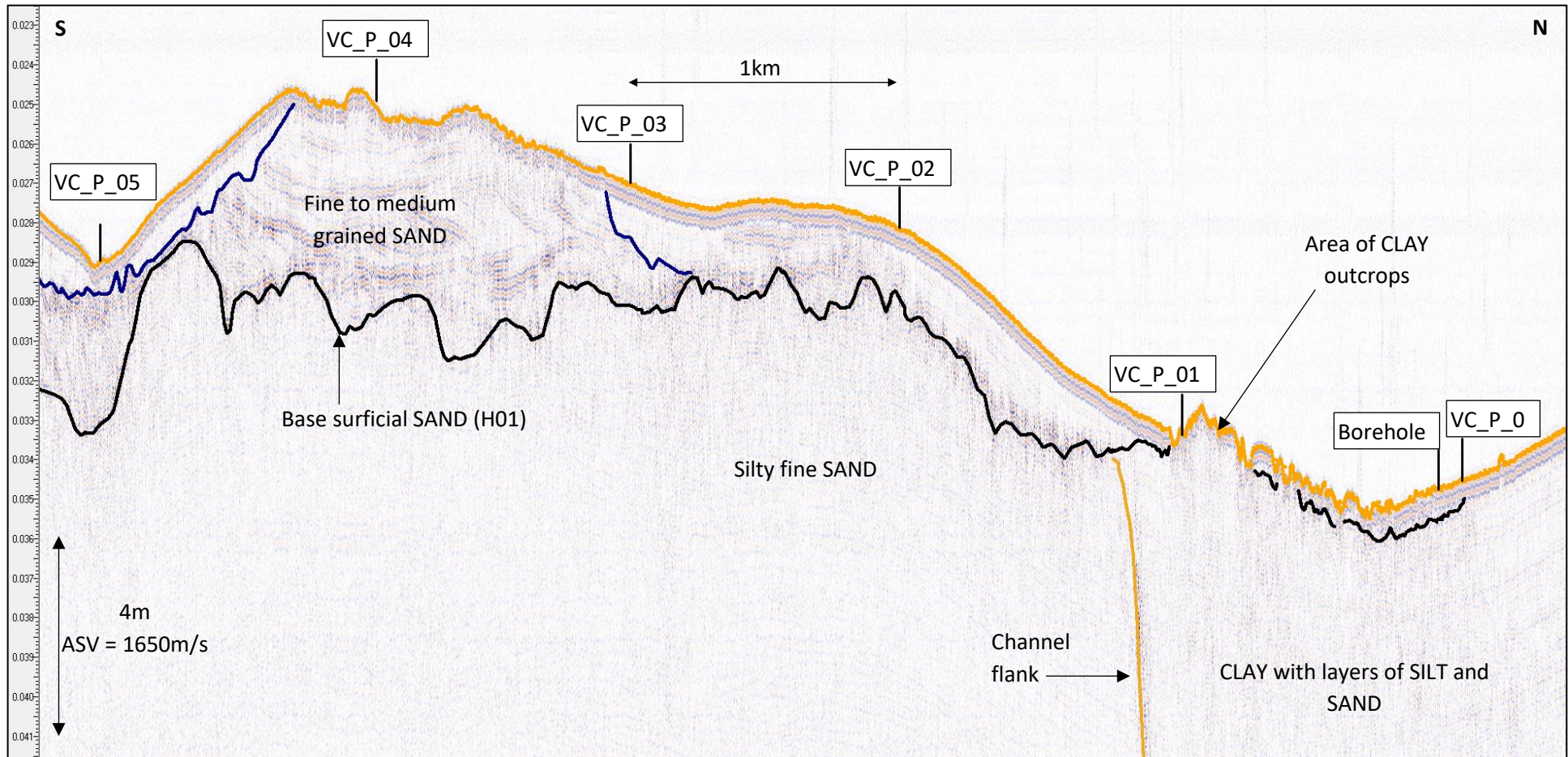


Figure 16. SBP data example north end of the Proposed Route, Line RN_7_KP0-1_PROC

4.3.3 Burial assessment of the NGT 36" pipeline

The NGT 36" pipeline has been observed on pinger data on all lines crossing the database position. The depth of burial of the pipe is interpreted on the pinger records, based on an assumed seismic velocity of 1650m/s to be between 0.2 and 0.8m below seabed. Figure 17 below shows a single diffraction similar to those observed on all lines over the pipeline crossing location.

Table 9: Depth of burial of NGT 36" pipeline

Line Name	Depth of burial (metres)
0270_MBES_Infill_14_PROC	0.49
0196-RS_111_PROC	0.25
0228-RS_45_PROC	0.58
0243_RS_47_PROC	0.41
0230-RS_46_PROC	0.66
0245_RS_48_PROC	0.74
0252_RS_50_PROC	0.49
0255_RS_52_PROC	0.49
0269_RS_51	0.41
0273_RS_42A	0.41
0191-RS_20_PROC	0.20
0221-RS_41_PROC	0.49
0195-RS_19_PROC	0.49
0271_MBES_Infill_12_PROC	0.33
0233-RS_38_PROC	0.58
0231-RS_37_PROC	0.33
0248-RS_36_PROC	0.33
0253_RS_33_PROC	0.58
0266_RS_32_A_PROC	0.49

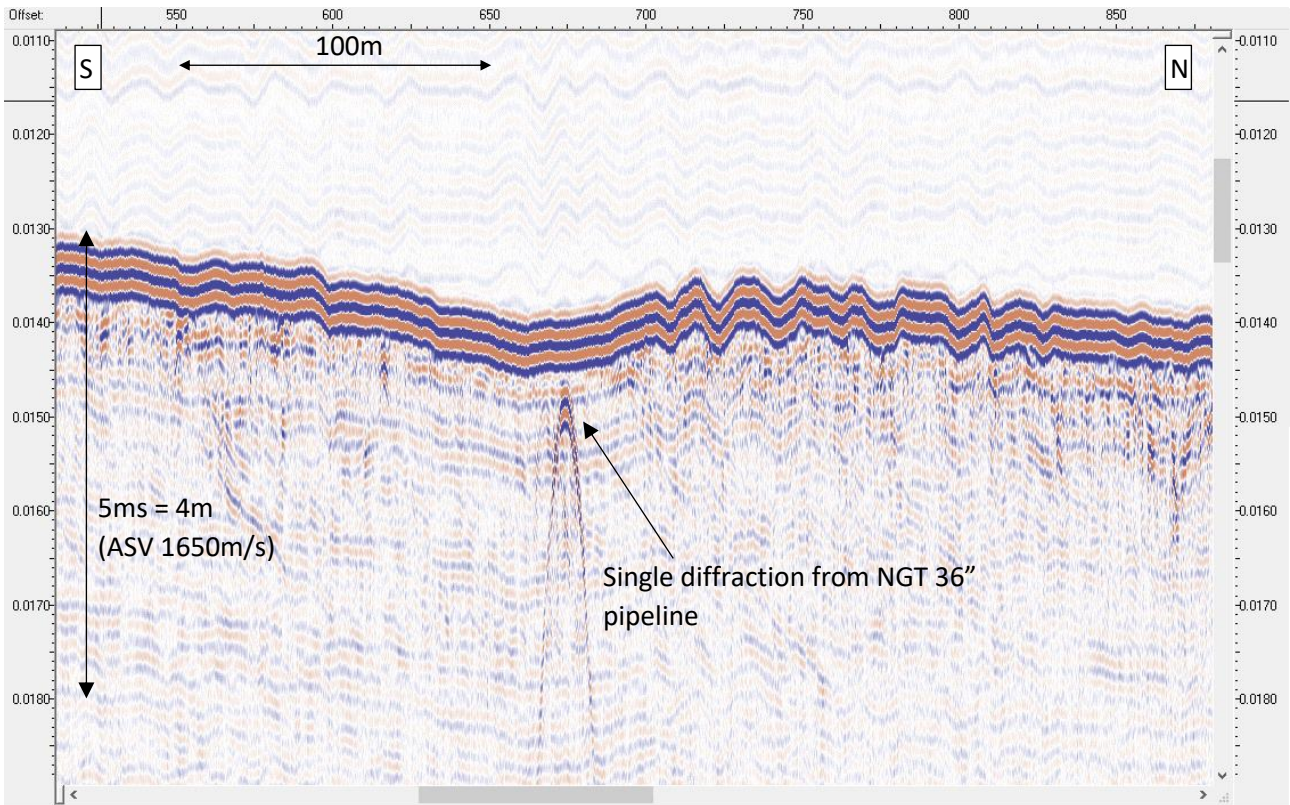


Figure 17. SBP data example illustrating a single diffraction representing the NGT 36" pipeline

APPENDIX A – PRELIMINARY VC RESULTS



POINT: VC_P_0
 COORDINATES (UTM)
 N 5954650.06 m
 E 721606.57 m
 Water depth 28.50 m

START DATE: 7/5/19
 FINISH DATE: 7/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS
					<input checked="" type="checkbox"/> TV <small>Pushed Through</small>	<input type="checkbox"/> PP <small>Pushed Penetration</small>		
		0.00- 0.37: Light yellowish brown (2.5Y 6/4) medium to coarse SAND with rare fine to medium gravel and frequent shell fragments (some of them gravel sized and flat). Clear but not sustained effervescence from HCl.						
		0.37- 0.39: Very dark gray (2.5Y 3/1) CLAY. Clear but not sustained effervescence from HCl.						
		0.39- 0.45: Light yellowish brown (2.5Y 6/4) medium to coarse SAND with rare fine to medium gravel and frequent shell fragments (some of them gravel sized and flat). Clear but not sustained effervescence from HCl.						
		0.45- 0.55: Very dark gray (2.5Y 3/1) CLAY with thinly laminated of gray (2.5Y 5/1) fine sand, with occasional amorphous organic matter. Sustained effervescence from HCl.	VC_P_0.2					
		0.55- 0.77: Dark gray (2.5Y 4/1) fine SAND with occasional medium sand and occasional clay pockets with organic matter, with rare shell fragments. Sustained effervescence from HCl.						
		0.77- 0.91: Gray (2.5Y 5/1) coarse SAND with rare fine gravel. No sustained effervescence from HCl.	S-2					
		0.91- 1.00: Gray (2.5Y 5/1) medium SAND with occasional millimetrical dark gray (2.5Y 4/1) clay layers. Clear but not sustained effervescence from HCl.						
		1.00- 1.18: Gray (2.5Y 5/1) medium SAND with occasional fine gravel thickly laminated with dark gray (2.5Y 4/1) clay with occasional amorphous organic matter. Clear but not sustained effervescence from HCl.						
		1.18- 1.32: Gray (2.5Y 5/1) medium to fine SAND with occasional amorphous organic matter and millimetrical clay layers. Clear but not sustained effervescence from HCl.						
		1.32- 2.10: Very closely fissured thickly laminated black (5Y 2.5/1) CLAY and black (2.5Y 2.5/2) CLAY with occasional millimetrical fine sand pockets highly reactive to HCl. No sustained effervescence from HCl. The discontinuities are horizontal and unpolished with a sustained effervescence from HCl.	VC_P_0.1					
		Bottom at 2.10 m	S-1					

POINT: VC_P_0Bis
 COORDINATES (UTM)
 N 5954649.28 m
 E 721615.25 m
 Water depth 28.50 m

START DATE: 7/5/19
 FINISH DATE: 7/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS	
					<input checked="" type="checkbox"/> TV Pocket Torque	<input type="checkbox"/> PP Pocket Penetration			
		0.00- 0.29: Olive brown (2.5Y 4/4) medium to coarse SAND with rare fine to medium gravel and occasional amorphous organic matter, with frequent shell fragments and polychaetes (specifically Lanice conchilega). Clear but not sustained effervescence from HCl.							
		0.29- 0.50: Very dark gray (2.5Y 3/1) fine SAND with rare fine to medium gravel, with frequent pockets of medium to coarse sands (from the level above) rare clay pockets, occasional fibrous organic matter wood fragments and frequent shell fragments (fine to medium gravel sized). Clear but not sustained effervescence from HCl.	S-6	VC_P_0Bis.6					
		0.50- 0.89: Very dark gray (2.5Y 3/1) medium to coarse SAND with rare fine to medium gravel and rare shell fragments. Clear but not sustained effervescence from HCl.							
1.00		0.89- 1.80: Black (5Y 2.5Y/2) CLAY with thinly bedded fine sand. Not sustained effervescence from HCl, sand with sustained effervescence from HCl. · From 1.25m to 1.45m: clayey SAND.	S-5	VC_P_0Bis.5					
2.00		1.80- 5.50: Very dark grayish brown (2.5Y 3/2) fine SAND with rare clay pockets and occasional amorphous organic matter. Clear but not sustained effervescence from HCl. · From 3.05m to 3.85m: frequent clay pockets.	S-4	VC_P_0Bis.4					
3.00	106		S-3	VC_P_0Bis.3					
4.00			S-2	VC_P_0Bis.2					
5.00			S-1	VC_P_0Bis.1					

Bottom at 5.50 m




POINT: VC_P_1
 COORDINATES (UTM)
 N 5953697.61 m
 E 721299.75 m
 Water depth 27.60 m

START DATE: 7/5/19
 FINISH DATE: 7/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)	REMARKS	DETAILED PHOTOS
		0.00- 0.58: Dark grayish brown (2.5Y 4/2) fine SAND with occasional medium sand with rare clay pockets and occasional fibrous to amorphous organic matter, with frequent shell fragments (some of them fine gravel sized). Clear but not sustained effervescence from HCl.			50 100 150 200		
		0.58- 1.60: Very closely fissured and thickly laminated black (5Y 2.5/1) CLAY and black (2.5Y 2.5/2) CLAY with occasional millimetrical grayish pockets highly reactive to HCl, with rare shell fragments. No sustained effervescence from HCl. The discontinuities are horizontal and unpolished with a sustained effervescence from HCl.	S-3				 
		1.60- 2.60: Very closely fissured and thickly laminated black (5Y 2.5/1) CLAY and black (2.5Y 2.5/2) CLAY with occasional millimetrical grayish pockets highly reactive to HCl. No sustained effervescence from HCl. The discontinuities are horizontal and unpolished with a sustained effervescence from HCl.	S-2				
			VC_P_1.1				

Bottom at 2.60 m

S-1

POINT: VC_P_1Bis
 COORDINATES (UTM)
 N 5953699.04 m
 E 721297.45 m
 Water depth 27.60 m




START DATE: 7/5/19
 FINISH DATE: 7/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)	REMARKS	DETAILED PHOTOS
0.00-0.42		Dark grayish brown (2.5Y 4/2) fine SAND with occasional medium sand with rare clay pockets and rare amorphous organic matter, with occasional shell fragments. Clear but not sustained effervescence from HCl.	VC_P_1Bis.3				
0.42-2.75		Very closely fissured and thickly laminated black (5Y 2.5/1) CLAY and black (2.5Y 2.5/2) CLAY with occasional millimetrical grayish pockets highly reactive to HCl, with rare shell fragments. No sustained effervescence from HCl. The discontinuities are horizontal and unpolished with a sustained effervescence from HCl.	S-3 VC_P_1Bis.2	<input checked="" type="checkbox"/>			
			S-2	<input checked="" type="checkbox"/>			
			VC_P_1Bis.1	<input checked="" type="checkbox"/>			
			S-1	<input checked="" type="checkbox"/>			

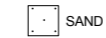
Bottom at 2.75 m

POINT: VC_P_2
 COORDINATES (UTM)
 N 5952750.10 m
 E 720978.79 m
 Water depth 23.50 m

START DATE: 7/5/19
 FINISH DATE: 7/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS	
					TV Pocket Torque	PP Pocket Penetrometer			
		0.00- 0.08: Olive gray (5Y 4/2) fine SAND with occasional shell fragments. Sustained effervescence from HCl.							
		0.08- 0.12: Dark grayish brown (2.5Y 4/2) medium to coarse SAND with frequent shell fragments. Clear but not sustained effervescence from HCl.							
		0.12- 0.15: Olive gray (5Y 4/2) fine SAND with occasional shell fragments. Sustained effervescence from HCl.							
		0.15- 0.23: Dark grayish brown (2.5Y 4/2) medium to coarse SAND with frequent shell fragments. Clear but not sustained effervescence from HCl.	VC_P_2.6						
		0.23- 0.47: Very dark gray (2.5Y 3/1) fine SAND with rare fine gravel, rare millimetrical clay layers and pockets, with occasional shell fragments. Clear but not sustained effervescence from HCl.							
		0.47- 0.63: Dark gray (2.5Y 4/1) medium to coarse SAND with frequent shell fragments. Clear but not sustained effervescence from HCl.	S-6						
		0.63- 3.60: DARK grayish brown (2.5Y 4/2) fine SAND with occasional amorphous organic matter blackish zones and rare shell fragments. No sustained effervescence from HCl.							
		· From 0.80m to 0.95m: rare coarse gravel.							
		· From 2.08m to 2.50m: frequent amorphous organic matter zones and millimetrical layers.	VC_P_2.5						
1.00									
			S-5						
			VC_P_2.4						
2.00									
			S-4						
			VC_P_2.3						
3.00									
			S-3						
		3.60- 4.95: DARK grayish brown (2.5Y 4/2) fine SAND with rare amorphous organic matter blackish zones and rare shell fragments. No sustained effervescence from HCl.							
		· From 4.92m to 4.95: amorfous organic matter blackish layer.	VC_P_2.2						
4.00									
			S-2						
			VC_P_2.1						
5.00									
		4.95- 5.60: DARK grayish brown (2.5Y 4/2) fine SAND with rare amorphous organic matter blackish zones and rare shell fragments. Sustained effervescence from HCl.							
			S-1						
		Bottom at 5.60 m							



POINT: VC_P_3
 COORDINATES (UTM)
 N 5951802.02 m
 E 720663.95 m
 Water depth 22.80 m







START DATE: 7/5/19
 FINISH DATE: 7/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND

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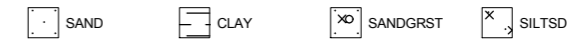
DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS	
					<input checked="" type="checkbox"/> TV Pocket Torque	<input type="checkbox"/> PP Pocket Penetration			
		0.00- 0.35: Dark grayish brown (2.5Y 4/2) fine SAND with frequent amorphous organic matter blackish zones and occasional shell fragments. Clear but not sustained effervescence from HCl.	VC_P_3.6						
		0.35- 0.62: Light yellowish brown (2.5Y 6/4) fine SAND with occasional organic matter pockets and occasional shell fragments. No sustained effervescence from HCl.	S-6						
1.00		0.62- 1.17: Olive gray (5Y 4/2) fine to medium SAND with occasional amorphous organic matter blackish zones and abundant shell fragments. Sand becomes to medium size towards the bottom. Clear but not sustained effervescence from HCl.	VC_P_3.5						
		1.17- 1.28: Dark olive gray (5Y 3/2) coarse SAND with occasional amorphous organic matter blackish zones with frequent shell fragments. No sustained effervescence from HCl.	S-5						
		1.28- 1.39: Very dark gray (5Y 3/1) sandy SILT with occasional shell fragments. Sustained effervescence from HCl.							
		1.39- 1.95: Dark gray (5Y 4/1) fine SAND with occasional clay millimetrical layers and pockets and with rare shell fragments. Sustained effervescence from HCl (Clay with no sustained effervescence from HCl).							
2.00		1.95- 2.45: Dark gray (5Y4/1) slightly silty gravelly fine to medium SAND, gravel is fine to coarse and frequent shell fragments. Clear but not sustained effervescence from HCl.	VC_P_3.4						
		2.45- 3.50: Olive gray (5Y 5/2) fine SAND. Progressively increasing size to medium sand towards the bottom. Mainly quartz. No sustained effervescence from HCl.	S-4						
	106	From 3.45m to 3.50m: Coarse SAND with occasional fine gravel.							
3.00			VC_P_3.3						
			S-3						
4.00		3.50- 4.60: Olive (5Y 4/3) fine SAND with occasional millimetrical silty sand layers and rare amorphous organic matter blackish pockets. No sustained effervescence from HCl.	VC_P_3.2						
			S-2						
5.00		4.60- 5.35: Dark olive gray (5Y 3/2) fine SAND with occasional millimetrical silty sand layers and rare amorphous organic matter blackish pockets. No sustained effervescence from HCl.	VC_P_3.1						
		From 5.30m to 5.35m: frequent amorphous organic matter blackish pockets.							
		Bottom at 5.35 m	S-1						

POINT: VC_P_5
 COORDINATES (UTM)
 N 5949898.99 m
 E 720042.60 m
 Water depth 24.07 m

START DATE: 7/5/19
 FINISH DATE: 7/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

LEGEND



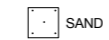
DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS	
					TV Pocket Torque	PP Pocket Penetration			
		0.00- 0.24: Dark olive gray (5Y 3/2) fine SAND with occasional clay pockets and occasional amorphous organic matter spots and frequent shell fragments. Sustained effervescence from HCl.							
		0.24- 0.30: Olive brown (2.5Y 4/1) medium SAND with frequent shell fragmetns. Clear but not sustained effervescence from HCl.							
		0.30- 0.51: Very dark gray (5Y 3/1) fine SAND with frequent clay pockets and layers, with occasional shell fragmetns. Sustained effervescence from HCl (Clay pockets with no sustained effervescence from HCl).	VC_P_5.6						
		0.51- 0.72: Very dark gray (5Y 3/1) CLAY with occasional milimetrical layers of fine sand. No sustained effervescence from HCl.	S-6						
		0.72- 0.84: Grayish brown (2.5Y 6/2) medium SAND with frequent cobbles and occasional amorphous organic matter pockets, with frequent shell fragments. Distinctive smell. Clear but not sustained effervescence from HCl.							
		-From 0.81m to 0.84m: amorphous organic matter layer.							
		0.84- 2.12: Dark gray (5Y 4/1) fine SAND with rare clay pockets and rare shell fragments. Sustained effervescence from HCl.	VC_P_5.5						
			S-5						
		2.12- 3.11: Dark gray (5Y 4/1) fine SAND with frequent clay layers and occasional milimetrical layers of amorphous organic matter. Sustained effervescence from HCl (Clay with no sustained effervescence from HCl)	VC_P_5.4						
			S-4						
		3.11- 3.40: Dark gray (5Y 4/1) fine to medium silty SAND with frequent fine to coarse gravel, with frequent shell fragments. Clear but not sustained effervescence from HCl.	VC_P_5.3						
		3.40- 3.63: Very dark gray (5Y 3/1) sandy SILT, sand is fine with frequent amorphous organic matter. No sustained effervescence from HCl.	S-3						
		3.63- 5.60: Dark olive gray (5Y 3/2) fine SAND with rare fine to medium gravel.	VC_P_5.2						
		-From 4.30m to 5.60m: occasional amorphous organic matter blackish zones.	S-2						
			VC_P_5.1						
			S-1						
		Bottom at 5.60 m							













POINT: VC_P_6
 COORDINATES (UTM)
 N 5948953.64 m
 E 719729.89 m
 Water depth 21.10 m

START DATE: 2/5/19
 FINISH DATE: 2/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS: LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)				REMARKS	DETAILED PHOTOS	
					TV Piston Tube	PP Pocket Penetrometer	50	100			
		0.00- 0.25: Light olive brown (2.5Y 5/3) medium to fine SAND with frequent shell fragments. Sustained effervescence from HCl.									
		0.25- 0.74: Grayish brown (2.5Y 5/2) fine SAND with frequent blackish zones of amorphous organic matter and frequent shell fragments. Clear but not sustained effervescence from HCl. - From 0.69m to 0.71m: zone with black amorfous organic matter spots.	VC_P_6.6								
		0.74- 0.84: Grayish brown (2.5Y 5/2) fine to medium SAND with frequent shell fragments. Clear but not sustained effervescence from HCl.									
		0.84- 1.50: Dark gray (5Y 4/1) fine SAND with rare shell fragments. Sustained effervescence from HCl. - From 1.38m to 1.46m: occasional clay pockets.	VC_P_6.5								
		1.50- 5.50: Dark gray (5Y 4/1) fine SAND with rare clay pockets and rare shell fragments. Sustained effervescence from HCl. - From 3.15m to 3.55m: frequent milimetrical clay layers and pockets.	S-5								
			VC_P_6.4								
			S-4								
			VC_P_6.3								
			S-3								
			VC_P_6.2								
			S-2								
			VC_P_6.1								
			S-1								

Bottom at 5.50 m

106

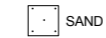
POINT: VC_P_7
 COORDINATES (UTM)
 N 5947998.56 m
 E 719415.30 m
 Water depth 20.86 m







START DATE: 2/5/19
 FINISH DATE: 2/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS	
					TV <small>Pusher Tube</small>	PP <small>Pusher Penetrometer</small>			
		0.00- 0.24: Olive gray (5Y 5/2) fine SAND with rare millimetrical to centimetrical clay pockets and rare shell fragments. Clear but not sustained effervescence from HCl.							
		0.24- 0.51: Gray (5Y 5/1) fine SAND with occasional clay pockets and occasional shell fragments. Clear but not sustained effervescence from HCl.		VC_P_7.6					
		0.51- 0.56: Olive gray (5Y 5/2) fine to medium SAND with frequent shell fragments. Clear but not sustained effervescence from HCl.							
		0.56- 1.86: Dark gray (5Y 4/1) clayey fine SAND with frequent millimetrical to centimetrical clay layers and pockets with rare shell fragments. Distinctive smell. Clear but not sustained effervescence from HCl.	S-6						
		From 1.79m to 1.86m: accumulation of millimetrical clay layers.							
		1.86- 2.08: Gray (5Y 5/1) fine SAND with rare shell fragments. Clear but not sustained effervescence from HCl.		VC_P_7.4					
		2.08- 2.70: Dark gray (5Y 4/1) fine SAND with occasional clay pockets and rare shell fragments. Sustained effervescence from HCl.							
		2.70- 4.80: Light olive gray (5Y 6/2) fine SAND with rare clay millimetrical layers and pockets and rare shell fragments. Distinctive smell. Clear but not sustained effervescence from HCl.	S-4						
		From 3.70 to 4.80: occasional shell fragments							
		4.80- 5.70: Light olive gray (5Y 6/2) fine SAND with occasional clay millimetrical layers and pockets and rare shell fragments. Distinctive smell. Clear but not sustained effervescence from HCl.	S-2						
			S-3						
			VC_P_7.2						
			VC_P_7.3						
			VC_P_7.4						
			VC_P_7.5						
			VC_P_7.6						
			S-6						
			S-5						
			S-4						
			S-3						
			S-2						
			S-1						
		Bottom at 5.70 m							

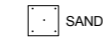
POINT: VC_P_8
 COORDINATES (UTM)
 N 5947050.26 m
 E 719103.52 m
 Water depth 20.20 m







START DATE: 2/5/19
 FINISH DATE: 2/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS	
					TV Pocket Torque	PP Pocket Penetration			
		0.00- 0.29: Light olive brown (2.5Y 5/3) medium SAND with occasional coarse sand, frequent gravel sized shell fragments. No sustained effervescence from HCl.	VC_P_8.6						
		0.29- 1.51: Dark gray (5Y 4/1) fine SAND with clay pockets and occasional shell fragments. Distinctive smell. Sustained effervescence from HCl.	S-6						
		1.51- 1.84: Gray (5Y 6/1) fine SAND with occasional clay pockets and milimetrical to centimetrical layers. Distinctive smell. Clear but not sustained effervescence from HCl	S-5						
		1.84- 3.20: Dark gray (5Y 4/1) fine SAND with occasional clay pockets. Distinctive smell. Sustained effervescence from HCl.	VC_P_8.4						
			S-4						
		3.20- 4.98: Dark gray (5Y 4/1) fine SAND with rare clay pockets and rare shell fragments. Distinctive smell. Sustained effervescence from HCl. · From 4.77m to 4.98m: frequent shell fragments.	VC_P_8.3						
			S-3	VC_P_8.2					
			S-2						
		4.98- 5.70: Very dark gray (5Y 3/1) fine SAND with rare clay pockets and rare shell fragments. Sustained effervescence from HCl. · From 5.48m to 5.61m: frequent clay pockets.	VC_P_8.1						
			S-1						
		Bottom at 5.70 m							

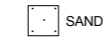
POINT: VC_P_9
 COORDINATES (UTM)
 N 5945904.02 m
 E 718856.66 m
 Water depth 19.30 m







START DATE: 12/5/19
 FINISH DATE: 12/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS	
					TV <small>Pusher Tube</small>	PP <small>Pushed Penetrometer</small>			
		0.00- 0.06: Olive gray (5Y 4/2) fine SAND with rare shell fragments. Sustained effervescence from HCl.							
		0.06- 0.38: Very dark gray (2.5Y 3/1) fine SAND with frequent amorphous organic matter blackish zones and occasional shell fragments (medium sand to fine gravel sized). Sustained effervescence from HCl.	VC_P_9.6						
		0.38- 0.50: Grayish brown (2.5Y 5/2) medium to coarse SAND with frequent shell fragments. Sustained effervescence from HCl.	S-6						
		0.50- 1.50: Gray (2.5Y 5/1) fine SAND with rare clay millimetrical pockets and rare shell fragments. Clear but not sustained effervescence from HCl.	VC_P_9.5						
		1.50- 3.50: Gray (2.5Y 5/1) fine SAND with rare shell fragments. No sustained effervescence from HCl. At 2.99m: millimetrical amorphous organic matter blackish layer.	S-5						
			VC_P_9.4						
			S-4						
			VC_P_9.3						
			S-3						
		3.50- 5.50: Gray (2.5Y 5/1) fine SAND. Clear but not sustained effervescence from HCl.	VC_P_9.2						
			S-2						
			VC_P_9.1						
			S-1						
		Bottom at 5.50 m							

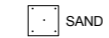
POINT: VC_P_10
 COORDINATES (UTM)
 N 5944909.65 m
 E 718774.37 m
 Water depth 19.60 m

START DATE: 12/5/19
 FINISH DATE: 12/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS	
					TV <small>Pusher Tube</small>	PP <small>Pusher Penetrometer</small>			
0.00-1.72		Dark grayish brown (2.5Y 4/2) to very dark gray (2.5Y 3/1) fine SAND with occasional medium sand with occasional amorphous organic matter blackish zones, and frequent shell fragments (medium sand to medium gravel sized) and polychaetes (specifically Lanice conchilega). Sustained effervescence from HCl. · From 0.45m to 0.70m: rare shell fragments and frequent amorphous organic matter zones. · From 1.17m to 1.50m: rare shell fragments	VC_P_10.5 S-5						
1.72-3.95		Dark gray (5Y 4/1) fine SAND with rare millimetrical clay layers and rare shell fragments. Clear but not sustained effervescence from HCl. · From 3.00m to 3.55m: occasional shell fragments. · From 3.77m to 3.95m: frequent shell fragments.	VC_P_10.4 S-4						
3.95-4.22		Grayish brown (2.5Y 5/2) medium to coarse SAND with rare fibrous wood fragments and frequent shell fragments. Sustained effervescence from HCl.	VC_P_10.3 S-3						
4.22-4.30		Dark gray (5Y 4/1) fine SAND with rare millimetrical clay layers and rare shell fragments. Clear but not sustained effervescence from HCl.	VC_P_10.2 S-2						
4.30-4.30		Bottom at 4.30 m	VC_P_10.1 S-1						

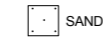
POINT: VC_P_11
 COORDINATES (UTM)
 N 5943915.24 m
 E 718699.71 m
 Water depth 16.70 m

START DATE: 11/5/19
 FINISH DATE: 11/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)				REMARKS	DETAILED PHOTOS	
					<input checked="" type="checkbox"/> TV <small>Pushed Through</small>	<input type="checkbox"/> PP <small>Pushed Penetration</small>	50	100			150
0.00 0.50 1.00 2.00		0.00- 0.03: Dark grayish brown (2.5Y 4/2) fine SAND with frequent shell fragments (some of them fine to medium gravel sized). Clear but not sustained effervescence from HCl.	S-3	VC_P_11.3							
		0.03- 0.58: Very dark gray (2.5Y 3/1) fine SAND with frequent amorphous organic matter zones and frequent shell fragments (some of them fine to medium gravel sized). Clear but not sustained effervescence from HCl. From 0.45m to 0.58m: occasional clay pockets.									
		0.58- 0.69: Light olive brown (2.5Y 5/3) fine SAND with frequent shell fragments (some of them medium gravel sized). Sustained effervescence from HCl.	S-2	VC_P_11.2							
		0.69- 0.88: Gray (2.5Y 5/1) fine SAND with rare fibrous wood fragments and occasional shell fragments. Sustained effervescence from HCl.									
		0.88- 1.09: Gray (2.5Y 5/1) fine SAND with occasional medium sand with frequent shell fragments (some of them medium sand to medium gravel sized). Sustained effervescence from HCl.	S-1	VC_P_11.1							
		1.09- 2.30: Gray (2.5Y 5/1) fine SAND with rare shell fragments. Sustained effervescence from HCl.									

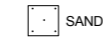
Bottom at 2.30 m

POINT: VC_P_11BIS
 COORDINATES (UTM)
 N 5943918.27 m
 E 718696.95 m
 Water depth 16.70 m

START DATE: 11/5/19
 FINISH DATE: 11/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore REMARKS:
 DRILLER: JC
 ASSISTANT: MC

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS	
					TV Piston Tube	PP Piston Penetrometer			
		0.00- 0.22: Dark grayish brown (2.5Y 4/2) fine SAND with frequent shell fragments (some of them medium gravel sized). Clear but not sustained effervescence from HCl.	VC_P_11Bis.5						
		0.22- 0.25: Black (2.5Y 2.5/1) fine SAND with frequent amorphous organic matter. Clear but not sustained effervescence from HCl.							
		0.25- 1.45: Dark gray (2.5Y 4/1) fine SAND with occasional amorphous organic matter and occasional shell fragments (medium sand to medium gravel sized). Sustained effervescence from HCl.							
		From 0.70m to 1.45m: frequent shell fragments (medium gravel sized).	S-5						
			VC_P_11Bis.4						
		1.45- 3.51: Gray (2.5Y 5/1) fine SAND with rare amorphous organic matter millimetrical spots and rare shell fragments (medium gravel sized). Sustained effervescence from HCl.	S-4						
			VC_P_11Bis.3						
			S-3						
		3.51- 3.73: Gray (2.5Y 5/1) fine SAND with occasional clay pockets and millimetrical layers and frequent shell fragments (medium sand to medium gravel sized). Sustained effervescence from HCl.	VC_P_11Bis.2						
		3.73- 4.70: Gray (2.5Y 5/1) fine SAND with rare millimetrical clay pockets, rare amorphous organic matter spots and rare shell fragments. Sustained effervescence from HCl.	S-2						
		From 4.67m to 4.70m: frequent fibrous to pseudo fibrous wood fragments and frequent shell fragments (medium gravel sized).	VC_P_11Bis.1						
			S-1						
		Bottom at 4.70 m							

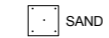
POINT: VC_P_12
 COORDINATES (UTM)
 N 5942705.61 m
 E 718573.63 m
 Water depth 15.70 m





START DATE: 11/5/19
 FINISH DATE: 11/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS
					<input checked="" type="checkbox"/> TV <small>Pushed Through</small>	<input type="checkbox"/> PP <small>Pushed Penetration</small>		
		0.00- 0.18: Olive brown (2.5Y 4/3) medium SAND with frequent shell fragments (some of them coarse gravel sized). Sustained effervescence from HCl.		VC_P_12.4				
		0.18- 0.40: Very dark gray (2.5Y 3/1) fine SAND with occasional clay millimetrical pockets, frequent amorphous organic matter and occasional shell fragments. Sustained effervescence from HCl.						
		0.40- 0.90: Light olive brown (2.5Y 5/3) fine SAND with occasional shell fragments. Sustained effervescence from HCl.	S-4					
		-From 0.80m to 0.90m: frequent amorphous organic matter.						
1.00		0.90- 3.40: Dark gray (2.5Y 4/2) fine SAND with rare clay pockets and rare shell fragments. Sustained effervescence from HCl.		VC_P_12.3				
			S-3					
2.00	106			VC_P_12.2				
			S-2					
3.00				VC_P_12.1				
			S-1					

Bottom at 3.40 m

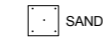
POINT: VC_P_13
 COORDINATES (UTM)
 N 5941924.00 m
 E 718525.07 m
 Water depth 15.90 m

START DATE: 11/5/19
 FINISH DATE: 11/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)		REMARKS	DETAILED PHOTOS	
					TV Pocket Torque	PP Pocket Penetration			
		0.00- 0.30: Dark grayish brown (2.5Y 4/2) fine SAND with frequent amorphous organic matter zones and occasional shell fragments. Sustained effervescence from HCl.		VC_P_13.6					
		0.30- 0.70: Dark grayish brown (2.5Y 4/2) fine SAND with rare millimetrical amorphous organic matter layers and occasional shell fragments. Sustained effervescence from HCl. · From 0.55m to 0.70m: frequent shell fragments.	S-6						
		0.70- 1.30: Black (2.5Y 2.5/1) fine SAND. Sustained effervescence from HCl.		VC_P_13.5					
		1.30- 4.80: Gray (2.5Y 5/1) fine SAND with rare amorphous millimetrical organic matter spots and rare shell fragments (some of them medium sand sized). Sustained effervescence from HCl. · From 4.10m to 4.30m: Rare clay pockets.	S-5						
				VC_P_13.4					
			S-4						
				VC_P_13.3					
			S-3						
				VC_P_13.2					
			S-2						
		4.80- 5.30: Gray (2.5Y 5/1) fine SAND with rare clay pockets and frequent shell fragments. Sustained effervescence from HCl.		VC_P_13.1					
			S-1						

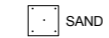
Bottom at 5.30 m

POINT: VC_P_14
 COORDINATES (UTM)
 N 5940923.80 m
 E 718448.90 m
 Water depth 14.00 m

START DATE: 11/5/19
 FINISH DATE: 11/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore REMARKS:
 DRILLER: JC
 ASSISTANT: MC

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)				REMARKS	DETAILED PHOTOS	
					TV <small>Pusher Tube</small>	PP <small>Pusher Penetrometer</small>	50	100		150	200
0.00 1.00 2.00 3.00 4.00 5.00		0.00- 0.27: Dark grayish brown (2.5Y 4/2) fine to medium SAND with frequent gravel sized shell fragments. Distinctive smell. Clear but not sustained effervescence from HCl. From 0.16m to 0.27m: frequent amorphous organic matter blackish zones.	VC_P_14.6	S-6							
		0.27- 0.50: Very dark gray (5Y 3/1) fine to medium SAND with occasional amorphous organic matter blackish zones and frequent shell fragments. Sustained effervescence from HCl.	VC_P_14.5								
		0.50- 1.10: Olive gray (5Y 5/2) fine SAND with frequent shell fragments (some of them gravel sized). Sustained effervescence from HCl.									
		1.10- 2.40: Gray (2.5Y 5/1) fine SAND with occasional shell fragments (medium sand sized). Sustained effervescence from HCl.	VC_P_14.4								
		2.40- 3.92: Gray (2.5Y 5/1) fine SAND with rare millimetrical clay pockets and occasional shell fragments (medium sand sized). Sustained effervescence from HCl. From 3.17m to 3.30m: frequent millimetrical to centimetrical silty clay layers. From 3.60m to 3.70m: frequent millimetrical to centimetrical clay layers. From 3.70m to 3.75m: occasional amorphous organic matter pockets.	VC_P_14.3								
		3.92- 5.40: Gray (2.5Y 5/1) medium to coarse SAND with frequent shell fragments (gravel sized). Sustained effervescence from HCl.	VC_P_14.2								
			VC_P_14.1	S-2							
				S-3							
				S-4							
				S-5							
				S-6							
				S-1							



Bottom at 5.40 m

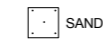
POINT: VC_P_15
 COORDINATES (UTM)
 N 5939924.51 m
 E 718363.89 m
 Water depth 11.60 m

START DATE: 11/5/19
 FINISH DATE: 11/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

REMARKS:

LEGEND



DEPTH (m BGL)	GRAPHIC LOG C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	Selected SAMPLES for laboratory tests	Undrained Shear Strength Su (kPa)				REMARKS	DETAILED PHOTOS
					TV <small>Pusher Tube</small>	PP <small>Pusher Penetrometer</small>	50	100		
		0.00- 0.28: Gray (2.5Y 5/1) fine to medium SAND with frequent shell fragments (fine to medium gravel sized). Clear but not sustained effervescence from HCl. From 0.22m to 0.28m: medium to coarse SAND. 0.28- 0.87: Gray (2.5Y 5/1) fine SAND with occasional shell fragments (medium sand to medium gravel sized). Sustained effervescence from HCl.	VC_P_15.5							
			S-5							
1.00		0.87- 4.50: Gray (2.5Y 5/1) fine SAND with rare clay pockets, rare amorphous organic matter blackish zones and rare shell fragments. Sustained effervescence from HCl.	VC_P_15.4							
			S-4							
2.00	106		VC_P_15.3							
			S-3							
3.00			VC_P_15.2							
			S-2							
4.00			VC_P_15.1							
			S-1							

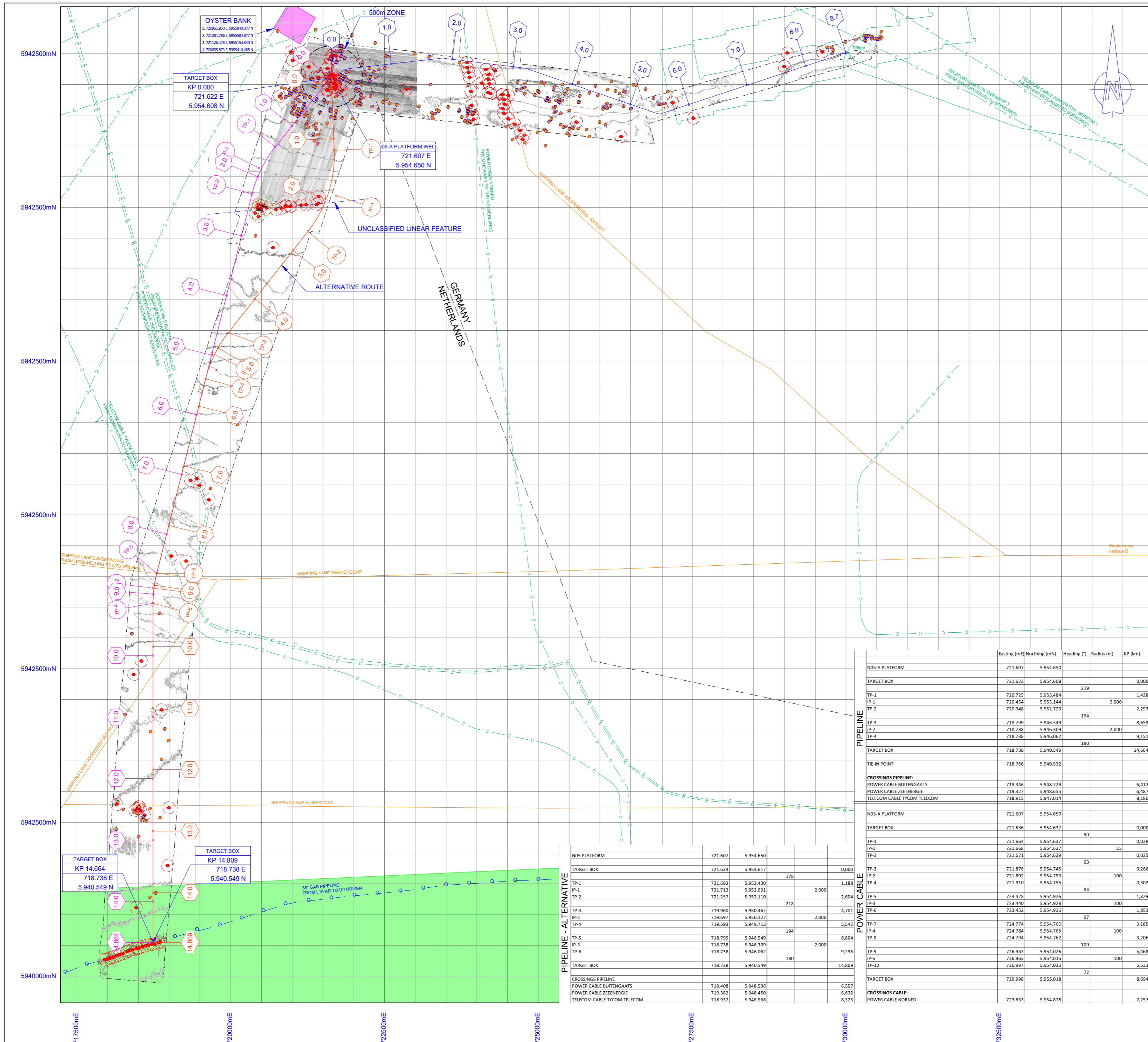


Bottom at 4.50 m

APPENDIX B – CHARTING

Table 10: List of charts

Chart No.	Chart type	Filename
01	Alignment Chart 1 of 4	N05A-7-50-0-72009-01
02	Alignment Chart 2 of 4	N05A-7-50-0-72010-01
03	Alignment Chart 3 of 4	N05A-7-50-0-72011-01
04	Alignment Chart 4 of 4	N05A-7-50-0-72012-01



REFERENCES

N05A-7-50-0-72018-01/06 Pipeline alignment sheet - Buried / Unburied option - sheet 01-06
 N05A-7-50-0-72019-01 Approach drawing @ N05A
 N05A-7-10-0-70032-01 Approach drawing @ NGT

GEOxyz
 LU0022H-553_A1_1905_UTM31-ED50_LAT_MB_#0.5
 LU0022H-553_A2_1905_UTM31-ED50_LAT_MB_#0.5 + EXTRA POLYGON
 LU0022H-553_A3_1905_UTM31-ED50_LAT_MB_#0.5 + EXTRA POLYGON
 LU0022H-553_A4_1905_UTM31-ED50_LAT_MB_#0.5
 LU0022H-553_A5_1905_UTM31-ED50_LAT_MB_#0.5

- LEGEND**
- GENERAL**
- 1.0 KILOMETER MARKER
 - PIPELINE: N05A - NGT
 - CABLE: N05A - RIFFGAT
 - BOUNDARY OF SURVEY AREA
 - EXISTING PIPELINE
 - EXISTING CABLE
 - SHIPPING LANE RIJKSWATERSTAAT
 - ROCKDUMP
 - NATURA2000
 - OYSTERBANK
- BATHYMETRY AND SEABED FEATURES**
- 0.5 CONTOUR LINE AT 1m INTERVAL
 - LvWh SONAR CONTACT
 - LvWh DEPRESSION
 - LvWh MOUND
 - AS-FOUND WELLHEAD
 - CP105 CONE PENETRATION TEST
 - VC05 VIBRE CORE
 - 65mT MAGNETIC ANOMALY
 - WRECK

GEODETTIC PARAMETERS

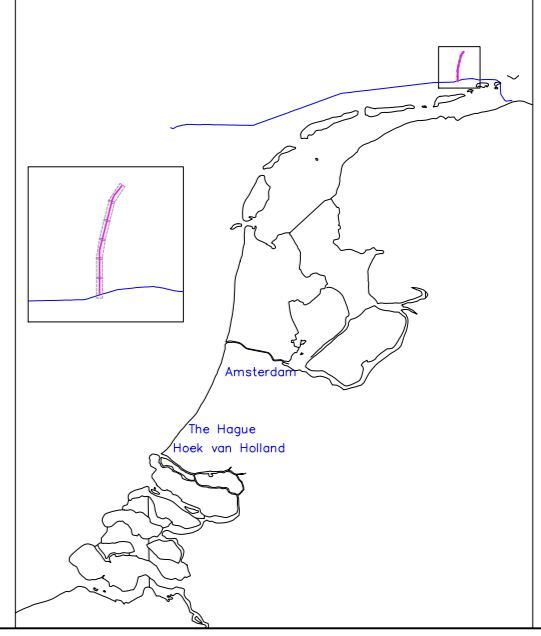
PROJECTED CRS: ED50/UTM zone 31N (EPSG: 23031)

Horizontal Datum Name: European Datum 1950 North Sea -UKCS
 Projection Name: Universal Transverse Mercator

Ellipsoid: International 1924 (Hayford 1909)
 Semi major axis a = 6 378 388.000
 Semi minor axis b = 6 356 911.946
 Inverse ELLatening 1/f = 297.000
 Eccentricity squared e = 0.006 722 670

Zone : = North 31
 Central meridian : = 3° East
 Latitude of origin : = Equator
 False Easting : = 500 000.00 m
 False Northing : = 0.00 m
 Scale factor on C.M.: = 0.999 6

WGS84 to ED50 TRANSFORMATION: UKOAA (EPSG: 1311)



KEYPLAN

Rev	Date	Description	Drawn	Eng.	Check	Appr.	Client
06	03-04-2020	ALTERNATIVE PIPELINE ROUTE	Svdv	-	PF	PF	
05	04-02-2020	CLIENT COMMENTS INCORPORATED	Svdv	-	PF	PF	
04	18-12-2019	CLIENT COMMENTS INCORPORATED	Svdv	-	PF	PF	
03	06-12-2019	FOR COMMENTS	Svdv	-	PF	PF	
02	20-11-2019	REROUTING OF PIPELINE & CABLE	Svdv	-	-	-	

enersea
 Jan Evertsenweg 12
 3115 JA Schiedam
 The Netherlands
 +31(0) 103132100
 info@enersea.nl

Client
ONEDyas B.V.

Project
N05-A TO NGT PIPELINE

Document
Pipeline Route Overall Field Layout

one dyas

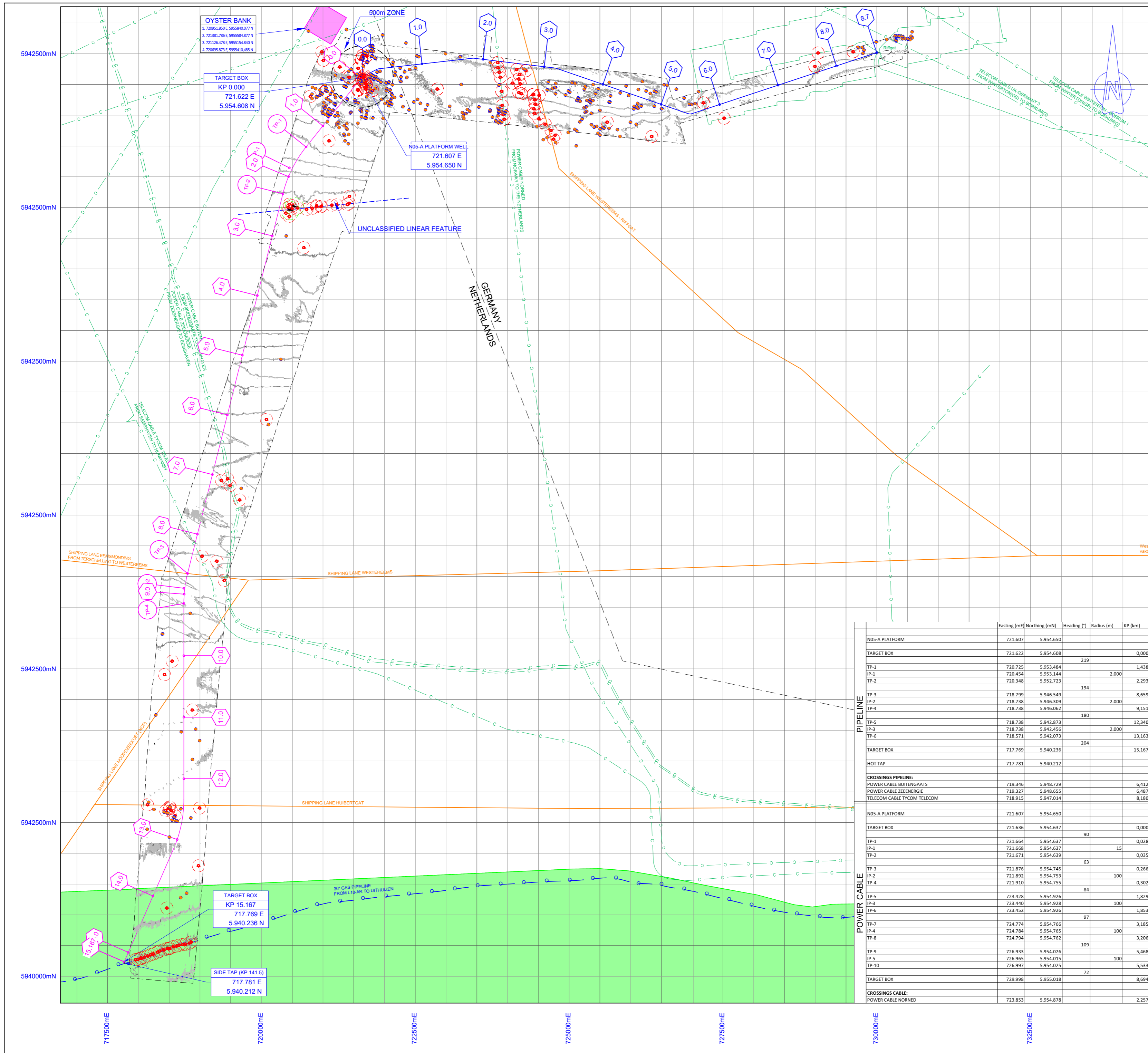
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Project number: 19018
 Document Number: N05A-7-51-0-72510-01

	Eastings (mE)	Northings (mN)	Heading (°)	Radius (m)	KP (km)
N05-A PLATFORM	721.607	5.954.650			
TARGET BOX	721.622	5.954.608			0,000
TP-1	720.725	5.953.484	219		1,438
IP-1	720.454	5.953.144		2,000	2,293
TP-2	720.348	5.952.723			
TP-3	718.799	5.946.549	194		8,659
IP-2	718.738	5.946.309		2,000	9,151
TP-4	718.738	5.946.062			
TARGET BOX	718.738	5.940.549		180	14,664
TIE-IN POINT	718.766	5.940.532			
CROSSINGS PIPELINE:					
POWER CABLE BUITENGAATS	719.346	5.948.729			6,412
POWER CABLE ZEEENERGIE	719.327	5.948.655			6,487
TELECOM CABLE TYCOM TELECOM	718.915	5.947.014			8,180
N05-A PLATFORM	721.607	5.954.650			
TARGET BOX	721.636	5.954.637			0,000
TP-1	721.664	5.954.637	90		0,028
IP-1	721.668	5.954.637		15	0,035
TP-2	721.671	5.954.639		63	
TP-3	721.876	5.954.745		100	0,266
IP-2	721.892	5.954.753		84	0,302
TP-4	721.910	5.954.755			
TP-5	723.428	5.954.926		100	1,829
IP-3	723.440	5.954.928		100	1,853
TP-6	723.452	5.954.926			
TP-7	724.774	5.954.766	97		3,185
IP-4	724.784	5.954.765		100	3,206
TP-8	724.794	5.954.762			
TP-9	726.933	5.954.026	109		5,468
IP-5	726.965	5.954.015		100	5,533
TP-10	726.997	5.954.025			
TARGET BOX	729.998	5.955.018	72		8,694
CROSSINGS CABLE:					
POWER CABLE NORRD	723.853	5.954.878			2,257

PIPELINE - ALTERNATIVE

	Eastings (mE)	Northings (mN)	Heading (°)	Radius (m)	KP (km)
N05 PLATFORM	721.607	5.954.650			
TARGET BOX	721.634	5.954.617			0,000
TP-1	721.683	5.953.430	178		1,188
IP-1	721.713	5.952.691		2,000	2,604
TP-2	721.257	5.952.110			
TP-3	719.960	5.950.462	218		4,701
IP-2	719.697	5.950.127		2,000	5,542
TP-4	719.593	5.949.713			
TP-5	718.960	5.950.462	194		8,804
IP-3	718.738	5.946.309		2,000	9,296
TP-6	718.738	5.946.062			
TARGET BOX	718.738	5.940.549		180	14,809
CROSSINGS PIPELINE:					
POWER CABLE BUITENGAATS	719.408	5.948.536			6,557
POWER CABLE ZEEENERGIE	719.382	5.948.450			6,632
TELECOM CABLE TYCOM TELECOM	718.937	5.946.968			8,325



REFERENCES

N05A-7-50-0-72018-01/06 Pipeline alignment sheet - Buried / Unburied option - sheet 01-06
 N05A-7-50-0-72019-01 Approach drawing @ N05A
 N05A-7-10-0-70032-01 Approach drawing @ NGT

Geoxyz
 LU0022H-553_A1_1905_UTM31-ED50_LAT_MB_#0.5
 LU0022H-553_A2_1905_UTM31-ED50_LAT_MB_#0.5 + EXTRA POLYGON
 LU0022H-553_A3_1905_UTM31-ED50_LAT_MB_#0.5 + EXTRA POLYGON
 LU0022H-553_A4_1905_UTM31-ED50_LAT_MB_#0.5
 LU0022H-553_A5_1905_UTM31-ED50_LAT_MB_#0.5

LEGEND

- GENERAL**
- 1.0 KILOMETER MARKER
 - PIPELINE: N05A - NGT
 - CABLE: N05A - RIFFGAT
 - BOUNDARY OF SURVEY AREA
 - EXISTING PIPELINE
 - EXISTING CABLE
 - SHIPPING LANE RIJKSWATERSTAAT
 - ROCKDUMP
 - NATURA2000
 - OYSTERBANK
- BATHYMETRY AND SEABED FEATURES**
- 0.5 CONTOUR LINE AT 1m INTERVAL
 - LvWh SONAR CONTACT
 - LvWh DEPRESSION
 - LvWh MOUND
 - AS-FOUND WELLHEAD
 - CP105 CONE PENETRATION TEST
 - VC05 VIBRE CORE
 - 65mT MAGNETIC ANOMALY
 - WRECK

GEODETTIC PARAMETERS

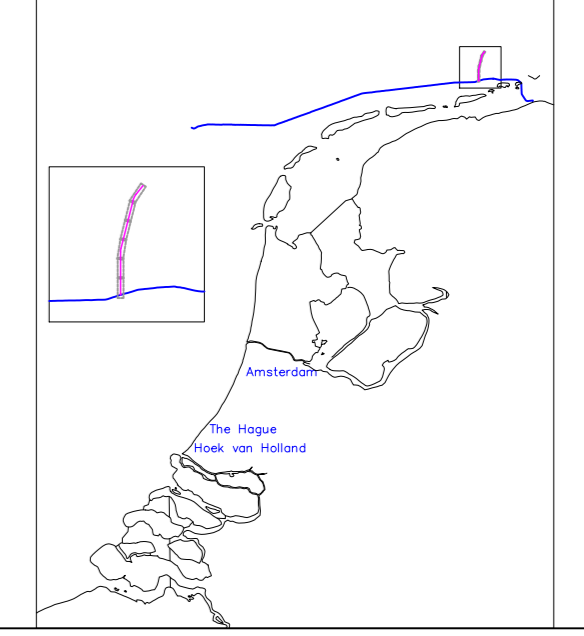
PROJECTED CRS: ED50/UTM zone 31N (EPSG: 23031)

Horizontal Datum Name: European Datum 1950 North Sea -UKCS
 Projection Name: Universal Transverse Mercator

Ellipsoid: International 1924 (Hayford 1909)
 Semi major axis a = 6 378 388.000
 Semi minor axis b = 6 356 911.946
 Inverse Ellattening 1/f = 297.000
 Eccentricity squared e = 0.006 722 670

Zone : = North 31
 Central meridian : = 3° East
 Latitude of origin : = Equator
 False Easting : = 500 000.00 m
 False Northing : = 0.00 m
 Scale factor on C.M.: = 0.999 6

WGS84 to ED50 TRANSFORMATION: UKOAA (EPSG: 1311)



KEYPLAN

	Easting (mE)	Northing (mN)	Heading (°)	Radius (m)	KP (km)
N05-A PLATFORM	721.607	5.954.650			
TARGET BOX	721.622	5.954.608			0,000
TP-1	720.725	5.953.484	219		1,438
IP-1	720.454	5.953.144		2,000	2,293
TP-2	720.348	5.952.723	194		8,659
TP-3	718.799	5.946.549			9,151
IP-2	718.738	5.946.309		2,000	12,340
TP-4	718.738	5.946.062	180		13,163
TP-5	718.738	5.942.873			
IP-3	718.738	5.942.456		2,000	15,167
TP-6	718.571	5.942.073	204		
TARGET BOX	717.769	5.940.236			
HOT TAP	717.781	5.940.212			
CROSSINGS PIPELINE:					
POWER CABLE BUITENGAATS	719.346	5.948.729			6,412
POWER CABLE ZEEENERGIE	719.327	5.948.655			6,487
TELECOM CABLE TYCOM TELECOM	718.915	5.947.014			8,180
N05-A PLATFORM	721.607	5.954.650			
TARGET BOX	721.636	5.954.637		90	0,000
TP-1	721.664	5.954.637			0,028
IP-1	721.668	5.954.637		15	0,035
TP-2	721.671	5.954.639			
TP-3	721.876	5.954.745		63	0,266
IP-2	721.892	5.954.753		100	0,302
TP-4	721.910	5.954.755			
TP-5	723.428	5.954.926		84	1,829
IP-3	723.440	5.954.928		100	1,853
TP-6	723.452	5.954.926			
TP-7	724.774	5.954.766		97	3,185
IP-4	724.784	5.954.765		100	3,206
TP-8	724.794	5.954.762		109	5,468
TP-9	726.933	5.954.026		100	5,533
IP-5	726.965	5.954.015		72	8,694
TP-10	726.997	5.954.025			
TARGET BOX	729.998	5.955.018			
CROSSINGS CABLE:					
POWER CABLE NORMED	723.853	5.954.878			2,257

Rev	Date	Description	Drawn	Eng.	Check	Appr.	Client
02	10-07-2020	SIDE TAP POSITION UPDATED	SvdV				
01	20-05-2020	FOR COMMENTS	SvdV				

enersea
 Jan Evertsenweg 12
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 +31(0) 103132100
 info@enersea.nl

Client
ONEDyas B.V.

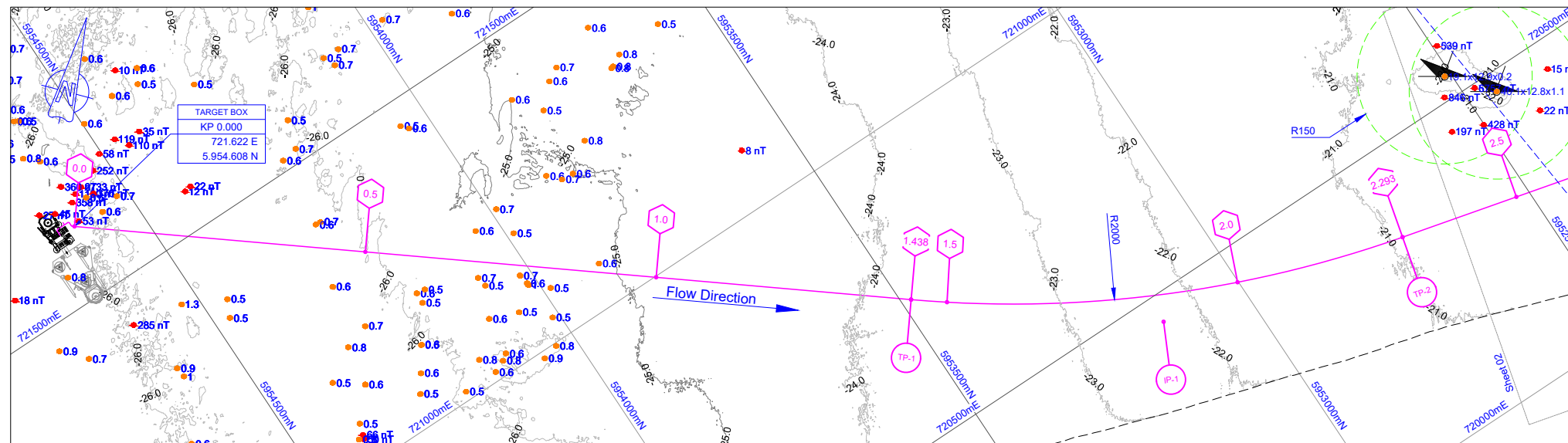
Project
N05-A TO NGT PIPELINE

Document
Pipeline Route - Overall Field Layout
Alternative route to existing NGT side tap
at KP141.5

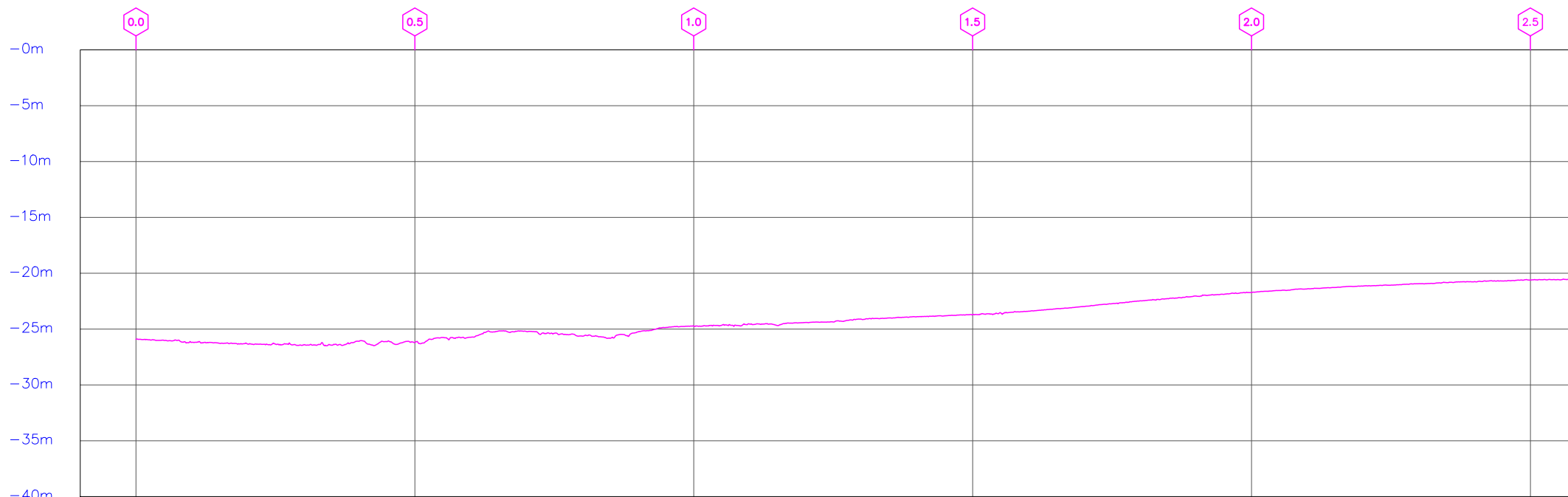
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Scale: 1:30000
 Size: A1

Project number: **19018** Document Number: **N05A-7-50-0-72026-01**



PLAN VIEW



PROFILE

Vertical scale 1:250
Horizontal scale 1:5000

START KP 0.0 KP 0.05 KP 0.5 KP 1.0 KP 1.438 KP 1.5 KP 2.0 KP 2.293 KP 2.5 MATCHLINE

PIPELINE	START	END
PIPE SIZE O.D./W.T./GRADE	←	→ 20" NB 20.62mm L450 HFIW
ANTI CORROSION COATING/THICKNESS(mm)	←	→ 3LPE 2.8mm / 2.1mm FJC HEAT SHRINK SLEEVE
CONCRETE WEIGHT COATING THICKNESS(mm) / DENSITY KG/M3	←	→ N/A (BURIED) / 140mm CWC, 3300 KG/M3 (UNBURIED)
ANODE TYPE/SPACING/WEIGHT(kg)	←	→ 20" HALF SHELL SACRIFICIAL ANODE / 1 EVERY TBD JOINTS / TBD
PIPE WEIGHT IN AIR(kg/m)/SUBMERGED EMPTY(kg/m)/ SUBMERGED FILLED(kg/m)	←	→ 252.2 / 39.5 / 214.9 (BURIED) [HOLD] / 1201.4 / 693.3 / 869.3 (UNBURIED) [HOLD]
ALLOWABLE FREE SPAN LENGTHS(m) (INSTALLATION / OPERATION)	←	→ TBD/TBD
HEADING	←	→ 218.6°
SPECIAL ITEMS	←	→ ROCK DUMP
PRESSURE(barg) DESIGN/HYDROTEST	←	→ 111.1 / 138.9
TRENCHING	←	→ 50m TRANSITION (ROCK DUMPED) / 0.8m MINIMUM COVER OVER TOP OF PIPELINE (BURIED) / N/A (UNBURIED)

GENERAL NOTES

REFERENCES

N05A-7-51-0-72510-01 Overall field layout drawing
N05A-7-50-0-72018-01/06 Pipeline alignment sheet - Buried / Unburied option - sheet 01 / 06
N05A-7-50-0-72019-01 Approach drawing @N05A

LEGEND

GENERAL

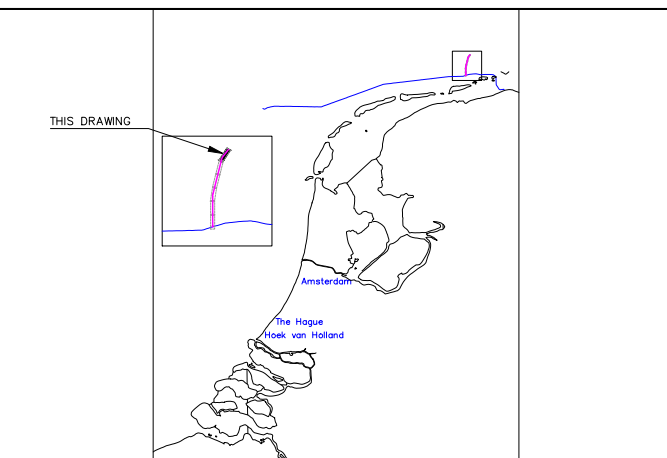
- KILOMETER MARKER
- PIPELINE: N05A - NGT
- CABLE: N05A - RIFFGAT
- BOUNDARY OF SURVEY AREA
- EXISTING PIPELINE
- EXISTING CABLE
- SHIPPING LANE RIJKSWATERSTAAT
- ROCKDUMP
- NATURA2000
- OYSTERBANK

BATHYMETRY AND SEABED FEATURES

- CONTOUR LINE AT 1m INTERVAL
- SONAR CONTACT
- DEPRESSION
- MOUND
- AS-FOUND WELLHEAD
- CP105 CONE PENETRATION TEST
- VC05 VIBRE CORE
- 65nT MAGNETIC ANOMALY
- WRECK

GEODETIC PARAMETERS

PROJECTED CRS: ED50/UTM zone 31N (EPSG: 23031)
Horizontal Datum Name: European Datum 1950 North Sea -UKCS
Projection Name: Universal Transverse Mercator
Ellipsoid: International 1924 (Hayford 1909)
Semi major axis a = 6 378 388.000
Semi minor axis b = 6 356 911.946
Inverse ELatening 1/f = 297.000
Excentricity squared e = 0.006 722 670
Zone : = North 31
Central meridian : = 3° East
Latitude of origin : = Equator
False Easting : = 500 000.00 m
False Northing : = 0.00 m
Scale factor on C.M.: = 0.999 6
WGS84 to ED50 TRANSFORMATION: UKOAA (EPSG: 1311)



KEYPLAN

Rev	Date	Description	Drawn	Eng.	Check	Appr.	Client
02	18-12-2019	CLIENT COMMENTS INCORPORATED	SvdV	-	PP	PP	
01	06-12-2019	FOR COMMENTS	SvdV	-	PP	PP	

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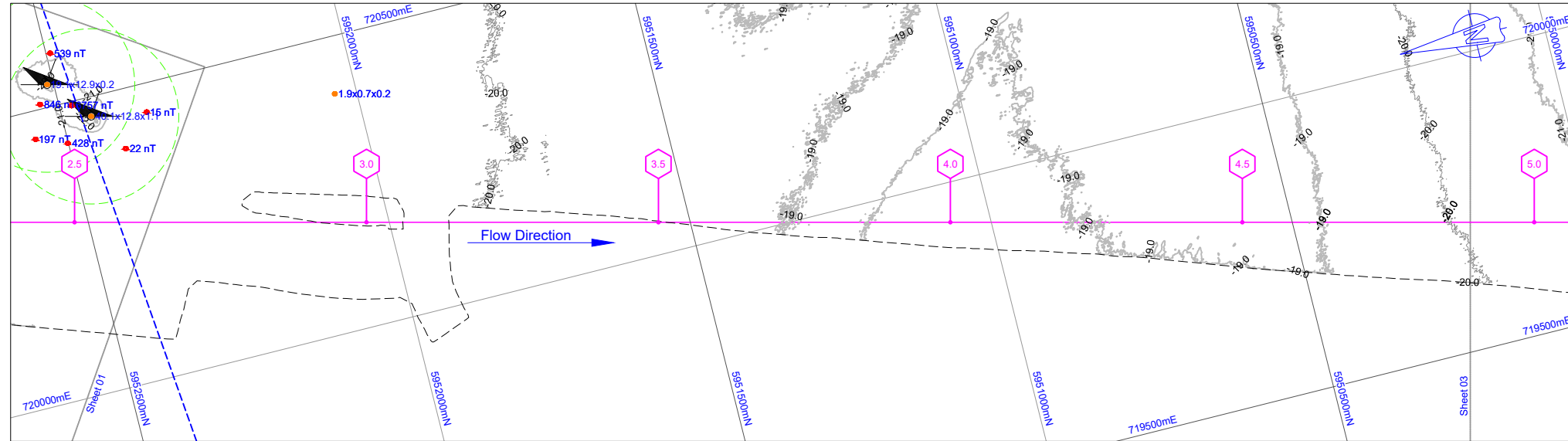
Client
ONEDyas B.V.

Project
N05-A TO NGT PIPELINE

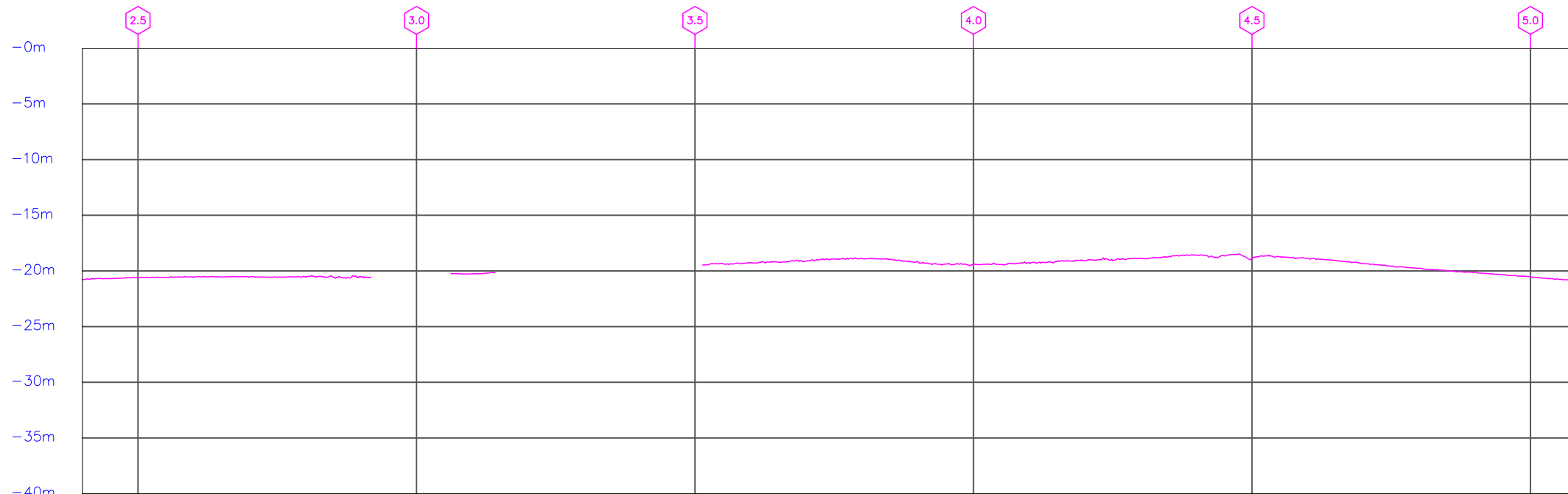
Document
Pipeline alignment sheet
Buried / Unburied option
Sheet 01

Scale: **1:5000**
Size: **A1**

Project number: **19018** Document Number: **N05A-7-50-0-72018-01**



PLAN VIEW



PROFILE

Vertical scale 1:250
Horizontal scale 1:5000

MATCHLINE

MATCHLINE

PIPELINE	KP 2.5	KP 3.0	KP 3.5	KP 4.0	KP 4.5	KP 5.0
PIPE SIZE O.D./W.T./GRADE	20" NB 20.62mm L450 HFIW					
ANTI CORROSION COATING/THICKNESS(mm)	3LPE 2.8mm / 2.1mm FJC HEAT SHRINK SLEEVE					
CONCRETE WEIGHT COATING THICKNESS(mm) / DENSITY KG/M3	N/A (BURIED) / 140mm CWC, 3300 KG/M3 (UNBURIED)					
ANODE TYPE/SPACING/WEIGHT(kg)	20" HALF SHELL SACRIFICIAL ANODE / 1 EVERY TBD JOINTS / TBD					
PIPE WEIGHT IN AIR(kg/m)/SUBMERGED EMPTY(kg/m)/ SUBMERGED FILLED(kg/m)	252.2 / 39.5 / 214.9 (BURIED) [HOLD] / 1201.4 / 693.3 / 869.3 (UNBURIED) [HOLD]					
ALLOWABLE FREE SPAN LENGTHS(m) (INSTALLATION / OPERATION)	TBD/TBD					
HEADING	194.1°					
SPECIAL ITEMS						
PRESSURE(barg) DESIGN/HYDROTEST	111.1 / 138.9					
TRENCHING	0.8m MINIMUM COVER OVER TOP OF PIPELINE (BURIED) / N/A (UNBURIED)					

GENERAL NOTES

REFERENCES

N05A-7-51-0-72510-01 Overall field layout drawing
N05A-7-50-0-72018-01/06 Pipeline alignment sheet - Buried / Unburied option - sheet 01 / 06

LEGEND

GENERAL

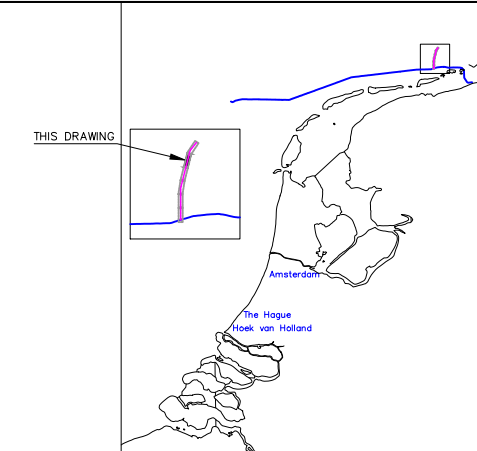
- KILOMETER MARKER
- PIPELINE: N05A - NGT
- CABLE: N05A - RIFFGAT
- BOUNDARY OF SURVEY AREA
- EXISTING PIPELINE
- EXISTING CABLE
- SHIPPING LANE RIJKSWATERSTAAT
- ROCKDUMP
- NATURA2000
- OYSTERBANK

BATHYMETRY AND SEABED FEATURES

- CONTOUR LINE AT 1m INTERVAL
- LVWH SONAR CONTACT
- LVWH DEPRESSION
- LVWH MOUND
- AS-FOUND WELLHEAD
- CP105 CONE PENETRATION TEST
- VC05 VIBRE CORE
- 65nT MAGNETIC ANOMALY
- WRECK

GEODETTIC PARAMETERS

PROJECTED CRS: ED50/UTM zone 31N (EPSG: 23031)
Horizontal Datum Name: European Datum 1950 North Sea -UKCS
Projection Name: Universal Transverse Mercator
Zone : = North 31
Central meridian : = 3° East
Latitude of origin : = Equator
Semi major axis a = 6 378 388.000
Semi minor axis b = 6 356 911.946
Inverse ELatening 1/f = 297.000
Excentricity squared e = 0.006 722 670
Scale factor on C.M.: = 0.999 6
WGS84 to ED50 TRANSFORMATION: UKOAA (EPSG: 1311)



KEYPLAN

Rev	Date	Description	Drawn	Eng.	Check	Appr.	Client
02	18-12-2019	CLIENT COMMENTS INCORPORATED	SvdV	-	RF	RF	
01	06-12-2019	FOR COMMENTS	SvdV	-	PF	PF	

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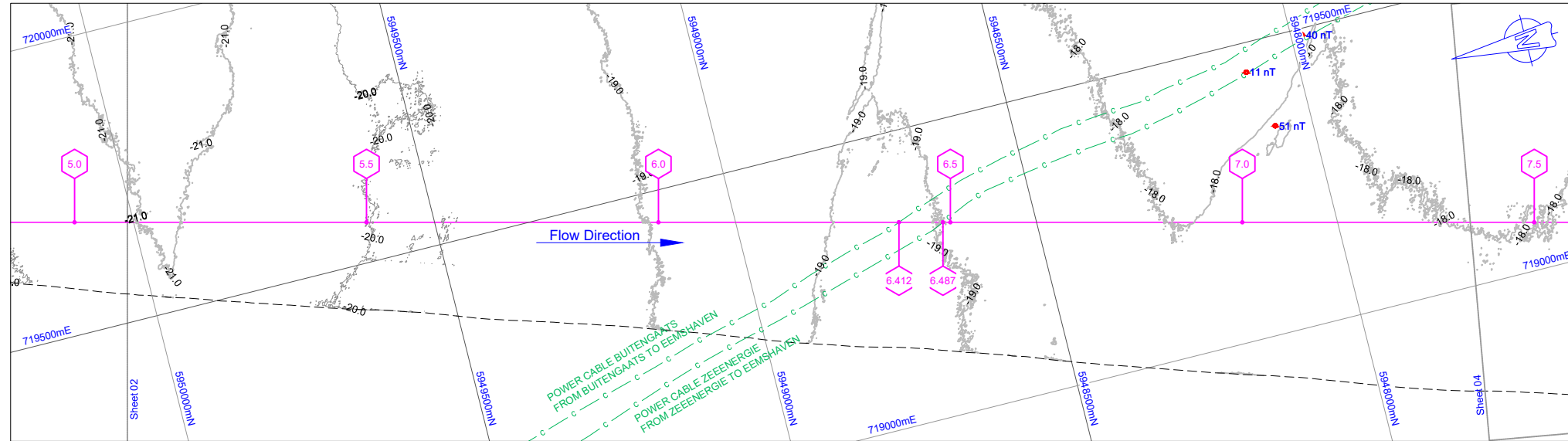
Client
ONEDyas B.V.

Project
N05-A TO NGT PIPELINE

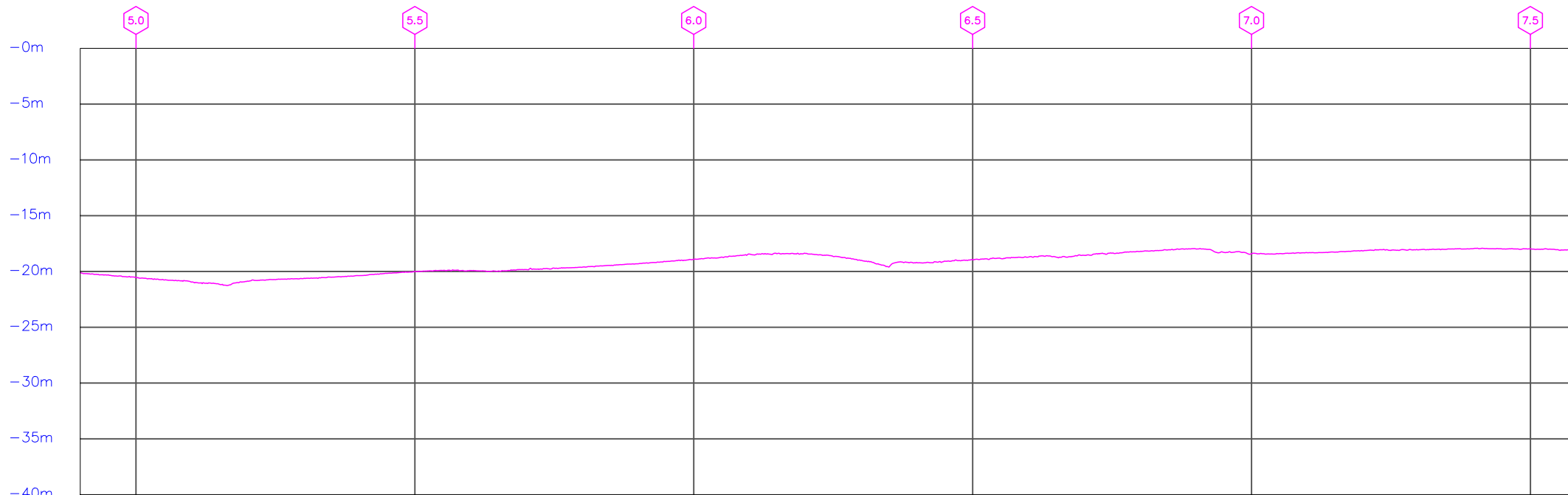
Document
Pipeline alignment sheet
Buried / Unburied option
Sheet 02

Scale: **1:5000**
Size: **A1**

Project number: **19018** Document Number: **N05A-7-50-0-72018-02**



PLAN VIEW



PROFILE

Vertical scale 1:250
Horizontal scale 1:5000

GENERAL NOTES

REFERENCES

N05A-7-51-0-72510-01 Overall field layout drawing
N05A-7-50-0-72018-01/06 Pipeline alignment sheet - Buried / Unburied option - sheet 01 / 06

LEGEND

GENERAL

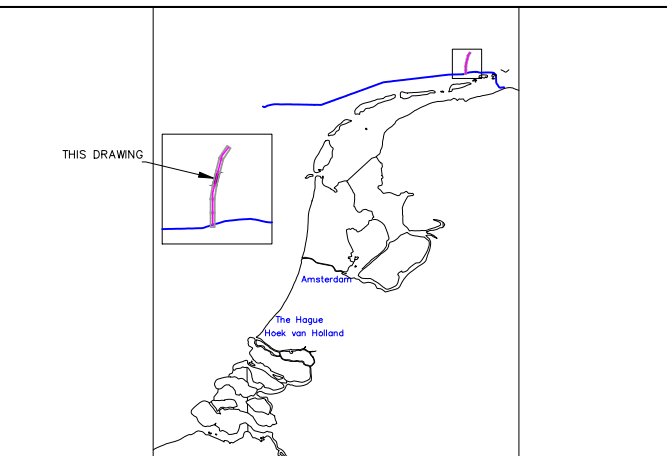
- KILOMETER MARKER
- PIPELINE: N05A - NGT
- CABLE: N05A - RIFFGAT
- BOUNDARY OF SURVEY AREA
- EXISTING PIPELINE
- EXISTING CABLE
- SHIPPING LANE RIJKSWATERSTAAT
- ROCKDUMP
- NATURA2000
- OYSTERBANK

BATHYMETRY AND SEABED FEATURES

- CONTOUR LINE AT 1m INTERVAL
- SONAR CONTACT
- DEPRESSION
- MOUND
- AS-FOUND WELLHEAD
- CP105 CONE PENETRATION TEST
- VC05 VIBRE CORE
- 65nT MAGNETIC ANOMALY
- WRECK

GEODETTIC PARAMETERS

PROJECTED CRS: ED50/UTM zone 31N (EPSG: 23031)
Horizontal Datum Name: European Datum 1950 North Sea -UKCS
Projection Name: Universal Transverse Mercator
Zone : = North 31
Central meridian : = 3° East
Latitude of origin : = Equator
Semi major axis a = 6 378 388.000
Semi minor axis b = 6 356 911.946
False Easting : = 500 000.00 m
Inverse Ellattening 1/f = 297.000
False Northing : = 0.00 m
Excentricity squared e = 0.006 722 670
Scale factor on C.M.: = 0.999 6
WGS84 to ED50 TRANSFORMATION: UKOAA (EPSG: 1311)



KEYPLAN

MATCHLINE

MATCHLINE

PIPELINE	KP 5.0	KP 5.5	KP 6.0	KP 6.412	KP 6.487	KP 6.5	KP 7.0	KP 7.5
PIPE SIZE O.D./W.T./GRADE	20" NB 20.62mm L450 HFIW							
ANTI CORROSION COATING/THICKNESS(mm)	3LPE 2.8mm / 2.1mm FJC HEAT SHRINK SLEEVE							
CONCRETE WEIGHT COATING THICKNESS(mm) / DENSITY KG/M3	N/A (BURIED) / 140mm CWC, 3300 KG/M3 (UNBURIED)							
ANODE TYPE/SPACING/WEIGHT(kg)	20" HALF SHELL SACRIFICIAL ANODE / 1 EVERY TBD JOINTS / TBD							
PIPE WEIGHT IN AIR(kg/m)/SUBMERGED EMPTY(kg/m)/ SUBMERGED FILLED(kg/m)	252.2 / 39.5 / 214.9 (BURIED) [HOLD] / 1201.4 / 693.3 / 869.3 (UNBURIED) [HOLD]							
ALLOWABLE FREE SPAN LENGTHS(m) (INSTALLATION / OPERATION)	TBD/TBD							
HEADING	194.1°							
SPECIAL ITEMS	CROSSING							
PRESSURE(barg) DESIGN/HYDROTEST	111.1 / 138.9							
TRENCHING	0.8m MINIMUM COVER OVER TOP OF PIPELINE (BURIED) / N/A (UNBURIED)							

Rev	Date	Description	Drawn	Eng.	Check	Appr.	Client
02	18-12-2019	CLIENT COMMENTS INCORPORATED	SvdV	-	PH	PH	
01	06-12-2019	FOR COMMENTS	SvdV	-	PH	PH	

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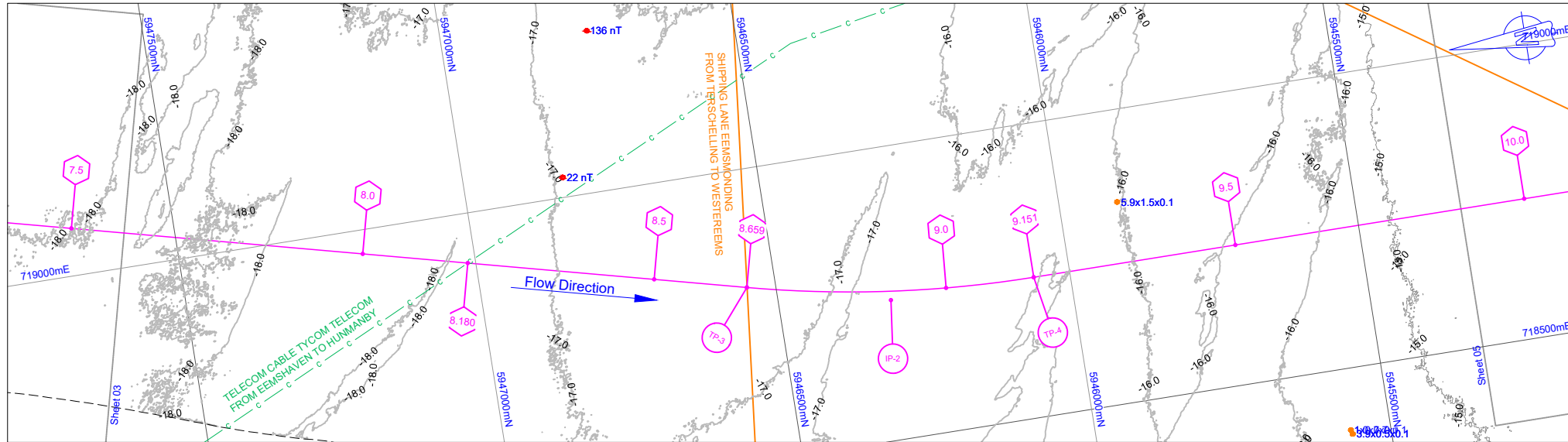
Client
ONEDyas B.V.

Project
N05-A TO NGT PIPELINE

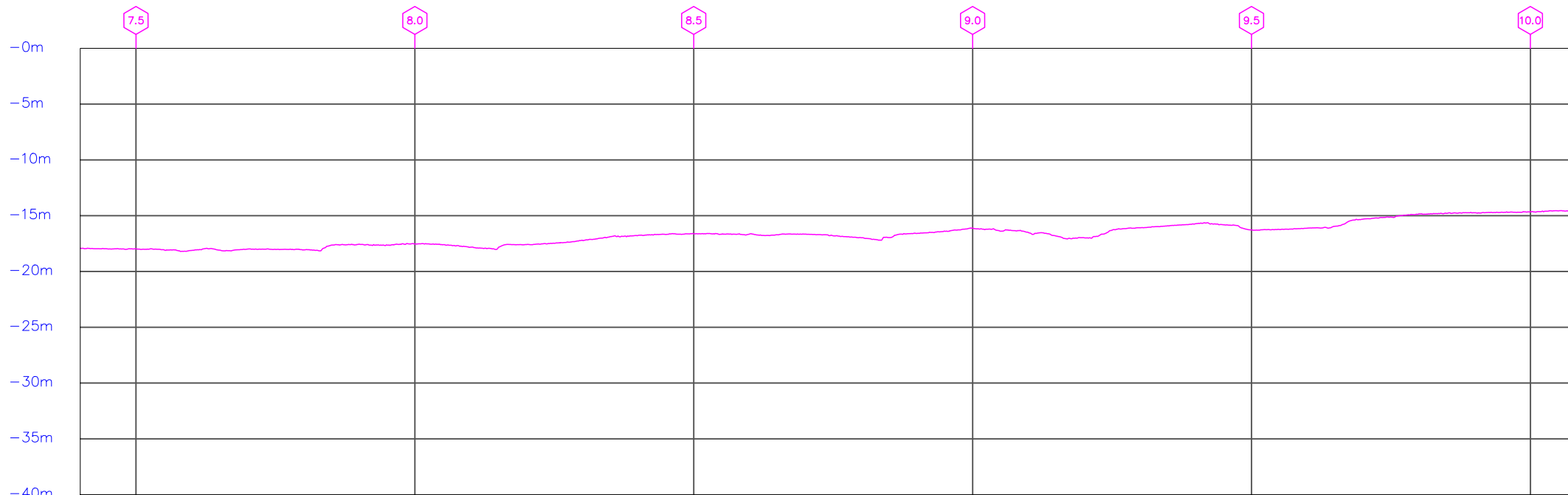
Document
Pipeline alignment sheet
Buried / Unburied option
Sheet 03

Scale: **1:5000**
Size: **A1**

Project number: **19018** Document Number: **N05A-7-50-0-72018-03**



PLAN VIEW



PROFILE

Vertical scale 1:250
Horizontal scale 1:5000

GENERAL NOTES

REFERENCES

N05A-7-51-0-72510-01 Overall field layout drawing
N05A-7-50-0-72018-01/06 Pipeline alignment sheet - Buried / Unburied option - sheet 01 / 06

LEGEND

GENERAL

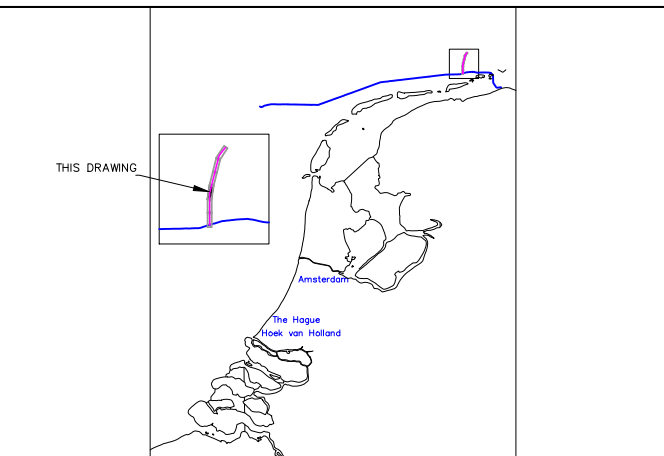
- KILOMETER MARKER
- PIPELINE: N05A - NGT
- CABLE: N05A - RIFFGAT
- BOUNDARY OF SURVEY AREA
- EXISTING PIPELINE
- EXISTING CABLE
- SHIPPING LANE RIJKSWATERSTAAT
- ROCKDUMP
- NATURA2000
- OYSTERBANK

BATHYMETRY AND SEABED FEATURES

- 0.5 CONTOUR LINE AT 1m INTERVAL
- SONAR CONTACT
- LW/H DEPRESSION
- LW/H MOUND
- AS-FOUND WELLHEAD
- CP105 CONE PENETRATION TEST
- VC05 VIBRE CORE
- 65nT MAGNETIC ANOMALY
- WRECK

GEODETTIC PARAMETERS

PROJECTED CRS: ED50/UTM zone 31N (EPSG: 23031)
Horizontal Datum Name: European Datum 1950 North Sea -UKCS
Projection Name: Universal Transverse Mercator
Zone : = North 31
Central meridian : = 3° East
Latitude of origin : = Equator
Semi major axis a = 6 378 388.000
Semi minor axis b = 6 356 911.946
Inverse ELatening 1/f = 297.000
Excentricity squared e = 0.006 722 670
False Easting : = 500 000.00 m
False Northing : = 0.00 m
Scale factor on C.M.: = 0.999 6
WGS84 to ED50 TRANSFORMATION: UKOAA (EPSG: 1311)



KEYPLAN

MATCHLINE

MATCHLINE

PIPELINE	KP 7.5	KP 8.0	KP 8.180	KP 8.5	KP 8.659	KP 9.0	KP 9.151	KP 9.5	KP 10.0
PIPE SIZE O.D./W.T./GRADE	20" NB 20.62mm L450 HFIW								
ANTI CORROSION COATING/THICKNESS(mm)	3LPE 2.8mm / 2.1mm FJC HEAT SHRINK SLEEVE								
CONCRETE WEIGHT COATING THICKNESS(mm) / DENSITY KG/M3	N/A (BURIED) / 140mm CWC, 3300 KG/M3 (UNBURIED)								
ANODE TYPE/SPACING/WEIGHT(kg)	20" HALF SHELL SACRIFICIAL ANODE / 1 EVERY TBD JOINTS / TBD								
PIPE WEIGHT IN AIR(kg/m)/SUBMERGED EMPTY(kg/m)/ SUBMERGED FILLED(kg/m)	252.2 / 39.5 / 214.9 (BURIED) [HOLD] / 1201.4 / 693.3 / 869.3 (UNBURIED) [HOLD]								
ALLOWABLE FREE SPAN LENGTHS(m) (INSTALLATION / OPERATION)	TBD/TBD								
HEADING	194.1°				180.0°				
SPECIAL ITEMS	CROSSING								
PRESSURE(barg) DESIGN/HYDROTEST	111.1 / 138.9								
TRENCHING	0.8m MINIMUM COVER OVER TOP OF PIPELINE (BURIED) / N/A (UNBURIED)								

Rev	Date	Description	Drawn	Eng.	Check	Appr.	Client
02	18-12-2019	CLIENT COMMENTS INCORPORATED	SvdV	-	-	-	-
01	06-12-2019	FOR COMMENTS	SvdV	-	-	-	-

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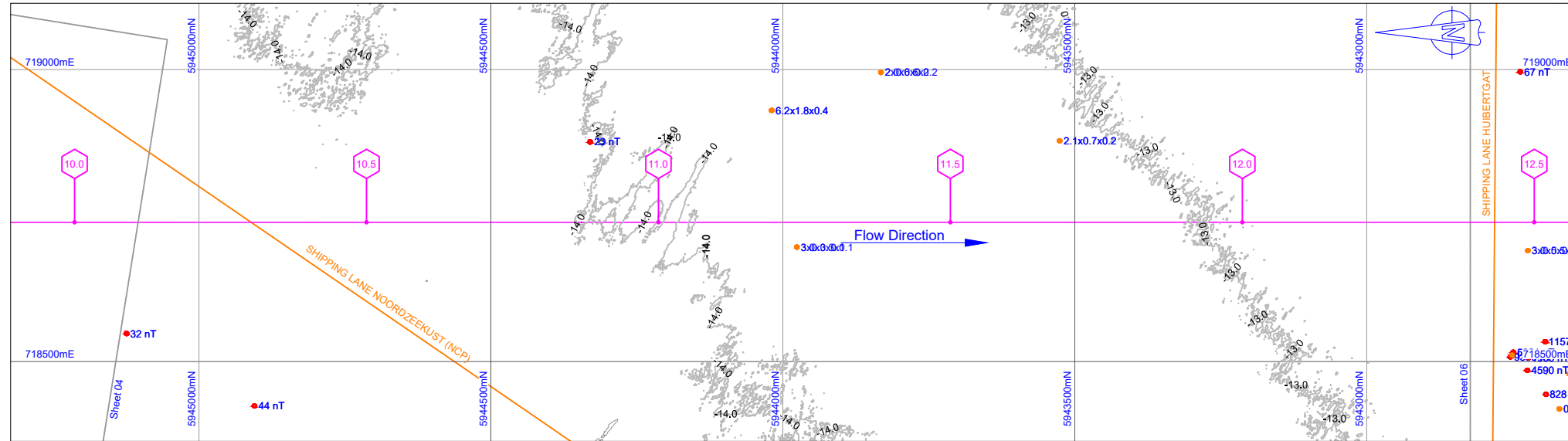
Client
ONEDyas B.V.

Project
N05-A TO NGT PIPELINE

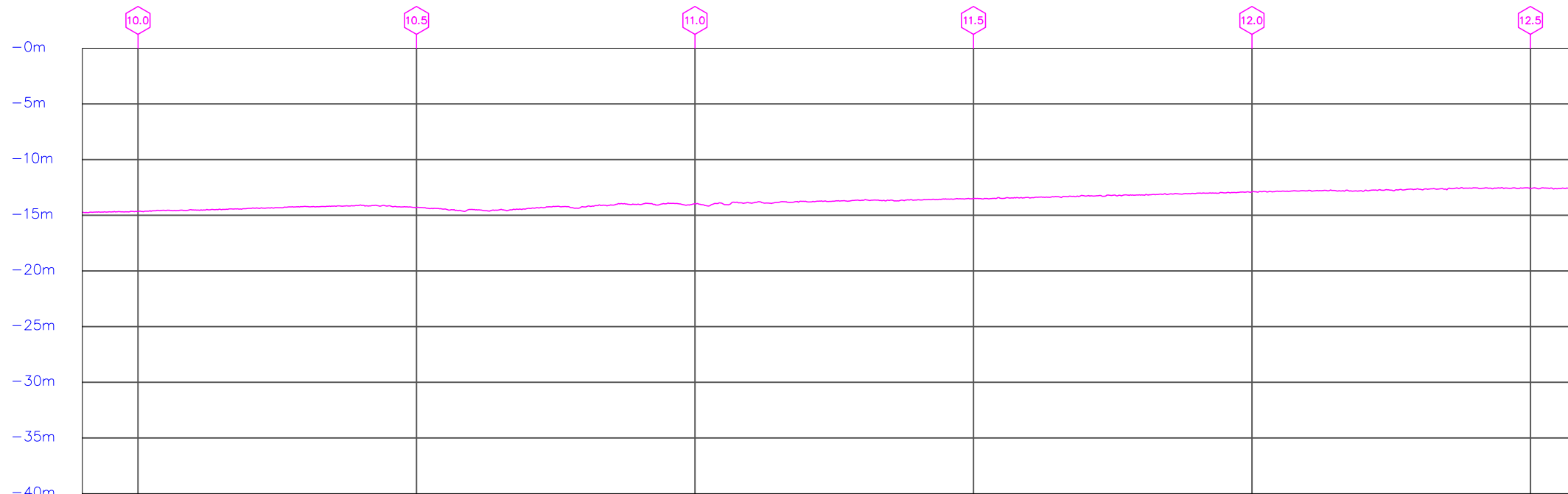
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**Pipeline alignment sheet
Buried / Unburied option
Sheet 04**

Scale: **1:5000**
Size: **A1**

Project number: **19018** Document Number: **N05A-7-50-0-72018-04**



PLAN VIEW



PROFILE

Vertical scale 1:250
Horizontal scale 1:5000

MATCHLINE

MATCHLINE

PIPELINE	KP 10.0	KP 10.5	KP 11.0	KP 11.5	KP 12.0	KP 12.5
PIPE SIZE O.D./W.T./GRADE	20" NB 20.62mm L450 HFIW					
ANTI CORROSION COATING/THICKNESS(mm)	3LPE 2.8mm / 2.1mm FJC HEAT SHRINK SLEEVE					
CONCRETE WEIGHT COATING THICKNESS(mm) / DENSITY KG/M3	N/A (BURIED) / 140mm CWC, 3300 KG/M3 (UNBURIED)					
ANODE TYPE/SPACING/WEIGHT(kg)	20" HALF SHELL SACRIFICIAL ANODE / 1 EVERY TBD JOINTS / TBD					
PIPE WEIGHT IN AIR(kg/m)/SUBMERGED EMPTY(kg/m)/ SUBMERGED FILLED(kg/m)	252.2 / 39.5 / 214.9 (BURIED) [HOLD] / 1201.4 / 693.3 / 869.3 (UNBURIED) [HOLD]					
ALLOWABLE FREE SPAN LENGTHS(m) (INSTALLATION / OPERATION)	TBD/TBD					
HEADING	180.0°					
SPECIAL ITEMS						
PRESSURE(barg) DESIGN/HYDROTEST	111.1 / 138.9					
TRENCHING	0.8m MINIMUM COVER OVER TOP OF PIPELINE (BURIED) / N/A (UNBURIED)					

GENERAL NOTES

REFERENCES

N05A-7-51-0-72510-01 Overall field layout drawing
N05A-7-50-0-72018-01/06 Pipeline alignment sheet - Buried / Unburied option - sheet 01 / 06

LEGEND

GENERAL

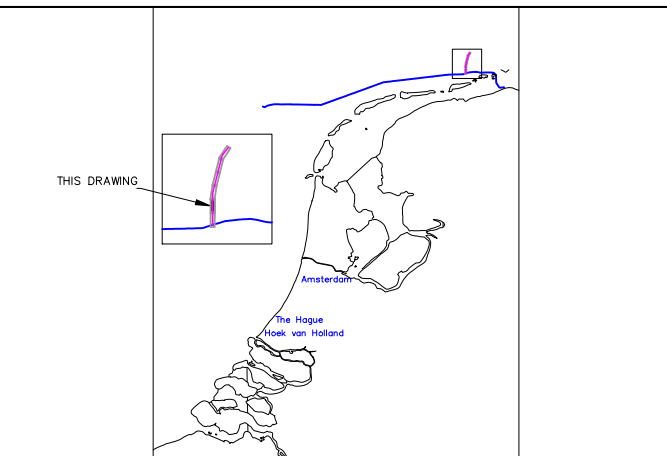
- KILOMETER MARKER
- PIPELINE: N05A - NGT
- CABLE: N05A - RIFFGAT
- BOUNDARY OF SURVEY AREA
- EXISTING PIPELINE
- EXISTING CABLE
- SHIPPING LANE RIJKSWATERSTAAT
- ROCKDUMP
- NATURA2000
- OYSTERBANK

BATHYMETRY AND SEABED FEATURES

- 0.5 CONTOUR LINE AT 1m INTERVAL
- LVWH SONAR CONTACT
- LVWH DEPRESSION
- LVWH MOUND
- AS-FOUND WELLHEAD
- CP105 CONE PENETRATION TEST
- VC05 VIBRE CORE
- 65nT MAGNETIC ANOMALY
- WRECK

GEODETTIC PARAMETERS

PROJECTED CRS: ED50/UTM zone 31N (EPSG: 23031)
Horizontal Datum Name: European Datum 1950 North Sea -UKCS
Projection Name: Universal Transverse Mercator
Zone : = North 31
Central meridian : = 3° East
Latitude of origin : = Equator
Semi major axis a = 6 378 388.000
Semi minor axis b = 6 356 911.946
Inverse ELatening 1/f = 297.000
Excentricity squared e = 0.006 722 670
Scale factor on C.M.: = 0.999 6
WGS84 to ED50 TRANSFORMATION: UKOAA (EPSG: 1311)



KEYPLAN

Rev	Date	Description	Drawn	Eng.	Check	Appr.	Client
02	18-12-2019	CLIENT COMMENTS INCORPORATED	SvdV	-	PF	PF	
01	06-12-2019	FOR COMMENTS	SvdV	-	PF	PF	

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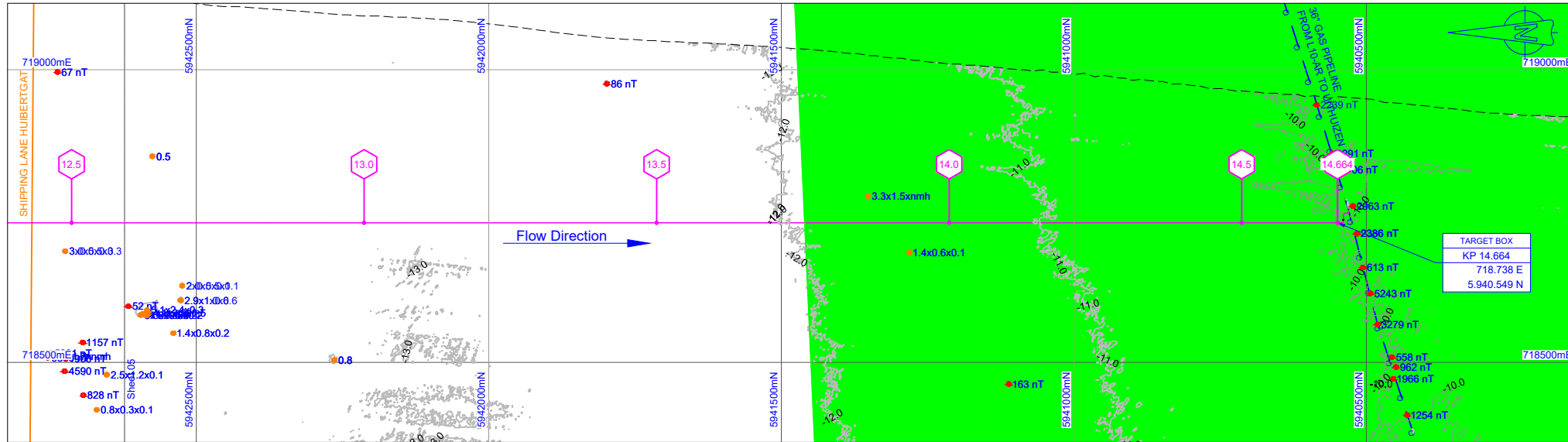
Client
ONEDyas B.V.

Project
N05-A TO NGT PIPELINE

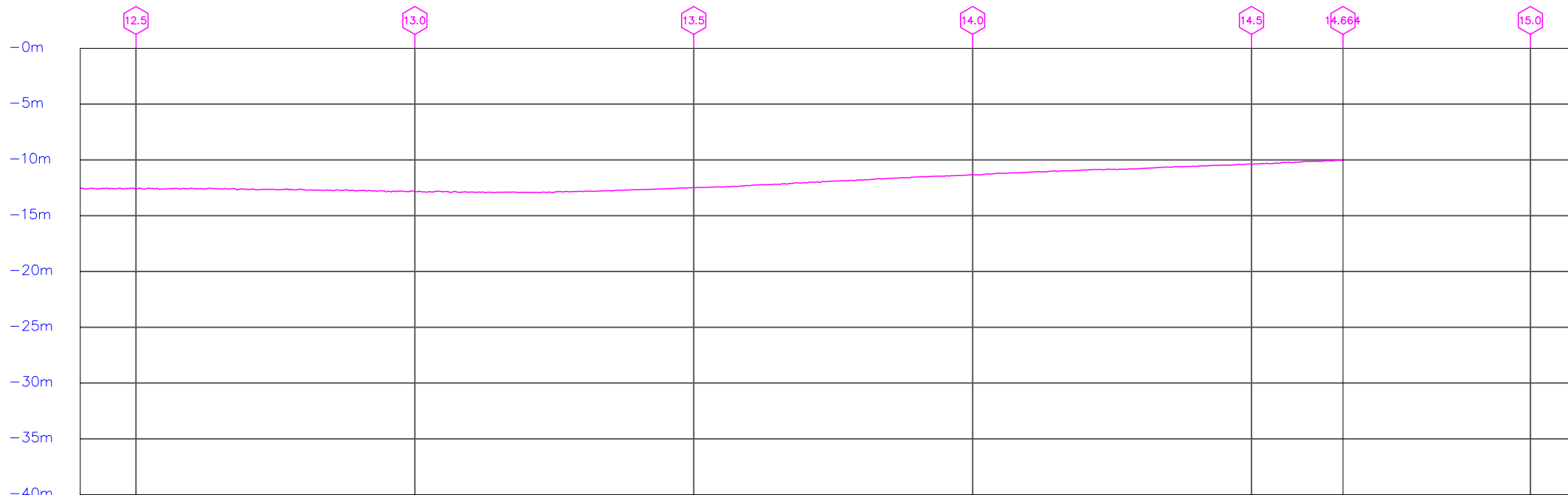
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Pipeline alignment sheet
Buried / Unburied option
Sheet 05

Scale: **1:5000**
Size: **A1**

Project number: 19018	Document Number N05A-7-50-0-72018-05
---------------------------------	--



PLAN VIEW



PROFILE

Vertical scale 1:250
Horizontal scale 1:5000

MATCHLINE

END POINT

PIPELINE	KP 12.5	KP 13.0	KP 13.5	KP 14.0	KP 14.5	KP 14.614 KP 14.664
PIPE SIZE O.D./W.T./GRADE	20" NB 20.62mm L450 HFIW					
ANTI CORROSION COATING/THICKNESS(mm)	3LPE 2.8mm / 2.1mm FJC HEAT SHRINK SLEEVE					
CONCRETE WEIGHT COATING THICKNESS(mm) / DENSITY KG/M3	N/A (BURIED) / 140mm CWC, 3300 KG/M3 (UNBURIED)					
ANODE TYPE/SPACING/WEIGHT(kg)	20" HALF SHELL SACRIFICIAL ANODE / 1 EVERY TBD JOINTS / TBD					
PIPE WEIGHT IN AIR(kg/m)/SUBMERGED EMPTY(kg/m)/ SUBMERGED FILLED(kg/m)	252.2 / 39.5 / 214.9 (BURIED) [HOLD] / 1201.4 / 693.3 / 869.3 (UNBURIED) [HOLD]					
ALLOWABLE FREE SPAN LENGTHS(m) (INSTALLATION / OPERATION)	TBD/TBD					
HEADING	180.0°					
SPECIAL ITEMS	ROCK DUMP					
PRESSURE(barg) DESIGN/HYDROTEST	111.1 / 138.9					
TRENCHING	0.8m MINIMUM COVER OVER TOP OF PIPELINE (BURIED) / N/A (UNBURIED) 50m TRANSITION (ROCK DUMPED)					

GENERAL NOTES

REFERENCES

N05A-7-51-0-72510-01 Overall field layout drawing
N05A-7-50-0-72018-01/06 Pipeline alignment sheet - Buried / Unburied option - sheet 01 / 06
N05A-7-10-0-70032-01 Approach drawing @NGT

LEGEND

GENERAL

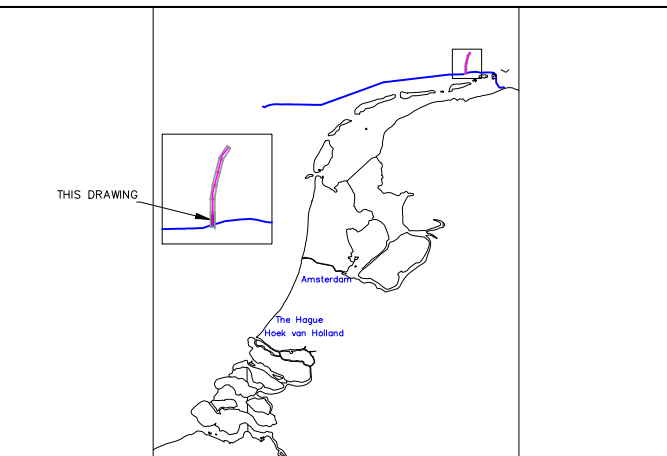
- KILOMETER MARKER
- PIPELINE: N05A - NGT
- CABLE: N05A - RIFFGAT
- BOUNDARY OF SURVEY AREA
- EXISTING PIPELINE
- EXISTING CABLE
- SHIPPING LANE RIJKSWATERSTAAT
- ROCKDUMP
- NATURA2000
- OYSTERBANK

BATHYMETRY AND SEABED FEATURES

- CONTOUR LINE AT 1m INTERVAL
- SONAR CONTACT
- DEPRESSION
- MOUND
- AS-FOUND WELLHEAD
- CP105 CONE PENETRATION TEST
- VC05 VIBRE CORE
- 65nT MAGNETIC ANOMALY
- WRECK

GEODETTIC PARAMETERS

PROJECTED CRS: ED50/UTM zone 31N (EPSG: 23031)
Horizontal Datum Name: European Datum 1950 North Sea -UKCS
Projection Name: Universal Transverse Mercator
Ellipsoid: International 1924 (Hayford 1909)
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Semi minor axis b = 6 356 911.946
Inverse Elattening 1/f = 297.000
Excentricity squared e = 0.006 722 670
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Central meridian : = 3° East
Latitude of origin : = Equator
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False Northing : = 0.00 m
Scale factor on C.M.: = 0.999 6
WGS84 to ED50 TRANSFORMATION: UKOAA (EPSG: 1311)



KEYPLAN

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01	06-12-2019	FOR COMMENTS	SvdV	-	PP	PP	

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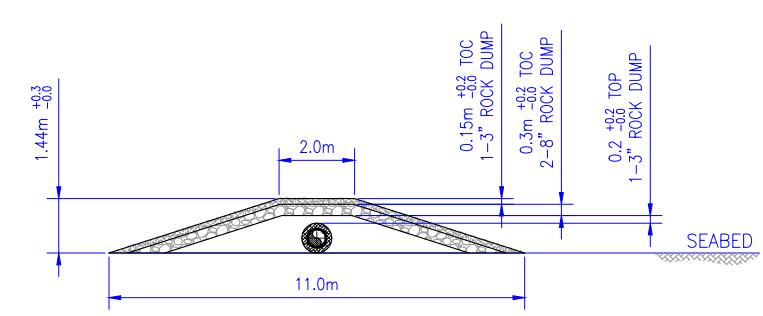
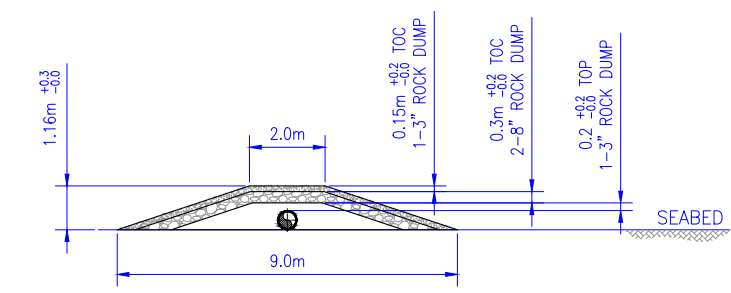
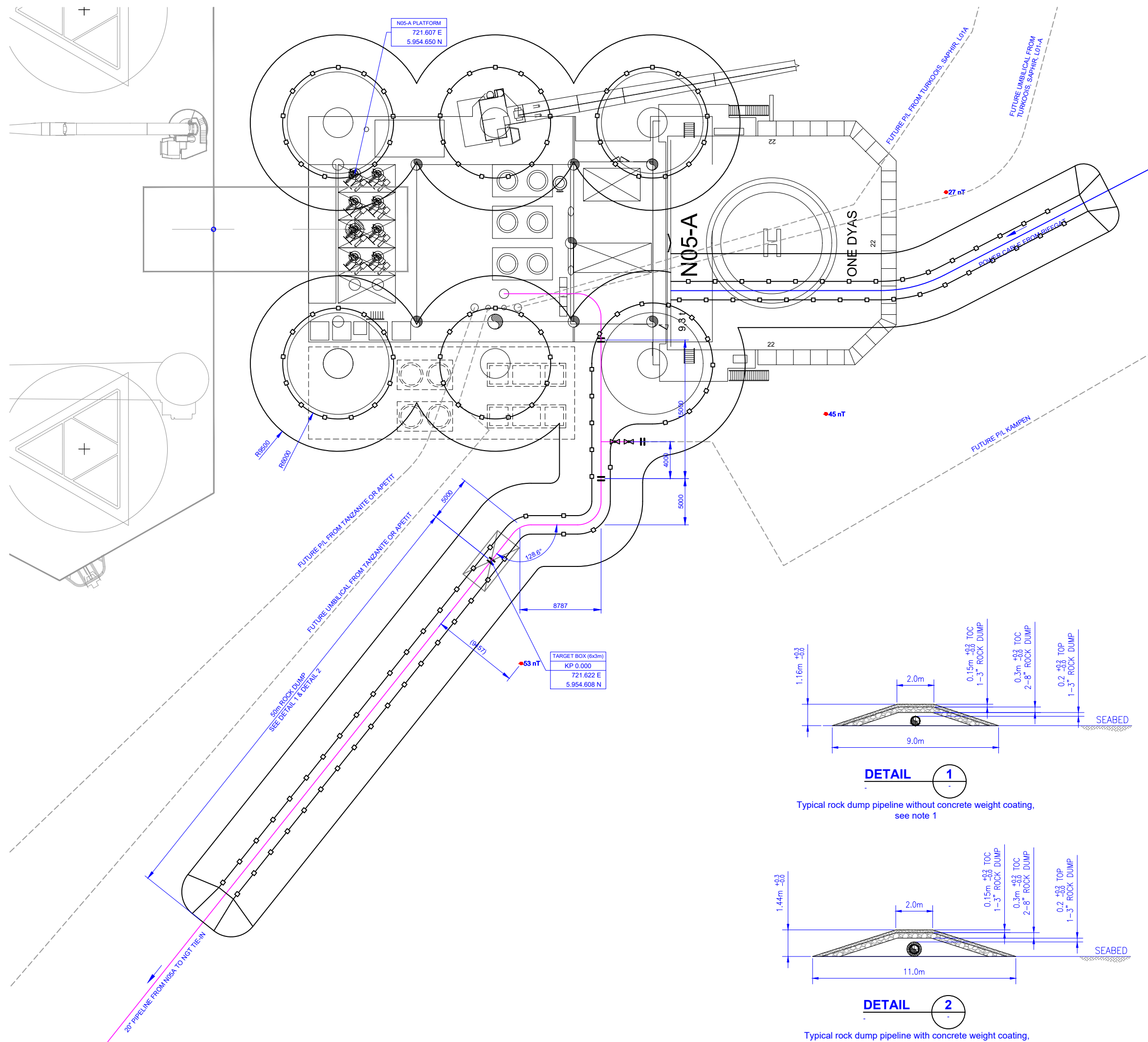
Client
ONEDyas B.V.

Project
N05-A TO NGT PIPELINE

Document
Pipeline alignment sheet
Buried / Unburied option
Sheet 06

Scale: **1:5000**
Size: **A1**

Project number: **19018** Document Number: **N05A-7-50-0-72018-06**



GENERAL NOTES

1 COMPOSITION AND STABILITY TO BE DETERMINED BY CONTRACTOR. MINIMUM REQUIRED DOWNWARD FORCE BASED ON ROCK BERM HEIGHT 0.8 m T.O.P. AND 2650 kg/m³ ROCK DENSITY.

REFERENCES

N05A-7-51-0-72510-01 Overall field layout drawing
N05A-7-50-0-72018-01/06 Pipeline alignment sheet - Buried / Unburied option - sheet 01-06

LEGEND

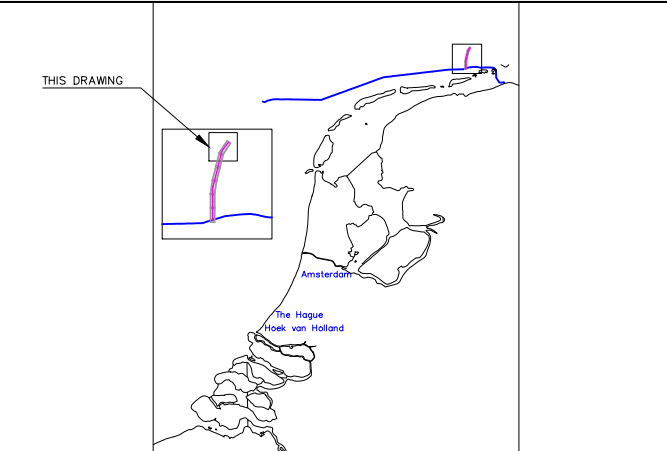
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- KILOMETER MARKER
- PIPELINE: N05A - NGT
- CABLE: N05A - RIFFGAT
- BOUNDARY OF SURVEY AREA
- EXISTING PIPELINE
- EXISTING CABLE
- SHIPPING LANE RIJKSWATERSTAAT
- ROCKDUMP
- NATURA2000
- OYSTERBANK

ROCKDUMP VOLUME			
	LAYER 1 (1"-3")	LAYER 2 (2"-8")	LAYER 3 (1"-3")
BURIED	225 m ³	175 m ³	100 m ³
UNBURIED	400 m ³	225 m ³	150 m ³
LEGS	650 m ³	425 m ³	250 m ³

GEODETTIC PARAMETERS

PROJECTED CRS: ED50/UTM zone 31N (EPSG: 23031)
Horizontal Datum Name: European Datum 1950 North Sea -UKCS
Projection Name: Universal Transverse Mercator
Ellipsoid: International 1924 (Hayford 1909)
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Semi minor axis b = 6 356 911.946
Inverse Elattening 1/f = 297.000
Eccentricity squared e = 0.006 722 670
Zone : = North 31
Central meridian : = 3° East
Latitude of origin : = Equator
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False Northing : = 0.00 m
Scale factor on C.M.: = 0.999 6
WGS84 to ED50 TRANSFORMATION: UKOAA (EPSG: 1311)



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01	06-12-2019	FOR COMMENTS	SvdV	-	PF	PF	

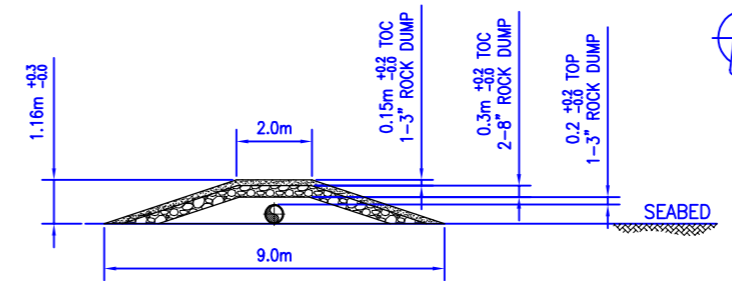
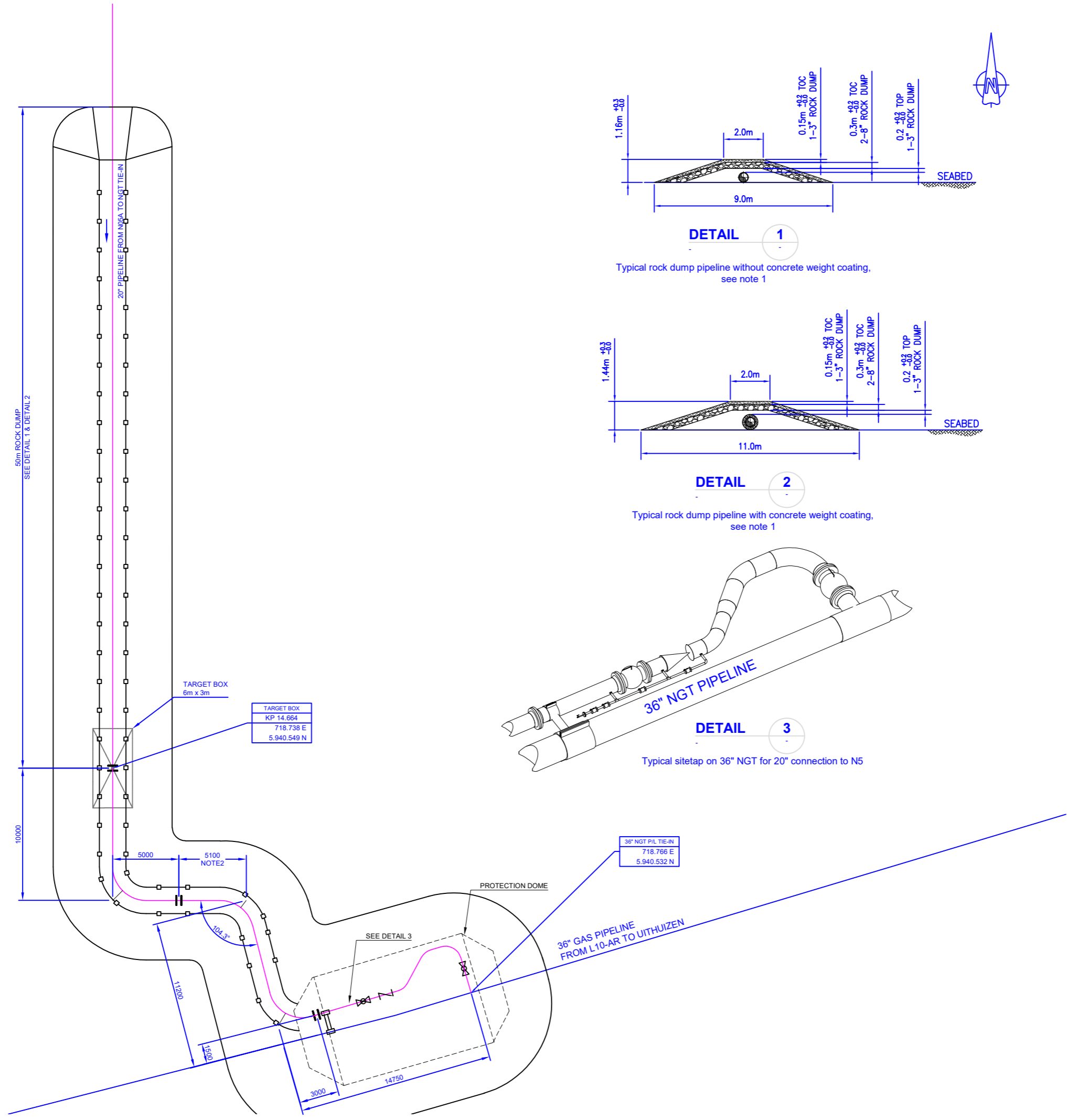
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Client ONEDyas B.V.
Project **N05-A TO NGT PIPELINE**
Document **Approach drawing at N05-A**

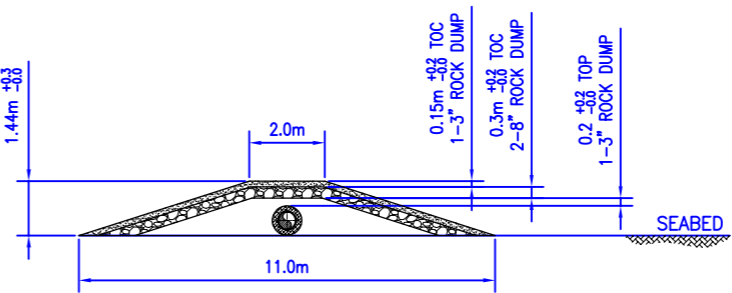
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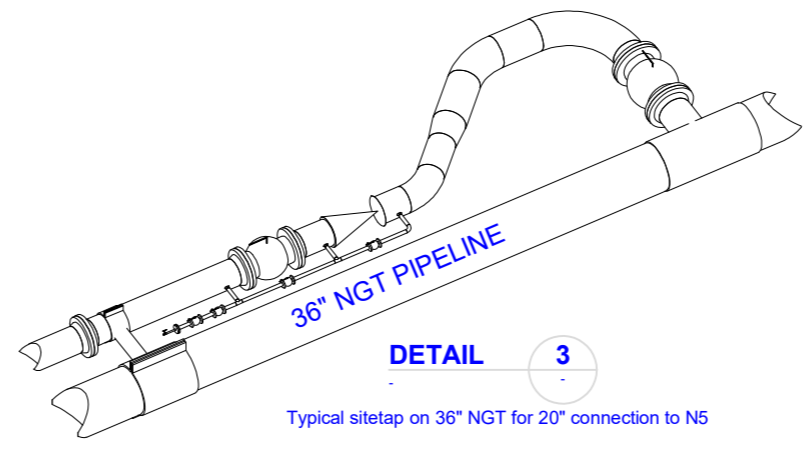
Project number: **19018**
Document Number: **N05A-7-50-0-72019-01**



DETAIL 1
Typical rock dump pipeline without concrete weight coating, see note 1



DETAIL 2
Typical rock dump pipeline with concrete weight coating, see note 1



DETAIL 3
Typical sitetap on 36" NGT for 20' connection to N5

GENERAL NOTES

- COMPOSITION AND STABILITY TO BE DETERMINED BY CONTRACTOR. MINIMUM REQUIRED DOWNWARD FORCE BASED ON ROCK BERM HEIGHT 0.8 m T.O.P. AND 2650 kg/m³ ROCK DENSITY.
- SPOOL LENGTH TO BE CONFIRMED BY STRESS ANALYSIS

REFERENCES

N05A-7-51-0-72510-01 Overall field layout drawing
 N05A-7-50-0-72018-01/06 Pipeline alignment sheet - Buried / Unburied option - sheet 01-06

LEGEND

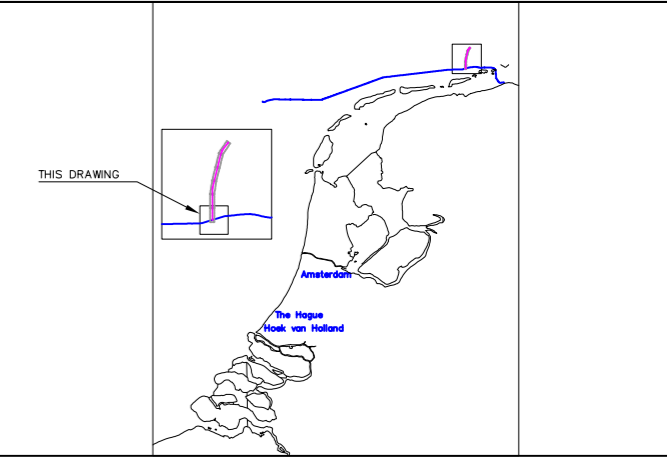
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- KILOMETER MARKER
- PIPELINE: N05A - NGT
- CABLE: N05A - RIFFGAT
- BOUNDARY OF SURVEY AREA
- EXISTING PIPELINE
- EXISTING CABLE
- SHIPPING LANE RIJKSWATERSTAAT
- ROCKDUMP
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ROCKDUMP VOLUME			
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BURIED	225 m ³	200 m ³	125 m ³
UNBURIED	400 m ³	250 m ³	150 m ³

GEODETTIC PARAMETERS

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 Horizontal Datum Name: European Datum 1950 North Sea -UKCS
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 WGS84 to ED50 TRANSFORMATION: UKOAA (EPSG: 1311)



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Client ONEDyas B.V.
 Project **N05-A TO NGT PIPELINE**
 Document **Approach drawing AT NGT**

one dyas

Scale: **1:150**
 Size: **A1**

Project number: **19018**
 Document Number: **N05A-7-10-0-70032-01**

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BURIED	825 m3	475 m3	275 m3




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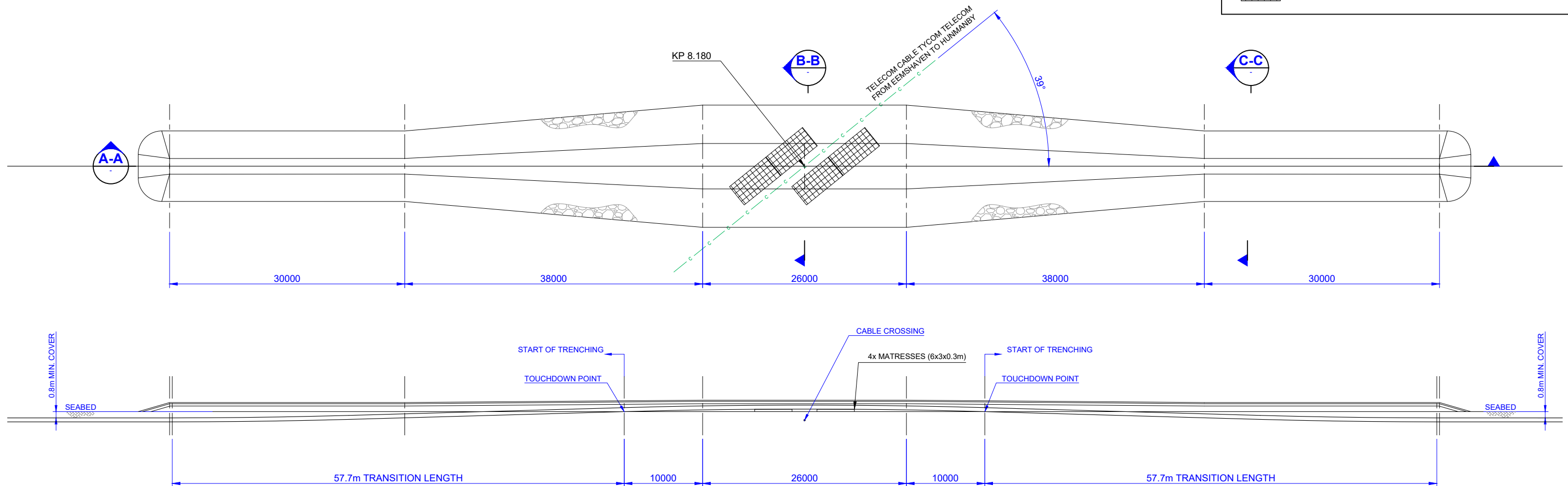
- COMPOSITION AND STABILITY TO BE DETERMINED BY CONTRACTOR. MINIMUM REQUIRED DOWNWARD FORCE BASED ON ROCK BERM HEIGHT 0,8 m T.O.P. AND 2650 kg/m³ ROCK DENSITY.

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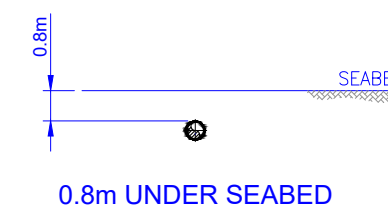
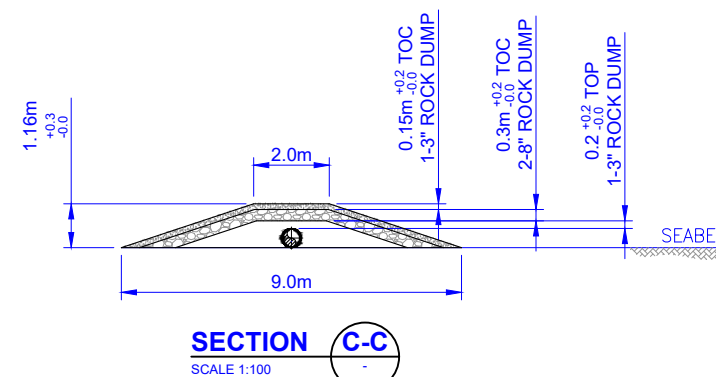
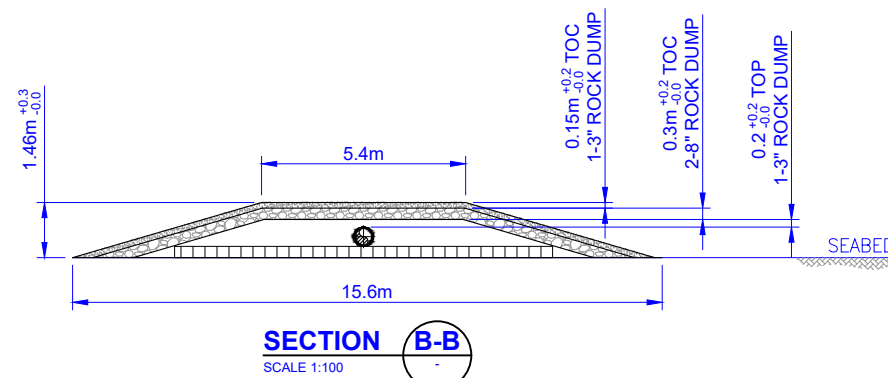
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LEGEND


-  EXISTING CABLE
-  ROCK DUMP
-  CONCRETE MATTRESSES



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SCALE 1:250



Rev	Date	Description	Drawn	Eng.	Check	Appr.	Client
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01	06-12-2019	FOR COMMENTS	SvdV	-	PF	PF	



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Client
ONEDyas B.V.

Project
N05-A TO NGT PIPELINE

Document
Crossing design
Buried pipeline
Sheet 01

Scale: **1:250**
Size: **A1**

Project number:
19018

Document Number
N05A-7-50-0-72022-01

ROCKDUMP VOLUME			
	LAYER 1 (1'-3")	LAYER 2 (2'-8")	LAYER 3 (1'-3")
BURIED	1475 m3	800 m3	450 m3

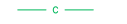

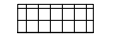
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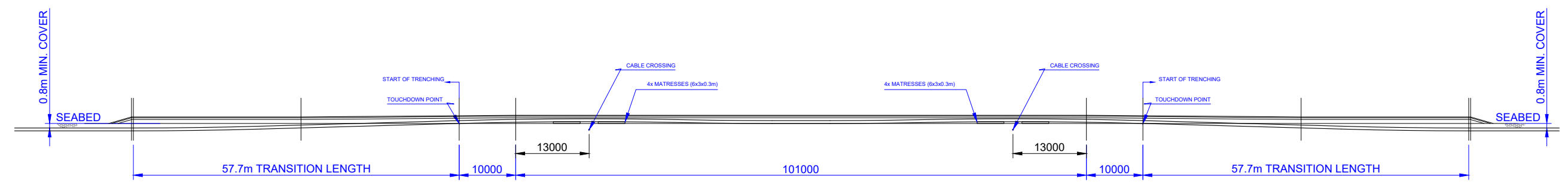
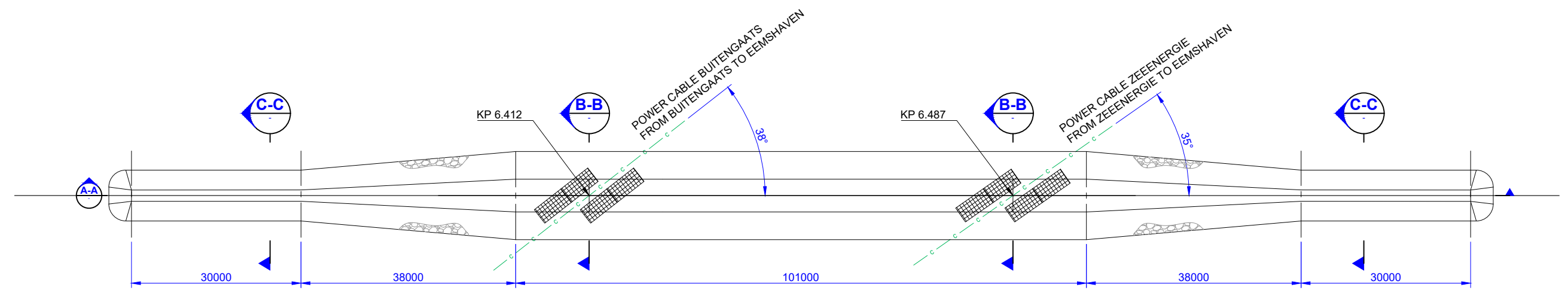
- COMPOSITION AND STABILITY TO BE DETERMINED BY CONTRACTOR. MINIMUM REQUIRED DOWNWARD FORCE BASED ON ROCK BERM HEIGHT 0,8 m T.O.P. AND 2650 kg/m³ ROCK DENSITY.

REFERENCES

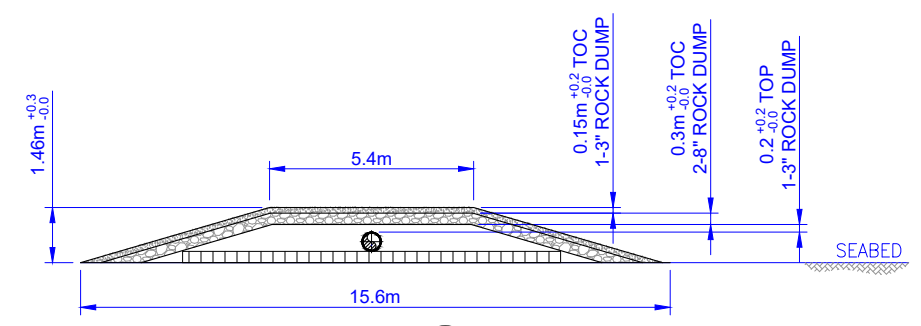
N05A-7-51-0-72510-01 Overall field layout drawing

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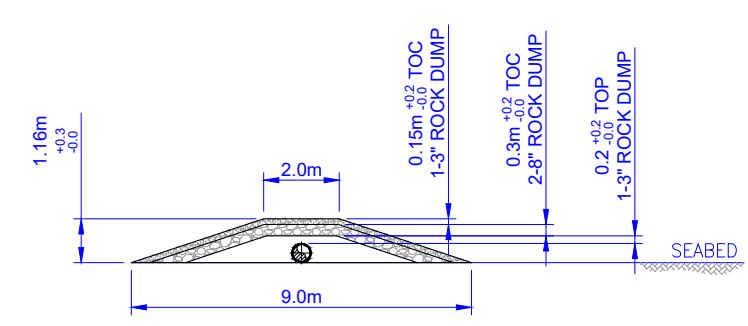
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-  ROCK DUMP
-  CONCRETE MATTRESSES



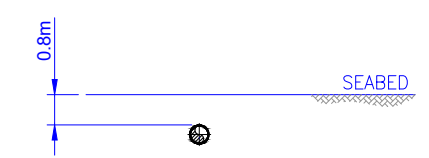
SECTION A-A
SCALE 1:400





SECTION B-B
SCALE 1:100



SECTION C-C
SCALE 1:100



0.8m UNDER SEABED

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Jan Evertsenweg 12 3115 JA Schiedam The Netherlands +31(0) 103132100 info@enersea.nl			Project N05a development				
			Document Crossing design Buried pipeline Sheet 02				
Project number: 19018			Document Number: N05A-7-50-0-72022-02				
			Scale: 1:400 Size: A1				



N5A-Development-Pipeline Route and Platform Area Survey

DOCUMENT CONTROL SHEET

Client	GEOXYZ					
Project	N5A-Development-Pipeline Route and Platform Area Survey					
Type	Factual Report					
Igeotest Project N°	2019.015 OFF One GEOXYZ					
Written by	ALN/ AV	Date	29/11/2019			
Revised by	AD	Date	29/11/2019			
Authorised by	RC	Date	29/11/2019			
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Authorised copies	Organization		Name			
	GEOxyz					
Revision History	Revision	Written by	Revised by	Authorised by	Date	Status
	R0				20/11/2019	Issued for Comment
	R1				29/11/2019	Issued for Comment

Signatory legend:

ONE Document Number: N05A-7-10-0-70018-01
 GEOXYZ Document Number: LU0022H-553-RR-03

ABSTRACT

IGEOTEST Geoscience Group was contracted by GEOXYZ to undertake an offshore geotechnical investigation for the N5A-Development-Pipeline Route and Platform Area Survey.

This Report resumes the methodologies, equipment and results of the Offshore Geotechnical Survey conducted by the IGEOTEST between April 28th and 17th May 2019 at North Sea Dutch Continental Shelf. The geotechnical offshore investigation consisted of:

- Sampling tests: Vibrocore (VC)
- Laboratory tests campaign on samples recovered during field works,
- Reporting.

DISCLAIMER

This report has been produced in line with the requirements and objectives of the scope of work and contract terms between IGEOTEST and the Client.

This report is produced solely for the benefit of GEOXYZ; no liability is accepted for any reliance placed on it by any other party, unless there is a specific written agreement.

Within the stated limitations, this report refers to the site conditions at the time of the investigation. There is not given warranty after the time of the investigation due to the possibility of changes in the site conditions.

The results are based upon expert interpretation of the data. All interpretation and opinions contained herein are provided based upon the data collected as part of survey, data provided by the client and data available within the public domain.

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3	INVESTIGATION OVERVIEW.....	10
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1 ACRONYMS AND SYMBOLS

The next table summarises the abbreviations and the acronyms used in this document.

AB's	Able Seaman
BS	British Standard
BGL	Below ground level
bsb	Below seabed
Diff.	Difference
DPR	Daily Progress Report
E	East
Lab test	Laboratory Test
LL	Liquid Limit
N	North
PL	Plastic Limit
PP	Pocket penetrometer
QC	Quality Control
SOW	Scope of Work
UTM	Universal Transversal Mercator
VC	Vibrocore
VT	Pocket Vane Test
WD	Water depth

Dr	%	Relative density
S _u	kPa	Undrained shear strength
u ₀	kPa	In situ pore pressure
σ _{v0}	kPa	total vertical stress
z	m	Depth below the reference level
z _w	m	Groundwater depth below the reference level
γ _w	kg/m ³	unit weight of water
WC	%	Water Content
LL	%	Liquid Limit
PL	%	Plastic Limit
PP	KPa	Pocket Penetrometer
TV	KPa	Torvane
p'	KPa	Preconsolidation pres.
C _c	-	Compression index

2 INTRODUCTION

IGEOTEST Geoscience Group was contracted by GEOXYZ to undertake an offshore geotechnical investigation for the N5A-Development-Pipeline Route and Platform Area Survey.

The investigation was carried out between 28th April and 17th May 2019 on board the GEO OCEAN III vessel. Locations were defined by the Client. Figure 1 and Figure 2 present the work area and the test locations. Water depth (mLAT) for the tested locations varied between -11 m and -26 m. The survey included two work areas: Hot Tap pipeline Route and Riffgat Cable Route.

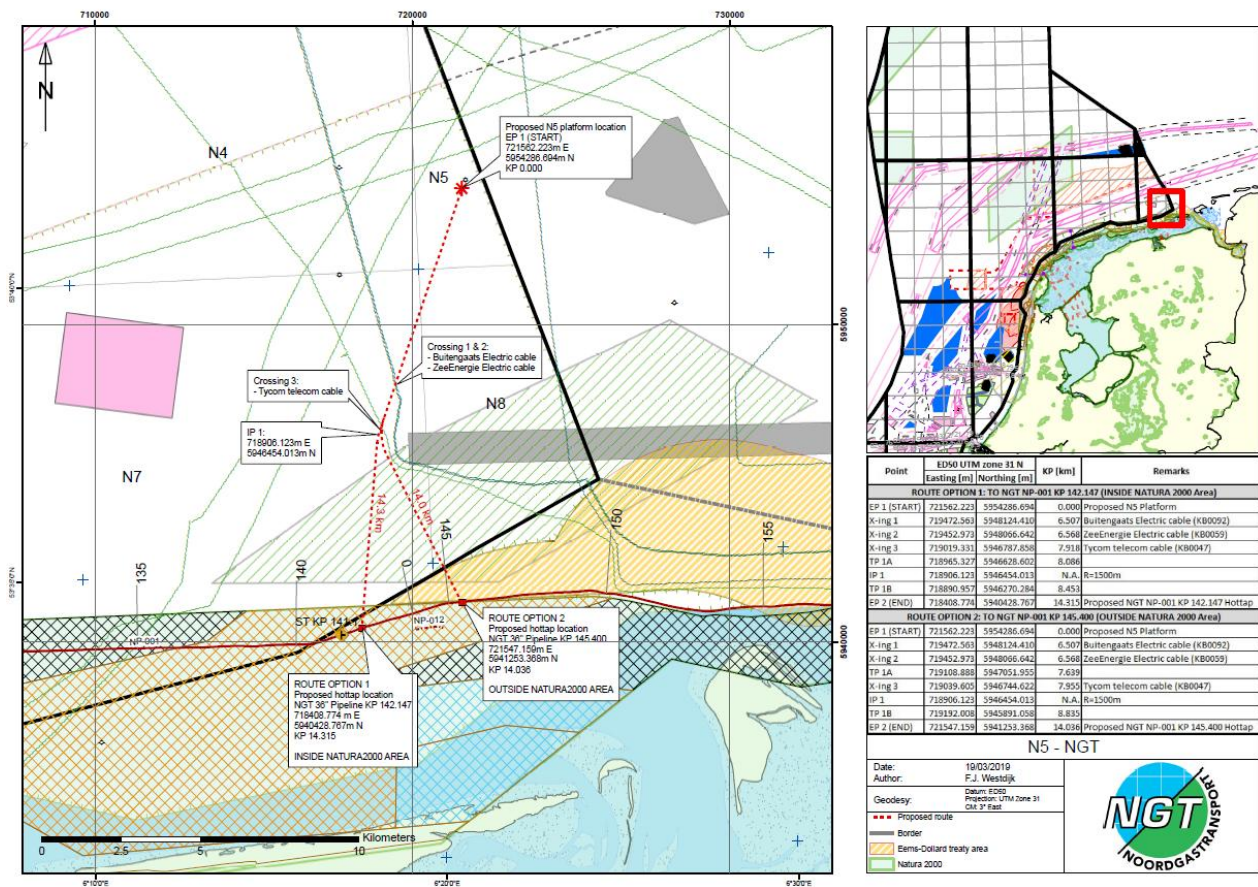


Figure 1 General work area

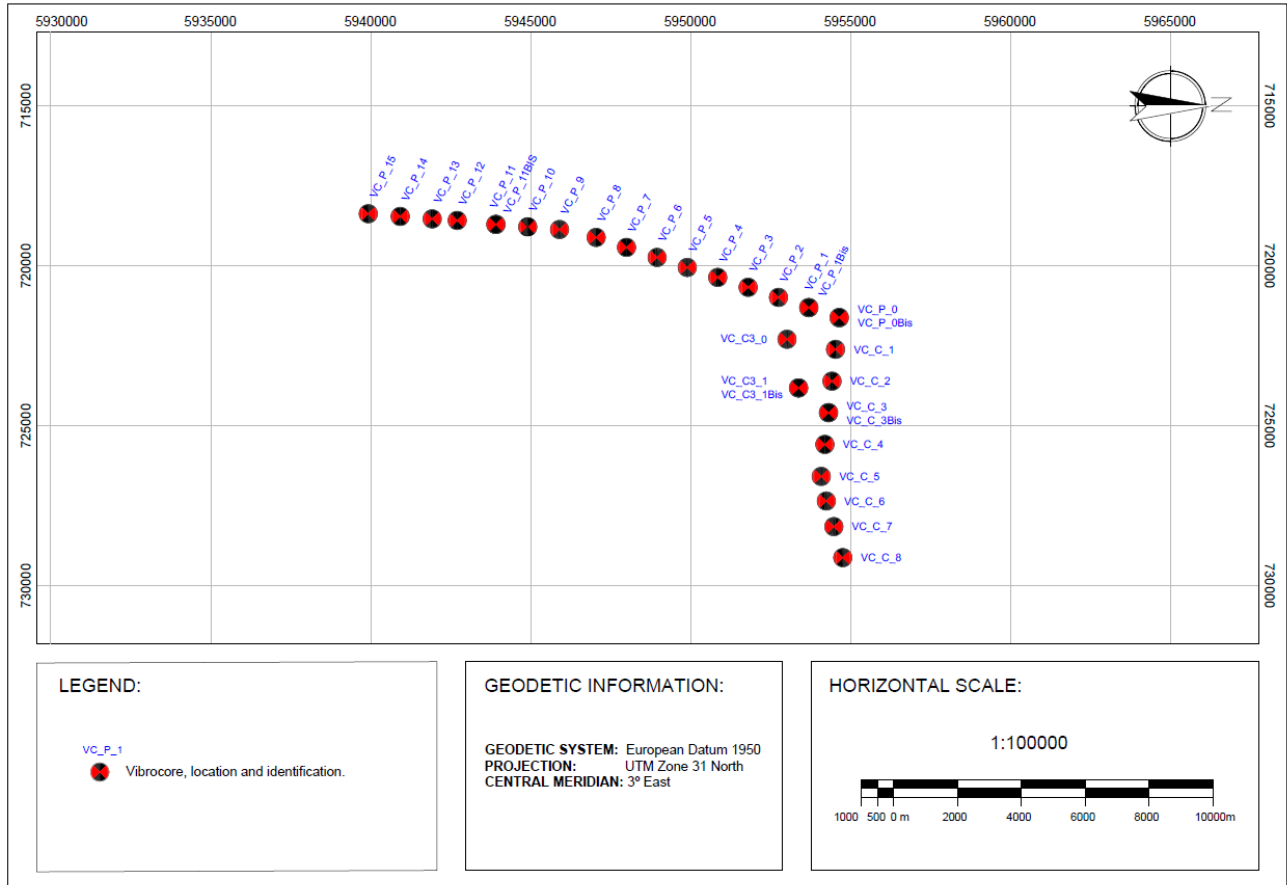


Figure 2 Sampling locations

The final scope of the geotechnical survey is summarised in Table 1.

Table 1 Scope of Works

Geotechnical survey	Area	Type of test	Num of test	Equipment
	OFFSHORE	VC 6m	27	GEOCORE
LABORATORY TESTS (see APPENDIX 2)				

WD: -11 m and -26 m LAT.

3 INVESTIGATION OVERVIEW

3.1 SCHEDULE OPERATIONS

The survey operations, including mobilisation and demobilisation, were carried out between 28th April and 17th May 2019. Key dates and real durations of the geotechnical campaign are available in Table 2.

Table 2 Operation key dates

Real operations plan		
Date	Days	Activity
28/04/2019	3	Mobilisation
29/04/2019		Mobilisation
30/04/2019		Mobilisation
01/05/2019	15	Standby. Other operations were carried out.
02/05/2019		Geotechnical operations
03/05/2019		Geotechnical operations
04/05/2019		Standby for weather.
05/05/2019		Standby for weather.
06/05/2019		Standby for weather.
07/05/2019		Geotechnical operations
08/05/2019		Geotechnical operations
09/05/2019		Geotechnical operations
10/05/2019		Geotechnical operations
11/05/2019		Geotechnical operations
12/05/2019		Geotechnical operations.
13/05/2019		Standby. Other operations were carried out.
14/05/2019		Geotechnical operations combined with other operations
15/05/2019		Geotechnical operations combined with demob operations
16/05/2019	2	Demob
17/05/2019		Demob

3.2 SURVEY ORGANISATION

The organisation of the campaign and personnel concerning to the project is shown in Figure 3.

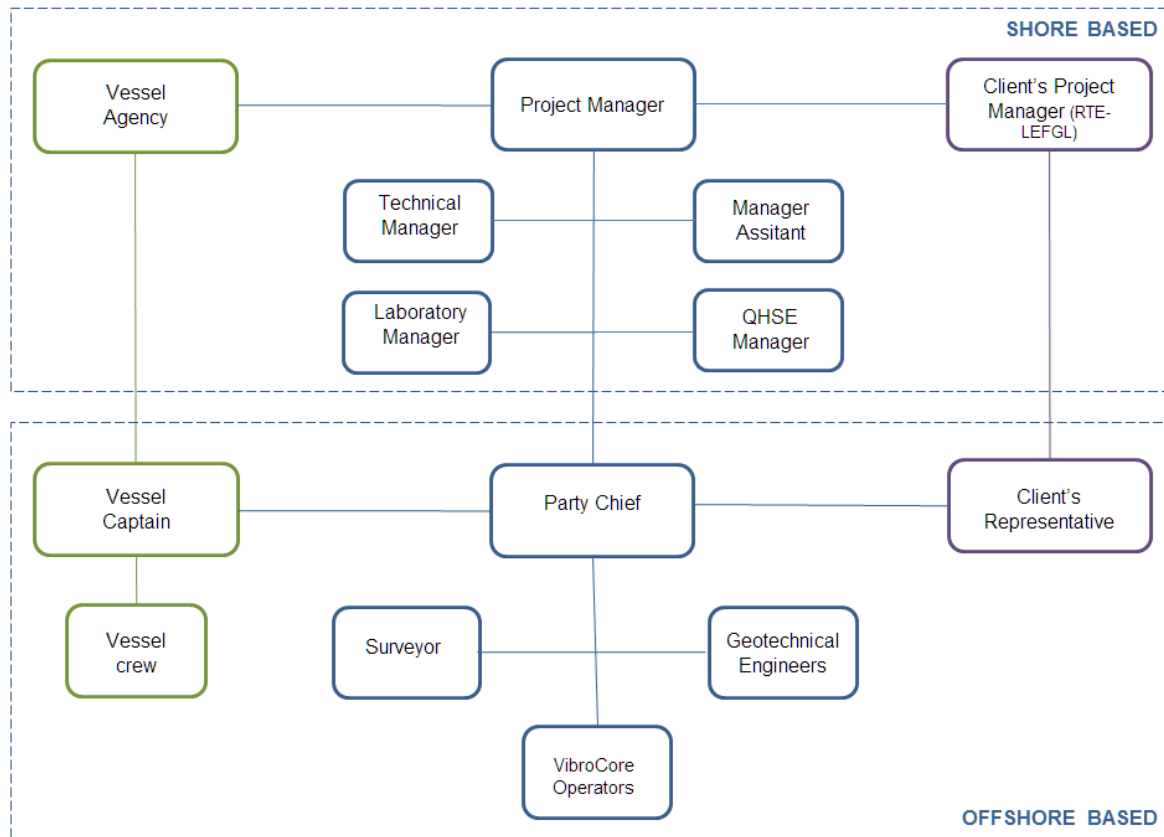


Figure 3 Organization chart in project

Table 3 summarises the name, position and tasks of personnel involved in the project.

Table 3 Key Personnel and Project Management

Position	Name	Tasks
Project Manager	Rafael del Castillo	<ul style="list-style-type: none"> Primary point of contact of Igeotest onshore. Coordinator between GEOxyz and Igeotest. Senior member of Project Management team which liaises with internal departments to co-ordinate information and ensure project runs smoothly. Supervises production of project paperwork, Liaises with in situ Project Manager to produce progress and financial reports. Overall management of project mobilisation, Operational, commercial and safety management of project, On-going and daily project management, including general logistics of personnel, equipment.
		<ul style="list-style-type: none"> Provides remote support to onsite field staff and ensures projects are executed following client's technical specifications, Recruitment, coordination and management of technical and workshop personnel,
Technical Manager	Amadeu Deu	

Position	Name	Tasks
		Responsible of data and report quality.
HSE & QA Manager	Esperanza López	<p>Liaises with management and clients on all aspects of QA/QC, Responsible for QA program and audits, Guarantees QA/QC procedures are implemented throughout the company, Ensures HSE policies are followed throughout the company at all levels, Advises Board of all matters pertaining to Health, Safety and the Environment, Chairs Safety Committee and Safety Review Meetings,</p>
Laboratory Manager	Guillem Massallé	<p>Responsible to run the laboratory safely and efficiently. Works with health and safety department to ensure lab complies with regulations and all required trainings. Ensures the completion and quality of the laboratory test campaign. Takes responsibility for all aspects of the labs where they work, including equipment, employees, supplies, software, and documentation. Prepares periodic progress reports or written reports on all phases of the research project.</p>
Geotechnical Supervisor, Processing and Sampling Team (GEO) at office	Ana-Lidia Navarro	<p>Provides management support during project. Liaisons with field personnel to ensure project integrity, Performs all phases of project execution including drafting proposals, site exploration and laboratory assignments, analysis and report preparation, Consults extensively with a high degree of reliance placed on scientific interpretations and advice. Supervises all laboratory tests and reports to ensure deadlines are met. QA of reports and test results.</p>
Vessel Master	--	<p>Overall responsibility for management of vessel, Ultimate responsibility for safety and operation of vessel, Responsible for co-ordination of vessel based Emergency Response and contingencies.</p>
Party chief	Wendy Cooney Kane	<p>Overall management of offshore operations, Primary point of liaison between technical and vessel teams, Ensures offshore operations conducted safely and competently in line with project and company procedures, Host regular safety and toolbox talk meetings, Advises the Project Manager of the progress and planning of operations, Informs the Project Manager of any HSE incident and to provide incident report within 24 hours of occurrence in-line with Igeotest reporting procedures. QA of reports. Supervises field work operations and field reports and deliverables, Gives support to field works and in situ decisions, Monitors progress and status of offshore survey activities, Liaises with office personnel to ensures project integrity, Gives support in the processing of test data.</p>
Deck supervisor and technical Operator	Joel Costa	<p>Responsible for inspections and running the geotechnical operation of state of the deck work, Directs, coaches and supervises the geotechnical operations. Gives support to the Party Chief,</p>

On board key personnel

Position	Name	Tasks
		<p>Manages assignment of duties and workstations to deck staff and reviews daily requirements,</p> <p>Conducts inspections in work areas and ensures that safety standards are met during the geotechnical operations,</p> <p>Performs operations in accordance with Igeotest quality Standards,</p> <p>Responsible of Mob and Demob activities,</p> <hr/> <p>Acquires geotechnical data,</p> <p>Sets up and maintains technical equipment. Able to separate normal and abnormal operation and identifies malfunctions and their nature.</p> <p>Possess a broad general knowledge as a mechanic, in order to work safely and efficiently. Ensures quality of test data and test procedures.</p> <p>Executes VC sampling test.</p> <p>Gives support to Party chief and GEO team</p>
Client Representative	--	<p>Represent client's technical, commercial and safety interests on-board the vessel.</p> <p>Responsible for liaison with client's Emergency Response Co-ordinators in the event of an incident.</p> <p>The Client Rep. has the right to stop any operation which he considers dangerous. He may request but not order the commencement of operations.</p>
Surveyor	GEOxyz	<p>Responsible for positioning using specialised technical software and equipment including satellite and terrestrial positioning systems.</p> <p>Monitors progress and status of offshore survey activities.</p> <p>Participates in offshore jobs as part of the operation team, if required.</p>
Reporting and Data Processing Team. And technical supervisor	Juan Espliego/ Marc Colomer	<p>Procurement of engineering and equipment requirements,</p> <p>Prints out sampling logs by means of dedicated software,</p> <p>Gives support to Party chief,</p> <p>Ensures QA of reports and test results.</p>

4 GEODESY AND REFERENCES

4.1 PROJECT GEODESY

The positioning was according to the following geodesy: European Datum 1950 UTM Zone 31N.

4.2 POSITIONING SYSTEM

The vessel positioning was under GEOxyz responsibility.

4.3 VERTICAL REFERENCE

The vessel positioning was under GEOxyz responsibility. Where bathymetry and depth data information were reported, it was expressed using the Lowest Astronomical Tide (LAT) vertical datum.

5 GEOTECHNICAL LOCATIONS

Theoretical coordinates of investigation points were provided by the client. Tests were performed as close as reasonably possible to the theoretical locations provided. The following Table 4 resumes the final coordinates, number of attempts and water depth for each investigation point.

Table 4 Theoretical and final coordinates of every investigation point

Location Reference	Type	Date	Final Location		WD [m] LAT	Attempts
			E [m]	N [m]		
VC_P_11BIS	VC	11/05/2019	718696.95	5943918.27	-13.7	1
VC_C_1	VC	10/05/2019	722602.76	5954534.42	-25.2	1
VC_C_2	VC	10/05/2019	723596.51	5954423.75	-24.7	1
VC_C_3	VC	10/05/2019	724581.29	5954314.25	-24.4	1
VC_C_3Bis	VC	10/05/2019	724581.23	5954315.81	-24.4	2
VC_C_4	VC	10/05/2019	725574.08	5954201.36	-24.5	1
VC_C_5	VC	10/05/2019	726572.99	5954087.23	-22.7	1
VC_C_6	VC	09/05/2019	727343.67	5954245.05	-20.8	1
VC_C_7	VC	09/05/2019	728142.96	5954481.18	-20.9	1
VC_C_8	VC	09/05/2019	729111.94	5954761.23	-20	1
VC_C3_0	VC	14/05/2019	722287.16	5953017.65	-23.1	1
VC_C3_1	VC	14/05/2019	723808.10	5953379.00	-24.5	1
VC_C3_1Bis	VC	14/05/2019	723807.68	5953377.07	-24.6	2
VC_P_0	VC	07/05/2019	721606.57	5954650.06	-25.8	1
VC_P_0Bis	VC	07/05/2019	721615.25	5954649.28	-25.8	2
VC_P_1	VC	07/05/2019	721299.75	5953697.61	-24.7	1
VC_P_10	VC	12/05/2019	718774.37	5944909.65	-14.2	1
VC_P_11	VC	11/05/2019	718699.71	5943915.24	-13.7	1
VC_P_12	VC	11/05/2019	718573.63	5942705.61	-12.7	1

Location Reference	Type	Date	Final Location		WD [m] LAT	Attempts
VC_P_13	VC	11/05/2019	718525.07	5941924.00	-12.9	1
VC_P_14	VC	11/05/2019	718448.90	5940923.80	-11	1
VC_P_15	VC	11/05/2019	718363.89	5939924.51	-11	1
VC_P_1Bis	VC	07/05/2019	721297.45	5953699.04	-24.7	2
VC_P_2	VC	07/05/2019	720978.79	5952750.10	-21.1	1
VC_P_3	VC	07/05/2019	720663.95	5951802.02	-20.2	1
VC_P_4	VC	07/05/2019	720354.17	5950851.21	-18.3	1
VC_P_5	VC	07/05/2019	720042.60	5949898.99	-21.6	1
VC_P_6	VC	02/05/2019	719729.89	5948953.64	-18.4	1
VC_P_7	VC	02/05/2019	719415.30	5947998.56	-18.1	1
VC_P_8	VC	02/05/2019	719103.52	5947050.26	-17.5	1
VC_P_9	VC	12/05/2019	718856.66	5945904.02	-16	1

6 VIBROCORE SAMPLING

A total of 31 VC tests in a 6 m configuration were carried out. The following table summarises the penetration and recovery of each Vibrocore.

Table 5: Summary for Vibrocore survey

Point ID	Penetration		Recovery	
	(m)	(m)	(m)	(%)
VC_P_11BIS	5.80	4.70		81.03
VC_C_1	3.20	3.20		100.00
VC_C_2	3.00	3.00		100.00
VC_C_3	2.80	2.50		89.29
VC_C_3Bis	2.40	2.10		87.50
VC_C_4	6.00	5.50		91.67
VC_C_5	5.80	5.50		94.83
VC_C_6	5.70	5.60		98.25
VC_C_7	5.30	5.30		100.00
VC_C_8	5.60	5.50		98.21
VC_C3_0	5.80	5.55		95.69
VC_C3_1	2.55	2.55		100.00
VC_C3_1Bis	2.05	1.80		87.80
VC_P_0	2.20	2.10		95.45
VC_P_0Bis	5.60	5.50		98.21
VC_P_1	2.60	2.60		100.00
VC_P_10	5.80	4.30		74.14
VC_P_11	2.80	2.30		82.14
VC_P_12	3.50	3.40		97.14
VC_P_13	6.00	5.30		88.33
VC_P_14	5.40	5.40		100.00
VC_P_15	5.50	4.50		81.82
VC_P_1Bis	2.75	2.75		100.00


Point ID	Penetration		Recovery
	(m)	(m)	(%)
VC_P_2	5.60	5.60	100.00
VC_P_3	5.60	5.35	95.54
VC_P_4	5.80	5.60	96.55
VC_P_5	6.00	5.60	93.33
VC_P_6	5.50	5.50	100.00
VC_P_7	5.70	5.70	100.00
VC_P_8	5.70	5.70	100.00
VC_P_9	5.80	5.50	94.83

7 EQUIPMENT

This chapter summarises the marine spreads and geotechnical equipment used for this work.

7.1 VESSEL

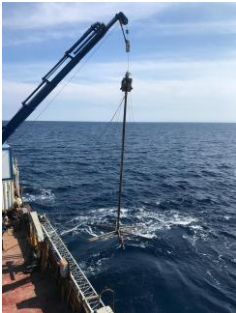
Table 6 Vessel description

GEO OCEAN III	
	Dimensions:
	Overall Length: 77.30 m
	Width: 18 m
	Min/Max Draught: 3.80 m/ 6.10 m
	Speed: 8 - 11 knots
	Licensed for: 56 passengers & crew
	AUT-UMS - ALM - DYNAPOS-AM/AT-R; SDS Unrestricted Navigation

7.2 GEOTECHNICAL EQUIPMENT

The main technical specifications of the equipment used to conduct the geotechnical investigation is listed in the following Table 7.

Table 7 Sampling equipment specification

VIBRO CORER GEO-CORER 6000	
	Name of manufacturer: GEO 6000
	Setup: 6 meters.
	Max. weight in air 1000-1200 kg
	Max. weight in water 850-1050 kg
	Core barrel ID/OD: 113mm / 121mm, seamless stainless steel 316
	Core catcher (stainless steel 316). Replaceable cutting shoe (carbon steel)
	Core liner ID/OD: 106 mm / 110 mm, PVC or transparent PVC
	Motor (5.5 kVA), Frequency of vibration 28 Hz. Non return valve.

7.3 ON BOARD LABORATORY EQUIPMENT

Table 8 Laboratory equipment on board

POCKET PENETROMETER TEST



Name of manufacturer: FORESTRY SUPPLIERS, INC.

Model: 77114

Range: 0 a 4.5 kg/cm2

Resolution: 0.25 kg/cm2

TORVANE



Name of manufacturer: CONTROLS

Model: 16-T0175/A

Range: 0 to 2.5 kg/ cm²

Resolution: 0.02 kg/cm²

8 METHODOLOGIES

8.1 VIBROCORE

The standard model Geo Corer used for the project is suitable for water depths up to 250 m. The Geo Corer normally penetrates into the sediment at about 3 m per minute. Increased or reduced penetration rate could be achieved by adding or removing dead weights mounted on the vibrating head, see equipment at Figure 4 and Figure 4.



Figure 4 Vibrocore

The following operations are typically undertaken for Vibrocore test performance:

- The Vibrocore is lifted on an area where the vessel side is free. Then, it is lowered to the water surface. While the Vibrocore is being lifted and lowered, it is steadied by two AB's, using ropes to prevent rotation.
- Once the vessel is in a stable position, the Vibrocore is lowered into the water.
- Vibration begins as soon as possible after the equipment is positioned on the seabed.
- Once the Vibrocore is on the seabed, the cable is marked at this length. After this, the motor is activated to start the vibration.
- The umbilical cable is lowered with constant tension at the same rate as penetration.
- Once the penetration is completed, the vibromotor is switched off automatically.
- The core barrel is then retrieved from the seabed. The sample remains inside the liner because a core catcher prevents losing it.

In the case of vibro core, the stop criteria are determined for the following reasons:

- Target depth
- Abnormal changes the type of vibration or amperage that appear on the meter, higher than 8 A.
- Non penetration of the equipment during vibration in approximately 10 seconds.

8.2 SAMPLING

Samples were performed until the appropriate depth was reached. In every case the Vibrocore/ Pistoncore was completed following Igeotest internal procedures and the Scope Work.

The Scope of Works contemplated the execution of geotechnical vibrocores and pistoncores. Geotechnical samples were analysed on site by a Geotechnical Engineer before packaging and storage. Identification of constituent materials was carried out visually according to grain size, and/or plasticity characteristics. Because the liners were not open on-site, the soil description was carried out only on the TOP and BOTTOM of each sample (These preliminary data were delivered to Party Chief onboard).

During the survey, cores were stored inside a container near of the offshore laboratory so they can be retrieved and in an environment that does not alter the properties of interest. Samples were stored in the same orientation in which these were obtained (i.e. vertical), away from sources of vibrations and near the central axis of the vessel where the least movement occurs.

The following requirements and procedures were considered when transporting a core from one location to another:

- Handling during loading and unloading should be done gently. Never drop core boxes or tubes, but rather slide gently into position. If a box is accidentally dropped, this fact is recorded.
- Vibro Corer was sent by commercial carriers. The commercial carrier company was advice of the fragile material.

Samples removed from the inventory for testing and analyses in the laboratory were handled carefully to preserve fluid content and integrity. The specimen preparation was in accordance with the appropriate

standards. During transport, it was important to maintain sample moisture and fluid content. The samples were received in good condition and most liners had water at the top, which proves a good seal. Figure 5 shows a core catcher in core barrel.



Figure 5 Core catcher

8.3 ONSHORE LABORATORY

Once the field works were finished, samples were sent to Igeotest’s onshore laboratory located in Figueres (Spain), to be properly opened and described. Taking into account the soil lithology and the number and type of laboratory tests included in the client requirements, a laboratory tests schedule was defined by Igeotest’s technicians and then slightly modified and approved by GEOXYZ. The step-by-step procedure for defining the laboratory tests schedule and submission of results is shown in Figure 6.

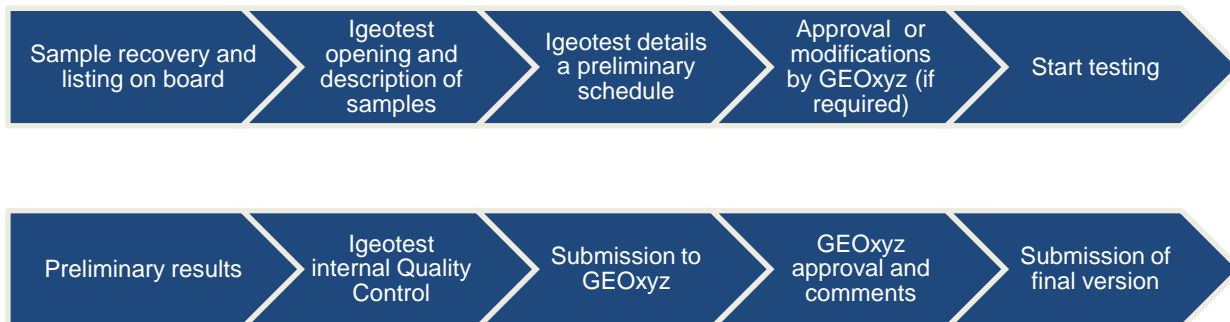


Figure 6 Laboratory testing procedure diagram

The laboratory results are summarised in chapter APPENDIX 2. Moreover, all results, for each vibrocore, are included in VC logs together with soil description in APPENDIX 1.

9 LABORATORY

Samples recovered during the offshore geotechnical survey were sent to Igeotest onshore laboratory in order to carry out geotechnical tests. The approved proposal of Laboratory test program is summarised in

Table 9. Approved laboratory tests campaign

Group	Test	Standard	Total
Description	Description and photo	-	148
Index tests	Moisture content	ISO 17892-1:2014	148
	Dry & Bulk density	ISO 17892-2:2014	148
	Particle density	ISO 17892-3:2014	148
	PSD (sieve)	ISO 17892-4:2016	148
	PSD (hydrometer)	ISO 17892-4:2016	76
	Atterberg limits	ISO 17892-12:2018	18
	Minimum and maximum density	UNE 103106:1993	63
	Shear Strength	Triaxial test UU (undisturbed)	ISO 17892-8:2018
Fall cone test (undisturbed + remoulded)		ISO 17892-6:2018	12
CID Triaxial test with bender elements		BS1377: Part 8: 1990	3
Interface ring shear		ICP Design Methods for Driven Piles in Sands and Clays (Jardine et al , 2005)	2
CAUc Triaxial test with bender elements		ASTM D3999/D3999M-11	1
CAUe Triaxial test with bender elements		ASTM D3999/D3999M-11	1
Monotonic DSS test		ASTM D6528-07	1
Stress-controlled cyclic CIU Triaxial test		ASTM D3999/D3999M-11	1
Stress-controlled cyclic DSS test		ASTM D6528-07	1
Resonant column test		ASTM D4015-07/ASTM D4015-15e1	1
Consolidation	Incremental loading oedometer test	ISO 17892-5:2017	12
Permeability	Permeability by constant head	ISO 17892-11:2019	29
Chemical tests	Organic and total carbon	ISO 10694:1995	148
	Carbonate content	ISO 10693:1995	109

10 RESULTS

All the lab results and final descriptions are summarized in the APPENDIX 1 and APPENDIX 2.

APPENDIX 1 include vibrocore logs updated with lab test results and APPENDIX 2 included tests results summary table and the laboratory test sheets area available on the file Lab Results.rar.

This report is limited to provide all results but does not include an interpretation or a definition of geotechnical levels according to all data provided.

Penetrations are lower than 5 mm, so results are out of standard and may be taken with due reservations

11 BRIEF SUMMARY OF SOIL ENCOUNTERED

The overall modern topography of the North Sea sea bed has originated from the influences of deep geological structure on the patterns of basin subsidence, uplift and climate on sediment input. The smaller-scale seabed geometry of the continental shelf is a relict of several glacial periods when large volumes of material were eroded from the adjacent mainlands and from the continental shelf itself. This material was then re-deposited on the shelf or in the deeper later on the adjacent continental slope. The modern sedimentary environment of the North Sea continental shelf is now dominated by very low sediment input and the reworking of the seabed by near-bottom currents

The soils in the study area mostly consist of fine to medium SAND. Along the VC_C locations the percentage of clayey SILT (which can include a variable percentage of clay) increase. It should be noted that gravelly Sand was found in VC_C_5, VC_C_6, VC_C_8 VC_P, VC_P_3 between -22 and -25 m LAT approximately.

APPENDIX

APPENDIX 1. SAMPLING LOGS

APPENDIX 2. LAB RESULTS

APPENDIX 3. GENERAL MAP

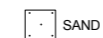
APPENDIX 1. SAMPLING LOGS

POINT: VC_P_11BIS
COORDINATES (UTM)
N 5943918.27 m
E 718696.95 m
Elevation - 13.70 m LAT

START DATE: 11/5/19
FINISH DATE: 11/5/19
GEOLOGIST: MC/AV
STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore REMARKS:
DRILLER: JC
ASSISTANT: MC

LEGEND



DEPTH (m BGL)	ELEVATION (m LAT)	GRAPHIC LOG	C.BARREL/C.SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	LABORATORY TEST RESULTS																		
						Identification & classification						Strength tests			Oedometer		Perm.			Soil Chemical analysis				
						WC (%)	LL (%)	PL (%)	Density (g/cm³)	Particle Bulk	Dry	Gravel (%)	Sand (%)	Fines (%)	Silt (%)	Clay (%)	Su peak (kPa)	Tx UU	Su PP (kPa)	Su TV (kPa)	p' (kPa)	Cc (kPa)	Permeability constant (cm/s)	Total carbon (g/kg)
-14.00				0.00- 0.22: Dark grayish brown (2.5Y 4/2) medium to fine SAND with frequent shell fragments (coarse sand to medium gravel sized). Clear but not sustained effervescence from HCl.	S-5	X																3.7	0	34.8
				0.22- 0.25: Dark gray (2.5Y 4/1) fine SAND with occasional amorphous organic matter and frequent shell fragments (fine to medium gravel sized)																				
				0.25- 1.45: Gray (2.5Y 5/1) fine SAND with rare amorphous organic matter millimetrical pockets and rare shell fragments.																				
1.00					S-4	X																4.5	0	38.2
-15.00																								
				1.45- 3.51: Gray (2.5Y 5/1) fine SAND with occasional medium sand with frequent shell fragments (some of them medium sand to medium gravel sized)																				
2.00					S-3	X																		
-16.00																								
3.00					S-2	X																		
-17.00																								
				3.51- 3.73: Gray (2.5Y 5/1) fine SAND with rare clay millimetrical pockets and occasional medium sand, with rare amorphous organic matter pockets and rare shell fragments (some of them medium sand to medium gravel sized)																				
				3.73- 4.70: Gray (2.5Y 5/1) fine SAND with rare millimetrical clay pockets, rare amorphous organic matter spots and rare shell fragments. Sustained effervescence from HCl.																				
4.00				From 4.67m to 4.70m: frequent fibrous to pseudo fibrous wood fragments and frequent shell fragments (medium gravel sized).	S-1	X																		
-18.00																								

Bottom at 4.70 m

PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_11BIS



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_11BIS



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_11BIS





PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY.
 CLIENT: GEOxyz. LOCATION: North Sea Dutch Continental Shelf

POINT: VC_C_1
 COORDINATES (UTM)
 N 5954534.42 m
 E 722602.76 m
 Elevation - 25.20 m LAT

START DATE: 10/5/19
 FINISH DATE: 1/10/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore REMARKS:
 DRILLER: JC
 ASSISTANT: MC

LEGEND



DEPTH (m BGL)	ELEVATION (m LAT)	GRAPHIC LOG	C.BARREL/C.SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	LABORATORY TEST RESULTS																				
						Identification & classification						Strength tests			Oedometer		Perm.			Soil Chemical analysis						
						WC (%) LL (%) PL (%)	Density (g/cm ³) Particle Bulk Dry	Gravel (%)	Sand (%)	Fines (%)	Silt (%) Clay (%)	Su peak (kPa) Tx UU Su peak (kPa) Fall cone	Su PP (kPa) Su TV (kPa)	p' (kPa)	Cc (kPa)	Permeability constant (cm/s)	Total carbon (g/kg)	Organic carbon (g/kg)	Carbonates (g/kg)							
0.00-0.16	-25.20	X	106	Very dark gray (2.5Y 3/1) medium to coarse SAND with rare fine gravel and frequent shell fragments (some of them medium gravel sized). Clear but not sustained effervescence from HCl.	S-3																					
0.16-0.89	-26.00	X	106	Very closely fissured black (5Y 2.5/1) clayey SILT with occasional fine sand pockets. No sustained effervescence from HCl. The fissures are horizontal and unpolished with a sustained effervescence from HCl.	S-3																					
0.89-1.05	-26.50	X	106	Very dark grayish brown (2.5Y 3/2) slightly sandy SILT with occasional clay pockets.	S-3																					
1.05-1.07	-26.80	X	106	Very closely fissured black (5Y 2.5/1) clayey SILT. No sustained effervescence from HCl. The fissures are horizontal and unpolished with a sustained effervescence from HCl.	S-3																					
1.07-1.12	-27.00	X	106	Black (5Y 2.5/1) fine SAND. Clear but not sustained effervescence from HCl.	S-3																					
1.12-2.30	-27.50	X	106	High strength very closely fissured black (5Y 2.5/1) clayey SILT with frequent fine sand pockets. No sustained effervescence from HCl. The fissures are horizontal and unpolished with a sustained effervescence from HCl.	S-2															0.150			10.47	7.15	27.6	
2.30-3.20	-28.00	X	106	Very dark grayish brown (2.5Y 3/2) silty fine SAND with frequent clay pockets and millimetric to centimetric clay layers. Clear but not sustained effervescence from HCl.	S-1																					

Bottom at 3.20 m

PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_1



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_1





PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY.
 CLIENT: GEOxyz. LOCATION: North Sea Dutch Continental Shelf

POINT: VC_C_2
 COORDINATES (UTM)
 N 5954423.75 m
 E 723596.51 m
 Elevation - 24.70 m LAT

START DATE: 10/5/19
 FINISH DATE: 10/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore REMARKS:
 DRILLER: JC
 ASSISTANT: MC

LEGEND

□ SAND □ SILTCL

DEPTH (m BGL)	ELEVATION (m LAT)	GRAPHIC LOG	C.BARREL/C.SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	LABORATORY TEST RESULTS													
						Identification & classification					Strength tests			Oedometer		Perm.		Soil Chemical analysis	
						WC (%) LL (%) PL (%)	Density (g/cm ³) Particle Bulk Dry	Gravel (%) Sand (%) Fines (%) Silt (%) Clay (%)	Su peak (kPa) Tx UU Su peak (kPa) Fall cone	Su PP (kPa) Su TV (kPa)	p' (kPa) Cc (kPa)	Permeability constant (cm/s)	Total carbon (g/kg) Organic carbon (g/kg) Carbonates (g/kg)						
-25.00				0.00- 0.50: Light olive brown (2.5Y 5/4) gravelly fine to medium SAND with rare amorphous organic matter blackish zones and occasional shell fragments and polychaetes (specifically Lanice conchilega). Clear but not sustained effervescence from HCl. · From 0.43m to 0.50m: fine to medium SAND with fine to medium gravel with frequent shell fragments	S-3	X	1.9	96.5	1.6						2.8	0.2	21.7		
1.00				0.50- 1.10: High strength very closely fissured black (5Y 2.5/1) clayey SILT. No sustained effervescence from HCl. The fissures are horizontal and unpolished with a sustained effervescence from HCl.															
-26.00				1.10- 3.00: High strength fissured black (5Y 2.5/1) clayey SILT with rare brownish pockets. No sustained effervescence from HCl. The fissures are horizontal and unpolished with a sustained effervescence from HCl.	S-2														
2.00																			
-27.00					S-1		0	0.2	99.8	69.8	30								
3.00				Bottom at 3.00 m															

Bottom at 3.00 m

PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_2



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_2



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_3



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_3





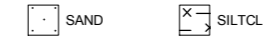
PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY.
 CLIENT: GEOxyz. LOCATION: North Sea Dutch Continental Shelf

POINT: VC_C_3Bis
 COORDINATES (UTM)
 N 5954315.81 m
 E 724581.23 m
 Elevation - 24.40 m LAT

START DATE: 10/5/19
 FINISH DATE: 10/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore REMARKS:
 DRILLER: JC
 ASSISTANT: MC

LEGEND



DEPTH (m BGL)	ELEVATION (m LAT)	GRAPHIC LOG	C.BARREL/C.SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	LABORATORY TEST RESULTS																
						Identification & classification						Strength tests			Oedometer		Perm.			Soil Chemical analysis		
						WC (%) LL (%) PL (%)	Density (g/cm ³) Particle Bulk Dry	Gravel (%)	Sand (%)	Fines (%)	Silt (%) Clay (%)	Su peak (kPa) Tx UU Su peak (kPa) Fall cone	Su PP (KPa) Su TV (KPa)	p' (kPa)	Cc (kPa)	Permeability constant (cm/s)	Total carbon (g/kg)	Organic carbon (g/kg)	Carbonates (g/kg)			
				0.00- 0.35: Olive brown (2.5Y 4/3) medium SAND with frequent amorphous organic matter, occasional shell fragments and polychaetes. (specifically Lanice conchilega). Clear but not sustained effervescence from HCl.	S-2	X	0.5	97.6	1.9									5.8	3.7	17.8		
				0.35- 2.10: High strength very closely fissured black (5Y 2.5/1) clayey SILT. No sustained effervescence from HCl. The fissures are horizontal and unpolished with a sustained effervescence from HCl.	S-1		0	9.05	90.95	61.95	29	▽			0.237			41.37	30.99	86.50		

Bottom at 2.10 m

PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_3Bis



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_4



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_4



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_4



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_5



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_5



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_5



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_6



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_6



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_6



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_7



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_7



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_7



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_8



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_8



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C_8



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C3_0



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C3_0



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C3_0



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C3_1



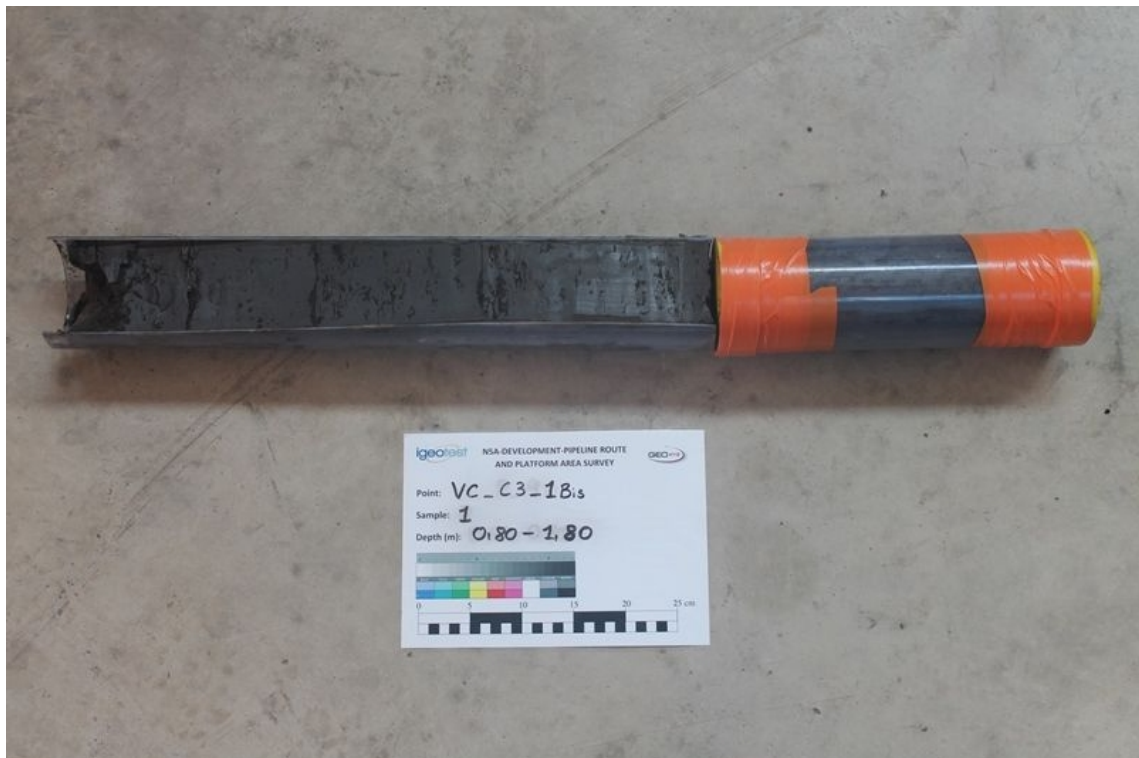
PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C3_1



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_C3_1Bis



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_0



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_0Bis



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_0Bis



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_0Bis



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_1



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_1



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_10



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_10



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_10



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_11



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_11





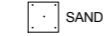
PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY.
 CLIENT: GEOxyz. LOCATION: North Sea Dutch Continental Shelf

POINT: VC_P_12
 COORDINATES (UTM)
 N 5942705.61 m
 E 718573.63 m
 Elevation - 12.70 m LAT

START DATE: 11/5/19
 FINISH DATE: 11/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore REMARKS:
 DRILLER: JC
 ASSISTANT: MC

LEGEND



DEPTH (m BGL)	ELEVATION (m LAT)	GRAPHIC LOG	C.BARREL/C.SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	LABORATORY TEST RESULTS														
						Identification & classification						Strength tests			Oedometer		Perm.		Soil Chemical analysis	
						WC (%) LL (%) PL (%)	Density (g/cm ³) Particle Bulk Dry	Gravel (%)	Sand (%)	Fines (%)	Silt (%) Clay (%)	Su peak (kPa) Tx UU Su peak (kPa) Fall cone	Su PP (kPa) Su TV (kPa)	p' (kPa)	Cc (kPa)	Permeability constant (cm/s)	Total carbon (g/kg)	Organic carbon (g/kg)	Carbonates (g/kg)	
				0.00- 0.18: Olive brown (2.5Y 4/3) fine to medium SAND with occasional fine to gravel and frequent shell fragments (some of them coarse gravel sized). Sustained effervescence from HCl.	S-4	X	25.3	73.5	1.2									5.2	0	78.1
				0.18- 0.40: Very dark gray (2.5Y 3/1) fine SAND with occasional clay millimetrical pockets, frequent amorphous organic matter and occasional shell fragments. Sustained effervescence from HCl.																
				0.40- 0.90: Light olive brown (2.5Y 5/3) fine SAND with occasional shell fragments. Sustained effervescence from HCl.	S-3															
				·From 0.80m to 0.90m: frequent amorphous organic matter.																
				0.90- 3.40: Dark gray (2.5Y 4/2) fine SAND with rare clay pockets and rare shell fragments. Sustained effervescence from HCl.	S-2	X	0	96.9	3.1									6	2.6	28.7
					S-1	X	0	97.5	2.5								1.54E-05	4.2	0.9	27.2
					S-1	X	0	96.3	3.7									5.8	2.3	28.9

Bottom at 3.40 m

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_12



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_12



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_13



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_13



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_13



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_14



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_14



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_14



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_14



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_15



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_15



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_15



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_1Bis



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_1Bis



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_2



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_2



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_2



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_3



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_3



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_3



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_4



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_4



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_4



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_5



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_5



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_5



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_6



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_6



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_6

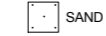


POINT: VC_P_7
 COORDINATES (UTM)
 N 5947998.56 m
 E 719415.30 m
 Elevation - 18.10 m LAT

START DATE: 2/5/19
 FINISH DATE: 2/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore REMARKS:
 DRILLER: JC
 ASSISTANT: MC

LEGEND



DEPTH (m BGL)	ELEVATION (m LAT)	GRAPHIC LOG	C.BARREL/C.SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	LABORATORY TEST RESULTS															
						Identification & classification						Strength tests			Oedometer		Perm.	Soil Chemical analysis			
						WC (%) LL (%) PL (%)	Density (g/cm³) Particle Bulk Dry	Gravel (%)	Sand (%)	Fines (%)	Silt (%) Clay (%)	Su peak (kPa) Tx UU Su peak (kPa) Fall cone	Su PP (kPa) Su TV (kPa)	p' (kPa)	Cc (kPa)	Permeability constant (cm/s)	Total carbon (g/kg)	Organic carbon (g/kg)	Carbonates (g/kg)		
				0.00- 0.24: Olive gray (5Y 5/2) fine SAND with rare millimetrical to centimetrical clay pockets and rare shell fragments. Clear but not sustained effervescence from HCl.	S-6	X	0.9	97.3	1.8										4.78	1.72	25.5
				0.24- 0.51: Gray (5Y 5/1) fine SAND with occasional clay pockets and occasional shell fragments. Clear but not sustained effervescence from HCl.																	
				0.51- 0.56: Olive gray (5Y 5/2) fine to medium SAND with frequent shell fragments. Clear but not sustained effervescence from HCl.																	
				0.56- 1.86: Dark gray (5Y 4/1) fine SAND with frequent millimetrical to centimetrical clay layers and pockets with rare shell fragments. Distinctive smell. Clear but not sustained effervescence from HCl.																	
				· From 1.79m to 1.86m: accumulation of millimetrical clay layers.	S-5	X	0.3	85.7	14	11	3								4.19	0.18	33.4
				1.86- 2.08: Gray (5Y 5/1) fine SAND with rare shell fragments. Clear but not sustained effervescence from HCl.																	
				2.08- 2.70: Dark gray (5Y 4/1) fine SAND with occasional clay pockets and rare shell fragments. Sustained effervescence from HCl.	S-4	X	0.4	94.1	5.5								1.16E-04		9.67	3.54	51.1
				2.70- 4.80: Light olive gray (5Y 6/2) fine SAND with rare clay millimetrical layers and pockets and rare shell fragments. Distinctive smell. Clear but not sustained effervescence from HCl.																	
				· From 3.70 to 4.80: occasional shell fragments	S-3	X	0.3	98.7	1										8.56	2.41	51.3
				4.80- 5.70: Light olive gray (5Y 6/2) fine SAND with occasional clay millimetrical layers and pockets and rare shell fragments. Distinctive smell. Clear but not sustained effervescence from HCl.	S-2	X	0.8	94.8	4.4								1.93E-04		4.69	0.63	33.9
					S-1	X	0	98.3	1.7										4.6	3.3	11.1

Bottom at 5.70 m

PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_7



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_7



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_7



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_8



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_8



MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_8





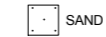
PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY.
 CLIENT: GEOxyz. LOCATION: North Sea Dutch Continental Shelf

POINT: VC_P_9
 COORDINATES (UTM)
 N 5945904.02 m
 E 718856.66 m
 Elevation - 16.00 m LAT

START DATE: 12/5/19
 FINISH DATE: 12/5/19
 GEOLOGIST: MC/AV
 STANDARD: BS EN 5930:2015

EQUIPMENT: Vibrocore
 DRILLER: JC
 ASSISTANT: MC

LEGEND



DEPTH (m BGL)	ELEVATION (m LAT)	GRAPHIC LOG	C. BARREL/C. SIZE (mm)	MATERIAL DESCRIPTION	SAMPLE TYPE-NUM	LABORATORY TEST RESULTS																		
						Identification & classification							Strength tests			Oedometer		Perm.		Soil Chemical analysis				
						WC (%)	LL (%)	PL (%)	Density (g/cm ³) Bulk	Density (g/cm ³) Particle	Gravel (%)	Sand (%)	Fines (%)	Silt (%)	Clay (%)	Su peak (kPa) Tx UU	Su peak (kPa) Fall cone	Su PP (kPa)	Su TV (kPa)	p' (kPa)	Cc (kPa)	Permeability constant (cm/s)	Total carbon (g/kg)	Organic carbon (g/kg)
				0.00- 0.06: Olive gray (5Y 4/2) fine SAND with rare shell fragments. Sustained effervescence from HCl.																				
				0.06- 0.38: Very dark gray (2.5Y 3/1) fine SAND with frequent amorphous organic matter blackish zones and occasional shell fragments (medium sand to fine gravel sized). Sustained effervescence from HCl.	S-6	X																		
				0.38- 0.50: Grayish brown (2.5Y 5/2) medium to coarse SAND with frequent shell fragments. Sustained effervescence from HCl.																				
				0.50- 1.50: Gray (2.5Y 5/1) fine SAND with rare clay millimetrical pockets and rare shell fragments. Clear but not sustained effervescence from HCl.																				
1.00	-17.00				S-5	X																		
				1.50- 3.50: Gray (2.5Y 5/1) fine SAND with rare shell fragments. No sustained effervescence from HCl. At 2.99m: millimetrical amorphous organic matter blackish layer.	S-4	X																		
2.00	-18.00																							
					S-3	X																		
3.00	-19.00																							
					S-2	X																		
4.00	-20.00																							
					S-1	X																		
5.00	-21.00																							

Bottom at 5.50 m

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_9



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_9



PROJECT: 2019.015 N5A DEVELOPMENT - PIPELINE ROUTE & PLATFORM AREA SURVEY
CLIENT: GEOxyz. PROJECT LOCATION: North Sea Dutch Continental Shelf

MORE DETAILED PHOTOS
POINT OF INVESTIGATION: VC_P_9



APPENDIX 2. LAB RESULTS (See rar file for lab sheets)

Geotechnical laboratory

c/ Holanda, parcela 12-14, nau 3

17600-Figueraes (Girona, España)

Tel. +34 972 513 466

e-mail: mail@igeotest.com

www.igeotest.com



Reg. Num. LECCE L0600292

CLIENT:

Company: GEO.XYZ Luxembourg S.A.

Address: rue d'Arlon 2
Windhof

Mr./Mrs.: Timon de Boer

PROJECT:

N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Laboratory tests report num.**CB0019-19-0005**

Samples: Taken by IGEOEST

Materials tested: Soils

Date first reception: 20-05-19

Date last reception: 20-05-19

DOCUMENT CONTROL:

Version	Date	Pages	Modifications	Written by	Checked by	Approved by
1	31-10-10	848		ALEXANDRE VANCELLS MORA	AMADEU DEU LOZANO	GUILLEM MASSALLÉ PUIG
2	19-11-19	848		ALEXANDRE VANCELLS MORA	AMADEU DEU LOZANO	GUILLEM MASSALLÉ PUIG
3	27-11-19	854	COMMENTS AND MINOR ERRORS	ALEXANDRE VANCELLS MORA	AMADEU DEU LOZANO	GUILLEM MASSALLÉ PUIG

Validation date: 27-11-19

LABORATORY MANAGER

GUILLEM MASSALLÉ PUIG
GEOLOGIST

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0368	MB19-0369	MB19-0370	MB19-0371	MB19-0372	MB19-0373	MB19-0374	MB19-0375	MB19-0376	MB19-0377	MB19-0378	MB19-0379	MB19-0380	MB19-0381	MB19-0382	MB19-0383	MB19-0384	MB19-0385	MB19-0386	MB19-0387	
Situation	VC P 8	VC P 8	VC P 8	VC P 8	VC P 8	VC P 8	VC P 7	VC P 7	VC P 7	VC P 7	VC P 7	VC P 7	VC P 7	VC P 7	VC P 6	VC P 6	VC P 6	VC P 6	VC P 6	VC P 6	VC P 5
	P 8.6	P 8.5	P 8.4	P 8.3	P 8.2	P 8.1	P 7.6	P 7.5	P 7.4	P 7.4B	P 7.3	P 7.2	P 7.1	P 6.6	P 6.5	P 6.4	P 6.3	P 6.2	P 6.1	P 5.6	
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	0.1-0.2	1.2-1.3	2-2.7	3.3-3.4	3.7-4.4	5.25-5.36	0.35-0.46	1.2-1.3	1.97-2.07	2.3-2.7	3.3-3.5	3.95-4.7	5.3-5.45	0.3-0.44	1.05-1.3	2.04-2.15	3.23-3.35	3.95-4.2	5.04-5.18	0.36-0.48	
USCS classification																					
ISO classification		Sa			Sa	Sa							Sa	Sa		Sa	Sa				
MOISTURE																					
Moisture content, w (%)	6.2	26.8	21.9	24.2	28.1	21.2	18.1	28.4	19.4		19.0	14.4	20.7	18.7	20.1	18.6	20.9	18.2	21.7	63.9	
DENSITY																					
Bulk density (Mg/m³)	1.59	1.93	1.92	1.90	1.87	1.93	1.89	1.91	2.01		1.94	1.80	1.94	1.94	1.83	1.87	1.91	1.88	1.83	1.69	
Dry density (Mg/m³)	1.50	1.52	1.58	1.53	1.46	1.59	1.60	1.49	1.68		1.63	1.57	1.61	1.63	1.52	1.58	1.58	1.59	1.50	1.03	
PARTICLE DENSITY																					
Particle density (Mg/m³)	2.717	2.649	2.743	2.750	2.655	2.640	2.750	2.728	2.728		2.747	2.731	2.622	2.683	2.748	2.690	2.686	2.750	2.741	2.728	
PARTICLE SIZE DISTRIBUTION BY SIEVING																					
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #6.3 mm, %	95.0	100.0	100.0	100.0	100.0	99.8	99.1	100.0	100.0		100.0	99.2	100.0	98.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #2 mm, %	91.8	99.5	100.0	99.5	100.0	99.5	98.5	99.7	99.6		99.7	98.1	100.0	96.3	99.9	100.0	100.0	99.8	99.9	99.5	
Pass #0.63 mm, %	53.5	99.3	99.0	98.1	99.9	99.3	97.4	97.7	98.9		99.6	96.4	100.0	94.2	99.5	99.9	99.9	99.4	98.8	98.4	
Pass #0.063 mm, %	1.9	8.4	15.8	9.9	11.8	4.1	1.8	14.0	5.5		1.0	4.4	1.7	2.4	3.1	2.1	5.9	2.5	5.1	51.2	
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																					
Silt, between 0.063 and 0.002 mm (%)			12.8		8.4			11.0												43.2	
Clay, smaller than 0.002 mm (%)			3.0		3.4			3.0												8.0	
ATTERBERG LIMITS																					
Liquid limit, LL																					
Plastic limit, LP																					
Plasticity index, IP																					
FALL CONE TEST																					
cu (kPa)																					
cu(corr) (kPa)																					
cur (kPa)																					
SOIL TRIAXIAL																					
Test type																					
Phi (°)																					
cu (kPa)																					
OEDOMETER																					
Swelling Pressure (kPa)																					
Preconsolidation pres., σ'p (kPa)																					
Compression index, cc																					
PERMEABILITY IN TRIAXIAL																					
Permeability constant, K (cm/s)			2.42E-05		1.43E-05				1.16E-04			1.93E-04			3.48E-05			1.02E-04			
MINIMUM AND MAXIMUM DENSITY																					
Minimum density (Mg/m³)	1.582	1.34		1.31		1.45	1.406		1.395		1.329	1.444	1.41		1.338	1.47	1.4	1.342	1.341		
Maximum density (Mg/m³)	1.855	1.64		1.577		1.68	1.628		1.707		1.651	1.645	1.7		1.611	1.71	1.63	1.663	1.598		
Relative density (%)	-30*	60		82		61	87		91		93	63	69		67	46	78	77	62		
SOIL CHEMICAL ANALYSIS																					
Total carbon (g/kg)	26.36	9.3	8.75	10.80	11.6	5.5	4.78	4.19	9.67		8.56	4.69	4.6	4.6	5.28	3.4	5.5	4.08	3.76	12.56	
Organic carbon (g/kg)	14.65	4.5	4.26	4.84	7	1.5	1.72	0.18	3.54		2.41	0.63	3.3	1.7	1.32	1.7	2.7	0.22	0.38	0.34	
Carbonates (g/kg)	97.60	39.80	35.90	49.60	38.70	33.50	25.50	33.40	51.10		51.30	33.90	11.10	24.20	33.00	14.20	23.50	32.20	28.20	101.90	

* This result could have been due to sampling system. In this case is recommended not to consider this result for calculations

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0388	MB19-0389	MB19-0390	MB19-0391	MB19-0392	MB19-0393	MB19-0394	MB19-0395	MB19-0396	MB19-0397	MB19-0398	MB19-0399	MB19-0400	MB19-0401	MB19-0402	MB19-0403	MB19-0404	MB19-0405	MB19-0406	MB19-0407
Situation	VC P 5	VC P 5	VC P 5	VC P 5	VC P 5	VC P 4	VC P 4	VC P 4	VC P 4	VC P 4	VC P 4	VC P 3	VC P 3	VC P 3	VC P 3	VC P 3	VC P 3	VC P 2	VC P 2	VC P 2
	P 5.5	P 5.4	P 5.3	P 5.2	P 5.1	P 4.6	P 4.5	P 4.4	P 4.3	P 4.2	P 4.1	P 3.6	P 3.5	P 3.4	P 3.3	P 3.2	P 3.1	P 2.6	P 2.5	P 2.4
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	1.2-1.5	2.33-2.45	3.2-3.35	3.9-4.22	5.05-5.2	0.45-0.6	1.07-1.4	2.2-2.3	3-3.35	4.06-4.15	5.11-5.26	0.15-0.27	0.85-1.17	2.17-2.3	2.98-3.14	3.78-4.35	4.93-5.05	0.25-0.35	1.1-1.42	2.2-2.3
USCS classification																				
ISO classification		siSa				Sa		Sa		Sa	Sa						siSa			
MOISTURE																				
Moisture content, w (%)	25.9	21.1	18.8	13.5	13.4	21.3	23.2	25.3	23.7	26.1	8.7	20.2	15.7	13.2	8.6	19.3	19.4	21.6	21.2	22.5
DENSITY																				
Bulk density (Mg/m³)	1.78	1.92	2.16	2.16	2.12	1.96	1.92	1.90	1.95	1.94	1.78	1.89	1.95	1.99	1.85	1.89	1.89	1.99	1.97	2.01
Dry density (Mg/m³)	1.41	1.59	1.82	1.90	1.87	1.62	1.56	1.52	1.58	1.54	1.64	1.57	1.69	1.76	1.70	1.58	1.58	1.64	1.63	1.64
PARTICLE DENSITY																				
Particle density (Mg/m³)	2.746	2.634	2.719	2.744	2.744	2.664	2.749	2.644	2.723	2.665	2.646	2.745	2.725	2.730	2.758	2.741	2.635	2.757	2.740	2.731
PARTICLE SIZE DISTRIBUTION BY SIEVING																				
Pass #20 mm, %	100.0	100.0	65.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	100.0	100.0	95.6	100.0	100.0	100.0	100.0	100.0	100.0
Pass #6.3 mm, %	100.0	100.0	53.0	98.0	100.0	99.2	100.0	100.0	100.0	100.0	97.5	99.6	97.1	73.7	100.0	100.0	99.6	98.0	100.0	100.0
Pass #2 mm, %	99.7	100.0	46.4	96.8	98.4	99.0	100.0	100.0	99.7	100.0	95.6	98.4	89.1	67.0	98.6	99.8	99.1	95.2	99.3	100.0
Pass #0.63 mm, %	97.7	99.9	34.7	81.0	81.0	98.5	99.9	100.0	97.3	99.5	89.6	95.8	77.2	58.0	70.1	98.2	97.7	89.8	98.1	99.9
Pass #0.063 mm, %	14.6	15.8	5.3	12.3	11.9	2.3	3.7	10.7	7.6	9.5	1.7	4.3	3.5	3.6	3.7	6.1	17.6	8.7	7.4	42.9
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																				
Silt, between 0.063 and 0.002 mm (%)	11.6	13.1		8.3	7.9			6.5									16.7			32.9
Clay, smaller than 0.002 mm (%)	3.0	2.7		4.0	4.0			4.2									0.9			10.0
ATTERBERG LIMITS																				
Liquid limit, LL																				
Plastic limit, LP																				
Plasticity index, IP																				
FALL CONE TEST																				
cu (kPa)																				
cu(corr) (kPa)																				
cur (kPa)																				
SOIL TRIAXIAL																				
Test type																				
Phi (°)																				
cu (kPa)																				
OEDOMETER																				
Swelling Pressure (kPa)																				
Preconsolidation pres., σ'p (kPa)																				
Compression index, cc																				
PERMEABILITY IN TRIAXIAL																				
Permeability constant, K (cm/s)	7.22E-06			2.44E-06			7.44E-05		3.31E+05				1.28E-06			1.69E-04				6.45E-05
MINIMUM AND MAXIMUM DENSITY																				
Minimum density (Mg/m³)			1.35				1.293		1.339	1.43		1.432	1.541	1.373	1.524	1.349		1.377	1.281	
Maximum density (Mg/m³)			1.621				1.602		1.595	1.73		1.707	1.757	1.776	1.841	1.602		1.674	1.57	
Relative density (%)			173				86		94	37		50	69	96	56	91		89	121	
SOIL CHEMICAL ANALYSIS																				
Total carbon (g/kg)	5.03	11.7	8.24	2.71	3.38	3.4	4.51	7.5	4.19	5.8	2.1	6.89	3.43	11.30	3.22	9.74	6.2	6.20	4.92	4.31
Organic carbon (g/kg)	1.03	7.8	3.54	1.94	2.88	1.1	0.23	3.6	0.56	0.6	0.9	0.59	0.90	5.92	1.88	9.17	6	1.05	4.65	3.78
Carbonates (g/kg)	33.30	32.20	39.10	6.40	4.10	19.10	35.70	32.80	30.20	43.70	9.80	52.50	21.10	44.80	11.10	4.70		42.90	2.20	4.40

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0408	MB19-0409	MB19-0410	MB19-0411	MB19-0412	MB19-0413	MB19-0414	MB19-0415	MB19-0416	MB19-0417	MB19-0418	MB19-0419	MB19-0420	MB19-0421	MB19-0422	MB19-0423	MB19-0424	MB19-0425	MB19-0426	MB19-0427
Situation	VC P 2	VC P 2	VC P 2	VC P 1	VC P 1	VC P 1	VC P 1Bis	VC P 1Bis	VC P 1Bis	VC P 0	VC P 0	VC P 0Bis	VC P 0Bis	VC P 0Bis	VC P 0Bis	VC P 0Bis	VC P 0Bis	VC C 8	VC C 8	VC C 8
	P 2.3	P 2.2	P 2.1	P 1.3	P 1.2	P 1.1	P 1Bis.3	P 1Bis.2	P 1Bis.1	P 0.2	P 0.1	P 0Bis.6	P 0Bis.5	P 0Bis.4	P 0Bis.3	P 0Bis.2	P 0Bis.1	C 8.6	C 8.5	C 8.4
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	3.4-3.5	4.2-4.5	5.32-5.45	0.32-0.42	0.9-1.6	2.2-2.6	0.15-0.3	0.75-1.75	2.24-2.7	0.6-0.7	1.7-2.1	0.4-0.5	0.9-1.5	2.11-2.26	3.2-3.3	4.2-4.3	4.92-5.07	0.2-0.3	1.22-1.3	2.2-2.45
USCS classification									MH		CH		CL							
ISO classification			saSi	Sa					siCl	Sa	saCl		sasiCl	clSa	clSa	clSa	Sa	Sa	Sa	grSa
MOISTURE																				
Moisture content, w (%)	19.2	20.6	21.9	21.8	36.8	36.3	20.0	41.4	38.2	16.4	28.8	14.8	18.2	20.5	20.7	22.0	19.2	17.6	18.6	18.3
DENSITY																				
Bulk density (Mg/m³)	2.01	2.03	2.08	1.94	1.85	1.83	1.97	1.81	1.83	2.03	1.99	1.97	2.04	2.02	2.00	2.00	1.84	1.88	1.99	1.97
Dry density (Mg/m³)	1.69	1.68	1.71	1.59	1.35	1.34	1.64	1.28	1.32	1.74	1.55	1.72	1.73	1.68	1.66	1.64	1.54	1.60	1.68	1.67
PARTICLE DENSITY																				
Particle density (Mg/m³)	2.742	2.744	2.719	2.672	2.717	2.651	2.745	2.651	2.700	2.678	2.454	2.752	2.710	2.694	2.666	2.665	2.673	2.685	2.652	2.668
PARTICLE SIZE DISTRIBUTION BY SIEVING																				
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	82.7
Pass #6.3 mm, %	100.0	100.0	100.0	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	90.8	100.0	100.0	100.0	100.0	100.0	99.8	99.9	77.3
Pass #2 mm, %	100.0	100.0	100.0	98.9	100.0	100.0	99.0	100.0	100.0	99.4	100.0	86.0	100.0	100.0	100.0	100.0	100.0	99.5	99.7	74.1
Pass #0.63 mm, %	99.9	99.9	100.0	97.6	99.9	99.8	97.0	99.9	99.9	91.6	100.0	55.5	99.8	100.0	99.9	100.0	99.9	97.9	99.1	67.9
Pass #0.063 mm, %	10.3	26.1	41.2	3.9	99.6	96.3	0.8	99.5	99.1	13.5	78.4	5.0	77.9	19.5	23.6	19.8	11.5	1.0	3.4	1.0
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																				
Silt, between 0.063 and 0.002 mm (%)	5.3	17.1	38.0		65.6	67.3		66.5	62.2	8.2	45.3		52.2	9.6	10.0	9.2	5.6			
Clay, smaller than 0.002 mm (%)	5.0	9.0	3.2		34.0	29.0		33.0	36.9	5.3	33.1		25.7	9.9	13.6	10.6	5.9			
ATTERBERG LIMITS																				
Liquid limit, LL					71.6	70.8		75.3	69.4		62.5		46.5							
Plastic limit, LP					40.2	37.6		36.8	34.1		31.3		19.6							
Plasticity index, IP					31.4	33.2		38.5	35.3		31.2		26.9							
FALL CONE TEST																				
cu (kPa)					341*	353*		163*	280*		142		210*							
cu(corr) (kPa)					271*	282*		127*	226*		120		203*							
cur (kPa)					184*	186*		109	179*		140*		163*							
SOIL TRIAXIAL																				
Test type					UU 1.5'	UU 1.5'		UU 1.5'	UU 1.5'		UU 1.5'		UU 1.5'							
Φu (°)					0.0	0.0		0.0	0.0		0.0		0.0							
cu (kPa)					72.5	100.0		68.6	57		105		56							
OEDOMETER																				
Swelling Pressure (kPa)													<20		<20					
Preconsolidation pres., σ'p (kPa)					205.35	200.09		212.55	130		242		158							
Compression index, cc					0.2840	0.2750		0.2830	0.3344		0.2280		0.2087							
PERMEABILITY IN TRIAXIAL																				
Permeability constant, K (cm/s)		1.88E-05																		
MINIMUM AND MAXIMUM DENSITY																				
Minimum density (Mg/m³)				1.44			1.436					1.442								
Maximum density (Mg/m³)				1.69			1.723					1.971								
Relative density (%)				60			71					53								
SOIL CHEMICAL ANALYSIS																				
Total carbon (g/kg)	4.34	4.56	11.7	6.4	44.19	42.10	6.09	49.95	91.6	15.8	69.2	7.90	72.4	15.1	26.8	21.1	12	3.1	5.3	5.6
Organic carbon (g/kg)	3.01	3.18	0.7	4	33.20	27.55	1.49	39.78	82.4	13.7	63.9	4.34	66	13.6	24.8	19.7	10.9	0.1	2.6	3.6
Carbonates (g/kg)	11.10	11.50	91.60	20.00	91.60	121.20	38.40	84.80	76.70	17.90	44.50	29.70	53.50	12.50	16.50	11.80	9.40		22.6	

* results out of standard, may be taken with due reservations

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0428	MB19-0429	MB19-0430	MB19-0431	MB19-0432	MB19-0433	MB19-0434	MB19-0435	MB19-0436	MB19-0437	MB19-0438	MB19-0439	MB19-0440	MB19-0441	MB19-0442	MB19-0443	MB19-0444	MB19-0445	MB19-0446	MB19-0447
Situation	VC C 8	VC C 8	VC C 8	VC C 7	VC C 7	VC C 7	VC C 7	VC C 7	VC C 7	VC C 6	VC C 6	VC C 6	VC C 6	VC C 6	VC C 6	VC C 5	VC C 5	VC C 5	VC C 5	VC C 5
	C 8.3	C 8.2	C 8.1	C 7.6	C 7.5	C 7.4	C 7.3	C 7.2	C 7.1	C 6.6	C 6.5	C 6.4	C 6.3	C 6.2	C 6.1	C 5.6	C 5.5	C 5.4	C 5.3	C 5.2
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	3.02-3.5	3.95-4.1	4.92-5.06	0.07-0.2	1-1.15	1.64-2.2	2.9-3.3	3.78-3.9	4.4-4.9	0.45-0.55	0.75-0.9	2.15-2.3	3.3-3.6	4.08-4.22	5.04-5.6	0.1-0.25	0.5-0.8	2.14-2.5	2.82-3.05	3.91-4.05
USCS classification																				
ISO classification	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	siSa	grSa	Sa	Sa	siSa	Sa	qrSa	Sa	Sa	siSa
MOISTURE																				
Moisture content, w (%)	19.7	16.9	15.5	20.4	18.9	15.6	18.2	11.4	18.2	16.5	19.1	12.8	16.3	9.7	18.9	19.3	10.4	25.4	22.8	23.4
DENSITY																				
Bulk density (Mg/m³)	1.91	1.78	1.89	2.04	2.00	1.84	1.89	1.73	1.83	2.02	1.88	2.02	1.99	1.82	1.87	1.97	1.75	1.85	1.91	1.93
Dry density (Mg/m³)	1.60	1.52	1.64	1.69	1.68	1.59	1.60	1.55	1.55	1.73	1.58	1.79	1.71	1.66	1.57	1.65	1.59	1.48	1.56	1.56
PARTICLE DENSITY																				
Particle density (Mg/m³)	2.632	2.652	2.647	2.672	2.681	2.642	2.624	2.698	2.629	2.653	2.652	2.657	2.676	2.686	2.659	2.675	2.648	2.660	2.663	2.683
PARTICLE SIZE DISTRIBUTION BY SIEVING																				
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	89.6	100.0	100.0	100.0	100.0	82.3	100.0	100.0	100.0
Pass #6.3 mm, %	100.0	100.0	100.0	99.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	82.2	99.5	100.0	100.0	98.6	74.9	100.0	100.0	100.0
Pass #2 mm, %	100.0	100.0	100.0	99.4	99.4	100.0	100.0	99.7	100.0	100.0	99.9	74.4	98.7	100.0	100.0	95.8	69.9	99.8	100.0	100.0
Pass #0.63 mm, %	99.7	100.0	100.0	97.4	98.8	100.0	100.0	97.4	99.9	98.4	98.4	67.8	78.1	78.2	99.9	83.6	65.5	99.2	99.9	99.9
Pass #0.063 mm, %	1.6	1.3	2.0	7.8	9.2	1.1	1.0	1.7	2.2	8.0	19.7	1.8	2.3	2.2	37.4	2.7	2.6	12.5	7.4	22.0
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																				
Silt, between 0.063 and 0.002 mm (%)											18.3				35.4			11.7		20.1
Clay, smaller than 0.002 mm (%)											1.4				2.0			0.8		1.9
ATTERBERG LIMITS																				
Liquid limit, LL																				
Plastic limit, LP																				
Plasticity index, IP																				
FALL CONE TEST																				
cu (kPa)																				
cu(corr) (kPa)																				
cur (kPa)																				
SOIL TRIAXIAL																				
Test type																				
Φ (°)																				
cu (kPa)																				
OEDOMETER																				
Swelling Pressure (kPa)																				
Preconsolidation pres., σ'p (kPa)																				
Compression index, cc																				
PERMEABILITY IN TRIAXIAL																				
Permeability constant, K (cm/s)	2.93E-05					1.06E-05				1.78E-05				1.09E-04					1.51E-05	
MINIMUM AND MAXIMUM DENSITY																				
Minimum density (Mg/m³)	1.41				1.39	1.49				1.51	1.52			1.57	1.56					1.27
Maximum density (Mg/m³)	1.66				1.69	1.73				1.82	1.82			1.87	1.87					1.59
Relative density (%)	76				97	42				13	70			47	32					91
SOIL CHEMICAL ANALYSIS																				
Total carbon (g/kg)	4	4.4	2.6	8.4	4.8	3.8	3	2.8	3.8	4.3	9.9	1.7	2.6	2.4	11.1	3.1	5.2	26.7	5.8	9.6
Organic carbon (g/kg)	3	4.1	2.4	6	3.2	3.5	2.9	1.3	3.6	1.1	5.5	1.3	2.5	2.2	9.6	1.1	4.5	25.6	4.2	8.6
Carbonates (g/kg)				20.1	13.30						27.00	36.8								

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0448	MB19-0449	MB19-0450	MB19-0451	MB19-0452	MB19-0453	MB19-0454	MB19-0455	MB19-0456	MB19-0457	MB19-0458	MB19-0459	MB19-0460	MB19-0461	MB19-0462	MB19-0463	MB19-0464	MB19-0465	MB19-0466
Situation	VC C 5	VC C 4	VC C 4	VC C 4	VC C 4	VC C 4	VC C 4	VC C 3	VC C 3	VC C 3	VC C 3BIS	VC C3Bis	VC C 2	VC C 2	VC C 2	VC C 1	VC C 1	VC C 1	VC P 15
	C 5.1	C 4.6	C 4.5	C 4.4	C 4.3	C 4.2	C 4.1	C 3.3	C 3.2	C 3.1	C 3BIS.2	C3Bis.1	C 2.3	C 2.2	C 2.1	C 1.3	C 1.2	C 1.1	P 15.5
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	4.92-5.1	0.27-0.4	1.2-1.5	2.1-2.22	2.8-2.9	4-4.5	5.3-5.4	0.16-0.32	0.77-1.5	1.9-2.05	0.15-0.3	1.1-1.4	0.25-0.35	1.4-2	2.6-2.71	0.89-1.05	1.8-2.2	2.75-2.9	0.1-0.2
USCS classification									MH					MH			CL		
ISO classification	siSa	siSa	siSa	siSa	siSa		siSa	Sa	Cl		Sa		Sa	siCl			sasiCl		Sa
MOISTURE																			
Moisture content, w (%)	22.9	18.4	17.2	17.3	17.0	17.6	17.5	18.6	36.2	32.6	18.9	32.3	3.6	38.7	38.7	18.4	30.8	21.0	20.0
DENSITY																			
Bulk density (Mg/m³)	1.97	2.03	2.11	2.02	2.09	2.05	2.05	1.96	1.85	1.89	1.95	1.83	1.62	1.80	1.85	2.04	1.91	2.04	1.89
Dry density (Mg/m³)	1.60	1.71	1.80	1.72	1.79	1.74	1.74	1.65	1.36	1.43	1.64	1.38	1.56	1.30	1.33	1.72	1.46	1.69	1.58
PARTICLE DENSITY																			
Particle density (Mg/m³)	2.677	2.673	2.664	2.680	2.642	2.743	2.649	2.637	2.714	2.652	2.653	2.664	2.664	2.694	2.665	2.715	2.747	2.746	2.648
PARTICLE SIZE DISTRIBUTION BY SIEVING																			
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #6.3 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.4	100.0	100.0	100.0	100.0	100.0	98.2
Pass #2 mm, %	100.0	97.6	98.9	99.1	98.6	99.4	99.1	99.7	100.0	100.0	99.5	100.0	98.1	100.0	100.0	100.0	100.0	100.0	94.6
Pass #0.63 mm, %	100.0	92.5	95.1	95.3	94.6	93.9	95.6	98.3	100.0	99.9	97.6	99.9	89.9	99.9	100.0	99.4	99.8	99.7	91.9
Pass #0.063 mm, %	22.9	19.7	21.8	20.5	18.6	14.1	20.5	2.3	99.6	98.6	1.9	91.0	1.6	99.4	99.8	48.8	76.4	29.2	1.2
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																			
Silt, between 0.063 and 0.002 mm (%)	20.8	17.7	19.9	18.9	16.6	9.1	19.1		56.8	71.6		62.0		60.1	69.8	31.8	49.5	14.2	
Clay, smaller than 0.002 mm (%)	2.1	2.0	1.9	1.6	2.0	5.0	1.4		42.8	27.0		29.0		39.3	30.0	17.0	26.9	15.0	
ATTERBERG LIMITS																			
Liquid limit, LL									67.8	75.3		60.4		63.3	66.8	36.9	40.4		
Plastic limit, LP									36.4	35.5		32.3		35.3	35.2	17.6	18.7		
Plasticity index, IP									31.4	39.8		28.1		28.0	31.6	19.3	21.7		
FALL CONE TEST																			
cu (kPa)									241*			232*		189*			128		
cu(corr) (kPa)									196*			199*		159*			132		
cur (kPa)									136*			130*		122			74		
SOIL TRIAXIAL																			
Test type									UU 1.5'			UU 1.5'		UU 1.5'			UU 1.5'		
Φu (°)									0.0			0.0		0.0			0.0		
cu (kPa)									47			128		54			99		
OEDOMETER																			
Swelling Pressure (kPa)									<20					<20					
Preconsolidation pres., σ'p (kPa)									192			230		226			85		
Compression index, cc									0.2921			0.2370		0.2607			0.1501		
PERMEABILITY IN TRIAXIAL																			
Permeability constant, K (cm/s)						4.38E-05													
MINIMUM AND MAXIMUM DENSITY																			
Minimum density (Mg/m³)																			
Maximum density (Mg/m³)																			
Relative density (%)																			
SOIL CHEMICAL ANALYSIS																			
Total carbon (g/kg)	11.3	6.5	6.2	4.6	5.2	3.26	5.7	5.8	86.4	21.38	5.8	41.37	2.8	87.3	46.51	10.47	93.2	11.85	3.4
Organic carbon (g/kg)	10.9	5.4	5.2	4.3	5.2	2.23	5.1	4.5	73.2	10.87	3.7	30.99	0.2	78.9	30.61	7.15	87.2	9.13	0.5
Carbonates (g/kg)						8.60		11.1	110.20	87.60	17.80	86.50	21.7	70.10	123.50	27.60	49.80	22.70	24.50

* results out of standard, may be taken with due reservations

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0467	MB19-0468	MB19-0469	MB19-0470	MB19-0471	MB19-0472	MB19-0473	MB19-0474	MB19-0475	MB19-0476	MB19-0477	MB19-0478	MB19-0479	MB19-0480	MB19-0481	MB19-0482	MB19-0483	MB19-0483	MB19-0484
Situation	VC P 15	VC P 15	VC P 15	VC P 15	VC P 14	VC P 14	VC P 14	VC P 14	VC P 14	VC P 14	VC P 13	VC P 13	VC P 13	VC P 13	VC P 13	VC P 13	VC P 12	VC P 12	VC P 12
	P 15.4	P 15.3	P 15.2	P 15.1	P 14.6	P 14.5	P 14.4	P 14.3	P 14.2	P 14.1	P 13.6	P 13.5	P 13.4	P 13.3	P 13.2	P 13.1	P 12.4	P 12.4	P 12.3
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	1.08-1.21	2.2-2.5	3.18-3.31	4.15-4.3	0.12-0.25	0.7-0.85	2.05-2.4	2.9-3	4.1-4.25	5.1-5.2	0.1-0.3	0.85-1.3	2.1-2.2	2.9-3	4-4.1	5.03-5.2	0-0.14	0-0.14	1.15-1.3
USCS classification																			
ISO classification	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	qrSa	grSa	Sa
MOISTURE																			
Moisture content, w (%)	20.3	21.0	21.4	22.0	18.9	22.1	20.9	18.5	14.8	15.8	20.9	21.9	22.9	19.2	19.2	18.9	14.8	14.8	20.6
DENSITY																			
Bulk density (Mg/m³)	1.83	1.96	1.95	1.90	1.76	1.98	1.85	1.91	1.76	1.93	1.98	1.80	1.87	1.90	1.92	1.95	1.71	1.71	1.91
Dry density (Mg/m³)	1.52	1.62	1.61	1.56	1.48	1.62	1.53	1.61	1.53	1.67	1.64	1.48	1.52	1.59	1.61	1.64	1.49	1.49	1.58
PARTICLE DENSITY																			
Particle density (Mg/m³)	2.633	2.660	2.652	2.625	2.652	2.659	2.671	2.680	2.654	2.647	2.637	2.652	2.659	2.652	2.663	2.656	2.681	2.681	2.642
PARTICLE SIZE DISTRIBUTION BY SIEVING																			
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	99.8	100.0	100.0	100.0	100.0	100.0	100.0	99.7	99.7	100.0
Pass #6.3 mm, %	98.0	100.0	100.0	100.0	97.5	96.8	100.0	99.1	93.2	96.7	100.0	100.0	100.0	100.0	100.0	97.9	87.8	87.8	100.0
Pass #2 mm, %	95.7	100.0	100.0	100.0	93.6	94.9	100.0	98.4	90.7	95.6	97.6	99.9	99.8	99.4	100.0	96.5	74.7	74.7	100.0
Pass #0.63 mm, %	93.8	99.9	100.0	100.0	90.3	94.0	99.8	97.7	88.7	94.2	97.2	99.8	99.8	99.4	99.9	95.2	69.0	69.0	99.9
Pass #0.063 mm, %	1.3	1.5	1.5	1.4	1.5	1.3	1.2	1.9	1.0	1.9	6.3	1.4	1.3	2.3	1.1	6.4	1.2	1.2	3.1
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																			
Silt, between 0.063 and 0.002 mm (%)																			
Clay, smaller than 0.002 mm (%)																			
ATTERBERG LIMITS																			
Liquid limit, LL																			
Plastic limit, LP																			
Plasticity index, IP																			
FALL CONE TEST																			
cu (kPa)																			
cu(corr) (kPa)																			
cur (kPa)																			
SOIL TRIAXIAL																			
Test type																			
Φu (°)																			
cu (kPa)																			
OEDOMETER																			
Swelling Pressure (kPa)																			
Preconsolidation pres., σ'p (kPa)																			
Compression index, cc																			
PERMEABILITY IN TRIAXIAL																			
Permeability constant, K (cm/s)		2.17E-04						3.39E-05						3.93E-05					
MINIMUM AND MAXIMUM DENSITY																			
Minimum density (Mg/m³)		1.38						1.4	1.47	1.53			1.46		1.34		1.44		
Maximum density (Mg/m³)		1.64						1.69	1.71	1.8			1.68		1.64		1.73		
Relative density (%)		92						45	58	0			9		83		69		
SOIL CHEMICAL ANALYSIS																			
Total carbon (g/kg)	4.2	5.1	4.5	3.5	3.8	4.3	3.2	3.9	3.8	2.8	7	4.7	4.8	4.4	3.1	6	5.2	5.2	6
Organic carbon (g/kg)	0.5	0.2	2.7	2	0	1.5	2.4	0	0.8	1.6	1.4	1.5	1.7	2.2	1.5	4	0	0	2.6
Carbonates (g/kg)	31.2	41.10	15.4	12.50	37.70	23.7	6.40	41.20	24.80	10.2	46.4	26.50	26	18.70	13.1	17.00	78.10	78.1	28.7

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0485	MB19-0486	MB19-0487	MB19-0488	MB19-0489	MB19-0490	MB19-0491	MB19-0492	MB19-0493	MB19-0494	MB19-0495	MB19-0496	MB19-0497	MB19-0498	MB19-0499	MB19-0500	MB19-0501	MB19-0502	MB19-0503	MB19-0504
Situation	VC P 12	VC P 12	VC P 11	VC P 11	VC P 11	VC_P_11BIS	VC_P_11BIS	VC_P_11BIS	VC_P_11BIS	VC_P_11BIS	VC P 10	VC P 10	VC P 10	VC P 10	VC P 10	VC P 9	VC P 9	VC P 9	VC P 9	VC P 9
	P 12.2	P 12.1	P 11.3	P 11.2	P 11.1	P_11BIS.5	P_11BIS.4	P_11BIS.3	P_11BIS.2	P_11BIS.1	P 10.5	P 10.4	P 10.3	P 10.2	P 10.1	P 9.6	P 9.5	P 9.4	P 9.3	P 9.2
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	2-2.4	2.93-3.07	0.1-0.3	0.88-1.09	2-2.3	0.05-0.18	1-1.15	2.35-2.7	3.55-3.7	4.3-4.4	0.1-0.23	0.83-0.97	1.9-2.03	2.9-3.3	4-4.17	0.23-0.36	1.15-1.5	2.19-2.31	3.2-3.33	4.22-4.37
USCS classification																				
ISO classification	Sa	Sa	Sa	grSa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa		Sa	Sa	Sa
MOISTURE																				
Moisture content, w (%)	19.8	22.4	17.8	13.3	21.6	7.1	19.6	22.0	17.4	23.4	16.1	16.4	20.9	21.9	13.5	18.5	18.6	18.0	20.2	20.7
DENSITY																				
Bulk density (Mg/m³)	1.90	1.96	1.92	1.69	1.84	1.47	1.90	1.90	1.89	1.94	1.78	1.77	1.90	1.86	1.68	1.85	1.90	1.83	1.93	1.93
Dry density (Mg/m³)	1.59	1.60	1.63	1.49	1.51	1.37	1.59	1.56	1.61	1.57	1.53	1.52	1.57	1.53	1.48	1.56	1.60	1.55	1.61	1.60
PARTICLE DENSITY																				
Particle density (Mg/m³)	2.705	2.649	2.634	2.666	2.658	2.659	2.684	2.668	2.669	2.676	2.673	2.651	2.649	2.780	2.677	2.632	2.746	2.641	2.647	2.646
PARTICLE SIZE DISTRIBUTION BY SIEVING																				
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #6.3 mm, %	100.0	100.0	89.7	92.5	100.0	92.5	97.8	100.0	90.3	99.6	91.9	97.2	99.7	99.3	96.4	96.0	100.0	100.0	100.0	100.0
Pass #2 mm, %	100.0	100.0	83.1	77.9	100.0	84.2	95.1	100.0	82.4	99.5	82.8	95.1	99.6	98.7	88.8	94.4	99.7	99.9	100.0	100.0
Pass #0.63 mm, %	99.6	99.9	80.0	70.3	99.9	78.8	93.3	100.0	76.4	99.3	79.3	94.2	99.5	98.5	65.0	92.6	99.3	99.8	100.0	100.0
Pass #0.063 mm, %	2.5	3.7	1.8	1.8	1.5	1.3	1.8	1.2	2.6	2.0	1.5	2.2	1.1	0.9	2.1	1.2	2.1	1.7	1.1	1.4
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																				
Silt, between 0.063 and 0.002 mm (%)																				
Clay, smaller than 0.002 mm (%)																				
ATTERBERG LIMITS																				
Liquid limit, LL																				
Plastic limit, LP																				
Plasticity index, IP																				
FALL CONE TEST																				
cu (kPa)																				
cu(corr) (kPa)																				
cur (kPa)																				
SOIL TRIAXIAL																				
Test type																				
Φu (°)																				
cu (kPa)																				
OEDOMETER																				
Swelling Pressure (kPa)																				
Preconsolidation pres., σ'p (kPa)																				
Compression index, cc																				
PERMEABILITY IN TRIAXIAL																				
Permeability constant, K (cm/s)	1.54E-05				4.14E-05				1.87E-05						3.45E-05			3.98E-04		
MINIMUM AND MAXIMUM DENSITY																				
Minimum density (Mg/m³)	1.37			1.49	1.36		1.47	1.4	1.44	1.34		1.45	1.46	1.326	1.46		1.36	1.45		1.45
Maximum density (Mg/m³)	1.64			1.73	1.66		1.7	1.69	1.7	1.63		1.75	1.64	1.589	1.72		1.62	1.66		1.7
Relative density (%)	81			0	50		52	55	65	79		23	61	78	8		92	48		60
SOIL CHEMICAL ANALYSIS																				
Total carbon (g/kg)	4.2	5.8	4.5	5.2	4.4	3.7	4.5	4.2	5.1	4.3	5.3	2.8	3.8	4.56	5.1	4.9	1.76	4	3.4	3.3
Organic carbon (g/kg)	0.9	2.3	0	0	4.1	0	0	1	0	1	0.5	0.2	0.4	1.97	0	1.2	0.94	1.8	0.4	0.6
Carbonates (g/kg)	27.20	28.9	43.6	117.80	2.87	34.8	38.20	26.70	70.10	27.30	39.7	21.30	28.00	21.50	182.90	30.70	6.80			22.30

SUMMARY OF TESTS

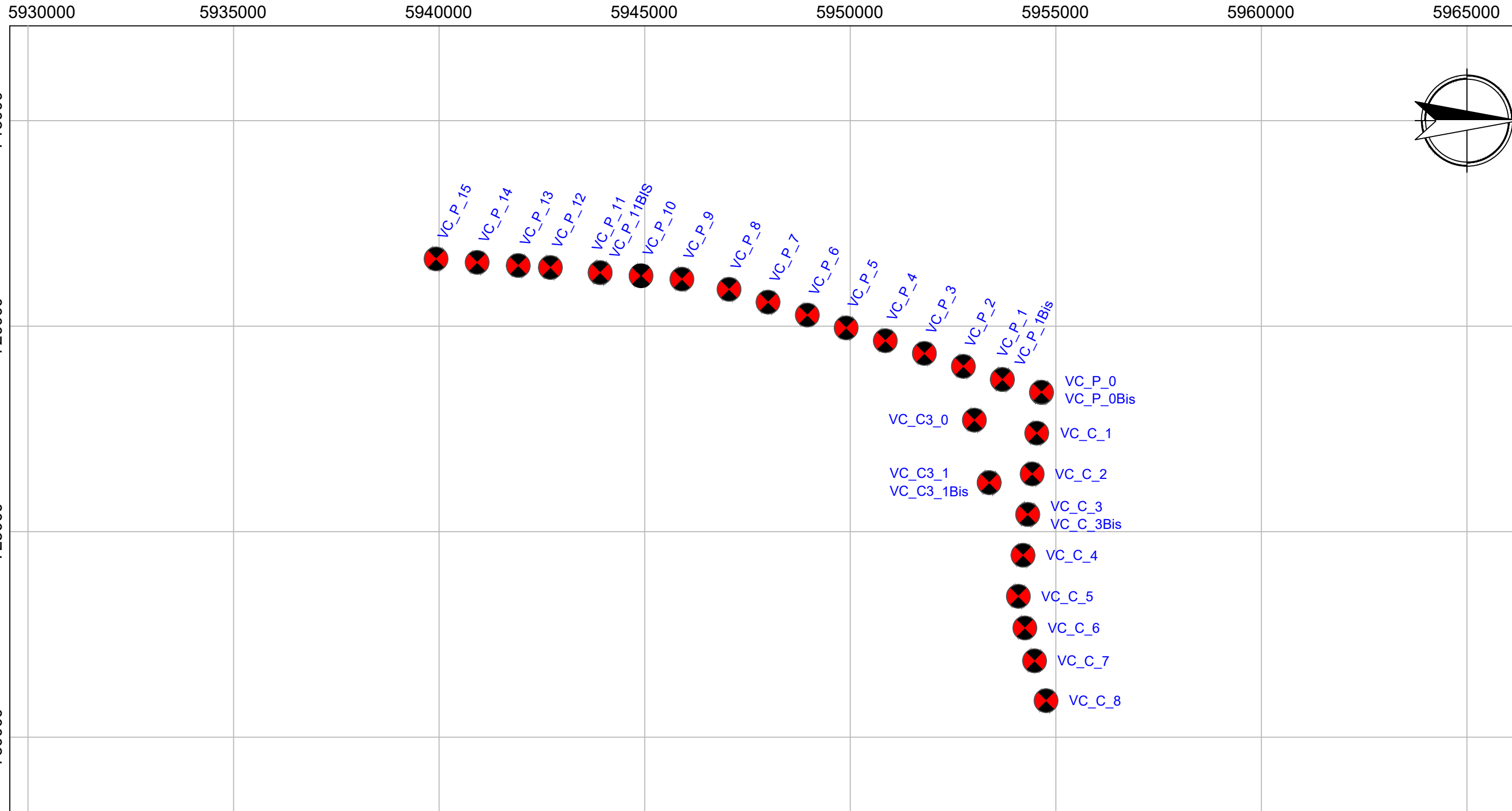
GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005


SAMPLES NUM.	MB19-0505	MB19-0506	MB19-0507	MB19-0508	MB19-0509	MB19-0510	MB19-0511	MB19-0512	MB19-0513	MB19-0514	MB19-0515	MB19-0516
Situation	VC P 9	VC C3 0	VC C3 0	VC C3 0	VC C3 0	VC C3 0	VC C3 0	VC C3 1	VC C3 1	VC C3 1	VC C3 1Bis	VC C3 1Bis
	P 9.1	C3 0.6	C3 0.5	C3 0.4	C3 0.3	C3 0.2	C3 0.1	C3 1.3	C3 1.2	C3 1.1	C3 1Bis.2	C3 1Bis.1
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	5.14-5.29	0.3-0.48	1.3-1.45	2.15-2.55	3.2-3.35	4.1-4.25	5.2-5.35	0.2-0.3	0.78-1.4	1.9-2.05	0.45-0.6	1.2-1.8
USCS classification									CH			CH
ISO classification	Sa	Sa							CI			siCI
MOISTURE												
Moisture content, w (%)	21.4	20.5	8.3	22.8	20.4	19.9	21.2	28.7	30.0	31.5	25.6	31.9
DENSITY												
Bulk density (Mg/m³)	1.88	2.00	1.73	1.97	1.91	1.82	1.89	1.63	1.87	1.87	1.85	2.00
Dry density (Mg/m³)	1.55	1.66	1.60	1.60	1.59	1.52	1.56	1.27	1.44	1.42	1.47	1.52
PARTICLE DENSITY												
Particle density (Mg/m³)	2.665	2.636	2.744	2.740	2.746	2.744	2.742	2.658	2.685	2.662	2.703	2.681
PARTICLE SIZE DISTRIBUTION BY SIEVING												
Pass #20 mm, %	100.0	100.0	95.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #6.3 mm, %	100.0	98.7	82.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #2 mm, %	100.0	97.7	78.8	99.9	100.0	100.0	100.0	99.9	100.0	99.2	100.0	100.0
Pass #0.63 mm, %	100.0	96.8	25.0	99.3	99.9	99.9	100.0	99.6	99.9	99.1	99.3	99.3
Pass #0.063 mm, %	1.0	1.3	1.6	4.1	2.2	2.8	2.7	85.3	88.3	95.9	66.8	81.3
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION												
Silt, between 0.063 and 0.002 mm (%)								63.3	52.3	75.9	41.8	49.0
Clay, smaller than 0.002 mm (%)								22.0	36.0	20.0	25.0	32.3
ATTERBERG LIMITS												
Liquid limit, LL								56.1	55.3	52.2	56.0	50.5
Plastic limit, LP								27.4	29.4	25.5	27.9	25.5
Plasticity index, IP								28.7	25.9	26.7	28.1	25.0
FALL CONE TEST												
cu (kPa)									201*			306*
cu(corr) (kPa)									179*			285*
cur (kPa)									147*			192*
SOIL TRIAXIAL												
Test type									UU 1.5'			UU 1.5'
Φu (°)									0.0			0.0
cu (kPa)									142			90
OEDOMETER												
Swelling Pressure (kPa)									<20			70
Preconsolidation pres., σ'p (kPa)									184			245
Compression index, cc									0.2323			0.1974
PERMEABILITY IN TRIAXIAL												
Permeability constant, K (cm/s)				1.13E-04								
MINIMUM AND MAXIMUM DENSITY												
Minimum density (Mg/m³)		1.46	1.502	1.256	1.26	1.266	1.278					
Maximum density (Mg/m³)		1.66	1.833	1.498	1.491	1.496	1.759					
Relative density (%)		100	30	142	143	110	59					
SOIL CHEMICAL ANALYSIS												
Total carbon (g/kg)	2.9	7	7.82	4.21	2.11	3.05	2.82	28.59	76.9	44.70	27.76	69.9
Organic carbon (g/kg)	1.3	4.1	0.52	3.95	1.60	2.78	2.31	29.63	67.4	34.19	20.08	61.8
Carbonates (g/kg)	13.40	24.50	60.80	2.20	4.30	2.20	4.30	74.70	78.90	87.60	64.00	67.30

* results out of standard, may be taken with due reservations

APPENDIX 3. GENERAL MAP



LEGEND:

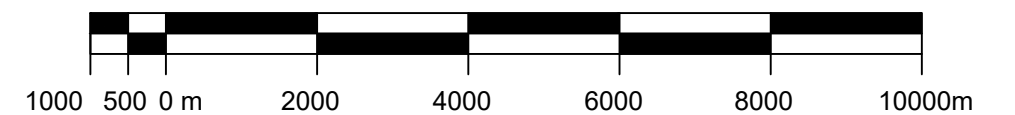
VC_P_1
 Vibrocore, location and identification.

GEODETC INFORMATION:

GEODETC SYSTEM: European Datum 1950
PROJECTION: UTM Zone 31 North
CENTRAL MERIDIAN: 3° East

HORIZONTAL SCALE:

1:100000



CLIENT:
Company: GEO.XYZ Luxembourg S.A.
Address: rue d'Arlon 2
Windhof
Mr./Mrs.: Timon de Boer
PROJECT:

N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Laboratory tests report num.

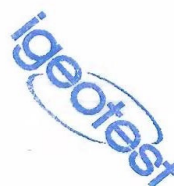
CB0019-19-0005

Samples: Taken by IGEOTEST
Materials tested: Soils
Date first reception: 20-05-19
Date last reception: 20-05-19

DOCUMENT CONTROL:

Version	Date	Pages	Modifications	Written by	Checked by	Approved by
1	31-10-10	848				
2	19-11-19	848				
3	27-11-19	854	COMMENTS AND MINOR ERRORS			

Validation date: 27-11-19
LABORATORY MANAGER



SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0368	MB19-0369	MB19-0370	MB19-0371	MB19-0372	MB19-0373	MB19-0374	MB19-0375	MB19-0376	MB19-0377	MB19-0378	MB19-0379	MB19-0380	MB19-0381	MB19-0382	MB19-0383	MB19-0384	MB19-0385	MB19-0386	MB19-0387	
Situation	VC P 8	VC P 8	VC P 8	VC P 8	VC P 8	VC P 8	VC P 7	VC P 7	VC P 7	VC P 7	VC P 7	VC P 7	VC P 7	VC P 7	VC P 6	VC P 6	VC P 6	VC P 6	VC P 6	VC P 6	VC P 5
	P 8.6	P 8.5	P 8.4	P 8.3	P 8.2	P 8.1	P 7.6	P 7.5	P 7.4	P 7.4B	P 7.3	P 7.2	P 7.1	P 6.6	P 6.5	P 6.4	P 6.3	P 6.2	P 6.1	P 5.6	
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	0.1-0.2	1.2-1.3	2-2.7	3.3-3.4	3.7-4.4	5.25-5.36	0.35-0.46	1.2-1.3	1.97-2.07	2.3-2.7	3.3-3.5	3.95-4.7	5.3-5.45	0.3-0.44	1.05-1.3	2.04-2.15	3.23-3.35	3.95-4.2	5.04-5.18	0.36-0.48	
USCS classification																					
ISO classification		Sa			Sa	Sa							Sa	Sa		Sa	Sa				
MOISTURE																					
Moisture content, w (%)	6.2	26.8	21.9	24.2	28.1	21.2	18.1	28.4	19.4			19.0	14.4	20.7	18.7	20.1	18.6	20.9	18.2	21.7	63.9
DENSITY																					
Bulk density (Mg/m³)	1.59	1.93	1.92	1.90	1.87	1.93	1.89	1.91	2.01			1.94	1.80	1.94	1.94	1.83	1.87	1.91	1.88	1.83	1.69
Dry density (Mg/m³)	1.50	1.52	1.58	1.53	1.46	1.59	1.60	1.49	1.68			1.63	1.57	1.61	1.63	1.52	1.58	1.58	1.59	1.50	1.03
PARTICLE DENSITY																					
Particle density (Mg/m³)	2.717	2.649	2.743	2.750	2.655	2.640	2.750	2.728	2.728			2.747	2.731	2.622	2.683	2.748	2.690	2.686	2.750	2.741	2.728
PARTICLE SIZE DISTRIBUTION BY SIEVING																					
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0			100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #6.3 mm, %	95.0	100.0	100.0	100.0	100.0	99.8	99.1	100.0	100.0			100.0	99.2	100.0	98.5	100.0	100.0	100.0	100.0	100.0	100.0
Pass #2 mm, %	91.8	99.5	100.0	99.5	100.0	99.5	98.5	99.7	99.6			99.7	98.1	100.0	96.3	99.9	100.0	100.0	99.8	99.9	99.5
Pass #0.63 mm, %	53.5	99.3	99.0	98.1	99.9	99.3	97.4	97.7	98.9			99.6	96.4	100.0	94.2	99.5	99.9	99.9	99.4	98.8	98.4
Pass #0.063 mm, %	1.9	8.4	15.8	9.9	11.8	4.1	1.8	14.0	5.5			1.0	4.4	1.7	2.4	3.1	2.1	5.9	2.5	5.1	51.2
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																					
Silt, between 0.063 and 0.002 mm (%)			12.8		8.4			11.0													43.2
Clay, smaller than 0.002 mm (%)			3.0		3.4			3.0													8.0
ATTERBERG LIMITS																					
Liquid limit, LL																					
Plastic limit, LP																					
Plasticity index, IP																					
FALL CONE TEST																					
cu (kPa)																					
cu(corr) (kPa)																					
cur (kPa)																					
SOIL TRIAXIAL																					
Test type																					
Phi (°)																					
cu (kPa)																					
OEDOMETER																					
Swelling Pressure (kPa)																					
Preconsolidation pres., σ'p (kPa)																					
Compression index, cc																					
PERMEABILITY IN TRIAXIAL																					
Permeability constant, K (cm/s)			2.42E-05		1.43E-05					1.16E-04			1.93E-04			3.48E-05			1.02E-04		
MINIMUM AND MAXIMUM DENSITY																					
Minimum density (Mg/m³)	1.582	1.34		1.31		1.45	1.406		1.395		1.329	1.444	1.41		1.338	1.47	1.4	1.342	1.341		
Maximum density (Mg/m³)	1.855	1.64		1.577		1.68	1.628		1.707		1.651	1.645	1.7		1.611	1.71	1.63	1.663	1.598		
Relative density (%)	-30*	60		82		61	87		91		93	63	69		67	46	78	77	62		
SOIL CHEMICAL ANALYSIS																					
Total carbon (g/kg)	26.36	9.3	8.75	10.80	11.6	5.5	4.78	4.19	9.67		8.56	4.69	4.6	4.6	5.28	3.4	5.5	4.08	3.76	12.56	
Organic carbon (g/kg)	14.65	4.5	4.26	4.84	7	1.5	1.72	0.18	3.54		2.41	0.63	3.3	1.7	1.32	1.7	2.7	0.22	0.38	0.34	
Carbonates (g/kg)	97.60	39.80	35.90	49.60	38.70	33.50	25.50	33.40	51.10		51.30	33.90	11.10	24.20	33.00	14.20	23.50	32.20	28.20	101.90	

* This result could have been due to sampling system. In this case is recommended not to consider this result for calculations

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0388	MB19-0389	MB19-0390	MB19-0391	MB19-0392	MB19-0393	MB19-0394	MB19-0395	MB19-0396	MB19-0397	MB19-0398	MB19-0399	MB19-0400	MB19-0401	MB19-0402	MB19-0403	MB19-0404	MB19-0405	MB19-0406	MB19-0407
Situation	VC P 5	VC P 5	VC P 5	VC P 5	VC P 5	VC P 4	VC P 4	VC P 4	VC P 4	VC P 4	VC P 4	VC P 3	VC P 3	VC P 3	VC P 3	VC P 3	VC P 3	VC P 2	VC P 2	VC P 2
	P 5.5	P 5.4	P 5.3	P 5.2	P 5.1	P 4.6	P 4.5	P 4.4	P 4.3	P 4.2	P 4.1	P 3.6	P 3.5	P 3.4	P 3.3	P 3.2	P 3.1	P 2.6	P 2.5	P 2.4
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	1.2-1.5	2.33-2.45	3.2-3.35	3.9-4.22	5.05-5.2	0.45-0.6	1.07-1.4	2.2-2.3	3-3.35	4.06-4.15	5.11-5.26	0.15-0.27	0.85-1.17	2.17-2.3	2.98-3.14	3.78-4.35	4.93-5.05	0.25-0.35	1.1-1.42	2.2-2.3
USCS classification																				
ISO classification		siSa				Sa		Sa		Sa	Sa						siSa			
MOISTURE																				
Moisture content, w (%)	25.9	21.1	18.8	13.5	13.4	21.3	23.2	25.3	23.7	26.1	8.7	20.2	15.7	13.2	8.6	19.3	19.4	21.6	21.2	22.5
DENSITY																				
Bulk density (Mg/m³)	1.78	1.92	2.16	2.16	2.12	1.96	1.92	1.90	1.95	1.94	1.78	1.89	1.95	1.99	1.85	1.89	1.89	1.99	1.97	2.01
Dry density (Mg/m³)	1.41	1.59	1.82	1.90	1.87	1.62	1.56	1.52	1.58	1.54	1.64	1.57	1.69	1.76	1.70	1.58	1.58	1.64	1.63	1.64
PARTICLE DENSITY																				
Particle density (Mg/m³)	2.746	2.634	2.719	2.744	2.744	2.664	2.749	2.644	2.723	2.665	2.646	2.745	2.725	2.730	2.758	2.741	2.635	2.757	2.740	2.731
PARTICLE SIZE DISTRIBUTION BY SIEVING																				
Pass #20 mm, %	100.0	100.0	65.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	100.0	100.0	95.6	100.0	100.0	100.0	100.0	100.0	100.0
Pass #6.3 mm, %	100.0	100.0	53.0	98.0	100.0	99.2	100.0	100.0	100.0	100.0	97.5	99.6	97.1	73.7	100.0	100.0	99.6	98.0	100.0	100.0
Pass #2 mm, %	99.7	100.0	46.4	96.8	98.4	99.0	100.0	100.0	99.7	100.0	95.6	98.4	89.1	67.0	98.6	99.8	99.1	95.2	99.3	100.0
Pass #0.63 mm, %	97.7	99.9	34.7	81.0	81.0	98.5	99.9	100.0	97.3	99.5	89.6	95.8	77.2	58.0	70.1	98.2	97.7	89.8	98.1	99.9
Pass #0.063 mm, %	14.6	15.8	5.3	12.3	11.9	2.3	3.7	10.7	7.6	9.5	1.7	4.3	3.5	3.6	3.7	6.1	17.6	8.7	7.4	42.9
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																				
Silt, between 0.063 and 0.002 mm (%)	11.6	13.1		8.3	7.9			6.5									16.7			32.9
Clay, smaller than 0.002 mm (%)	3.0	2.7		4.0	4.0			4.2									0.9			10.0
ATTERBERG LIMITS																				
Liquid limit, LL																				
Plastic limit, LP																				
Plasticity index, IP																				
FALL CONE TEST																				
cu (kPa)																				
cu(corr) (kPa)																				
cur (kPa)																				
SOIL TRIAXIAL																				
Test type																				
Φu (°)																				
cu (kPa)																				
OEDOMETER																				
Swelling Pressure (kPa)																				
Preconsolidation pres., σ'p (kPa)																				
Compression index, cc																				
PERMEABILITY IN TRIAXIAL																				
Permeability constant, K (cm/s)	7.22E-06			2.44E-06			7.44E-05		3.31E+05				1.28E-06			1.69E-04				6.45E-05
MINIMUM AND MAXIMUM DENSITY																				
Minimum density (Mg/m³)			1.35				1.293		1.339	1.43		1.432	1.541	1.373	1.524	1.349		1.377	1.281	
Maximum density (Mg/m³)			1.621				1.602		1.595	1.73		1.707	1.757	1.776	1.841	1.602		1.674	1.57	
Relative density (%)			173				86		94	37		50	69	96	56	91		89	121	
SOIL CHEMICAL ANALYSIS																				
Total carbon (g/kg)	5.03	11.7	8.24	2.71	3.38	3.4	4.51	7.5	4.19	5.8	2.1	6.89	3.43	11.30	3.22	9.74	6.2	6.20	4.92	4.31
Organic carbon (g/kg)	1.03	7.8	3.54	1.94	2.88	1.1	0.23	3.6	0.56	0.6	0.9	0.59	0.90	5.92	1.88	9.17	6	1.05	4.65	3.78
Carbonates (g/kg)	33.30	32.20	39.10	6.40	4.10	19.10	35.70	32.80	30.20	43.70	9.80	52.50	21.10	44.80	11.10	4.70		42.90	2.20	4.40

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0408	MB19-0409	MB19-0410	MB19-0411	MB19-0412	MB19-0413	MB19-0414	MB19-0415	MB19-0416	MB19-0417	MB19-0418	MB19-0419	MB19-0420	MB19-0421	MB19-0422	MB19-0423	MB19-0424	MB19-0425	MB19-0426	MB19-0427
Situation	VC P 2	VC P 2	VC P 2	VC P 1	VC P 1	VC P 1	VC P 1Bis	VC P 1Bis	VC P 1Bis	VC P 0	VC P 0	VC P 0Bis	VC P 0Bis	VC P 0Bis	VC P 0Bis	VC P 0Bis	VC P 0Bis	VC C 8	VC C 8	VC C 8
	P 2.3	P 2.2	P 2.1	P 1.3	P 1.2	P 1.1	P 1Bis.3	P 1Bis.2	P 1Bis.1	P 0.2	P 0.1	P 0Bis.6	P 0Bis.5	P 0Bis.4	P 0Bis.3	P 0Bis.2	P 0Bis.1	C 8.6	C 8.5	C 8.4
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	3.4-3.5	4.2-4.5	5.32-5.45	0.32-0.42	0.9-1.6	2.2-2.6	0.15-0.3	0.75-1.75	2.24-2.7	0.6-0.7	1.7-2.1	0.4-0.5	0.9-1.5	2.11-2.26	3.2-3.3	4.2-4.3	4.92-5.07	0.2-0.3	1.22-1.3	2.2-2.45
USCS classification									MH		CH		CL							
ISO classification			saSi	Sa					siCl	Sa	saCl		sasiCl	clSa	clSa	clSa	Sa	Sa	Sa	grSa
MOISTURE																				
Moisture content, w (%)	19.2	20.6	21.9	21.8	36.8	36.3	20.0	41.4	38.2	16.4	28.8	14.8	18.2	20.5	20.7	22.0	19.2	17.6	18.6	18.3
DENSITY																				
Bulk density (Mg/m³)	2.01	2.03	2.08	1.94	1.85	1.83	1.97	1.81	1.83	2.03	1.99	1.97	2.04	2.02	2.00	2.00	1.84	1.88	1.99	1.97
Dry density (Mg/m³)	1.69	1.68	1.71	1.59	1.35	1.34	1.64	1.28	1.32	1.74	1.55	1.72	1.73	1.68	1.66	1.64	1.54	1.60	1.68	1.67
PARTICLE DENSITY																				
Particle density (Mg/m³)	2.742	2.744	2.719	2.672	2.717	2.651	2.745	2.651	2.700	2.678	2.454	2.752	2.710	2.694	2.666	2.665	2.673	2.685	2.652	2.668
PARTICLE SIZE DISTRIBUTION BY SIEVING																				
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	82.7
Pass #6.3 mm, %	100.0	100.0	100.0	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	90.8	100.0	100.0	100.0	100.0	100.0	99.8	99.9	77.3
Pass #2 mm, %	100.0	100.0	100.0	98.9	100.0	100.0	99.0	100.0	100.0	99.4	100.0	86.0	100.0	100.0	100.0	100.0	100.0	99.5	99.7	74.1
Pass #0.63 mm, %	99.9	99.9	100.0	97.6	99.9	99.8	97.0	99.9	99.9	91.6	100.0	55.5	99.8	100.0	99.9	100.0	99.9	97.9	99.1	67.9
Pass #0.063 mm, %	10.3	26.1	41.2	3.9	99.6	96.3	0.8	99.5	99.1	13.5	78.4	5.0	77.9	19.5	23.6	19.8	11.5	1.0	3.4	1.0
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																				
Silt, between 0.063 and 0.002 mm (%)	5.3	17.1	38.0		65.6	67.3		66.5	62.2	8.2	45.3		52.2	9.6	10.0	9.2	5.6			
Clay, smaller than 0.002 mm (%)	5.0	9.0	3.2		34.0	29.0		33.0	36.9	5.3	33.1		25.7	9.9	13.6	10.6	5.9			
ATTERBERG LIMITS																				
Liquid limit, LL					71.6	70.8		75.3	69.4		62.5		46.5							
Plastic limit, LP					40.2	37.6		36.8	34.1		31.3		19.6							
Plasticity index, IP					31.4	33.2		38.5	35.3		31.2		26.9							
FALL CONE TEST																				
cu (kPa)					341*	353*		163*	280*		142		210*							
cu(corr) (kPa)					271*	282*		127*	226*		120		203*							
cur (kPa)					184*	186*		109	179*		140*		163*							
SOIL TRIAXIAL																				
Test type					UU 1.5'	UU 1.5'		UU 1.5'	UU 1.5'		UU 1.5'		UU 1.5'							
Φu (°)					0.0	0.0		0.0	0.0		0.0		0.0							
cu (kPa)					72.5	100.0		68.6	57		105		56							
OEDOMETER																				
Swelling Pressure (kPa)													<20		<20					
Preconsolidation pres., σ'p (kPa)					205.35	200.09		212.55	130		242		158							
Compression index, cc					0.2840	0.2750		0.2830	0.3344		0.2280		0.2087							
PERMEABILITY IN TRIAXIAL																				
Permeability constant, K (cm/s)		1.88E-05																		
MINIMUM AND MAXIMUM DENSITY																				
Minimum density (Mg/m³)				1.44			1.436					1.442								
Maximum density (Mg/m³)				1.69			1.723					1.971								
Relative density (%)				60			71					53								
SOIL CHEMICAL ANALYSIS																				
Total carbon (g/kg)	4.34	4.56	11.7	6.4	44.19	42.10	6.09	49.95	91.6	15.8	69.2	7.90	72.4	15.1	26.8	21.1	12	3.1	5.3	5.6
Organic carbon (g/kg)	3.01	3.18	0.7	4	33.20	27.55	1.49	39.78	82.4	13.7	63.9	4.34	66	13.6	24.8	19.7	10.9	0.1	2.6	3.6
Carbonates (g/kg)	11.10	11.50	91.60	20.00	91.60	121.20	38.40	84.80	76.70	17.90	44.50	29.70	53.50	12.50	16.50	11.80	9.40		22.6	

* results out of standard, may be taken with due reservations

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0428	MB19-0429	MB19-0430	MB19-0431	MB19-0432	MB19-0433	MB19-0434	MB19-0435	MB19-0436	MB19-0437	MB19-0438	MB19-0439	MB19-0440	MB19-0441	MB19-0442	MB19-0443	MB19-0444	MB19-0445	MB19-0446	MB19-0447
Situation	VC C 8	VC C 8	VC C 8	VC C 7	VC C 7	VC C 7	VC C 7	VC C 7	VC C 7	VC C 6	VC C 6	VC C 6	VC C 6	VC C 6	VC C 6	VC C 5	VC C 5	VC C 5	VC C 5	VC C 5
	C 8.3	C 8.2	C 8.1	C 7.6	C 7.5	C 7.4	C 7.3	C 7.2	C 7.1	C 6.6	C 6.5	C 6.4	C 6.3	C 6.2	C 6.1	C 5.6	C 5.5	C 5.4	C 5.3	C 5.2
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	3.02-3.5	3.95-4.1	4.92-5.06	0.07-0.2	1-1.15	1.64-2.2	2.9-3.3	3.78-3.9	4.4-4.9	0.45-0.55	0.75-0.9	2.15-2.3	3.3-3.6	4.08-4.22	5.04-5.6	0.1-0.25	0.5-0.8	2.14-2.5	2.82-3.05	3.91-4.05
USCS classification																				
ISO classification	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	siSa	grSa	Sa	Sa	siSa	Sa	qrSa	Sa	Sa	siSa
MOISTURE																				
Moisture content, w (%)	19.7	16.9	15.5	20.4	18.9	15.6	18.2	11.4	18.2	16.5	19.1	12.8	16.3	9.7	18.9	19.3	10.4	25.4	22.8	23.4
DENSITY																				
Bulk density (Mg/m³)	1.91	1.78	1.89	2.04	2.00	1.84	1.89	1.73	1.83	2.02	1.88	2.02	1.99	1.82	1.87	1.97	1.75	1.85	1.91	1.93
Dry density (Mg/m³)	1.60	1.52	1.64	1.69	1.68	1.59	1.60	1.55	1.55	1.73	1.58	1.79	1.71	1.66	1.57	1.65	1.59	1.48	1.56	1.56
PARTICLE DENSITY																				
Particle density (Mg/m³)	2.632	2.652	2.647	2.672	2.681	2.642	2.624	2.698	2.629	2.653	2.652	2.657	2.676	2.686	2.659	2.675	2.648	2.660	2.663	2.683
PARTICLE SIZE DISTRIBUTION BY SIEVING																				
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	89.6	100.0	100.0	100.0	100.0	82.3	100.0	100.0	100.0
Pass #6.3 mm, %	100.0	100.0	100.0	99.8	100.0	100.0	100.0	100.0	100.0	100.0	82.2	99.5	100.0	100.0	98.6	74.9	100.0	100.0	100.0	100.0
Pass #2 mm, %	100.0	100.0	100.0	99.4	99.4	100.0	100.0	99.7	100.0	100.0	99.9	74.4	98.7	100.0	100.0	95.8	69.9	99.8	100.0	100.0
Pass #0.63 mm, %	99.7	100.0	100.0	97.4	98.8	100.0	100.0	97.4	99.9	98.4	98.4	67.8	78.1	78.2	99.9	83.6	65.5	99.2	99.9	99.9
Pass #0.063 mm, %	1.6	1.3	2.0	7.8	9.2	1.1	1.0	1.7	2.2	8.0	19.7	1.8	2.3	2.2	37.4	2.7	2.6	12.5	7.4	22.0
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																				
Silt, between 0.063 and 0.002 mm (%)											18.3				35.4			11.7		20.1
Clay, smaller than 0.002 mm (%)											1.4				2.0			0.8		1.9
ATTERBERG LIMITS																				
Liquid limit, LL																				
Plastic limit, LP																				
Plasticity index, IP																				
FALL CONE TEST																				
cu (kPa)																				
cu(corr) (kPa)																				
cur (kPa)																				
SOIL TRIAXIAL																				
Test type																				
Φ (°)																				
cu (kPa)																				
OEDOMETER																				
Swelling Pressure (kPa)																				
Preconsolidation pres., σ'p (kPa)																				
Compression index, cc																				
PERMEABILITY IN TRIAXIAL																				
Permeability constant, K (cm/s)	2.93E-05					1.06E-05				1.78E-05				1.09E-04					1.51E-05	
MINIMUM AND MAXIMUM DENSITY																				
Minimum density (Mg/m³)	1.41				1.39	1.49				1.51	1.52			1.57	1.56					1.27
Maximum density (Mg/m³)	1.66				1.69	1.73				1.82	1.82			1.87	1.87					1.59
Relative density (%)	76				97	42				13	70			47	32					91
SOIL CHEMICAL ANALYSIS																				
Total carbon (g/kg)	4	4.4	2.6	8.4	4.8	3.8	3	2.8	3.8	4.3	9.9	1.7	2.6	2.4	11.1	3.1	5.2	26.7	5.8	9.6
Organic carbon (g/kg)	3	4.1	2.4	6	3.2	3.5	2.9	1.3	3.6	1.1	5.5	1.3	2.5	2.2	9.6	1.1	4.5	25.6	4.2	8.6
Carbonates (g/kg)				20.1	13.30						27.00	36.8								

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0448	MB19-0449	MB19-0450	MB19-0451	MB19-0452	MB19-0453	MB19-0454	MB19-0455	MB19-0456	MB19-0457	MB19-0458	MB19-0459	MB19-0460	MB19-0461	MB19-0462	MB19-0463	MB19-0464	MB19-0465	MB19-0466
Situation	VC C 5	VC C 4	VC C 4	VC C 4	VC C 4	VC C 4	VC C 4	VC C 3	VC C 3	VC C 3	VC C 3BIS	VC C3Bis	VC C 2	VC C 2	VC C 2	VC C 1	VC C 1	VC C 1	VC P 15
	C 5.1	C 4.6	C 4.5	C 4.4	C 4.3	C 4.2	C 4.1	C 3.3	C 3.2	C 3.1	C 3BIS.2	C3Bis.1	C 2.3	C 2.2	C 2.1	C 1.3	C 1.2	C 1.1	P 15.5
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	4.92-5.1	0.27-0.4	1.2-1.5	2.1-2.22	2.8-2.9	4-4.5	5.3-5.4	0.16-0.32	0.77-1.5	1.9-2.05	0.15-0.3	1.1-1.4	0.25-0.35	1.4-2	2.6-2.71	0.89-1.05	1.8-2.2	2.75-2.9	0.1-0.2
USCS classification									MH					MH			CL		
ISO classification	siSa	siSa	siSa	siSa	siSa		siSa	Sa	Cl		Sa		Sa	siCl			sasiCl		Sa
MOISTURE																			
Moisture content, w (%)	22.9	18.4	17.2	17.3	17.0	17.6	17.5	18.6	36.2	32.6	18.9	32.3	3.6	38.7	38.7	18.4	30.8	21.0	20.0
DENSITY																			
Bulk density (Mg/m³)	1.97	2.03	2.11	2.02	2.09	2.05	2.05	1.96	1.85	1.89	1.95	1.83	1.62	1.80	1.85	2.04	1.91	2.04	1.89
Dry density (Mg/m³)	1.60	1.71	1.80	1.72	1.79	1.74	1.74	1.65	1.36	1.43	1.64	1.38	1.56	1.30	1.33	1.72	1.46	1.69	1.58
PARTICLE DENSITY																			
Particle density (Mg/m³)	2.677	2.673	2.664	2.680	2.642	2.743	2.649	2.637	2.714	2.652	2.653	2.664	2.664	2.694	2.665	2.715	2.747	2.746	2.648
PARTICLE SIZE DISTRIBUTION BY SIEVING																			
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #6.3 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.4	100.0	100.0	100.0	100.0	100.0	98.2
Pass #2 mm, %	100.0	97.6	98.9	99.1	98.6	99.4	99.1	99.7	100.0	100.0	99.5	100.0	98.1	100.0	100.0	100.0	100.0	100.0	94.6
Pass #0.63 mm, %	100.0	92.5	95.1	95.3	94.6	93.9	95.6	98.3	100.0	99.9	97.6	99.9	89.9	99.9	100.0	99.4	99.8	99.7	91.9
Pass #0.063 mm, %	22.9	19.7	21.8	20.5	18.6	14.1	20.5	2.3	99.6	98.6	1.9	91.0	1.6	99.4	99.8	48.8	76.4	29.2	1.2
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																			
Silt, between 0.063 and 0.002 mm (%)	20.8	17.7	19.9	18.9	16.6	9.1	19.1		56.8	71.6		62.0		60.1	69.8	31.8	49.5	14.2	
Clay, smaller than 0.002 mm (%)	2.1	2.0	1.9	1.6	2.0	5.0	1.4		42.8	27.0		29.0		39.3	30.0	17.0	26.9	15.0	
ATTERBERG LIMITS																			
Liquid limit, LL									67.8	75.3		60.4		63.3	66.8	36.9	40.4		
Plastic limit, LP									36.4	35.5		32.3		35.3	35.2	17.6	18.7		
Plasticity index, IP									31.4	39.8		28.1		28.0	31.6	19.3	21.7		
FALL CONE TEST																			
cu (kPa)									241*			232*		189*			128		
cu(corr) (kPa)									196*			199*		159*			132		
cur (kPa)									136*			130*		122			74		
SOIL TRIAXIAL																			
Test type									UU 1.5'			UU 1.5'		UU 1.5'			UU 1.5'		
Φu (°)									0.0			0.0		0.0			0.0		
cu (kPa)									47			128		54			99		
OEDOMETER																			
Swelling Pressure (kPa)									<20					<20					
Preconsolidation pres., σ'p (kPa)									192			230		226			85		
Compression index, cc									0.2921			0.2370		0.2607			0.1501		
PERMEABILITY IN TRIAXIAL																			
Permeability constant, K (cm/s)						4.38E-05													
MINIMUM AND MAXIMUM DENSITY																			
Minimum density (Mg/m³)																			
Maximum density (Mg/m³)																			
Relative density (%)																			
SOIL CHEMICAL ANALYSIS																			
Total carbon (g/kg)	11.3	6.5	6.2	4.6	5.2	3.26	5.7	5.8	86.4	21.38	5.8	41.37	2.8	87.3	46.51	10.47	93.2	11.85	3.4
Organic carbon (g/kg)	10.9	5.4	5.2	4.3	5.2	2.23	5.1	4.5	73.2	10.87	3.7	30.99	0.2	78.9	30.61	7.15	87.2	9.13	0.5
Carbonates (g/kg)						8.60		11.1	110.20	87.60	17.80	86.50	21.7	70.10	123.50	27.60	49.80	22.70	24.50

* results out of standard, may be taken with due reservations

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0467	MB19-0468	MB19-0469	MB19-0470	MB19-0471	MB19-0472	MB19-0473	MB19-0474	MB19-0475	MB19-0476	MB19-0477	MB19-0478	MB19-0479	MB19-0480	MB19-0481	MB19-0482	MB19-0483	MB19-0483	MB19-0484
Situation	VC P 15	VC P 15	VC P 15	VC P 15	VC P 14	VC P 14	VC P 14	VC P 14	VC P 14	VC P 14	VC P 13	VC P 13	VC P 13	VC P 13	VC P 13	VC P 13	VC P 12	VC P 12	VC P 12
	P 15.4	P 15.3	P 15.2	P 15.1	P 14.6	P 14.5	P 14.4	P 14.3	P 14.2	P 14.1	P 13.6	P 13.5	P 13.4	P 13.3	P 13.2	P 13.1	P 12.4	P 12.4	P 12.3
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	1.08-1.21	2.2-2.5	3.18-3.31	4.15-4.3	0.12-0.25	0.7-0.85	2.05-2.4	2.9-3	4.1-4.25	5.1-5.2	0.1-0.3	0.85-1.3	2.1-2.2	2.9-3	4-4.1	5.03-5.2	0-0.14	0-0.14	1.15-1.3
USCS classification																			
ISO classification	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	qrSa	grSa	Sa
MOISTURE																			
Moisture content, w (%)	20.3	21.0	21.4	22.0	18.9	22.1	20.9	18.5	14.8	15.8	20.9	21.9	22.9	19.2	19.2	18.9	14.8	14.8	20.6
DENSITY																			
Bulk density (Mg/m³)	1.83	1.96	1.95	1.90	1.76	1.98	1.85	1.91	1.76	1.93	1.98	1.80	1.87	1.90	1.92	1.95	1.71	1.71	1.91
Dry density (Mg/m³)	1.52	1.62	1.61	1.56	1.48	1.62	1.53	1.61	1.53	1.67	1.64	1.48	1.52	1.59	1.61	1.64	1.49	1.49	1.58
PARTICLE DENSITY																			
Particle density (Mg/m³)	2.633	2.660	2.652	2.625	2.652	2.659	2.671	2.680	2.654	2.647	2.637	2.652	2.659	2.652	2.663	2.656	2.681	2.681	2.642
PARTICLE SIZE DISTRIBUTION BY SIEVING																			
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	99.8	100.0	100.0	100.0	100.0	100.0	100.0	99.7	99.7	100.0
Pass #6.3 mm, %	98.0	100.0	100.0	100.0	97.5	96.8	100.0	99.1	93.2	96.7	100.0	100.0	100.0	100.0	100.0	97.9	87.8	87.8	100.0
Pass #2 mm, %	95.7	100.0	100.0	100.0	93.6	94.9	100.0	98.4	90.7	95.6	97.6	99.9	99.8	99.4	100.0	96.5	74.7	74.7	100.0
Pass #0.63 mm, %	93.8	99.9	100.0	100.0	90.3	94.0	99.8	97.7	88.7	94.2	97.2	99.8	99.8	99.4	99.9	95.2	69.0	69.0	99.9
Pass #0.063 mm, %	1.3	1.5	1.5	1.4	1.5	1.3	1.2	1.9	1.0	1.9	6.3	1.4	1.3	2.3	1.1	6.4	1.2	1.2	3.1
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																			
Silt, between 0.063 and 0.002 mm (%)																			
Clay, smaller than 0.002 mm (%)																			
ATTERBERG LIMITS																			
Liquid limit, LL																			
Plastic limit, LP																			
Plasticity index, IP																			
FALL CONE TEST																			
cu (kPa)																			
cu(corr) (kPa)																			
cur (kPa)																			
SOIL TRIAXIAL																			
Test type																			
Φu (°)																			
cu (kPa)																			
OEDOMETER																			
Swelling Pressure (kPa)																			
Preconsolidation pres., σ'p (kPa)																			
Compression index, cc																			
PERMEABILITY IN TRIAXIAL																			
Permeability constant, K (cm/s)		2.17E-04						3.39E-05						3.93E-05					
MINIMUM AND MAXIMUM DENSITY																			
Minimum density (Mg/m³)		1.38						1.4	1.47	1.53			1.46		1.34		1.44		
Maximum density (Mg/m³)		1.64						1.69	1.71	1.8			1.68		1.64		1.73		
Relative density (%)		92						45	58	0			9		83		69		
SOIL CHEMICAL ANALYSIS																			
Total carbon (g/kg)	4.2	5.1	4.5	3.5	3.8	4.3	3.2	3.9	3.8	2.8	7	4.7	4.8	4.4	3.1	6	5.2	5.2	6
Organic carbon (g/kg)	0.5	0.2	2.7	2	0	1.5	2.4	0	0.8	1.6	1.4	1.5	1.7	2.2	1.5	4	0	0	2.6
Carbonates (g/kg)	31.2	41.10	15.4	12.50	37.70	23.7	6.40	41.20	24.80	10.2	46.4	26.50	26	18.70	13.1	17.00	78.10	78.1	28.7

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0485	MB19-0486	MB19-0487	MB19-0488	MB19-0489	MB19-0490	MB19-0491	MB19-0492	MB19-0493	MB19-0494	MB19-0495	MB19-0496	MB19-0497	MB19-0498	MB19-0499	MB19-0500	MB19-0501	MB19-0502	MB19-0503	MB19-0504
Situation	VC P 12	VC P 12	VC P 11	VC P 11	VC P 11	VC_P_11BIS	VC_P_11BIS	VC_P_11BIS	VC_P_11BIS	VC_P_11BIS	VC P 10	VC_P_10	VC P 10	VC P 10	VC P 10	VC P 9	VC P 9	VC P 9	VC P 9	VC P 9
	P 12.2	P 12.1	P 11.3	P 11.2	P 11.1	P_11BIS.5	P_11BIS.4	P_11BIS.3	P_11BIS.2	P_11BIS.1	P 10.5	P 10.4	P 10.3	P 10.2	P 10.1	P 9.6	P 9.5	P 9.4	P 9.3	P 9.2
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	2-2.4	2.93-3.07	0.1-0.3	0.88-1.09	2-2.3	0.05-0.18	1-1.15	2.35-2.7	3.55-3.7	4.3-4.4	0.1-0.23	0.83-0.97	1.9-2.03	2.9-3.3	4-4.17	0.23-0.36	1.15-1.5	2.19-2.31	3.2-3.33	4.22-4.37
USCS classification																				
ISO classification	Sa	Sa	Sa	grSa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa	Sa
MOISTURE																				
Moisture content, w (%)	19.8	22.4	17.8	13.3	21.6	7.1	19.6	22.0	17.4	23.4	16.1	16.4	20.9	21.9	13.5	18.5	18.6	18.0	20.2	20.7
DENSITY																				
Bulk density (Mg/m³)	1.90	1.96	1.92	1.69	1.84	1.47	1.90	1.90	1.89	1.94	1.78	1.77	1.90	1.86	1.68	1.85	1.90	1.83	1.93	1.93
Dry density (Mg/m³)	1.59	1.60	1.63	1.49	1.51	1.37	1.59	1.56	1.61	1.57	1.53	1.52	1.57	1.53	1.48	1.56	1.60	1.55	1.61	1.60
PARTICLE DENSITY																				
Particle density (Mg/m³)	2.705	2.649	2.634	2.666	2.658	2.659	2.684	2.668	2.669	2.676	2.673	2.651	2.649	2.780	2.677	2.632	2.746	2.641	2.647	2.646
PARTICLE SIZE DISTRIBUTION BY SIEVING																				
Pass #20 mm, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #6.3 mm, %	100.0	100.0	89.7	92.5	100.0	92.5	97.8	100.0	90.3	99.6	91.9	97.2	99.7	99.3	96.4	96.0	100.0	100.0	100.0	100.0
Pass #2 mm, %	100.0	100.0	83.1	77.9	100.0	84.2	95.1	100.0	82.4	99.5	82.8	95.1	99.6	98.7	88.8	94.4	99.7	99.9	100.0	100.0
Pass #0.63 mm, %	99.6	99.9	80.0	70.3	99.9	78.8	93.3	100.0	76.4	99.3	79.3	94.2	99.5	98.5	65.0	92.6	99.3	99.8	100.0	100.0
Pass #0.063 mm, %	2.5	3.7	1.8	1.8	1.5	1.3	1.8	1.2	2.6	2.0	1.5	2.2	1.1	0.9	2.1	1.2	2.1	1.7	1.1	1.4
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION																				
Silt, between 0.063 and 0.002 mm (%)																				
Clay, smaller than 0.002 mm (%)																				
ATTERBERG LIMITS																				
Liquid limit, LL																				
Plastic limit, LP																				
Plasticity index, IP																				
FALL CONE TEST																				
cu (kPa)																				
cu(corr) (kPa)																				
cur (kPa)																				
SOIL TRIAXIAL																				
Test type																				
Φu (°)																				
cu (kPa)																				
OEDOMETER																				
Swelling Pressure (kPa)																				
Preconsolidation pres., σ'p (kPa)																				
Compression index, cc																				
PERMEABILITY IN TRIAXIAL																				
Permeability constant, K (cm/s)	1.54E-05				4.14E-05				1.87E-05						3.45E-05			3.98E-04		
MINIMUM AND MAXIMUM DENSITY																				
Minimum density (Mg/m³)	1.37			1.49	1.36		1.47	1.4	1.44	1.34		1.45	1.46	1.326	1.46		1.36	1.45		1.45
Maximum density (Mg/m³)	1.64			1.73	1.66		1.7	1.69	1.7	1.63		1.75	1.64	1.589	1.72		1.62	1.66		1.7
Relative density (%)	81			0	50		52	55	65	79		23	61	78	8		92	48		60
SOIL CHEMICAL ANALYSIS																				
Total carbon (g/kg)	4.2	5.8	4.5	5.2	4.4	3.7	4.5	4.2	5.1	4.3	5.3	2.8	3.8	4.56	5.1	4.9	1.76	4	3.4	3.3
Organic carbon (g/kg)	0.9	2.3	0	0	4.1	0	0	1	0	1	0.5	0.2	0.4	1.97	0	1.2	0.94	1.8	0.4	0.6
Carbonates (g/kg)	27.20	28.9	43.6	117.80	2.87	34.8	38.20	26.70	70.10	27.30	39.7	21.30	28.00	21.50	182.90	30.70	6.80			22.30

SUMMARY OF TESTS

GEO.XYZ Luxembourg S.A.
NSA-DEVELOPMENT-PIPELINE ROUTE AND
PLATFORM AREA SURVEY

CB0019-19-0005

SAMPLES NUM.	MB19-0505	MB19-0506	MB19-0507	MB19-0508	MB19-0509	MB19-0510	MB19-0511	MB19-0512	MB19-0513	MB19-0514	MB19-0515	MB19-0516
Situation	VC P 9	VC C3 0	VC C3 0	VC C3 0	VC C3 0	VC C3 0	VC C3 0	VC C3 1	VC C3 1	VC C3 1	VC C3 1Bis	VC C3 1Bis
	P 9.1	C3 0.6	C3 0.5	C3 0.4	C3 0.3	C3 0.2	C3 0.1	C3 1.3	C3 1.2	C3 1.1	C3 1Bis.2	C3 1Bis.1
Sample type	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE	VIBROCORE
Depth (m)	5.14-5.29	0.3-0.48	1.3-1.45	2.15-2.55	3.2-3.35	4.1-4.25	5.2-5.35	0.2-0.3	0.78-1.4	1.9-2.05	0.45-0.6	1.2-1.8
USCS classification									CH			CH
ISO classification	Sa	Sa							CI			siCI
MOISTURE												
Moisture content, w (%)	21.4	20.5	8.3	22.8	20.4	19.9	21.2	28.7	30.0	31.5	25.6	31.9
DENSITY												
Bulk density (Mg/m³)	1.88	2.00	1.73	1.97	1.91	1.82	1.89	1.63	1.87	1.87	1.85	2.00
Dry density (Mg/m³)	1.55	1.66	1.60	1.60	1.59	1.52	1.56	1.27	1.44	1.42	1.47	1.52
PARTICLE DENSITY												
Particle density (Mg/m³)	2.665	2.636	2.744	2.740	2.746	2.744	2.742	2.658	2.685	2.662	2.703	2.681
PARTICLE SIZE DISTRIBUTION BY SIEVING												
Pass #20 mm, %	100.0	100.0	95.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #6.3 mm, %	100.0	98.7	82.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pass #2 mm, %	100.0	97.7	78.8	99.9	100.0	100.0	100.0	99.9	100.0	99.2	100.0	100.0
Pass #0.63 mm, %	100.0	96.8	25.0	99.3	99.9	99.9	100.0	99.6	99.9	99.1	99.3	99.3
Pass #0.063 mm, %	1.0	1.3	1.6	4.1	2.2	2.8	2.7	85.3	88.3	95.9	66.8	81.3
PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION												
Silt, between 0.063 and 0.002 mm (%)								63.3	52.3	75.9	41.8	49.0
Clay, smaller than 0.002 mm (%)								22.0	36.0	20.0	25.0	32.3
ATTERBERG LIMITS												
Liquid limit, LL								56.1	55.3	52.2	56.0	50.5
Plastic limit, LP								27.4	29.4	25.5	27.9	25.5
Plasticity index, IP								28.7	25.9	26.7	28.1	25.0
FALL CONE TEST												
cu (kPa)									201*			306*
cu(corr) (kPa)									179*			285*
cur (kPa)									147*			192*
SOIL TRIAXIAL												
Test type									UU 1.5'			UU 1.5'
Φu (°)									0.0			0.0
cu (kPa)									142			90
OEDOMETER												
Swelling Pressure (kPa)									<20			70
Preconsolidation pres., σ'p (kPa)									184			245
Compression index, cc									0.2323			0.1974
PERMEABILITY IN TRIAXIAL												
Permeability constant, K (cm/s)				1.13E-04								
MINIMUM AND MAXIMUM DENSITY												
Minimum density (Mg/m³)		1.46	1.502	1.256	1.26	1.266	1.278					
Maximum density (Mg/m³)		1.66	1.833	1.498	1.491	1.496	1.759					
Relative density (%)		100	30	142	143	110	59					
SOIL CHEMICAL ANALYSIS												
Total carbon (g/kg)	2.9	7	7.82	4.21	2.11	3.05	2.82	28.59	76.9	44.70	27.76	69.9
Organic carbon (g/kg)	1.3	4.1	0.52	3.95	1.60	2.78	2.31	29.63	67.4	34.19	20.08	61.8
Carbonates (g/kg)	13.40	24.50	60.80	2.20	4.30	2.20	4.30	74.70	78.90	87.60	64.00	67.30

* results out of standard, may be taken with due reservations

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0368

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_8 P_8.6
Top depth, m	0.1
Bottom depth, m	0.2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	3-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light olive brown (2.5Y 5/3) fine to medium SAND with frequent gravel sized shell fragments.	0.1	
	0.2	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

MB19-0368

PHOTOGRAPHIC RECORD



REMARKS

Operator: ALEX VANCELLS

Date: 03/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0368

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	111.31
Tare + soil + water (g)	229.77
Tare + soil (g)	222.84
Water (g)	6.93
Soil (g)	111.53
Moisture, w (%)	6.2

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 04/06/2019

Results	
Moisture content, w (%)	6.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	80.09
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.59
Dry density (Mg/m ³)	1.50

Operator: MARC COLOMER
Test final date: 03/06/2019

Results	
Bulk density (Mg/m³)	1.59
Dry density (Mg/m³)	1.50

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0369

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_8 P_8.5
Top depth, m	1.2
Bottom depth, m	1.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	3-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/1) fine SAND with rare clay pockets and occasional shell fragments. Distinctive smell.	1.2	
	1.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0369



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 03/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0369

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.16
Tare + soil + water (g)	217.27
Tare + soil (g)	194.82
Water (g)	22.45
Soil (g)	83.66
Moisture, w (%)	26.8

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 04/06/2019

Results	
Moisture content, w (%)	26.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	96.98
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.93
Dry density (Mg/m ³)	1.52

Operator: MARC COLOMER
Test final date: 03/07/2019

Results	
Bulk density (Mg/m³)	1.93
Dry density (Mg/m³)	1.52

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	19.8
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2670
Pyc. mass + soil + water at test temp. M2 (g)	184.8790
Soil mass, M1 (g)	10.6110
Particle density, G20°C (Mg/m ³)	2.649

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.649

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0369

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

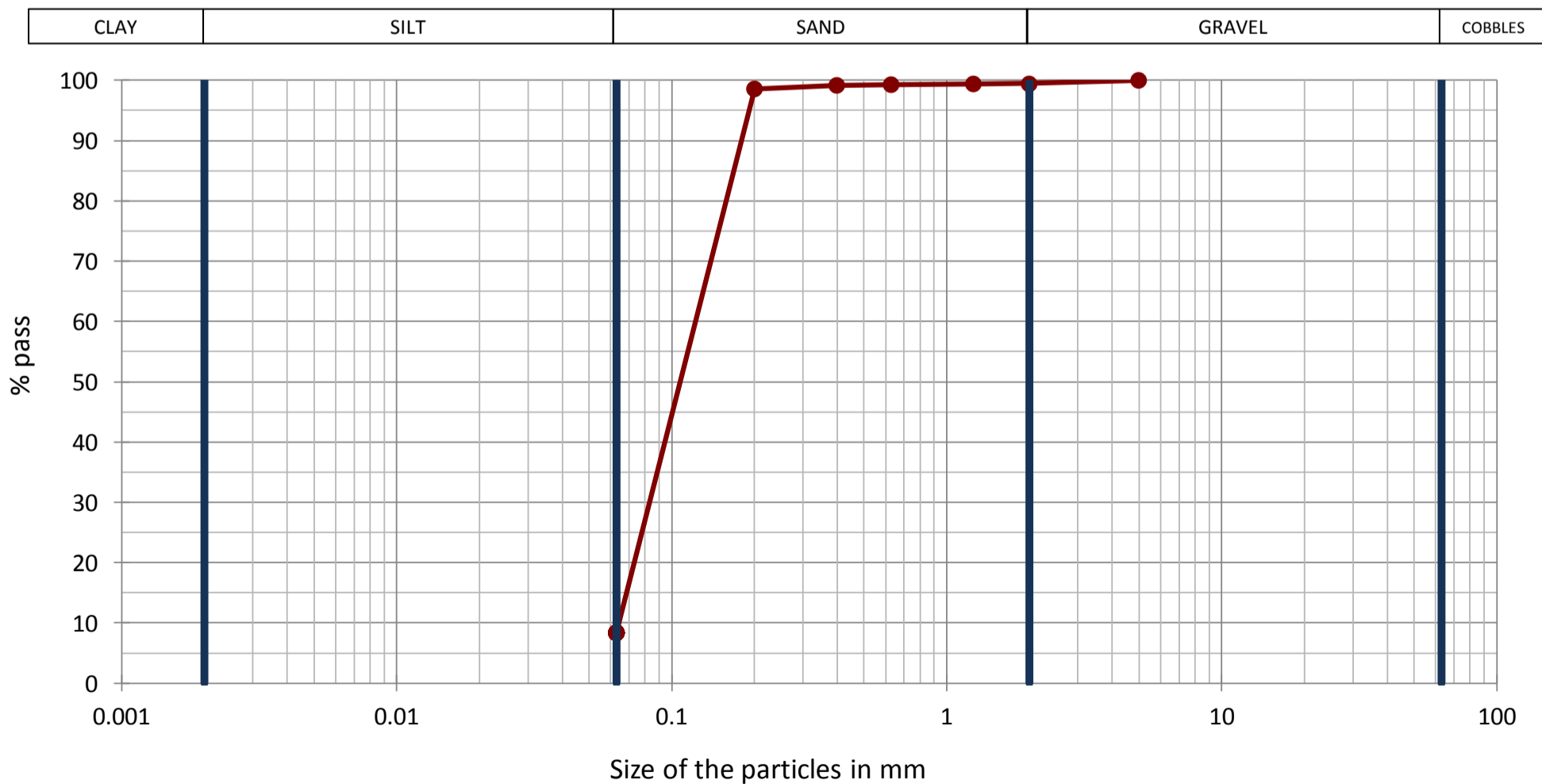
Previous calculations
 Total dried sample (g) **105.41**

 Hygrosc. moisture, % (fraction < 2 mm) **0.4**
 Corr. parameter, f (fraction < 2 mm) **0.9956**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
5		0.00	0.0	104.95	100.0
2		0.53	0.5	104.42	99.5
1.25		0.07	0.6	104.35	99.4
0.63		0.10	0.7	104.25	99.3
0.4		0.11	0.8	104.14	99.2
0.2		0.68	1.4	103.46	98.6
0.063		94.61	91.6	8.85	8.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.5	% SAND	2-0.063 mm	91.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.2	8.4	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.7		
	% Fine gravel	6.3-2 mm	0.5	% Fine sand	0.2-0.063 mm	90.2		



REMARKS

GRAVEL AND COARSE SAND ARE COMPOSED OF SHELL FRAGMENTS. MEDIUM SAND ALSO CONTAINS SHELL FRAGMENTS.

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Sample reference

MB19-0369

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: ALEX VANCELLS

Test final date: 02-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.414 g

Equipment:

RESULT: **9.3 g/kg (total)**

MUFLA OVEN ETI HD150

4.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass: 3.966 g

Equipment:

RESULT: **39.8 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0369

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6150
Soil mass, g	1333
Minimum density, Mg/m³	1.34

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6456
Soil mass, g	1639
Maximum density, Mg/m³	1.64

Relative density	
Dry density, Mg/m ³	1.52
Relative density, %	60

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0370

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_8 P_8.4
Top depth, m	2
Bottom depth, m	2.7
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	70
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	3-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with occasional clay pockets. Distinctive smell.	2	
	2.7	From 2.40m to 2.70m: RESERVED FOR ADVANCED TESTING

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report and at RUSSELL GEOTECHNICAL INNOVATION report.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0370



REMARKS

Operator: ALEX VANCELLS

Date: 03/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0370

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	107.66
Tare + soil + water (g)	230.66
Tare + soil (g)	208.54
Water (g)	22.12
Soil (g)	100.88
Moisture, w (%)	21.9

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 04/06/2019

Results	
Moisture content, w (%)	21.9

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	96.26
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.92
Dry density (Mg/m ³)	1.58

Operator: MARC COLOMER
Test final date: 03/06/2019

Results	
Bulk density (Mg/m³)	1.92
Dry density (Mg/m³)	1.58

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0371

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_8 P_8.3
Top depth, m	3.3
Bottom depth, m	3.4
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	3-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with rare clay pockets and rare shell fragments. Distinctive smell.	3.3	

3.4

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0371

PHOTOGRAPHIC RECORD



REMARKS

Operator: ALEX VANCELLS

Date: 03/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0371

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	111.90
Tare + soil + water (g)	207.86
Tare + soil (g)	189.19
Water (g)	18.67
Soil (g)	77.29
Moisture, w (%)	24.2

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 04/06/2019

Results	
Moisture content, w (%)	24.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	95.38
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.90
Dry density (Mg/m ³)	1.53

Operator: MARC COLOMER
Test final date: 03/06/2019

Results	
Bulk density (Mg/m³)	1.90
Dry density (Mg/m³)	1.53

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0372

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_8 P_8.2
Top depth, m	3.7
Bottom depth, m	4.4
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	70
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	5-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with occasional silt/clay pockets and rare shell fragments. Distinctive smell.	3.7	
	4.4	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0372



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 05/06/2019

Report num.: CB0019-19-0005
 Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0372

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	106.80
Tare + soil + water (g)	224.04
Tare + soil (g)	198.34
Water (g)	25.70
Soil (g)	91.54
Moisture, w (%)	28.1

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 10/06/2019

Results	
Moisture content, w (%)	28.1

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	94.09
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.87
Dry density (Mg/m ³)	1.46

Operator: MARC COLOMER
Test final date: 05/06/2019

Results	
Bulk density (Mg/m³)	1.87
Dry density (Mg/m³)	1.46

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	19.9
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6749
Pyc. mass + soil + water at test temp. M2 (g)	188.1090
Soil mass, M1 (g)	15.1100
Particle density, G20°C (Mg/m ³)	2.655

Operator: GUILLEM MASSALLÉ
Test final date: 02/10/2019

Results	
Particle density (Mg/m³)	2.655

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0372

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

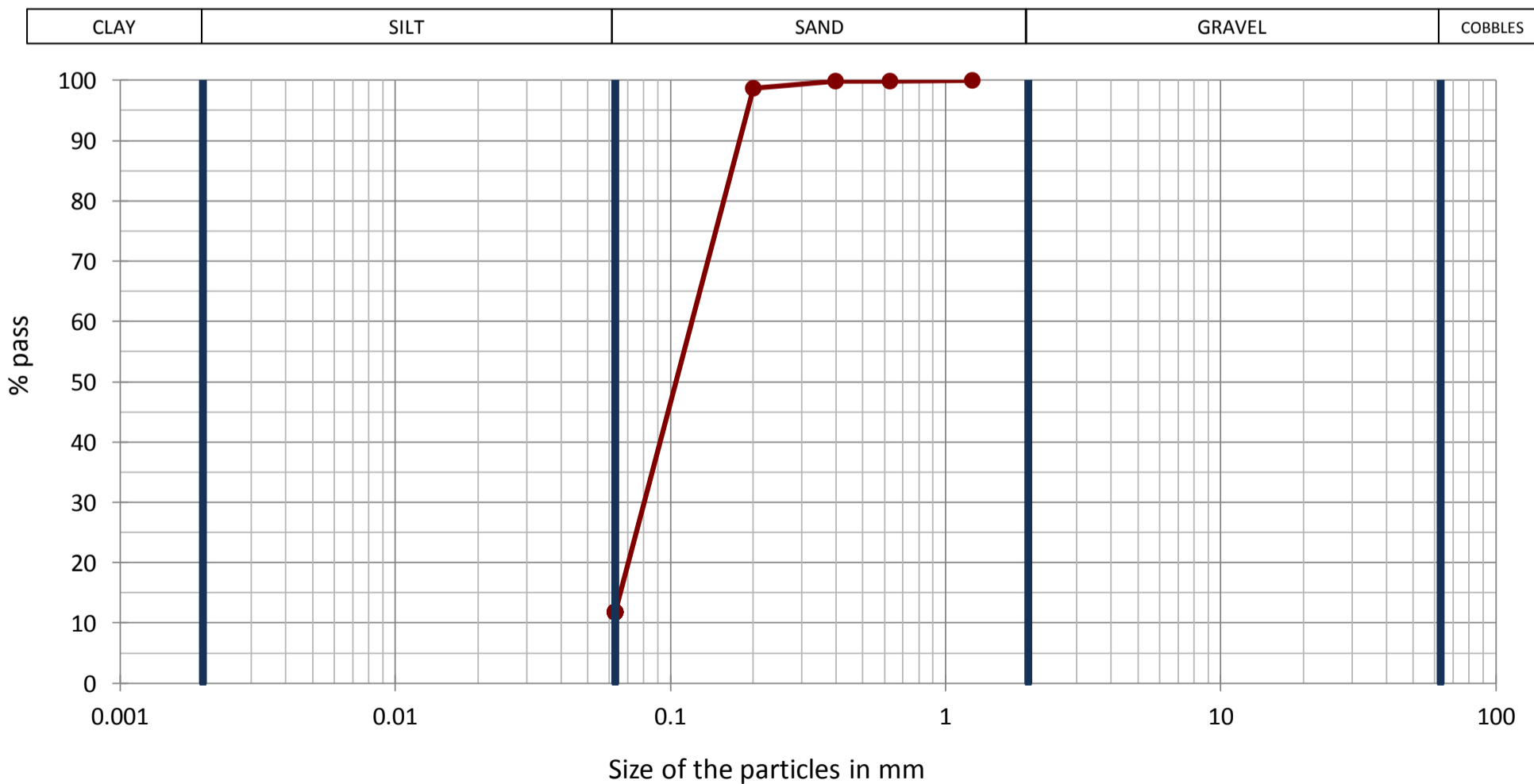
Previous calculations
 Total dried sample (g) **108.11**

 Hygrosc. moisture, % (fraction<2 mm) **0.5**
 Corr. parameter, f (fraction<2 mm) **0.9947**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
1.25			0.00	0.0	107.54	100.0
0.63			0.06	0.1	107.48	99.9
0.4			0.04	0.1	107.44	99.9
0.2			1.25	1.3	106.19	98.7
0.063			93.46	88.2	12.73	11.8

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	88.2	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	1.2		11.8
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	86.9		



REMARKS

SAND CONTAINS SHELL FRAGMENTS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0372

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	75.99
Hygroscopic moisture, W (%)	0.5
Tested and dried soil mass, m (g)	75.59
Particle density (Mg/m ³)	2.655

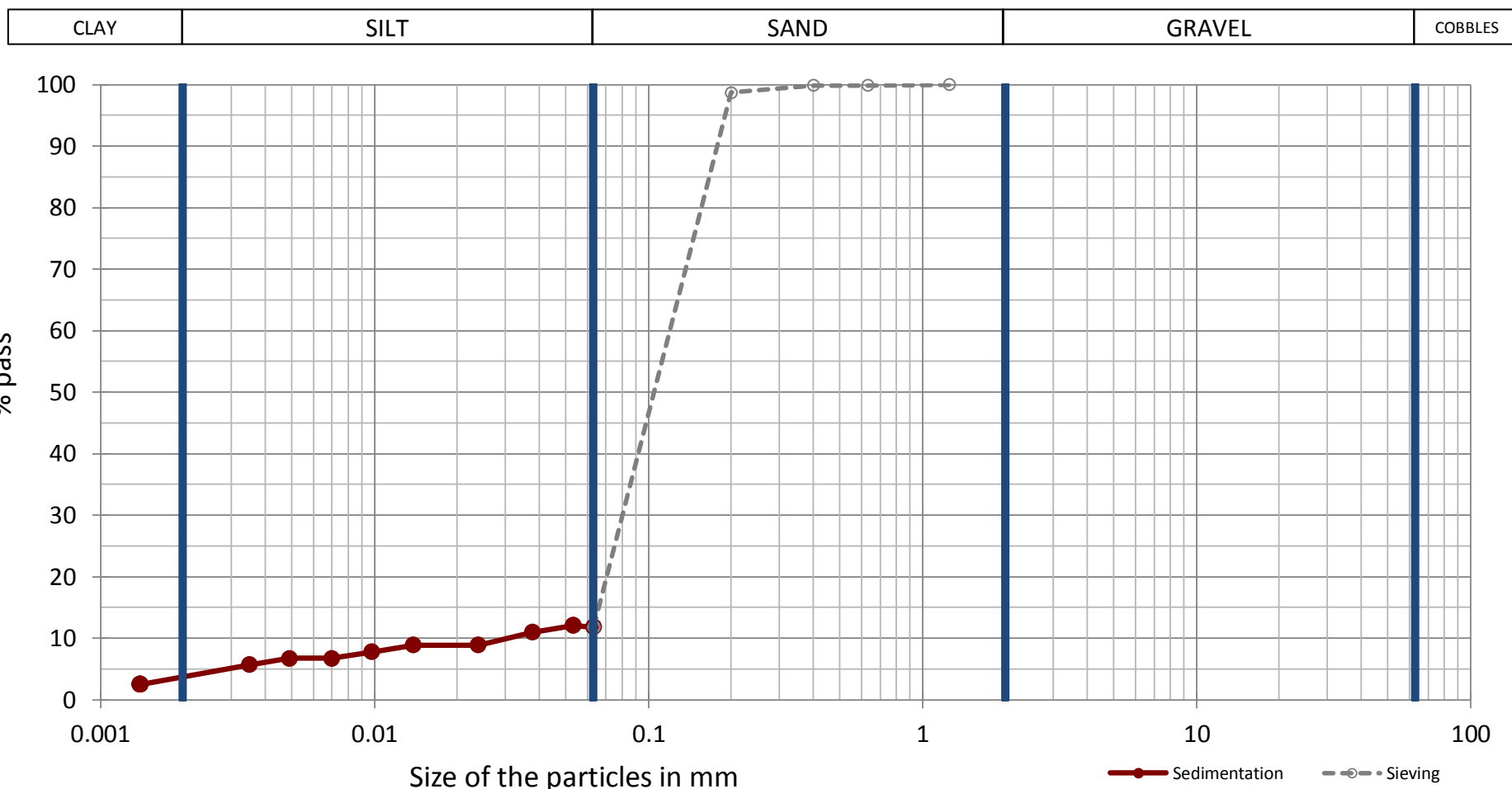
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	22	1.0095	9.5	159.8	5.7	0.0531	12.0
2	22	1.0090	9	161.0	5.2	0.0377	11.0
5	22	1.0080	8	163.4	4.2	0.0240	8.9
15	22	1.0080	8	163.4	4.2	0.0139	8.9
30	22	1.0075	7.5	164.6	3.7	0.0098	7.8
60	22	1.0070	7	165.8	3.2	0.0070	6.7
120	22	1.0070	7	165.8	3.2	0.0049	6.7
240	22	1.0065	6.5	166.9	2.7	0.0035	5.7
1440	22	1.0050	5	170.5	1.2	0.0014	2.5

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	11.8
Silt, between 0.063 and 0.002 mm (%)	8.4
Clay, smaller than 0.002 mm (%)	3.4



REMARKS

Operator: ALEX VANCELLS

Test final date: 08/10/2019

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0372

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Specimen dimensions

Specimen length (cm)	7.570
Specimen diameter (cm)	3.835
Specimen area (cm ²)	11.55
Specimen volume (cm ³)	87.43

Prior saturation process

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	65

Test data

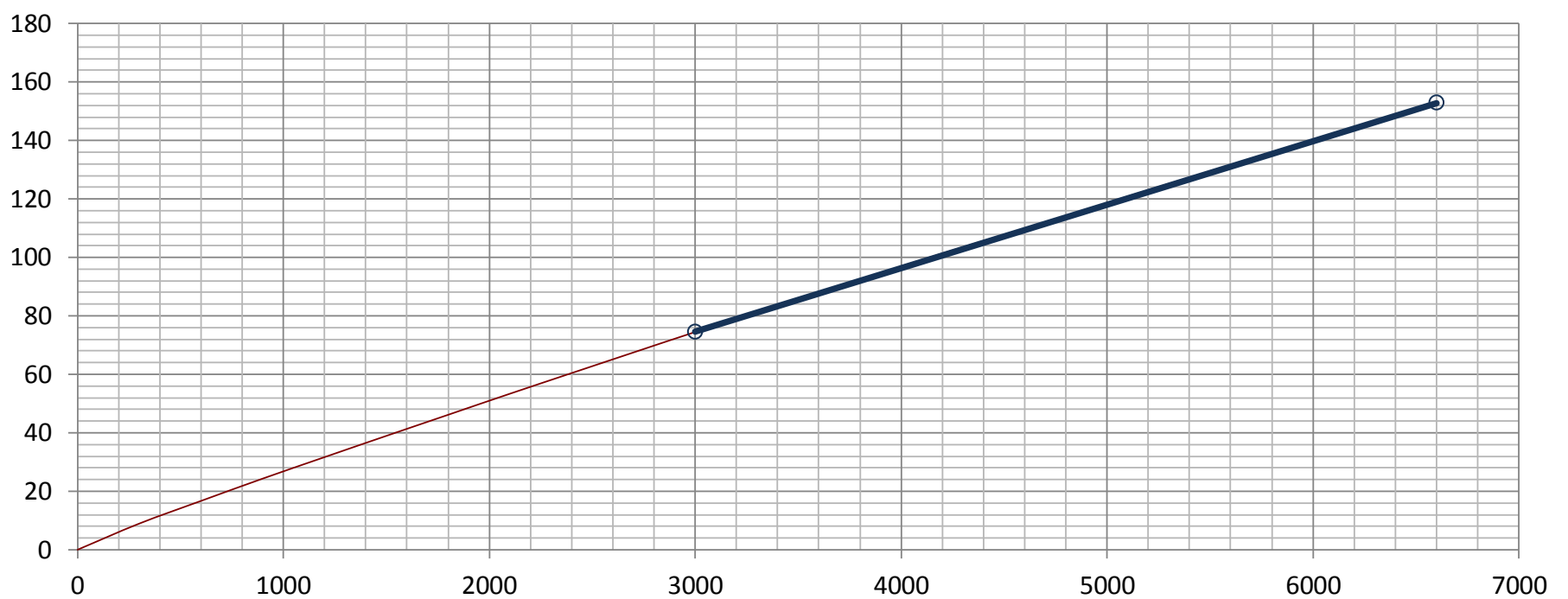
Soil weight (g)	165.21
Dry soil weight (g)	128.52
Initial moisture content (%)	28.8
Initial bulk density (Mg/m ³)	1.89
Initial dry density (Mg/m ³)	1.47
Initial void index, e ₀	0.8061
Initial saturation degree (%)	94.85
Final moisture content (%)	32.7
Final bulk density (Mg/m ³)	1.95
Final dry density (Mg/m ³)	1.47

Pressures applied during test execution

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6
Pressure gradient (bar)	1

Results

Permeability constant, K (cm/s) 1.43E-05



REMARKS

Operator: MARC COLOMER

Test final date: 27/08/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0372

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 01-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.426 g

Equipment:

RESULT: **11.6 g/kg (total)**

MUFLA OVEN ETI HD150

7 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass: 1.016 g

Equipment:

RESULT: **38.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0373

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_8 P_8.1
Top depth, m	5.25
Bottom depth, m	5.36
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	11
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	10-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark gray (5Y 3/1) fine SAND with rare clay pockets and rare shell fragments	5.25	
	5.36	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

MB19-0373

PHOTOGRAPHIC RECORD



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 10/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0373

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.99
Tare + soil + water (g)	225.36
Tare + soil (g)	204.33
Water (g)	21.03
Soil (g)	99.34
Moisture, w (%)	21.2

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 11/06/2019

Results	
Moisture content, w (%)	21.2

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	96.91
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.93
Dry density (Mg/m ³)	1.59

Operator: MARC COLOMER
Test final date: 10/06/2019

Results	
Bulk density (Mg/m³)	1.93
Dry density (Mg/m³)	1.59

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	19.9
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0880
Pyc. mass + soil + water at test temp. M2 (g)	183.5940
Soil mass, M1 (g)	10.4630
Particle density, G20°C (Mg/m ³)	2.640

Operator: GUILLEM MASSALLÉ
Test final date: 02/10/2019

Results	
Particle density (Mg/m³)	2.640

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0373

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

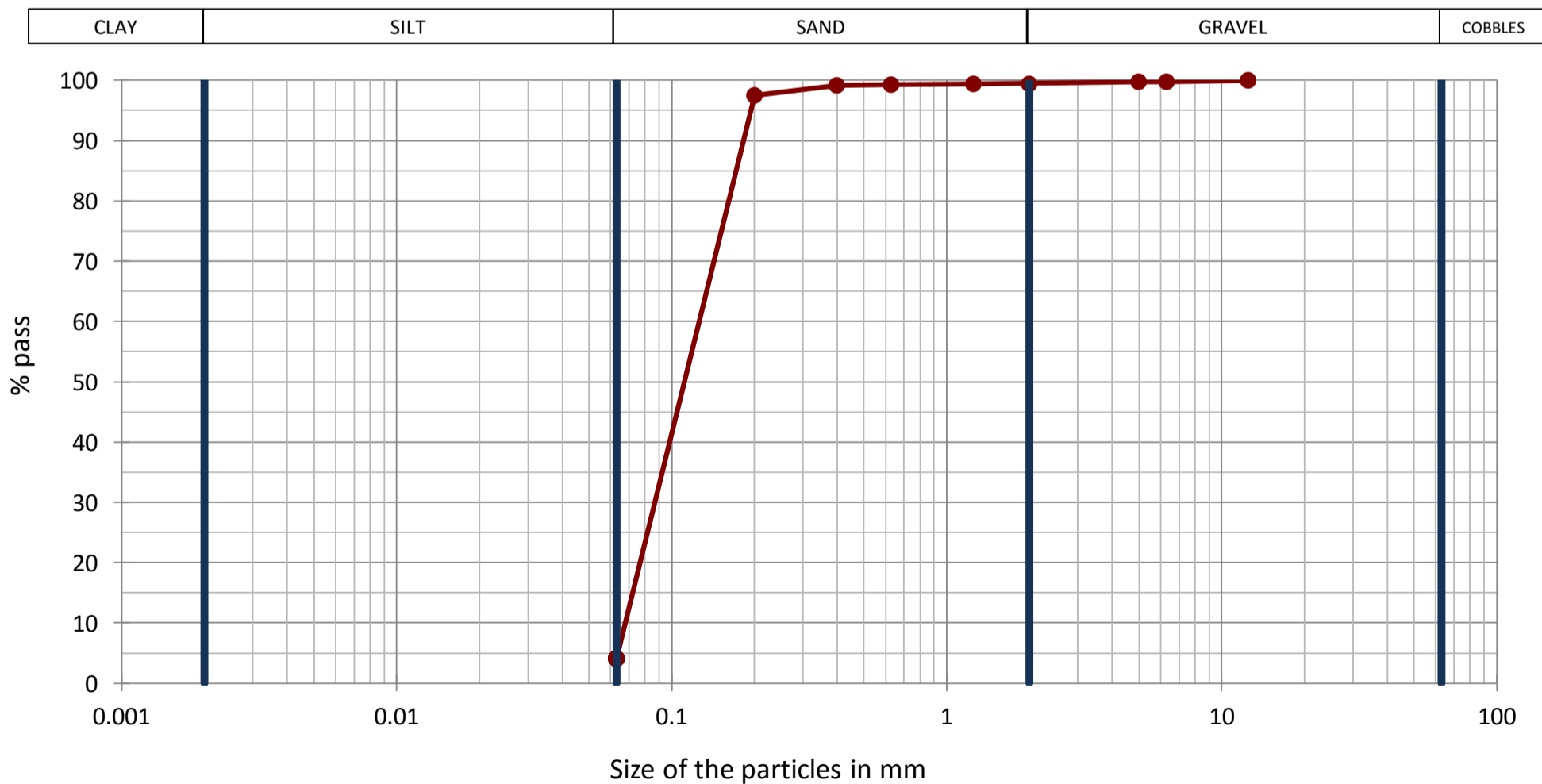
Previous calculations
 Total dried sample (g) **106.97**

 Hygrosc. moisture, % (fraction<2 mm) **0.5**
 Corr. parameter, f (fraction<2 mm) **0.9953**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
12.5		0.00	0.0	106.47	100.0
6.3		0.21	0.2	106.26	99.8
5		0.03	0.2	106.23	99.8
2		0.28	0.5	105.95	99.5
1.25		0.09	0.6	105.86	99.4
0.63		0.10	0.7	105.76	99.3
0.4		0.10	0.8	105.66	99.2
0.2		1.88	2.5	103.78	97.5
0.063		99.40	95.9	4.38	4.1

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.5	% SAND	2-0.063 mm	95.4	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.2	4.1	
	% Medium gravel	20-6.3 mm	0.2	% Medium sand	0.63-0.2 mm	1.8		
	% Fine gravel	6.3-2 mm	0.3	% Fine sand	0.2-0.063 mm	93.4		



REMARKS

GRAVEL AND COARSE SAND ARE COMPOSED OF SHELL FRAGMENTS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0373

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 01-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.141 g

Equipment:

RESULT: **5.5 g/kg (total)**

MUFLA OVEN ETI HD150

1.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass: 3.498 g

Equipment:

RESULT: **33.5 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0373

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6263
Soil mass, g	1446
Minimum density, Mg/m³	1.45

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6495
Soil mass, g	1678
Maximum density, Mg/m³	1.68

Relative density	
Dry density, Mg/m ³	1.59
Relative density, %	61

REMARKS

Operator:

Date final test:

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0374

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_7 P_7.6
Top depth, m	0.35
Bottom depth, m	0.46
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	11
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	10-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (5Y 5/1) fine SAND with occasional clay pockets and occasional shell fragments.	0.35	
	0.46	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0374



REMARKS

Operator: ALEX VANCELLS

Date: 10/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0374

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	106.63
Tare + soil + water (g)	234.29
Tare + soil (g)	214.70
Water (g)	19.59
Soil (g)	108.07
Moisture, w (%)	18.1

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 11/06/2019

Results	
Moisture content, w (%)	18.1

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	94.96
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.89
Dry density (Mg/m ³)	1.60

Operator: MARC COLOMER
Test final date: 10/06/2019

Results	
Bulk density (Mg/m³)	1.89
Dry density (Mg/m³)	1.60

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0375

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_7 P_7.5
Top depth, m	1.2
Bottom depth, m	1.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	11
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	10-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with frequent millimetrical to centimetrical clay layers and pockets with rare shell fragments. Distinctive smell.	1.2	
	1.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

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Sample reference

MB19-0375

PHOTOGRAPHIC RECORD



REMARKS

Operator: ALEX VANCELLS

Date: 10/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0375

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.56
Tare + soil + water (g)	215.40
Tare + soil (g)	190.86
Water (g)	24.54
Soil (g)	86.30
Moisture, w (%)	28.4

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 11/06/2019

Results	
Moisture content, w (%)	28.4

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	95.97
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.91
Dry density (Mg/m ³)	1.49

Operator: MARC COLOMER
Test final date: 10/06/2019

Results	
Bulk density (Mg/m³)	1.91
Dry density (Mg/m³)	1.49

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0376

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_7 P_7.4
Top depth, m	1.97
Bottom depth, m	2.07
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	10-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (5Y 5/1) fine SAND with rare shell fragmetns.	1.97	
	2.07	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

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Sample reference

MB19-0376

PHOTOGRAPHIC RECORD



REMARKS

Operator: ALEX VANCELLS

Date: 10/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0376

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	111.83
Tare + soil + water (g)	209.58
Tare + soil (g)	193.67
Water (g)	15.91
Soil (g)	81.84
Moisture, w (%)	19.4

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 11/06/2019

Results	
Moisture content, w (%)	19.4

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	99.88
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.500
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	49.65
Bulk density (Mg/m ³)	2.01
Dry density (Mg/m ³)	1.68

Operator: MARC COLOMER
Test final date: 10/06/2019

Results	
Bulk density (Mg/m³)	2.01
Dry density (Mg/m³)	1.68

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0377

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_7 P_7.4B
Top depth, m	2.3
Bottom depth, m	2.7
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	10-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with occasional clay pockets and rare shell fragments.	2.3	
	2.7	

CARRIED OUT TESTS

--

REMARKS

See results at RUSSELL GEOTECHNICAL INNOVATIONS report.

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Sample reference

MB19-0377

PHOTOGRAPHIC RECORD



REMARKS

Operator: ALEX VANCELLS

Date: 10/06/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0378

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_7 P_7.3
Top depth, m	3.3
Bottom depth, m	3.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	20
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	10-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light olive gray (5Y 6/2) fine SAND with rare clay millimetrical layers and pockets and rare shell fragments.	3.3	
	3.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0378



REMARKS

Operator: ALEX VANCELLS

Date: 10/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0378

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.55
Tare + soil + water (g)	204.49
Tare + soil (g)	188.52
Water (g)	15.97
Soil (g)	83.97
Moisture, w (%)	19.0

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 11/06/2019

Results	
Moisture content, w (%)	19.0

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	97.19
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.94
Dry density (Mg/m ³)	1.63

Operator: MARC COLOMER
Test final date: 10/06/2019

Results	
Bulk density (Mg/m³)	1.94
Dry density (Mg/m³)	1.63

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0379

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_7 P_7.2
Top depth, m	3.95
Bottom depth, m	4.7
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	75
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	10-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light olive gray (5Y 6/2) fine SAND with rare clay millimetrical layers and pockets and rare shell fragments.	3.95	
	4.7	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0379



REMARKS

Operator: ALEX VANCELLS

Date: 10/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0379

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	98.18
Tare + soil + water (g)	209.01
Tare + soil (g)	195.02
Water (g)	13.99
Soil (g)	96.84
Moisture, w (%)	14.4

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 11/06/2019

Results	
Moisture content, w (%)	14.4

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	90.54
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.80
Dry density (Mg/m ³)	1.57

Operator: MARC COLOMER
Test final date: 10/06/2019

Results	
Bulk density (Mg/m³)	1.80
Dry density (Mg/m³)	1.57

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0380

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_7 P_7.1
Top depth, m	5.3
Bottom depth, m	5.45
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	10-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light olive gray (5Y 6/2) fine SAND with rare millimetrical clay layers and pockets and rare shell fragments. Distinctive smell.	5.3	

5.45

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

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Sample reference

MB19-0380

PHOTOGRAPHIC RECORD



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 10/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0380

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.16
Tare + soil + water (g)	212.99
Tare + soil (g)	195.56
Water (g)	17.43
Soil (g)	84.40
Moisture, w (%)	20.7

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 11/06/2019

Results	
Moisture content, w (%)	20.7

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	97.64
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.94
Dry density (Mg/m ³)	1.61

Operator: MARC COLOMER
Test final date: 10/06/2019

Results	
Bulk density (Mg/m³)	1.94
Dry density (Mg/m³)	1.61

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	19.8
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.4079
Pyc. mass + soil + water at test temp. M2 (g)	185.8120
Soil mass, M1 (g)	11.9440
Particle density, G20°C (Mg/m ³)	2.622

Operator: GUILLEM MASSALLÉ
Test final date: 02/10/2019

Results	
Particle density (Mg/m³)	2.622

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0380

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

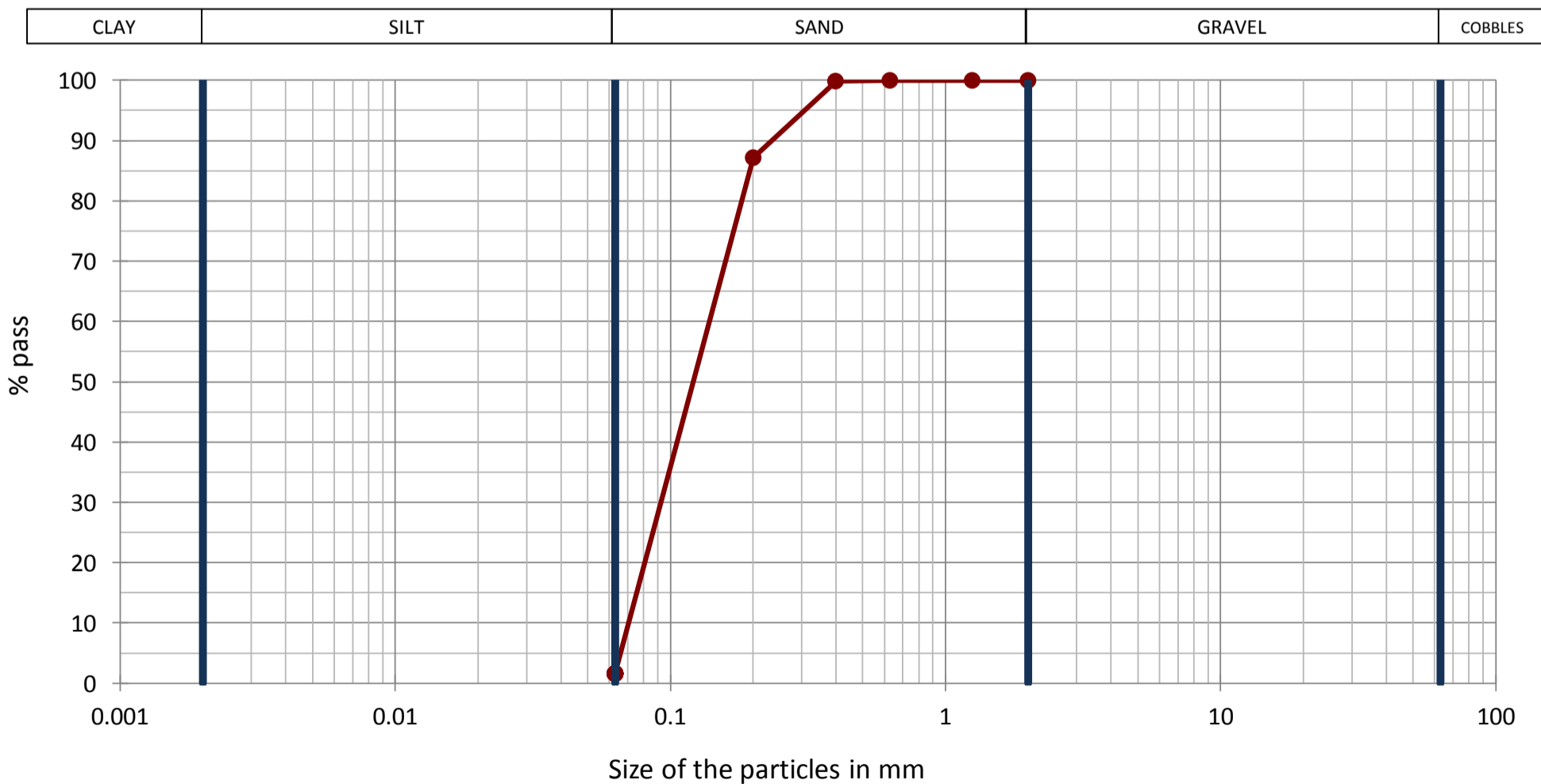
Previous calculations
 Total dried sample (g) **105.77**

 Hygrosc. moisture, % (fraction<2 mm) **0.3**
 Corr. parameter, f (fraction<2 mm) **0.9969**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2		0.00	0.0	105.45	100.0
1.25		0.01	0.0	105.44	100.0
0.63		0.04	0.0	105.40	100.0
0.4		0.05	0.1	105.35	99.9
0.2		13.39	12.8	91.96	87.2
0.063		90.13	98.3	1.83	1.7

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.3	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	12.8		1.7
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	85.5		



REMARKS

SAND CONTAINS RARE SHELL FRAGMENTS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0380

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 01-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 11.22 g

Equipment:

RESULT: **4.6 g/kg (total)**

MUFLA OVEN ETI HD150

3.3 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass: 4.018 g

Equipment:

RESULT: **11.1 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0380

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6224
Soil mass, g	1407
Minimum density, Mg/m³	1.41

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6509
Soil mass, g	1692
Maximum density, Mg/m³	1.70

Relative density	
Dry density, Mg/m ³	1.61
Relative density, %	69

REMARKS

Operator: JOAN SAHUN

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0381

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_6 P_6.6
Top depth, m	0.3
Bottom depth, m	0.44
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	14
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	10-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Grayish brown (2.5Y 5/2) fine to medium SAND with frequent bluish zones of amorphous organic matter and frequent shell fragments.	0.3	
	0.44	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Not enough sample for minimum and maximum density test.

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0381



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0381

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	106.79
Tare + soil + water (g)	235.64
Tare + soil (g)	215.37
Water (g)	20.27
Soil (g)	108.58
Moisture, w (%)	18.7

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 11/06/2019

Results	
Moisture content, w (%)	18.7

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	97.56
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.94
Dry density (Mg/m ³)	1.63

Operator: MARC COLOMER
Test final date: 11/06/2019

Results	
Bulk density (Mg/m³)	1.94
Dry density (Mg/m³)	1.63

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.5
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0525
Pyc. mass + soil + water at test temp. M2 (g)	184.5880
Soil mass, M1 (g)	12.0210
Particle density, G20°C (Mg/m ³)	2.683

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.683

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0381

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment	

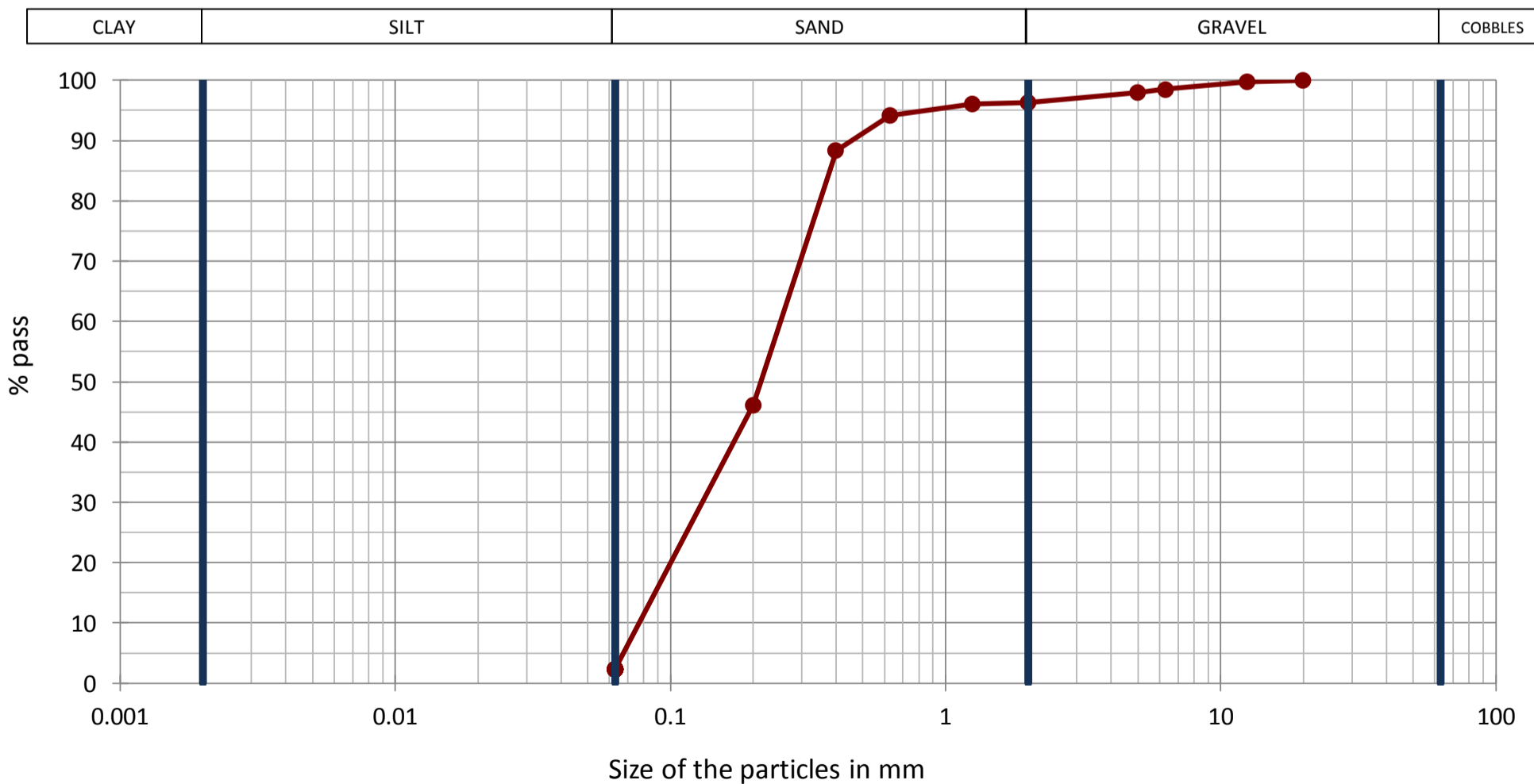
Predrying temperature (°C) **60**

Previous calculations	
Total dried sample (g)	1208.63
M. > 2mm, washed and dried (g)	44.17
M. < 2 mm, dried tested (g)	112.72
M. < 2 mm, dried tested (g)	112.56
M. < 2 mm, dried total (g)	1162.86
Total dried sample (g)	1207.03
Hygros. moisture, % (fraction<2 mm)	0.1
Corr. parameter, f (fraction<2 mm)	0.9986
Corr. parameter, f2 (fraction<2 mm)	10.3306

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
20		0.00	0.0	1207.03	100.0
12.5		2.83	0.2	1204.20	99.8
6.3		14.93	1.5	1189.27	98.5
5		5.92	2.0	1183.35	98.0
2		20.49	3.7	1162.86	96.3
1.25	0.29		3.9	1159.86	96.1
0.63	2.21		5.8	1137.03	94.2
0.4	6.79		11.6	1066.89	88.4
0.2	49.30		53.8	557.59	46.2
0.063	51.15		97.6	29.18	2.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	3.7	% SAND	2-0.063 mm	93.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	2.1		
	% Medium gravel	20-6.3 mm	1.5	% Medium sand	0.63-0.2 mm	48.0		2.4
	% Fine gravel	6.3-2 mm	2.2	% Fine sand	0.2-0.063 mm	43.8		



REMARKS

GRAVEL COMPOSED OF SHELL FRAGMENTS.

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0381

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Predrying temperature:	60 °C	Test final date:	09-10-19
Mean of analyzed soil mass:	10.24 g	Calcination temperature:	450 °C
RESULT:	4.6 g/kg (total)	Equipment:	MUFLA OVEN ETI HD150
	1.7 g/kg (organic)		PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator:	ALEX VANCELLS	Test final date:	23-10-19
Mean of analyzed soil mass:	2.086 g	Equipment:	SCHEIBLER APPARATUS
RESULT:	24.2 g/kg		

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0382

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_6 P_6.5
Top depth, m	1.05
Bottom depth, m	1.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	25
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	11-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with rare shell fragments.	1.05	
	1.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0382



REMARKS

Operator: ALEX VANCELLS

Date: 11/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0382

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	112.95
Tare + soil + water (g)	240.66
Tare + soil (g)	219.29
Water (g)	21.37
Soil (g)	106.34
Moisture, w (%)	20.1

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 12/06/2019

Results	
Moisture content, w (%)	20.1

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	91.72
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.83
Dry density (Mg/m ³)	1.52

Operator: MARC COLOMER
Test final date: 11/06/2019

Results	
Bulk density (Mg/m³)	1.83
Dry density (Mg/m³)	1.52

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0383

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_6 P_6.4
Top depth, m	2.04
Bottom depth, m	2.15
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	11
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	11-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with occasional medium sand, rare clay pockets and rare shell fragments.	2.04	
	2.15	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0383



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0383

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	108.66
Tare + soil + water (g)	230.62
Tare + soil (g)	211.45
Water (g)	19.17
Soil (g)	102.79
Moisture, w (%)	18.6

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 12/06/2019

Results	
Moisture content, w (%)	18.6

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	93.70
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.87
Dry density (Mg/m ³)	1.58

Operator: MARC COLOMER
Test final date: 12/06/2019

Results	
Bulk density (Mg/m³)	1.87
Dry density (Mg/m³)	1.58

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.5
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6391
Pyc. mass + soil + water at test temp. M2 (g)	187.3700
Soil mass, M1 (g)	13.8920
Particle density, G20°C (Mg/m ³)	2.690

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.690

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0383

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

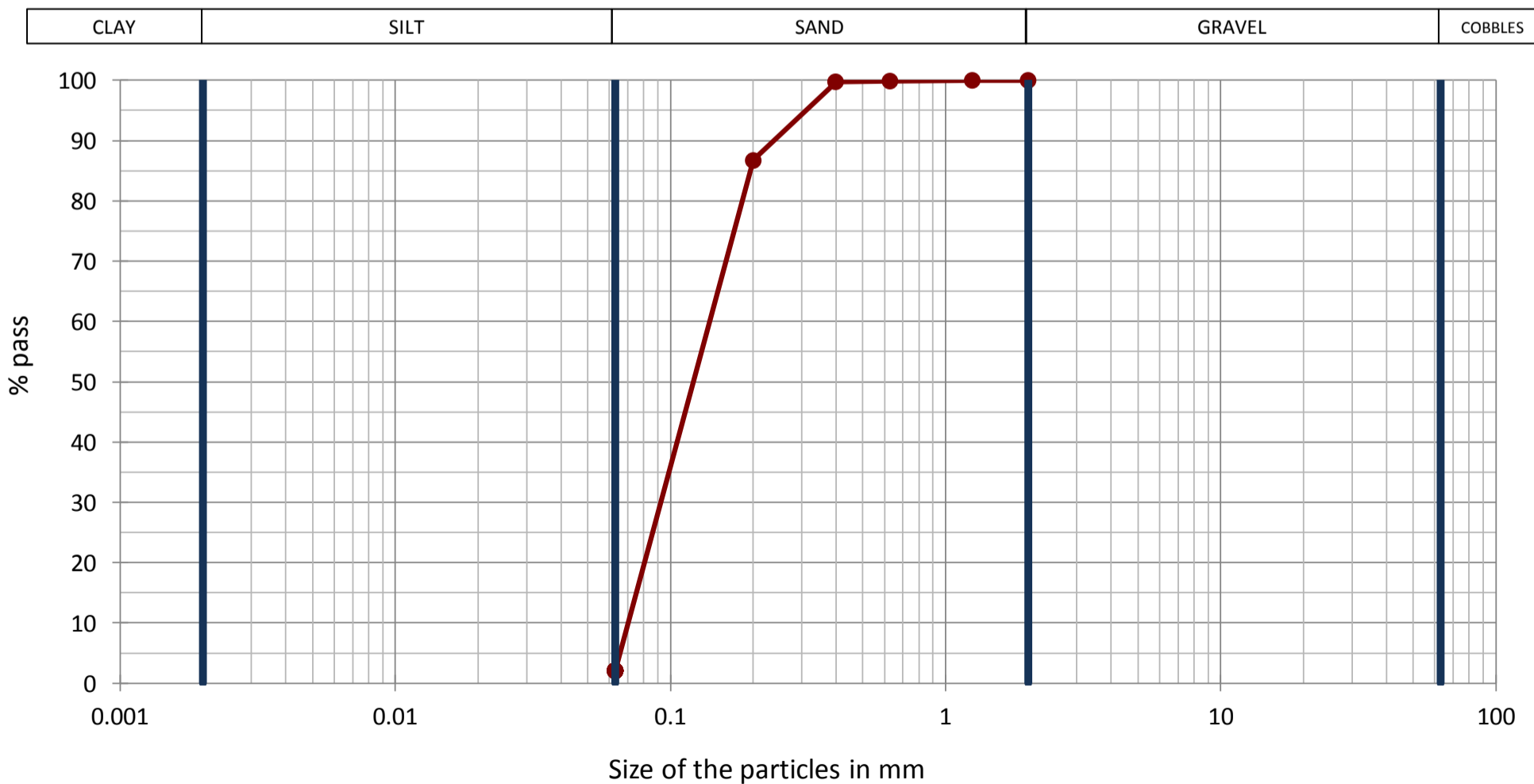
Previous calculations
 Total dried sample (g) **117.93**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9978**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
2		0.00	0.0	117.66	100.0
1.25		0.02	0.0	117.64	100.0
0.63		0.05	0.1	117.59	99.9
0.4		0.13	0.2	117.46	99.8
0.2		15.37	13.2	102.09	86.8
0.063		99.66	97.9	2.43	2.1

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	97.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	13.1		2.1
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	84.7		



REMARKS

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Sample reference

MB19-0383

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Predrying temperature:	60 °C	Test final date:	09-10-19
Mean of analyzed soil mass:	10.75 g	Calcination temperature:	450 °C
RESULT:	3.4 g/kg (total)	Equipment:	MUFLA OVEN ETI HD150
	1.7 g/kg (organic)		PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator:	ALEX VANCELLS	Test final date:	23-10-19
Mean of analyzed soil mass:	4.094 g	Equipment:	SCHEIBLER APPARATUS
RESULT:	14.2 g/kg		

REMARKS

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0383

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6278
Soil mass, g	1461
Minimum density, Mg/m³	1.47

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6518
Soil mass, g	1701
Maximum density, Mg/m³	1.71

Relative density	
Dry density, Mg/m ³	1.58
Relative density, %	46

REMARKS

Operator: JOAN SAHUN

Date final test: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0384

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_6 P_6.3
Top depth, m	3.23
Bottom depth, m	3.35
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	12
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	11-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) medium to fine SAND with frequent millimetrical clay layers and pockets and rare shell fragments.	3.23	
	3.35	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0384



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0384

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	112.86
Tare + soil + water (g)	246.10
Tare + soil (g)	223.08
Water (g)	23.02
Soil (g)	110.22
Moisture, w (%)	20.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 12/06/2019

Results	
Moisture content, w (%)	20.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.96
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.91
Dry density (Mg/m ³)	1.58

Operator: ALEX VANCELLS
Test final date: 12/06/2019

Results	
Bulk density (Mg/m³)	1.91
Dry density (Mg/m³)	1.58

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.5
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3721
Pyc. mass + soil + water at test temp. M2 (g)	185.7950
Soil mass, M1 (g)	11.8240
Particle density, G20°C (Mg/m ³)	2.686

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.686

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0384

PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **105**

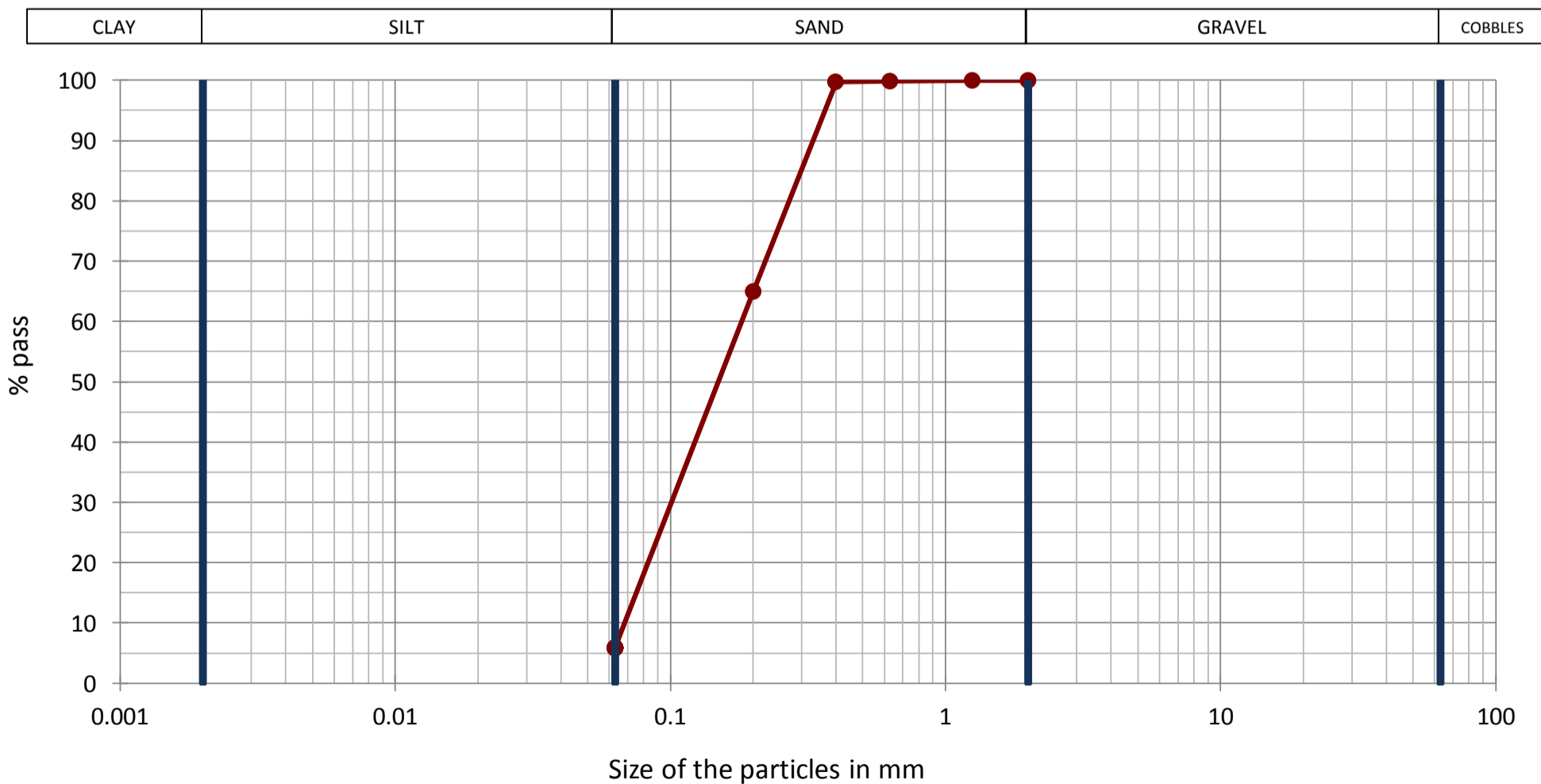
Previous calculations
 Total dried sample (g) **109.93**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9982**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2		0.00	0.0	109.73	100.0
1.25		0.02	0.0	109.71	100.0
0.63		0.04	0.1	109.67	99.9
0.4		0.15	0.2	109.52	99.8
0.2		38.22	35.0	71.30	65.0
0.063		64.88	94.1	6.42	5.9

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	94.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	34.9		5.9
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	59.1		



REMARKS

Report num.: CB0019-19-0005
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Sample reference

MB19-0384

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 08-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.139 g

Equipment:

RESULT: **5.5 g/kg (total)**

MUFLA OVEN ETI HD150

2.7 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 4.012 g

Equipment:

RESULT: **23.5 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0384

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6211
Soil mass, g	1394
Minimum density, Mg/m³	1.40

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6443
Soil mass, g	1626
Maximum density, Mg/m³	1.63

Relative density	
Dry density, Mg/m ³	1.58
Relative density, %	78

REMARKS

Operator: JOAN SAHUN

Date final test: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0385

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_6 P_6.2
Top depth, m	3.95
Bottom depth, m	4.2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	25
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	12-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with rare clay pockets and rare shell fragments.	3.95	
	4.2	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0385



REMARKS

Operator: ALEX VANCELLS

Date: 12/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0385

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	103.26
Tare + soil + water (g)	248.53
Tare + soil (g)	226.12
Water (g)	22.41
Soil (g)	122.86
Moisture, w (%)	18.2

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Moisture content, w (%)	18.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	94.20
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.88
Dry density (Mg/m ³)	1.59

Operator: MARC COLOMER
Test final date: 12/06/2019

Results	
Bulk density (Mg/m³)	1.88
Dry density (Mg/m³)	1.59

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0386

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_6 P_6.1
Top depth, m	5.04
Bottom depth, m	5.18
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	14
Acquisition date	2-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	12-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with rare clay pockets and rare shell fragments.	5.04	
	5.18	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0386



REMARKS

Operator: ALEX VANCELLS

Date: 12/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0386

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	111.46
Tare + soil + water (g)	225.40
Tare + soil (g)	205.05
Water (g)	20.35
Soil (g)	93.59
Moisture, w (%)	21.7

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Moisture content, w (%)	21.7

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	91.97
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.83
Dry density (Mg/m ³)	1.50

Operator: MARC COLOMER
Test final date: 12/06/2019

Results	
Bulk density (Mg/m³)	1.83
Dry density (Mg/m³)	1.50

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0387

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_5 P_5.6
Top depth, m	0.36
Bottom depth, m	0.48
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	12
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	12-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark gray (5Y 3/1) fine SAND with frequent clay pockets and layers with occasional shell fragments.	0.36	
	0.48	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0387



REMARKS

Operator: ALEX VANCELLS

Date: 12/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0387

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	112.77
Tare + soil + water (g)	227.81
Tare + soil (g)	182.97
Water (g)	44.84
Soil (g)	70.20
Moisture, w (%)	63.9

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Moisture content, w (%)	63.9

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	84.70
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.69
Dry density (Mg/m ³)	1.03

Operator: MARC COLOMER
Test final date: 12/06/2019

Results	
Bulk density (Mg/m³)	1.69
Dry density (Mg/m³)	1.03

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0388

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_5 P_5.5
Top depth, m	1.2
Bottom depth, m	1.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	30
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	12-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with rare clay pockets and rare shell fragments.	1.2	
	1.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

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Sample reference

MB19-0388

PHOTOGRAPHIC RECORD



REMARKS

Operator: ALEX VANCELLS

Date: 12/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0388

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.56
Tare + soil + water (g)	233.11
Tare + soil (g)	206.67
Water (g)	26.44
Soil (g)	102.11
Moisture, w (%)	25.9

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Moisture content, w (%)	25.9

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	89.40
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.78
Dry density (Mg/m ³)	1.41

Operator: MARC COLOMER
Test final date: 12/06/2019

Results	
Bulk density (Mg/m³)	1.78
Dry density (Mg/m³)	1.41

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0389

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_5 P_5.4
Top depth, m	2.33
Bottom depth, m	2.45
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	12
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	13-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with frequent silt/clay layers and occasional millimetric layers of amorphous organic matter.	2.33	
	2.45	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

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Sample reference

MB19-0389

PHOTOGRAPHIC RECORD



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 13/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0389

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.18
Tare + soil + water (g)	222.03
Tare + soil (g)	202.71
Water (g)	19.32
Soil (g)	91.53
Moisture, w (%)	21.1

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Moisture content, w (%)	21.1

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	96.32
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.92
Dry density (Mg/m ³)	1.59

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Bulk density (Mg/m³)	1.92
Dry density (Mg/m³)	1.59

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	19.8
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2670
Pyc. mass + soil + water at test temp. M2 (g)	185.8170
Soil mass, M1 (g)	12.1590
Particle density, G20°C (Mg/m ³)	2.634

Operator: GUILLEM MASSALLÉ
Test final date: 02/10/2019

Results	
Particle density (Mg/m³)	2.634

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0389

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

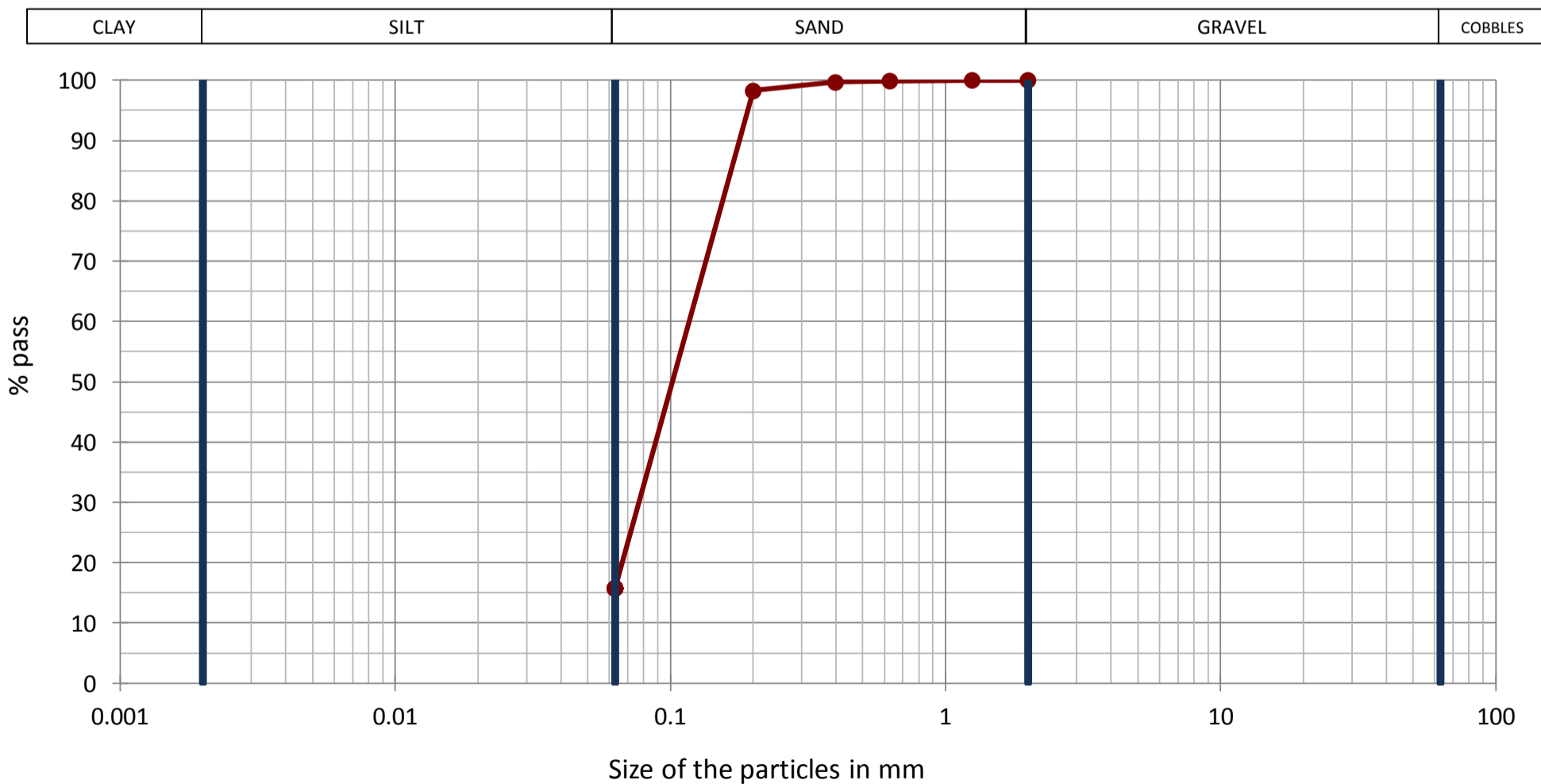
Previous calculations
 Total dried sample (g) **102.08**

 Hygrosc. moisture, % (fraction<2 mm) **0.5**
 Corr. parameter, f (fraction<2 mm) **0.9949**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2		0.00	0.0	101.56	100.0
1.25		0.03	0.0	101.53	100.0
0.63		0.11	0.1	101.42	99.9
0.4		0.17	0.3	101.25	99.7
0.2		1.43	1.7	99.82	98.3
0.063		83.81	84.2	16.01	15.8

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	84.2	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	1.6		15.8
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	82.5		



REMARKS

SAND CONTAINS SHELL FRAGMENTS AND ORGANIC MATTER

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0389

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	75.90
Hygroscopic moisture, W (%)	0.5
Tested and dried soil mass, m (g)	75.51
Particle density (Mg/m ³)	2.634

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582
Meniscus correction (Cm)	0.0005

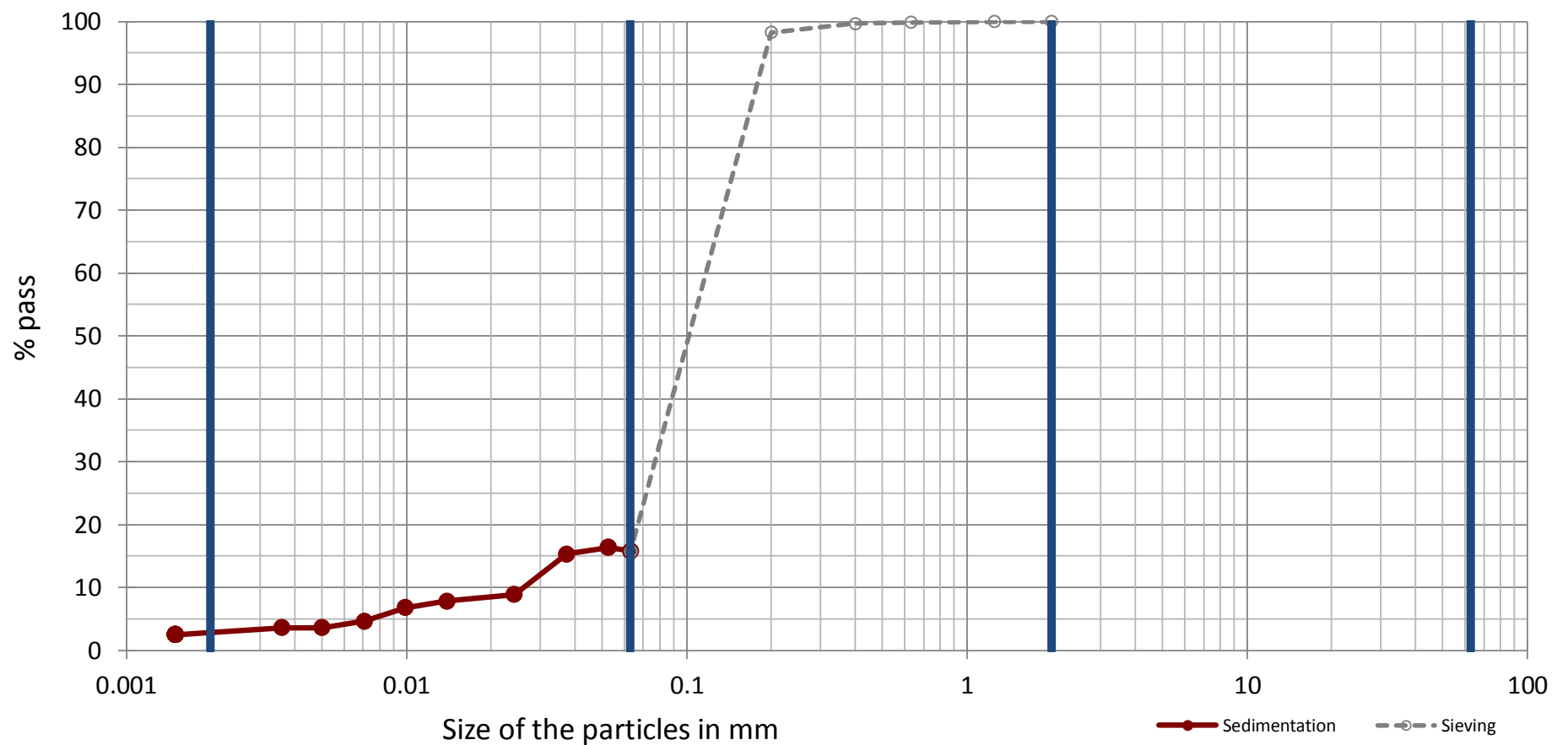
Test tube data	
Area of the inner section (A), mm ²	2933.99

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	22	1.0115	11.5	155.1	7.7	0.0527	16.4
2	22	1.0110	11	156.2	7.2	0.0374	15.3
5	22	1.0080	8	163.4	4.2	0.0242	8.9
15	22	1.0075	7.5	164.6	3.7	0.0140	7.8
30	22	1.0070	7	165.8	3.2	0.0099	6.8
60	22	1.0060	6	168.1	2.2	0.0071	4.6
120	22	1.0055	5.5	169.3	1.7	0.0050	3.6
240	22	1.0055	5.5	169.3	1.7	0.0036	3.6
1440	22	1.0050	5	170.5	1.2	0.0015	2.5

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	15.8
Silt, between 0.063 and 0.002 mm (%)	13.1
Clay, smaller than 0.002 mm (%)	2.7

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 08/10/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0389

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 01-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.282 g

Equipment:

RESULT: **11.7 g/kg (total)**

MUFLA OVEN ETI HD150

7.8 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass: 3.94 g

Equipment:

RESULT: **32.2 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0390

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_5 P_5.3
Top depth, m	3.2
Bottom depth, m	3.35
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	13-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine to medium SAND with frequent fine to coarse gravel and frequent shell fragments.	3.2	
	3.35	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

MB19-0390

PHOTOGRAPHIC RECORD



REMARKS

Operator: ALEX VANCELLS

Date: 13/06/2019

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0390

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.20
Tare + soil + water (g)	207.14
Tare + soil (g)	190.87
Water (g)	16.27
Soil (g)	86.67
Moisture, w (%)	18.8

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Moisture content, w (%)	18.8

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	108.30
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.16
Dry density (Mg/m ³)	1.82

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Bulk density (Mg/m³)	2.16
Dry density (Mg/m³)	1.82

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0391

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_5 P_5.2
Top depth, m	3.9
Bottom depth, m	4.22
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	32
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	13-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark olive gray (5Y 3/2) fine SAND with rare fine to medium gravel.	3.9	
	4.22	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

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Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0391



REMARKS

Operator: ALEX VANCELLS

Date: 13/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0391

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	111.91
Tare + soil + water (g)	232.40
Tare + soil (g)	218.11
Water (g)	14.29
Soil (g)	106.20
Moisture, w (%)	13.5

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Moisture content, w (%)	13.5

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	108.46
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.16
Dry density (Mg/m ³)	1.90

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Bulk density (Mg/m³)	2.16
Dry density (Mg/m³)	1.90

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0392

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_5 P_5.1
Top depth, m	5.05
Bottom depth, m	5.2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	13-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark olive gray (5Y 3/2) fine SAND with rare fine to medium gravel.	5.05	

5.2

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0392



REMARKS

Operator: ALEX VANCELLS

Date: 13/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0392

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	105.74
Tare + soil + water (g)	227.77
Tare + soil (g)	213.39
Water (g)	14.38
Soil (g)	107.65
Moisture, w (%)	13.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 14/06/2019

Results	
Moisture content, w (%)	13.4

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	106.53
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.12
Dry density (Mg/m ³)	1.87

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Bulk density (Mg/m³)	2.12
Dry density (Mg/m³)	1.87

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0393

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_4 P_4.6
Top depth, m	0.45
Bottom depth, m	0.6
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	13-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive gray (5Y 4/2) fine to medium SAND with rare shell fragments.	0.45	
	0.6	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
 DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
 DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0393



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0393

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	103.80
Tare + soil + water (g)	223.68
Tare + soil (g)	202.66
Water (g)	21.02
Soil (g)	98.86
Moisture, w (%)	21.3

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Moisture content, w (%)	21.3

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	98.19
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.96
Dry density (Mg/m ³)	1.62

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	1.96
Dry density (Mg/m³)	1.62

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.8
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2313
Pyc. mass + soil + water at test temp. M2 (g)	188.3430
Soil mass, M1 (g)	16.1960
Particle density, G20°C (Mg/m ³)	2.664

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.664

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0393

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE KERN PLE 4200-2N
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

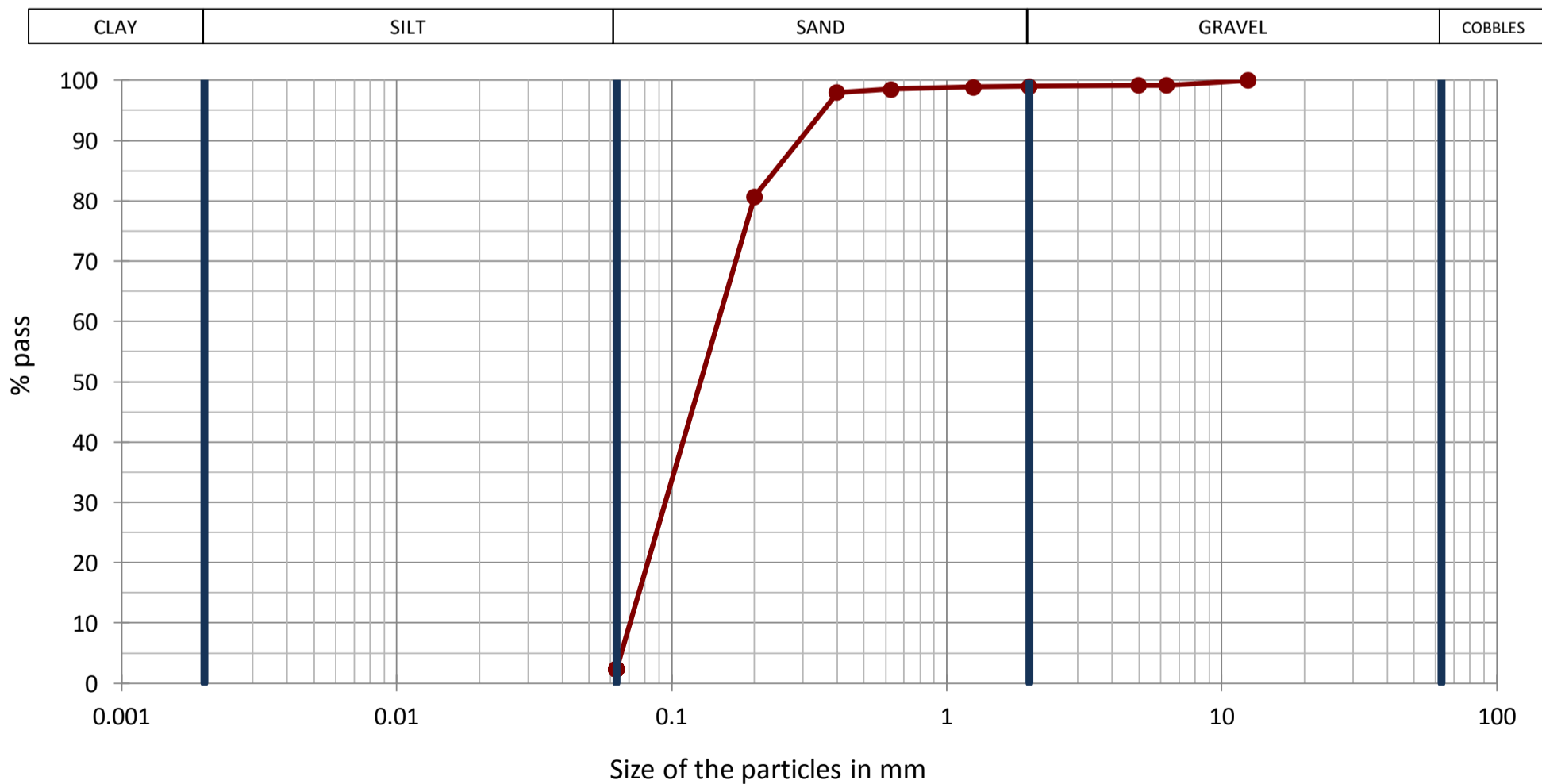
Previous calculations
 Total dried sample (g) **114.76**

 Hygrosc. moisture, % (fraction < 2 mm) **0.3**
 Corr. parameter, f (fraction < 2 mm) **0.9974**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
12.5		0.00	0.0	114.47	100.0
6.3		0.90	0.8	113.57	99.2
5		0.00	0.8	113.57	99.2
2		0.27	1.0	113.30	99.0
1.25		0.11	1.1	113.19	98.9
0.63		0.38	1.5	112.81	98.5
0.4		0.61	2.0	112.20	98.0
0.2		19.80	19.3	92.40	80.7
0.063		89.78	97.7	2.62	2.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	1.0	% SAND	2-0.063 mm	96.7	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.5	2.3	
	% Medium gravel	20-6.3 mm	0.8	% Medium sand	0.63-0.2 mm	17.8		
	% Fine gravel	6.3-2 mm	0.2	% Fine sand	0.2-0.063 mm	78.4		



REMARKS

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Sample reference

MB19-0393

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: ALEX VANCELLS

Test final date: 22-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.411 g

Equipment:

RESULT: **3.4 g/kg (total)**

MUFLA OVEN ETI HD150

1.1 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 3.037 g

Equipment:

RESULT: **19.1 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0394

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_4 P_4.5
Top depth, m	1.07
Bottom depth, m	1.4
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	33
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	13-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with rare clay pockets and rare shell fragments.	1.07	
	1.4	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0394



REMARKS

Operator: ALEX VANCELLS

Date: 13/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0394

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	105.30
Tare + soil + water (g)	209.39
Tare + soil (g)	189.77
Water (g)	19.62
Soil (g)	84.47
Moisture, w (%)	23.2

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 14/06/2019

Results	
Moisture content, w (%)	23.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	96.64
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.92
Dry density (Mg/m ³)	1.56

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Bulk density (Mg/m³)	1.92
Dry density (Mg/m³)	1.56

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0395

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_4 P_4.4
Top depth, m	2.2
Bottom depth, m	2.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	13-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with occasional silt/clay pockets and millimetrical to centimetrical layers, with rare shell fragments.	2.2	
	2.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0395



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 13/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0395

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	108.59
Tare + soil + water (g)	221.71
Tare + soil (g)	198.88
Water (g)	22.83
Soil (g)	90.29
Moisture, w (%)	25.3

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Moisture content, w (%)	25.3

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.64
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.90
Dry density (Mg/m ³)	1.52

Operator: ALEX VANCELLS
Test final date: 13/06/2019

Results	
Bulk density (Mg/m³)	1.90
Dry density (Mg/m³)	1.52

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data		
Drying temperature (°C)	105	105
Pycnometer reference num.	9	
Test temperature (°C)	20.3	
Water density at test temp., δwTi (Mg/m ³)	0.9982	
Temperature correction parameter, K1	0.9982	
Pyc. mass when full of water at test temp., M3 (g)	178.6570	
Pyc. mass + soil + water at test temp. M2 (g)	187.6550	
Soil mass, M1 (g)	14.4550	
Particle density, G20°C (Mg/m ³)	2.644	

Operator: GUILLEM MASSALLÉ
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.644

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0395

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

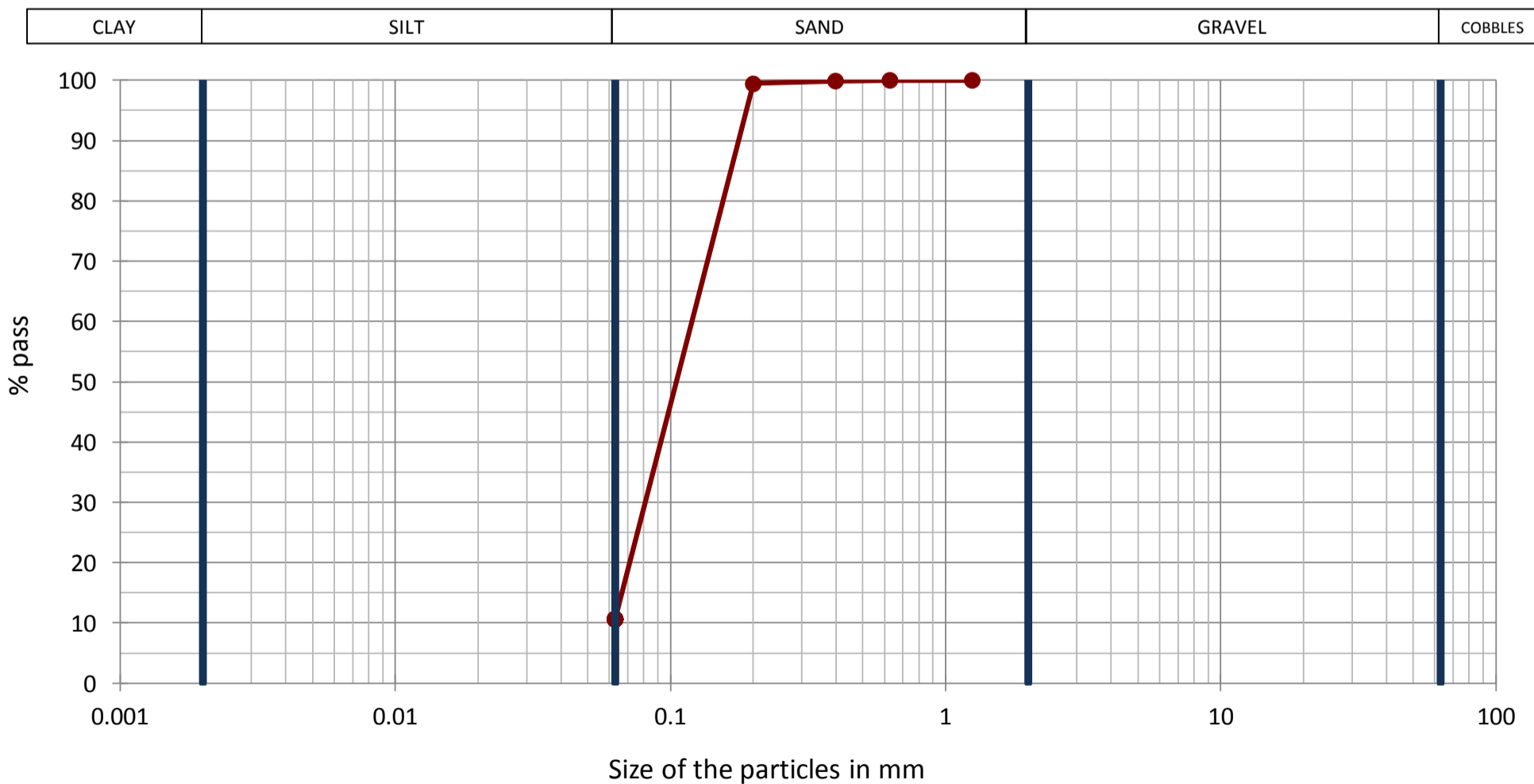
Previous calculations
 Total dried sample (g) **106.69**

 Hygrosc. moisture, % (fraction<2 mm) **0.5**
 Corr. parameter, f (fraction<2 mm) **0.9946**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
1.25			0.00	0.0	106.11	100.0
0.63			0.02	0.0	106.09	100.0
0.4			0.05	0.1	106.04	99.9
0.2			0.43	0.5	105.61	99.5
0.063			94.31	89.3	11.30	10.7

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	89.3	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.5		10.7
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	88.8		



REMARKS

SAND CONTAINS SHELL FRAGMENTS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0395

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	75.03
Hygroscopic moisture, W (%)	0.5
Tested and dried soil mass, m (g)	74.62
Particle density (Mg/m ³)	2.644

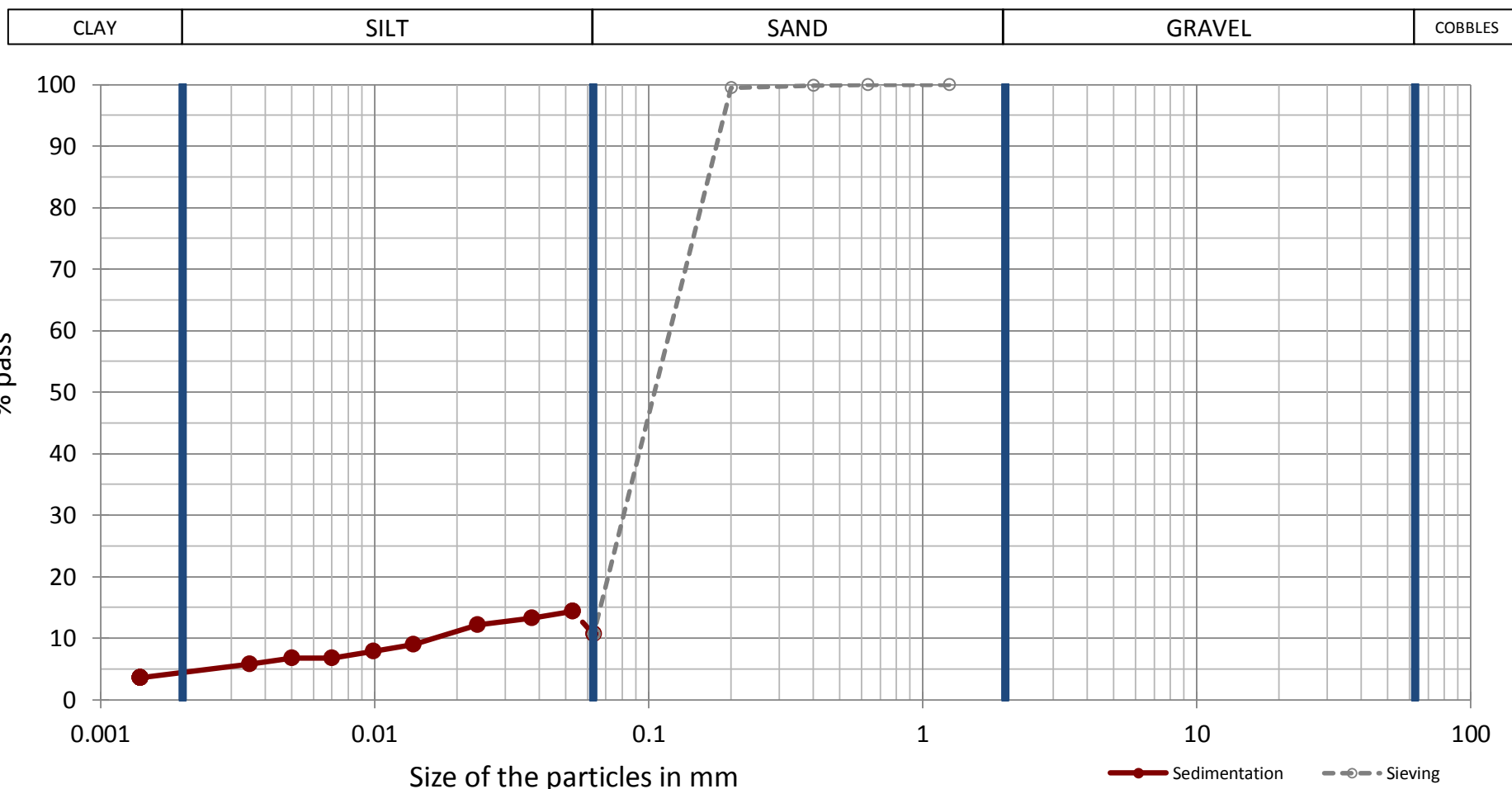
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	22	1.0105	10.5	157.4	6.7	0.0529	14.4
2	22	1.0100	10	158.6	6.2	0.0376	13.3
5	22	1.0095	9.5	159.8	5.7	0.0238	12.2
15	22	1.0080	8	163.4	4.2	0.0139	9.0
30	22	1.0075	7.5	164.6	3.7	0.0099	7.9
60	22	1.0070	7	165.8	3.2	0.0070	6.8
120	22	1.0070	7	165.8	3.2	0.0050	6.8
240	22	1.0065	6.5	166.9	2.7	0.0035	5.8
1440	22	1.0055	5.5	169.3	1.7	0.0014	3.6

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	10.7
Silt, between 0.063 and 0.002 mm (%)	6.5
Clay, smaller than 0.002 mm (%)	4.2



REMARKS

Operator: ALEX VANCELLS

Test final date: 08/10/2019

Report num.: CB0019-19-0005
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Sample reference

MB19-0395

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 02-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.251 g

Equipment:

RESULT: **7.5 g/kg (total)**

MUFLA OVEN ETI HD150

3.6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass: 2.756 g

Equipment:

RESULT: **32.8 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0396

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_4 P_4.3
Top depth, m	3
Bottom depth, m	3.35
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	35
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	13-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with rare clay pockets and rare shell fragments and rare amorphous organic matter pockets.	3	

3.35

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0396



REMARKS

Operator: ALEX VANCELLS

Date: 13/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISITY - ISO 17892-2:2014

Sample reference

MB19-0396

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	106.44
Tare + soil + water (g)	209.94
Tare + soil (g)	190.14
Water (g)	19.80
Soil (g)	83.70
Moisture, w (%)	23.7

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Moisture content, w (%)	23.7

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	98.07
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.95
Dry density (Mg/m ³)	1.58

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Bulk density (Mg/m³)	1.95
Dry density (Mg/m³)	1.58

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0397

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_4 P_4.2
Top depth, m	4.06
Bottom depth, m	4.15
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	9
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	13-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with occasional millimetrical to centimetrical clay layers and frequent clay pockets.	4.06	
	4.15	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0397



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0397

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	107.72
Tare + soil + water (g)	225.44
Tare + soil (g)	201.09
Water (g)	24.35
Soil (g)	93.37
Moisture, w (%)	26.1

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Moisture content, w (%)	26.1

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	97.28
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.94
Dry density (Mg/m ³)	1.54

Operator: MARC COLOMER
Test final date: 13/06/2019

Results	
Bulk density (Mg/m³)	1.94
Dry density (Mg/m³)	1.54

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.8
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6391
Pyc. mass + soil + water at test temp. M2 (g)	186.3810
Soil mass, M1 (g)	12.3900
Particle density, G20°C (Mg/m ³)	2.665

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.665

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0397

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

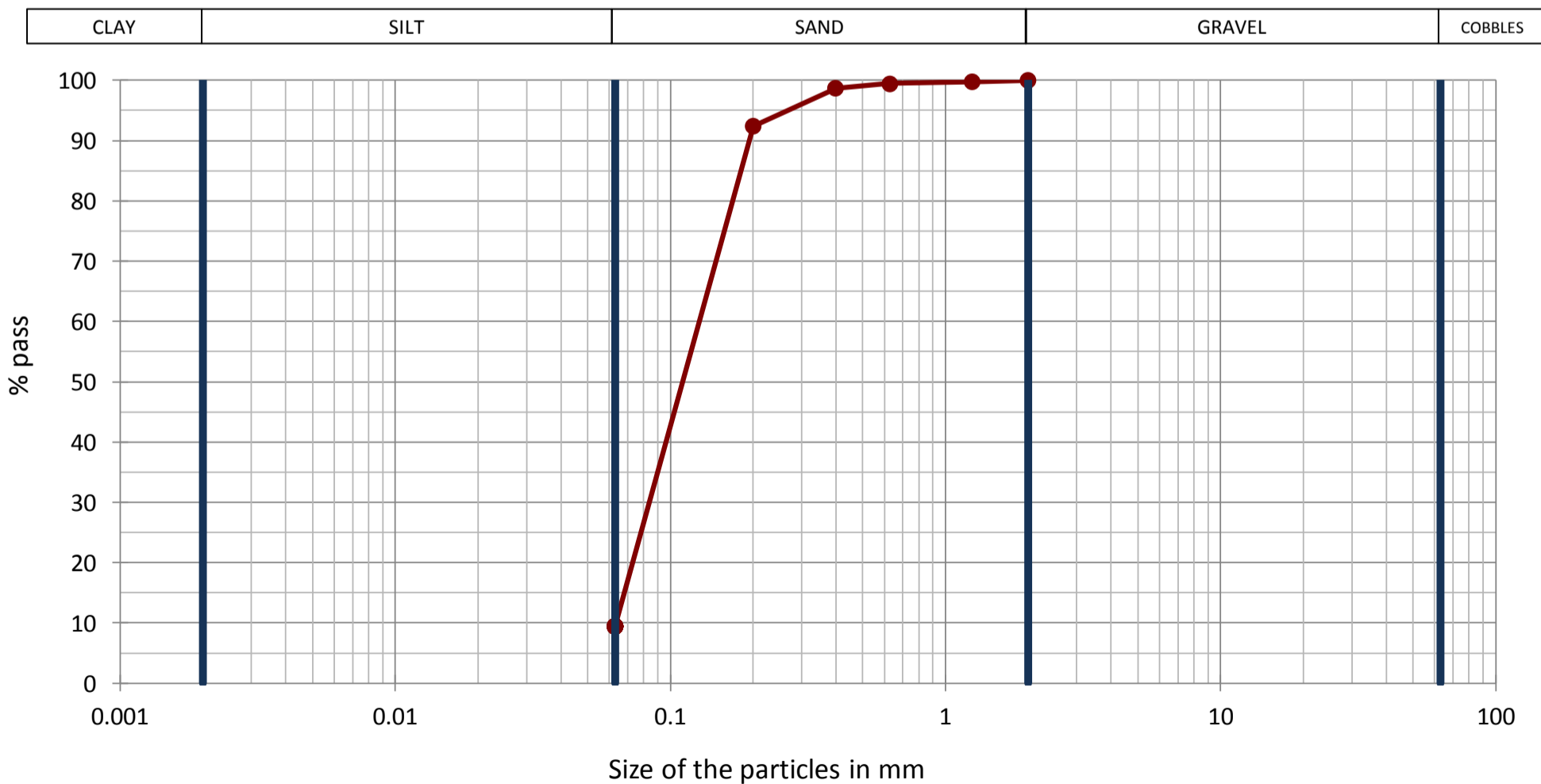
Previous calculations
 Total dried sample (g) **132.80**

 Hygrosc. moisture, % (fraction<2 mm) **0.5**
 Corr. parameter, f (fraction<2 mm) **0.9950**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2			0.00	0.0	132.14
1.25			0.26	0.2	131.88
0.63			0.37	0.5	131.51
0.4			1.09	1.3	130.42
0.2			8.30	7.6	122.12
0.063			109.54	90.5	12.58
					9.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	90.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.5		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	7.1		9.5
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	82.9		



REMARKS

Report num.: CB0019-19-0005
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Sample reference

MB19-0397

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 22-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.075 g

Equipment:

RESULT: **5.8 g/kg (total)**

MUFLA OVEN ETI HD150

0.6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 2.536 g

Equipment:

RESULT: **43.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993

Sample reference

MB19-0397

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6241
Soil mass, g	1424
Minimum density, Mg/m³	1.43

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6537
Soil mass, g	1720
Maximum density, Mg/m³	1.73

Relative density	
Dry density, Mg/m ³	1.54
Relative density, %	37

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0398

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_4 P_4.1
Top depth, m	5.11
Bottom depth, m	5.26
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	13-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine to medium SAND with rare fine to medium gravel and occasional shell fragments.	5.11	

5.26

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0398



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0398

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	109.68
Tare + soil + water (g)	217.59
Tare + soil (g)	208.95
Water (g)	8.64
Soil (g)	99.27
Moisture, w (%)	8.7

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 14/06/2019

Results	
Moisture content, w (%)	8.7

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	89.18
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.78
Dry density (Mg/m ³)	1.64

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	1.78
Dry density (Mg/m³)	1.64

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.8
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0302
Pyc. mass + soil + water at test temp. M2 (g)	188.3180
Soil mass, M1 (g)	16.5340
Particle density, G20°C (Mg/m ³)	2.646

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.646

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0398

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

Previous calculations

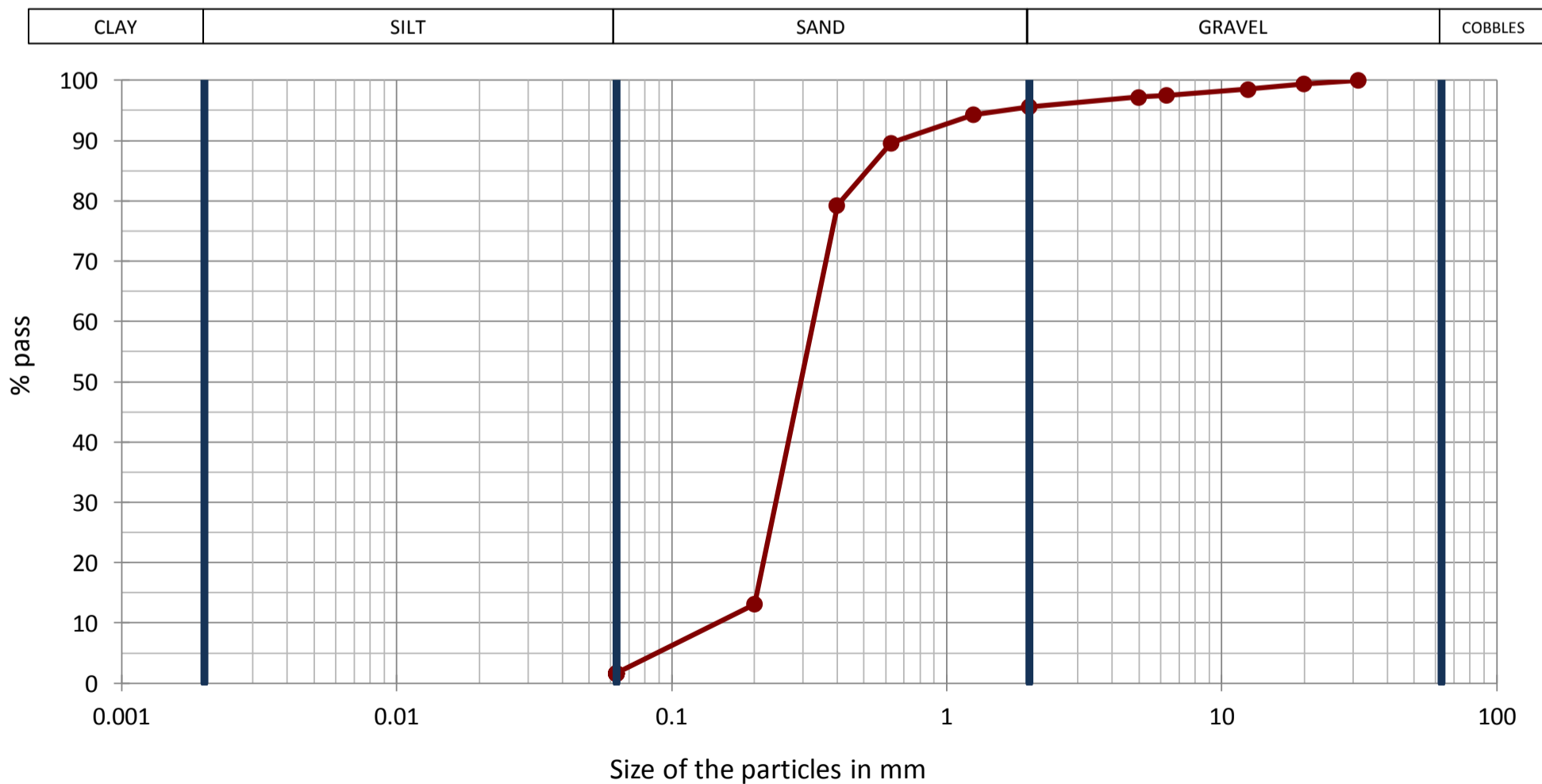
Total dried sample (g)	1201.95
M. > 2mm, washed and dried (g)	52.68
M. < 2 mm, dried tested (g)	152.65
M. < 2 mm, dried tested (g)	152.51
M. < 2 mm, dried total (g)	1148.24
Total dried sample (g)	1200.92
Hygros. moisture, % (fraction<2 mm)	0.1
Corr. parameter, f (fraction<2 mm)	0.9991
Corr. parameter, f2 (fraction<2 mm)	7.5288

Results

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
31.5			0.00	0.0	1200.92	100.0
20			6.88	0.6	1194.04	99.4
12.5			11.11	1.5	1182.93	98.5
6.3			12.44	2.5	1170.49	97.5
5			3.33	2.8	1167.16	97.2
2			18.92	4.4	1148.24	95.6
1.25	2.02			5.7	1133.03	94.3
0.63	7.60			10.4	1075.81	89.6
0.4	16.33			20.7	952.87	79.3
0.2	105.62			86.9	157.68	13.1
0.063	18.20			98.3	20.65	1.7

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	4.4	% SAND	2-0.063 mm	93.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.6	% Coarse sand	2-0.63 mm	6.0		
	% Medium gravel	20-6.3 mm	1.9	% Medium sand	0.63-0.2 mm	76.5		1.7
	% Fine gravel	6.3-2 mm	1.9	% Fine sand	0.2-0.063 mm	11.4		



REMARKS

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Sample reference

MB19-0398

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: ALEX VANCELLS

Test final date: 22-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 11.124 g

Equipment:

RESULT: **2.1 g/kg (total)**

MUFLA OVEN ETI HD150

0.9 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 2.548 g

Equipment:

RESULT: **9.8 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0399

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_3 P_3.6
Top depth, m	0.15
Bottom depth, m	0.27
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	12
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	14-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) fine SAND with occasional shell fragments and frequent amorphous organic matter blackish zones.	0.15	
	0.27	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0399



REMARKS

Operator: ALEX VANCELLS

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0399

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	111.17
Tare + soil + water (g)	257.61
Tare + soil (g)	232.97
Water (g)	24.64
Soil (g)	121.80
Moisture, w (%)	20.2

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Moisture content, w (%)	20.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	94.92
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.89
Dry density (Mg/m ³)	1.57

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	1.89
Dry density (Mg/m³)	1.57

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0400

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_3 P_3.5
Top depth, m	0.85
Bottom depth, m	1.17
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	12
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	14-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive gray (5Y 4/2) fine to medium SAND with abundant shell fragments and occasional amorphous organic matter blackish zones.	0.85	
	1.17	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0400



REMARKS

Operator: ALEX VANCELLS

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0400

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	98.12
Tare + soil + water (g)	200.95
Tare + soil (g)	187.00
Water (g)	13.95
Soil (g)	88.88
Moisture, w (%)	15.7

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Moisture content, w (%)	15.7

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	97.79
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.95
Dry density (Mg/m ³)	1.69

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	1.95
Dry density (Mg/m³)	1.69

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0401

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_3 P_3.4
Top depth, m	2.17
Bottom depth, m	2.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	14-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) gravelly fine to medium SAND, gravel is fine to medium with frequent shell fragments.	2.17	
	2.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0401



REMARKS

Operator: ALEX VANCELLS

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISITY - ISO 17892-2:2014

Sample reference

MB19-0401

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.56
Tare + soil + water (g)	238.18
Tare + soil (g)	222.58
Water (g)	15.60
Soil (g)	118.02
Moisture, w (%)	13.2

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Moisture content, w (%)	13.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	100.08
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.99
Dry density (Mg/m ³)	1.76

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	1.99
Dry density (Mg/m³)	1.76

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0402

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_3 P_3.3
Top depth, m	2.98
Bottom depth, m	3.14
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	16
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	14-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive gray (5Y 5/2) fine SAND.	2.98	
	3.14	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0402



REMARKS

Operator: ALEX VANCELLS

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0402

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	112.74
Tare + soil + water (g)	248.50
Tare + soil (g)	237.72
Water (g)	10.78
Soil (g)	124.98
Moisture, w (%)	8.6

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Moisture content, w (%)	8.6

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	93.14
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.85
Dry density (Mg/m ³)	1.70

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	1.85
Dry density (Mg/m³)	1.70

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0403

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_3 P_3.2
Top depth, m	3.78
Bottom depth, m	4.35
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	16
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	14-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive gray (5Y 5/2) fine SAND.	3.78	
	4.35	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at RUSSELL GEOTECHNICAL INNOVATION report and at CEPASA report.

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0403



REMARKS

Operator: ALEX VANCELLS

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0403

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.16
Tare + soil + water (g)	254.03
Tare + soil (g)	229.83
Water (g)	24.20
Soil (g)	125.67
Moisture, w (%)	19.3

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Moisture content, w (%)	19.3

Equipment	
BALANCE RADWAG PS4500.R1	

Bulk density test data	
Soil weight (g)	94.76
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.89
Dry density (Mg/m ³)	1.58

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	1.89
Dry density (Mg/m³)	1.58

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0404

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_3 P_3.1
Top depth, m	4.93
Bottom depth, m	5.05
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	12
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	14-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark olive gray (5Y 4/1) fine SAND with occasional milimetrical silty/clayey sand layers and rare amorphous organi matter blackish pockets.	4.93	
	5.05	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0404



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0404

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.59
Tare + soil + water (g)	235.68
Tare + soil (g)	214.37
Water (g)	21.31
Soil (g)	109.78
Moisture, w (%)	19.4

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Moisture content, w (%)	19.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	94.98
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.89
Dry density (Mg/m ³)	1.58

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	1.89
Dry density (Mg/m³)	1.58

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	19.8
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.4079
Pyc. mass + soil + water at test temp. M2 (g)	185.0500
Soil mass, M1 (g)	10.6820
Particle density, G20°C (Mg/m ³)	2.635

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.635

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0404

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

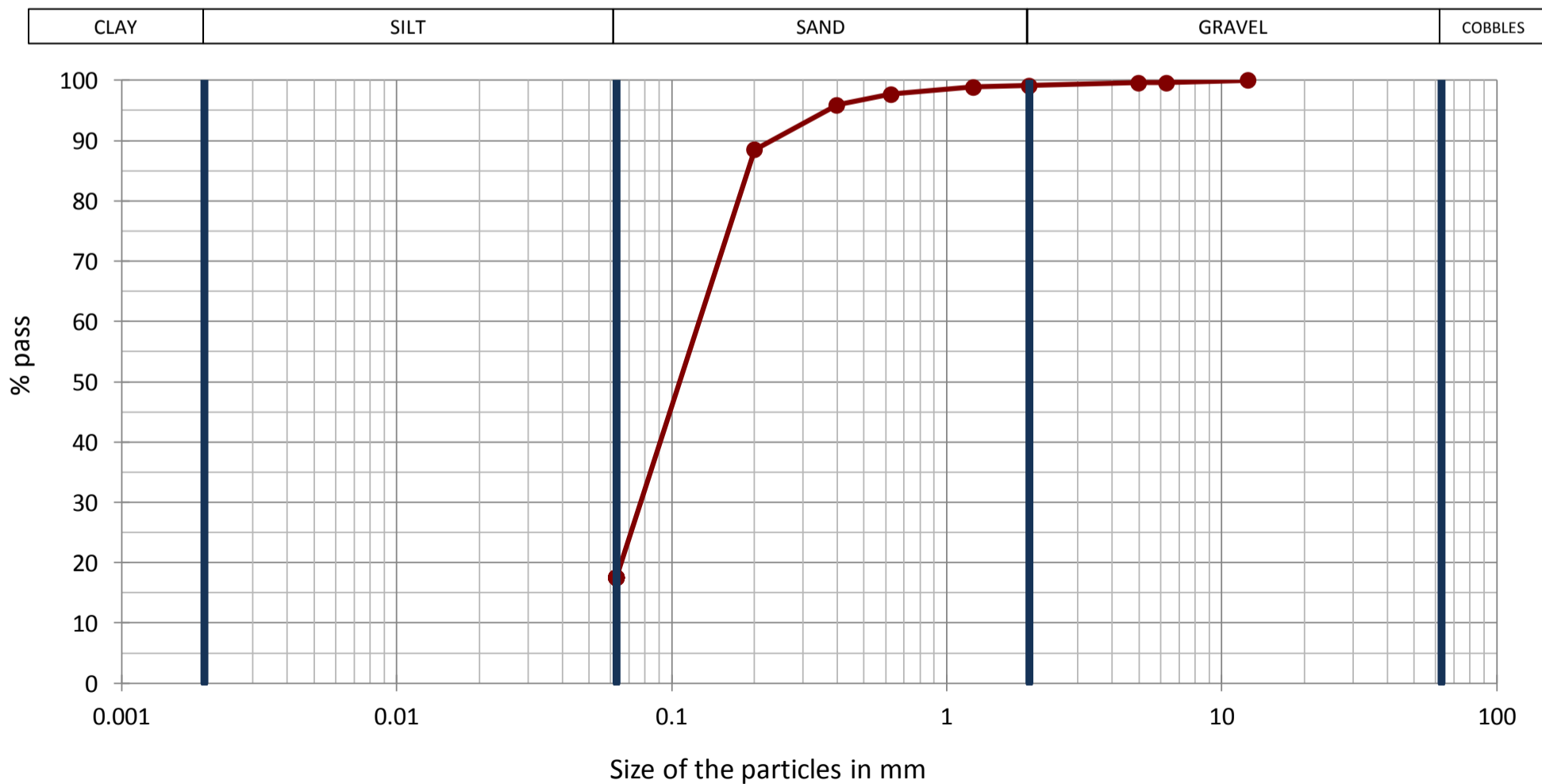
Previous calculations
 Total dried sample (g) **104.58**

 Hygrosc. moisture, % (fraction < 2 mm) **0.4**
 Corr. parameter, f (fraction < 2 mm) **0.9960**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
12.5		0.00	0.0	104.17	100.0
6.3		0.43	0.4	103.74	99.6
5		0.00	0.4	103.74	99.6
2		0.50	0.9	103.24	99.1
1.25		0.24	1.1	103.00	98.9
0.63		1.22	2.3	101.78	97.7
0.4		1.83	4.1	99.95	95.9
0.2		7.77	11.5	92.18	88.5
0.063		73.86	82.4	18.32	17.6

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.9	% SAND	2-0.063 mm	81.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.4		
	% Medium gravel	20-6.3 mm	0.4	% Medium sand	0.63-0.2 mm	9.2		17.6
	% Fine gravel	6.3-2 mm	0.5	% Fine sand	0.2-0.063 mm	70.9		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0404

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	99.1
Tested soil mass, mw (g)	75.23
Hygroscopic moisture, W (%)	0.4
Tested and dried soil mass, m (g)	74.93
Particle density (Mg/m ³)	2.635

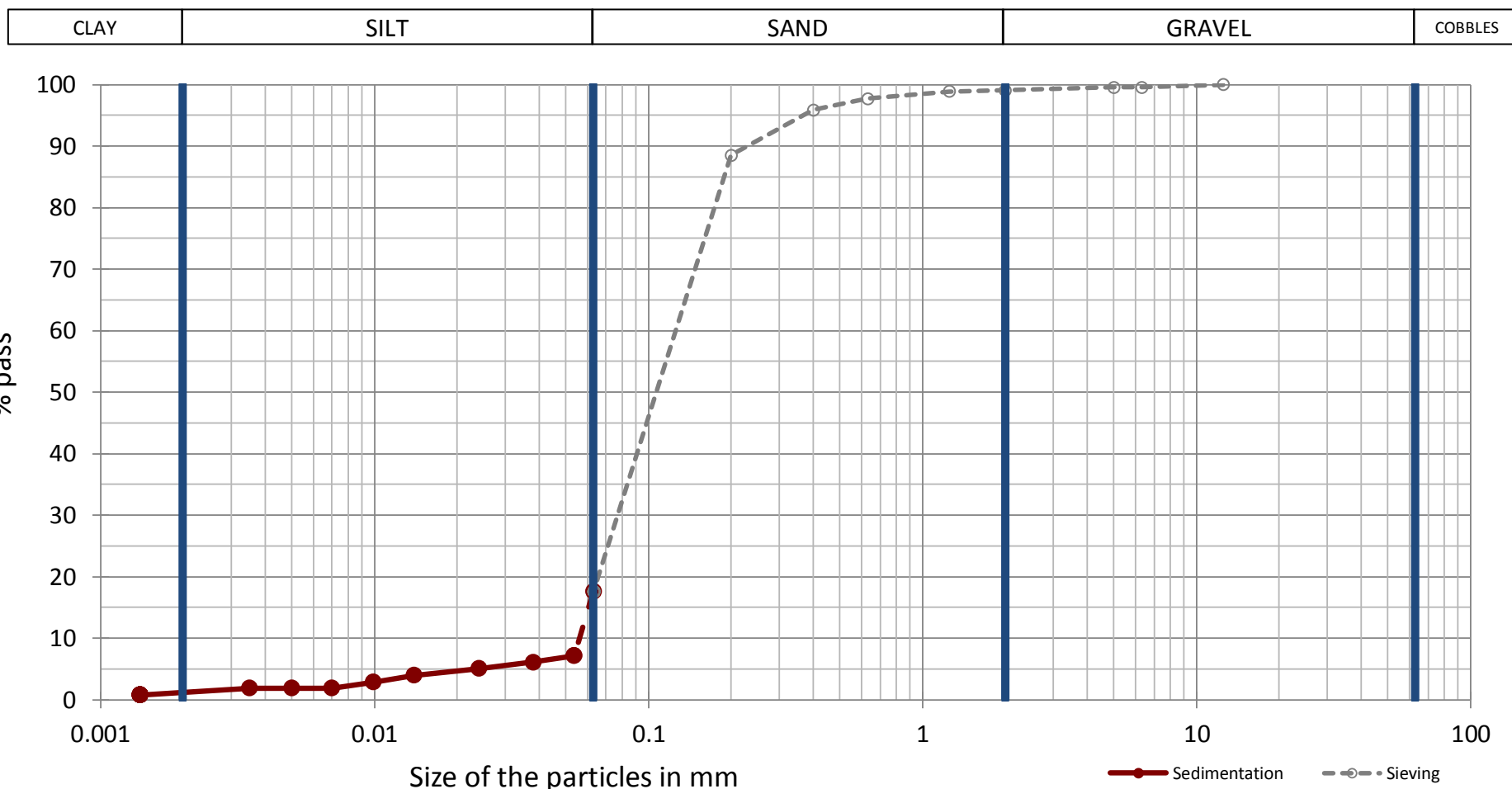
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2933.99

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	23	1.0075	7.5	164.6	3.4	0.0536	7.2
2	23	1.0070	7	165.8	2.9	0.0380	6.1
5	23	1.0065	6.5	166.9	2.4	0.0241	5.0
15	23	1.0060	6	168.1	1.9	0.0140	4.0
30	23	1.0055	5.5	169.3	1.4	0.0099	2.9
60	23	1.0050	5	170.5	0.9	0.0070	1.8
120	23	1.0050	5	170.5	0.9	0.0050	1.8
240	23	1.0050	5	170.5	0.9	0.0035	1.8
1440	23	1.0045	4.5	171.7	0.4	0.0014	0.8

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	17.6
Silt, between 0.063 and 0.002 mm (%)	16.7
Clay, smaller than 0.002 mm (%)	0.9



REMARKS

Operator: ALEX VANCELLS

Test final date: 16/10/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0404

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 02-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.138 g

Equipment:

RESULT: **6.2 g/kg (total)**

MUFLA OVEN ETI HD150

6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0405

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_2 P_2.6
Top depth, m	0.25
Bottom depth, m	0.35
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	14-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark gray (2.5Y 3/1) medium to fine SAND with rare fine gravle rare millimetrical clay layers and occasional shell fragmetns.	0.25	
	0.35	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0405



REMARKS

Operator: ALEX VANCELLS

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0405

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	111.85
Tare + soil + water (g)	222.38
Tare + soil (g)	202.72
Water (g)	19.66
Soil (g)	90.87
Moisture, w (%)	21.6

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Moisture content, w (%)	21.6

Equipment	

Bulk density test data	
Soil weight (g)	99.82
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.99
Dry density (Mg/m ³)	1.64

Operator:
Test final date:

Results	
Bulk density (Mg/m³)	1.99
Dry density (Mg/m³)	1.64

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0406

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_2 P_2.5
Top depth, m	1.1
Bottom depth, m	1.42
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	32
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	14-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) fine SAND with occasional amorphous organic matter blackish zones and rare shell fragments.	1.1	
	1.42	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

MB19-0406

PHOTOGRAPHIC RECORD



REMARKS

Operator: ALEX VANCELLS

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0406

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	111.68
Tare + soil + water (g)	212.06
Tare + soil (g)	194.47
Water (g)	17.59
Soil (g)	82.79
Moisture, w (%)	21.2

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Moisture content, w (%)	21.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	98.82
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.97
Dry density (Mg/m ³)	1.63

Operator: MARC COLOMER
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	1.97
Dry density (Mg/m³)	1.63

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0407

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_2 P_2.4
Top depth, m	2.2
Bottom depth, m	2.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	14-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) fine SAND with occasional amorphous organic matter blackish zones and rare shell fragments.	2.2	
	2.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0407



REMARKS

Operator: ALEX VANCELLS

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0407

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	105.03
Tare + soil + water (g)	213.59
Tare + soil (g)	193.64
Water (g)	19.95
Soil (g)	88.61
Moisture, w (%)	22.5

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Moisture content, w (%)	22.5

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	100.77
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.01
Dry density (Mg/m ³)	1.64

Operator: ALEX VANCELLS
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	2.01
Dry density (Mg/m³)	1.64

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0408

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_2 P_2.3
Top depth, m	3.4
Bottom depth, m	3.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	14-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) fine SAND with occasional amorphous organic matter blackish zones and rare shell fragments.	3.4	
	3.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0408



REMARKS

Operator: ALEX VANCELLS

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0408

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	106.65
Tare + soil + water (g)	226.45
Tare + soil (g)	207.17
Water (g)	19.28
Soil (g)	100.52
Moisture, w (%)	19.2

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Moisture content, w (%)	19.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	101.11
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.01
Dry density (Mg/m ³)	1.69

Operator: ALEX VANCELLS
Test final date: 14/06/2019

Results	
Bulk density (Mg/m³)	2.01
Dry density (Mg/m³)	1.69

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0409

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_2 P_2.2
Top depth, m	4.2
Bottom depth, m	4.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	30
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	17-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) fine SAND with occasional amorphous organic matter blackish zones and rare shell fragments.	4.2	
	4.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

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Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0409



REMARKS

Operator: ALEX VANCELLS

Date: 14/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0409

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	108.68
Tare + soil + water (g)	215.59
Tare + soil (g)	197.30
Water (g)	18.29
Soil (g)	88.62
Moisture, w (%)	20.6

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 18/06/2019

Results	
Moisture content, w (%)	20.6

Equipment	

Bulk density test data	
Soil weight (g)	101.80
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.03
Dry density (Mg/m ³)	1.68

Operator: ALEX VANCELLS
Test final date: 17/06/2019

Results	
Bulk density (Mg/m³)	2.03
Dry density (Mg/m³)	1.68

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0410

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_2 P_2.1
Top depth, m	5.32
Bottom depth, m	5.45
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	17-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	saSi
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) sandy SILT with rare amorphous organic matter blackish zones and rare shell fragments. Sand is fine.	5.32	
	5.45	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0410



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 17/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0410

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	112.85
Tare + soil + water (g)	210.25
Tare + soil (g)	192.75
Water (g)	17.50
Soil (g)	79.90
Moisture, w (%)	21.9

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 18/06/2019

Results	
Moisture content, w (%)	21.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	104.46
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.08
Dry density (Mg/m ³)	1.71

Operator: ALEX VANCELLS
Test final date: 17/06/2019

Results	
Bulk density (Mg/m³)	2.08
Dry density (Mg/m³)	1.71

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	184.5260
Soil mass, M1 (g)	11.7900
Particle density, G20°C (Mg/m ³)	2.719

Operator: ALEX VANCELLS
Test final date: 20/09/2019

Results	
Particle density (Mg/m³)	2.719

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0410

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

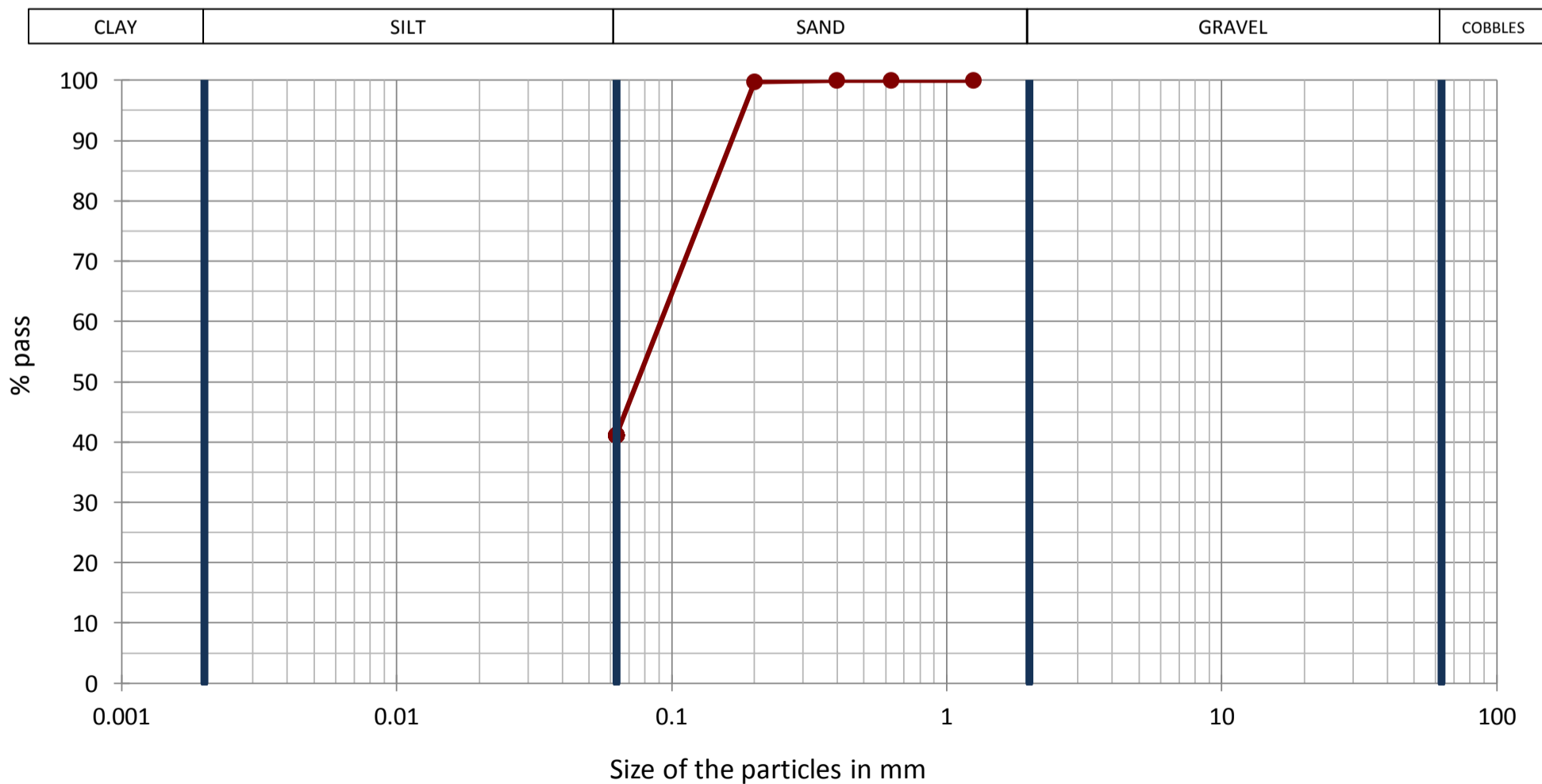
Previous calculations
 Total dried sample (g) **105.53**

 Hygros. moisture, % (fraction<2 mm) **0.4**
 Corr. parameter, f (fraction<2 mm) **0.9955**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
1.25			0.00	0.0	105.06	100.0
0.63			0.01	0.0	105.05	100.0
0.4			0.02	0.0	105.03	100.0
0.2			0.21	0.2	104.82	99.8
0.063			61.54	58.8	43.28	41.2

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	58.8	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0	41.2	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.2		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	58.6		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0410

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	75.04
Hygroscopic moisture, W (%)	0.4
Tested and dried soil mass, m (g)	74.70
Particle density (Mg/m ³)	2.719

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

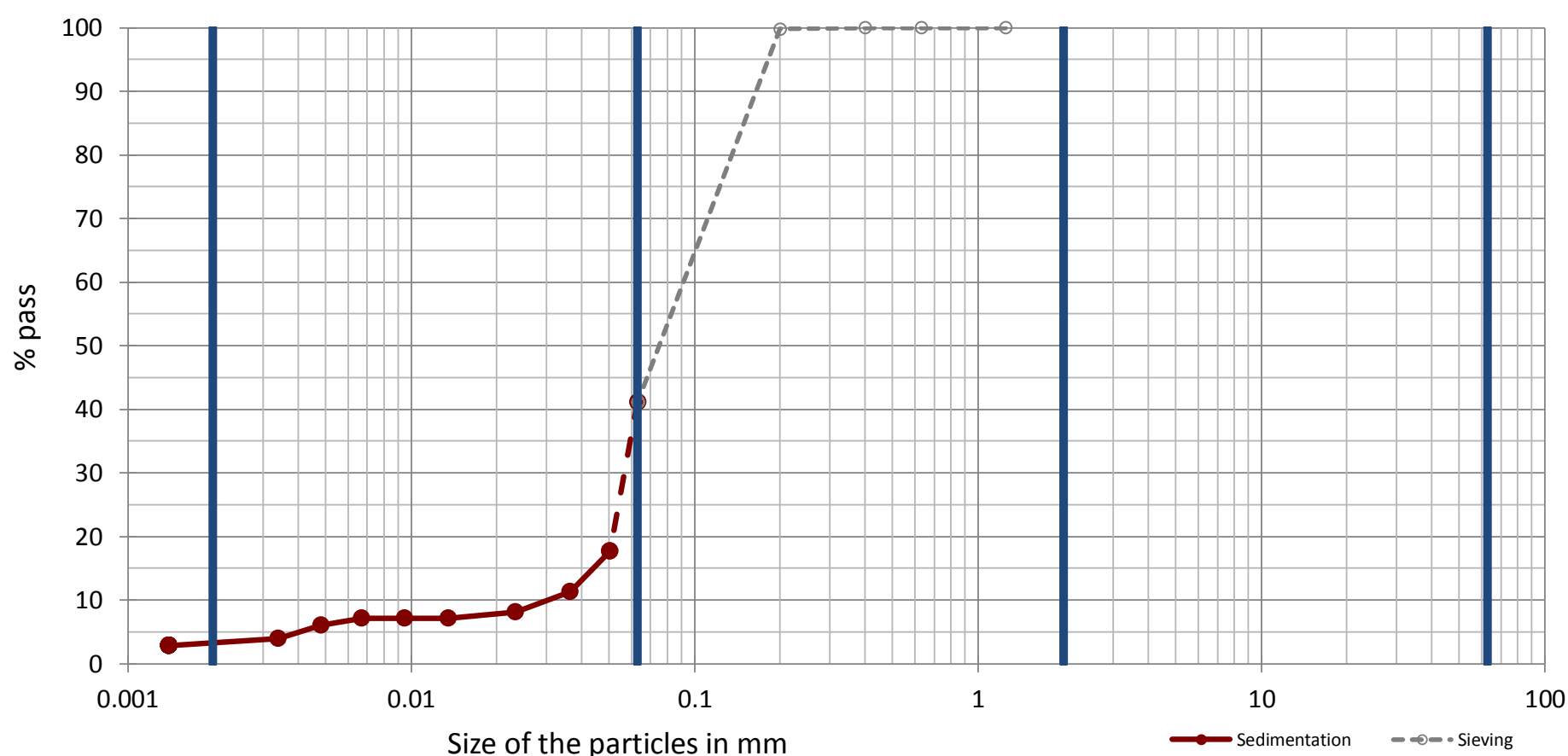
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	23	1.0125	12.5	152.7	8.4	0.0504	17.7
2	23	1.0095	9.5	159.8	5.4	0.0364	11.4
5	23	1.0080	8	163.4	3.9	0.0233	8.2
15	23	1.0075	7.5	164.6	3.4	0.0135	7.1
30	23	1.0075	7.5	164.6	3.4	0.0095	7.1
60	23	1.0075	7.5	164.6	3.4	0.0067	7.1
120	23	1.0070	7	165.8	2.9	0.0048	6.1
240	23	1.0060	6	168.1	1.9	0.0034	3.9
1440	23	1.0055	5.5	169.3	1.4	0.0014	2.9

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	41.2
Silt, between 0.063 and 0.002 mm (%)	38.0
Clay, smaller than 0.002 mm (%)	3.2

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 02/10/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0410

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 20-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.009 g

Equipment:

RESULT: **11.7 g/kg (total)**

MUFLA OVEN ETI HD150

0.7 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 20-09-19

Mean of analyzed soil mass: 0.957 g

Equipment:

RESULT: **91.6 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0411

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_1 P_1.3
Top depth, m	0.32
Bottom depth, m	0.42
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	17-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) fine SAND with occasional medium sand with rare clay pockets and occasional fibrous to amorphous organic matter with frequent shell fragments (some of them gravel sized)	0.32	
	0.42	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
 DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
 DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
 DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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www.igeotest.com
Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0411



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 17/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0411

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	106.42
Tare + soil + water (g)	209.96
Tare + soil (g)	191.40
Water (g)	18.56
Soil (g)	84.98
Moisture, w (%)	21.8

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 18/06/2019

Results	
Moisture content, w (%)	21.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	97.18
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.94
Dry density (Mg/m ³)	1.59

Operator: ALEX VANCELLS
Test final date: 17/06/2019

Results	
Bulk density (Mg/m³)	1.94
Dry density (Mg/m³)	1.59

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	187.5650
Soil mass, M1 (g)	14.6460
Particle density, G20°C (Mg/m ³)	2.672

Operator: ALEX VANCELLS
Test final date: 20/09/2019

Results	
Particle density (Mg/m³)	2.672

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0411

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

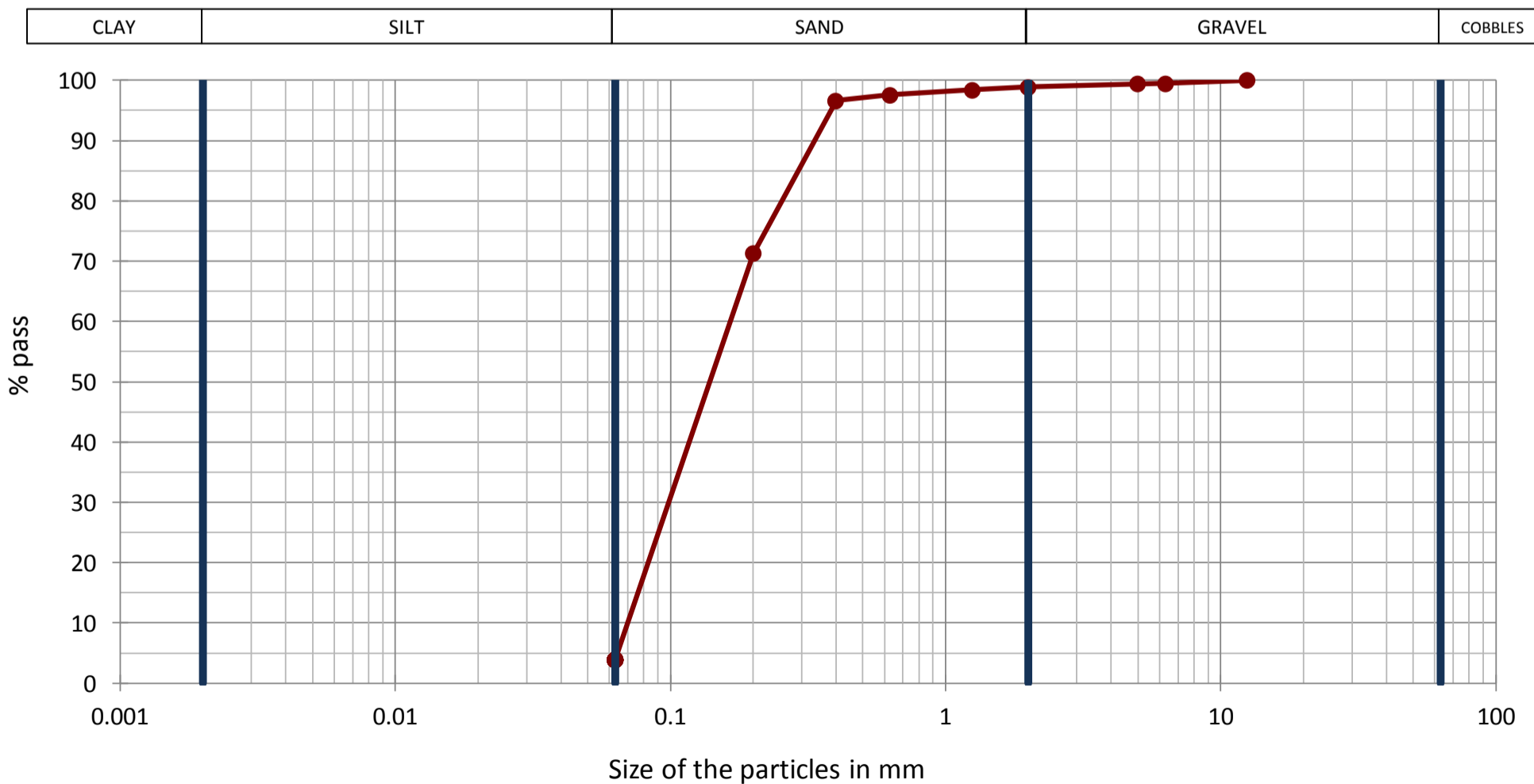
Previous calculations
 Total dried sample (g) **105.52**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9979**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
12.5		0.00	0.0	105.30	100.0
6.3		0.52	0.5	104.78	99.5
5		0.13	0.6	104.65	99.4
2		0.54	1.1	104.11	98.9
1.25		0.46	1.6	103.65	98.4
0.63		0.85	2.4	102.80	97.6
0.4		1.04	3.4	101.76	96.6
0.2		26.71	28.7	75.05	71.3
0.063		70.95	96.1	4.10	3.9

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	1.1	% SAND	2-0.063 mm	95.0	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.3		
	% Medium gravel	20-6.3 mm	0.5	% Medium sand	0.63-0.2 mm	26.3		3.9
	% Fine gravel	6.3-2 mm	0.6	% Fine sand	0.2-0.063 mm	67.4		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SHELL FRAGMENTS AND ORGANIC MATTER.

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Sample reference

MB19-0411

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: ALEX VANCELLS

Test final date: 20-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.006 g

Equipment:

RESULT: **6.4 g/kg (total)**

MUFLA OVEN ETI HD150

4 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 20-09-19

Mean of analyzed soil mass: 2.05 g

Equipment:

RESULT: **20 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0411

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6252
Soil mass, g	1435
Minimum density, Mg/m³	1.44

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6506
Soil mass, g	1689
Maximum density, Mg/m³	1.69

Relative density	
Dry density, Mg/m ³	1.59
Relative density, %	60

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0412

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_1 P_1.2
Top depth, m	0.9
Bottom depth, m	1.6
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	70
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	17-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured and thickly laminated black (5Y 2.5/1) clayey SILT and black (5Y 2.5/2) clayey SILT with occasional millimetrical grayish pockets highly reactive to HCl, with rare shell fragments.	0.9	
	1.6	From 1.15m to 1.60m RESERVED FOR ADVANCED TESTING.

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
FALL CONE TEST - ISO 17892-6:2017

REMARKS

See results at RUSSELL GEOTECHNICAL INNOVATION report and at CEPASA report.

Report num.: CB0019-19-0005
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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0412



REMARKS

Operator: ALEX VANCELLS

Date: 17/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0412

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	107.68
Tare + soil + water (g)	184.82
Tare + soil (g)	164.05
Water (g)	20.77
Soil (g)	56.37
Moisture, w (%)	36.8

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 18/06/2019

Results	
Moisture content, w (%)	36.8

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	92.73
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.85
Dry density (Mg/m ³)	1.35

Operator: ALEX VANCELLS
Test final date: 17/06/2019

Results	
Bulk density (Mg/m³)	1.85
Dry density (Mg/m³)	1.35

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0412

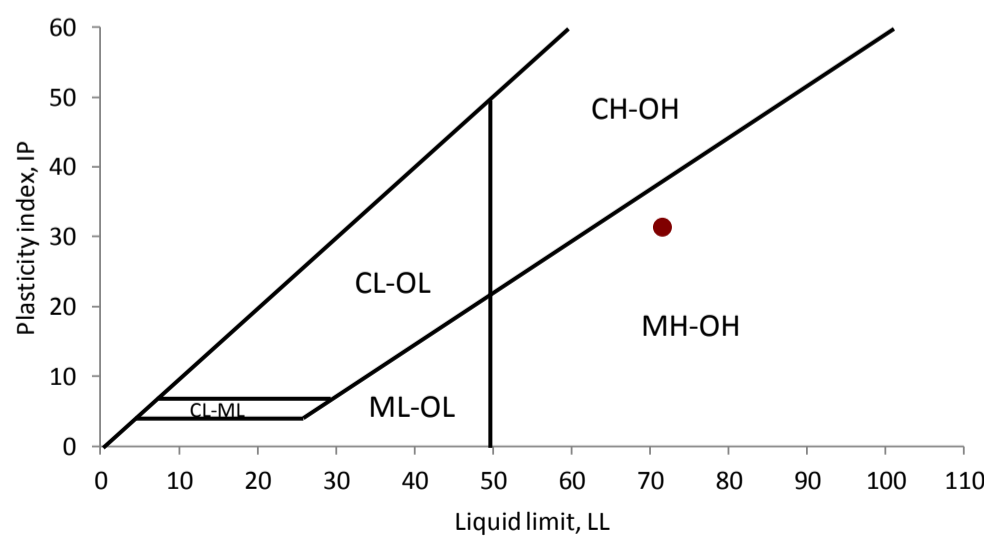
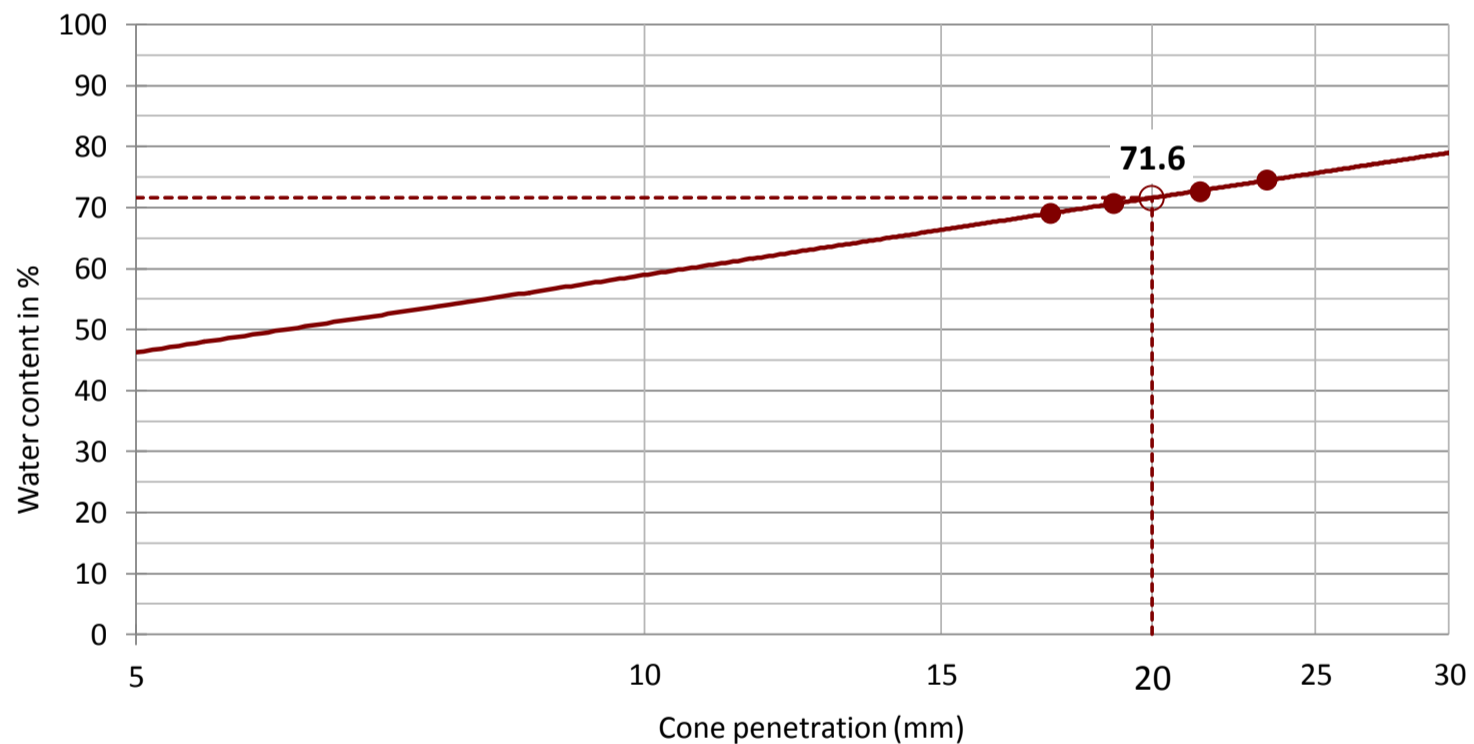
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	17.425	21.35	23.41	18.985
Water (g)	7.98	5.13	4.30	7.77
Mass moist soil + cont. (g)	130.89	117.92	121.34	132.09
Mass dry soil + cont. (g)	122.91	112.79	117.04	124.32
Mass container (g)	111.36	105.73	111.27	113.32
Soil (g)	11.55	7.06	5.77	11.00
Water content (%)	69.1	72.7	74.5	70.6

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data				
Water (g)	2.24	1.90		
Mass moist soil + cont. (g)	31.62	29.90		
Mass dry soil + cont. (g)	29.38	28.00		
Mass container (g)	23.80	23.29		
Soil (g)	5.58	4.71		
Water content (%)	40.1	40.3		

Results	
Liquid limit, LL	71.6
Plastic limit, LP	40.2
Plasticity index, IP	31.4
Natural water content (%)	36.8
Liquidity index, IL	-0.1
Consistency index, IC	1.1



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

FALL CONE TEST - ISO 17892-6:2017

Sample reference

MB19-0412

Equipment
PENETROMETER MATEST B057-11

Legend of symbols	
cu	Calculated Undrained Shear Strength (kPa)
cu(corr)	Corrected Undrained Shear Strength (kPa)
cur	Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	71.6	3.59	3.42	3.09	3.47	3.393	400	30	341	271	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	341
Corrected Undrained Shear Strength, cu(corr) (kPa)	271

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	4.21	4.01	4.19	4.11	4.13	400	30	184	
1	1	3.96	4.05	3.52	3.79	3.83	400	30	214	
1	3	3.93	3.82	3.49	4.03	3.818	400	30	215	
1	7	3.73	3.66	3.74	3.79	3.73	400	30	226	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	184

Thixotropy	
Loss at remoulding (%)	46
Recovery after 1 day (%)	19
Recovery after 7 days (%)	27

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0413

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_1 P_1.1
Top depth, m	2.2
Bottom depth, m	2.6
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	40
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	17-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured and thickly laminated black (5Y 2.5/1) clayey SILT and black (5Y 2.5/2) clayey SILT with occasional millimetrical grayish pockets highly reactive to HCl, with rare shell fragments.	2.2	
	2.6	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
FALL CONE TEST - ISO 17892-6:2017

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
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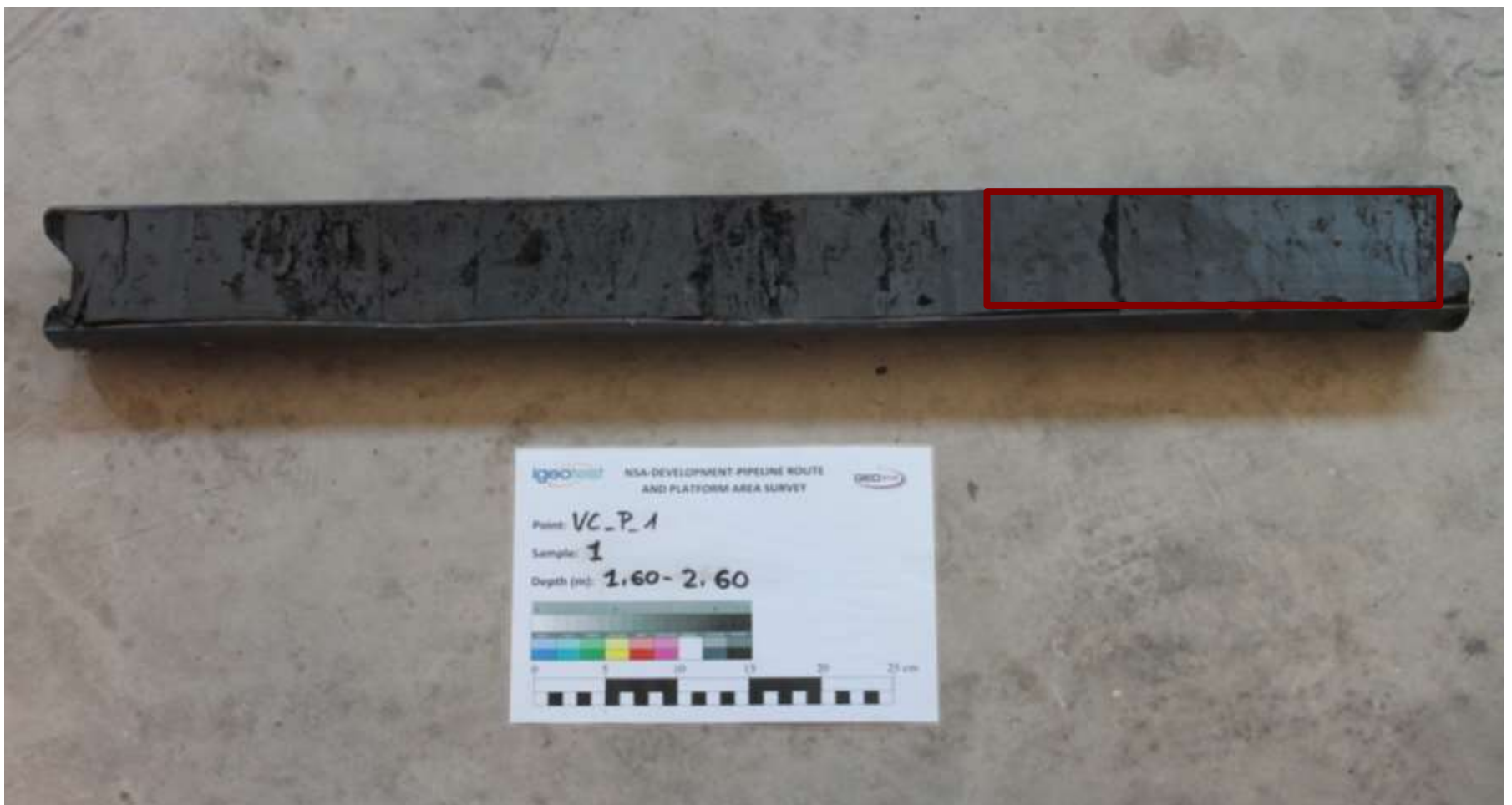


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Sample reference

PHOTOGRAPHIC RECORD

MB19-0413



REMARKS

Operator: ALEX VANCELLS

Date: 17/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0413

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	105.28
Tare + soil + water (g)	172.48
Tare + soil (g)	154.57
Water (g)	17.91
Soil (g)	49.29
Moisture, w (%)	36.3

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 18/06/2019

Results	
Moisture content, w (%)	36.3

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	91.99
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.83
Dry density (Mg/m ³)	1.34

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Bulk density (Mg/m³)	1.83
Dry density (Mg/m³)	1.34

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0413

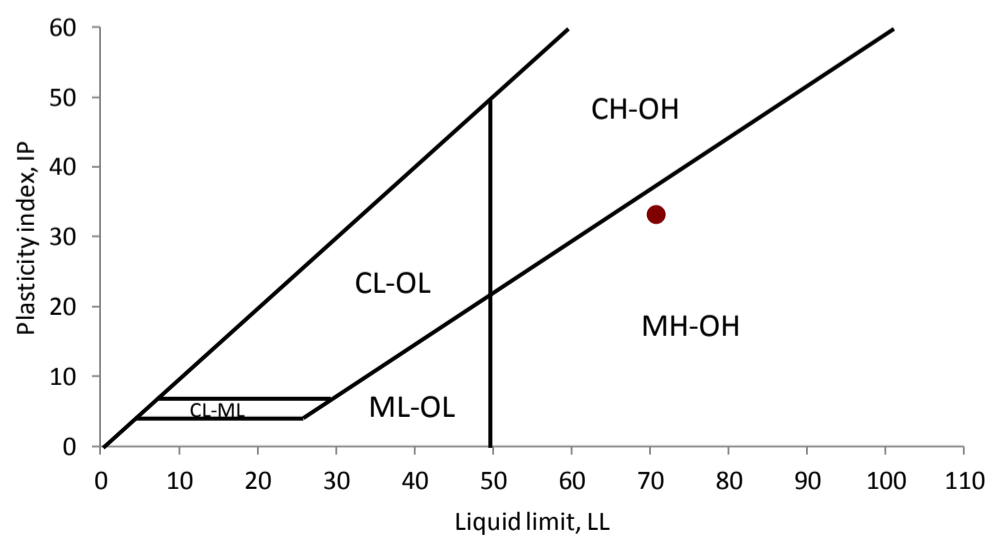
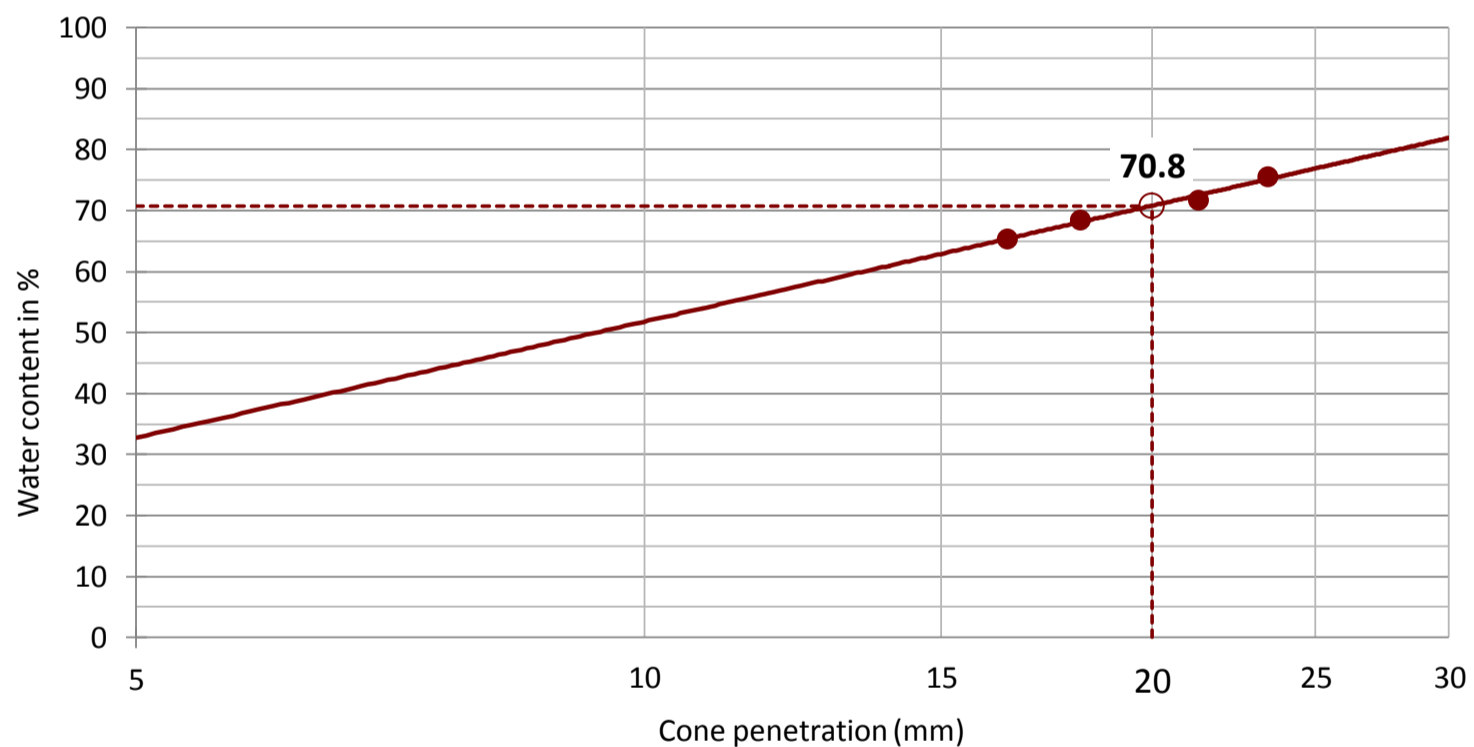
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	21.32	18.135	16.42	23.415
Water (g)	3.94	4.01	3.28	3.93
Mass moist soil + cont. (g)	38.41	33.76	37.61	38.60
Mass dry soil + cont. (g)	34.47	29.75	34.33	34.67
Mass container (g)	28.98	23.89	29.31	29.47
Soil (g)	5.49	5.86	5.02	5.20
Water content (%)	71.8	68.4	65.3	75.6

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data				
Water (g)	1.68	1.77		
Mass moist soil + cont. (g)	29.50	30.27		
Mass dry soil + cont. (g)	27.82	28.50		
Mass container (g)	23.34	23.80		
Soil (g)	4.48	4.70		
Water content (%)	37.5	37.7		

Results	
Liquid limit, LL	70.8
Plastic limit, LP	37.6
Plasticity index, IP	33.2
Natural water content (%)	36.3
Liquidity index, IL	0.0
Consistency index, IC	1.0



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

FALL CONE TEST - ISO 17892-6:2017

Sample reference

MB19-0413

Equipment
PENETROMETER MATEST B057-11

Legend of symbols
cu Calculated Undrained Shear Strength (kPa)
cu(corr) Corrected Undrained Shear Strength (kPa)
cur Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	70.8	3.57	3.41	2.9	3.45	3.333	400	30	353	282	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	353
Corrected Undrained Shear Strength, cu(corr) (kPa)	282

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	4.18	3.97	4.03	4.26	4.11	400	30	186	
1	1	3.89	4.03	3.53	3.89	3.835	400	30	213	
1	3	3.91	3.86	3.49	3.89	3.788	400	30	219	
1	7	3.7	3.68	3.59	3.76	3.683	400	30	231	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	186

Thixotropy	
Loss at remoulding (%)	47
Recovery after 1 day (%)	16
Recovery after 7 days (%)	27

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0414

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_1Bis P_1Bis.3
Top depth, m	0.15
Bottom depth, m	0.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	17-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) fine SAND with occasional medium sand with rare clay pockets and rare amorphous organic matter and occasional shell fragments.	0.15	
	0.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0414



REMARKS

Operator: ALEX VANCELLS

Date: 17/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0414

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	112.97
Tare + soil + water (g)	234.94
Tare + soil (g)	214.61
Water (g)	20.33
Soil (g)	101.64
Moisture, w (%)	20.0

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 18/06/2019

Results	
Moisture content, w (%)	20.0

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	99.18
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.97
Dry density (Mg/m ³)	1.64

Operator: MARC COLOMER
Test final date: 17/06/2019

Results	
Bulk density (Mg/m³)	1.97
Dry density (Mg/m³)	1.64

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0415

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_1Bis P_1Bis.2
Top depth, m	0.75
Bottom depth, m	1.75
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	100
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured and thickly laminated black (5Y 2.5/1) clayey SILT and black (5Y 2.5/2) clayey SILT with occasional millimetrical grayish pockets highly reactive to HCl, with rare shell fragments.	0.75	
	1.75	From 1.40m to 1.75m: RESERVED FOR ADVANCED TESTING

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
FALL CONE TEST - ISO 17892-6:2017

REMARKS

See results at RUSSELL GEOTECHNICAL INNOVATIONS report and at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0415



REMARKS

Operator: ALEX VANCELLS

Date: 17/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0415

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.19
Tare + soil + water (g)	174.13
Tare + soil (g)	153.65
Water (g)	20.48
Soil (g)	49.46
Moisture, w (%)	41.4

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Moisture content, w (%)	41.4

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	91.00
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.81
Dry density (Mg/m ³)	1.28

Operator: MARC COLOMER
Test final date: 18/06/2019

Results	
Bulk density (Mg/m³)	1.81
Dry density (Mg/m³)	1.28

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0415

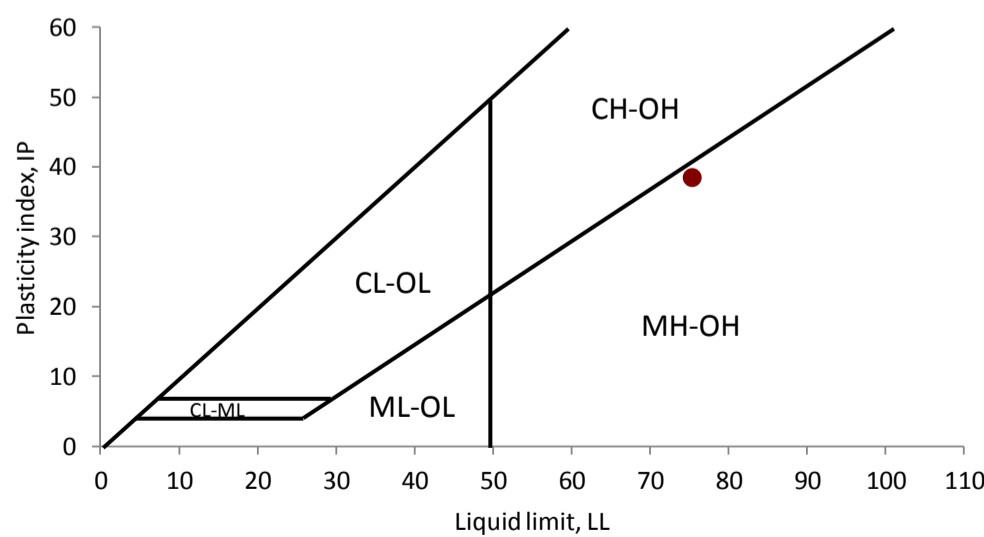
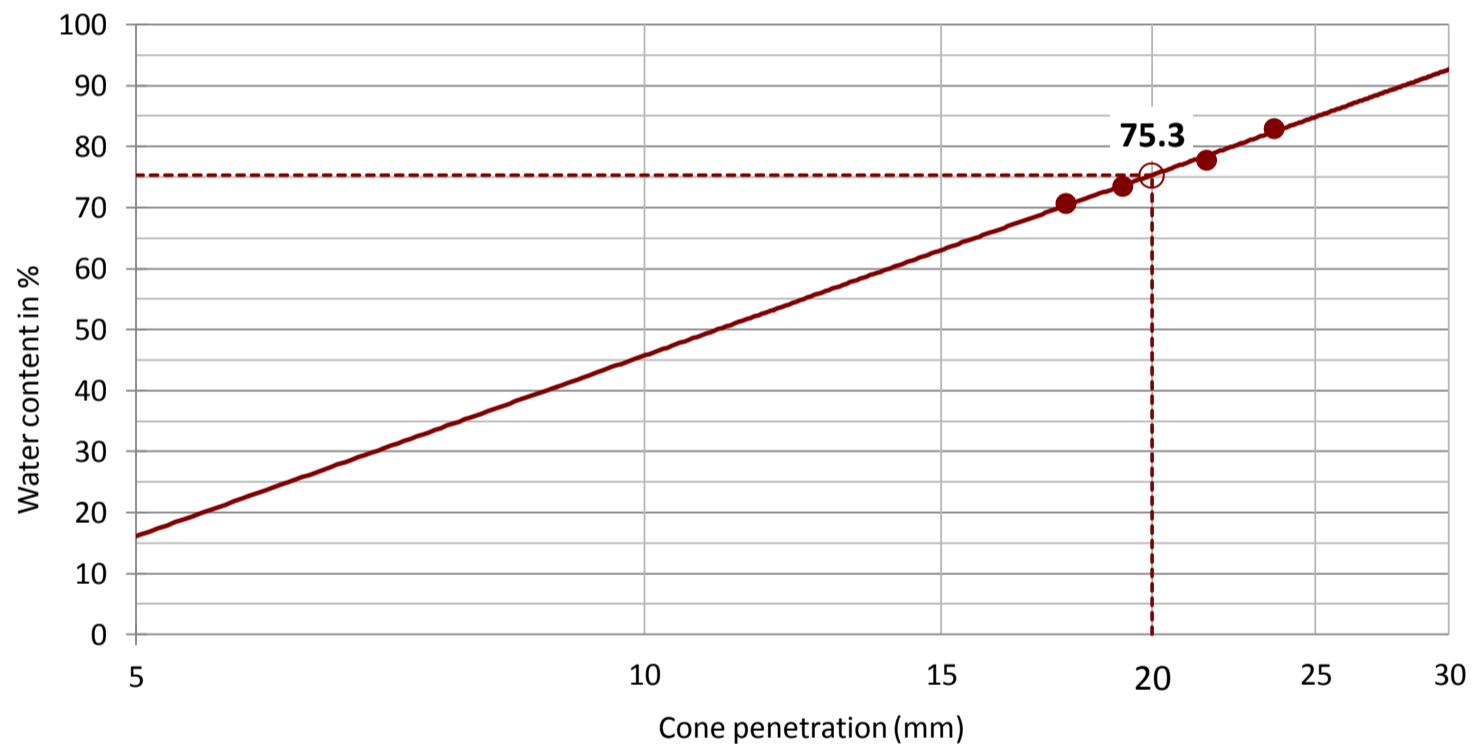
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	17.785	19.215	21.55	23.63
Water (g)	5.10	6.04	7.61	8.05
Mass moist soil + cont. (g)	41.23	43.89	49.38	48.03
Mass dry soil + cont. (g)	36.13	37.85	41.77	39.98
Mass container (g)	28.91	29.63	31.98	30.28
Soil (g)	7.22	8.22	9.79	9.70
Water content (%)	70.6	73.5	77.7	83.0

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data				
Water (g)	1.36	1.62		
Mass moist soil + cont. (g)	28.94	30.39		
Mass dry soil + cont. (g)	27.58	28.77		
Mass container (g)	23.86	24.40		
Soil (g)	3.72	4.37		
Water content (%)	36.6	37.1		

Results	
Liquid limit, LL	75.3
Plastic limit, LP	36.8
Plasticity index, IP	38.5
Natural water content (%)	41.4
Liquidity index, IL	0.1
Consistency index, IC	0.9



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

FALL CONE TEST - ISO 17892-6:2017

Sample reference

MB19-0415

Equipment
PENETROMETER MATEST B057-11

Legend of symbols
cu Calculated Undrained Shear Strength (kPa)
cu(corr) Corrected Undrained Shear Strength (kPa)
cur Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	75.3	4.28	5.21	5.14	5.01	4.91	400	30	163	127	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	163
Corrected Undrained Shear Strength, cu(corr) (kPa)	127

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	5.46	5.2	5.26	5.5	5.355	400	30	109	
1	1	5.36	5.1	4.66	4.45	4.893	400	30	131	
1	3	4.44	4.69	5.07	4.69	4.723	400	30	141	
1	7	4.59	4.51	4.45	4.62	4.543	400	30	152	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	109

Thixotropy	
Loss at remoulding (%)	33
Recovery after 1 day (%)	41
Recovery after 7 days (%)	80

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm WITH THE EXCEPTION OF THE REMOULDED SAMPLE AT 0 DAYS, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0416

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_1Bis P_1Bis.1
Top depth, m	2.24
Bottom depth, m	2.7
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	46
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

USCS classification	MH
ISO classification	siCl

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) CLAY with occasional grayish sand pockets highly reactive to HCl and rare shell fragments.	2.24	
	2.7	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
 DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
 FALL CONE TEST - ISO 17892-6:2017
 UNCONSOLIDATED UNDRAINED TRIAXIAL TEST, UU 1.5' - ISO 17892-8:2018
 INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
 DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
 DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0416



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 18/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0416

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0225	

Data of soil moisture content test	
Tare (g)	107.65
Tare + soil + water (g)	173.17
Tare + soil (g)	155.06
Water (g)	18.11
Soil (g)	47.41
Moisture, w (%)	38.2

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Moisture content, w (%)	38.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	92.07
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.83
Dry density (Mg/m ³)	1.32

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.83
Dry density (Mg/m³)	1.32

Equipment	
100 ml PYCNOMETER ALAMO V5573	
BALANCE GIBERTINI CRYSTAL 500 CAL	
DIGITAL THERMOMETER TESTO 5601110	
CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115	

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.8
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3721
Pyc. mass + soil + water at test temp. M2 (g)	187.8540
Soil mass, M1 (g)	15.0570
Particle density, G20°C (Mg/m ³)	2.700

Operator: ALEX VANCELLS
Test final date: 01/10/2019

Results	
Particle density (Mg/m³)	2.700

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0416

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

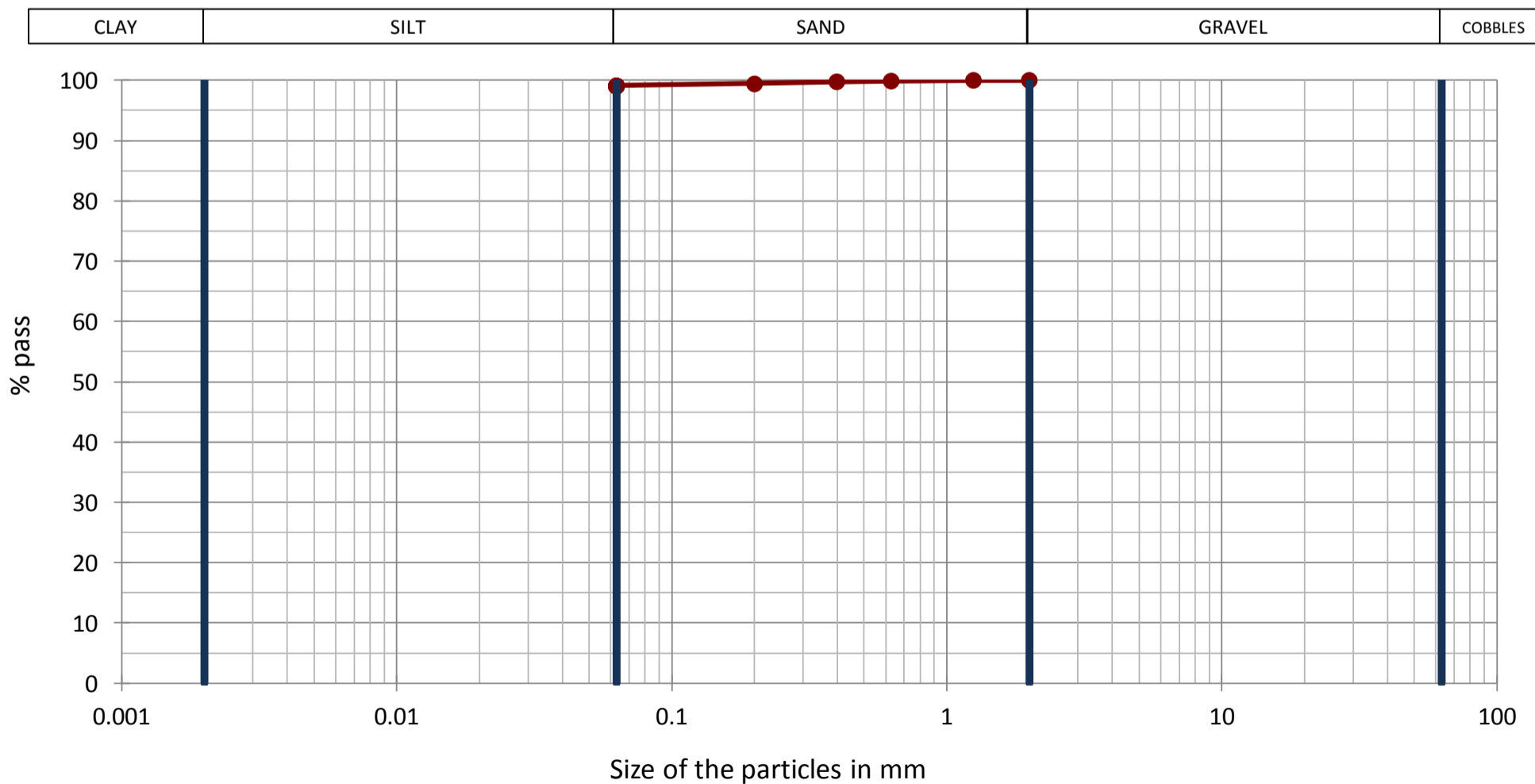
Previous calculations
 Total dried sample (g) **105.69**

 Hygrosc. moisture, % (fraction < 2 mm) **3.5**
 Corr. parameter, f (fraction < 2 mm) **0.9658**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
2		0.00	0.0	102.07	100.0
1.25		0.03	0.0	102.04	100.0
0.63		0.06	0.1	101.98	99.9
0.4		0.15	0.2	101.83	99.8
0.2		0.27	0.5	101.56	99.5
0.063		0.37	0.9	101.19	99.1

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	0.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1	99.1	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.4		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	0.4		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0416

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	33.13
Hygroscopic moisture, W (%)	3.5
Tested and dried soil mass, m (g)	32.00
Particle density (Mg/m ³)	2.700

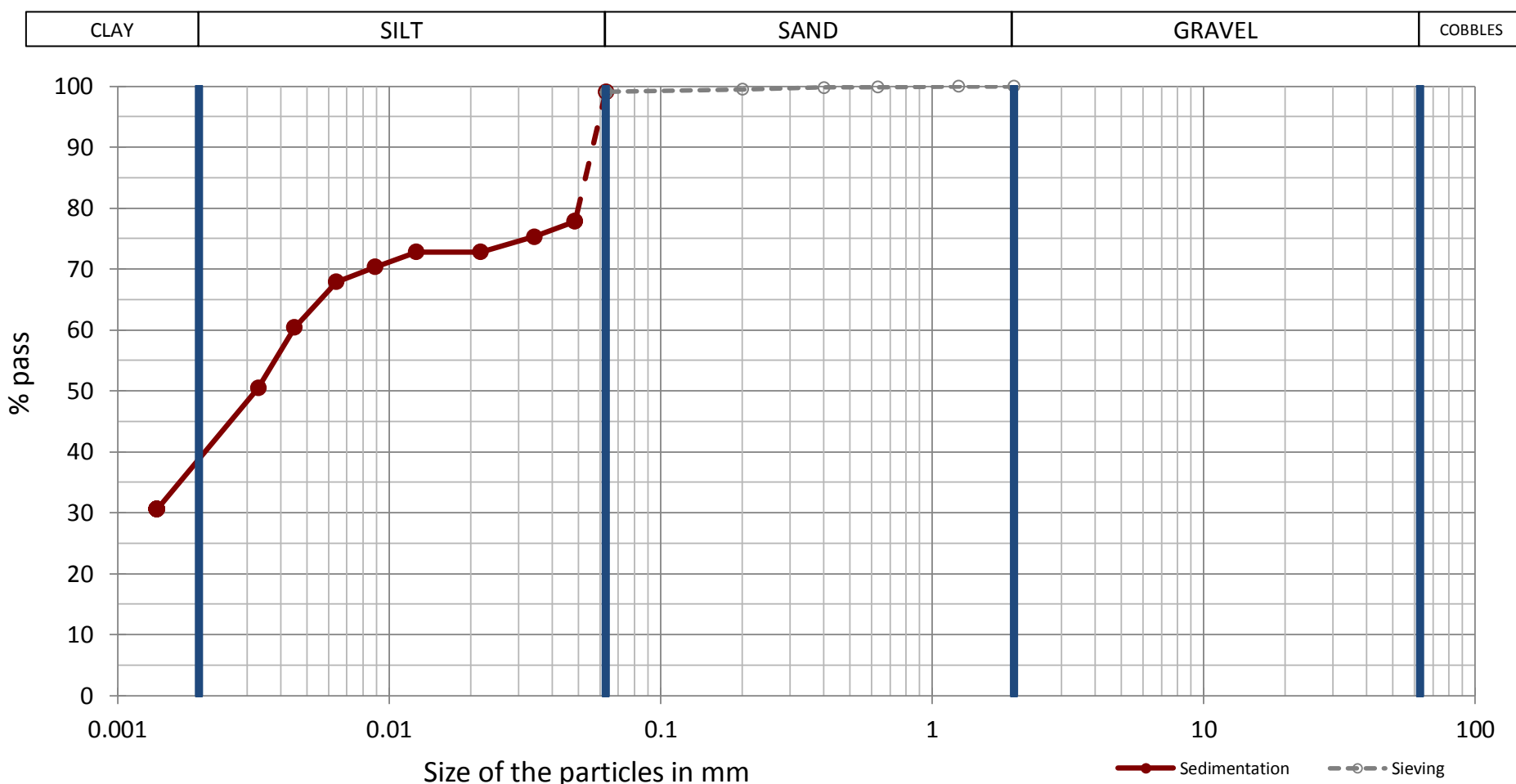
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	22	1.0195	19.5	136.0	15.7	0.0484	77.8
2	22	1.0190	19	137.2	15.2	0.0344	75.3
5	22	1.0185	18.5	138.4	14.7	0.0218	72.8
15	22	1.0185	18.5	138.4	14.7	0.0126	72.8
30	22	1.0180	18	139.6	14.2	0.0089	70.3
60	22	1.0175	17.5	140.8	13.7	0.0064	67.9
120	22	1.0160	16	144.4	12.2	0.0045	60.4
240	22	1.0140	14	149.1	10.2	0.0033	50.5
1440	22	1.0100	10	158.6	6.2	0.0014	30.6

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	99.1
Silt, between 0.063 and 0.002 mm (%)	62.2
Clay, smaller than 0.002 mm (%)	36.9



REMARKS

Operator: ALEX VANCELLS

Test final date: 23/10/2019

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0416

DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data

Type of cone used	80 g/30°			
Cone penetration (mm)	16.3	21.37	18.7	23.24
Water (g)	5.37	6.56	5.56	6.19
Mass moist soil + cont. (g)	43.24	47.28	44.08	45.87
Mass dry soil + cont. (g)	37.87	40.72	38.52	39.68
Mass container (g)	29.67	31.34	30.31	31.24
Soil (g)	8.20	9.38	8.21	8.44
Water content (%)	65.5	69.9	67.7	73.3

Equipment

PENETROMETER MATEST B057-11
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

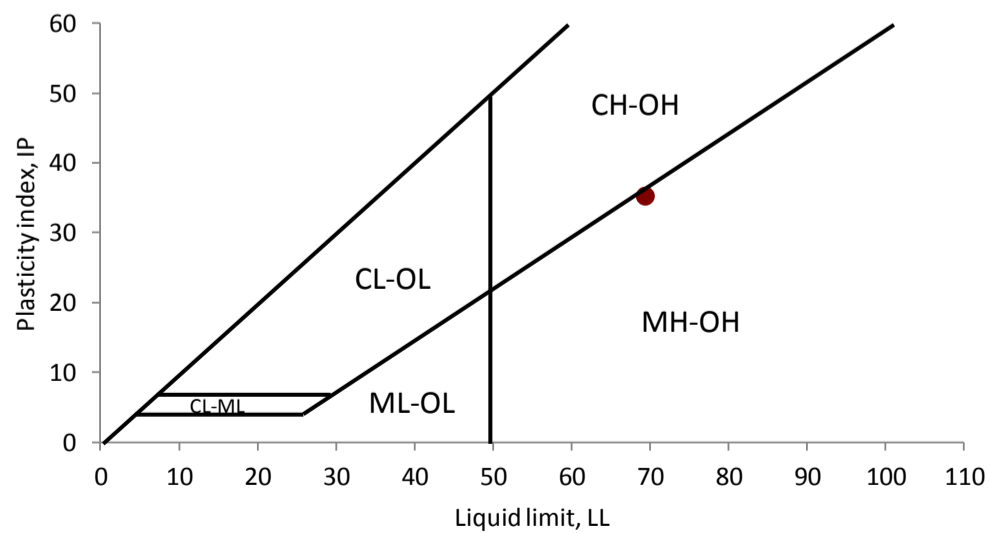
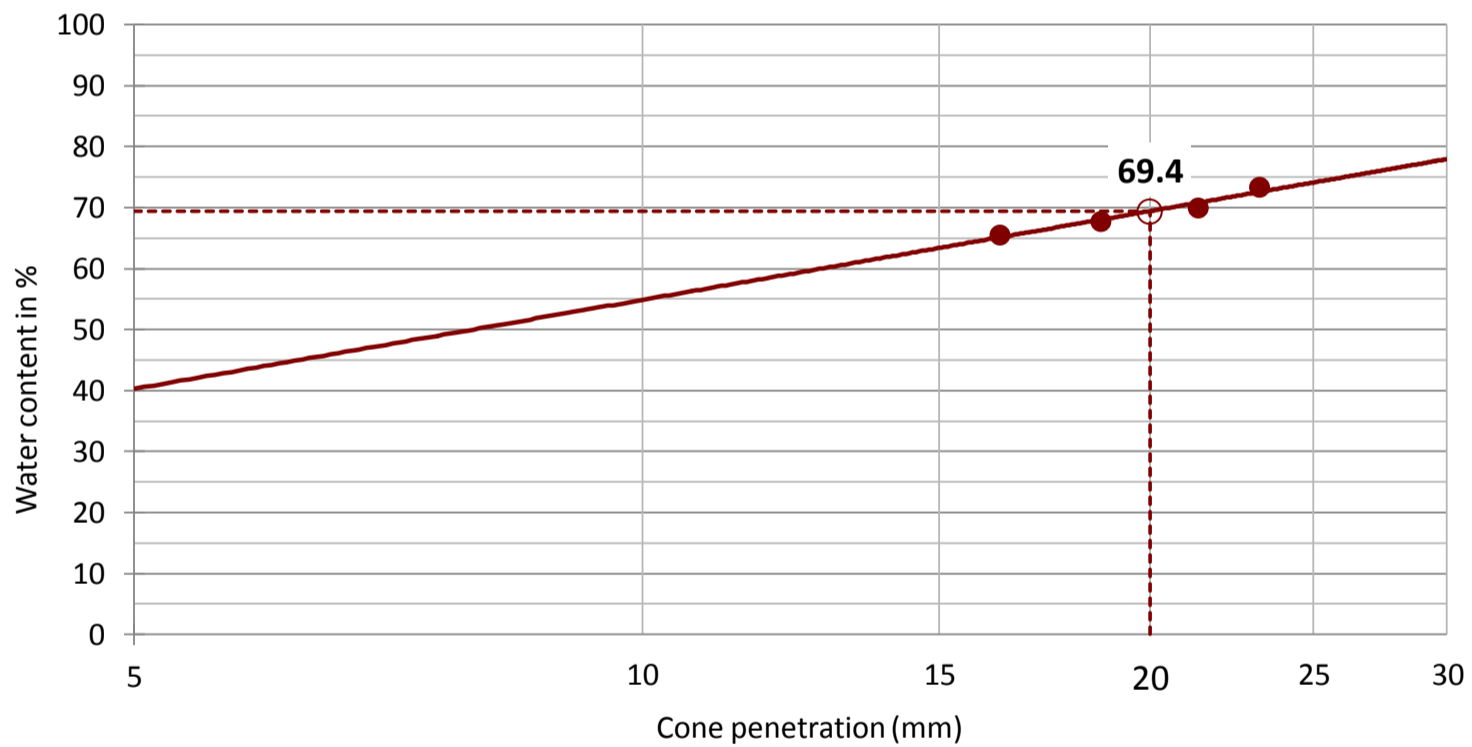
Plastic Limit data

Water (g)	1.66	1.42		
Mass moist soil + cont. (g)	30.45	29.94		
Mass dry soil + cont. (g)	28.79	28.52		
Mass container (g)	23.87	24.40		
Soil (g)	4.92	4.12		
Water content (%)	33.7	34.5		

Results

Liquid limit, LL 69.4
Plastic limit, LP 34.1
Plasticity index, IP 35.3

Natural water content (%) 38.2
 Liquidity index, IL 0.1
 Consistency index, IC 0.9



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0416

Equipment	
MECACISA 1.5' TRIAXIAL CHAMBER PRESSURE SYSTEM MECACISA 220004 TRIAXIAL LOAD FRAME MECACISA 210715 ELEC. DEF. TRANSD. SCHREIBER SM260 PC WITH SOFTWARE MECASOFT	

Test type	Unconsolidated Undrained (UU)
Soil conditions	UNDISTURBED







Soil sample data	
Specimen number	I
Initial length (cm)	7.720
Initial diameter (cm)	3.810
Initial area (cm ²)	11.401
Initial volume (cm ³)	88.016
Initial moisture content (%)	38.5
Final moisture content (%)	38.3
Initial bulk density (Mg/m ³)	1.78
Initial dry density (Mg/m ³)	1.29
Initial saturation degree (%)	95.1
Particle density (Mg/m ³)	2.700

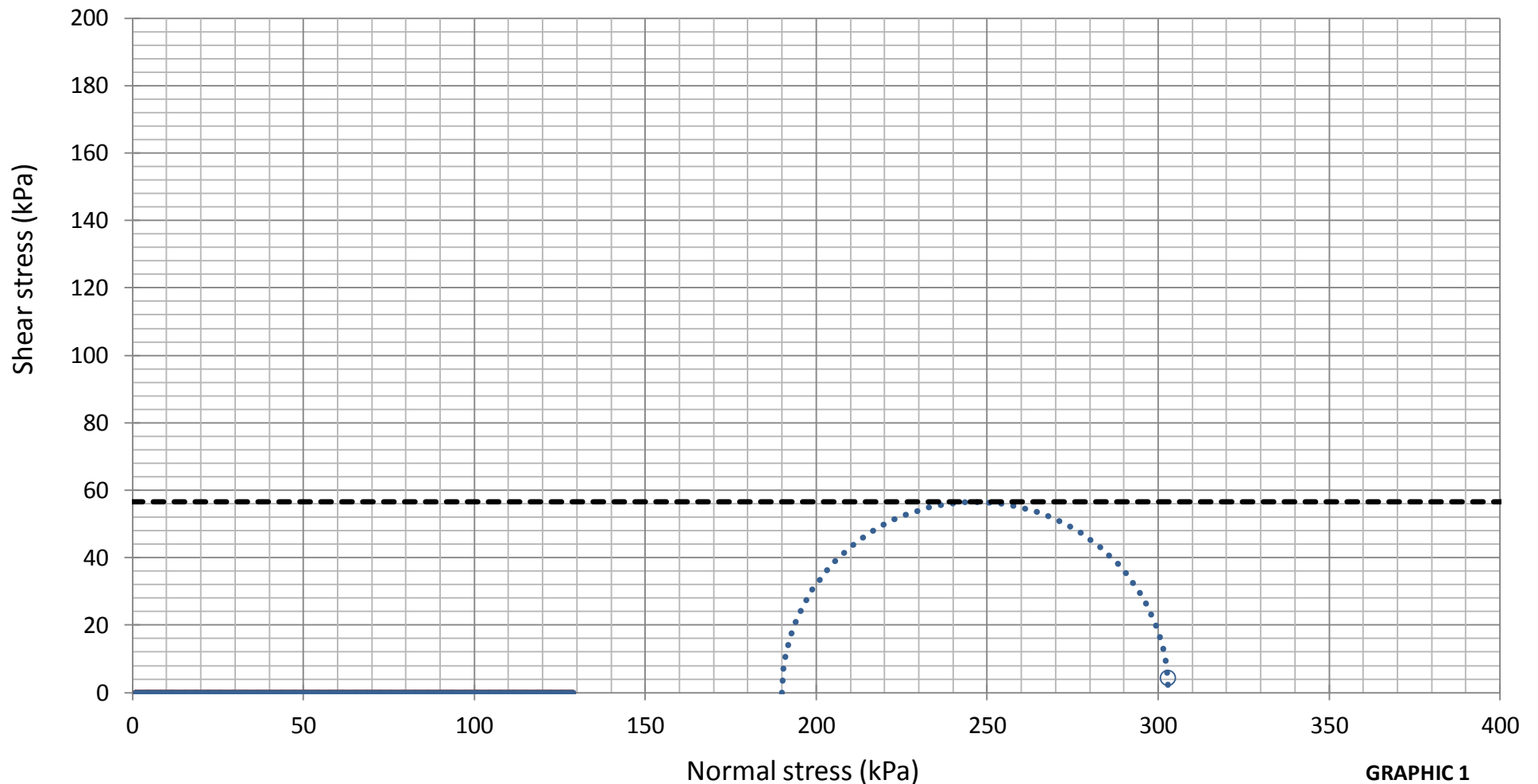
Prior saturation process	
Saturation prior to test	NO

Failure test results	
Specimen number	I
σ ₁ (kPa)	303.0
σ ₃ (kPa)	190.0
(σ ₁ -σ ₃)/2 (kPa)	56.5
(σ ₁ +σ ₃)/2 (kPa)	246.5

Test data and results	
Chamber pressure (kPa)	190
Back pressure, u _b (kPa)	0
Rate of axial displ. (mm/min)	0.8893
Major principal stress (kPa)	115.4
Failure stress (kPa)	113.0
Failure strain (%)	13.0

Estimate total	
Φ _u (°)	0.0
C _u (kPa)	57
C _u (kp/cm ²)	0.58

Graphic symbols						
	I total	II total	III total			



REMARKS

Operator: ALEX VANCELLS

Test final date: 10/10/2019

Report num.: CB0019-19-0005
Edition date:

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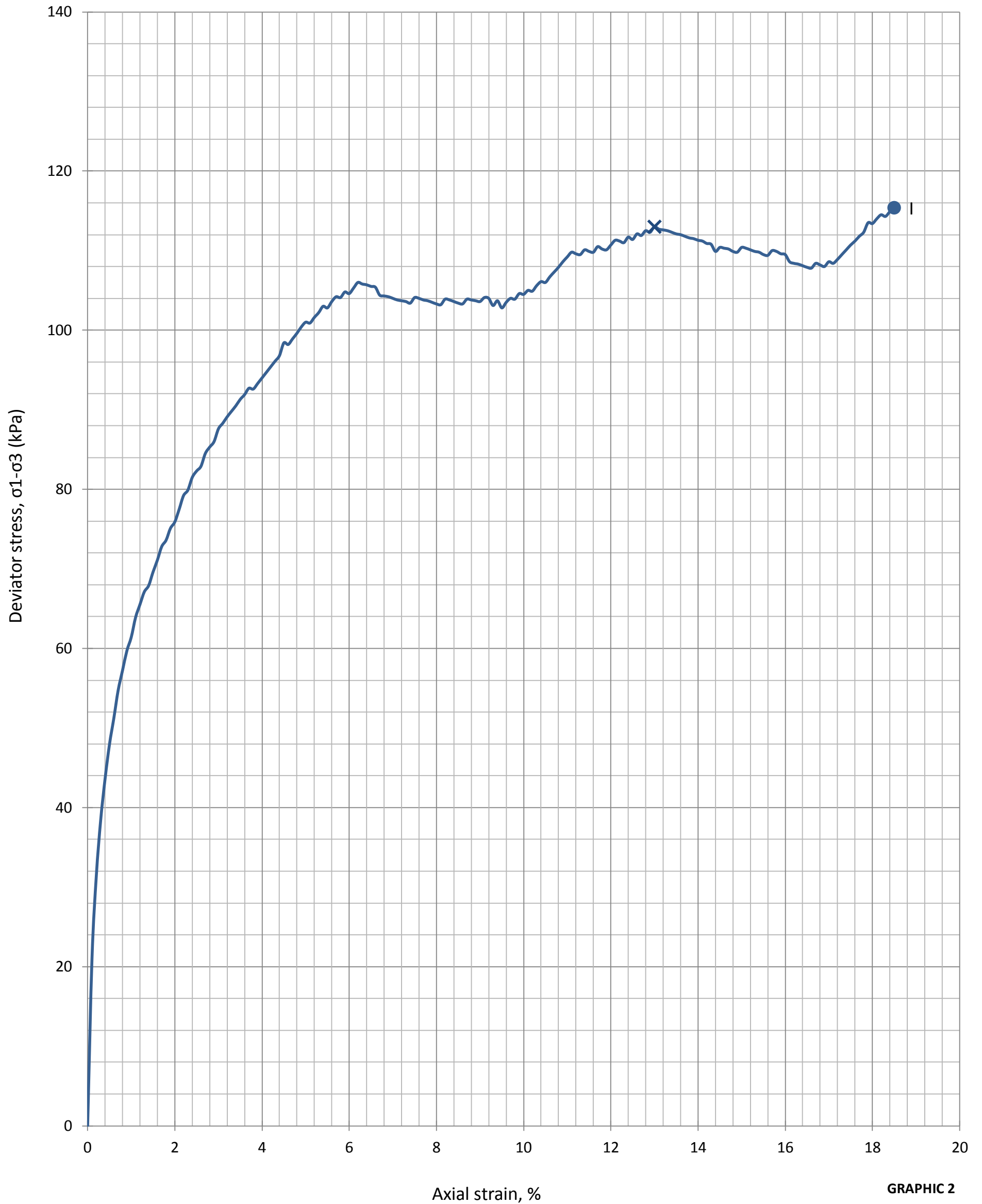


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Sample reference

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0416



GRAPHIC 2



Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018	Sample reference MB19-0416
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Failure process data summary

	Time sg	Deform. %	$(\sigma_1 - \sigma_3)_m$ kPa	$(\Delta\sigma_1)_m$ kPa	$(\Delta\sigma_1)_{fp}$ kPa	$(\sigma_1 - \sigma_3)$ kPa	u-ub kPa	ϵ_1	σ_1 kPa	σ'_1 kPa	σ'_3 kPa	Coeff. A	$(\sigma_1 + \sigma_3)/2$ kPa	$(\sigma_1 - \sigma_3)/2$ kPa	$(\sigma'_1 + \sigma'_3)/2$ kPa	$(\sigma'_1 - \sigma'_3)/2$ kPa
Specimen	0	0	0.0	0.0	0.0	0.0		0.000	190.0				190.0	0.0		
I	47	0.9	60.0	0.3	0.0	59.7		0.009	249.7				219.9	29.9		
Chamber pressure σ_3 , kPa	98	1.9	75.7	0.6	0.0	75.1		0.019	265.1				227.6	37.6		
190	151	2.9	86.9	0.9	0.0	86.0		0.029	276.0				233.0	43.0		
Back pressure u_b , kPa	201	3.799	93.7	1.1	0.0	92.6		0.038	282.6				236.3	46.3		
0	254	4.799	101.0	1.4	0.0	99.6		0.048	289.6				239.8	49.8		
σ'_3 , kPa	303	5.799	105.8	1.7	0.0	104.1		0.058	294.1				242.1	52.1		
190	353	6.799	106.3	2.0	0.0	104.3		0.068	294.3				242.2	52.2		
Rate of axial displ. mm/min	399	7.699	106.1	2.3	0.0	103.8		0.077	293.8				241.9	51.9		
0.8893	450	8.699	106.5	2.6	0.0	103.9		0.087	293.9				242.0	52.0		
	504	9.699	106.9	2.9	0.0	104.0		0.097	294.0				242.0	52.0		
	559	10.699	110.4	3.1	0.0	107.3		0.107	297.3				243.7	53.7		
	604	11.6	113.2	3.4	0.0	109.8		0.116	299.8				244.9	54.9		
	653	12.6	115.8	3.7	0.0	112.1		0.126	302.1				246.1	56.1		
	704	13.6	116.0	4.0	0.0	112.0		0.136	302.0				246.0	56.0		
	755	14.6	114.6	4.3	0.0	110.3		0.146	300.3				245.2	55.2		
	802	15.5	114.1	4.6	0.0	109.5		0.155	299.5				244.8	54.8		
	856	16.5	112.8	4.9	0.0	107.9		0.165	297.9				244.0	54.0		
	910	17.5	115.8	5.1	0.0	110.7		0.175	300.7				245.4	55.4		
	959	18.5	120.8	5.4	0.0	115.4		0.185	305.4				247.7	57.7		
Specimen																
Chamber pressure σ_3 , kPa																
Back pressure u_b , kPa																
σ'_3 , kPa																
Rate of axial displ. mm/min																
Specimen																
Chamber pressure σ_3 , kPa																
Back pressure u_b , kPa																
σ'_3 , kPa																
Rate of axial displ. mm/min																

Report num.:	CB0019-19-0005
Edition date:	

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017

MB19-0416

Test data	
Employee ring type	FIXED
Height (cm)	2.000
Diameter (cm)	5.200
Volume (cm ³)	42.48
Ring weight (g)	86.44
Ring+soil weight (g)	153.13
Ini. weight wet soil (g)	66.69
Soil part. density (Mg/m ³)	2.700
Initial moisture content (%)	39.1
Initial bulk density (Mg/m ³)	1.57
Initial dry density (Mg/m ³)	1.13
Initial saturation degree (%)	75.98
Final moisture content (%)	42.8
Final bulk density (Mg/m ³)	1.79
Final dry density (Mg/m ³)	1.25

Equipment	
OEDOMETER PROETI S0110 (PLACE 4)	
DATA ACQ. MODULE MECATEST-16	
ELECT. TRANSD. NOVOTECHNIK TR-10	

Soil conditions	UNDISTURBED
-----------------	-------------

Results	
Initial void ratio, e ₀	1.3894
Final void ratio, e _f	1.1541
Solid height, H _s (cm)	0.8370
Final height pore, H _{ps} (cm)	0.9660

Results																
Press. stage	Load date	Final time	Instant. settlement	Read. t= 8 sg	L ₀ (Casag. met.)	Final reading	Final sample height	Void ratio at L ₀	Final void ratio	Compr. ind. (*)	Swelling ind. (*)	Constr. mod. E _{oed}	Compr. coef. a _v	Cons. coef. c _v	Compr. coef. m _v	Sec. cons. coef. C _α
kPa		sg	mm	mm	mm	mm	cm	e _{L0}	e _f	c _c	c _s	kPa	1/kPa	cm ² /s)	1/kPa	C _α
20	09-10-19	91 228	0.072	0.072	0.057	0.163	1.9837	1.3827	1.3700					3.64E-03		2.92E-05
40	10-10-19	87 614	0.019	0.191	0.182	0.278	1.9722	1.3677	1.3563	0.0455		3 460	6.85E-04	9.61E-04	2.89E-04	6.09E-04
80	11-10-19	248 026	0.083	0.378	0.361	0.608	1.9393	1.3464	1.3169	0.1309		2 392	9.85E-04	6.50E-04	4.18E-04	5.22E-04
150	14-10-19	87 164	0.156	0.794	0.764	1.092	1.8908	1.2982	1.2590	0.2121		2 801	8.27E-04	1.25E-03	3.57E-04	1.73E-03
300	15-10-19	87 085	0.155	1.201	1.247	1.841	1.8159	1.2405	1.1695	0.2973		3 786	5.97E-04	1.19E-03	2.64E-04	1.67E-03
600	16-10-19	89 720	0.108	1.754	1.948	2.633	1.7368	1.1567	1.0750	0.3139		6 887	3.15E-04	3.90E-04	1.45E-04	2.01E-03
1000	17-10-19	105 626	0.037	2.639	2.669	3.233	1.6767	1.0706	1.0032	0.3236		11 560	1.80E-04	2.77E-04	8.65E-05	2.89E-03
1500	18-10-19	235 062	0.027	3.269	3.260	3.726	1.6274	1.0000	0.9443	0.3345		17 005	1.18E-04	1.20E-04	5.88E-05	2.47E-03
600	21-10-19	86 558	-0.040	3.674	3.686	3.391	1.6609	0.9491	0.9844		0.1008	43 638	4.46E-05		2.29E-05	
150	22-10-19	87 052	-0.098	3.280	3.293	2.681	1.7320	0.9961	1.0692		0.1408	10 530	1.88E-04		9.50E-05	
20	23-10-19	86 583	-0.028	2.638	2.653	1.970	1.8030	1.0725	1.1541		0.0970	3 168	6.53E-04		3.16E-04	

NOTE: Compression index (C_c) and swelling index (C_s), such as constrained modules (E_{oed}) and compressibility coefficient (a_v), are estimated between a pressure step and the immediately preceding as a first approximation, taking for calculatin the obtained void ratio values in the end of the considered pressure stage.

REMARKS

Operator: ALEX VANCELLS

Test final date: 25/10/2019

Report num.: CB0019-19-0005
 Edition date:

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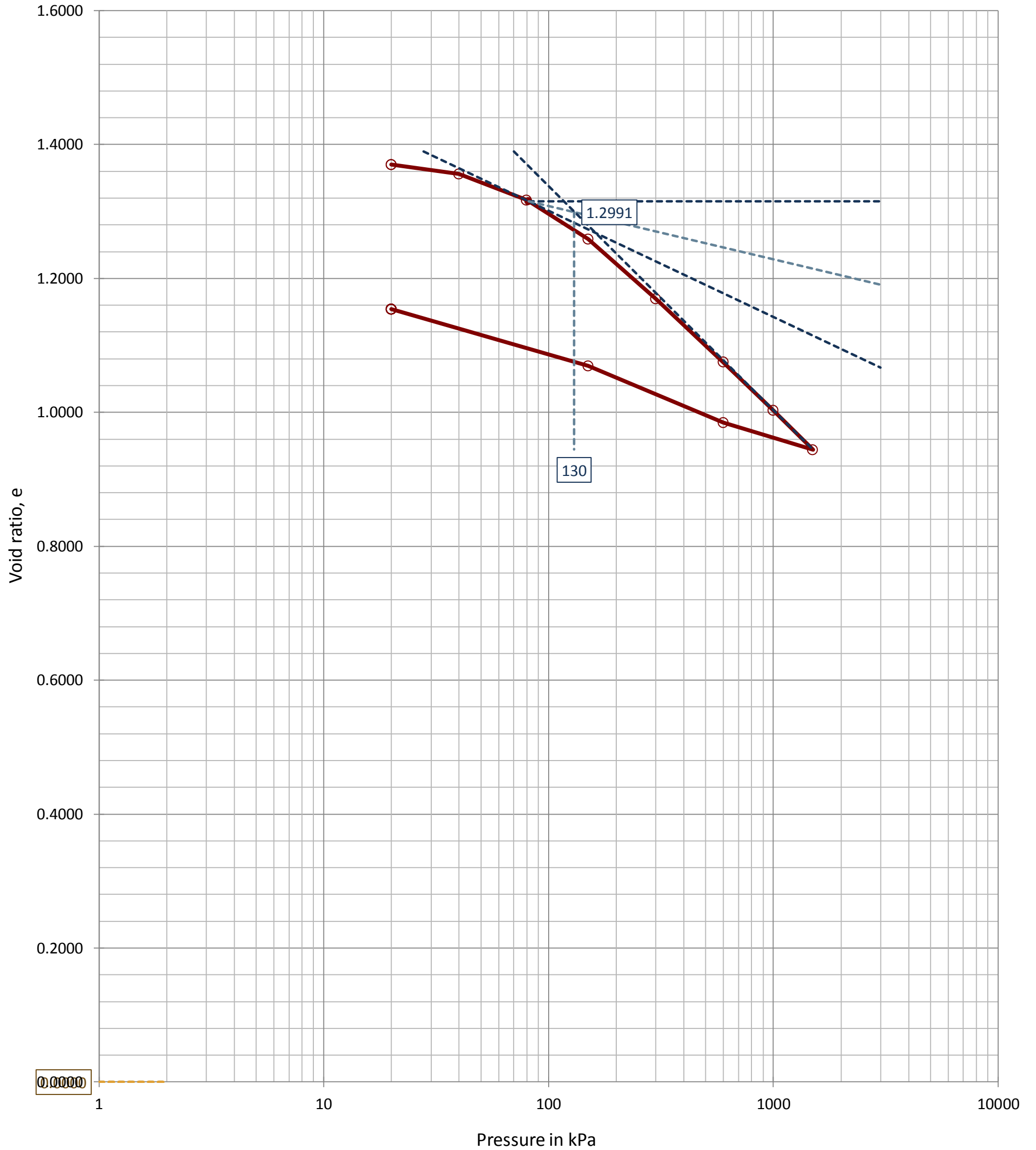
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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
OEDOMETRIC CURVE

Sample reference
MB19-0416

Initial void ratio	1.3894
Final void ratio	1.1541
Initial moisture content (%)	39.1
Final moisture content (%)	42.8

Preconsolidation pres., σ'_p (kPa)	130
Void ratio	1.2991
Determination method	Casagrande
Compression index, cc	0.3344



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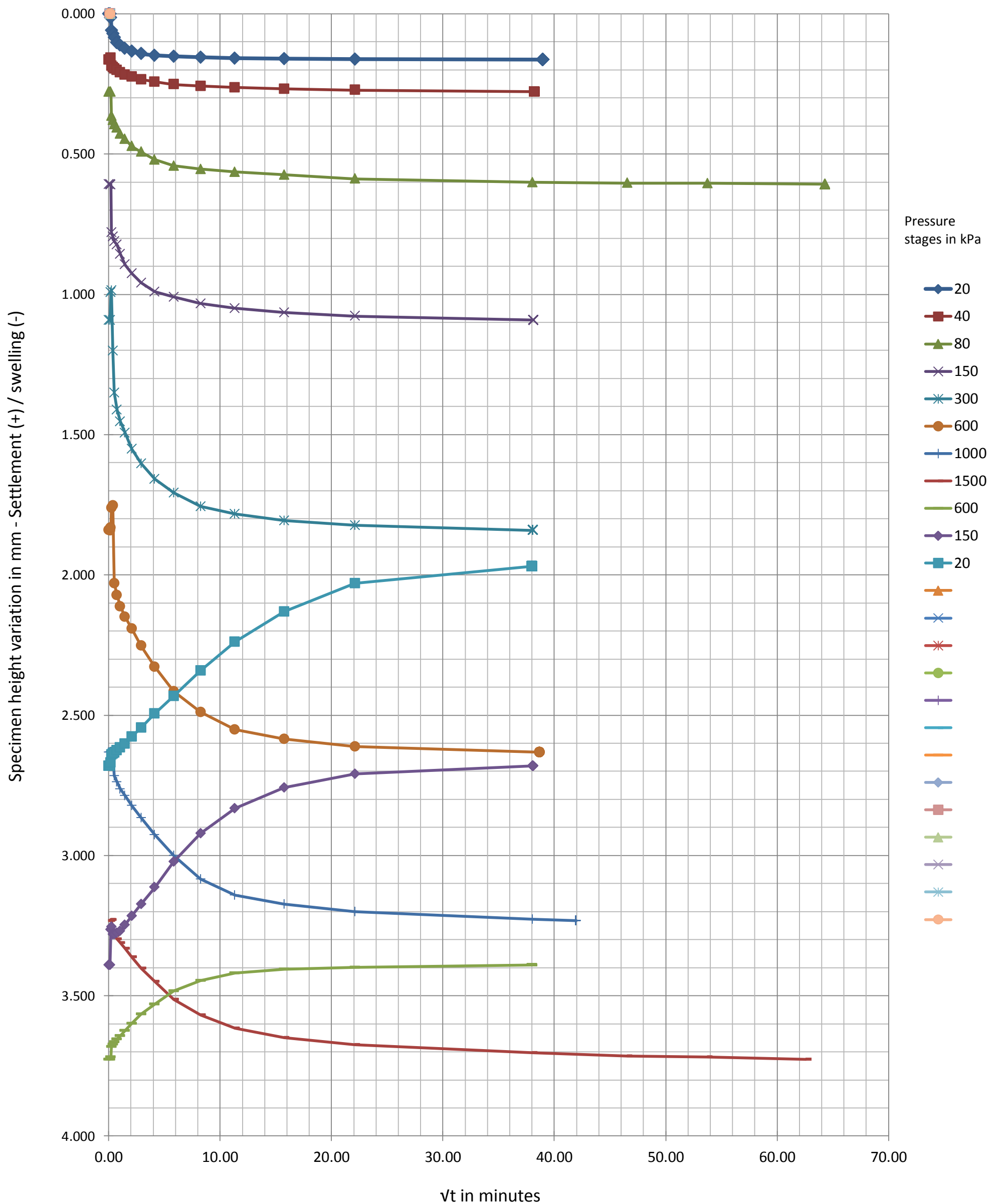


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Sample reference

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

MB19-0416



Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0416

Pressure stages

Pressure stage (kPa)	20	40	Specimen diameter (cm)	5.200
L0 (Casagrande method)	0.057	0.182	Specimen initial height (cm)	2.000

Date	Date
09-oct-19	10-oct-19

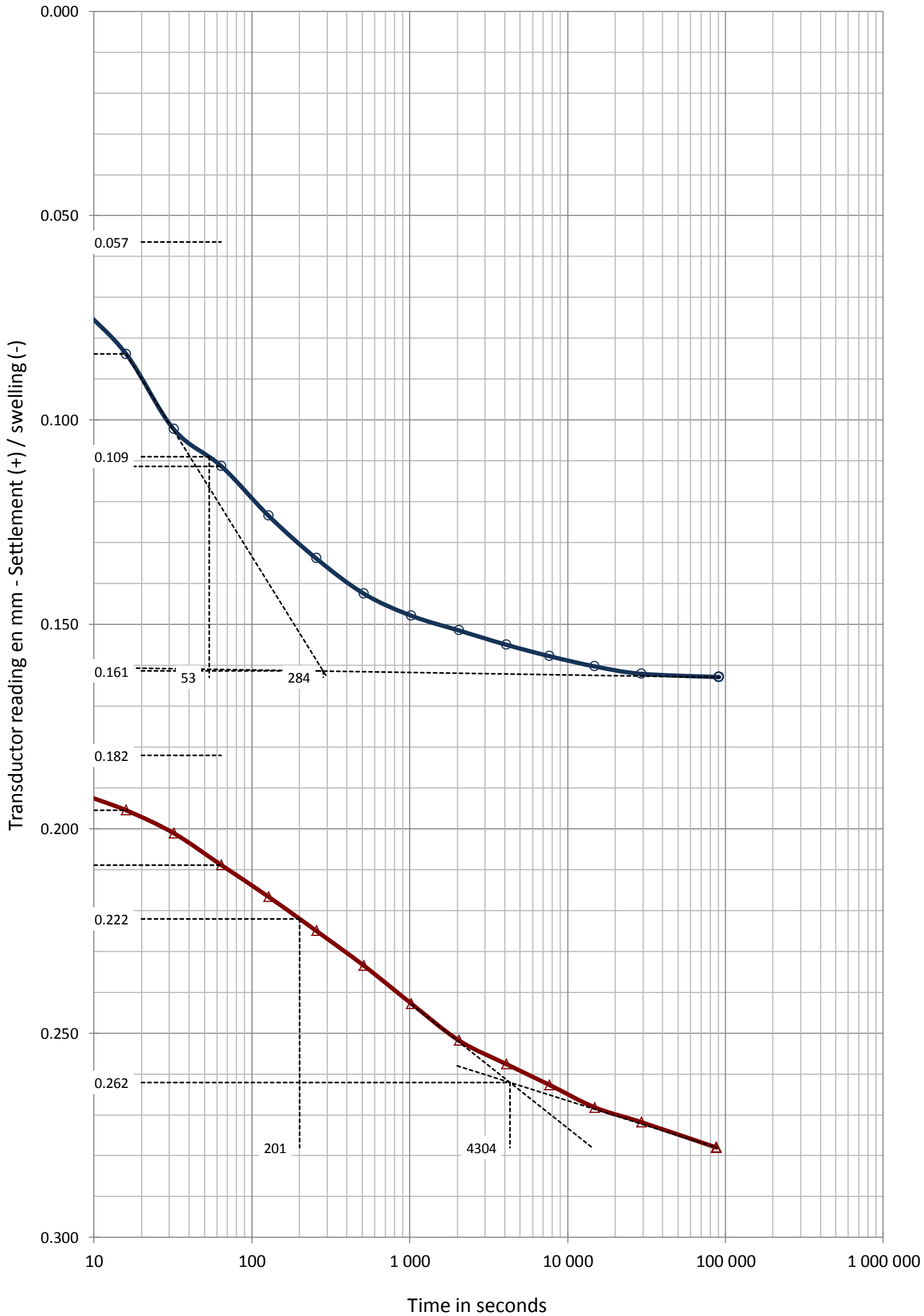
Pressure (kPa) Pressure (kPa)

20 **40**

Readings Void Readings Void
 Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e

1	0.001	1.3894	1	0.163	1.3700
2	0.014	1.3878	2	0.157	1.3707
4	0.059	1.3824	4	0.185	1.3674
8	0.072	1.3809	8	0.191	1.3667
16	0.084	1.3795	16	0.196	1.3661
32	0.102	1.3773	32	0.201	1.3655
64	0.111	1.3762	64	0.209	1.3645
128	0.124	1.3747	128	0.217	1.3636
256	0.134	1.3735	256	0.225	1.3626
512	0.143	1.3725	512	0.234	1.3616
1 024	0.148	1.3718	1 024	0.243	1.3605
2 048	0.152	1.3714	2 048	0.252	1.3594
4 096	0.155	1.3710	4 096	0.258	1.3587
7 696	0.158	1.3706	7 696	0.263	1.3581
14 896	0.160	1.3703	14 896	0.268	1.3574
29 296	0.162	1.3701	29 296	0.272	1.3570
91 228	0.163	1.3700	91 228	0.278	1.3563



Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

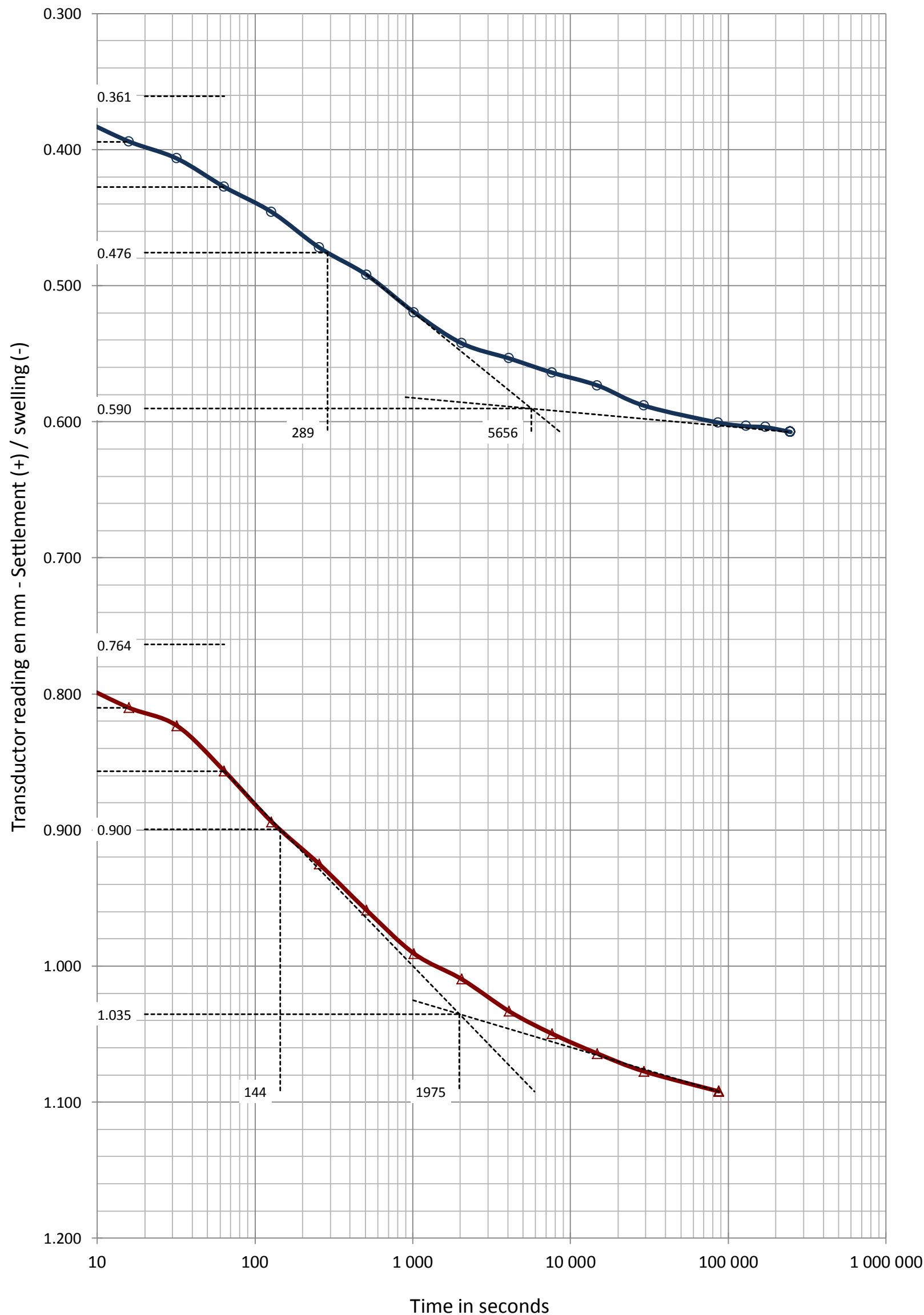
Sample reference

MB19-0416

Pressure stages

Pressure stage (kPa)	80	150	Specimen diameter (cm)	5.200
L0 (Casagrande method)	0.361	0.764	Specimen initial height (cm)	2.000

Date	Date
11-oct-19	14-oct-19



Pressure (kPa)		Pressure (kPa)			
80		150			
Readings	Void ratio	Readings	Void ratio		
Settlement (+)		Settlement (+)			
sg	mm	sg	mm		
0	0.278	1.3563	0	0.608	1.3169
1	0.278	1.3563	1	0.608	1.3169
2	0.278	1.3563	2	0.610	1.3167
4	0.365	1.3459	4	0.780	1.2963
8	0.378	1.3443	8	0.794	1.2946
16	0.394	1.3424	16	0.810	1.2927
32	0.407	1.3409	32	0.823	1.2911
64	0.428	1.3384	64	0.857	1.2871
128	0.446	1.3362	128	0.894	1.2827
256	0.472	1.3331	256	0.925	1.2789
512	0.492	1.3307	512	0.959	1.2749
1 024	0.520	1.3274	1 024	0.991	1.2711
2 048	0.542	1.3247	2 048	1.010	1.2689
4 096	0.554	1.3234	4 096	1.033	1.2660
7 696	0.564	1.3221	7 696	1.050	1.2641
14 896	0.573	1.3210	14 896	1.064	1.2623
29 296	0.588	1.3192	29 296	1.077	1.2608
86 896	0.601	1.3177	87 164	1.092	1.2590
130 096	0.603	1.3174			
173 296	0.604	1.3173			
248 026	0.608	1.3169			

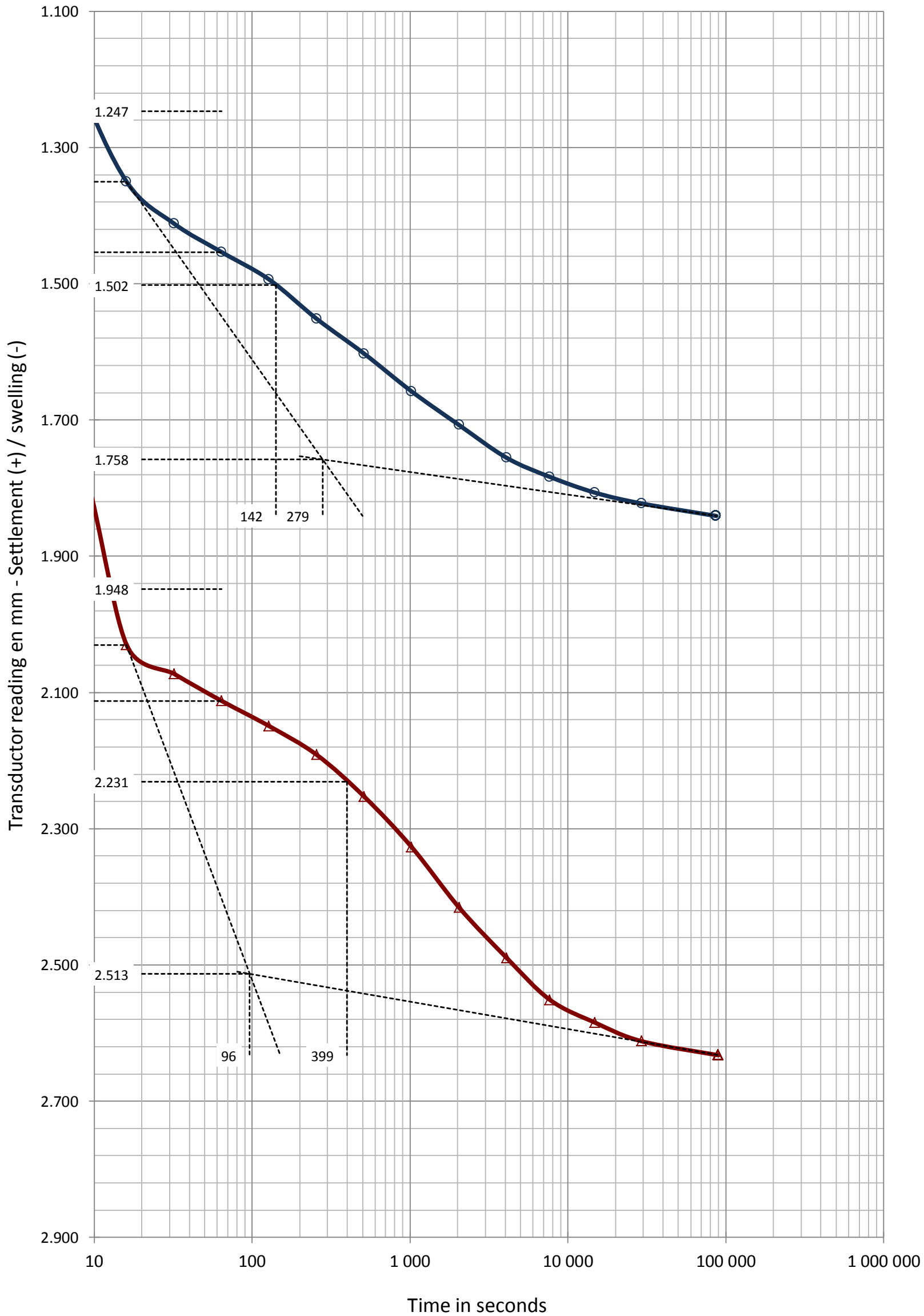
Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference
MB19-0416

Pressure stage (kPa)	300	600	Specimen diameter (cm)	5.200
L0 (Casagrande method)	1.247	1.948	Specimen initial height (cm)	2.000

Pressure stages	
Date	Date
15-oct-19	16-oct-19



Pressure (kPa)		Pressure (kPa)			
300		600			
Readings	Void ratio	Readings	Void ratio		
Settlement (+)		Settlement (+)			
sg	mm	sg	mm		
0	1.092	1.2590	0	1.841	1.1695
1	1.092	1.2590	1	1.841	1.1695
2	0.993	1.2709	2	1.832	1.1706
4	0.985	1.2718	4	1.761	1.1790
8	1.201	1.2460	8	1.754	1.1800
16	1.350	1.2282	16	2.030	1.1469
32	1.412	1.2208	32	2.073	1.1419
64	1.454	1.2158	64	2.112	1.1371
128	1.494	1.2110	128	2.149	1.1327
256	1.552	1.2041	256	2.192	1.1277
512	1.603	1.1980	512	2.253	1.1203
1 024	1.658	1.1914	1 024	2.327	1.1115
2 048	1.708	1.1855	2 048	2.416	1.1008
4 096	1.756	1.1797	4 096	2.490	1.0920
7 696	1.784	1.1764	7 696	2.551	1.0847
14 896	1.807	1.1736	14 896	2.585	1.0807
29 296	1.823	1.1717	29 296	2.612	1.0774
87 085	1.841	1.1695	87 720	2.633	1.0750

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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0416

Pressure stages

Pressure stage (kPa)	1000	1500	Specimen diameter (cm)	5.200
L0 (Casagrande method)	2.669	3.260	Specimen initial height (cm)	2.000

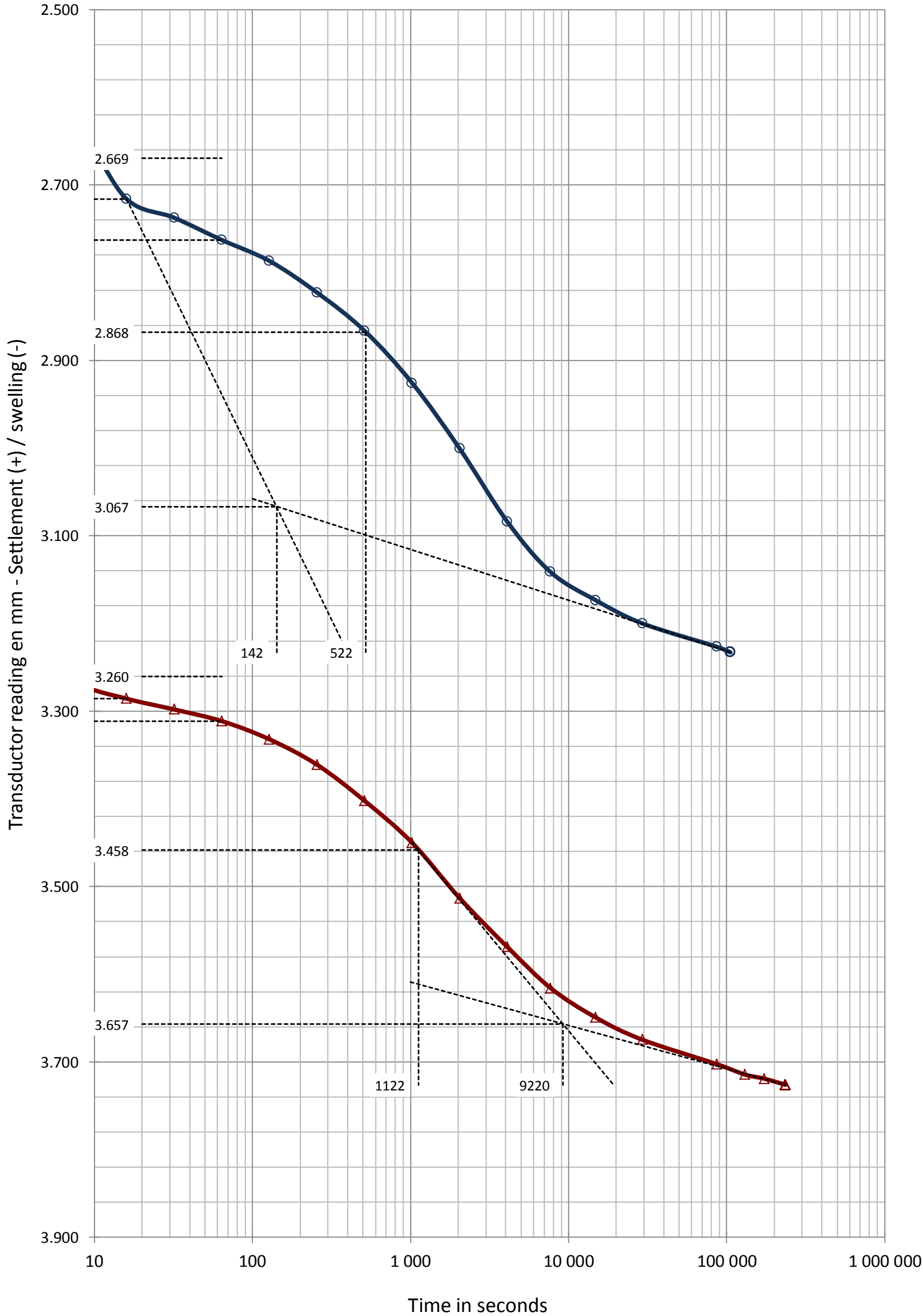
Date	Date
17-oct-19	18-oct-19

Pressure (kPa) Pressure (kPa)

1000 **1500**

Readings Void ratio
Settlement (+) Settlement (+)

sg mm e sg mm e



Readings	Void ratio	Readings	Void ratio				
Settlement (+)	sg	mm	e	Settlement (+)	sg	mm	e
0	2.633	1.0750	0	3.233	1.0032		
1	2.633	1.0750	1	3.233	1.0032		
2	2.631	1.0752	2	3.229	1.0037		
4	2.630	1.0753	4	3.229	1.0037		
8	2.639	1.0742	8	3.269	0.9990		
16	2.716	1.0650	16	3.286	0.9969		
32	2.737	1.0624	32	3.298	0.9954		
64	2.763	1.0594	64	3.311	0.9939		
128	2.787	1.0565	128	3.332	0.9914		
256	2.823	1.0522	256	3.361	0.9879		
512	2.866	1.0470	512	3.402	0.9830		
1 024	2.926	1.0399	1 024	3.450	0.9773		
2 048	3.001	1.0310	2 048	3.513	0.9697		
4 096	3.084	1.0210	4 096	3.569	0.9631		
7 696	3.142	1.0142	7 696	3.616	0.9575		
14 896	3.174	1.0103	14 896	3.650	0.9535		
29 296	3.200	1.0072	29 296	3.675	0.9505		
86 896	3.227	1.0040	86 896	3.703	0.9471		
105 626	3.233	1.0032	130 096	3.714	0.9457		
			173 296	3.719	0.9451		
			235 062	3.726	0.9443		

Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

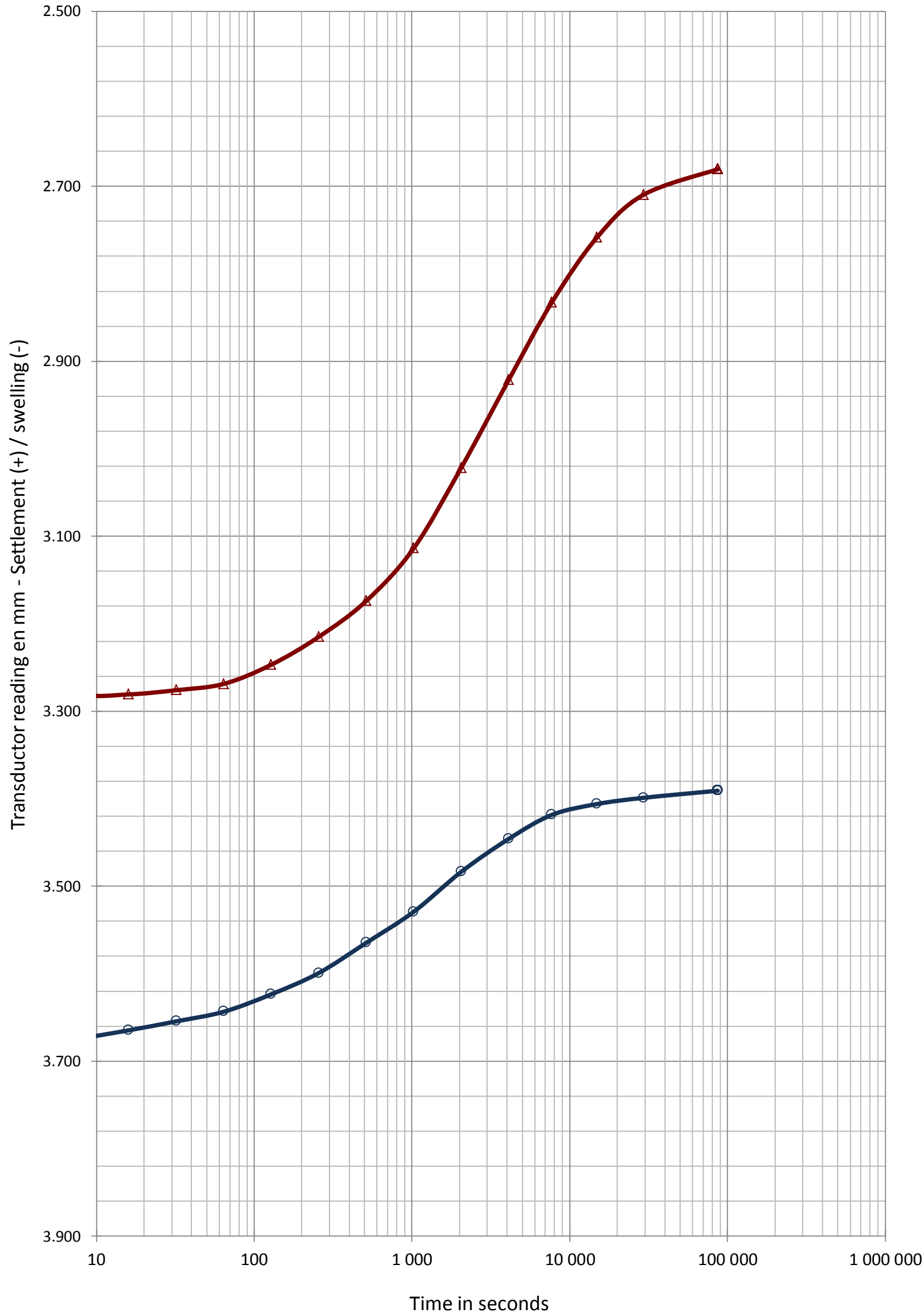
Sample reference

MB19-0416

Pressure stages

Date	Date
21-oct-19	22-oct-19

Pressure stage (kPa)	600	150	Specimen diameter (cm)	5.200
L0 (Casagrande method)	3.686	3.293	Specimen initial height (cm)	2.000



Pressure (kPa)			Pressure (kPa)		
600			150		
Readings	Void ratio		Readings	Void ratio	
Settlement (+)			Settlement (+)		
sg	mm	e	sg	mm	e
0	3.726	0.9443	0	3.391	0.9844
1	3.726	0.9443	1	3.391	0.9844
2	3.719	0.9452	2	3.264	0.9995
4	3.681	0.9497	4	3.255	1.0006
8	3.674	0.9506	8	3.280	0.9976
16	3.665	0.9516	16	3.281	0.9975
32	3.655	0.9529	32	3.276	0.9981
64	3.644	0.9542	64	3.269	0.9989
128	3.624	0.9566	128	3.247	1.0016
256	3.599	0.9595	256	3.215	1.0054
512	3.565	0.9636	512	3.174	1.0103
1 024	3.529	0.9678	1 024	3.114	1.0175
2 048	3.484	0.9733	2 048	3.022	1.0284
4 096	3.446	0.9778	4 096	2.922	1.0404
7 696	3.419	0.9811	7 696	2.833	1.0510
14 896	3.406	0.9825	14 896	2.758	1.0599
29 296	3.399	0.9834	29 296	2.710	1.0657
86 558	3.391	0.9844	87 052	2.681	1.0692

Operator:

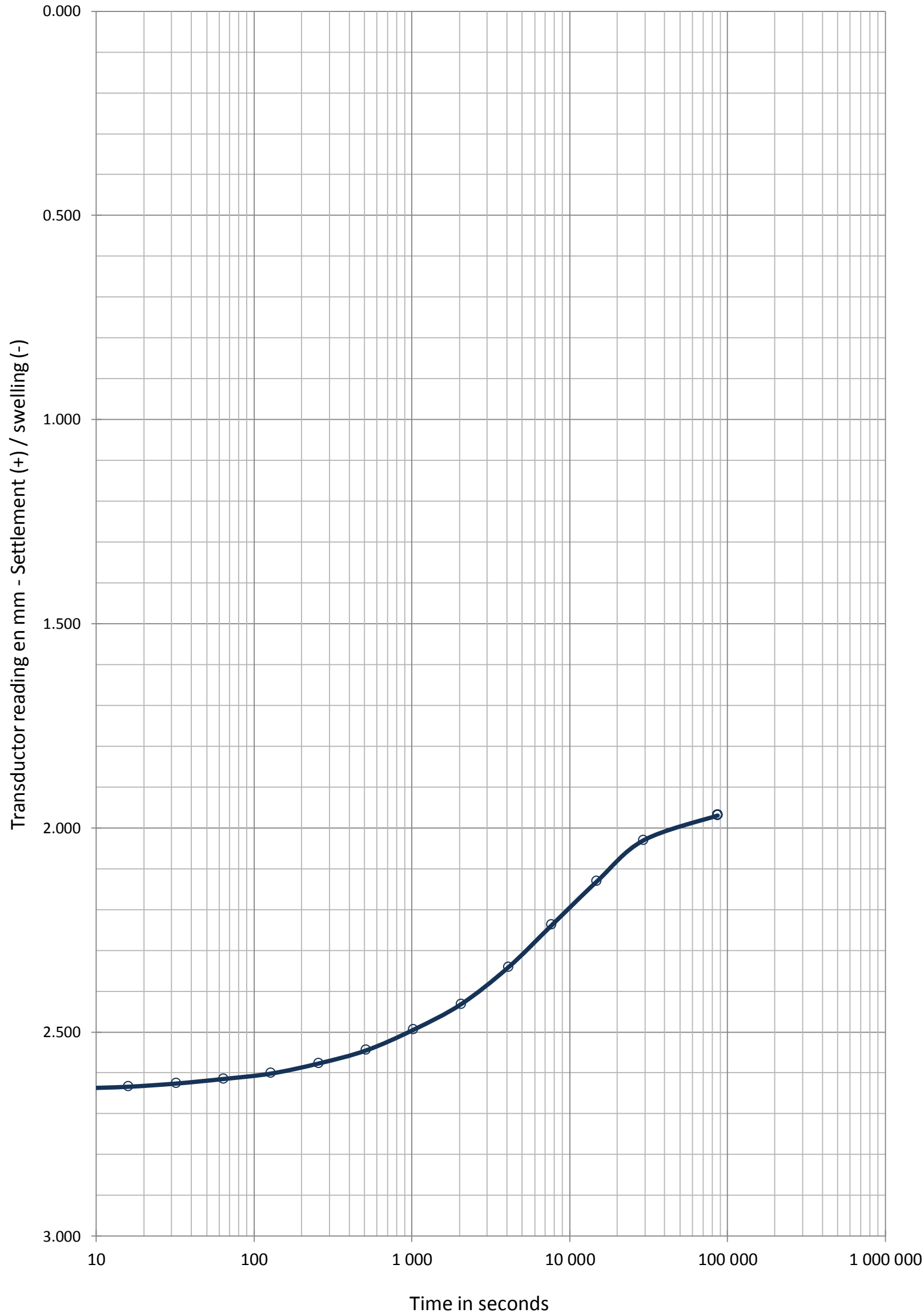
Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference
MB19-0416

Pressure stage (kPa) **20** Specimen diameter (cm) **5.200**
 L0 (Casagrande method) **2.653** Specimen initial height (cm) **2.000**

Pressure stages
 Date Date
 23-oct-19



Pressure (kPa) **20**

Readings Void ratio
 Settlement (+) Settlement (+) ratio

sg	mm	e	sg	mm	e
0	2.681	1.0692			
0	2.681	1.0692			
1	2.680	1.0693			
2	2.669	1.0706			
4	2.641	1.0740			
8	2.638	1.0743			
16	2.634	1.0748			
32	2.626	1.0757			
64	2.615	1.0771			
128	2.602	1.0786			
256	2.577	1.0816			
512	2.545	1.0854			
1 024	2.494	1.0915			
2 048	2.432	1.0989			
4 096	2.341	1.1098			
7 696	2.238	1.1221			
14 896	2.131	1.1349			
29 296	2.031	1.1469			
86 583	1.970	1.1541			

Report num.:	CB0019-19-0005
Edition date:	

FALL CONE TEST - ISO 17892-6:2017

Sample reference

MB19-0416

Equipment
PENETROMETER MATEST B057-11

Legend of symbols	
cu	Calculated Undrained Shear Strength (kPa)
cu(corr)	Corrected Undrained Shear Strength (kPa)
cur	Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1		69.4	3.63	3.63	4.04	3.67	3.743	400	30	280	226	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	280
Corrected Undrained Shear Strength, cu(corr) (kPa)	226

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	4.04	4.17	4.31	4.22	4.185	400	30	179	
1	1	4.17	4.19	3.85	4.12	4.083	400	30	188	
1	3	4.02	3.93	3.42	3.77	3.785	400	30	219	
1	7	3.03	3.28	3.75	3.53	3.398	400	30	272	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	179

Thixotropy	
Loss at remoulding (%)	36
Recovery after 1 day (%)	9
Recovery after 7 days (%)	92

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0416

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 23-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.198 g

Equipment:

RESULT: **91.6 g/kg (total)**

MUFLA OVEN ETI HD150

82.4 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 2.519 g

Equipment:

RESULT: **76.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0417

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_0 P_0.2
Top depth, m	0.6
Bottom depth, m	0.7
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/1) fine SAND with occasional medium sand and occasional silty clay pockets with organic matter with rare shell fragments	0.6	
	0.7	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0417



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 18/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0417

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.72
Tare + soil + water (g)	209.25
Tare + soil (g)	194.54
Water (g)	14.71
Soil (g)	89.82
Moisture, w (%)	16.4

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Moisture content, w (%)	16.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	101.84
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.03
Dry density (Mg/m ³)	1.74

Operator: ALEX VANCELLS
Test final date: 18/06/2019

Results	
Bulk density (Mg/m³)	2.03
Dry density (Mg/m³)	1.74

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	186.6770
Soil mass, M1 (g)	12.7850
Particle density, G20°C (Mg/m ³)	2.678

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.678

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0417

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

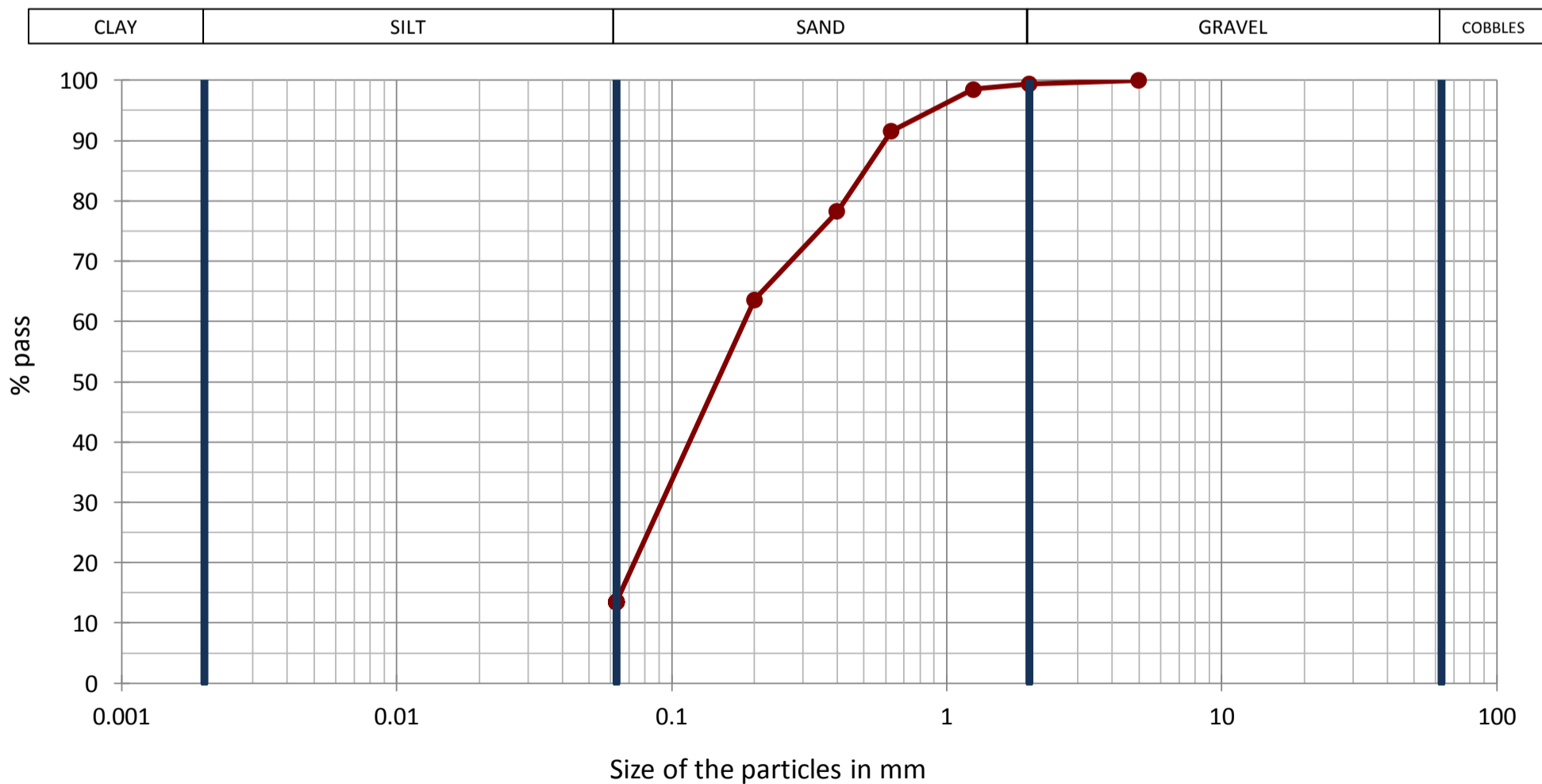
Previous calculations
 Total dried sample (g) **104.58**

 Hygrosc. moisture, % (fraction < 2 mm) **0.6**
 Corr. parameter, f (fraction < 2 mm) **0.9936**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
5		0.00	0.0	103.91	100.0
2		0.67	0.6	103.24	99.4
1.25		0.89	1.5	102.35	98.5
0.63		7.18	8.4	95.17	91.6
0.4		13.82	21.7	81.35	78.3
0.2		15.30	36.4	66.05	63.6
0.063		52.00	86.5	14.05	13.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.6	% SAND	2-0.063 mm	85.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	7.8		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	28.0		13.5
	% Fine gravel	6.3-2 mm	0.6	% Fine sand	0.2-0.063 mm	50.1		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0417

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	99.4
Tested soil mass, mw (g)	75.05
Hygroscopic moisture, W (%)	0.6
Tested and dried soil mass, m (g)	74.57
Particle density (Mg/m ³)	2.678

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

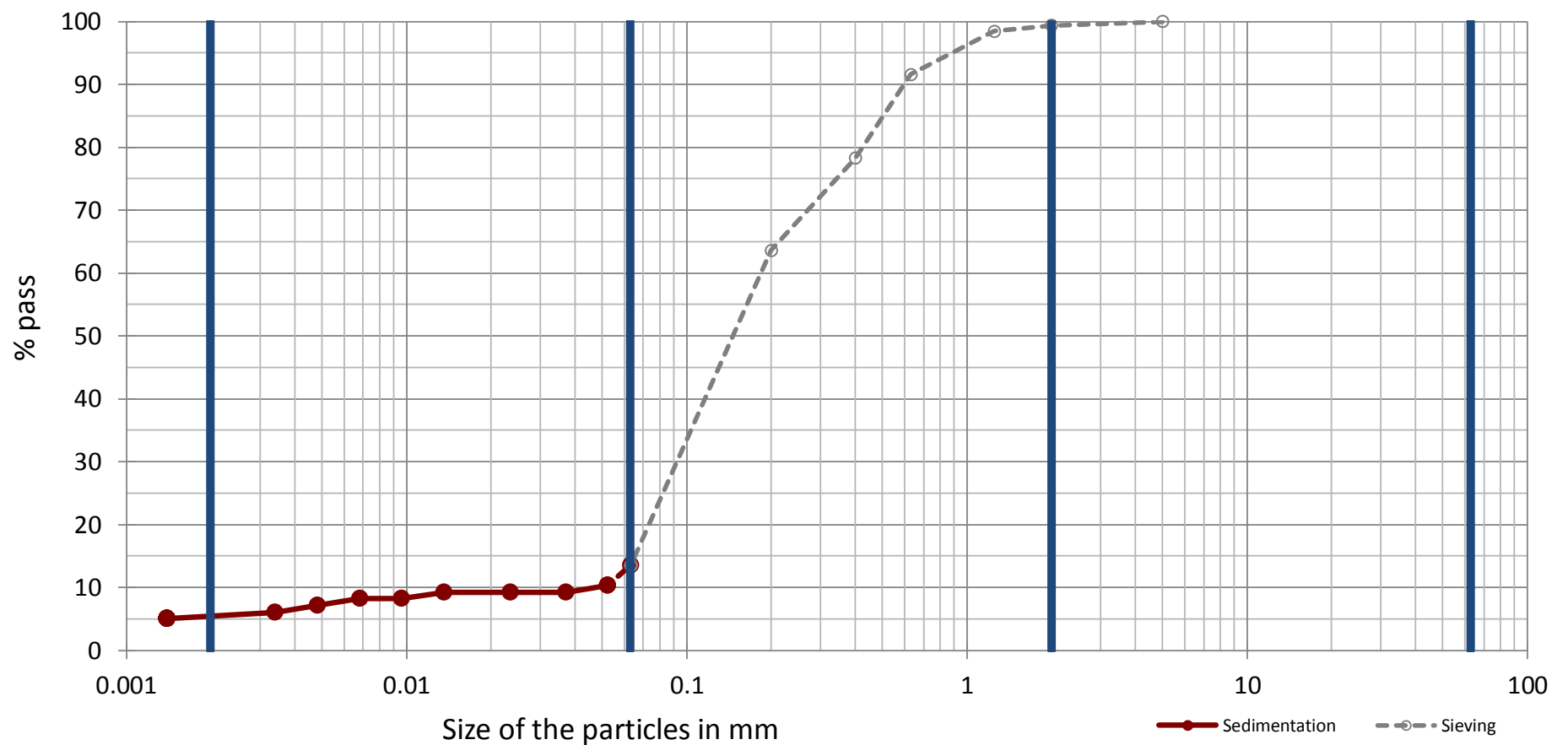
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	23	1.0090	9	161.0	4.9	0.0523	10.3
2	23	1.0085	8.5	162.2	4.4	0.0371	9.3
5	23	1.0085	8.5	162.2	4.4	0.0235	9.3
15	23	1.0085	8.5	162.2	4.4	0.0136	9.3
30	23	1.0080	8	163.4	3.9	0.0096	8.2
60	23	1.0080	8	163.4	3.9	0.0068	8.2
120	23	1.0075	7.5	164.6	3.4	0.0048	7.2
240	23	1.0070	7	165.8	2.9	0.0034	6.1
1440	23	1.0065	6.5	166.9	2.4	0.0014	5.0

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	13.5
Silt, between 0.063 and 0.002 mm (%)	8.2
Clay, smaller than 0.002 mm (%)	5.3

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 02/10/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0417

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 23-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.024 g

Equipment:

RESULT: **15.8 g/kg (total)**

MUFLA OVEN ETI HD150

13.7 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 20-09-19

Mean of analyzed soil mass: 4.946 g

Equipment:

RESULT: **17.9 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

MB19-0418

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P0 P_0.1
Top depth, m	1.7
Bottom depth, m	2.1
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	40
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

USCS classification	CH
ISO classification	saCl

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black clayey SILT with occasional millimetrical fine sand pockets highly reactive to HCl.	1.7	
	2.1	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
FALL CONE TEST - ISO 17892-6:2017
UNCONSOLIDATED UNDRAINED TRIAXIAL TEST, UU 1.5' - ISO 17892-8:2018
INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0418



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 18/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0418

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	113.43
Tare + soil + water (g)	189.40
Tare + soil (g)	172.40
Water (g)	17.00
Soil (g)	58.97
Moisture, w (%)	28.8

Drying temperature (°C) 105

Operator: GUILLEM MASSALLÉ
Test final date: 03/07/2019

Results	
Moisture content, w (%)	28.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	100.15
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.99
Dry density (Mg/m ³)	1.55

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.99
Dry density (Mg/m³)	1.55

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	186.8940
Soil mass, M1 (g)	13.8850
Particle density, G20°C (Mg/m ³)	2.454

Operator: ALEX VANCELLS
Test final date: 17/10/2019

Results	
Particle density (Mg/m³)	2.454

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0418

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

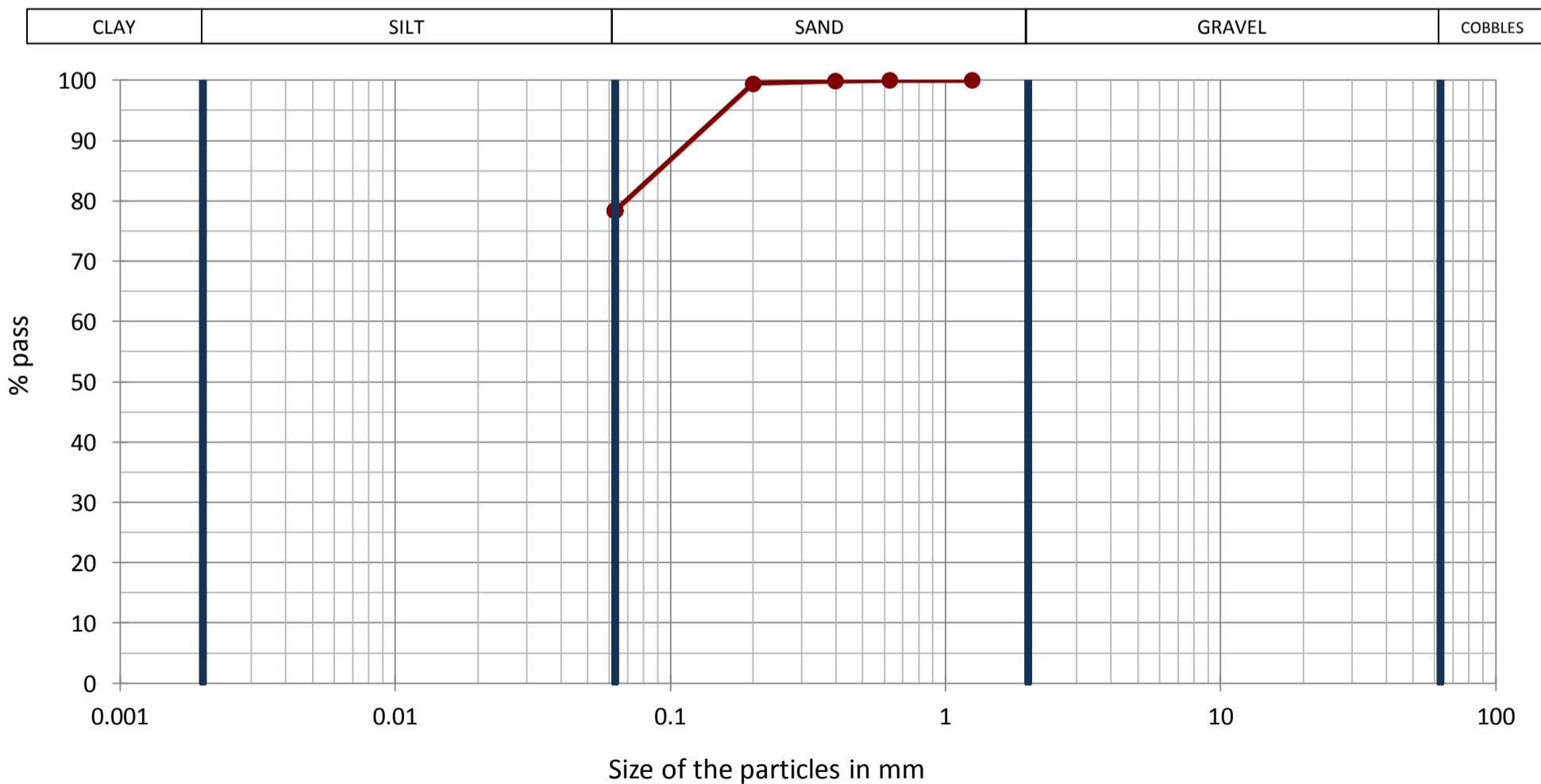
Previous calculations
 Total dried sample (g) **108.14**

 Hygrosc. moisture, % (fraction<2 mm) **2.9**
 Corr. parameter, f (fraction<2 mm) **0.9721**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
1.25		0.00	0.0	105.12	100.0
0.63		0.03	0.0	105.09	100.0
0.4		0.06	0.1	105.03	99.9
0.2		0.40	0.5	104.63	99.5
0.063		22.23	21.6	82.40	78.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	21.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0	78.4	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.5		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	21.1		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0418

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Hydrometer data
Bulb volume, V (ml) 47.77
Eq. scale calibration $y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd) $y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm) 0.0005

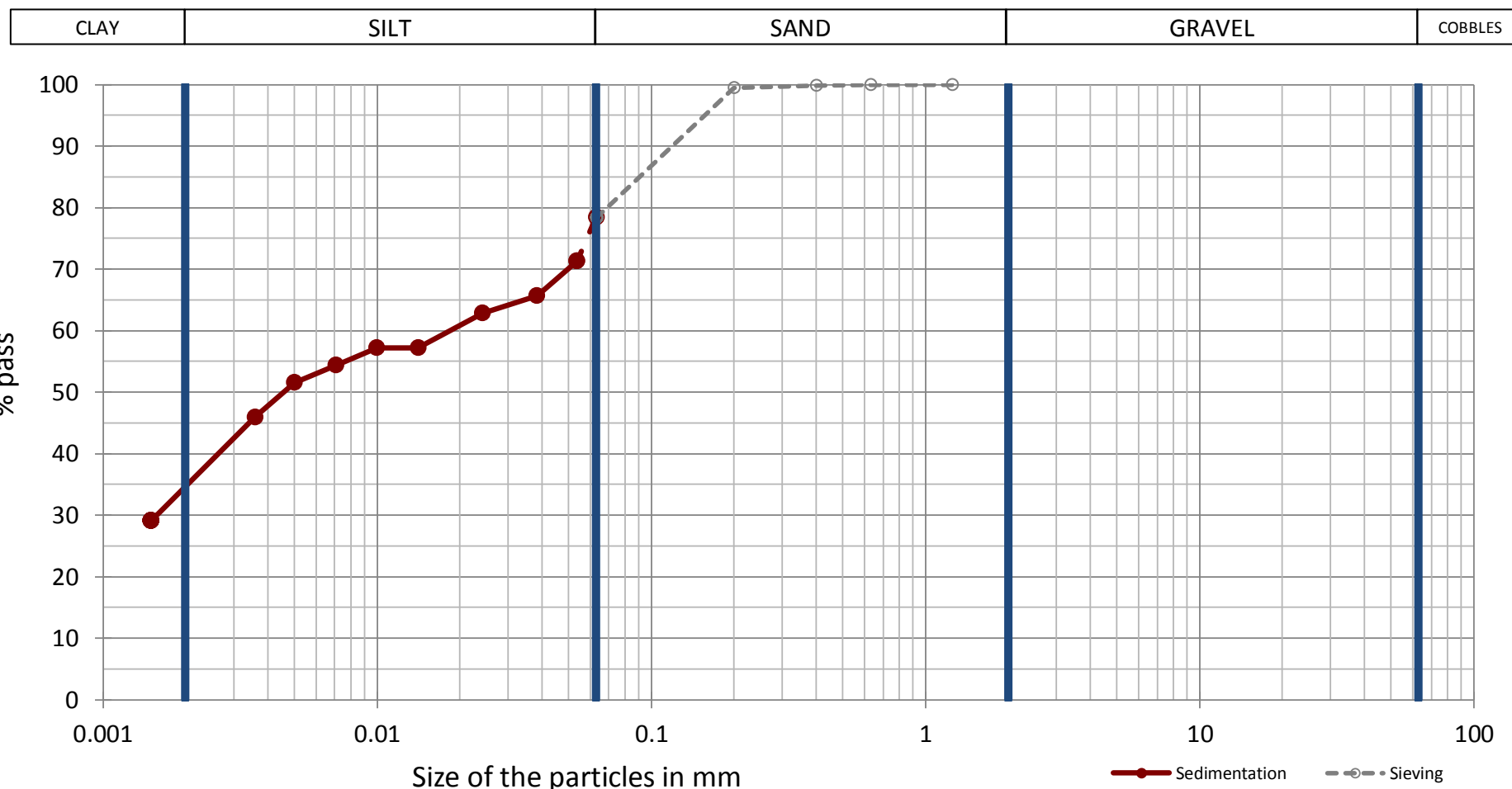
Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	30.85
Hygroscopic moisture, W (%)	2.9
Tested and dried soil mass, m (g)	29.99
Particle density (Mg/m ³)	2.454

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	22	1.0165	16.5	143.2	12.7	0.0537	71.3
2	22	1.0155	15.5	145.5	11.7	0.0383	65.7
5	22	1.0150	15	146.7	11.2	0.0243	62.9
15	22	1.0140	14	149.1	10.2	0.0141	57.2
30	22	1.0140	14	149.1	10.2	0.0100	57.2
60	22	1.0135	13.5	150.3	9.7	0.0071	54.4
120	22	1.0130	13	151.5	9.2	0.0050	51.6
240	22	1.0120	12	153.9	8.2	0.0036	46.0
1440	22	1.0090	9	161.0	5.2	0.0015	29.1

Test tube data	
Area of the inner section (A), mm ²	2933.99

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	78.4
Silt, between 0.063 and 0.002 mm (%)	45.3
Clay, smaller than 0.002 mm (%)	33.1



REMARKS

Operator: ALEX VANCELLS

Test final date: 23/10/2019

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0418

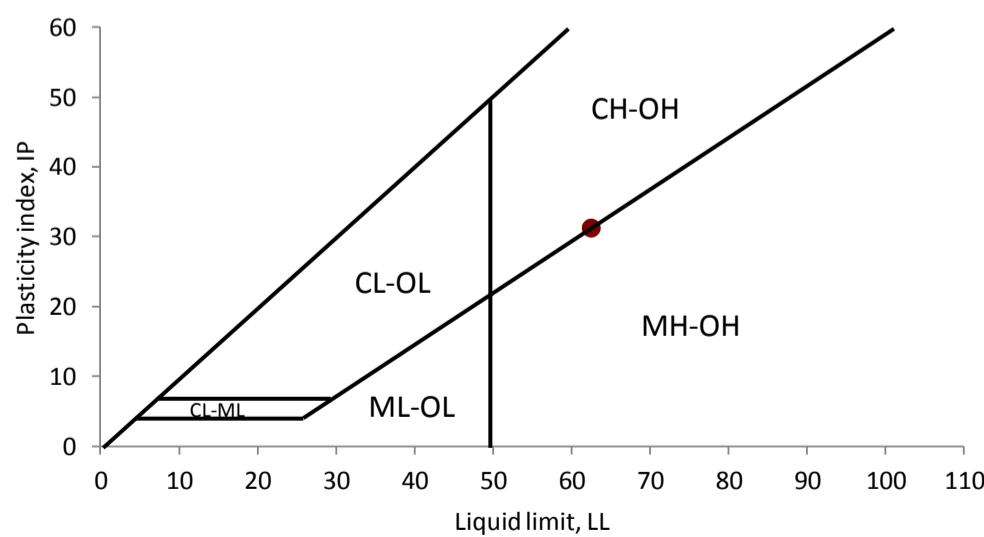
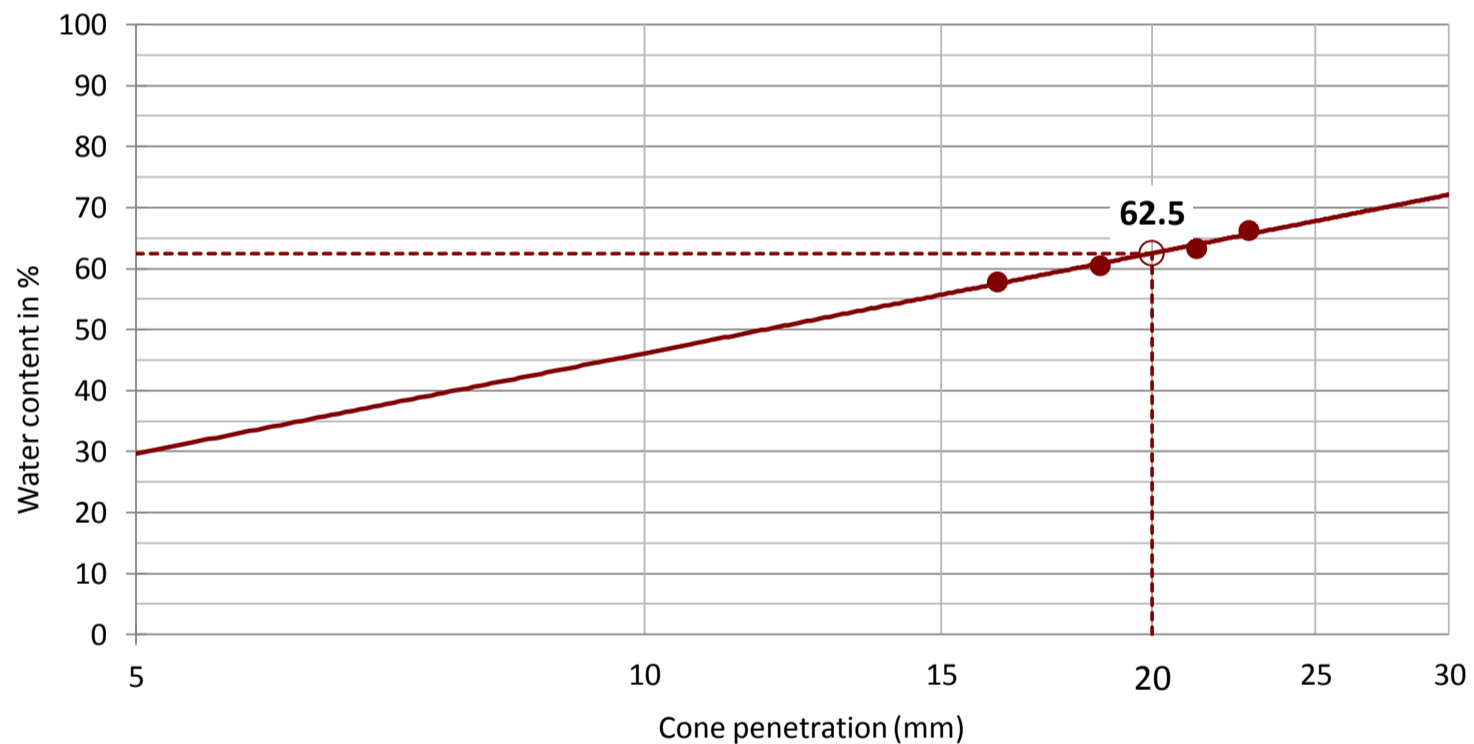
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	18.64	21.26	16.2	22.83
Water (g)	4.21	4.87	4.27	4.55
Mass moist soil + cont. (g)	40.85	41.29	41.19	40.37
Mass dry soil + cont. (g)	36.64	36.42	36.92	35.82
Mass container (g)	29.68	28.72	29.54	28.96
Soil (g)	6.96	7.70	7.38	6.86
Water content (%)	60.5	63.2	57.9	66.3

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data		
Water (g)	1.16	1.19
Mass moist soil + cont. (g)	29.15	28.85
Mass dry soil + cont. (g)	27.99	27.66
Mass container (g)	24.30	23.85
Soil (g)	3.69	3.81
Water content (%)	31.4	31.2

Results	
Liquid limit, LL	62.5
Plastic limit, LP	31.3
Plasticity index, IP	31.2
Natural water content (%)	28.8
Liquidity index, IL	-0.1
Consistency index, IC	1.1



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0418

Equipment	
MECACISA 1.5' TRIAXIAL CHAMBER PRESSURE SYSTEM MECACISA 220004 TRIAXIAL LOAD FRAME MECACISA 210715 ELEC. DEF. TRANSD. SCHREIBER SM260 PC WITH SOFTWARE MECASOFT	

Test type	Unconsolidated Undrained (UU)
Soil conditions	UNDISTURBED

Soil sample data	
Specimen number	I
Initial length (cm)	7.760
Initial diameter (cm)	3.825
Initial area (cm ²)	11.491
Initial volume (cm ³)	89.170
Initial moisture content (%)	29.6
Final moisture content (%)	30.2
Initial bulk density (Mg/m ³)	1.92
Initial dry density (Mg/m ³)	1.48
Initial saturation degree (%)	100.0
Particle density (Mg/m ³)	2.454

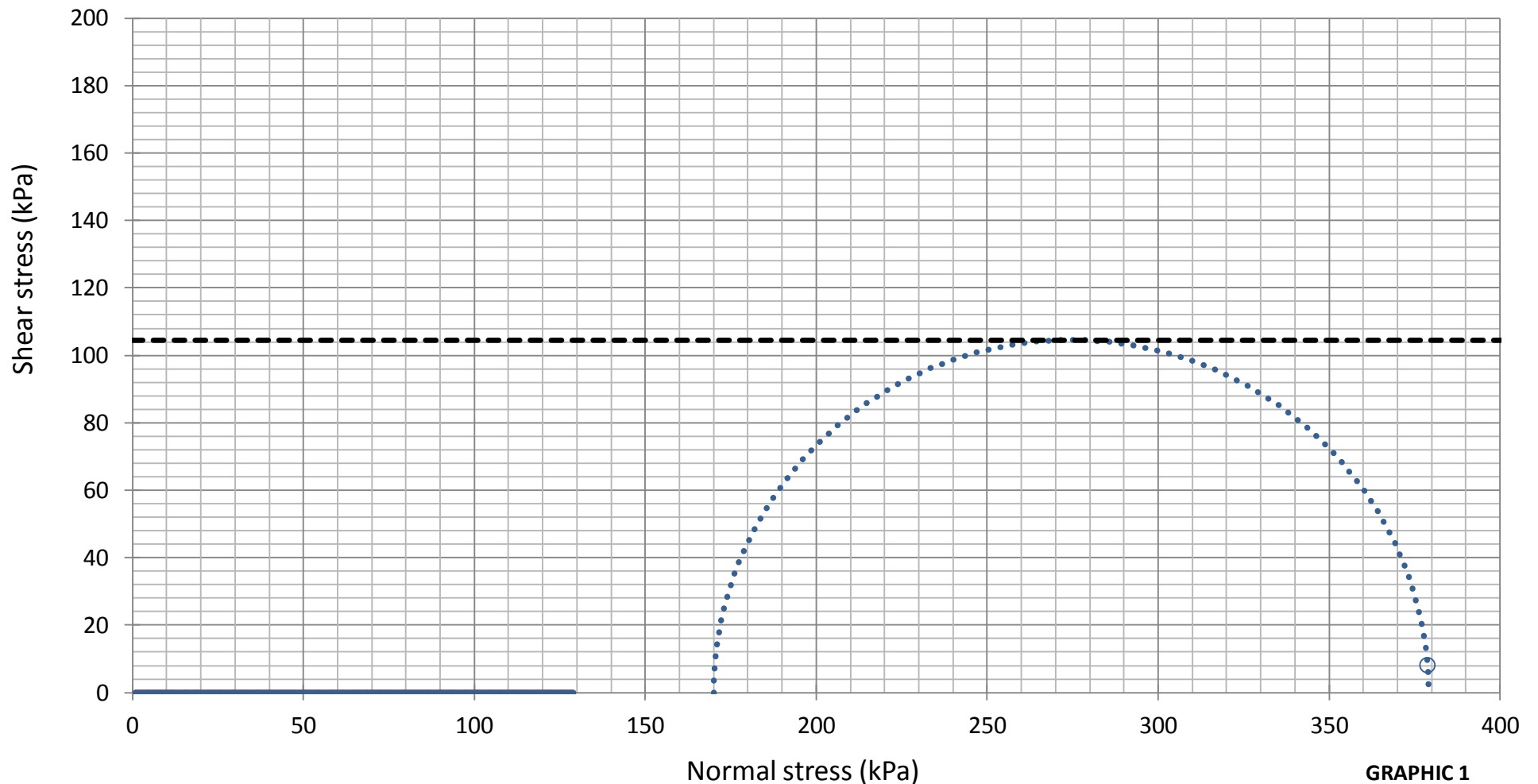
Prior saturation process	
Saturation prior to test	NO

Failure test results	
Specimen number	I
σ ₁ (kPa)	379.1
σ ₃ (kPa)	170.0
(σ ₁ -σ ₃)/2 (kPa)	104.6
(σ ₁ +σ ₃)/2 (kPa)	274.6

Test data and results	
Chamber pressure (kPa)	170
Back pressure, u _b (kPa)	0
Rate of axial displ. (mm/min)	0.9011
Major principal stress (kPa)	209.5
Failure stress (kPa)	209.1
Failure strain (%)	13.8

Estimate total	
Φ _u (°)	0.0
C _u (kPa)	105
C _u (kp/cm ²)	1.07

Graphic symbols						
	I total	II total	III total			



REMARKS

Operator: ALEX VANCELLS

Test final date: 09/10/2019

Report num.: CB0019-19-0005
Edition date:

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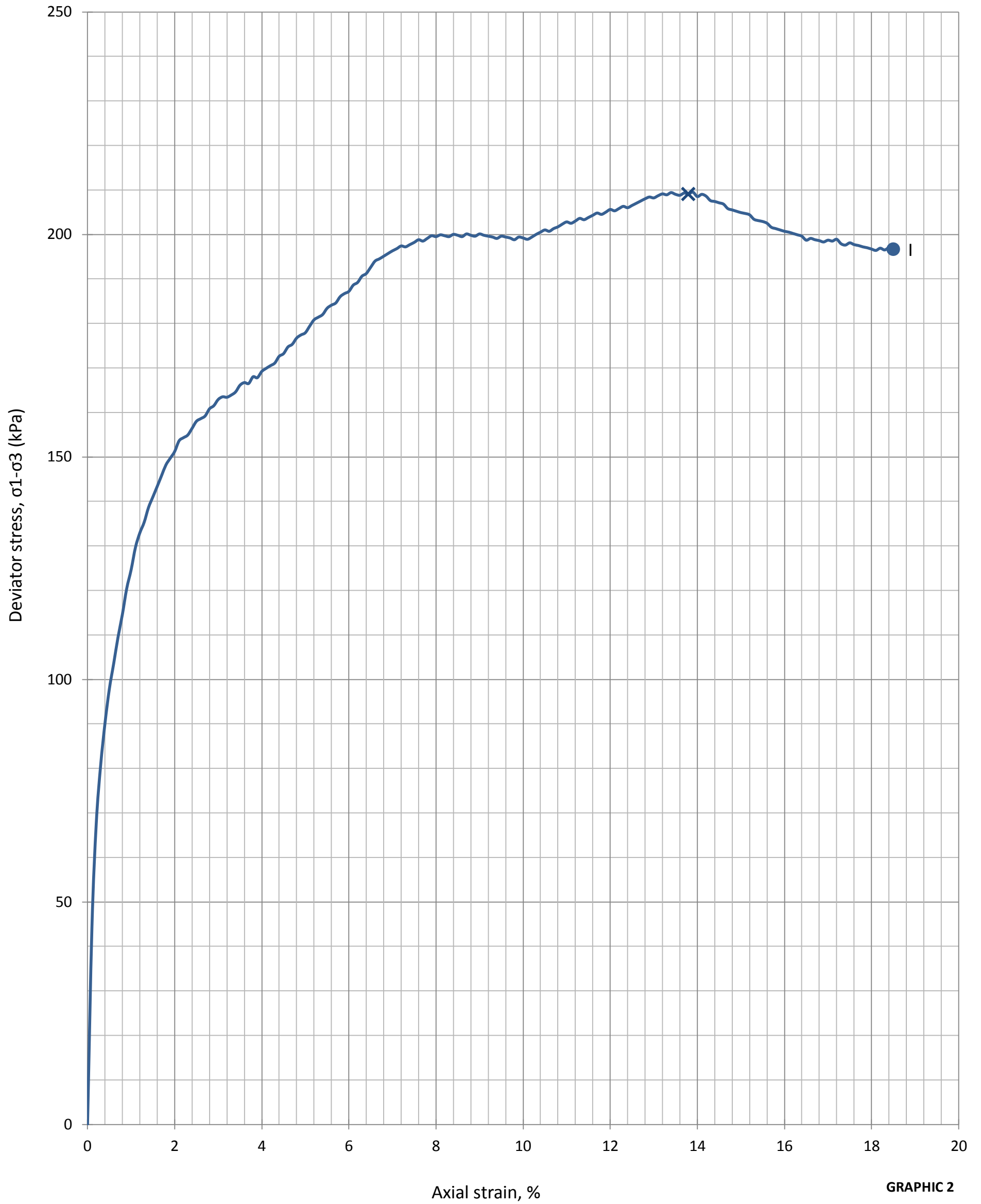


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Sample reference

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0418



GRAPHIC 2



Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0418

Failure process data summary

	Time sg	Deform. %	$(\sigma_1 - \sigma_3)_m$ kPa	$(\Delta\sigma_1)_m$ kPa	$(\Delta\sigma_1)_{fp}$ kPa	$(\sigma_1 - \sigma_3)$ kPa	u-ub kPa	ϵ_1	σ_1 kPa	σ'_1 kPa	σ'_3 kPa	Coeff. A	$(\sigma_1 + \sigma_3)/2$ kPa	$(\sigma_1 - \sigma_3)/2$ kPa	$(\sigma'_1 + \sigma'_3)/2$ kPa	$(\sigma'_1 - \sigma'_3)/2$ kPa
Specimen	0	0	0.0	0.0	0.0	0.0		0.000	170.0				170.0	0.0		
I	46	0.899	120.7	0.3	0.0	120.4		0.009	290.4				230.2	60.2		
Chamber pressure	96	1.899	150.3	0.6	0.0	149.7		0.019	319.7				244.9	74.9		
σ_3 , kPa	147	2.899	162.3	0.8	0.0	161.5		0.029	331.5				250.8	80.8		
170	194	3.8	169.1	1.1	0.0	168.0		0.038	338.0				254.0	84.0		
Back pressure	247	4.8	178.1	1.4	0.0	176.7		0.048	346.7				258.4	88.4		
u_b , kPa	303	5.8	187.7	1.7	0.0	186.0		0.058	356.0				263.0	93.0		
0	355	6.8	197.1	2.0	0.0	195.1		0.068	365.1				267.6	97.6		
σ'_3 , kPa	399	7.7	200.8	2.3	0.0	198.5		0.077	368.5				269.3	99.3		
170	449	8.7	202.6	2.5	0.0	200.1		0.087	370.1				270.1	100.1		
Rate of axial displ.	501	9.7	202.0	2.8	0.0	199.2		0.097	369.2				269.6	99.6		
mm/min	553	10.7	204.4	3.1	0.0	201.3		0.107	371.3				270.7	100.7		
0.9011	602	11.601	207.7	3.4	0.0	204.3		0.116	374.3				272.2	102.2		
	657	12.601	210.7	3.7	0.0	207.0		0.126	377.0				273.5	103.5		
	707	13.601	212.8	4.0	0.0	208.8		0.136	378.8				274.4	104.4		
	757	14.601	211.1	4.3	0.0	206.8		0.146	376.8				273.4	103.4		
	803	15.5	207.4	4.5	0.0	202.9		0.155	372.9				271.5	101.5		
	854	16.5	203.5	4.8	0.0	198.7		0.165	368.7				269.4	99.4		
	908	17.5	203.2	5.1	0.0	198.1		0.175	368.1				269.1	99.1		
	962	18.5	202.1	5.4	0.0	196.7		0.185	366.7				268.4	98.4		
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																

Report num.:	CB0019-19-0005
Edition date:	

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017

MB19-0418

Test data	
Employee ring type	FIXED
Height (cm)	2.000
Diameter (cm)	5.200
Volume (cm ³)	42.48
Ring weight (g)	86.43
Ring+soil weight (g)	161.09
Ini. weight wet soil (g)	74.66
Soil part. density (Mg/m ³)	2.454
Initial moisture content (%)	27.9
Initial bulk density (Mg/m ³)	1.76
Initial dry density (Mg/m ³)	1.38
Initial saturation degree (%)	87.97
Final moisture content (%)	28.1
Final bulk density (Mg/m ³)	1.86
Final dry density (Mg/m ³)	1.45

Equipment	
OEDOMETER PROETI S0110 (PLACE 5)	
DATA ACQ. MODULE MECATEST-16	
ELECT. TRANSD. NOVOTECHNIK TR-10	

Soil conditions	UNDISTURBED
-----------------	-------------

Swelling Pressure Test	
Swelling Pressure (kPa)	< 20
(kg/cm ²)	< 0.2

Results	
Initial void ratio, e ₀	0.7783
Final void ratio, e _f	0.6876
Solid height, H _s (cm)	1.1247
Final height pore, H _{ps} (cm)	0.7734

Results																
Press. stage	Load date	Final time	Instant. settlement	Read. t= 8 sg	L ₀ (Casag. met.)	Final reading	Final sample height	Void ratio at L ₀	Final void ratio	Compr. ind. (*)	Swelling ind. (*)	Constr. mod. E _{oed} kPa	Compr. coef. a _v 1/kPa	Cons. coef. c _v cm ² /s	Compr. coef. m _v 1/kPa	Sec. cons. coef. C _α
kPa		sg	mm	mm	mm	mm	cm	e _{L0}	e _f	c _c	c _s					
20	08-10-19	86 469	0.035	0.035	0.029	0.050	1.9950	0.7757	0.7738					8.78E-03		0.00E+00
40	09-10-19	91 237	0.015	0.066	0.065	0.098	1.9902	0.7725	0.7695	0.0143		8 250	2.15E-04	1.04E-03	1.21E-04	8.67E-05
80	10-10-19	87 634	0.042	0.145	0.140	0.238	1.9762	0.7658	0.7571	0.0412		5 708	3.10E-04	7.03E-04	1.75E-04	5.50E-04
150	11-10-19	248 048	0.082	0.330	0.320	0.509	1.9491	0.7498	0.7330	0.0883		5 104	3.44E-04	1.13E-03	1.96E-04	1.11E-03
300	14-10-19	86 924	0.078	0.565	0.587	0.935	1.9066	0.7261	0.6952	0.1256		6 877	2.52E-04	1.24E-03	1.45E-04	1.49E-03
600	15-10-19	87 288	0.085	0.855	1.019	1.536	1.8464	0.6876	0.6417	0.1777		9 506	1.78E-04	1.56E-03	1.05E-04	1.27E-03
1000	16-10-19	89 615	0.050	1.542	1.586	2.054	1.7946	0.6372	0.5957	0.2073		14 276	1.15E-04	9.75E-04	7.00E-05	2.57E-03
1500	17-10-19	105 564	0.018	2.087	2.072	2.492	1.7508	0.5941	0.5567	0.2215		20 458	7.80E-05	2.75E-04	4.89E-05	2.59E-03
600	18-10-19	235 243	-0.032	2.435	2.460	2.243	1.7757	0.5595	0.5788		0.0555	63 395	2.46E-05		1.58E-05	
150	21-10-19	86 577	-0.109	2.089	2.134	1.697	1.8303	0.5885	0.6274		0.0807	14 619	1.08E-04		6.84E-05	
20	22-10-19	87 021	-0.041	1.646	1.656	1.019	1.8981	0.6310	0.6876		0.0688	3 514	4.63E-04		2.85E-04	

NOTE: Compression index (C_c) and swelling index (C_s), such as constrained modules (E_{oed}) and compressibility coefficient (a_v), are estimated between a pressure step and the immediately preceding as a first approximation, taking for calculatin the obtained void ratio values in the end of the considered pressure stage.

REMARKS

SWELLING PRESSURE IS DETERMINED APPLYING SUCCESSIVE PRESSURE STAGES. ONCE REACHED THE EQUILIBRIUM SITUATION THE TEST CONTINUES WITH THE PRESSURE STAGE IMMEDIATELY SUPERIOR TO THE SWELLING PRESSURE

Operator: ALEX VANCELLS

Test final date: 23/10/2019

Report num.: CB0019-19-0005
 Edition date:

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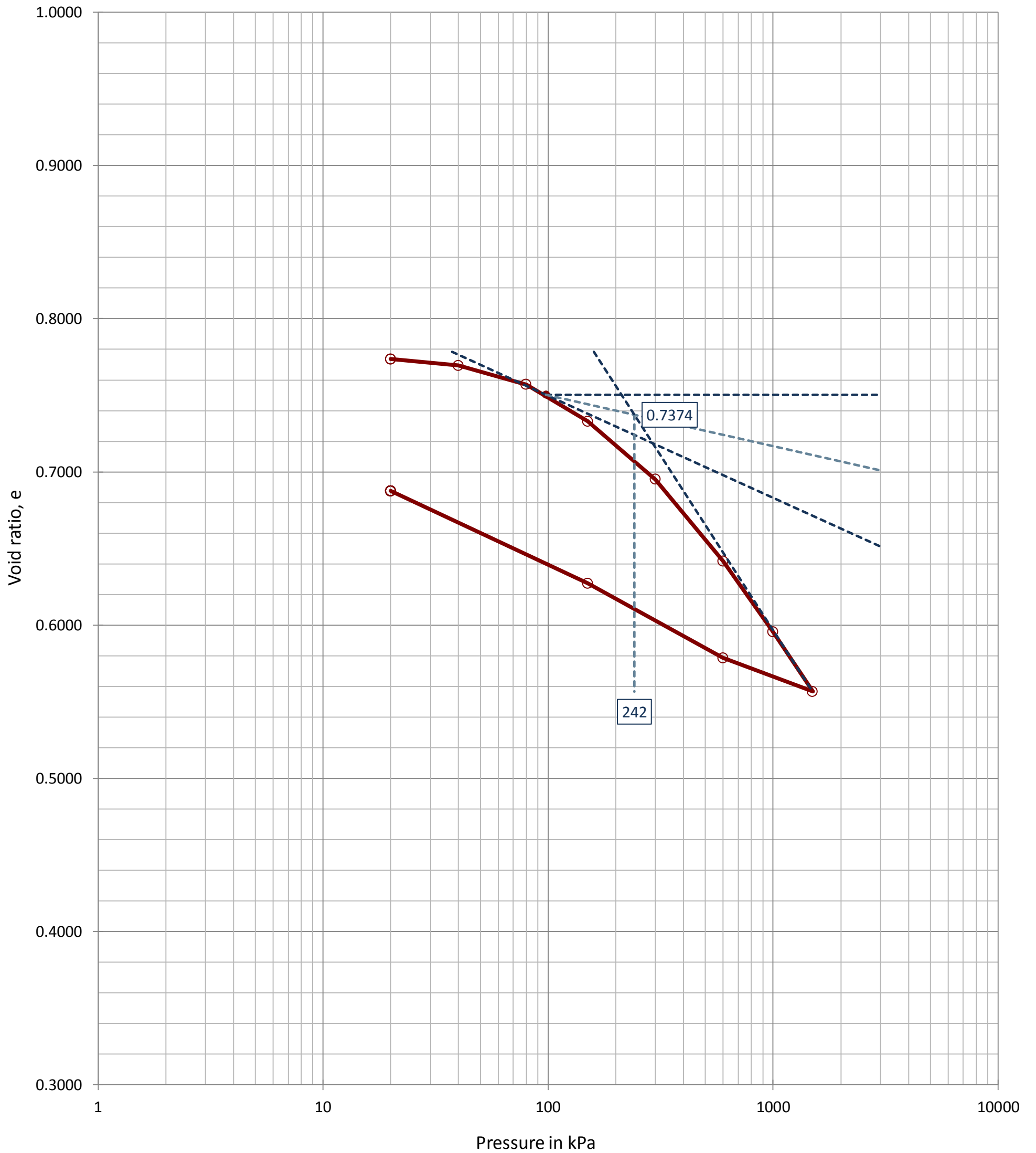
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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
OEDOMETRIC CURVE

Sample reference
MB19-0418

Initial void ratio	0.7783
Final void ratio	0.6876
Initial moisture content (%)	27.9
Final moisture content (%)	28.1

Preconsolidation pres., σ'_p (kPa)	242
Void ratio	0.7374
Determination method	Casagrande
Compression index, cc	0.2280



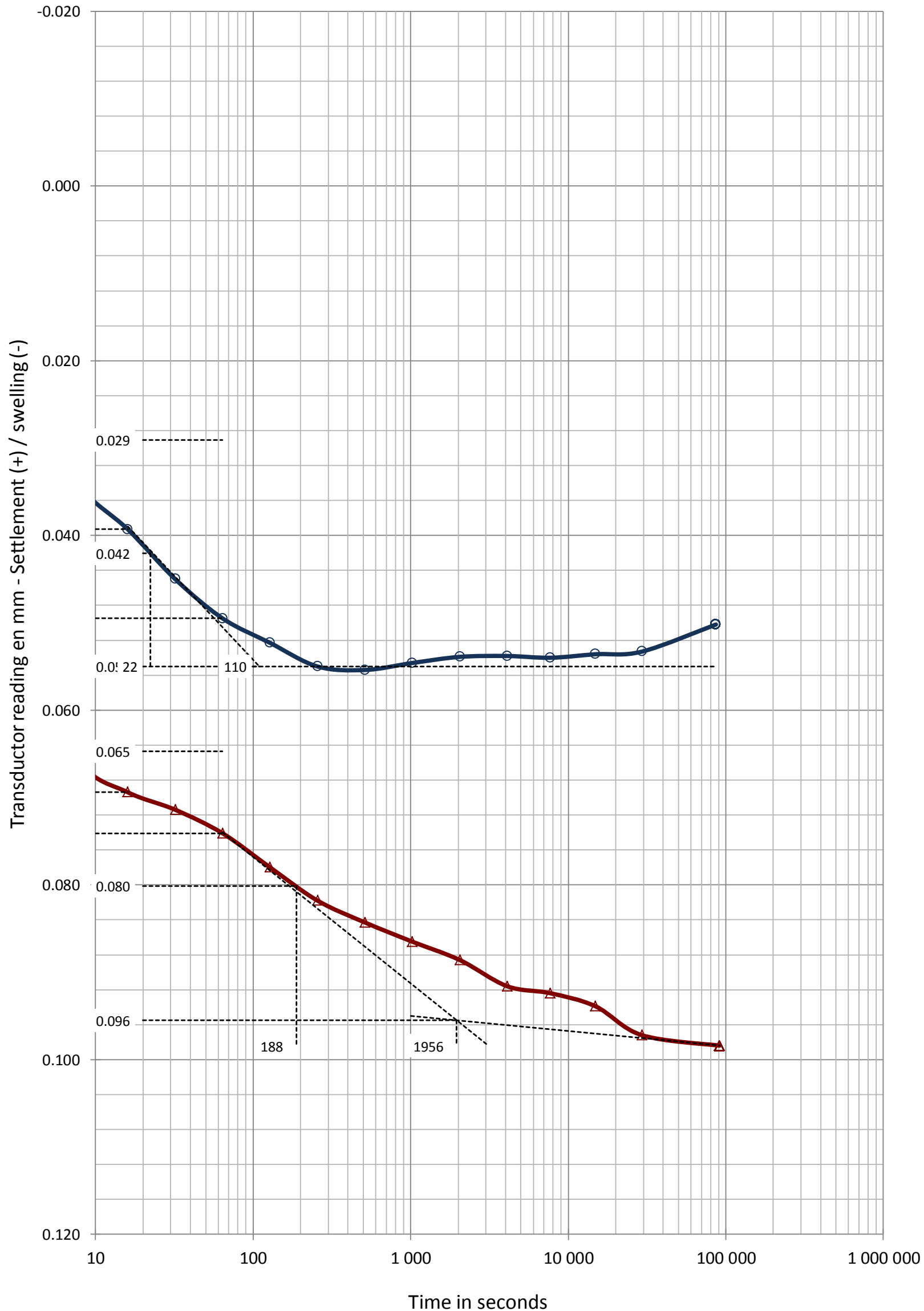
Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference
MB19-0418

Pressure stage (kPa)	20	40	Specimen diameter (cm)	5.200
L0 (Casagrande method)	0.029	0.065	Specimen initial height (cm)	2.000

Pressure stages					
Date	Date				
08-oct-19	09-oct-19				
Pressure (kPa)	Pressure (kPa)				
20	40				
Readings	Readings				
Settlement (+)	Settlement (+)				
sg	sg				
mm	mm				
e	e				
1	-0.006	0.7788	1	0.050	0.7738
2	0.011	0.7773	2	0.035	0.7751
4	0.026	0.7759	4	0.055	0.7733
8	0.035	0.7752	8	0.066	0.7724
16	0.039	0.7748	16	0.069	0.7721
32	0.045	0.7743	32	0.071	0.7719
64	0.050	0.7739	64	0.074	0.7717
128	0.052	0.7736	128	0.078	0.7713
256	0.055	0.7734	256	0.082	0.7710
512	0.055	0.7733	512	0.084	0.7708
1 024	0.055	0.7734	1 024	0.087	0.7706
2 048	0.054	0.7735	2 048	0.089	0.7704
4 096	0.054	0.7735	4 096	0.092	0.7701
7 696	0.054	0.7735	7 696	0.092	0.7700
14 896	0.054	0.7735	14 896	0.094	0.7699
29 296	0.053	0.7735	29 296	0.097	0.7696
86 469	0.050	0.7738	91 237	0.098	0.7695



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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0418

Pressure stages

Pressure stage (kPa)	80	150	Specimen diameter (cm)	5.200
L0 (Casagrande method)	0.140	0.320	Specimen initial height (cm)	2.000

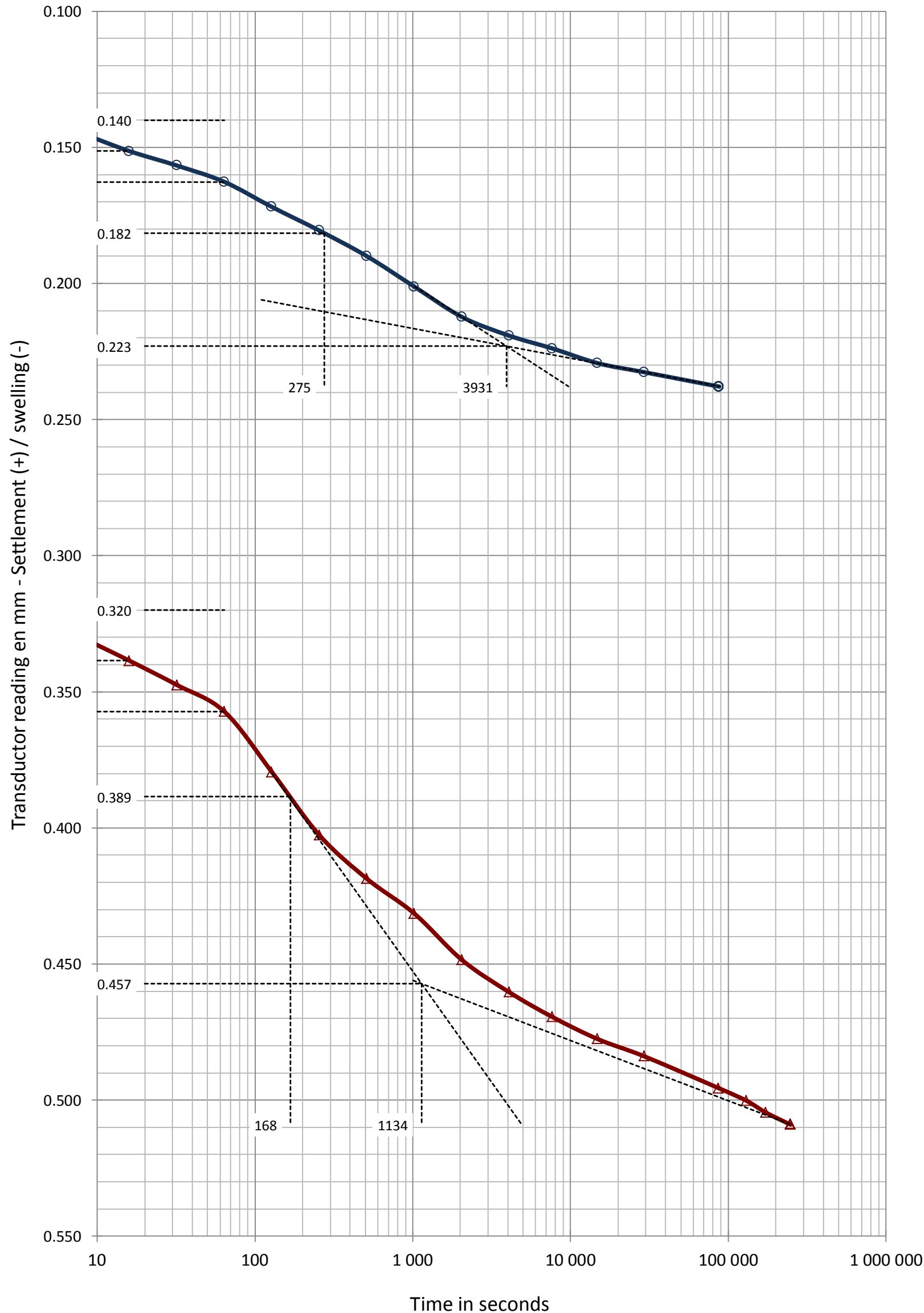
Date	Date
10-oct-19	11-oct-19

Pressure (kPa) Pressure (kPa)

80 **150**

Readings Void Readings Void
 Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e



sg	mm	e	sg	mm	e
0	0.098	0.7695	0	0.238	0.7571
1	0.098	0.7695	1	0.238	0.7571
2	0.102	0.7692	2	0.240	0.7569
4	0.140	0.7658	4	0.323	0.7496
8	0.145	0.7654	8	0.330	0.7489
16	0.151	0.7648	16	0.339	0.7481
32	0.157	0.7643	32	0.348	0.7474
64	0.163	0.7638	64	0.357	0.7465
128	0.172	0.7630	128	0.380	0.7445
256	0.181	0.7622	256	0.403	0.7424
512	0.190	0.7614	512	0.419	0.7410
1 024	0.201	0.7604	1 024	0.432	0.7399
2 048	0.212	0.7594	2 048	0.449	0.7384
4 096	0.219	0.7588	4 096	0.460	0.7373
7 696	0.224	0.7583	7 696	0.470	0.7365
14 896	0.229	0.7579	14 896	0.478	0.7358
29 296	0.233	0.7576	29 296	0.484	0.7352
87 634	0.238	0.7571	86 896	0.496	0.7342
			130 096	0.500	0.7338
			173 296	0.505	0.7334
			248 048	0.509	0.7330

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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0418

Pressure stages

Pressure stage (kPa)	300	600	Specimen diameter (cm)	5.200
L0 (Casagrande method)	0.587	1.019	Specimen initial height (cm)	2.000

Date	Date
14-oct-19	15-oct-19

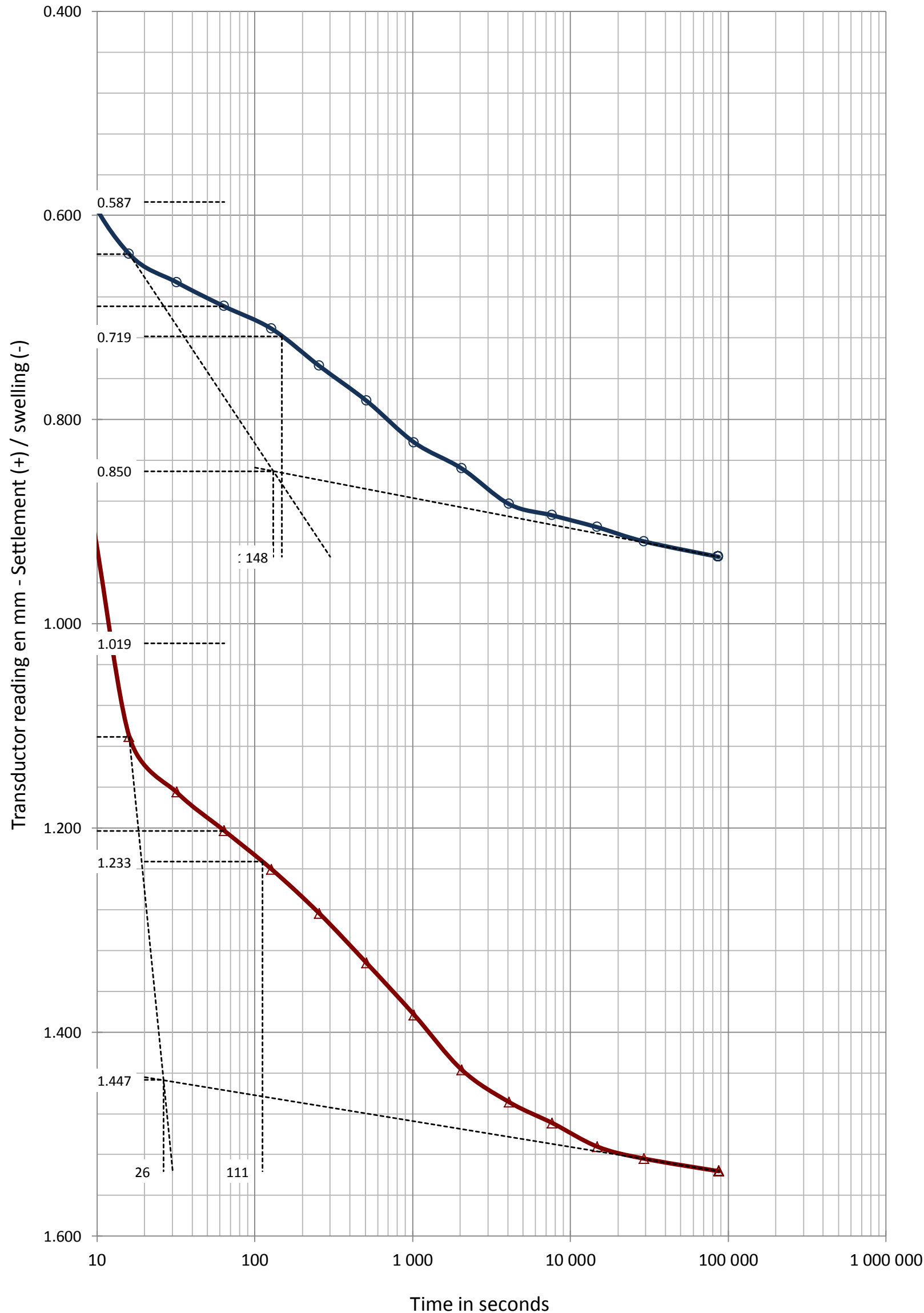
Pressure (kPa) Pressure (kPa)

300 **600**

Readings Void Readings Void
 Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e

0	0.509	0.7330	0	0.935	0.6952
1	0.509	0.7330	1	0.935	0.6951
2	0.443	0.7389	2	0.862	0.7016
4	0.432	0.7399	4	0.842	0.7034
8	0.565	0.7280	8	0.855	0.7023
16	0.638	0.7215	16	1.111	0.6795
32	0.666	0.7191	32	1.165	0.6747
64	0.689	0.7170	64	1.203	0.6713
128	0.711	0.7150	128	1.241	0.6679
256	0.748	0.7118	256	1.284	0.6641
512	0.782	0.7087	512	1.333	0.6598
1 024	0.823	0.7051	1 024	1.383	0.6553
2 048	0.848	0.7029	2 048	1.437	0.6505
4 096	0.883	0.6998	4 096	1.469	0.6477
7 696	0.894	0.6988	7 696	1.489	0.6458
14 896	0.906	0.6977	14 896	1.512	0.6438
29 296	0.919	0.6965	29 296	1.524	0.6427
86 924	0.935	0.6952	87 288	1.536	0.6417



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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0418

Pressure stages

Pressure stage (kPa)	1000	1500	Specimen diameter (cm)	5.200
L0 (Casagrande method)	1.586	2.072	Specimen initial height (cm)	2.000

Date	Date
16-oct-19	17-oct-19

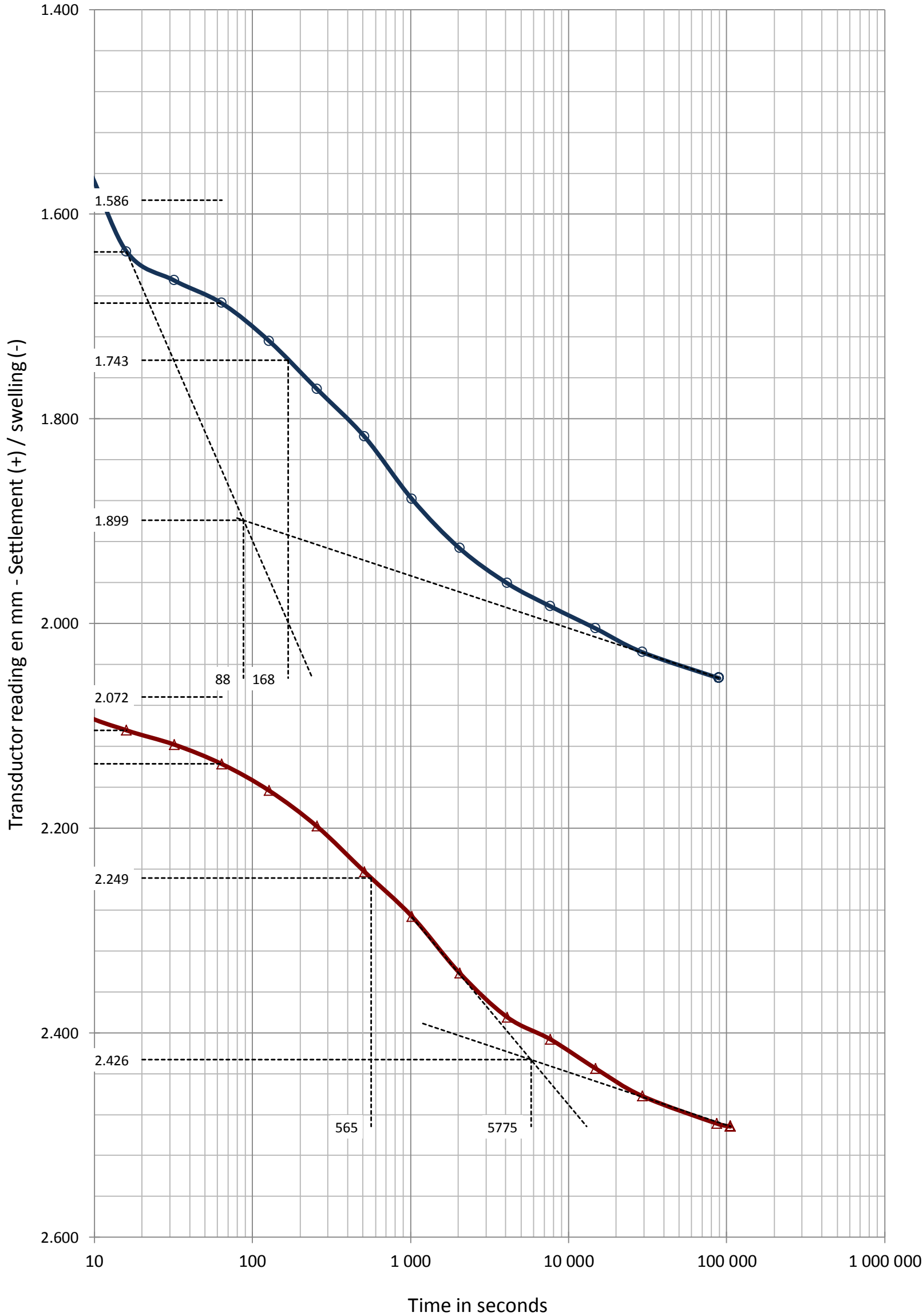
Pressure (kPa) Pressure (kPa)

1000 1500

Readings Void Readings Void

Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e



0	1.536	0.6417	0	2.054	0.5957
1	1.536	0.6417	1	2.054	0.5957
2	1.534	0.6419	2	2.050	0.5960
4	1.534	0.6419	4	2.050	0.5960
8	1.542	0.6412	8	2.087	0.5927
16	1.637	0.6327	16	2.105	0.5911
32	1.665	0.6302	32	2.118	0.5899
64	1.687	0.6282	64	2.137	0.5882
128	1.724	0.6249	128	2.164	0.5859
256	1.771	0.6208	256	2.198	0.5828
512	1.818	0.6166	512	2.243	0.5788
1 024	1.879	0.6112	1 024	2.287	0.5749
2 048	1.927	0.6069	2 048	2.342	0.5700
4 096	1.961	0.6039	4 096	2.385	0.5662
7 696	1.983	0.6019	7 696	2.407	0.5643
14 896	2.005	0.6000	14 896	2.435	0.5617
29 296	2.028	0.5979	29 296	2.462	0.5593
89 615	2.054	0.5957	89 615	2.489	0.5570
			105 564	2.492	0.5567



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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

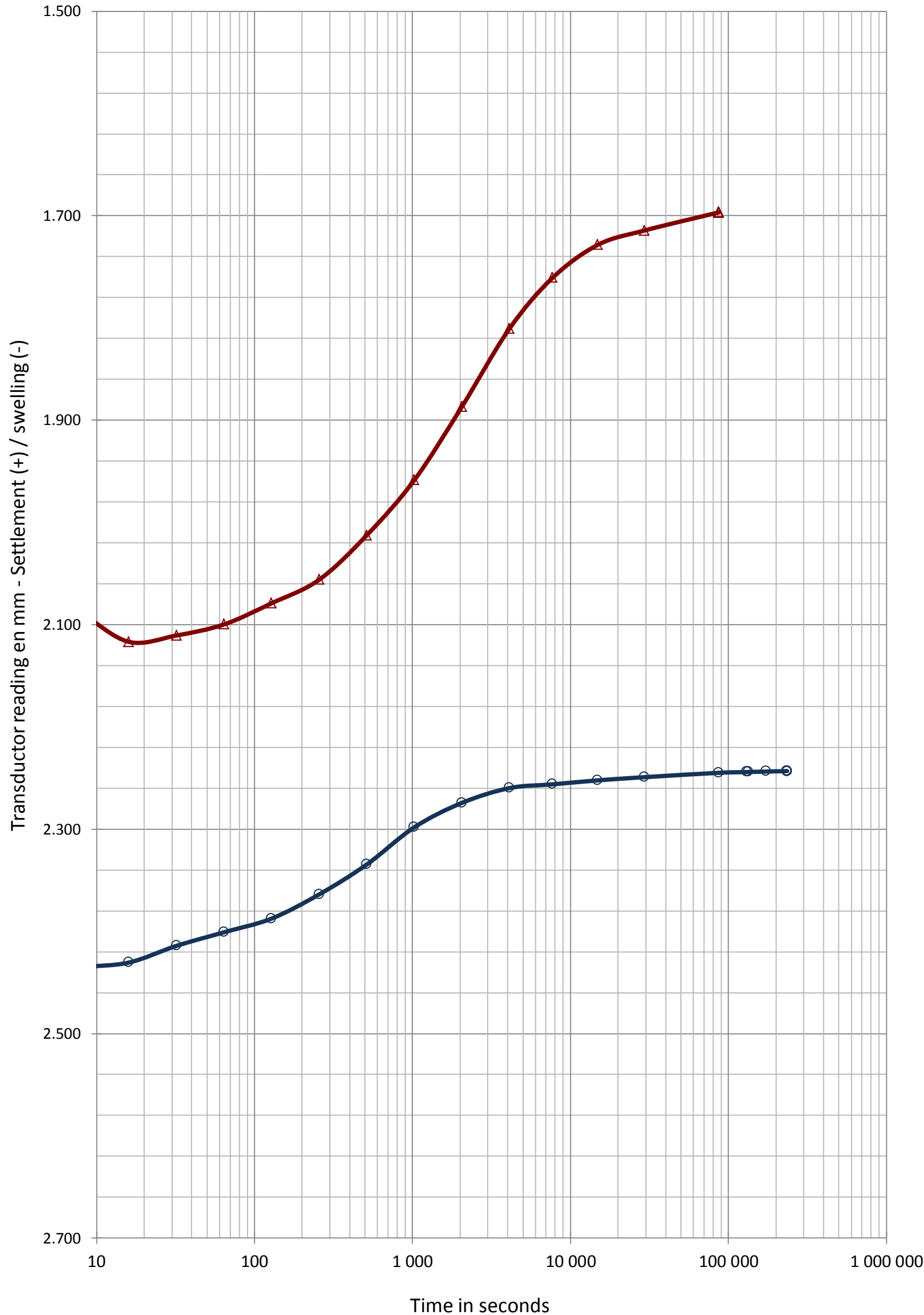
MB19-0418

Pressure stages

Pressure stage (kPa)	600	150	Specimen diameter (cm)	5.200
L0 (Casagrande method)	2.460	2.134	Specimen initial height (cm)	2.000

Date	Date
18-oct-19	21-oct-19

Pressure (kPa)	Pressure (kPa)
600	150



Readings	Void ratio	Readings	Void ratio		
Settlement (+)		Settlement (+)			
sg	mm	e	sg	mm	e

0	2.492	0.5567	0	2.243	0.5788
1	2.492	0.5567	1	2.175	0.5848
2	2.473	0.5584	2	0.228	0.7580
4	2.444	0.5609	4	2.060	0.5951
8	2.435	0.5617	8	2.089	0.5926
16	2.431	0.5621	16	2.117	0.5900
32	2.414	0.5636	32	2.111	0.5906
64	2.401	0.5648	64	2.100	0.5916
128	2.388	0.5660	128	2.079	0.5934
256	2.364	0.5681	256	2.056	0.5954
512	2.335	0.5707	512	2.013	0.5993
1 024	2.298	0.5739	1 024	1.959	0.6041
2 048	2.274	0.5760	2 048	1.887	0.6105
4 096	2.260	0.5773	4 096	1.811	0.6173
7 696	2.256	0.5776	7 696	1.761	0.6217
14 896	2.252	0.5780	14 896	1.729	0.6246
29 296	2.249	0.5783	29 296	1.715	0.6258
86 896	2.245	0.5787	86 577	1.697	0.6274
130 096	2.244	0.5787			
133 696	2.244	0.5787			
173 296	2.244	0.5788			
235 243	2.243	0.5788			

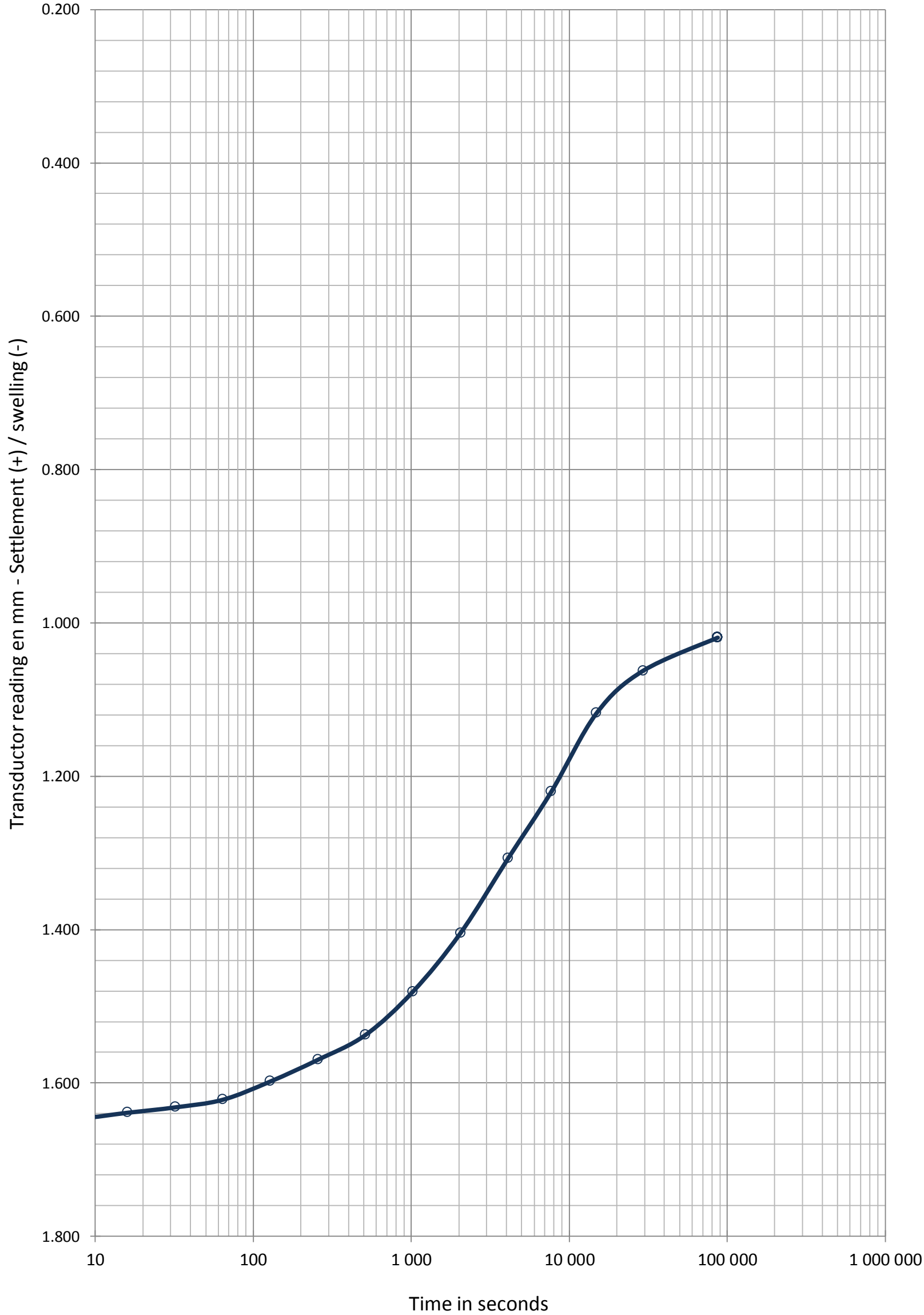
Operator:

Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference
MB19-0418

Pressure stage (kPa) **20** Specimen diameter (cm) **5.200**
 L0 (Casagrande method) **1.656** Specimen initial height (cm) **2.000**



Pressure stages			
Date		Date	
22-oct-19			
Pressure (kPa)	Pressure (kPa)		
20			
Readings	Void ratio	Readings	Void ratio
Settlement (+)	e	Settlement (+)	e
sg	mm	sg	mm
0	1.697	0.6274	
1	1.695	0.6276	
2	1.650	0.6315	
4	1.642	0.6323	
8	1.646	0.6319	
16	1.639	0.6325	
32	1.632	0.6332	
64	1.622	0.6340	
128	1.598	0.6362	
256	1.570	0.6387	
512	1.538	0.6415	
1 024	1.481	0.6466	
2 048	1.405	0.6534	
4 096	1.307	0.6620	
7 696	1.220	0.6698	
14 896	1.118	0.6789	
29 296	1.063	0.6838	
87 021	1.019	0.6876	

Report num.:	CB0019-19-0005
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FALL CONE TEST - ISO 17892-6:2017

MB19-0418

Equipment
PENETROMETER MATEST B057-11

Legend of symbols
cu Calculated Undrained Shear Strength (kPa)
cu(corr) Corrected Undrained Shear Strength (kPa)
cur Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	62.5	5.06	4.84	4.66	6.45	5.253	400	30	142	120	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	142
Corrected Undrained Shear Strength, cu(corr) (kPa)	120

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	4.49	5.12	4.56	4.76	4.733	400	30	140	
1	1	4.73	4.39	4.35	4.06	4.383	400	30	163	
1	3	4.39	3.76	3.95	4	4.025	400	30	194	
1	7	3.77	4.11	3.55	3.78	3.803	400	30	217	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	140

Thixotropy	
Loss at remoulding (%)	1
Recovery after 1 day (%)	1150
Recovery after 7 days (%)	3850

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm WITH THE EXCEPTION OF THE INTACT SAMPLE AT 0 DAYS, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



20 / 20

Sample reference

MB19-0418

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: ALEX VANCELLS

Test final date: 23-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.254 g

Equipment:

RESULT: **69.2 g/kg (total)**

MUFLA OVEN ETI HD150

63.9 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 1.561 g

Equipment:

RESULT: **44.5 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0419

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_0Bis P_0Bis.6
Top depth, m	0.4
Bottom depth, m	0.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark gray (2.5Y 3/1) fine SAND with rare fine to medium gravel, frequent pockets of medium to coarse sand, rare clay pockets occasional wood fragments and frequent shell fragments (fine to medium gravel sized)	0.4	
	0.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0419



REMARKS

Operator: ALEX VANCELLS

Date: 18/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0419

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	109.69
Tare + soil + water (g)	222.46
Tare + soil (g)	207.89
Water (g)	14.57
Soil (g)	98.20
Moisture, w (%)	14.8

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Moisture content, w (%)	14.8

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	98.90
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.97
Dry density (Mg/m ³)	1.72

Operator: MARC COLOMER
Test final date: 18/06/2019

Results	
Bulk density (Mg/m³)	1.97
Dry density (Mg/m³)	1.72

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

MB19-0420

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_0Bis P_0Bis.5
Top depth, m	0.9
Bottom depth, m	1.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	60
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

USCS classification	CL
ISO classification	sasiCl

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Black (5Y 2.5/2) clayey SILT with thinly bedded fine sand.	0.9	
	1.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
FALL CONE TEST - ISO 17892-6:2017
UNCONSOLIDATED UNDRAINED TRIAXIAL TEST, UU 1.5' - ISO 17892-8:2018
INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0420



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 18/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0420

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.30
Tare + soil + water (g)	207.82
Tare + soil (g)	192.93
Water (g)	14.89
Soil (g)	81.63
Moisture, w (%)	18.2

Drying temperature (°C) 105

Operator: GUILLEM MASSALLÉ
Test final date: 19/06/2019

Results	
Moisture content, w (%)	18.2

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	102.43
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.04
Dry density (Mg/m ³)	1.73

Operator: MARC COLOMER
Test final date: 18/06/2019

Results	
Bulk density (Mg/m³)	2.04
Dry density (Mg/m³)	1.73

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	185.1860
Soil mass, M1 (g)	10.9950
Particle density, G20°C (Mg/m ³)	2.710

Operator: ALEX VANCELLS
Test final date: 21/10/2019

Results	
Particle density (Mg/m³)	2.710

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0420

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

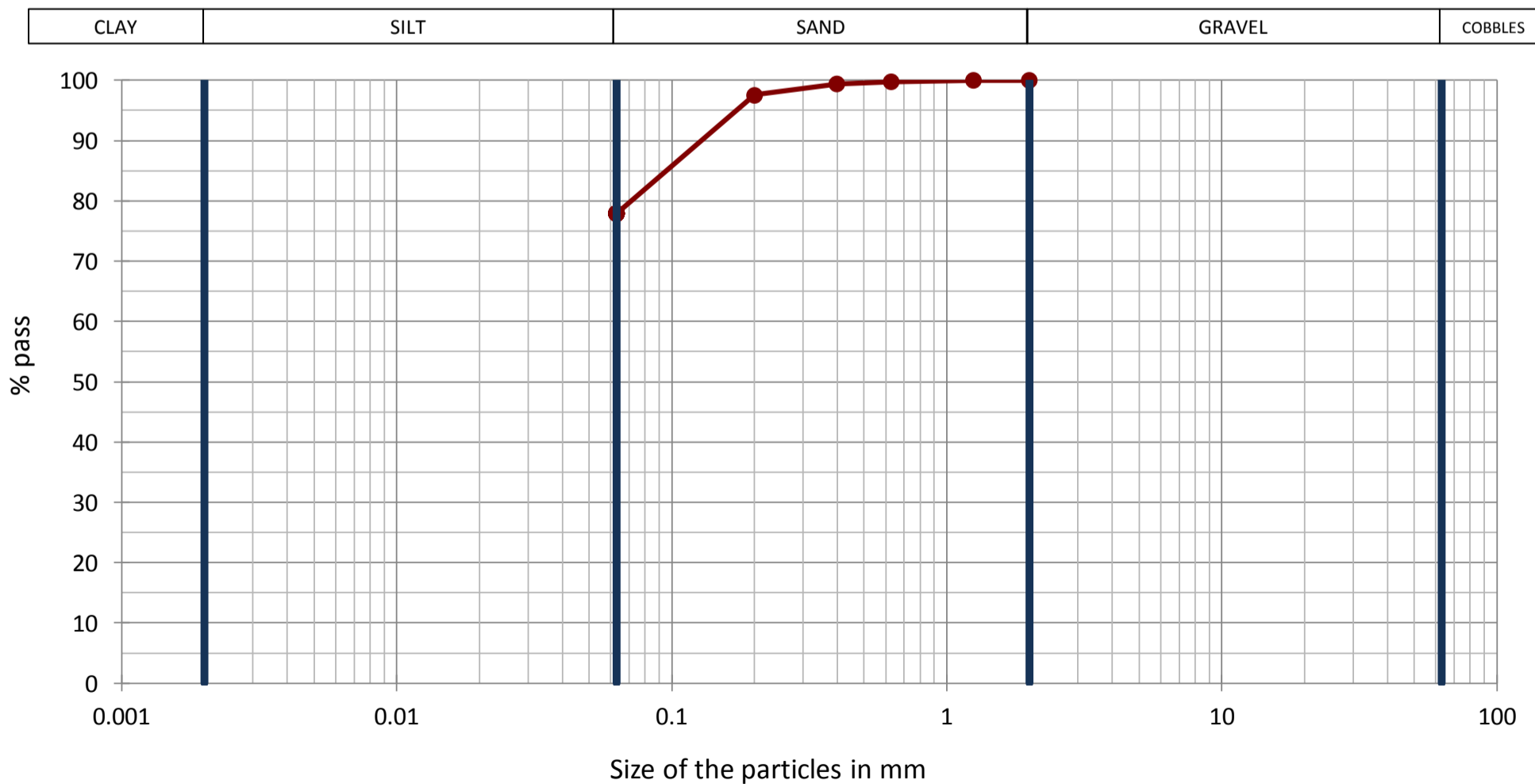
Previous calculations
 Total dried sample (g) **102.90**

 Hygrosc. moisture, % (fraction < 2 mm) **1.4**
 Corr. parameter, f (fraction < 2 mm) **0.9863**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
2		0.00	0.0	101.49	100.0
1.25		0.01	0.0	101.48	100.0
0.63		0.22	0.2	101.26	99.8
0.4		0.38	0.6	100.88	99.4
0.2		1.83	2.4	99.05	97.6
0.063		20.04	22.1	79.01	77.9

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	22.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.2	77.9	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	2.2		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	19.7		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0420

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	30.13
Hygroscopic moisture, W (%)	1.4
Tested and dried soil mass, m (g)	29.72
Particle density (Mg/m ³)	2.710

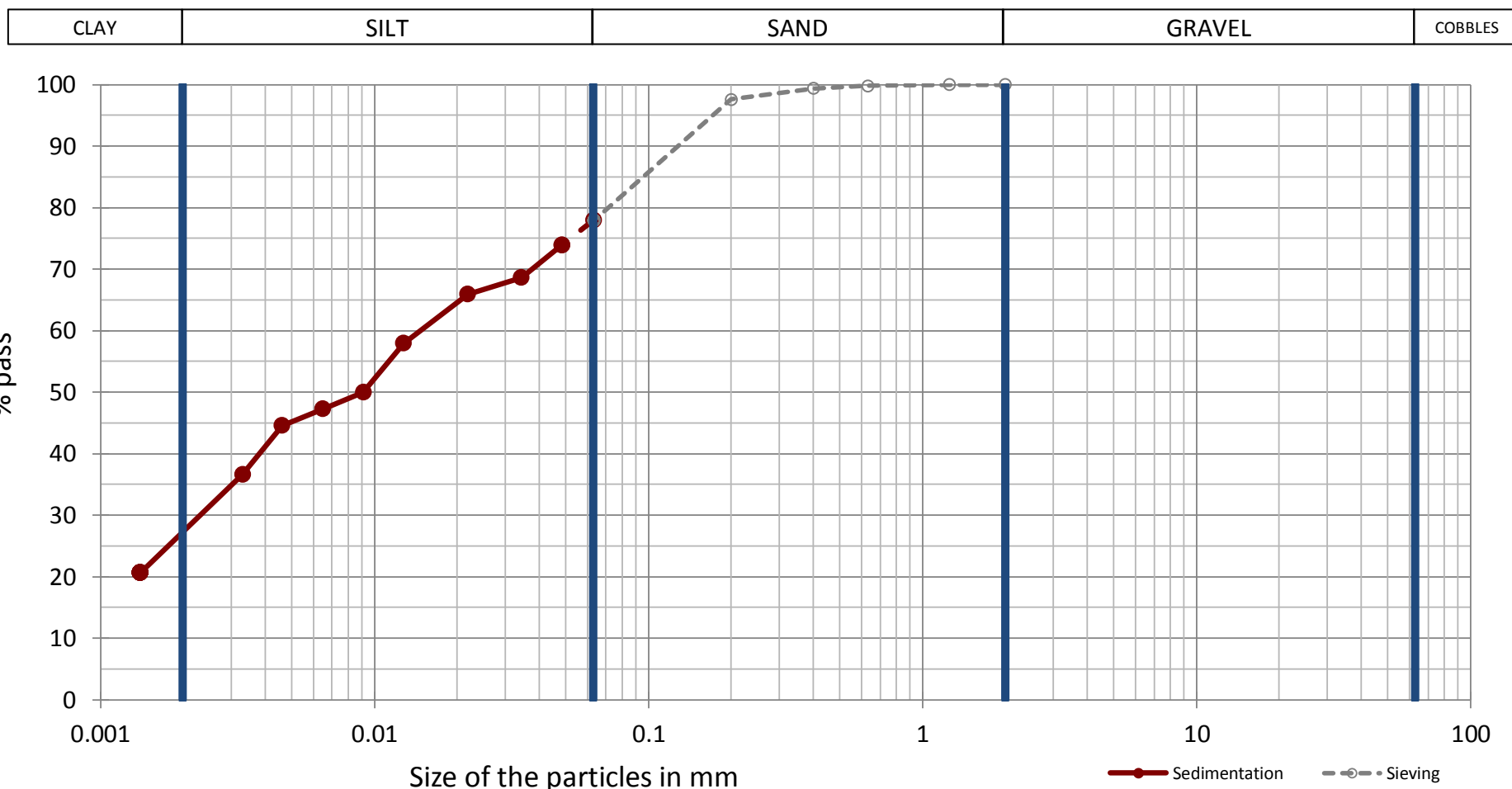
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	23	1.0180	18	139.6	13.9	0.0483	73.9
2	23	1.0170	17	142.0	12.9	0.0344	68.6
5	23	1.0165	16.5	143.2	12.4	0.0219	65.9
15	23	1.0150	15	146.7	10.9	0.0128	57.9
30	23	1.0135	13.5	150.3	9.4	0.0091	49.9
60	23	1.0130	13	151.5	8.9	0.0065	47.3
120	23	1.0125	12.5	152.7	8.4	0.0046	44.6
240	23	1.0110	11	156.2	6.9	0.0033	36.6
1440	23	1.0080	8	163.4	3.9	0.0014	20.6

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	77.9
Silt, between 0.063 and 0.002 mm (%)	52.2
Clay, smaller than 0.002 mm (%)	25.7



REMARKS

Operator: ALEX VANCELLS

Test final date: 25/10/2019

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0420

DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data

Type of cone used	80 g/30°			
Cone penetration (mm)	22.31	18.81	17.24	24.12
Water (g)	7.36	6.97	6.18	7.29
Mass moist soil + cont. (g)	54.66	52.27	51.50	53.27
Mass dry soil + cont. (g)	47.30	45.30	45.32	45.98
Mass container (g)	31.98	29.98	31.24	31.41
Soil (g)	15.32	15.32	14.08	14.57
Water content (%)	48.0	45.5	43.9	50.0

Equipment

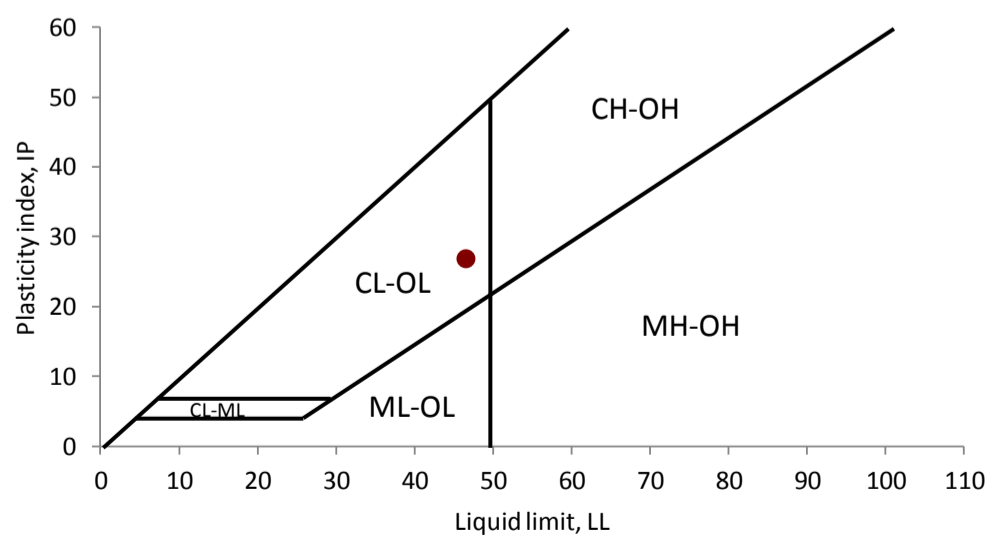
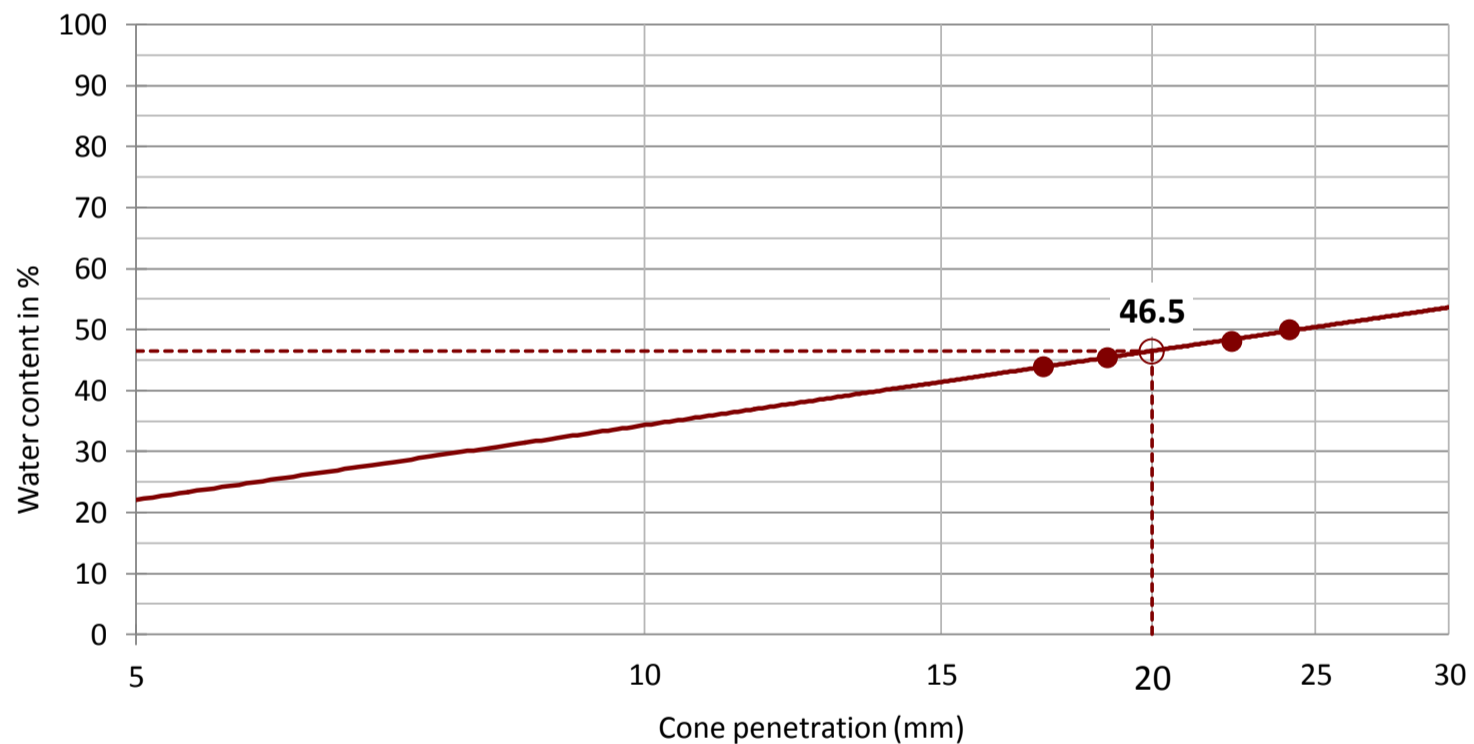
PENETROMETER MATEST B057-11
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Plastic Limit data

Water (g)	1.18	0.77		
Mass moist soil + cont. (g)	30.98	27.76		
Mass dry soil + cont. (g)	29.80	26.99		
Mass container (g)	23.88	23.00		
Soil (g)	5.92	3.99		
Water content (%)	19.9	19.3		

Results

Liquid limit, LL	46.5
Plastic limit, LP	19.6
Plasticity index, IP	26.9
Natural water content (%)	18.2
Liquidity index, IL	-0.1
Consistency index, IC	1.1



REMARKS

Report num.:	CB0019-19-0005
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UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0420

Equipment	
MECACISA 1.5' TRIAXIAL CHAMBER PRESSURE SYSTEM MECACISA 220004 TRIAXIAL LOAD FRAME MECACISA 210715 ELEC. DEF. TRANSD. SCHREIBER SM260 PC WITH SOFTWARE MECASOFT	

Test type	Unconsolidated Undrained (UU)
Soil conditions	UNDISTURBED

Soil sample data	
Specimen number	I
Initial length (cm)	7.733
Initial diameter (cm)	3.825
Initial area (cm ²)	11.491
Initial volume (cm ³)	88.860
Initial moisture content (%)	27.4
Final moisture content (%)	27.2
Initial bulk density (Mg/m ³)	1.89
Initial dry density (Mg/m ³)	1.48
Initial saturation degree (%)	89.3
Particle density (Mg/m ³)	2.710

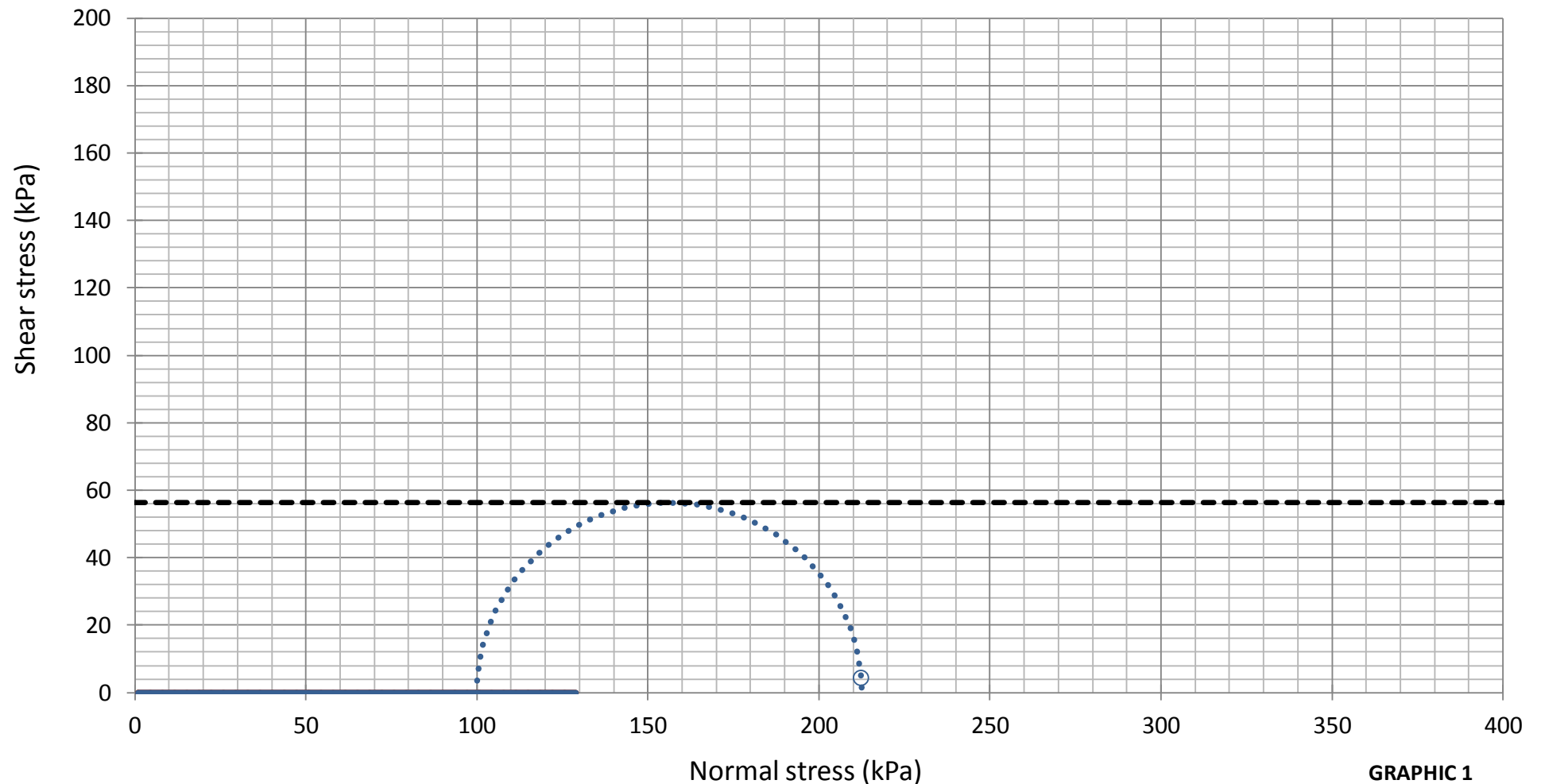
Prior saturation process	
Saturation prior to test	NO

Failure test results	
Specimen number	I
σ ₁ (kPa)	212.5
σ ₃ (kPa)	100.0
(σ ₁ -σ ₃)/2 (kPa)	56.3
(σ ₁ +σ ₃)/2 (kPa)	156.3

Test data and results	
Chamber pressure (kPa)	100
Back pressure, u _b (kPa)	0
Rate of axial displ. (mm/min)	0.9084
Major principal stress (kPa)	112.8
Failure stress (kPa)	112.5
Failure strain (%)	15.0

Estimate total	
Φ _u (°)	0.0
C _u (kPa)	56
C _u (kp/cm ²)	0.57

Graphic symbols						
	I total	II total	III total			



GRAPHIC 1

REMARKS

Operator: ALEX VANCELLS

Test final date: 24/09/2019

Report num.: CB0019-19-0005
Edition date:

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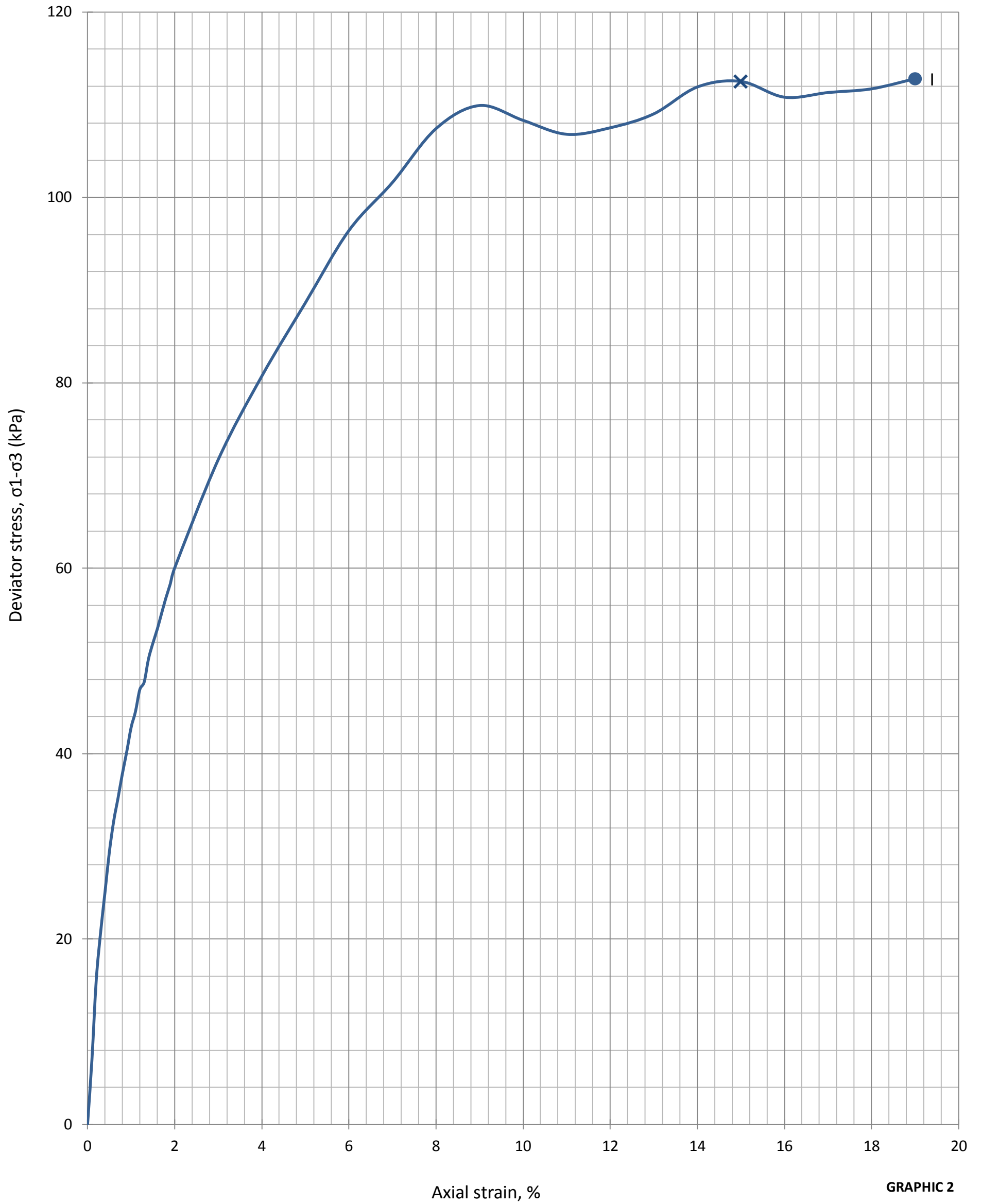


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Sample reference

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0420



GRAPHIC 2



Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0420

Failure process data summary

	Time sg	Deform. %	$(\sigma_1 - \sigma_3)_m$ kPa	$(\Delta\sigma_1)_m$ kPa	$(\Delta\sigma_1)_{fp}$ kPa	$(\sigma_1 - \sigma_3)$ kPa	u-ub kPa	ϵ_1	σ_1 kPa	σ'_1 kPa	σ'_3 kPa	Coeff. A	$(\sigma_1 + \sigma_3)/2$ kPa	$(\sigma_1 - \sigma_3)/2$ kPa	$(\sigma'_1 + \sigma'_3)/2$ kPa	$(\sigma'_1 - \sigma'_3)/2$ kPa
Specimen	0	0	0.0	0.0	0.0	0.0		0.000	100.0				100.0	0.0		
I	5	0.1	6.9	0.0	0.0	6.9		0.001	106.9				103.5	3.5		
Chamber pressure	15	0.3	20.8	0.1	0.0	20.7		0.003	120.7				110.4	10.4		
σ_3 , kPa	25	0.499	29.4	0.1	0.0	29.3		0.005	129.3				114.7	14.7		
100	35	0.7	35.4	0.2	0.0	35.2		0.007	135.2				117.6	17.6		
Back pressure	45	0.9	40.5	0.3	0.0	40.2		0.009	140.2				120.1	20.1		
u_b , kPa	56	1.099	44.8	0.3	0.0	44.5		0.011	144.5				122.3	22.3		
0	66	1.3	48.1	0.4	0.0	47.7		0.013	147.7				123.9	23.9		
σ'_3 , kPa	76	1.5	52.3	0.4	0.0	51.9		0.015	151.9				126.0	26.0		
100	86	1.699	55.6	0.5	0.0	55.1		0.017	155.1				127.6	27.6		
Rate of axial displ.	96	1.9	58.9	0.6	0.0	58.3		0.019	158.3				129.2	29.2		
mm/min	153	3	72.6	0.9	0.0	71.7		0.030	171.7				135.9	35.9		
0.9084	263	4.999	90.1	1.5	0.0	88.6		0.050	188.6				144.3	44.3		
	362	7	103.6	2.0	0.0	101.6		0.070	201.6				150.8	50.8		
	464	8.999	112.5	2.6	0.0	109.9		0.090	209.9				155.0	55.0		
	573	11	110.0	3.2	0.0	106.8		0.110	206.8				153.4	53.4		
	674	13	112.8	3.8	0.0	109.0		0.130	209.0				154.5	54.5		
	774	14.999	116.9	4.4	0.0	112.5		0.150	212.5				156.3	56.3		
	882	17	116.3	5.0	0.0	111.3		0.170	211.3				155.7	55.7		
	986	18.999	118.4	5.6	0.0	112.8		0.190	212.8				156.4	56.4		
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																

Report num.:	CB0019-19-0005
Edition date:	

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017

MB19-0420

Test data	
Employee ring type	FIXED
Height (cm)	2.000
Diameter (cm)	5.020
Volume (cm ³)	39.58
Ring weight (g)	83.81
Ring+soil weight (g)	158.43
Ini. weight wet soil (g)	74.62
Soil part. density (Mg/m ³)	2.710
Initial moisture content (%)	32.8
Initial bulk density (Mg/m ³)	1.89
Initial dry density (Mg/m ³)	1.42
Initial saturation degree (%)	97.84
Final moisture content (%)	27.2
Final bulk density (Mg/m ³)	1.98
Final dry density (Mg/m ³)	1.56

Equipment	
OEDOMETER PROETI S0110 (PLACE 6)	
DATA ACQ. MODULE MECATEST-16	
ELECT. TRANSD. NOVOTECHNIK TR-10	

Soil conditions	UNDISTURBED
-----------------	-------------

Swelling Pressure Test	
Swelling Pressure (kPa)	< 20
(kg/cm ²)	< 0.2

Results	
Initial void ratio, e ₀	0.9085
Final void ratio, e _f	0.7369
Solid height, H _s (cm)	1.0479
Final height pore, H _{ps} (cm)	0.7722

Results																
Press. stage	Load date	Final time	Instant. settlement	Read. t= 8 sg	L ₀ (Casag. met.)	Final reading	Final sample height	Void ratio at L ₀	Final void ratio	Compr. ind. (*)	Swelling ind. (*)	Constr. mod. E _{oed} kPa	Compr. coef. a _v 1/kPa	Cons. coef. c _v cm ² /s	Compr. coef. m _v 1/kPa	Sec. cons. coef. C _α
kPa		sg	mm	mm	mm	mm	cm	e _{L0}	e _f	c _c	c _s					
20	04-10-19	251 005	0.113	0.113	0.090	0.228	1.9772	0.9000	0.8868					2.14E-03		0.00E+00
40	07-10-19	86 607	0.006	0.241	0.235	0.316	1.9684	0.8862	0.8784	0.0279		4 492	4.20E-04	6.08E-04	2.23E-04	6.55E-04
80	08-10-19	88 747	0.054	0.384	0.371	0.607	1.9393	0.8732	0.8506	0.0923		2 703	6.95E-04	8.62E-04	3.70E-04	1.27E-03
150	09-10-19	90 695	0.111	0.740	0.718	1.003	1.8997	0.8401	0.8129	0.1381		3 436	5.39E-04	5.31E-04	2.91E-04	1.50E-03
300	10-10-19	87 644	0.151	1.131	1.154	1.673	1.8327	0.7985	0.7489	0.2126		4 249	4.27E-04	6.62E-04	2.35E-04	1.69E-03
600	11-10-19	248 028	0.039	1.591	1.712	2.133	1.7867	0.7452	0.7051	0.1455		11 979	1.46E-04	6.42E-04	8.35E-05	1.44E-03
1000	14-10-19	87 202	0.042	2.188	2.175	2.543	1.7457	0.7010	0.6659	0.1767		17 399	9.80E-05	2.42E-04	5.75E-05	2.16E-03
1500	15-10-19	86 925	0.014	2.576	2.557	2.912	1.7088	0.6645	0.6307	0.1999		23 663	7.04E-05	2.42E-04	4.23E-05	2.77E-03
600	16-10-19	89 684	-0.033	2.865	2.879	2.744	1.7256	0.6339	0.6468		0.0405	91 157	1.79E-05		1.10E-05	
150	17-10-19	105 568	-0.067	2.663	2.677	2.330	1.7670	0.6531	0.6862		0.0654	18 809	8.76E-05		5.32E-05	
20	18-10-19	235 301	-0.046	2.273	2.285	1.799	1.8201	0.6906	0.7369		0.0579	4 324	3.90E-04		2.31E-04	

NOTE: Compression index (C_c) and swelling index (C_s), such as constrained modules (E_{oed}) and compressibility coefficient (a_v), are estimated between a pressure step and the immediately preceding as a first approximation, taking for calculating the obtained void ratio values in the end of the considered pressure stage.

REMARKS

SWELLING PRESSURE IS DETERMINED APPLYING SUCCESSIVE PRESSURE STAGES. ONCE REACHED THE EQUILIBRIUM SITUATION THE TEST CONTINUES WITH THE PRESSURE STAGE IMMEDIATELY SUPERIOR TO THE SWELLING PRESSURE

Operator: ALEX VANCELLS

Test final date: 22/10/2019

Report num.: CB0019-19-0005
 Edition date:

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 Reg. Num. LECCE L0600292



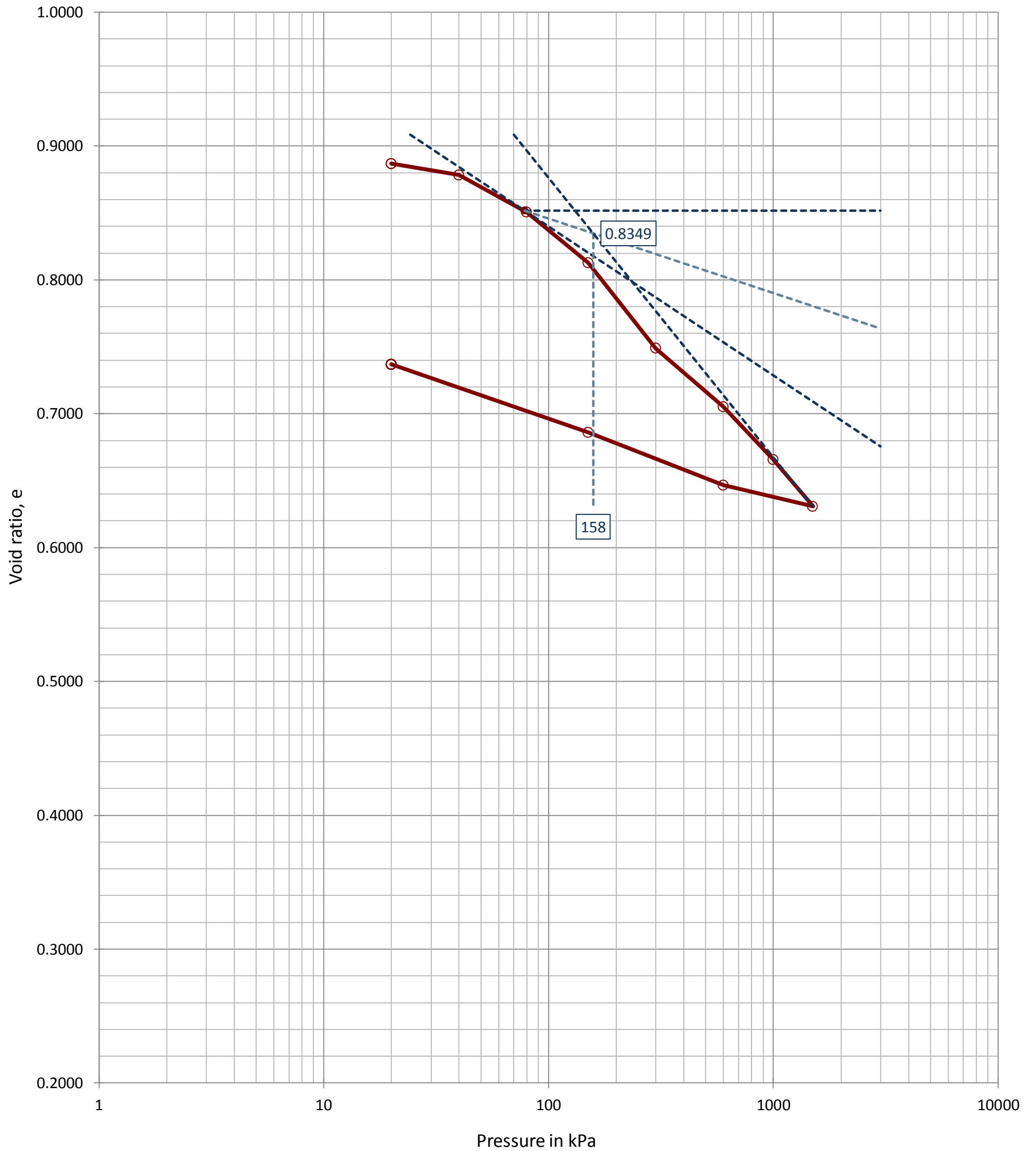
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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
OEDOMETRIC CURVE

Sample reference
MB19-0420

Initial void ratio	0.9085
Final void ratio	0.7369
Initial moisture content (%)	32.8
Final moisture content (%)	27.2

Preconsolidation pres., σ'_p (kPa)	158
Void ratio	0.8349
Determination method	Casagrande
Compression index, cc	0.2087



Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

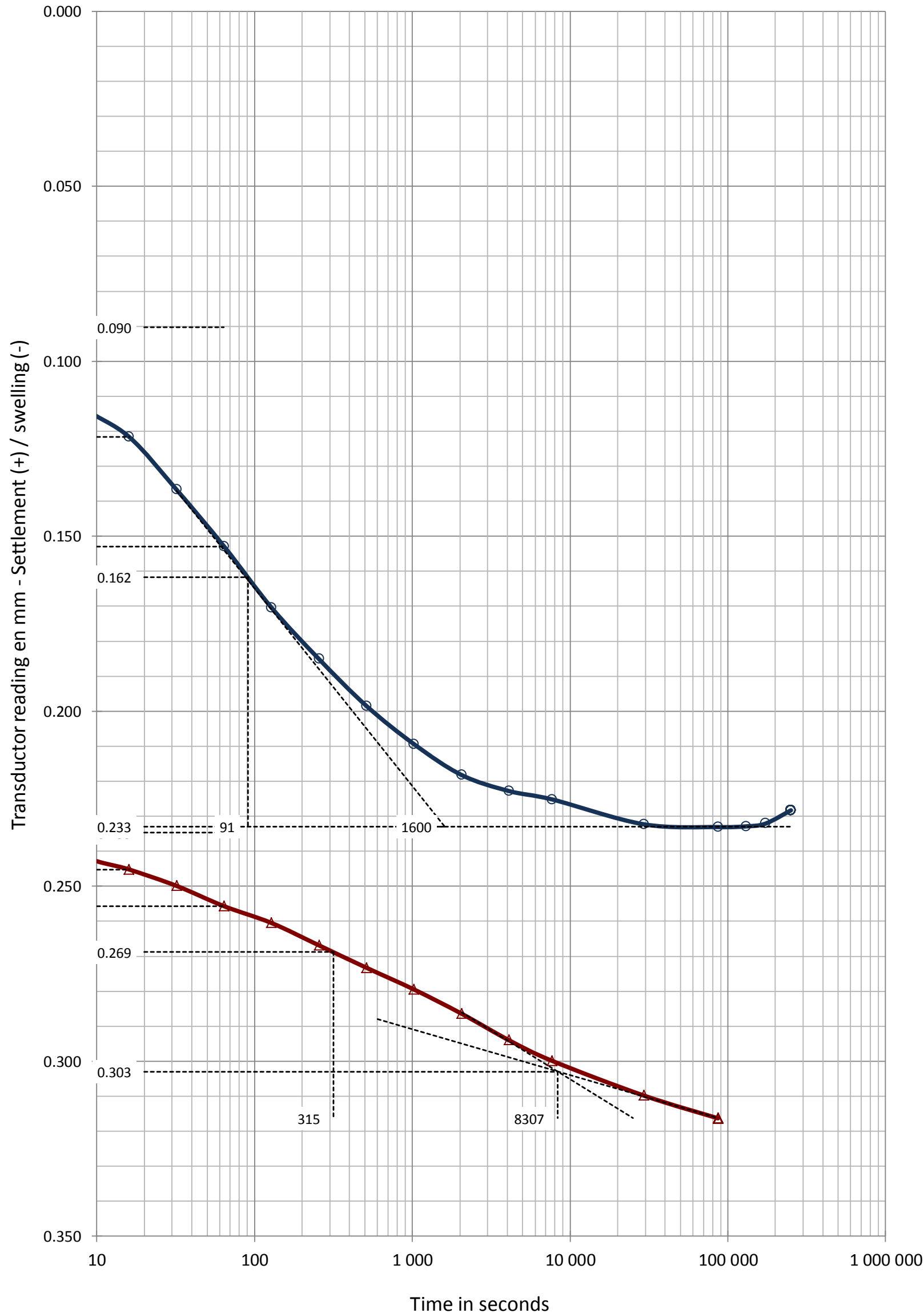
Sample reference

MB19-0420

Pressure stages

Pressure stage (kPa)	20	40	Specimen diameter (cm)	5.020
L0 (Casagrande method)	0.090	0.235	Specimen initial height (cm)	2.000

Date	Date
04-oct-19	07-oct-19



Pressure (kPa)

20 40

Readings: Void ratio
 Settlement (+) e

sg	mm	e	sg	mm	e
1	0.004	0.9082	1	0.228	0.8868
2	0.038	0.9049	2	0.220	0.8876
4	0.101	0.8989	4	0.230	0.8867
8	0.113	0.8978	8	0.241	0.8856
16	0.122	0.8970	16	0.245	0.8852
32	0.137	0.8955	32	0.250	0.8847
64	0.153	0.8940	64	0.256	0.8842
128	0.170	0.8923	128	0.261	0.8837
256	0.185	0.8909	256	0.267	0.8831
512	0.199	0.8896	512	0.273	0.8825
1 024	0.209	0.8886	1 024	0.280	0.8819
2 048	0.218	0.8878	2 048	0.286	0.8812
4 096	0.223	0.8873	4 096	0.294	0.8805
7 696	0.225	0.8871	7 696	0.300	0.8800
29 296	0.232	0.8864	29 296	0.310	0.8790
86 896	0.233	0.8863	86 607	0.316	0.8784
130 096	0.233	0.8864			
173 296	0.232	0.8864			
251 005	0.228	0.8868			

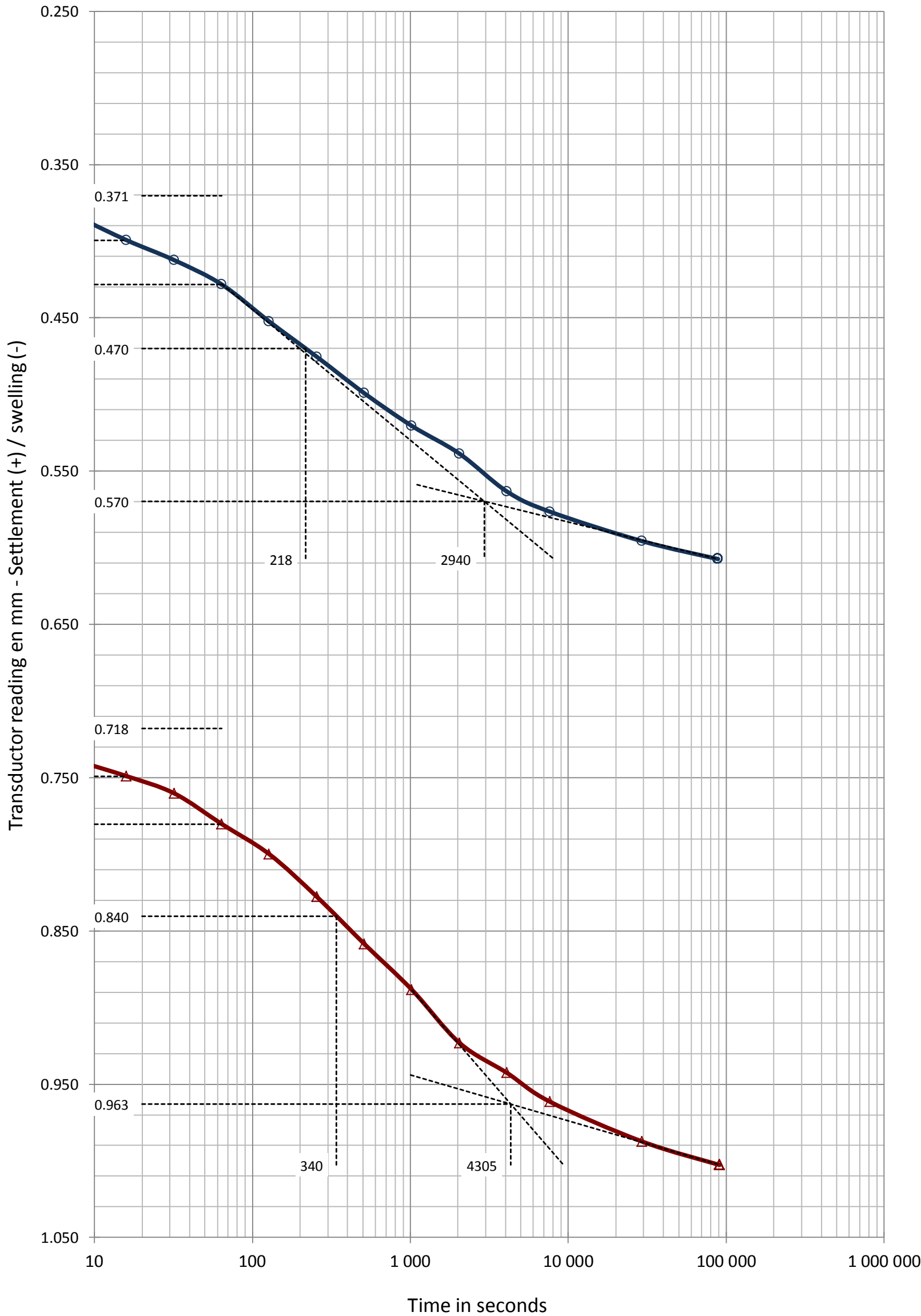
Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference
MB19-0420

Pressure stage (kPa) L0 (Casagrande method)	80 0.371	150 0.718	Specimen diameter (cm) Specimen initial height (cm)	5.020 2.000
--	---------------------------	----------------------------	--	------------------------------

Pressure stages	
Date	Date
08-oct-19	09-oct-19



80		150			
Readings	Void ratio	Readings	Void ratio		
Settlement (+)		Settlement (+)			
sg	mm	sg	mm		
0	0.316	0.8784	0	0.607	0.8506
1	0.313	0.8787	1	0.607	0.8506
2	0.318	0.8783	2	0.630	0.8484
4	0.367	0.8736	4	0.734	0.8386
8	0.384	0.8719	8	0.740	0.8380
16	0.399	0.8705	16	0.749	0.8371
32	0.412	0.8692	32	0.760	0.8360
64	0.428	0.8677	64	0.780	0.8341
128	0.453	0.8654	128	0.800	0.8322
256	0.476	0.8632	256	0.828	0.8296
512	0.499	0.8609	512	0.859	0.8266
1 024	0.521	0.8589	1 024	0.889	0.8238
2 048	0.539	0.8572	2 048	0.923	0.8205
4 096	0.563	0.8548	4 096	0.943	0.8186
7 696	0.577	0.8536	7 696	0.962	0.8168
29 296	0.596	0.8517	29 296	0.987	0.8144
88 747	0.607	0.8506	90 695	1.003	0.8129

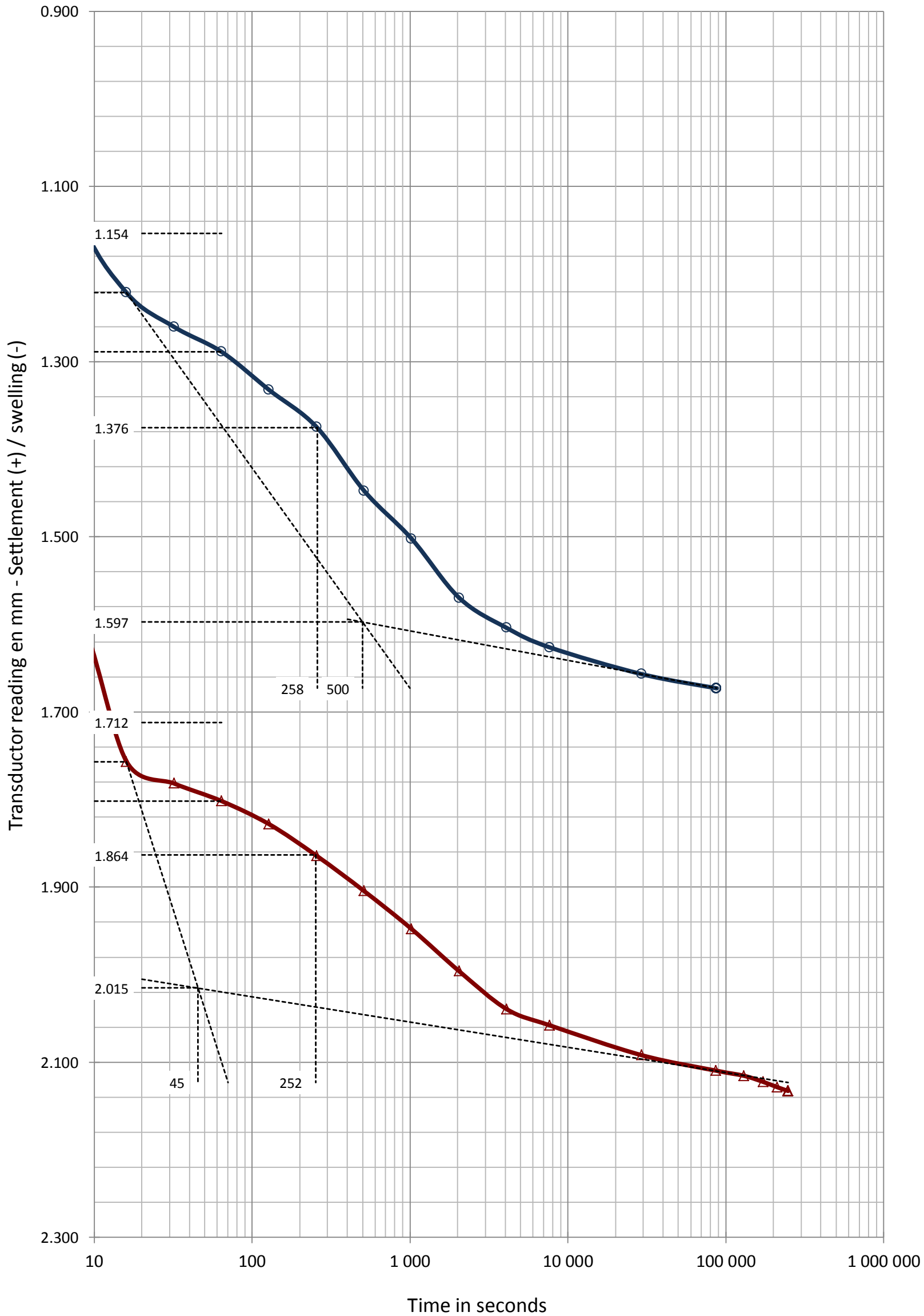
Report num.: CB0019-19-0005
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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference
MB19-0420

Pressure stage (kPa)	300	600	Specimen diameter (cm)	5.020
L0 (Casagrande method)	1.154	1.712	Specimen initial height (cm)	2.000

Pressure stages	
Date	Date
10-oct-19	11-oct-19



Pressure (kPa)		Pressure (kPa)			
300		600			
Readings	Void ratio	Readings	Void ratio		
Settlement (+)		Settlement (+)			
sg	mm	sg	mm		
0	1.003	0.8129	0	1.673	0.7489
1	0.992	0.8139	1	1.614	0.7546
2	0.937	0.8192	2	1.603	0.7556
4	0.926	0.8203	4	1.598	0.7561
8	1.131	0.8006	8	1.591	0.7567
16	1.221	0.7920	16	1.757	0.7409
32	1.260	0.7883	32	1.782	0.7386
64	1.289	0.7856	64	1.802	0.7366
128	1.332	0.7814	128	1.828	0.7341
256	1.375	0.7774	256	1.864	0.7307
512	1.448	0.7704	512	1.905	0.7268
1 024	1.502	0.7652	1 024	1.948	0.7227
2 048	1.570	0.7588	2 048	1.996	0.7181
4 096	1.604	0.7555	4 096	2.039	0.7140
7 696	1.626	0.7534	7 696	2.058	0.7122
29 296	1.657	0.7505	29 296	2.092	0.7090
87 644	1.673	0.7489	87 696	2.110	0.7073
			130 096	2.115	0.7067
			173 296	2.123	0.7060
			212 896	2.129	0.7054
			248 028	2.133	0.7051

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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0420

Pressure stages

Pressure stage (kPa)	1000	1500	Specimen diameter (cm)	5.020
L0 (Casagrande method)	2.175	2.557	Specimen initial height (cm)	2.000

Date	Date
14-oct-19	15-oct-19

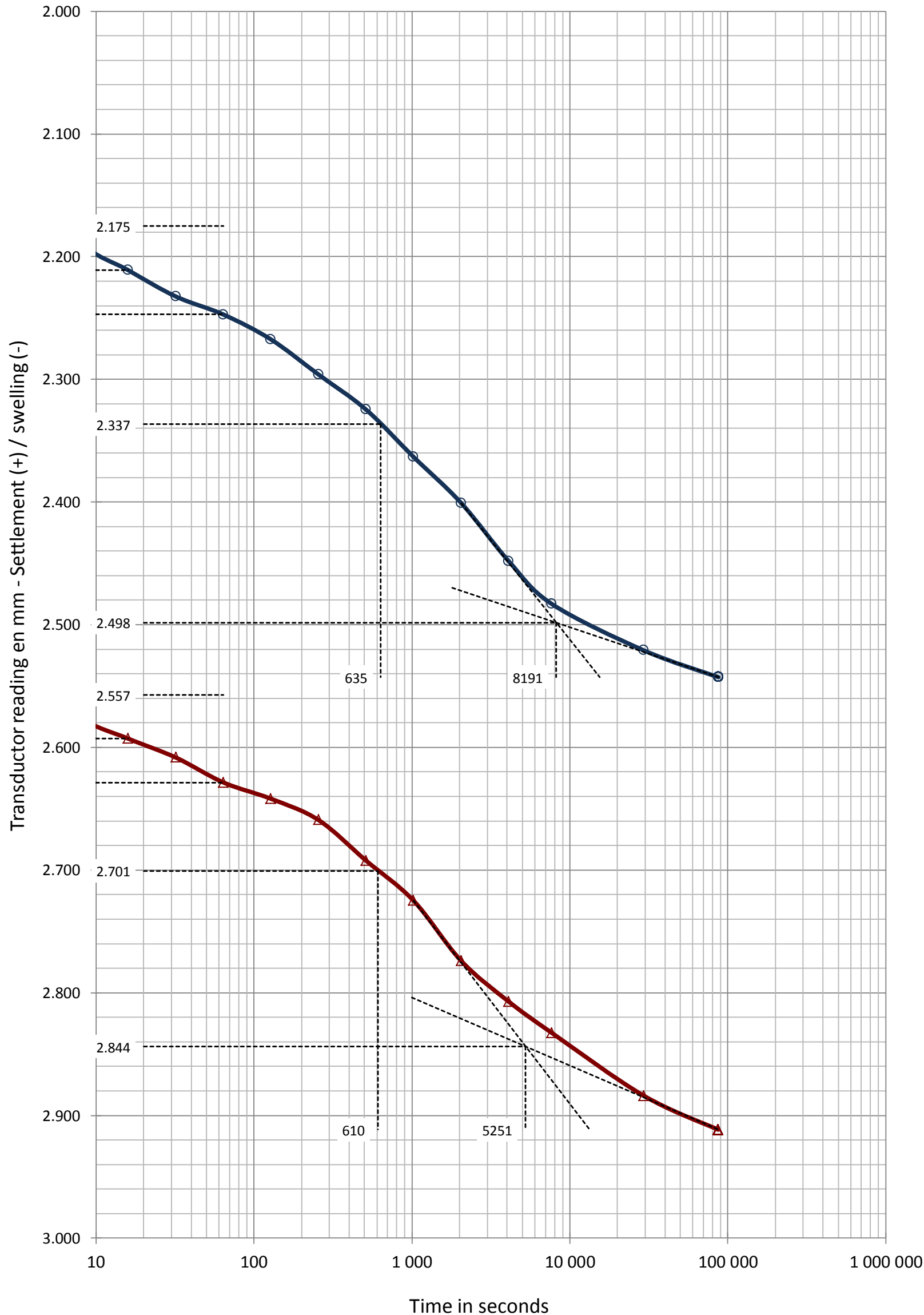
Pressure (kPa) Pressure (kPa)

1000 **1500**

Readings Void ratio
 Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e

0	2.133	0.7051	0	2.543	0.6659
1	2.134	0.7049	1	2.542	0.6660
2	2.133	0.7050	2	2.541	0.6661
4	2.133	0.7051	4	2.540	0.6662
8	2.188	0.6998	8	2.576	0.6628
16	2.211	0.6976	16	2.593	0.6611
32	2.233	0.6955	32	2.608	0.6597
64	2.247	0.6941	64	2.629	0.6577
128	2.268	0.6922	128	2.642	0.6565
256	2.296	0.6895	256	2.659	0.6548
512	2.325	0.6867	512	2.692	0.6517
1 024	2.363	0.6831	1 024	2.725	0.6485
2 048	2.401	0.6795	2 048	2.774	0.6439
4 096	2.448	0.6749	4 096	2.807	0.6407
7 696	2.483	0.6716	7 696	2.833	0.6382
29 296	2.521	0.6680	29 296	2.884	0.6334
87 202	2.543	0.6659	86 925	2.912	0.6307



Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

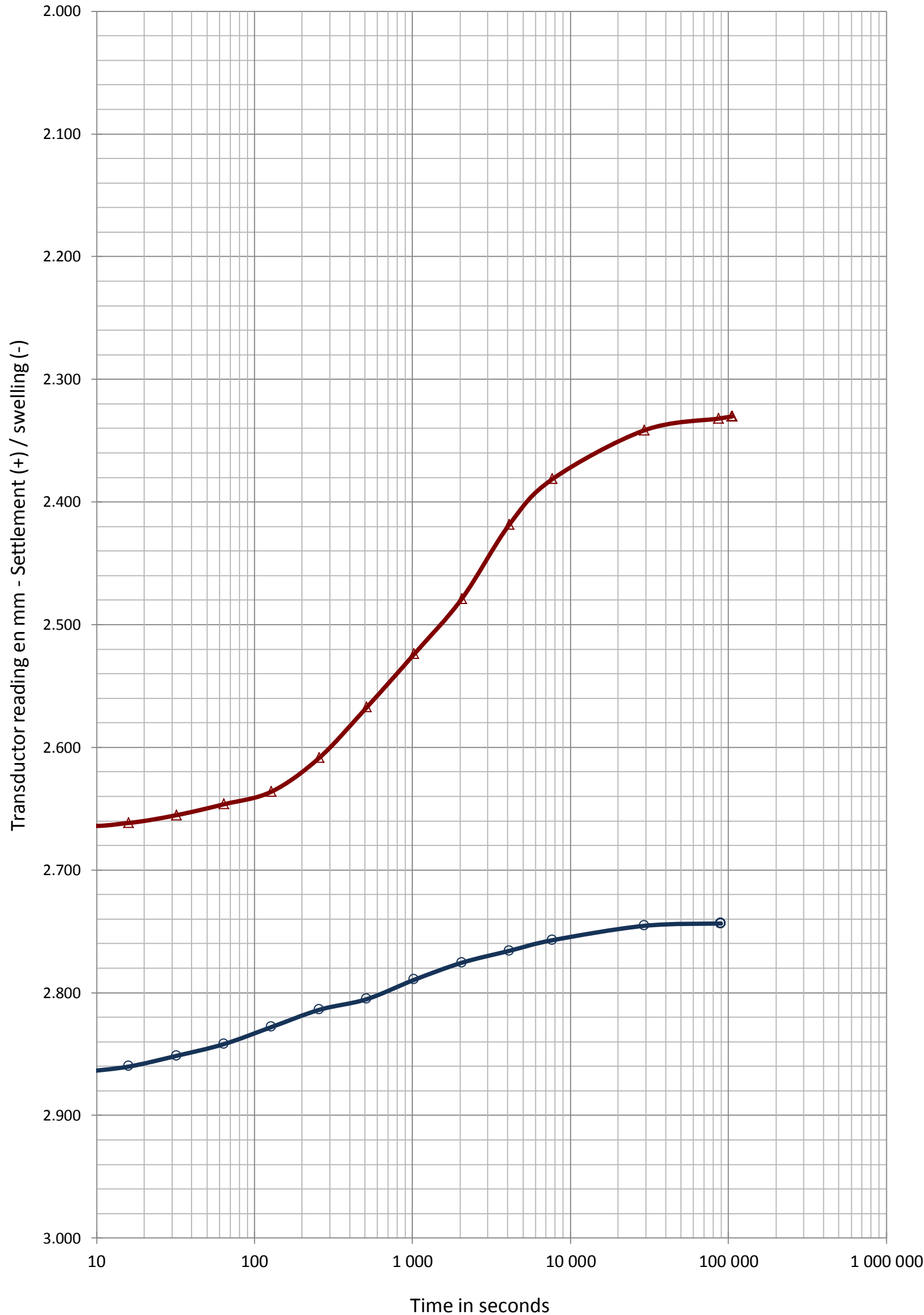
Sample reference

MB19-0420

Pressure stages

Pressure stage (kPa)	600	150	Specimen diameter (cm)	5.020
L0 (Casagrande method)	2.879	2.677	Specimen initial height (cm)	2.000

Date	Date
16-oct-19	17-oct-19



Pressure (kPa) Pressure (kPa)

600 **150**

Readings Void ratio
 Settlement (+) Settlement (+)

sg mm e sg mm e

0	2.912	0.6307	0	2.744	0.6468
1	2.912	0.6307	1	2.679	0.6529
2	2.881	0.6336	2	2.655	0.6552
4	2.870	0.6347	4	2.646	0.6560
8	2.865	0.6352	8	2.663	0.6545
16	2.860	0.6356	16	2.662	0.6546
32	2.852	0.6365	32	2.655	0.6552
64	2.842	0.6374	64	2.646	0.6560
128	2.828	0.6387	128	2.636	0.6570
256	2.814	0.6400	256	2.609	0.6596
512	2.805	0.6409	512	2.568	0.6636
1 024	2.790	0.6424	1 024	2.524	0.6677
2 048	2.776	0.6437	2 048	2.479	0.6720
4 096	2.766	0.6446	4 096	2.419	0.6778
7 696	2.757	0.6455	7 696	2.381	0.6813
29 296	2.746	0.6466	29 296	2.342	0.6851
89 684	2.744	0.6468	86 896	2.332	0.6860
			105 568	2.330	0.6862

Operator:

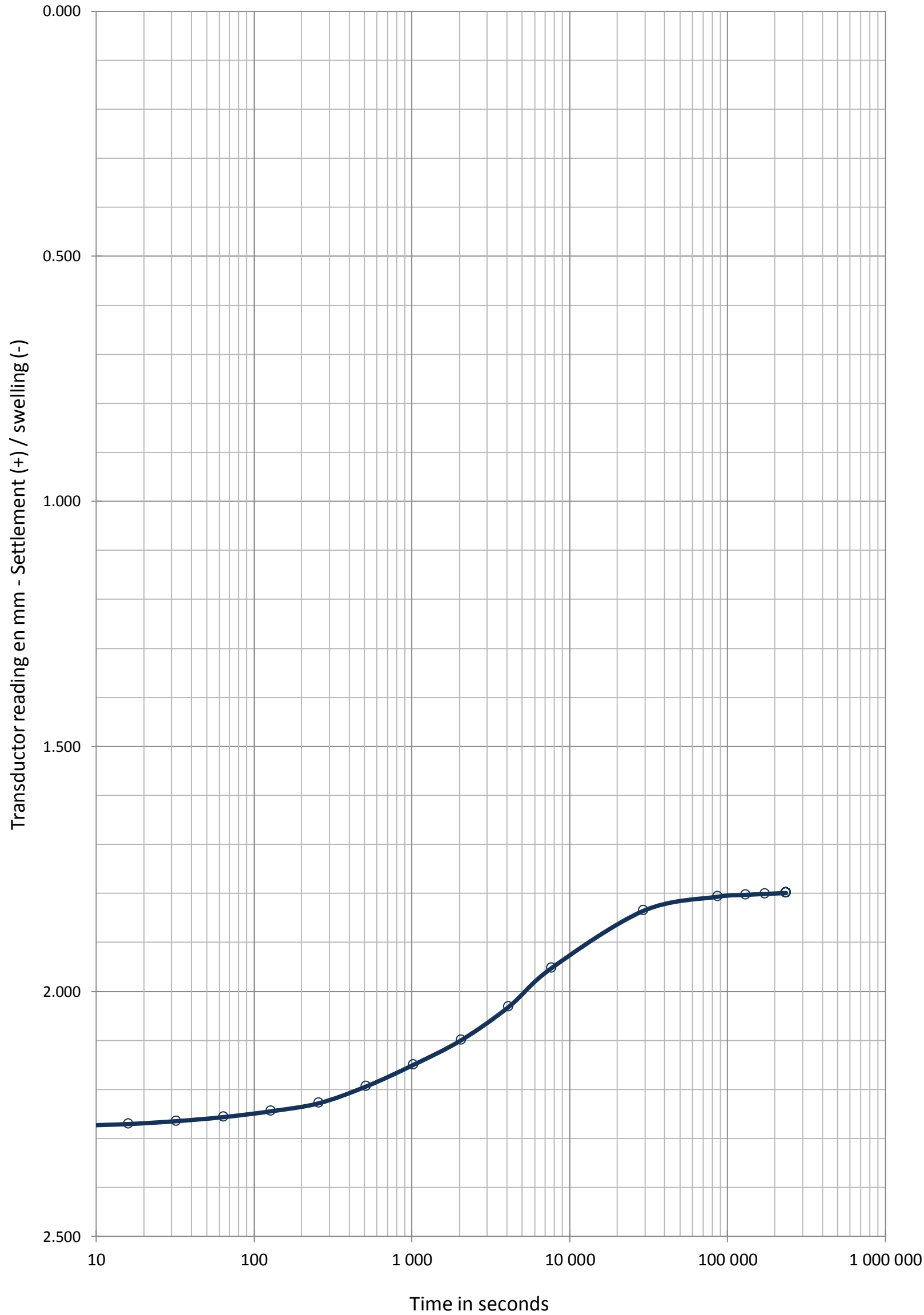
Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference
MB19-0420

Pressure stage (kPa) **20** Specimen diameter (cm) **5.020**
 L0 (Casagrande method) **2.285** Specimen initial height (cm) **2.000**

Pressure stages
 Date Date



18-oct-19

Pressure (kPa) **20**

Readings	Void ratio	Readings	Void ratio
Settlement (+)		Settlement (+)	
sg	mm	sg	mm

0	2.330	0.6862		
1	2.323	0.6869		
2	2.291	0.6900		
4	2.272	0.6918		
8	2.273	0.6916		
16	2.271	0.6919		
32	2.265	0.6925		
64	2.257	0.6932		
128	2.245	0.6944		
256	2.228	0.6959		
512	2.194	0.6992		
1 024	2.150	0.7034		
2 048	2.100	0.7082		
4 096	2.032	0.7147		
7 696	1.952	0.7223		
29 296	1.836	0.7334		
86 896	1.807	0.7362		
130 096	1.803	0.7365		
173 296	1.801	0.7367		
235 301	1.799	0.7369		

Report num.:	CB0019-19-0005
Edition date:	

FALL CONE TEST - ISO 17892-6:2017

MB19-0420

Equipment
PENETROMETER MATEST B057-11

Legend of symbols	
cu	Calculated Undrained Shear Strength (kPa)
cu(corr)	Corrected Undrained Shear Strength (kPa)
cur	Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	46.5	4.57	4	4.3	4.42	4.323	400	30	210	203	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	210
Corrected Undrained Shear Strength, cu(corr) (kPa)	203

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	4.28	4.63	4.39	4.25	4.388	400	30	163	
1	1	4.5	4.23	3.95	4.33	4.253	400	30	173	
1	3	4.18	4.74	3.79	4.01	4.18	400	30	180	
1	7	4.18	3.47	4.06	3.52	3.808	400	30	216	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	163

Thixotropy	
Loss at remoulding (%)	22
Recovery after 1 day (%)	21
Recovery after 7 days (%)	113

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



20 / 20

Sample reference

MB19-0420

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: ALEX VANCELLS

Test final date: 14-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.331 g

Equipment:

RESULT: **72.4 g/kg (total)**

MUFLA OVEN ETI HD150

66 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 1.508 g

Equipment:

RESULT: **53.5 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0421

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_0Bis P_0Bis.4
Top depth, m	2.11
Bottom depth, m	2.26
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	cISa
--------------------	------

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark grayish brown (2.5Y 3/2) fine SAND with occasional silty clay pockets and occasional amorphous organic matter zones.	2.11	
	2.26	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0421



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0421

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.15
Tare + soil + water (g)	211.58
Tare + soil (g)	194.50
Water (g)	17.08
Soil (g)	83.35
Moisture, w (%)	20.5

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Moisture content, w (%)	20.5

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	101.64
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.02
Dry density (Mg/m ³)	1.68

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	2.02
Dry density (Mg/m³)	1.68

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	184.4860
Soil mass, M1 (g)	10.2270
Particle density, G20°C (Mg/m ³)	2.694

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.694

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0421

PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

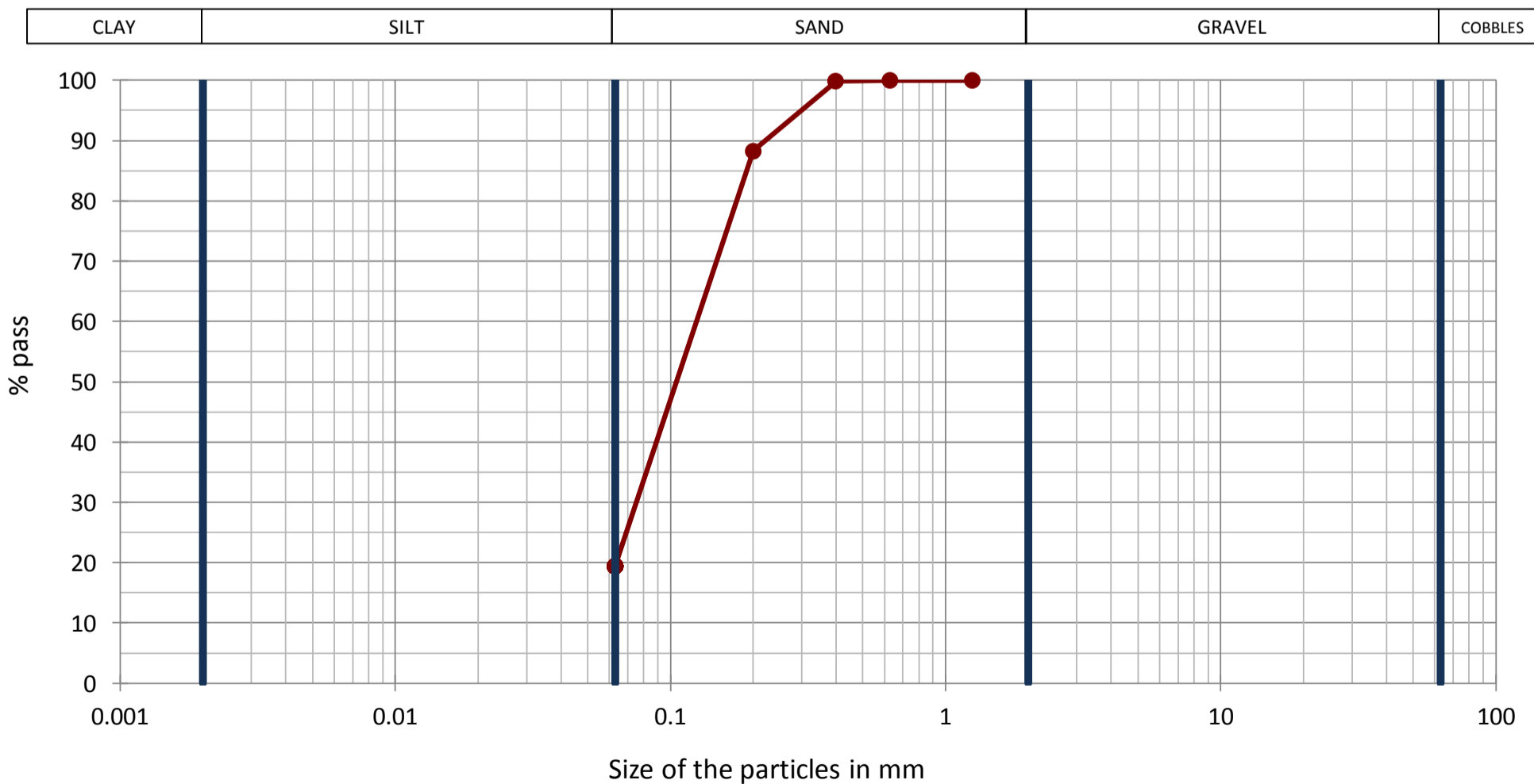
Previous calculations
 Total dried sample (g) **107.11**

 Hygros. moisture, % (fraction<2 mm) **0.9**
 Corr. parameter, f (fraction<2 mm) **0.9908**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
1.25			0.00	0.0	106.12	100.0
0.63			0.02	0.0	106.10	100.0
0.4			0.04	0.1	106.06	99.9
0.2			12.34	11.7	93.72	88.3
0.063			73.05	80.5	20.67	19.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm		% SAND	2-0.063 mm		% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0	19.5	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	11.7		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	68.8		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0421

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	75.78
Hygroscopic moisture, W (%)	0.9
Tested and dried soil mass, m (g)	75.08
Particle density (Mg/m ³)	2.694

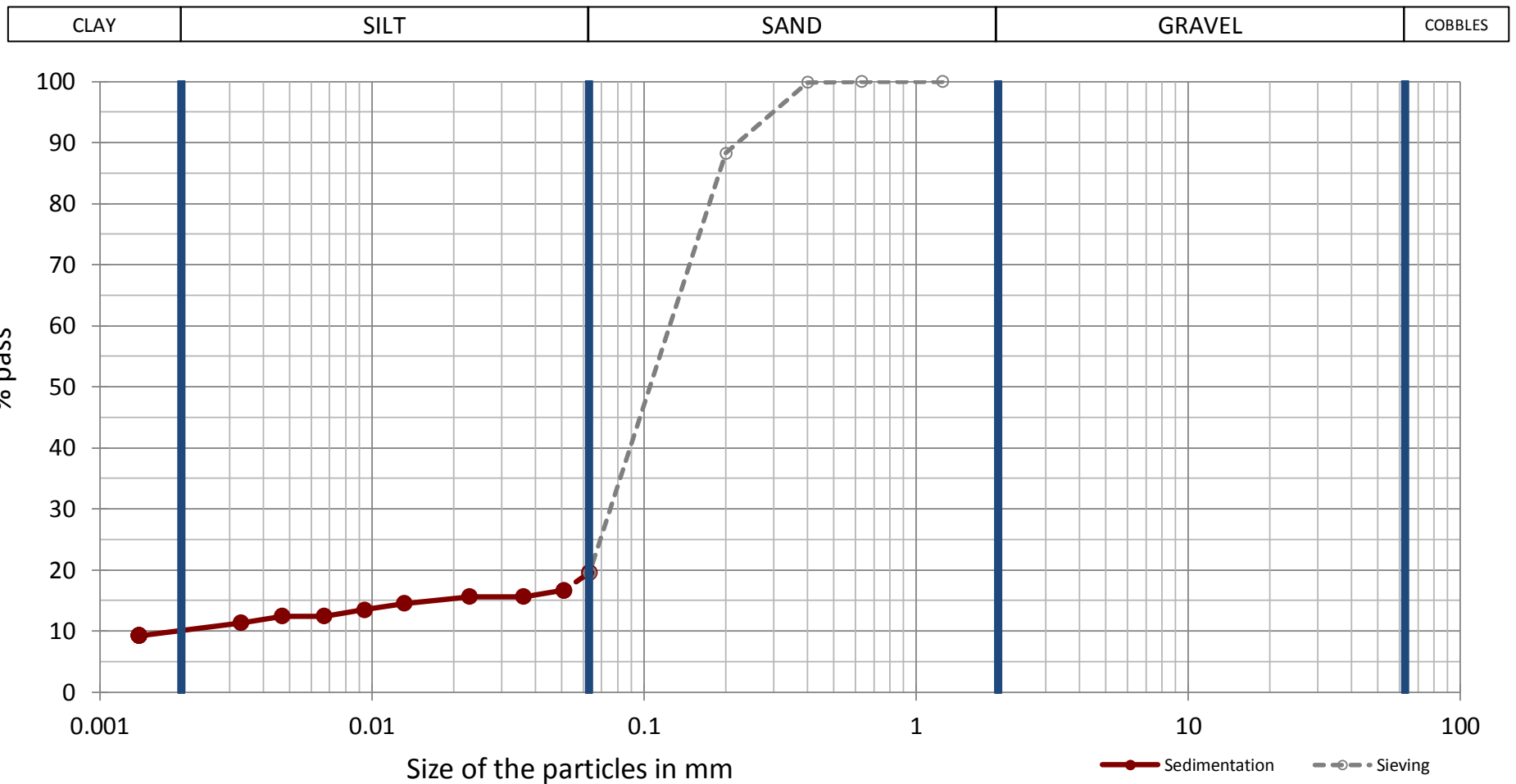
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	23	1.0120	12	153.9	7.9	0.0509	16.7
2	23	1.0115	11.5	155.1	7.4	0.0361	15.6
5	23	1.0115	11.5	155.1	7.4	0.0229	15.6
15	23	1.0110	11	156.2	6.9	0.0132	14.5
30	23	1.0105	10.5	157.4	6.4	0.0094	13.5
60	23	1.0100	10	158.6	5.9	0.0067	12.4
120	23	1.0100	10	158.6	5.9	0.0047	12.4
240	23	1.0095	9.5	159.8	5.4	0.0033	11.4
1440	23	1.0085	8.5	162.2	4.4	0.0014	9.2

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	19.5
Silt, between 0.063 and 0.002 mm (%)	9.6
Clay, smaller than 0.002 mm (%)	9.9



REMARKS

Operator: ALEX VANCELLS

Test final date: 16/10/2019

Report num.: CB0019-19-0005
Edition date:

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Tel. +34 972 513 466
e-mail: mail@igeotest.com
www.igeotest.com
Reg. Num. LECCE L0600292



6 / 6

Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0421

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Predrying temperature:	60 °C	Test final date:	07-10-19
Mean of analyzed soil mass:	10.167 g	Calcination temperature:	450 °C
RESULT:	15.1 g/kg (total)	Equipment:	MUFLA OVEN ETI HD150
	13.6 g/kg (organic)		PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass:	2.057 g	Equipment:	SCHEIBLER APPARATUS
RESULT:	12.5 g/kg		

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0422

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_0Bis P_0Bis.3
Top depth, m	3.2
Bottom depth, m	3.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	cISa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark grayish brown (2.5Y 3/2) medium to fine SAND with rare clay pockets and occasional amorphous organic matter.	3.2	
	3.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0422



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0422

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	103.81
Tare + soil + water (g)	234.45
Tare + soil (g)	212.06
Water (g)	22.39
Soil (g)	108.25
Moisture, w (%)	20.7

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Moisture content, w (%)	20.7

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	100.60
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.00
Dry density (Mg/m ³)	1.66

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	2.00
Dry density (Mg/m³)	1.66

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	187.2100
Soil mass, M1 (g)	13.6710
Particle density, G20°C (Mg/m ³)	2.666

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.666

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0422

PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

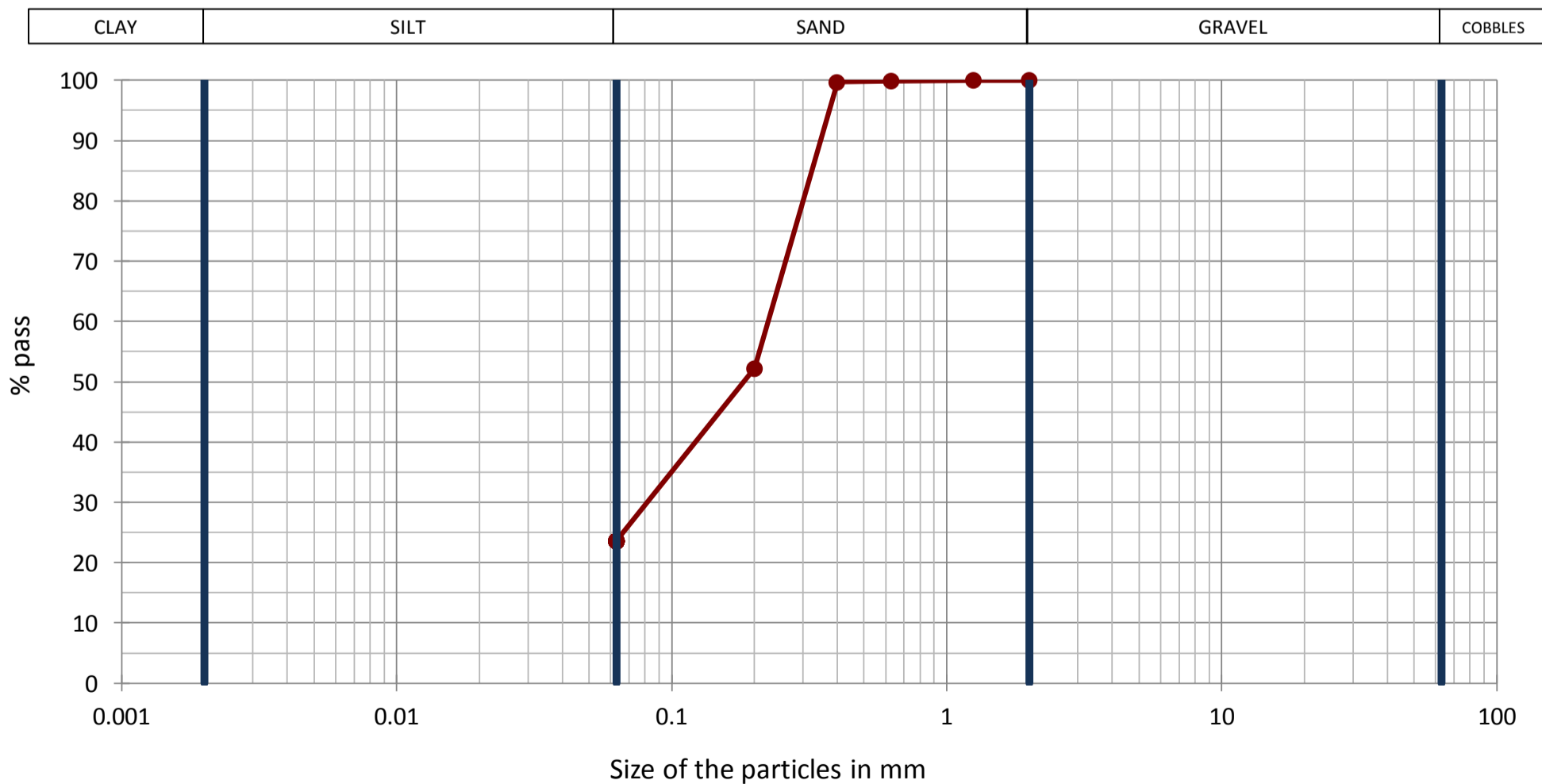
Previous calculations
 Total dried sample (g) **102.97**

 Hygrosc. moisture, % (fraction<2 mm) **1.1**
 Corr. parameter, f (fraction<2 mm) **0.9887**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
2			0.00	0.0	101.81	100.0
1.25			0.01	0.0	101.80	100.0
0.63			0.05	0.1	101.75	99.9
0.4			0.21	0.3	101.54	99.7
0.2			48.40	47.8	53.14	52.2
0.063			29.12	76.4	24.02	23.6

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	76.4	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1	23.6	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	47.7		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	28.6		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0422

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	75.27
Hygroscopic moisture, W (%)	1.1
Tested and dried soil mass, m (g)	74.42
Particle density (Mg/m ³)	2.666

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582
Meniscus correction (Cm)	0.0005

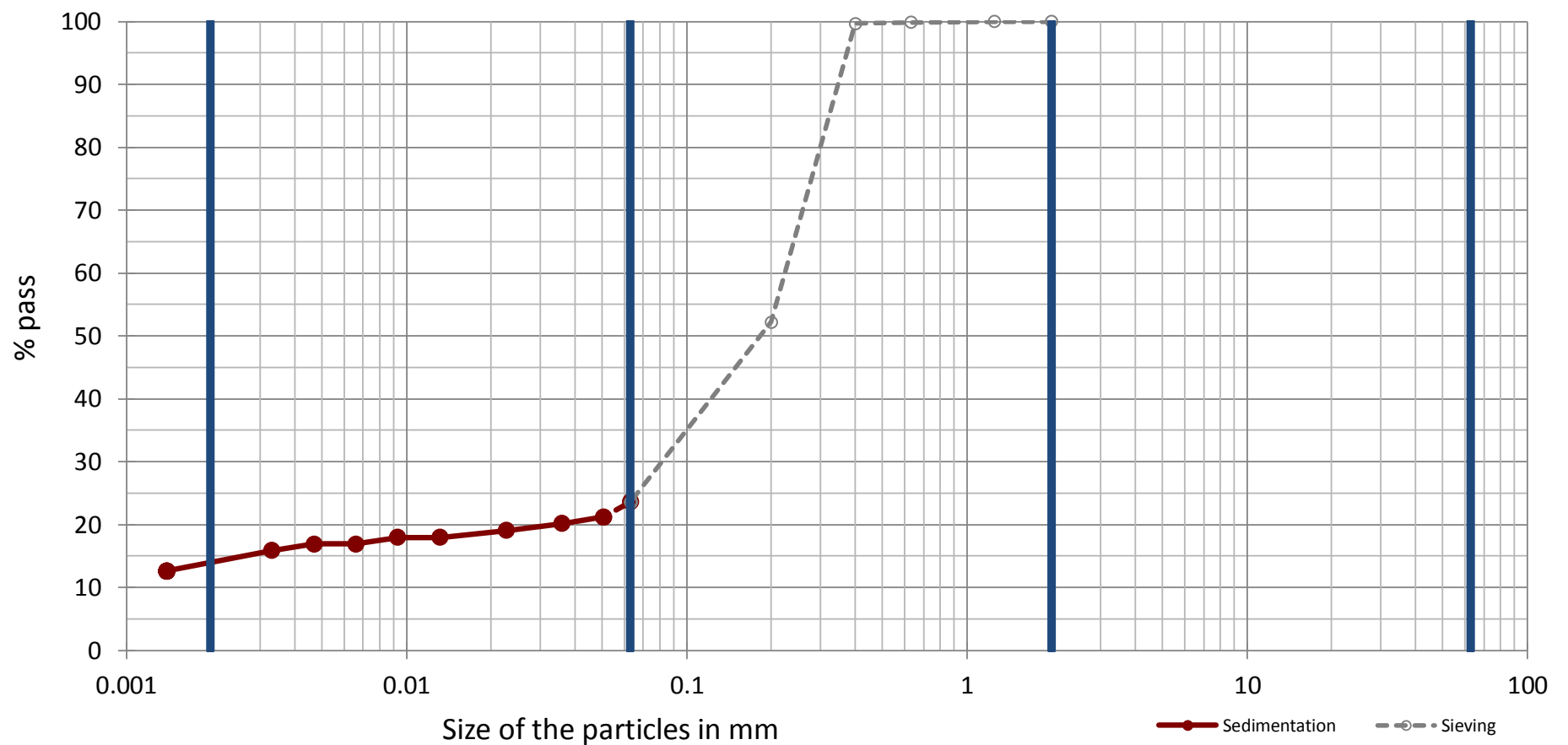
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	23	1.0140	14	149.1	9.9	0.0505	21.2
2	23	1.0135	13.5	150.3	9.4	0.0359	20.1
5	23	1.0130	13	151.5	8.9	0.0228	19.1
15	23	1.0125	12.5	152.7	8.4	0.0132	18.0
30	23	1.0125	12.5	152.7	8.4	0.0093	18.0
60	23	1.0120	12	153.9	7.9	0.0066	16.9
120	23	1.0120	12	153.9	7.9	0.0047	16.9
240	23	1.0115	11.5	155.1	7.4	0.0033	15.8
1440	23	1.0100	10	158.6	5.9	0.0014	12.6

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	23.6
Silt, between 0.063 and 0.002 mm (%)	10.0
Clay, smaller than 0.002 mm (%)	13.6

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 16/10/2019

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

MB19-0422

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Predrying temperature:	60 °C	Test final date:	07-10-19
Mean of analyzed soil mass:	10.133 g	Calcination temperature:	450 °C
RESULT:	26.8 g/kg (total)	Equipment:	MUFLA OVEN ETI HD150
	24.8 g/kg (organic)		PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator:	ALEX VANCELLS	Test final date:	23-10-19
Mean of analyzed soil mass:	3.067 g	Equipment:	SCHEIBLER APPARATUS
RESULT:	16.5 g/kg		

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0423

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_0Bis P_0Bis.2
Top depth, m	4.2
Bottom depth, m	4.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	cISa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark grayish brown (2.5Y 3/2) fine sand with occasional clay pockets and occasional amorphous organic matter.	4.2	
	4.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0423



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0423

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.53
Tare + soil + water (g)	223.44
Tare + soil (g)	203.28
Water (g)	20.16
Soil (g)	91.75
Moisture, w (%)	22.0

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Moisture content, w (%)	22.0

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	100.37
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.00
Dry density (Mg/m ³)	1.64

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	2.00
Dry density (Mg/m³)	1.64

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	186.8550
Soil mass, M1 (g)	13.5330
Particle density, G20°C (Mg/m ³)	2.665

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.665

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0423

PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **105**

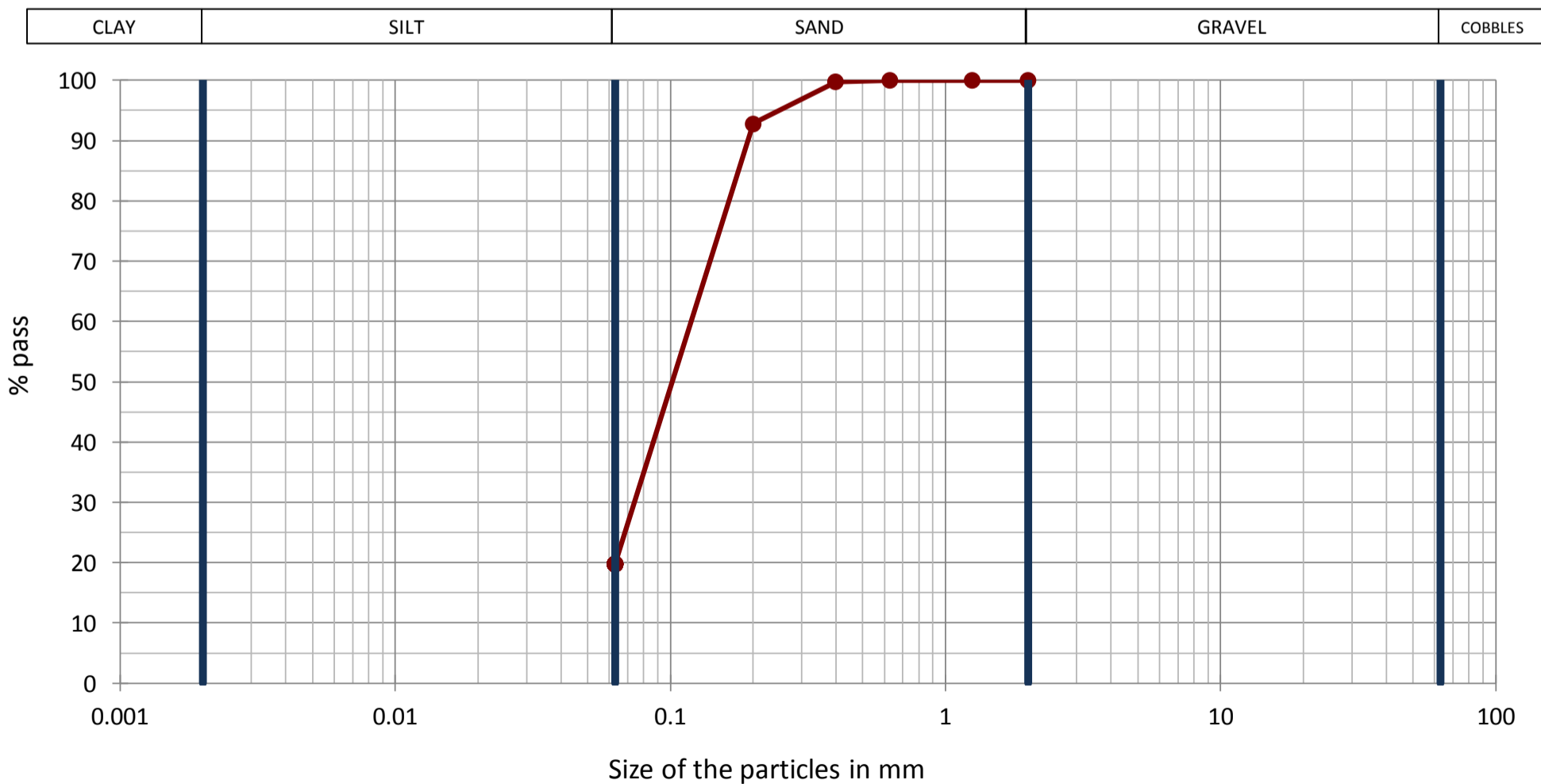
Previous calculations
 Total dried sample (g) **103.79**

 Hygrosc. moisture, % (fraction<2 mm) **1.0**
 Corr. parameter, f (fraction<2 mm) **0.9902**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2			0.00	0.0	102.77 100.0
1.25			0.01	0.0	102.76 100.0
0.63			0.04	0.0	102.72 100.0
0.4			0.11	0.2	102.61 99.8
0.2			7.22	7.2	95.39 92.8
0.063			75.06	80.2	20.33 19.8

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	80.2	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	7.2		19.8
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	73.0		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0423

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	75.68
Hygroscopic moisture, W (%)	1.0
Tested and dried soil mass, m (g)	74.94
Particle density (Mg/m ³)	2.665

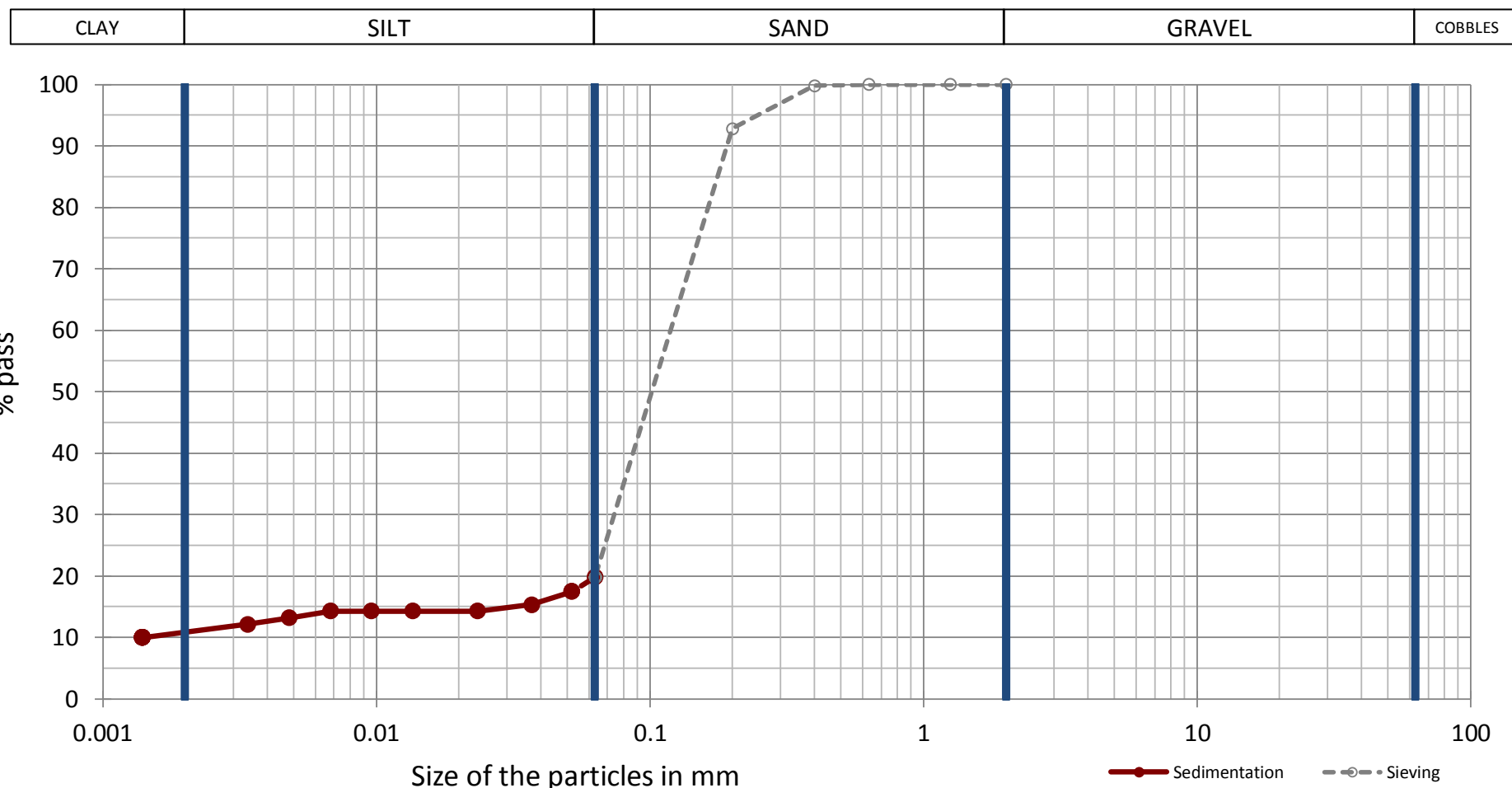
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	22	1.0120	12	153.9	8.2	0.0520	17.5
2	22	1.0110	11	156.2	7.2	0.0370	15.3
5	22	1.0105	10.5	157.4	6.7	0.0235	14.2
15	22	1.0105	10.5	157.4	6.7	0.0136	14.2
30	22	1.0105	10.5	157.4	6.7	0.0096	14.2
60	22	1.0105	10.5	157.4	6.7	0.0068	14.2
120	22	1.0100	10	158.6	6.2	0.0048	13.2
240	22	1.0095	9.5	159.8	5.7	0.0034	12.1
1440	22	1.0085	8.5	162.2	4.7	0.0014	10.0

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	19.8
Silt, between 0.063 and 0.002 mm (%)	9.2
Clay, smaller than 0.002 mm (%)	10.6



REMARKS

Operator: ALEX VANCELLS

Test final date: 23/10/2019

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

MB19-0423

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Predrying temperature:	60 °C	Calcination temperature:	450 °C
Mean of analyzed soil mass:	10.011 g	Equipment:	MUFLA OVEN ETI HD150
RESULT:	21.1 g/kg (total)		PORCELAIN CRUCIBLES 100 ml
	19.7 g/kg (organic)		

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass:	4.142 g	Equipment:	SCHEIBLER APPARATUS
RESULT:	11.8 g/kg		

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0424

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_0Bis P_0Bis.1
Top depth, m	4.92
Bottom depth, m	5.07
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	7-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark grayish brown (2.5Y 3/2) fine to medium SAND with rare clay pockets and occasional amorphous organic matter.	4.92	
	5.07	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0424



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0424

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	106.81
Tare + soil + water (g)	211.76
Tare + soil (g)	194.87
Water (g)	16.89
Soil (g)	88.06
Moisture, w (%)	19.2

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Moisture content, w (%)	19.2

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	92.44
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.84
Dry density (Mg/m ³)	1.54

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.84
Dry density (Mg/m³)	1.54

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	185.5720
Soil mass, M1 (g)	13.5820
Particle density, G20°C (Mg/m ³)	2.673

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.673

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0424

PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **105**

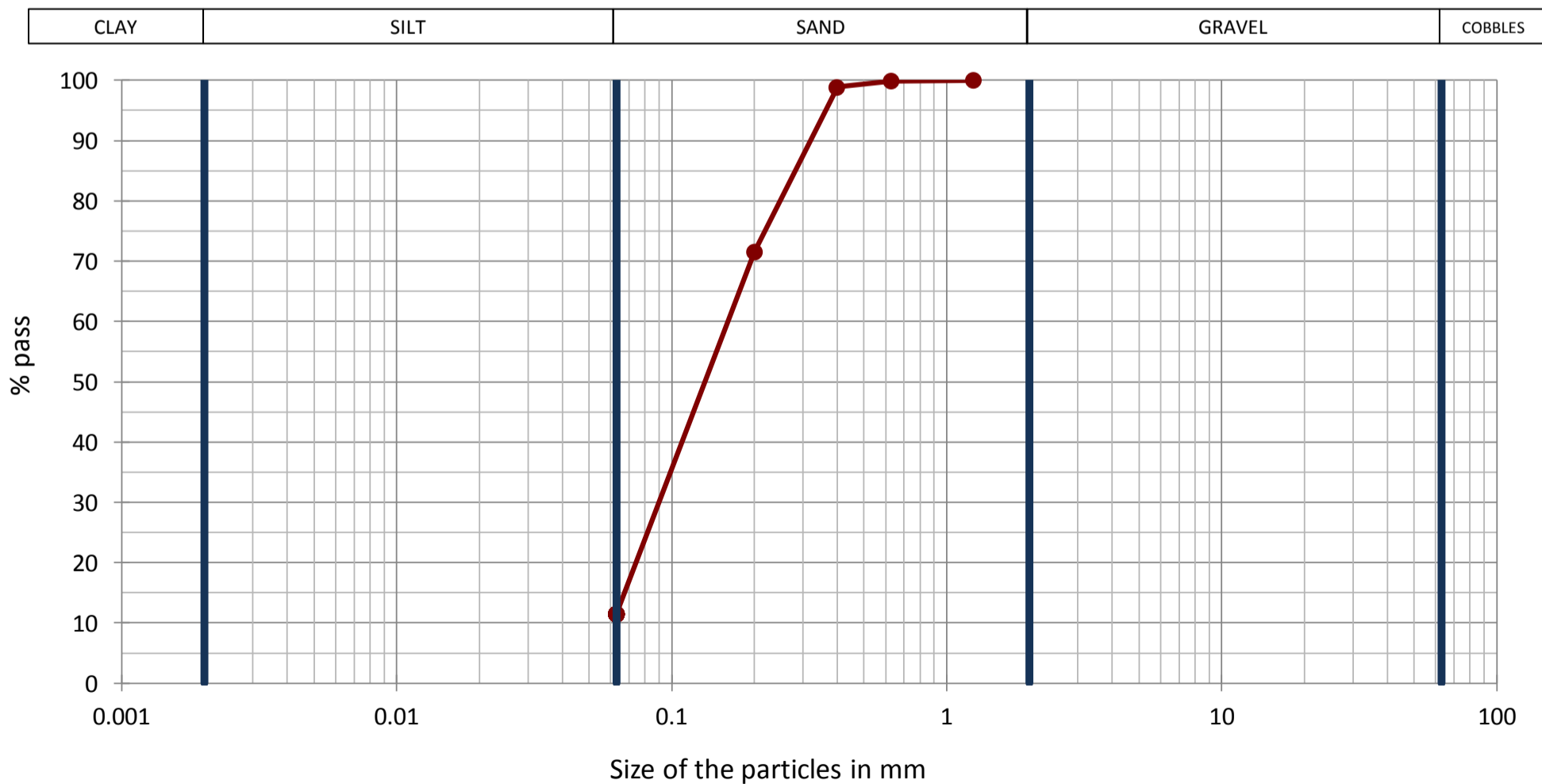
Previous calculations
 Total dried sample (g) **103.40**

 Hygrosc. moisture, % (fraction<2 mm) **0.5**
 Corr. parameter, f (fraction<2 mm) **0.9949**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
1.25			0.00	0.0	102.88	100.0
0.63			0.06	0.1	102.82	99.9
0.4			1.05	1.1	101.77	98.9
0.2			28.15	28.4	73.62	71.6
0.063			61.79	88.5	11.83	11.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	88.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1	11.5	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	28.3		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	60.1		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0424

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	75.47
Hygroscopic moisture, W (%)	0.5
Tested and dried soil mass, m (g)	75.09
Particle density (Mg/m ³)	2.673

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582
Meniscus correction (Cm)	0.0005

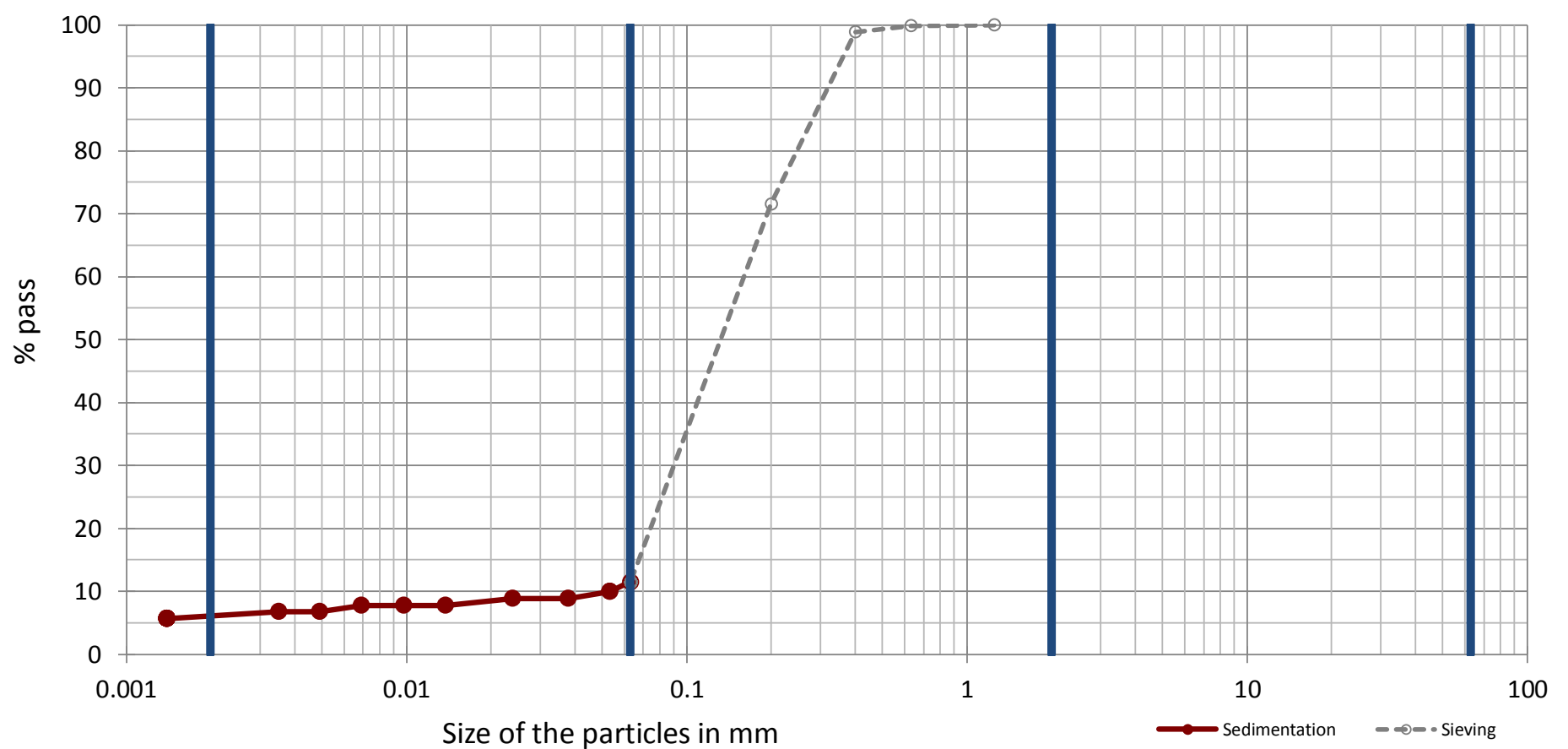
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	22	1.0085	8.5	162.2	4.7	0.0532	9.9
2	22	1.0080	8	163.4	4.2	0.0378	8.9
5	22	1.0080	8	163.4	4.2	0.0239	8.9
15	22	1.0075	7.5	164.6	3.7	0.0138	7.8
30	22	1.0075	7.5	164.6	3.7	0.0098	7.8
60	22	1.0075	7.5	164.6	3.7	0.0069	7.8
120	22	1.0070	7	165.8	3.2	0.0049	6.7
240	22	1.0070	7	165.8	3.2	0.0035	6.7
1440	22	1.0065	6.5	166.9	2.7	0.0014	5.7

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	11.5
Silt, between 0.063 and 0.002 mm (%)	5.6
Clay, smaller than 0.002 mm (%)	5.9

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 23/10/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0424

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: ALEX VANCELLS

Test final date: 08-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.272 g

Equipment:

RESULT: **12 g/kg (total)**

MUFLA OVEN ETI HD150

10.9 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 4.103 g

Equipment:

RESULT: **9.4 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0425

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_8 C_8.6
Top depth, m	0.2
Bottom depth, m	0.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	18-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light yellowish brown (2.5Y 6/4) medium SAND with occasional fine sand and occasional shell fragments	0.2	
	0.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0425



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 18/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0425

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.19
Tare + soil + water (g)	252.17
Tare + soil (g)	231.03
Water (g)	21.14
Soil (g)	119.84
Moisture, w (%)	17.6

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Moisture content, w (%)	17.6

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	94.21
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.88
Dry density (Mg/m ³)	1.60

Operator: ALEX VANCELLS
Test final date: 18/06/2019

Results	
Bulk density (Mg/m³)	1.88
Dry density (Mg/m³)	1.60

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	186.9880
Soil mass, M1 (g)	13.2610
Particle density, G20°C (Mg/m ³)	2.685

Operator: GUILLEM MASSALLÉ
Test final date: 23/09/2019

Results	
Particle density (Mg/m³)	2.685

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0425

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

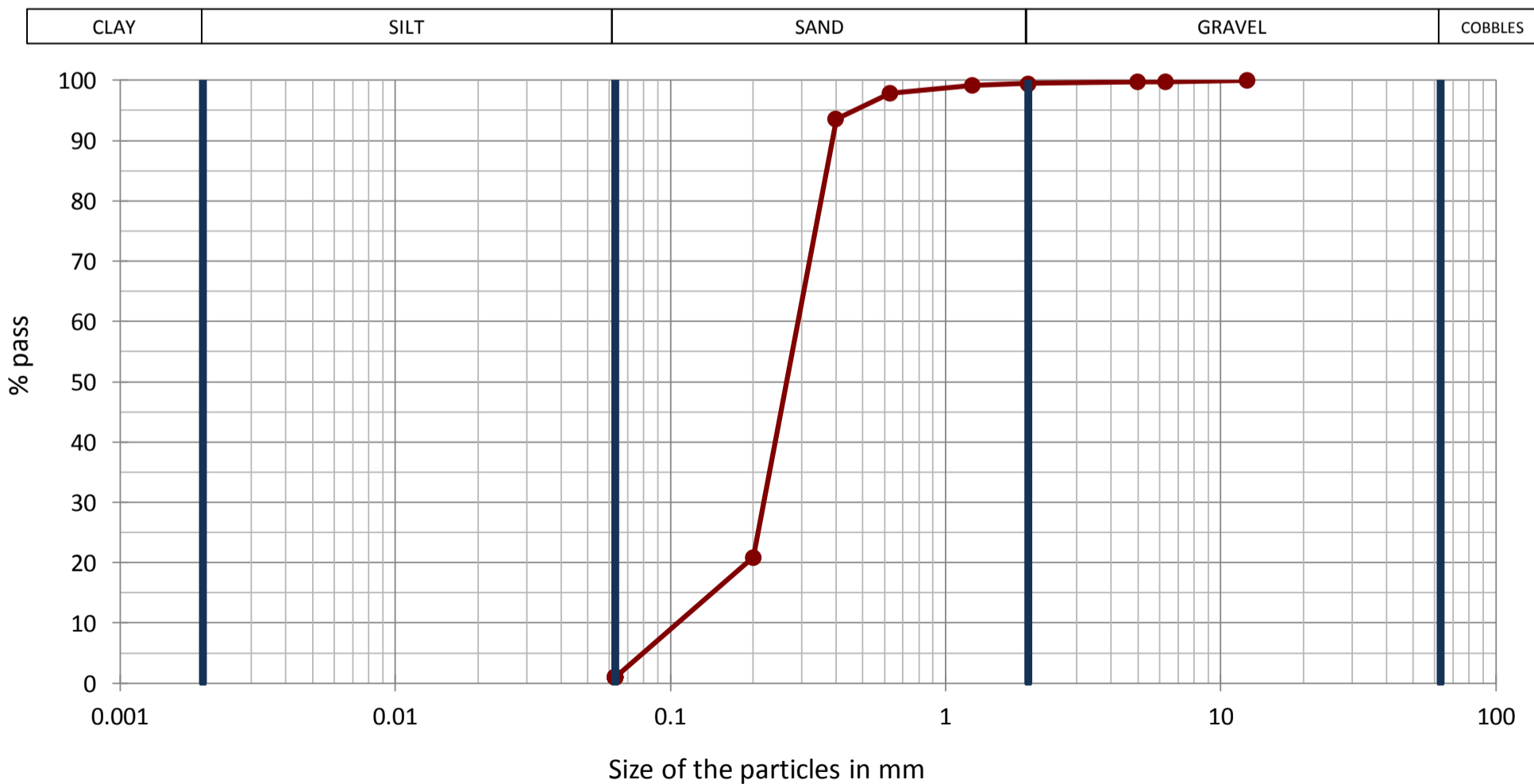
Previous calculations
 Total dried sample (g) **106.01**

 Hygrosc. moisture, % (fraction < 2 mm) **0.3**
 Corr. parameter, f (fraction < 2 mm) **0.9973**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
12.5		0.00	0.0	105.73	100.0
6.3		0.22	0.2	105.51	99.8
5		0.00	0.2	105.51	99.8
2		0.33	0.5	105.18	99.5
1.25		0.32	0.8	104.86	99.2
0.63		1.31	2.1	103.55	97.9
0.4		4.54	6.4	99.01	93.6
0.2		76.92	79.1	22.09	20.9
0.063		21.02	99.0	1.07	1.0

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.5	% SAND	2-0.063 mm	98.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.6	1.0	
	% Medium gravel	20-6.3 mm	0.2	% Medium sand	0.63-0.2 mm	77.0		
	% Fine gravel	6.3-2 mm	0.3	% Fine sand	0.2-0.063 mm	19.9		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SHELL FRAGMENTS.

Report num.: CB0019-19-0005
Edition date:

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5 / 5

Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0425

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 24-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.348 g

Equipment:

RESULT: **3.1 g/kg (total)**

MUFLA OVEN ETI HD150

0.1 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0426

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_8 C_8.5
Top depth, m	1.22
Bottom depth, m	1.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	8
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark gray (2.5Y 3/1) fine to medium SAND with frequent amorphous organic matter blackish millimetrical layers and pockets and rare shell fragments	1.22	
	1.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE TO PERFORM THE TEST

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0426



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0426

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.31
Tare + soil + water (g)	217.50
Tare + soil (g)	199.71
Water (g)	17.79
Soil (g)	95.40
Moisture, w (%)	18.6

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	18.6

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	100.01
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.99
Dry density (Mg/m ³)	1.68

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.99
Dry density (Mg/m³)	1.68

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.3
Water density at test temp., $\delta_w T_i$ (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	185.7250
Soil mass, M1 (g)	11.3330
Particle density, G20°C (Mg/m ³)	2.652

Operator: GUILLEM MASSALLÉ
Test final date: 16/09/2019

Results	
Particle density (Mg/m³)	2.652

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0426

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

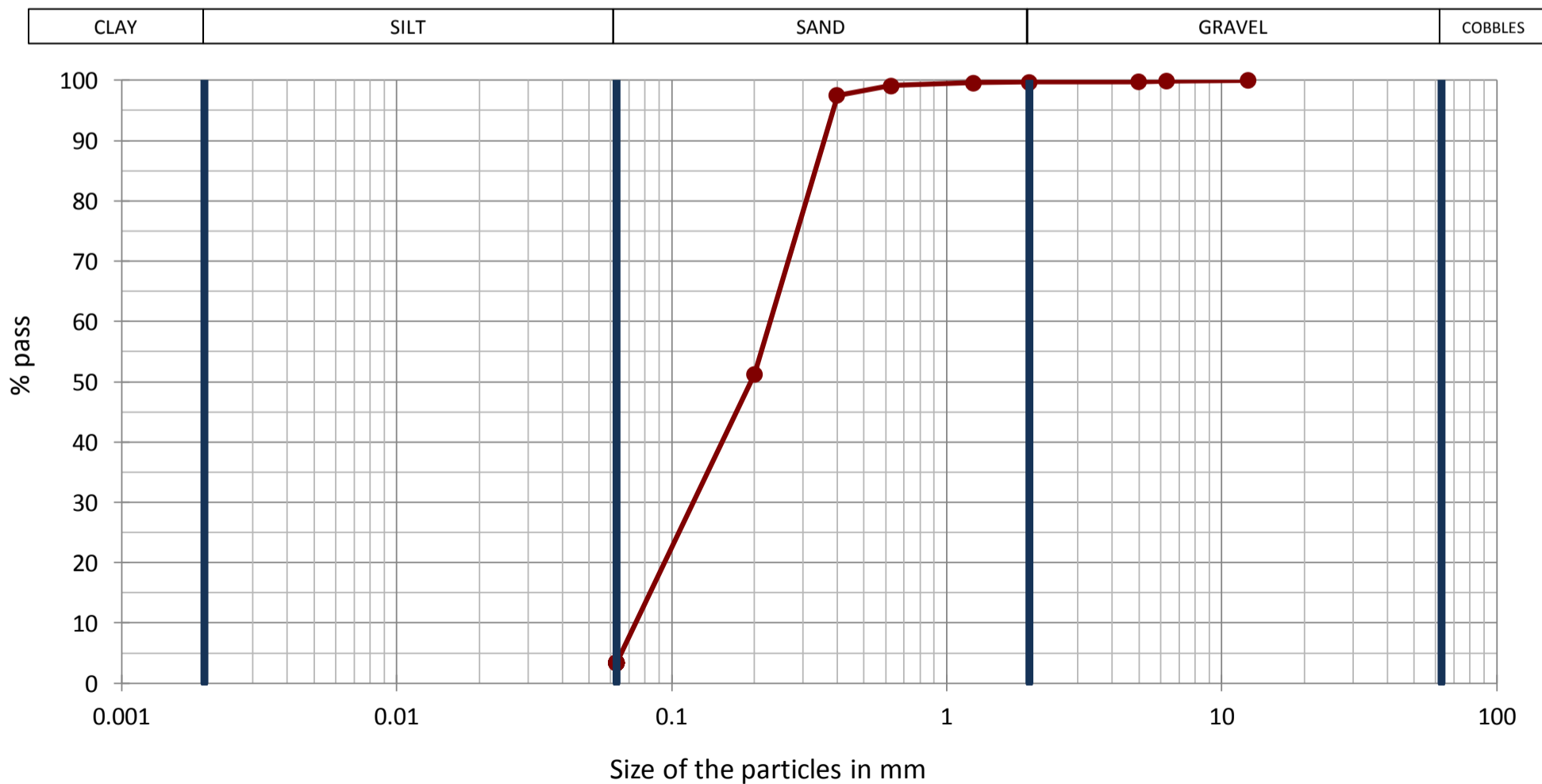
Previous calculations
 Total dried sample (g) **105.86**

 Hygrosc. moisture, % (fraction < 2 mm) **0.2**
 Corr. parameter, f (fraction < 2 mm) **0.9982**

Results					
Sieves Aperture mm	Retained sieves		Pass total sample		
	Partial g	Total g	Total %	g	%
12.5		0.00	0.0	105.68	100.0
6.3		0.14	0.1	105.54	99.9
5		0.10	0.2	105.44	99.8
2		0.11	0.3	105.33	99.7
1.25		0.10	0.4	105.23	99.6
0.63		0.47	0.9	104.76	99.1
0.4		1.75	2.5	103.01	97.5
0.2		48.78	48.7	54.23	51.3
0.063		50.59	96.6	3.64	3.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.3	% SAND	2-0.063 mm	96.3	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.6	3.4	
	% Medium gravel	20-6.3 mm	0.1	% Medium sand	0.63-0.2 mm	47.8		
	% Fine gravel	6.3-2 mm	0.2	% Fine sand	0.2-0.063 mm	47.9		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS AND CONTAINS RARE ORGANIC MATTER. SAND ALSO CONTAINS SOME SHELL FRAGMENTS AND RARE ORGANIC MATTER.

Operator: **GUILLEM MASSALLÉ**

Test final date: **13/09/2019**
 303/854

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



5 / 5

Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0426

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 17-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.204 g

Equipment:

RESULT: **5.3 g/kg (total)**

MUFLA OVEN ETI HD150

2.6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 18-09-19

Mean of analyzed soil mass: 5.561 g

Equipment:

RESULT: **22.6 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0427

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_8 C_8.4
Top depth, m	2.2
Bottom depth, m	2.45
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	25
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	grSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) gravelly fine to medium SAND with rare clay pockets and occasional shell fragments. Gravel is coarse and contains flint nodules and shell fragments.	2.2	
	2.45	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THE SAMPLE CONTAINS COARSE GRAVEL

Report num.: CB0019-19-0005
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Reg. Num. LECCE L0600292



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Sample reference

MB19-0427

PHOTOGRAPHIC RECORD



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0427

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	103.26
Tare + soil + water (g)	195.64
Tare + soil (g)	181.37
Water (g)	14.27
Soil (g)	78.11
Moisture, w (%)	18.3

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	18.3

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	98.72
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.97
Dry density (Mg/m ³)	1.67

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.97
Dry density (Mg/m³)	1.67

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.3
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	184.9500
Soil mass, M1 (g)	10.7180
Particle density, G20°C (Mg/m ³)	2.668

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.668

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Sample reference

MB19-0427

Equipment
STANDARD SIEVE SERIES PROETI 203 mm BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

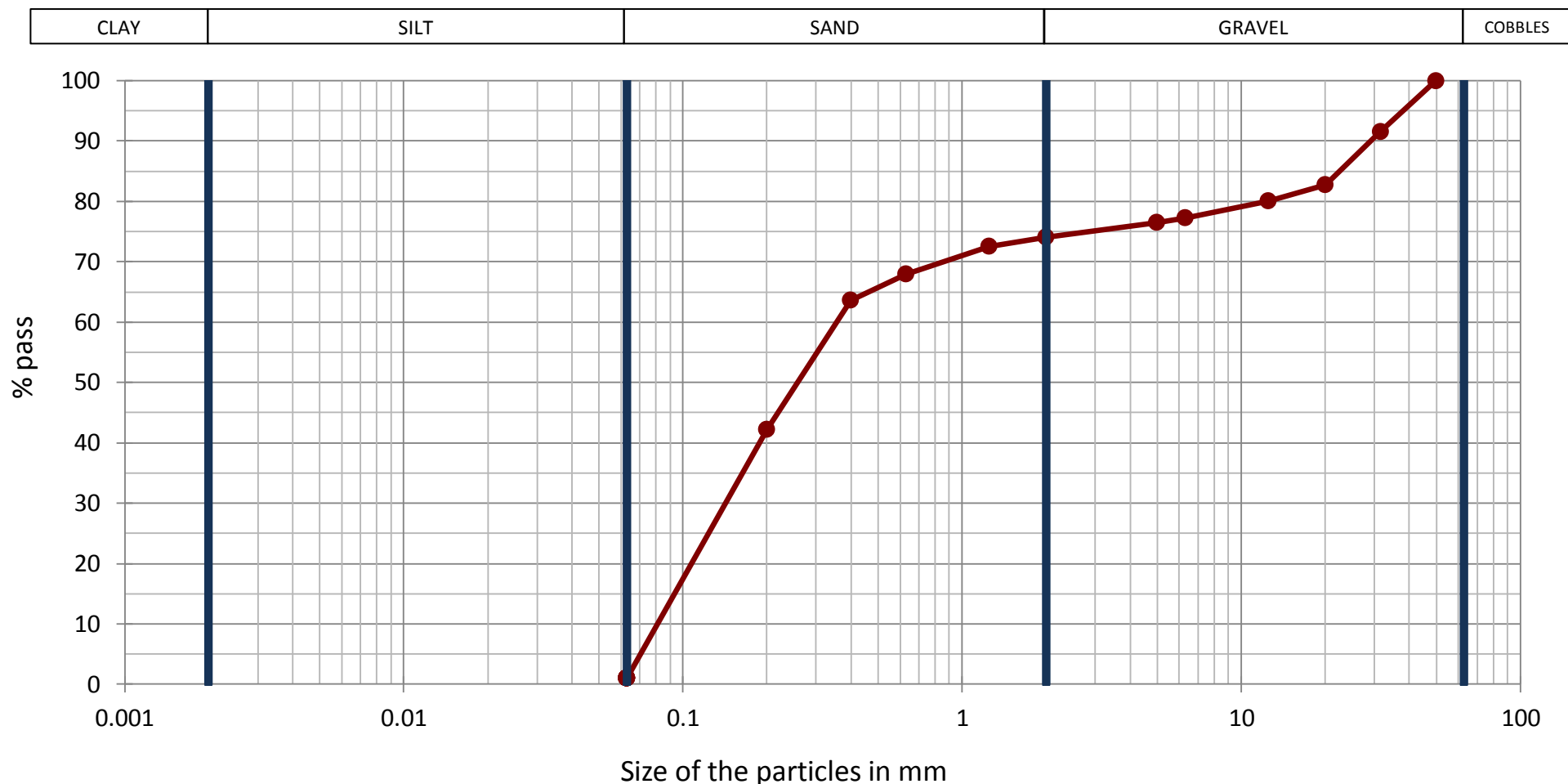
Predrying temperature (°C)	60
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Previous calculations	
Total dried sample (g)	1512.11
M. > 2mm, washed and dried (g)	391.73
M. < 2 mm, dried tested (g)	104.91
M. < 2 mm, dried tested (g)	104.72
M. < 2 mm, dried total (g)	1118.39
Total dried sample (g)	1510.12
Hygros. moisture, % (fraction<2 mm)	0.2
Corr. parameter, f (fraction<2 mm)	0.9982
Corr. parameter, f2 (fraction<2 mm)	10.6794

Results					
Sieves Aperture mm	Retained sieves		Pass total sample		
	Partial g	Total g	Total %	g	%
50		0.00	0.0	1510.12	100.0
31.5		128.15	8.5	1381.97	91.5
20		133.12	17.3	1248.85	82.7
12.5		39.68	19.9	1209.17	80.1
6.3		41.49	22.7	1167.68	77.3
5		13.08	23.5	1154.60	76.5
2		36.21	25.9	1118.39	74.1
1.25	2.21		27.5	1094.78	72.5
0.63	6.47		32.1	1025.69	67.9
0.4	6.09		36.4	960.65	63.6
0.2	30.22		57.8	637.92	42.2
0.063	58.26		99.0	15.73	1.0

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	25.9	% SAND	2-0.063 mm	73.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	17.3	% Coarse sand	2-0.63 mm	6.2		
	% Medium gravel	20-6.3 mm	5.4	% Medium sand	0.63-0.2 mm	25.7		1.0
	% Fine gravel	6.3-2 mm	3.2	% Fine sand	0.2-0.063 mm	41.2		



REMARKS

GRAVEL CONTAINS FLINT NODULES AND SHELL FRAGMENTS. SAND ALSO CONTAINS RARE SHELL FRAGMENTS AND RARE MICAS.

Operator: GUILLEM MASSALLÉ

Test final date: 13/09/2019

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0427

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 17-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.865 g

Equipment:

RESULT: **5.6 g/kg (total)**

MUFLA OVEN ETI HD150

3.6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0428

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_8 C_8.3
Top depth, m	3.02
Bottom depth, m	3.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	48
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light brownish gray (2.5Y 6/2) fine to medium SAND. Sand contains rare micas.	3.02	
	3.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0428



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0428

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	108.38
Tare + soil + water (g)	214.74
Tare + soil (g)	197.22
Water (g)	17.52
Soil (g)	88.84
Moisture, w (%)	19.7

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	19.7

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.93
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.91
Dry density (Mg/m ³)	1.60

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.91
Dry density (Mg/m³)	1.60

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.3
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	183.9600
Soil mass, M1 (g)	11.1090
Particle density, G20°C (Mg/m ³)	2.632

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.632

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0428

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

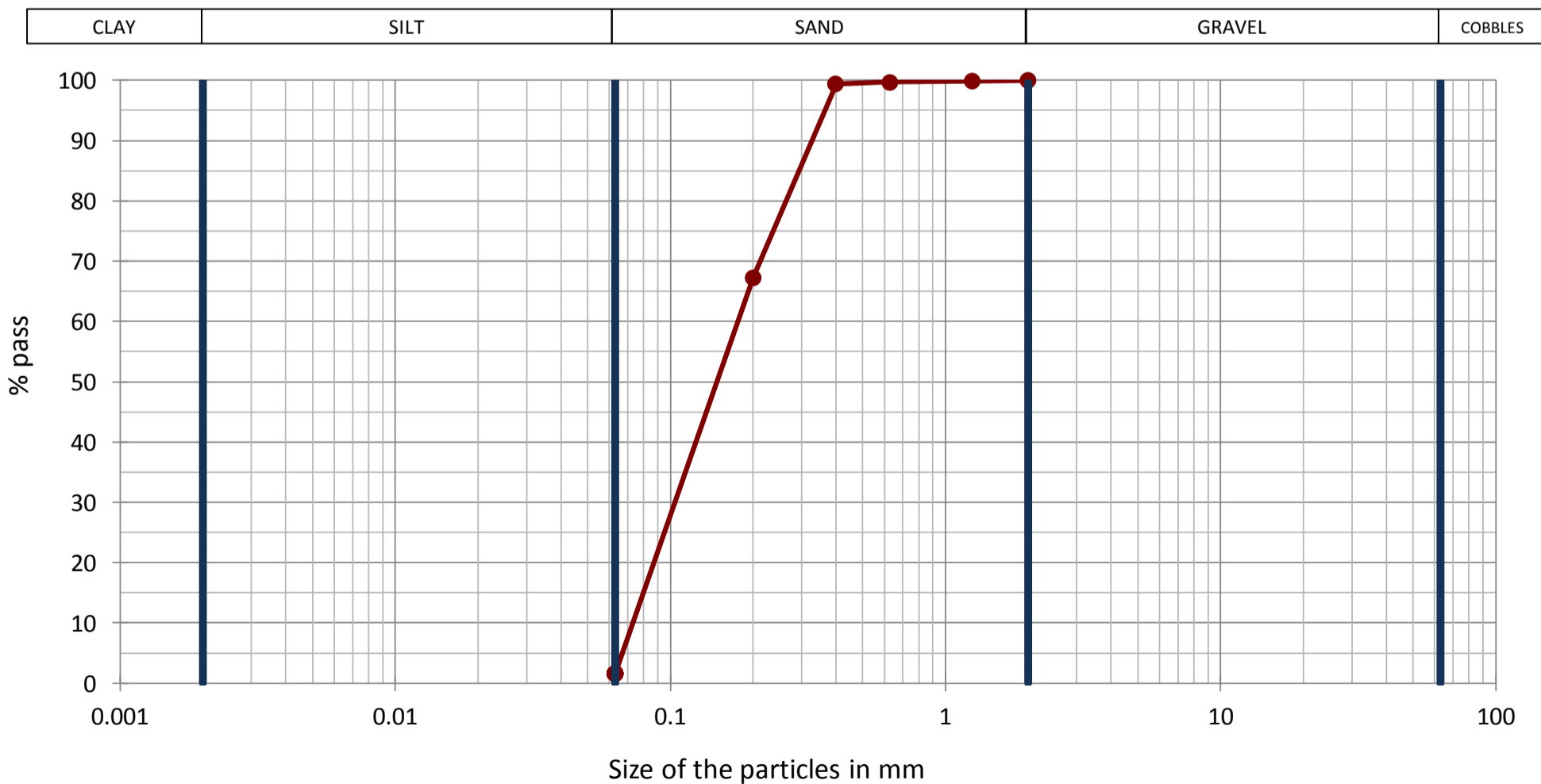
Previous calculations
 Total dried sample (g) **106.61**

 Hygrosc. moisture, % (fraction<2 mm) **0.1**
 Corr. parameter, f (fraction<2 mm) **0.9991**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2			0.00	0.0	106.52
1.25			0.06	0.1	106.46
0.63			0.23	0.3	106.23
0.4			0.40	0.6	105.83
0.2			34.11	32.7	71.72
0.063			69.98	98.4	1.74
					100.0
					99.9
					99.7
					99.4
					67.3
					1.6

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.4	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.3		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	32.4		1.6
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	65.7		



REMARKS

SAND CONTAINS RARE MICAS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0428

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Specimen dimensions

Specimen length (cm)	7.640
Specimen diameter (cm)	3.795
Specimen area (cm ²)	11.31
Specimen volume (cm ³)	86.41

Prior saturation process

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	20

Test data

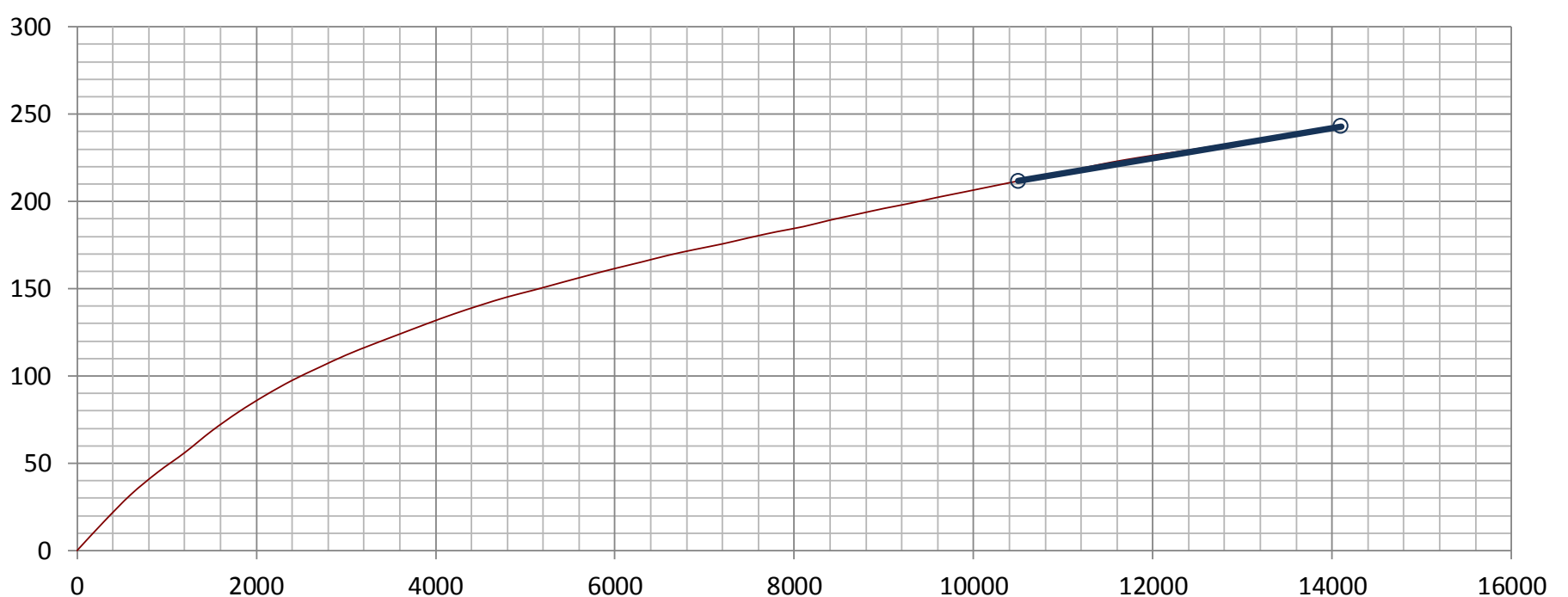
Soil weight (g)	174.57
Dry soil weight (g)	146.90
Initial moisture content (%)	18.9
Initial bulk density (Mg/m ³)	2.02
Initial dry density (Mg/m ³)	1.70
Initial void index, e ₀	0.5482
Initial saturation degree (%)	90.74
Final moisture content (%)	21.5
Final bulk density (Mg/m ³)	2.07
Final dry density (Mg/m ³)	1.70

Pressures applied during test excution

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results

Permeability constant, K (cm/s)	2.93E-05
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REMARKS

Operator: ALEX VANCELLS

Test final date: 18/09/2019

Report num.: CB0019-19-0005
Edition date:

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SOIL CHEMICAL ANALYSIS

Sample reference

MB19-0428

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 17-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.755 g

Equipment:

RESULT: **4 g/kg (total)**
3 g/kg (organic)

MUFLA OVEN ETI HD150
PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0428

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6222
Soil mass, g	1405
Minimum density, Mg/m³	1.41

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6477
Soil mass, g	1660
Maximum density, Mg/m³	1.66

Relative density	
Dry density, Mg/m ³	1.60
Relative density, %	76

REMARKS

Operator: JOAN SAHUN

Date final test: 04/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0429

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_8 C_8.2
Top depth, m	3.95
Bottom depth, m	4.1
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light brownish gray (2.5Y 6/2) fine to medium SAND. Sand contains rare micas.	3.95	
	4.1	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
 DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0429



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0429

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	103.11
Tare + soil + water (g)	228.55
Tare + soil (g)	210.44
Water (g)	18.11
Soil (g)	107.33
Moisture, w (%)	16.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	16.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	89.42
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.78
Dry density (Mg/m ³)	1.52

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.78
Dry density (Mg/m³)	1.52

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	185.8380
Soil mass, M1 (g)	12.4930
Particle density, G20°C (Mg/m ³)	2.652

Operator: GUILLEM MASSALLÉ
Test final date: 18/09/2019

Results	
Particle density (Mg/m³)	2.652

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0429

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

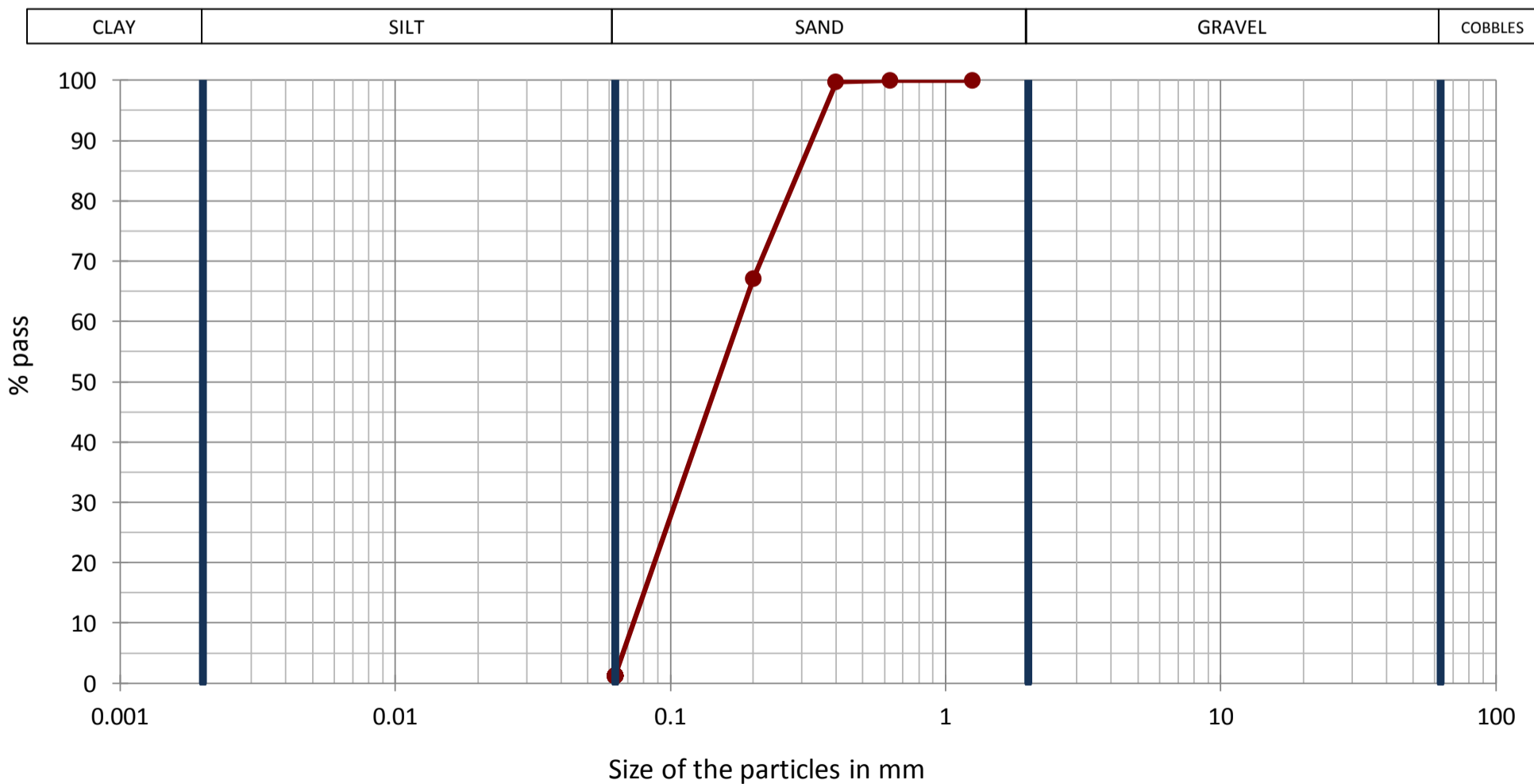
Previous calculations
 Total dried sample (g) **107.23**

 Hygrosc. moisture, % (fraction<2 mm) **0.1**
 Corr. parameter, f (fraction<2 mm) **0.9987**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
1.25			0.00	0.0	107.09	100.0
0.63			0.02	0.0	107.07	100.0
0.4			0.24	0.2	106.83	99.8
0.2			34.97	32.9	71.86	67.1
0.063			70.51	98.7	1.35	1.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.7	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	32.9		1.3
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	65.8		



REMARKS

SAND CONTAINS RARE MICAS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0429

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 17-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.375 g

Equipment:

RESULT: **4.4 g/kg (total)**

MUFLA OVEN ETI HD150

4.1 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0430

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_8 C_8.1
Top depth, m	4.92
Bottom depth, m	5.06
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	14
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light brownish gray (2.5Y 6/2) fine to medium SAND	4.92	
	5.06	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

REMARKS

THE LINER WAS BROKEN DURING THE EXTRUSION. UNDISTURBED PARAMETERS, SUCH AS WATER CONTENT AND BULK DENSITY, MUST BE TAKEN WITH DUE RESERVATIONS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0430



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0430

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	98.16
Tare + soil + water (g)	217.11
Tare + soil (g)	201.17
Water (g)	15.94
Soil (g)	103.01
Moisture, w (%)	15.5

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	15.5

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	94.82
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.89
Dry density (Mg/m ³)	1.64

Operator: GUILLEM MASSALLÉ
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.89
Dry density (Mg/m³)	1.64

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	184.5530
Soil mass, M1 (g)	10.4430
Particle density, G20°C (Mg/m ³)	2.647

Operator: ALEX VANCELLS
Test final date: 20/09/2019

Results	
Particle density (Mg/m³)	2.647

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0430

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

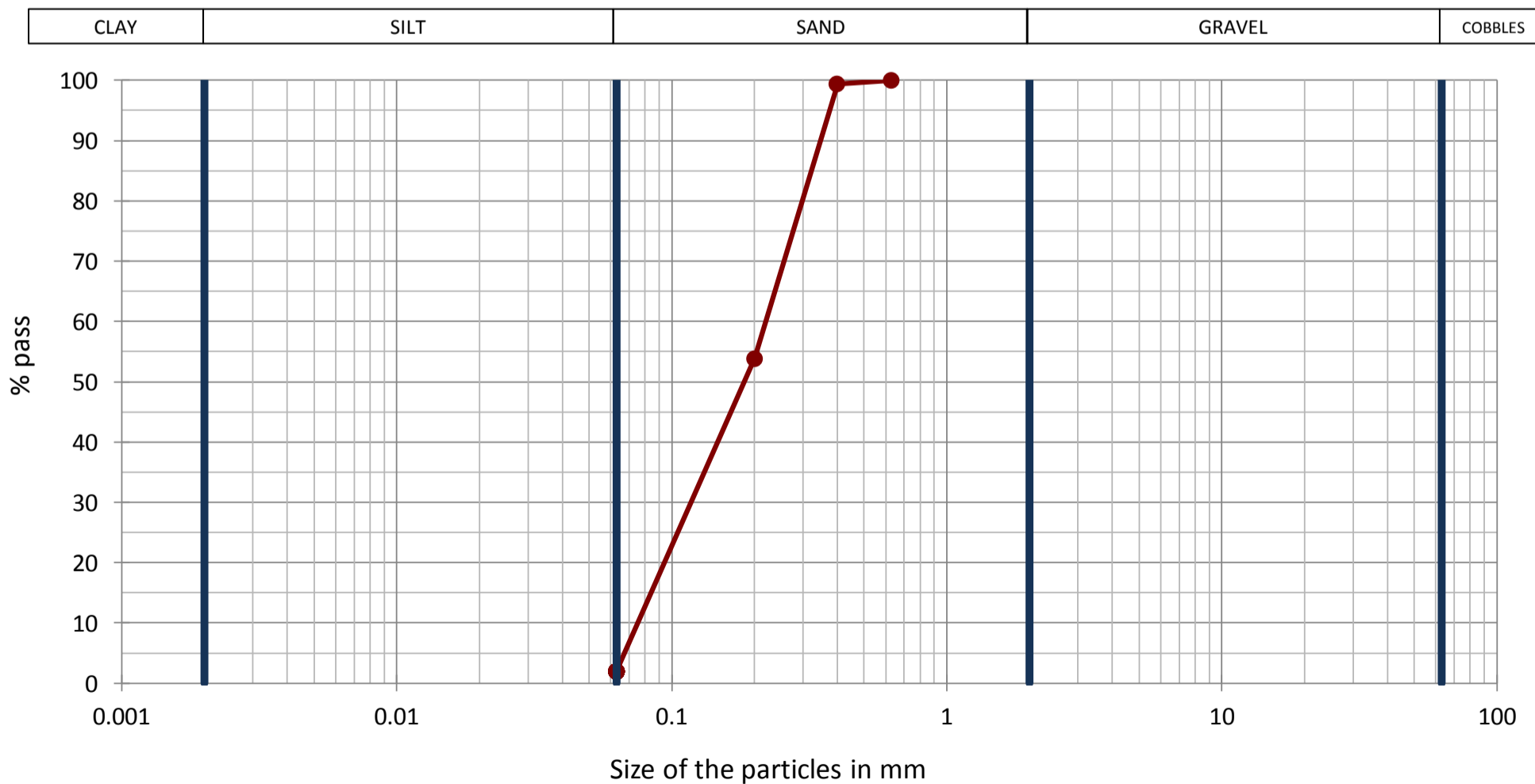
Previous calculations
 Total dried sample (g) **105.33**

 Hygroc. moisture, % (fraction<2 mm) **0.1**
 Corr. parameter, f (fraction<2 mm) **0.9989**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
0.63		0.00	0.0	105.22	100.0
0.4		0.64	0.6	104.58	99.4
0.2		47.86	46.1	56.72	53.9
0.063		54.66	98.0	2.06	2.0

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.0	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	46.1		2.0
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	51.9		



REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0430

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 23-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 11.128 g

Equipment:

RESULT: **2.6 g/kg (total)**
2.4 g/kg (organic)

MUFLA OVEN ETI HD150
PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0431

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_7 C_7.6
Top depth, m	0.07
Bottom depth, m	0.2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark olive gray (5Y 3/2) fine to medium SAND with rare amorphous organic matter blackish pockets and occasional shell fragments	0.07	
	0.2	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE

Report num.: CB0019-19-0005
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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0431



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0431

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	108.68
Tare + soil + water (g)	239.32
Tare + soil (g)	217.21
Water (g)	22.11
Soil (g)	108.53
Moisture, w (%)	20.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	20.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	102.61
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.04
Dry density (Mg/m ³)	1.69

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	2.04
Dry density (Mg/m³)	1.69

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	186.0360
Soil mass, M1 (g)	12.4400
Particle density, G20°C (Mg/m ³)	2.672

Operator: ALEX VANCELLS
Test final date: 20/09/2019

Results	
Particle density (Mg/m³)	2.672

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0431

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

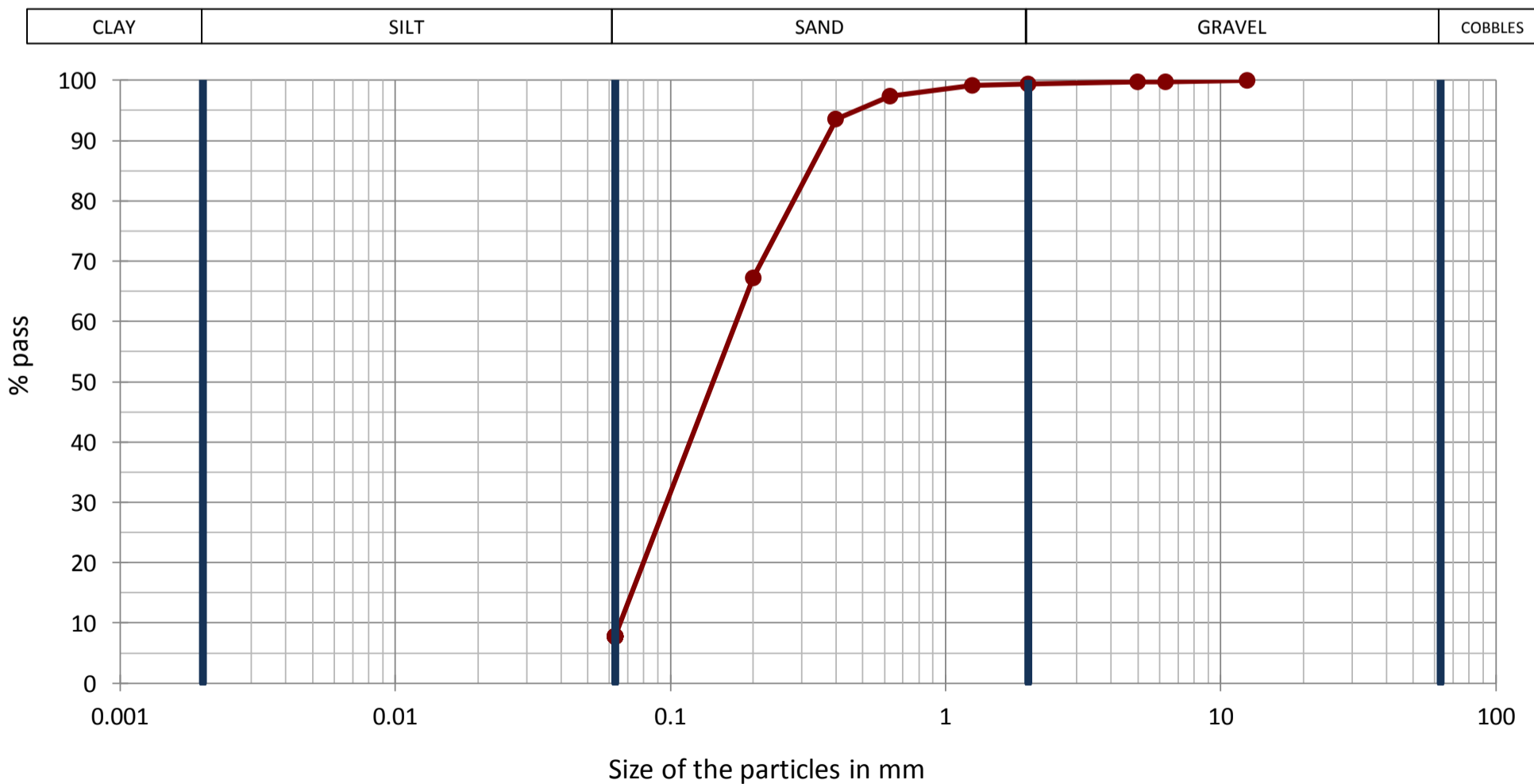
Previous calculations
 Total dried sample (g) **105.75**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9976**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
12.5		0.00	0.0	105.50	100.0
6.3		0.16	0.2	105.34	99.8
5		0.00	0.2	105.34	99.8
2		0.46	0.6	104.88	99.4
1.25		0.21	0.8	104.67	99.2
0.63		1.93	2.6	102.74	97.4
0.4		4.04	6.4	98.70	93.6
0.2		27.70	32.7	71.00	67.3
0.063		62.75	92.2	8.25	7.8

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.6	% SAND	2-0.063 mm	91.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	2.0	7.8	
	% Medium gravel	20-6.3 mm	0.2	% Medium sand	0.63-0.2 mm	30.1		
	% Fine gravel	6.3-2 mm	0.4	% Fine sand	0.2-0.063 mm	59.5		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SHELL FRAGMENTS.

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Sample reference

MB19-0431

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 23-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.298 g

Equipment:

RESULT: **8.4 g/kg (total)**

MUFLA OVEN ETI HD150

6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 20-09-19

Mean of analyzed soil mass: 4.999 g

Equipment:

RESULT: **20.1 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0432

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_7 C_7.5
Top depth, m	1
Bottom depth, m	1.15
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/1) medium to fine SAND with rare silt/clay and rare shell fragments	1	

1.15

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0432



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0432

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.57
Tare + soil + water (g)	254.88
Tare + soil (g)	230.94
Water (g)	23.94
Soil (g)	126.37
Moisture, w (%)	18.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	18.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	100.57
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.00
Dry density (Mg/m ³)	1.68

Operator: GUILLEM MASSALLÉ
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	2.00
Dry density (Mg/m³)	1.68

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	19.8
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6749
Pyc. mass + soil + water at test temp. M2 (g)	185.6800
Soil mass, M1 (g)	11.1480
Particle density, G20°C (Mg/m ³)	2.681

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.681

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0432

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

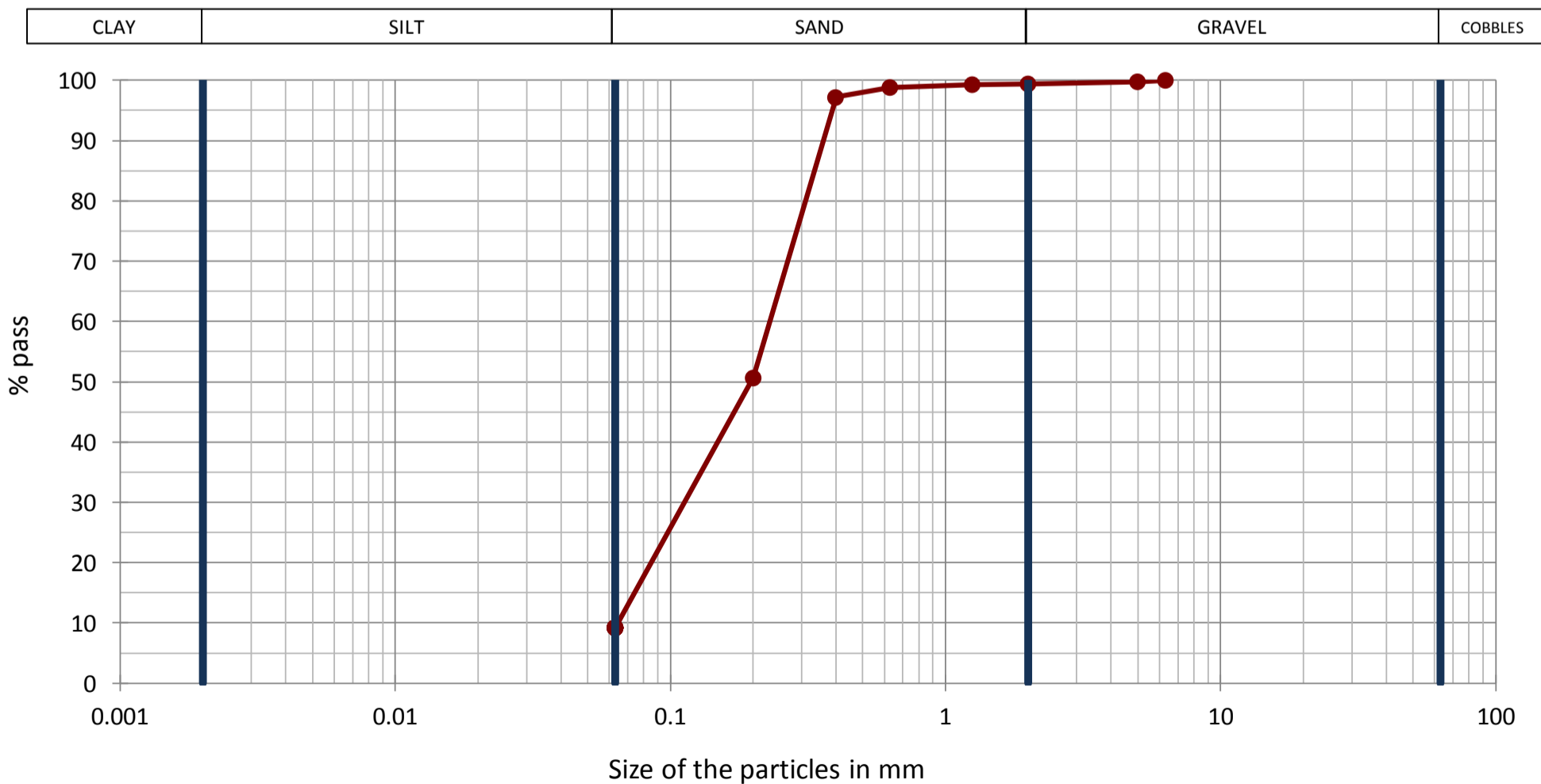
Previous calculations
 Total dried sample (g) **106.82**

 Hygrosc. moisture, % (fraction<2 mm) **0.3**
 Corr. parameter, f (fraction<2 mm) **0.9974**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
6.3		0.00	0.0	106.55	100.0
5		0.26	0.2	106.29	99.8
2		0.35	0.6	105.94	99.4
1.25		0.12	0.7	105.82	99.3
0.63		0.57	1.2	105.25	98.8
0.4		1.71	2.8	103.54	97.2
0.2		49.47	49.3	54.07	50.7
0.063		44.28	90.8	9.79	9.2

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.6	% SAND	2-0.063 mm	90.2	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.6	9.2	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	48.1		
	% Fine gravel	6.3-2 mm	0.6	% Fine sand	0.2-0.063 mm	41.5		



REMARKS

GRAVEL AND SAND CONTAIN SHELL FRAGMENTS

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Reg. Num. LECCE L0600292



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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0432

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 02-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.633 g

Equipment:

RESULT: **4.8 g/kg (total)**

MUFLA OVEN ETI HD150

3.2 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass: 3.19 g

Equipment:

RESULT: **13.3 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0432

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6203
Soil mass, g	1386
Minimum density, Mg/m³	1.39

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6499
Soil mass, g	1682
Maximum density, Mg/m³	1.69

Relative density	
Dry density, Mg/m ³	1.68
Relative density, %	97

REMARKS

Operator: JOAN SAHUN

Date final test: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0433

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_7 C_7.4
Top depth, m	1.64
Bottom depth, m	2.2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	56
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light brownish gray (2.5Y 6/2) medium SAND with rare amorphous organic matter blackish spots	1.64	
	2.2	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0433



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0433

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.17
Tare + soil + water (g)	209.76
Tare + soil (g)	196.45
Water (g)	13.31
Soil (g)	85.28
Moisture, w (%)	15.6

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	15.6

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	92.57
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.84
Dry density (Mg/m ³)	1.59

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.84
Dry density (Mg/m³)	1.59

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	186.1310
Soil mass, M1 (g)	12.6760
Particle density, G20°C (Mg/m ³)	2.642

Operator: GUILLEM MASSALLÉ
Test final date: 23/09/2019

Results	
Particle density (Mg/m³)	2.642

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0433

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

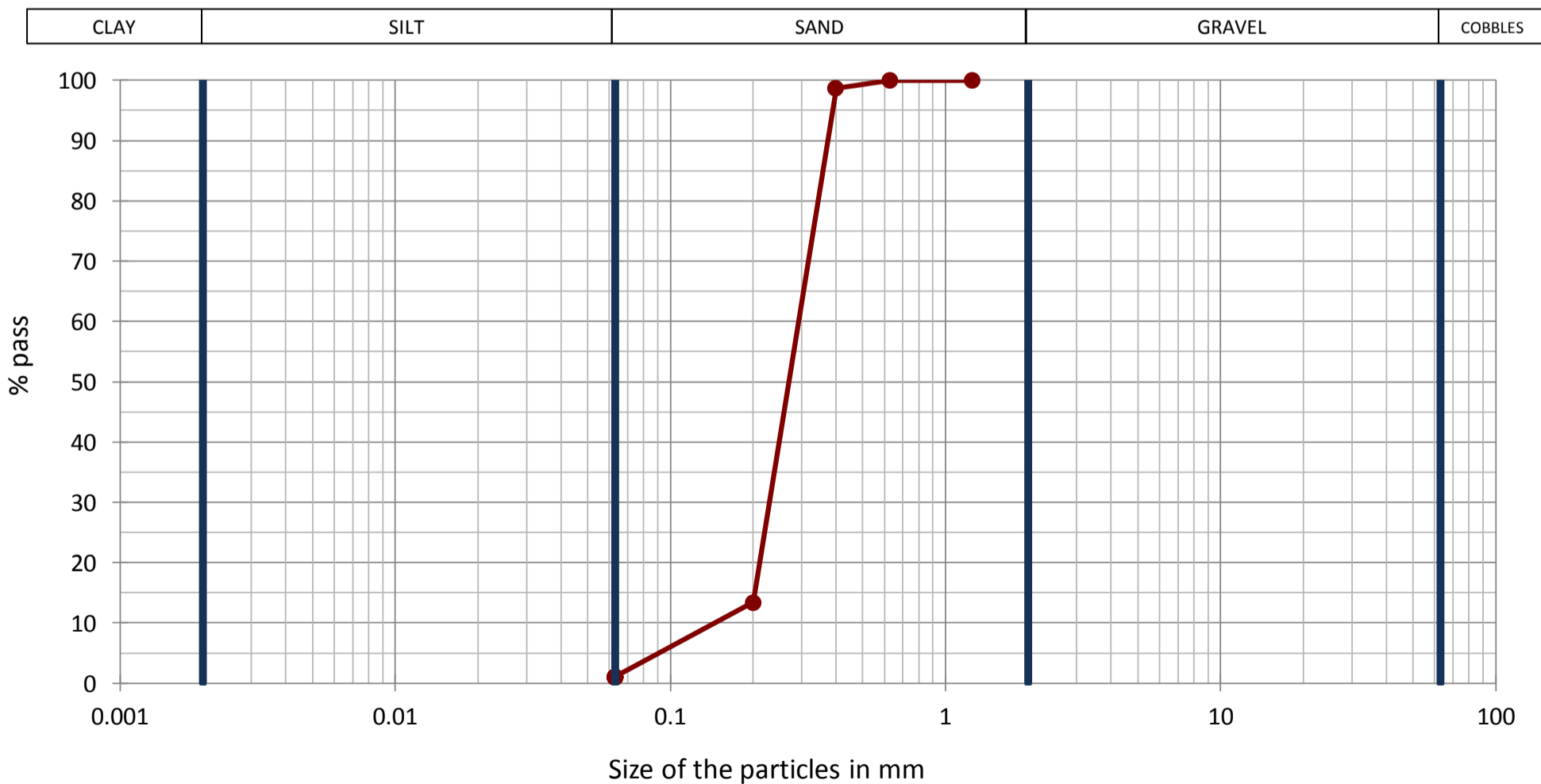
Previous calculations
 Total dried sample (g) **105.42**

 Hygros. moisture, % (fraction<2 mm) **0.1**
 Corr. parameter, f (fraction<2 mm) **0.9991**

Results					
Sieves Aperture mm	Retained sieves		Pass total sample		
	Partial g	Total g	Total %	g	%
1.25		0.00	0.0	105.33	100.0
0.63		0.05	0.0	105.28	100.0
0.4		1.29	1.3	103.99	98.7
0.2		89.89	86.6	14.10	13.4
0.063		12.92	98.9	1.18	1.1

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	86.6		1.1
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	12.3		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0433

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Specimen dimensions

Specimen length (cm)	7.610
Specimen diameter (cm)	3.820
Specimen area (cm ²)	11.46
Specimen volume (cm ³)	87.21

Prior saturation process

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	22

Test data

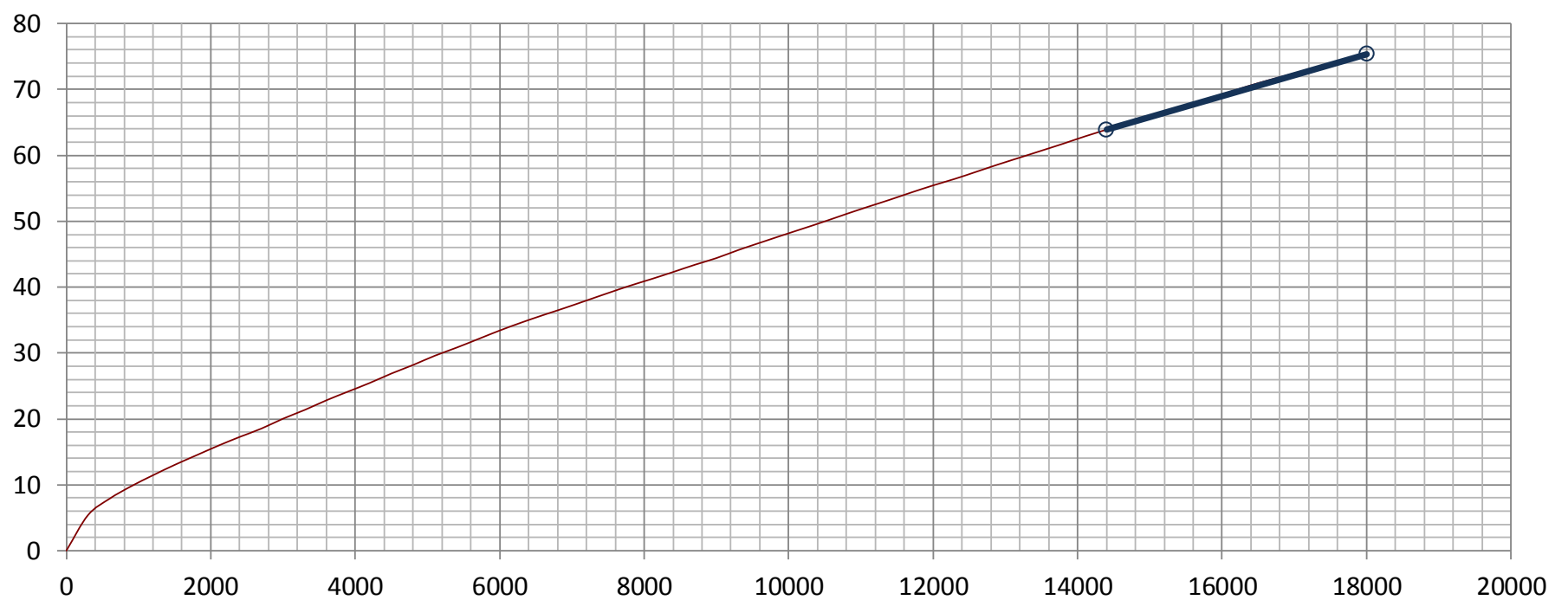
Soil weight (g)	174.66
Dry soil weight (g)	147.38
Initial moisture content (%)	18.0
Initial bulk density (Mg/m ³)	2.00
Initial dry density (Mg/m ³)	1.69
Initial void index, e ₀	0.5633
Initial saturation degree (%)	84.42
Final moisture content (%)	21.5
Final bulk density (Mg/m ³)	2.05
Final dry density (Mg/m ³)	1.69

Pressures applied during test execution

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results

Permeability constant, K (cm/s)	1.06E-05
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REMARKS

Operator: ALEX VANCELLS

Test final date: 27/09/2019

Report num.: CB0019-19-0005
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SOIL CHEMICAL ANALYSIS

Sample reference

MB19-0433

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 23-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.459 g

Equipment:

RESULT: **3.8 g/kg (total)**

MUFLA OVEN ETI HD150

3.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0433

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6305
Soil mass, g	1488
Minimum density, Mg/m³	1.49

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6544
Soil mass, g	1727
Maximum density, Mg/m³	1.73

Relative density	
Dry density, Mg/m ³	1.59
Relative density, %	42

REMARKS

Operator: JOAN SAHUN

Date final test: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0434

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_7 C_7.3
Top depth, m	2.9
Bottom depth, m	3.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	40
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB./RUSSELL GEOT. INNOV.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light brownish gray (2.5Y 6/2) medium to fine SAND with rare amorphous organic matter blackish spots	2.9	3.0-3.3 m: RESERVED FOR ADVANCED TESTING
	3.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

REMARKS

SEE ADVANCED TESTING RESULTS IN RUSSELL GEOTECHNICAL INNOVATIONS REPORT

Report num.:	CB0019-19-0005
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PHOTOGRAPHIC RECORD

MB19-0434



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0434

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.83
Tare + soil + water (g)	234.67
Tare + soil (g)	215.74
Water (g)	18.93
Soil (g)	103.91
Moisture, w (%)	18.2

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	18.2

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	94.82
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.89
Dry density (Mg/m ³)	1.60

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.89
Dry density (Mg/m³)	1.60

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	19.9
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2670
Pyc. mass + soil + water at test temp. M2 (g)	184.6490
Soil mass, M1 (g)	10.3020
Particle density, G20°C (Mg/m ³)	2.624

Operator: GUILLEM MASSALLÉ
Test final date: 18/09/2019

Results	
Particle density (Mg/m³)	2.624

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0434

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

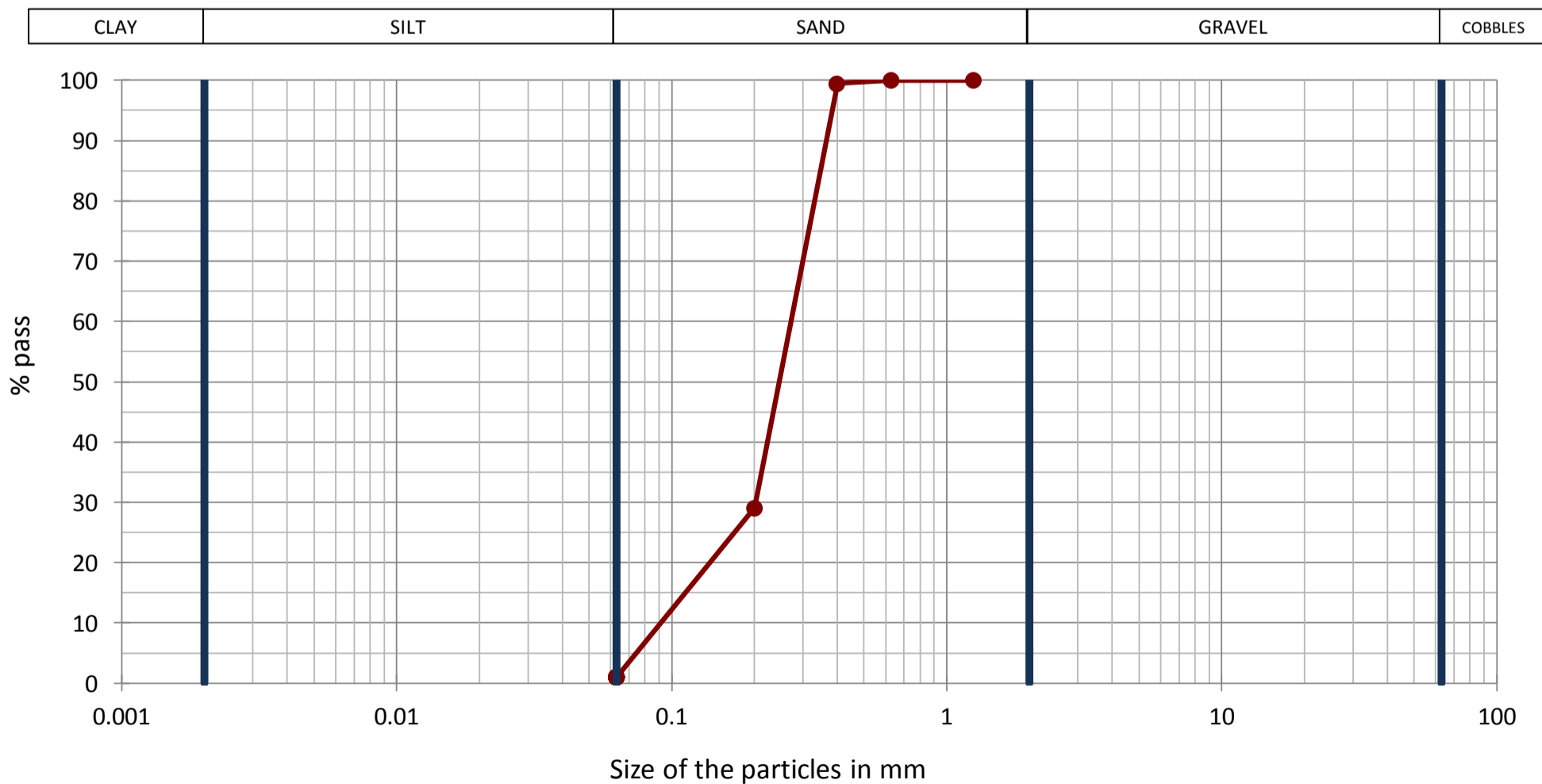
Previous calculations
 Total dried sample (g) **104.82**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9984**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
1.25		0.00	0.0	104.65	100.0
0.63		0.04	0.0	104.61	100.0
0.4		0.48	0.5	104.13	99.5
0.2		73.71	70.9	30.42	29.1
0.063		29.39	99.0	1.03	1.0

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm		% SAND	2-0.063 mm		% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	70.9		1.0
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	28.1		



REMARKS

SAND CONTAINS RARE ORGANIC MATTER AND RARE MICAS

Report num.: CB0019-19-0005
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Sample reference

MB19-0434

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 18-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 11.197 g

Equipment:

RESULT: **3 g/kg (total)**

MUFLA OVEN ETI HD150

2.9 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0435

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_7 C_7.2
Top depth, m	3.78
Bottom depth, m	3.9
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	12
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light brownish gray (2.5Y 6/2) medium SAND with occasional fine sand and rare amorphous organic matter blackish spots	3.78	
	3.9	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0435



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0435

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	112.90
Tare + soil + water (g)	218.08
Tare + soil (g)	207.28
Water (g)	10.80
Soil (g)	94.38
Moisture, w (%)	11.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	11.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	86.76
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.73
Dry density (Mg/m ³)	1.55

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.73
Dry density (Mg/m³)	1.55

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	19.9
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0658
Pyc. mass + soil + water at test temp. M2 (g)	186.0740
Soil mass, M1 (g)	12.7020
Particle density, G20°C (Mg/m ³)	2.698

Operator: GUILLEM MASSALLÉ
Test final date: 23/09/2019

Results	
Particle density (Mg/m³)	2.698

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0435

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

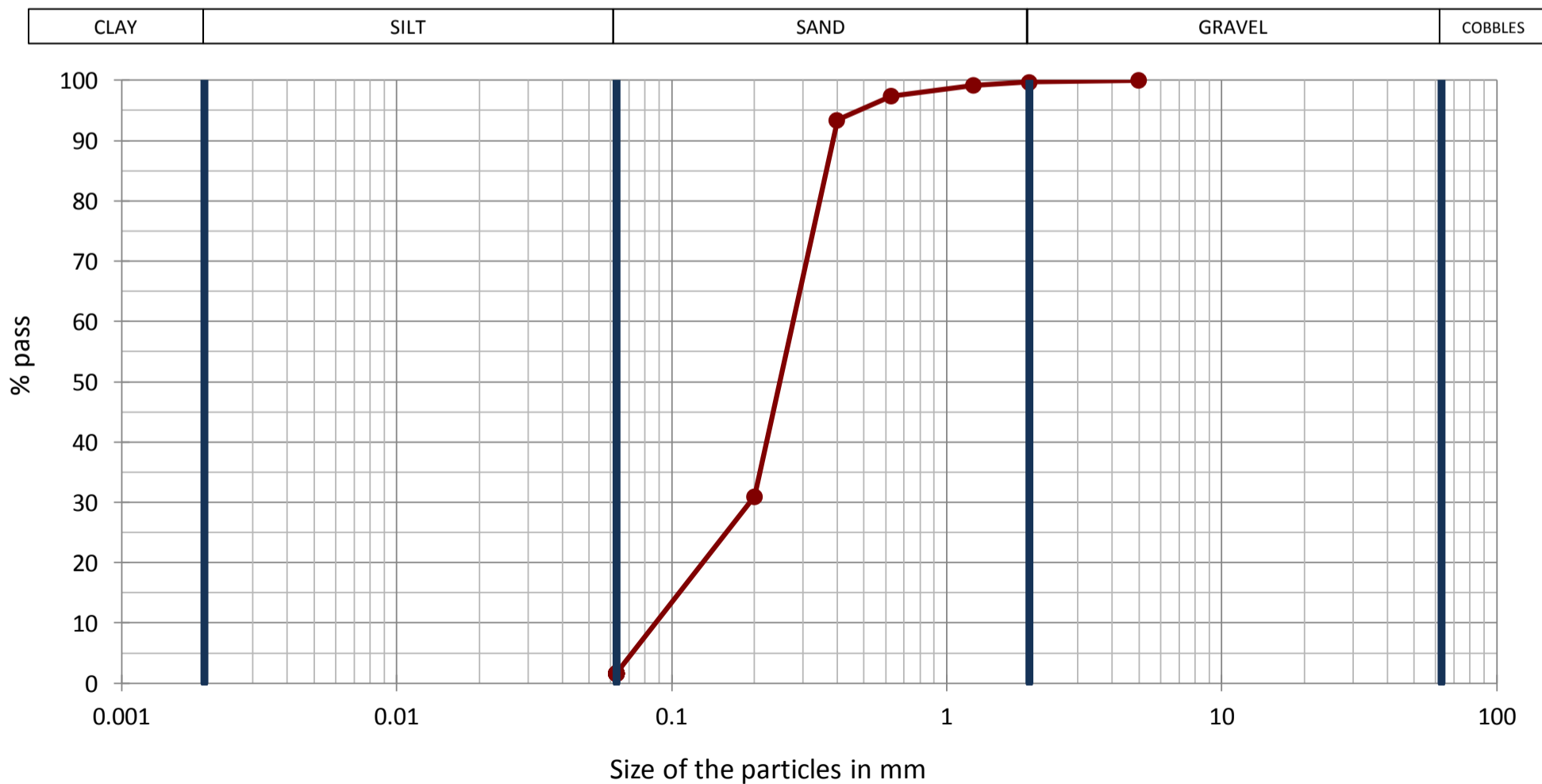
Previous calculations
 Total dried sample (g) **103.76**

 Hygrosc. moisture, % (fraction<2 mm) **0.3**
 Corr. parameter, f (fraction<2 mm) **0.9973**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
5		0.00	0.0	103.48	100.0
2		0.36	0.3	103.12	99.7
1.25		0.43	0.8	102.69	99.2
0.63		1.89	2.6	100.80	97.4
0.4		4.18	6.6	96.62	93.4
0.2		64.59	69.0	32.03	31.0
0.063		30.30	98.3	1.73	1.7

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.3	% SAND	2-0.063 mm	98.0	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	2.3		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	66.4		1.7
	% Fine gravel	6.3-2 mm	0.3	% Fine sand	0.2-0.063 mm	29.3		



REMARKS

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0435

Equipment

Sample data
 Percentage passing #2 mm (%) 99.7

Hydrometer data
 Eq. dispersant correc. (Cd) $y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582$

Test tube data

Test data and results

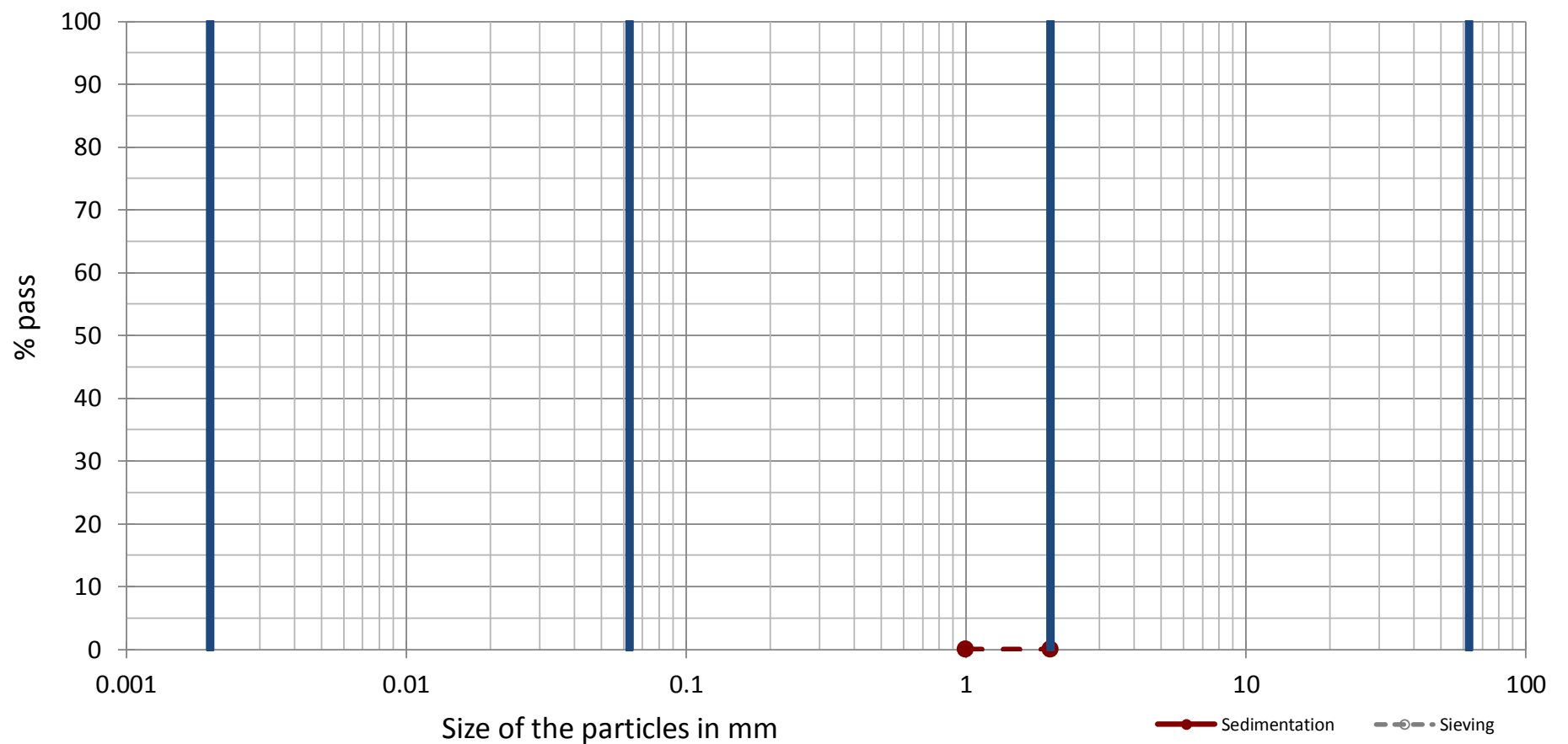
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1							
2							
5							
15							
30							
60							
120							
240							
1440							

Legend test data and results

- t - Time
- T - Temperature
- R'h - Reading suspension soil on top of the meniscus
- Rh - Corrected reading suspension of soil
 $Rh=(R'h-1)*1000$
- Hr - Effective depth
- R - Real reading suspension soil
 $R=Rh+Cm+Ct-Cd$
- d - Equivalent particle diameter
- K - Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017
 Particles smaller than 0.063 mm (%)
Silt, between 0.063 and 0.002 mm (%)
Clay, smaller than 0.002 mm (%)

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator:

Test final date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0435

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 24-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.834 g

Equipment:

RESULT: **2.8 g/kg (total)**

MUFLA OVEN ETI HD150

1.3 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0436

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_7 C_7.1
Top depth, m	4.4
Bottom depth, m	4.9
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	50
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light brownish gray (2.5Y 6/2) medium to fine SAND with rare amorphous organic matter blackish spots	4.4	
	4.9	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0436



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0436

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	105.74
Tare + soil + water (g)	206.57
Tare + soil (g)	191.07
Water (g)	15.50
Soil (g)	85.33
Moisture, w (%)	18.2

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	18.2

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	91.91
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.83
Dry density (Mg/m ³)	1.55

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.83
Dry density (Mg/m³)	1.55

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	19.8
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0880
Pyc. mass + soil + water at test temp. M2 (g)	183.4330
Soil mass, M1 (g)	10.2290
Particle density, G20°C (Mg/m ³)	2.629

Operator: GUILLEM MASSALLÉ
Test final date: 18/09/2019

Results	
Particle density (Mg/m³)	2.629

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0436

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

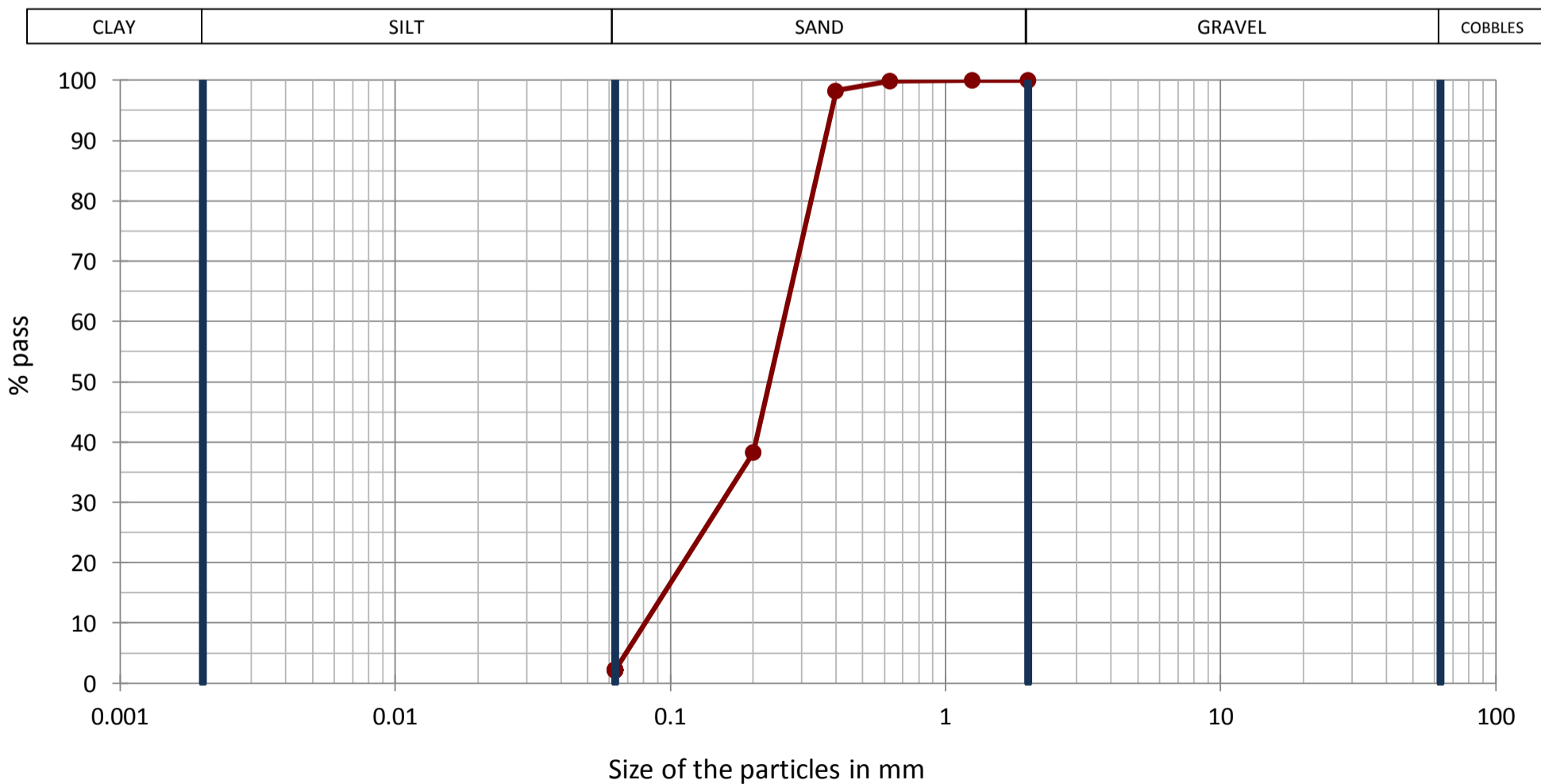
Previous calculations
 Total dried sample (g) **105.21**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9981**

Results					
Sieves Aperture mm	Retained sieves		Pass total sample		
	Partial g	Total g	Total %	g	%
2		0.00	0.0	105.01	100.0
1.25		0.03	0.0	104.98	100.0
0.63		0.11	0.1	104.87	99.9
0.4		1.63	1.7	103.24	98.3
0.2		63.03	61.7	40.21	38.3
0.063		37.90	97.8	2.31	2.2

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	97.8	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	61.6		2.2
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	36.1		



REMARKS

MEDIUM AND COARSE SAND CONTAINS SOME ORGANIC MATTER

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0436

Soil conditions **REMOULDED**

Equipment

Remoulding conditions of the specimen

TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Sieve lower fraction (mm)	
Remoulding reference data	NAT. COND.
Bulk density (Mg/m ³)	1.83
Moisture content (%)	
Compactness (%)	

Specimen dimensions

Prior saturation process

Specimen length (cm)	7.610
Specimen diameter (cm)	3.810
Specimen area (cm ²)	11.40
Specimen volume (cm ³)	86.75

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	20

Test data

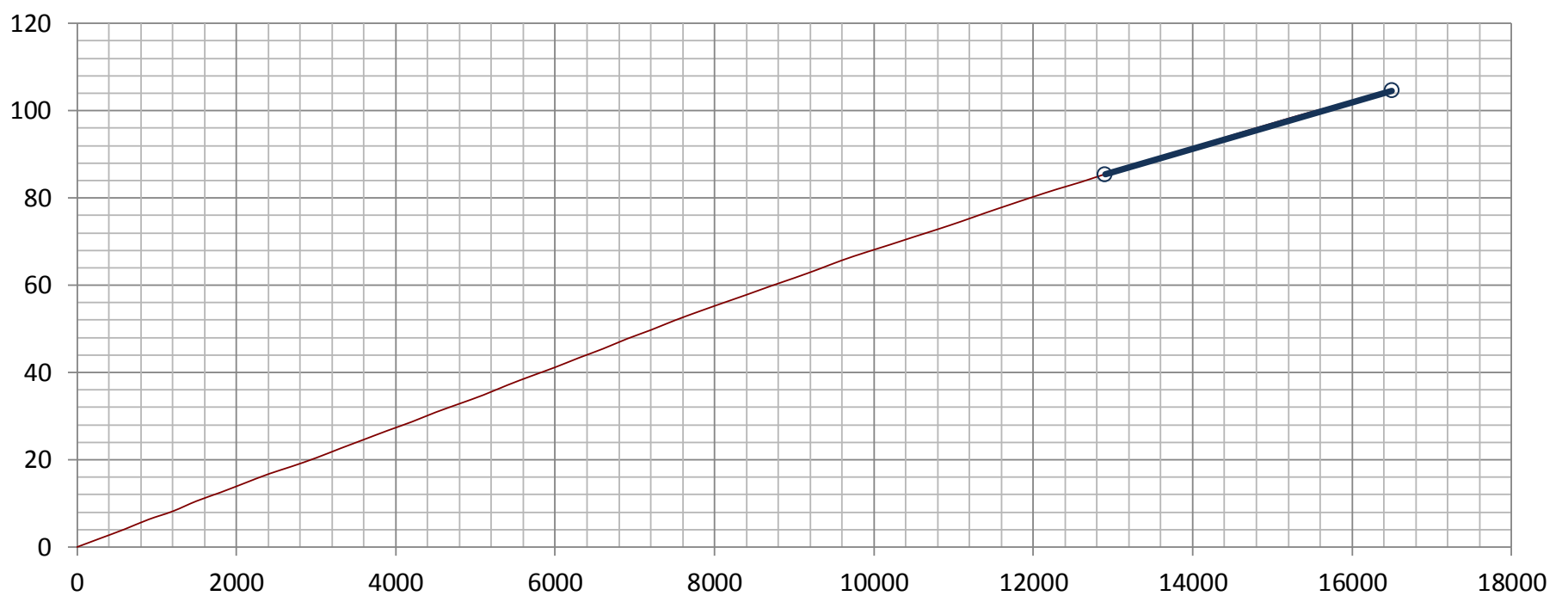
Pressures applied during test execution

Soil weight (g)	153.35
Dry soil weight (g)	139.67
Initial moisture content (%)	9.7
Initial bulk density (Mg/m ³)	1.77
Initial dry density (Mg/m ³)	1.61
Initial void index, e ₀	0.6329
Initial saturation degree (%)	40.29
Final moisture content (%)	21.2
Final bulk density (Mg/m ³)	1.95
Final dry density (Mg/m ³)	1.61

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results

Permeability constant, K (cm/s)	1.78E-05
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REMARKS

Operator: ALEX VANCELLS

Test final date: 20/09/2019

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SOIL CHEMICAL ANALYSIS

Sample reference

MB19-0436

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 18-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.208 g

Equipment:

RESULT: **3.8 g/kg (total)**

MUFLA OVEN ETI HD150

3.6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0436

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6323
Soil mass, g	1506
Minimum density, Mg/m³	1.51

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6631
Soil mass, g	1814
Maximum density, Mg/m³	1.82

Relative density	
Dry density, Mg/m ³	1.55
Relative density, %	13

REMARKS

Operator: JOAN SAHUN

Date final test: 04/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0437

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_6 C_6.6
Top depth, m	0.45
Bottom depth, m	0.55
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/1) medium to fine SAND with rare clay pockets and rare shell fragments	0.45	
	0.55	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0437



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0437

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.14
Tare + soil + water (g)	213.24
Tare + soil (g)	197.79
Water (g)	15.45
Soil (g)	93.65
Moisture, w (%)	16.5

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	16.5

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	101.55
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.02
Dry density (Mg/m ³)	1.73

Operator: MARC COLOMER
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	2.02
Dry density (Mg/m³)	1.73

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	185.4270
Soil mass, M1 (g)	11.2810
Particle density, G20°C (Mg/m ³)	2.653

Operator: GUILLEM MASSALLÉ
Test final date: 23/09/2019

Results	
Particle density (Mg/m³)	2.653

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0437

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

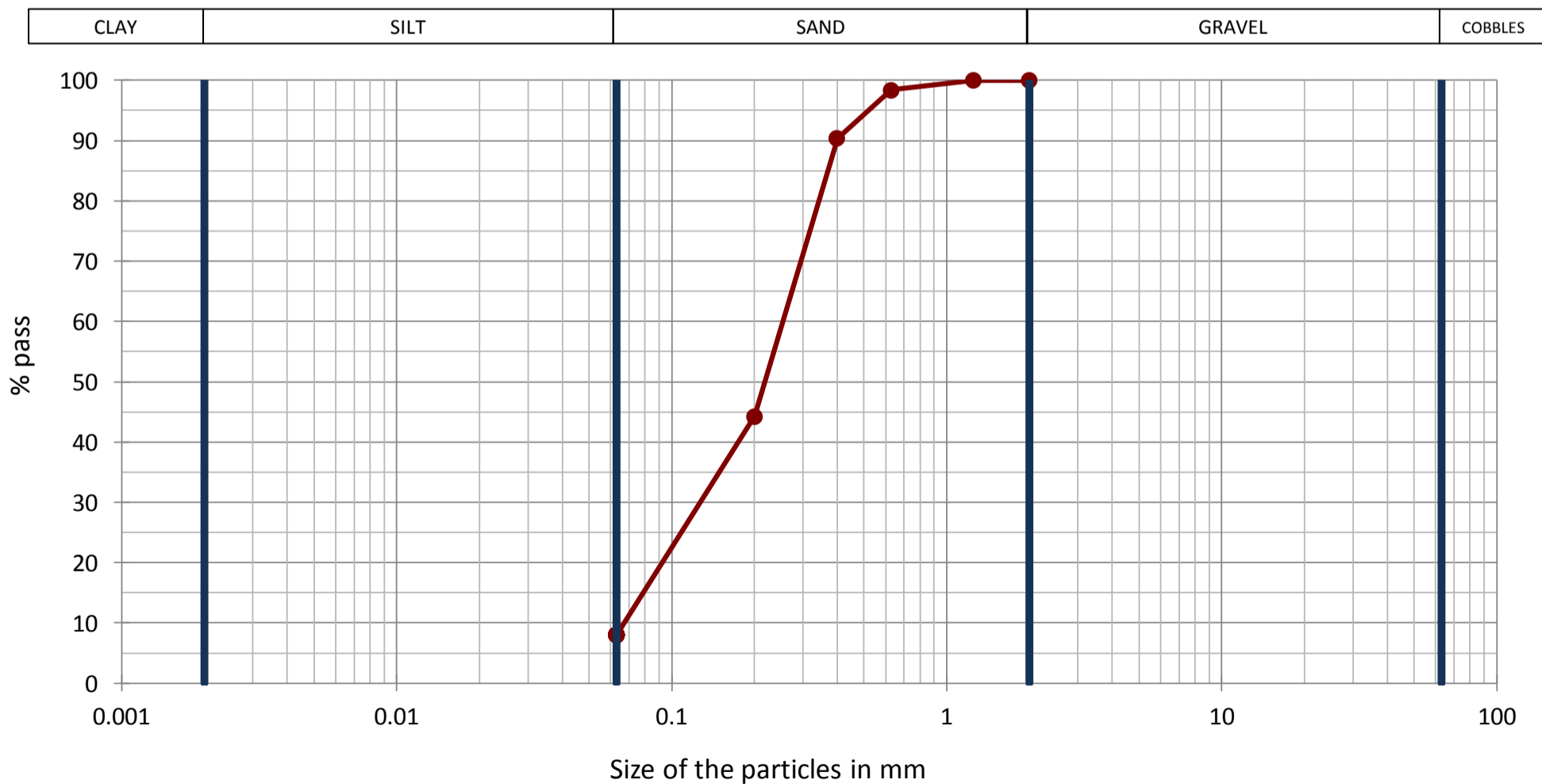
Previous calculations
 Total dried sample (g) **106.88**

 Hygros. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9982**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2			0.00	0.0	106.69 100.0
1.25			0.05	0.0	106.64 100.0
0.63			1.63	1.6	105.01 98.4
0.4			8.60	9.6	96.41 90.4
0.2			49.18	55.7	47.23 44.3
0.063			38.68	92.0	8.55 8.0

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	92.0	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.6		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	54.1		8.0
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	36.3		



REMARKS

COARSE SAND CONTAINS RARE SHELL FRAGMENTS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0437

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 24-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.251 g

Equipment:

RESULT: **4.3 g/kg (total)**

MUFLA OVEN ETI HD150

1.1 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 25-09-19

Mean of analyzed soil mass: 3.037 g

Equipment:

RESULT: **27 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0437

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6332
Soil mass, g	1515
Minimum density, Mg/m³	1.52

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6627
Soil mass, g	1810
Maximum density, Mg/m³	1.82

Relative density	
Dry density, Mg/m ³	1.73
Relative density, %	70

REMARKS

Operator: JOAN SAHUN

Date final test: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0438

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_6 C_6.5
Top depth, m	0.75
Bottom depth, m	0.9
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive gray (5Y 5/2) fine to medium SAND thickly laminated with dark olive gray (5Y 3/2) SILT with rare blackish amorphous organic matter pockets and rare shell fragments	0.75	
	0.9	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0438



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0438

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.45
Tare + soil + water (g)	224.71
Tare + soil (g)	206.56
Water (g)	18.15
Soil (g)	95.11
Moisture, w (%)	19.1

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	19.1

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	94.61
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.88
Dry density (Mg/m ³)	1.58

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	1.88
Dry density (Mg/m³)	1.58

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	19.7
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6749
Pyc. mass + soil + water at test temp. M2 (g)	186.0940
Soil mass, M1 (g)	11.8870
Particle density, G20°C (Mg/m ³)	2.652

Operator: GUILLEM MASSALLÉ
Test final date: 18/09/2019

Results	
Particle density (Mg/m³)	2.652

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Sample reference

MB19-0438

Equipment	
STANDARD SIEVE SERIES PROETI 203 mm	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

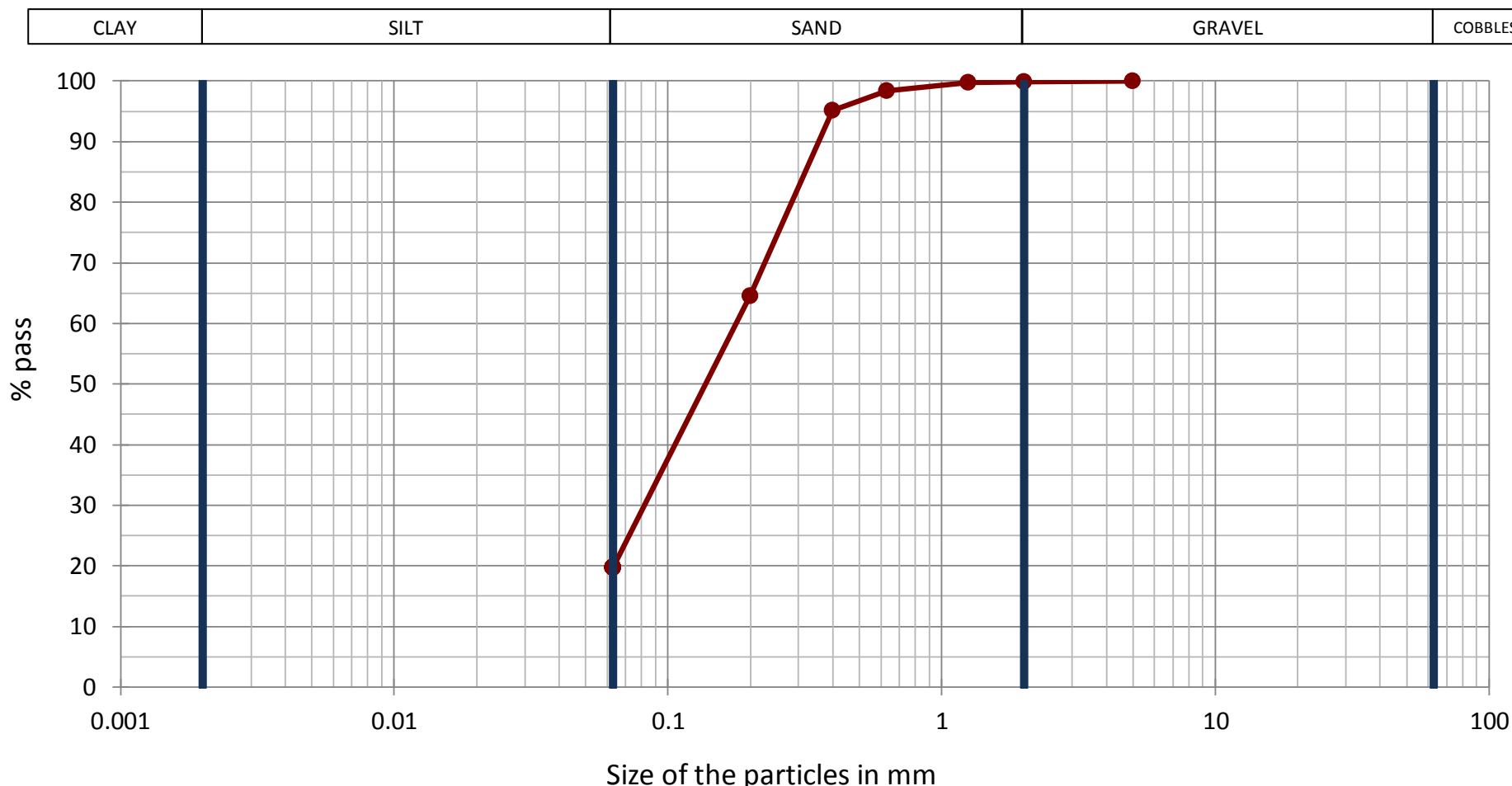
Predrying temperature (°C)	60
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Previous calculations	
Total dried sample (g)	107.45
Hygrosc. moisture, % (fraction < 2 mm)	0.4
Corr. parameter, f (fraction < 2 mm)	0.9962

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
5		0.00	0.0		107.04
2		0.10	0.1		106.94
1.25		0.16	0.2		106.78
0.63		1.40	1.6		105.38
0.4		3.56	4.9		101.82
0.2		32.68	35.4		69.14
0.063		48.04	80.3		21.10
					100.0
					99.9
					99.8
					98.4
					95.1
					64.6
					19.7

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.1	% SAND	2-0.063 mm	80.2	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.5	19.7	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	33.8		
	% Fine gravel	6.3-2 mm	0.1	% Fine sand	0.2-0.063 mm	44.9		



REMARKS

MEDIUM AND COARSE SAND CONTAINS SOME ORGANIC MATTER AND SHELL FRAGMENTS

Operator: MARC COLOMER

Test final date: 18/09/2019

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0438

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	99.9
Tested soil mass, mw (g)	75.31
Hygroscopic moisture, W (%)	0.4
Tested and dried soil mass, m (g)	75.03
Particle density (Mg/m ³)	2.652

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582
Meniscus correction (Cm)	0.0005

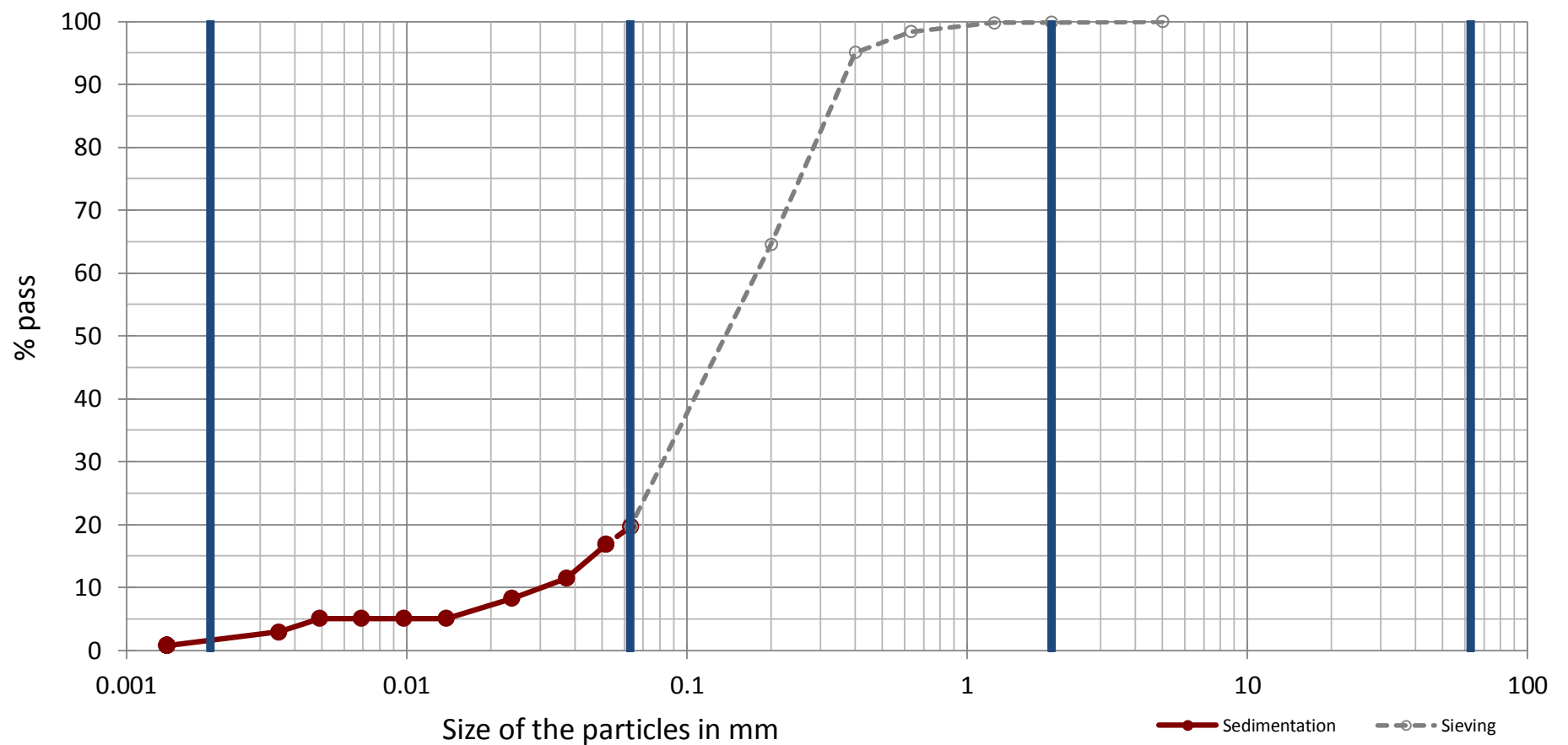
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	23	1.0120	12	153.9	7.9	0.0516	16.8
2	23	1.0095	9.5	159.8	5.4	0.0372	11.5
5	23	1.0080	8	163.4	3.9	0.0238	8.3
15	23	1.0065	6.5	166.9	2.4	0.0139	5.1
30	23	1.0065	6.5	166.9	2.4	0.0098	5.1
60	23	1.0065	6.5	166.9	2.4	0.0069	5.1
120	23	1.0065	6.5	166.9	2.4	0.0049	5.1
240	23	1.0055	5.5	169.3	1.4	0.0035	2.9
1440	23	1.0045	4.5	171.7	0.4	0.0014	0.8

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	19.7
Silt, between 0.063 and 0.002 mm (%)	18.3
Clay, smaller than 0.002 mm (%)	1.4

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 24/09/2019

Report num.: CB0019-19-0005
Edition date:

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6 / 6

Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0438

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 18-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.285 g

Equipment:

RESULT: **9.9 g/kg (total)**

MUFLA OVEN ETI HD150

5.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 19-09-19

Mean of analyzed soil mass: 4.907 g

Equipment:

RESULT: **36.8 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0439

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_6 C_6.4
Top depth, m	2.15
Bottom depth, m	2.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	19-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	grSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Grayish brown (2.5Y 5/2) gravelly medium SAND. Gravel is coarse to fine and contain some flint nodules.	2.15	
	2.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THE SAMPLE CONTAINS MEDIUM AND COARSE GRAVEL

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0439



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 19/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0439

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	112.74
Tare + soil + water (g)	212.13
Tare + soil (g)	200.86
Water (g)	11.27
Soil (g)	88.12
Moisture, w (%)	12.8

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Moisture content, w (%)	12.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	101.54
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.02
Dry density (Mg/m ³)	1.79

Operator: ALEX VANCELLS
Test final date: 19/06/2019

Results	
Bulk density (Mg/m³)	2.02
Dry density (Mg/m³)	1.79

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	186.6300
Soil mass, M1 (g)	13.1990
Particle density, G20°C (Mg/m ³)	2.657

Operator: GUILLEM MASSALLÉ
Test final date: 18/09/2019

Results	
Particle density (Mg/m³)	2.657

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0439

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

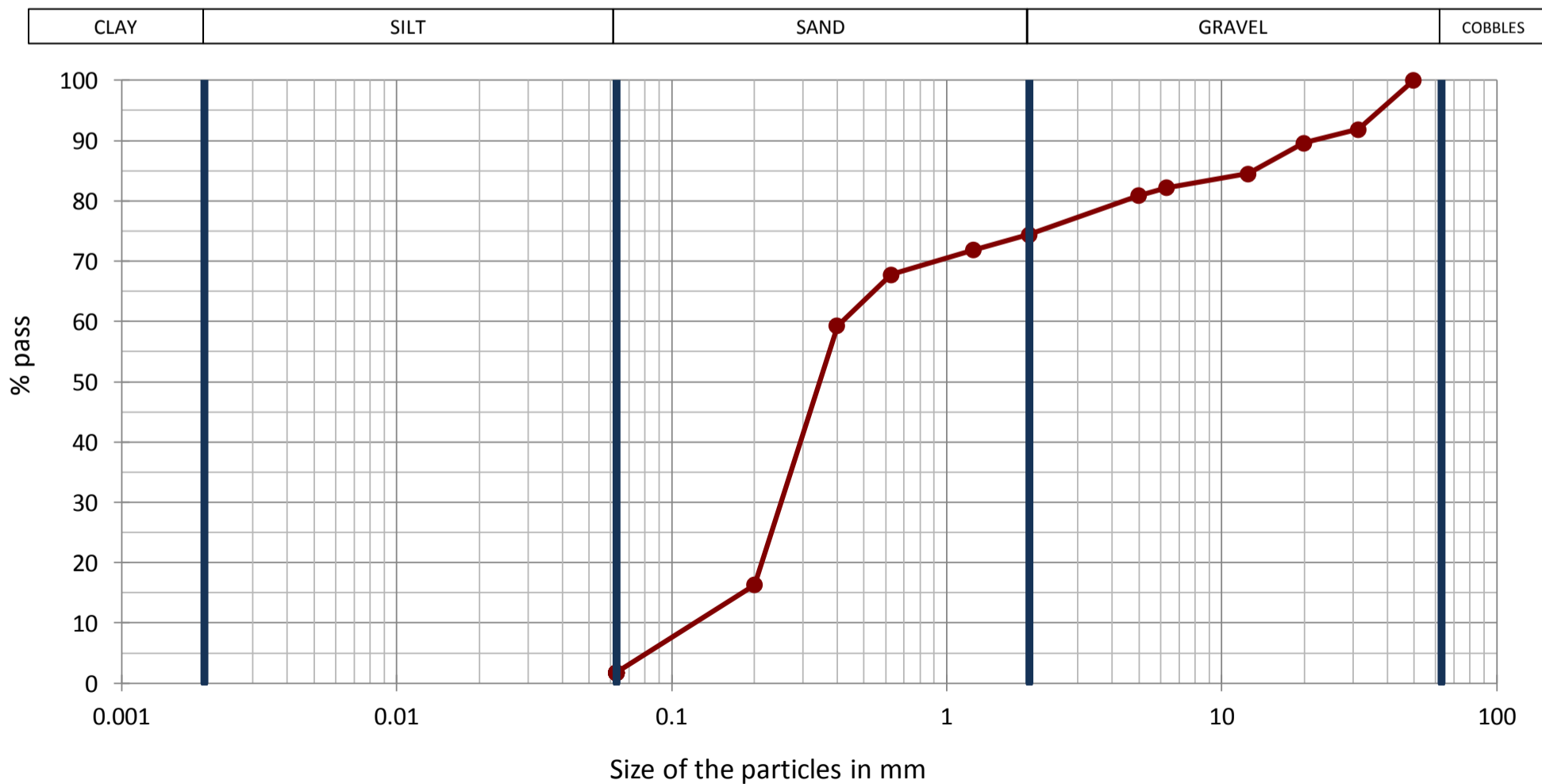
Total dried sample (g)	1896.38
M. > 2mm, washed and dried (g)	483.73
M. < 2 mm, dried tested (g)	105.88
M. < 2 mm, dried tested (g)	105.32
M. < 2 mm, dried total (g)	1405.18
Total dried sample (g)	1888.91
Hygros. moisture, % (fraction<2 mm)	0.5
Corr. parameter, f (fraction<2 mm)	0.9947
Corr. parameter, f2 (fraction<2 mm)	13.3420

Results

Sieves Aperture mm	Retained sieves		Pass total sample		
	Partial g	Total g	Total %	g	%
50		0.00	0.0	1888.91	100.0
31.5		153.57	8.1	1735.34	91.9
20		42.14	10.4	1693.20	89.6
12.5		96.18	15.5	1597.02	84.5
6.3		44.82	17.8	1552.20	82.2
5		24.64	19.1	1527.56	80.9
2		122.38	25.6	1405.18	74.4
1.25	3.53		28.1	1358.08	71.9
0.63	5.75		32.2	1281.37	67.8
0.4	12.15		40.7	1119.26	59.3
0.2	60.75		83.7	308.74	16.3
0.063	20.54		98.2	34.69	1.8

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	25.6	% SAND	2-0.063 mm	72.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	10.4	% Coarse sand	2-0.63 mm	6.6	1.8	
	% Medium gravel	20-6.3 mm	7.4	% Medium sand	0.63-0.2 mm	51.5		
	% Fine gravel	6.3-2 mm	7.8	% Fine sand	0.2-0.063 mm	14.5		



REMARKS

GRAVEL CONTAIN FLINT NODULES. FINE GRAVEL AND SAND CONTAIN RARE ORGANIC MATTER.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0439

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 19-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.131 g

Equipment:

RESULT: **1.7 g/kg (total)**
1.3 g/kg (organic)

MUFLA OVEN ETI HD150
PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0440

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_6 C_6.3
Top depth, m	3.3
Bottom depth, m	3.6
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	30
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Grayish brown (2.5Y 5/2) medium SAND with occasional fine and coarse sand, rare fine to medium gravel and rare amorphous organic matter blackish zones	3.3	
	3.6	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
 DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
 DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
 DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0440



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
 Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0440

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	103.79
Tare + soil + water (g)	206.09
Tare + soil (g)	191.77
Water (g)	14.32
Soil (g)	87.98
Moisture, w (%)	16.3

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	16.3

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	100.08
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.99
Dry density (Mg/m ³)	1.71

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	1.99
Dry density (Mg/m³)	1.71

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.4
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3721
Pyc. mass + soil + water at test temp. M2 (g)	185.2580
Soil mass, M1 (g)	10.9930
Particle density, G20°C (Mg/m ³)	2.676

Operator: GUILLEM MASSALLÉ
Test final date: 19/09/2019

Results	
Particle density (Mg/m³)	2.676

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0440

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

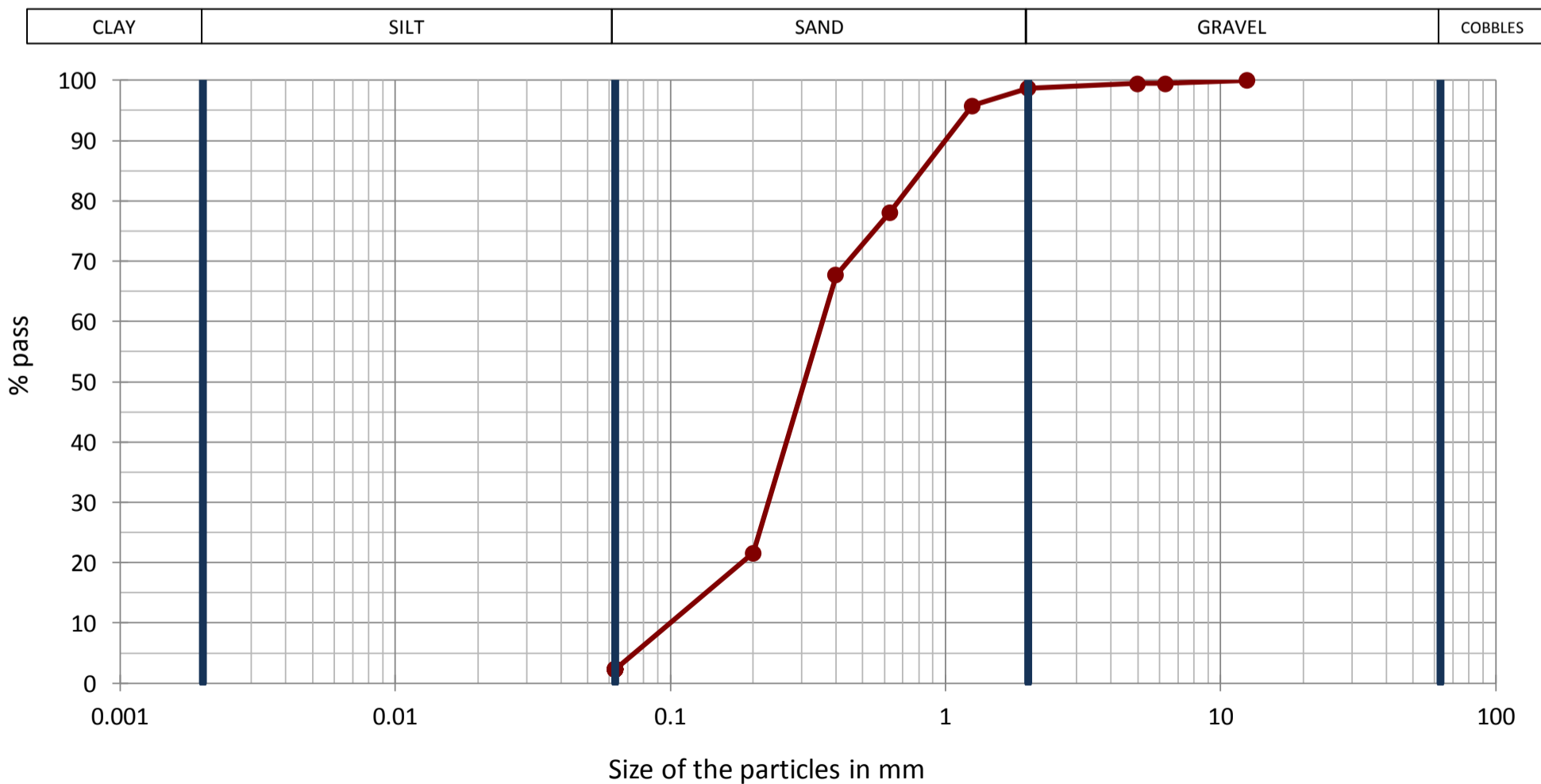
Previous calculations
 Total dried sample (g) **104.64**

 Hygrosc. moisture, % (fraction<2 mm) **0.1**
 Corr. parameter, f (fraction<2 mm) **0.9986**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
12.5		0.00	0.0	104.50	100.0
6.3		0.49	0.5	104.01	99.5
5		0.00	0.5	104.01	99.5
2		0.92	1.3	103.09	98.7
1.25		3.02	4.2	100.07	95.8
0.63		18.47	21.9	81.60	78.1
0.4		10.87	32.3	70.73	67.7
0.2		48.15	78.4	22.58	21.6
0.063		20.20	97.7	2.38	2.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	1.3	% SAND	2-0.063 mm	96.4	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	20.6	2.3	
	% Medium gravel	20-6.3 mm	0.5	% Medium sand	0.63-0.2 mm	56.5		
	% Fine gravel	6.3-2 mm	0.8	% Fine sand	0.2-0.063 mm	19.3		



REMARKS

GRAVEL AND SAND CONTAIN RARE ORGANIC MATTER

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0440

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Specimen dimensions

Specimen length (cm)	7.650
Specimen diameter (cm)	3.810
Specimen area (cm ²)	11.40
Specimen volume (cm ³)	87.21

Prior saturation process

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	19

Test data

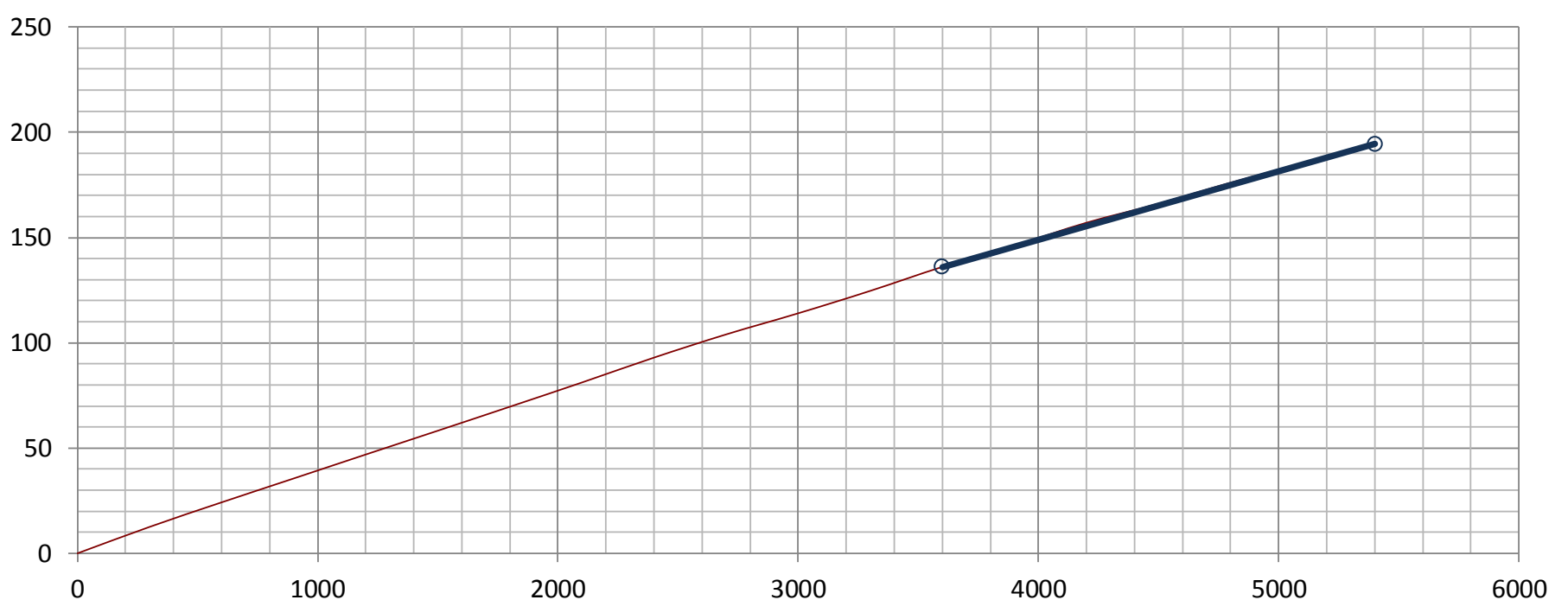
Soil weight (g)	167.79
Dry soil weight (g)	143.90
Initial moisture content (%)	16.3
Initial bulk density (Mg/m ³)	1.92
Initial dry density (Mg/m ³)	1.65
Initial void index, e ₀	0.6218
Initial saturation degree (%)	70.15
Final moisture content (%)	17.4
Final bulk density (Mg/m ³)	1.94
Final dry density (Mg/m ³)	1.65

Pressures applied during test execution

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results

Permeability constant, K (cm/s)	1.09E-04
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REMARKS

Operator: ALEX VANCELLS

Test final date: 23/09/2019

Report num.: CB0019-19-0005
Edition date:

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SOIL CHEMICAL ANALYSIS

Sample reference

MB19-0440

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 19-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.374 g

Equipment:

RESULT: **2.6 g/kg (total)**

MUFLA OVEN ETI HD150

2.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993

Sample reference

MB19-0440

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6382
Soil mass, g	1565
Minimum density, Mg/m³	1.57

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6680
Soil mass, g	1863
Maximum density, Mg/m³	1.87

Relative density	
Dry density, Mg/m ³	1.71
Relative density, %	47

REMARKS

Operator: ALEX VANCELLS

Date final test: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0441

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_6 C_6.2
Top depth, m	4.08
Bottom depth, m	4.22
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	14
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Grayish brown (2.5Y 5/2) medium SAND with occasional fine and coarse sand and rare amorphous organic matter blackish zones	4.08	
	4.22	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0441



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0441

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	107.66
Tare + soil + water (g)	207.62
Tare + soil (g)	198.81
Water (g)	8.81
Soil (g)	91.15
Moisture, w (%)	9.7

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	9.7

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	91.28
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.82
Dry density (Mg/m ³)	1.66

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	1.82
Dry density (Mg/m³)	1.66

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.4
Water density at test temp., $\delta_w T_i$ (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6391
Pyc. mass + soil + water at test temp. M2 (g)	185.1840
Soil mass, M1 (g)	10.4240
Particle density, G20°C (Mg/m ³)	2.686

Operator: GUILLEM MASSALLÉ
Test final date: 19/09/2019

Results	
Particle density (Mg/m³)	2.686

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0441

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

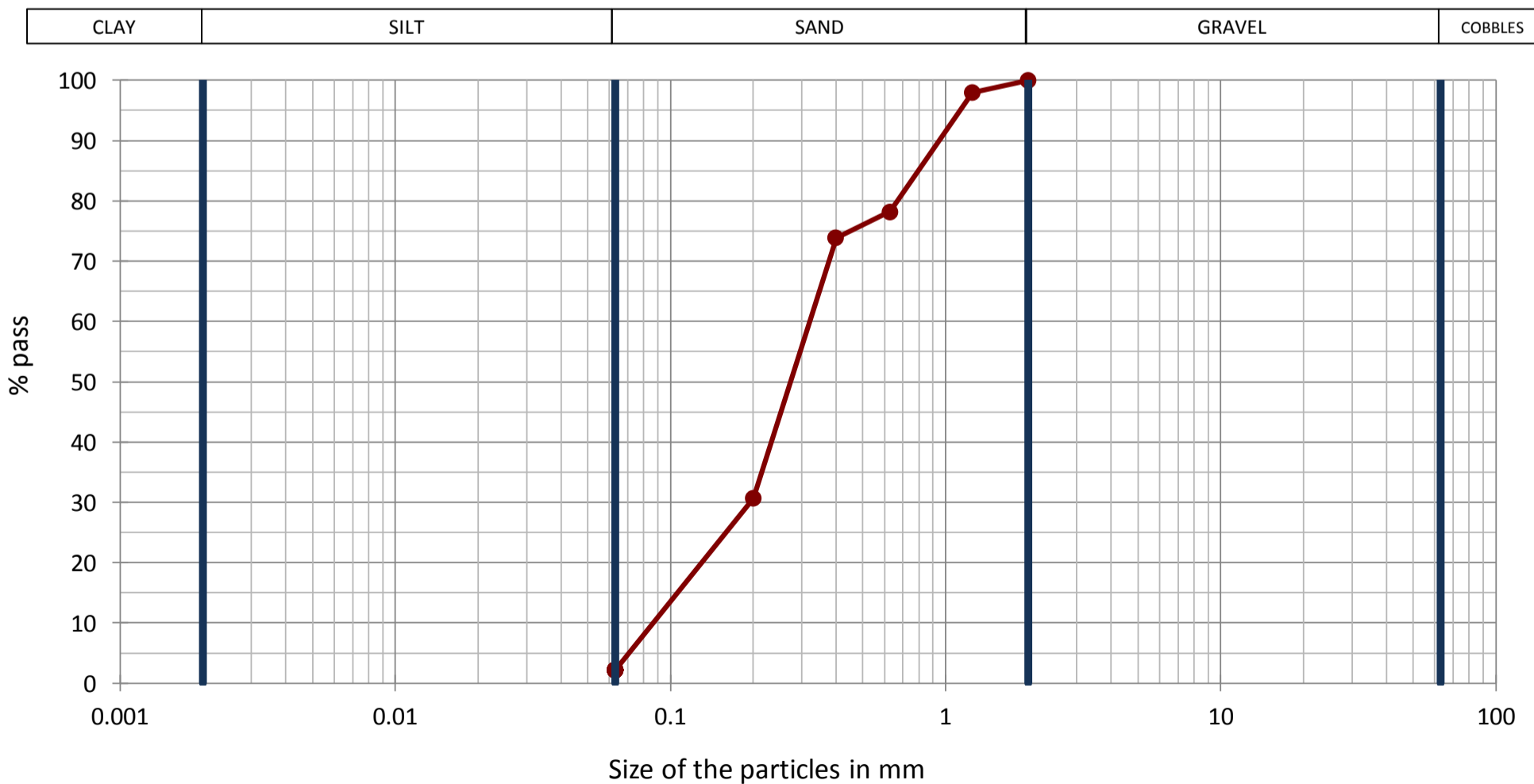
Previous calculations
 Total dried sample (g) **105.75**

 Hygros. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9979**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
2		0.00	0.0	105.53	100.0
1.25		2.11	2.0	103.42	98.0
0.63		20.88	21.8	82.54	78.2
0.4		4.51	26.1	78.03	73.9
0.2		45.62	69.3	32.41	30.7
0.063		30.07	97.8	2.34	2.2

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	97.8	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	21.8		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	47.5		2.2
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	28.5		



REMARKS

SAND CONTAINS RARE ORGANIC MATTER

Report num.: CB0019-19-0005
Edition date:

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SOIL CHEMICAL ANALYSIS

Sample reference

MB19-0441

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 19-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.277 g

Equipment:

RESULT: **2.4 g/kg (total)**

MUFLA OVEN ETI HD150

2.2 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993

Sample reference

MB19-0441

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6373
Soil mass, g	1556
Minimum density, Mg/m³	1.56

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6683
Soil mass, g	1866
Maximum density, Mg/m³	1.87

Relative density	
Dry density, Mg/m ³	1.66
Relative density, %	32

REMARKS

Operator: ALEX VANCELLS

Date final test: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0442

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_6 C_6.1
Top depth, m	5.04
Bottom depth, m	5.6
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	56
Acquisition date	9-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
--------------------	------

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Thickly laminated olive gray (5Y 4/2) silty fine SAND and fine SAND with occasional amorphous organic matter millimetrical layers	5.04	
	5.6	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0442



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0442

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	106.79
Tare + soil + water (g)	196.23
Tare + soil (g)	182.03
Water (g)	14.20
Soil (g)	75.24
Moisture, w (%)	18.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	18.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	94.12
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.87
Dry density (Mg/m ³)	1.57

Operator: MARC COLOMER
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	1.87
Dry density (Mg/m³)	1.57

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	183.9810
Soil mass, M1 (g)	11.0740
Particle density, G20°C (Mg/m ³)	2.659

Operator: GUILLEM MASSALLÉ
Test final date: 23/09/2019

Results	
Particle density (Mg/m³)	2.659

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0442

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

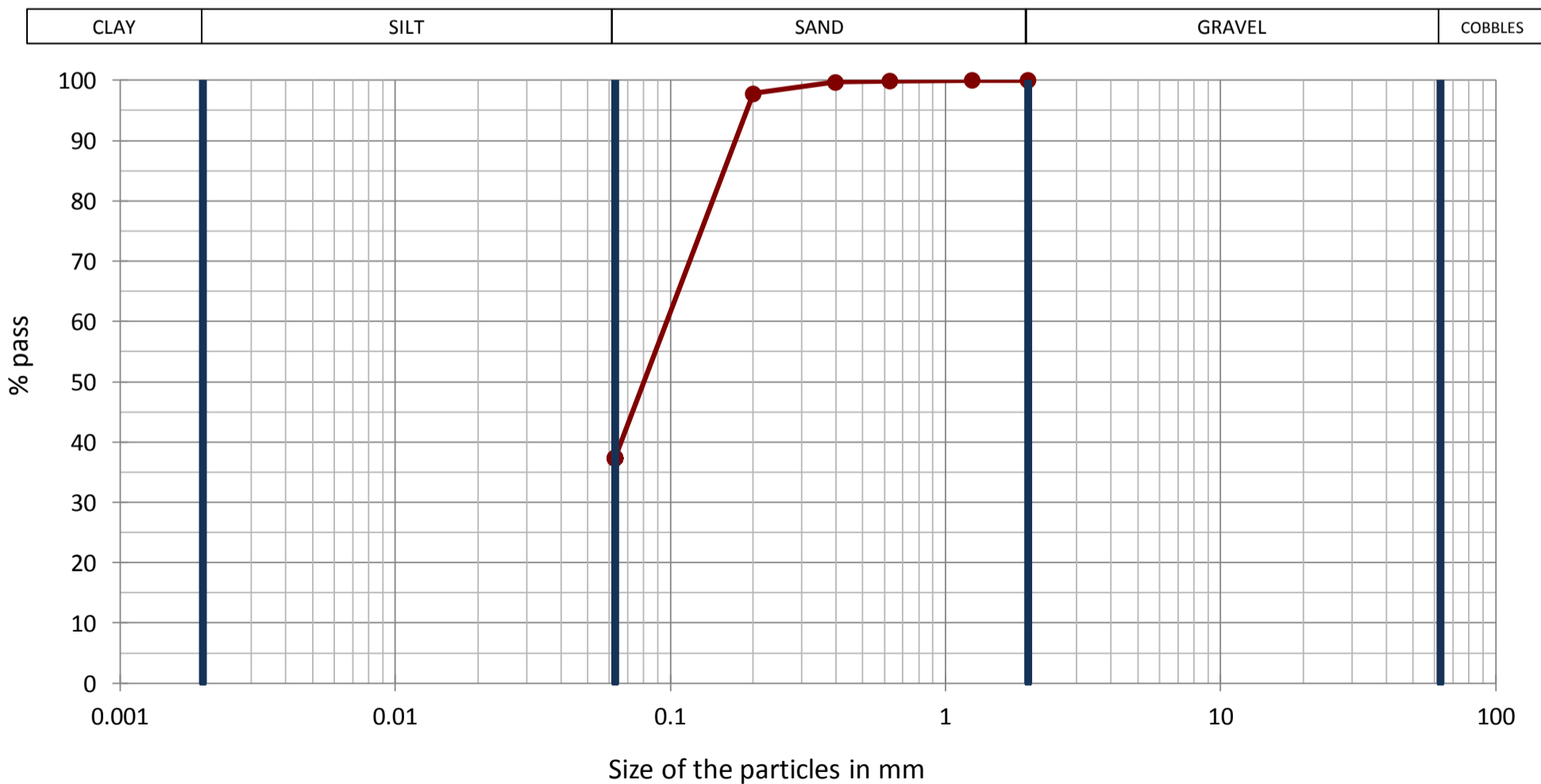
Previous calculations
 Total dried sample (g) **105.93**

 Hygrosc. moisture, % (fraction<2 mm) **0.6**
 Corr. parameter, f (fraction<2 mm) **0.9945**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2			0.00	0.0	105.34 100.0
1.25			0.01	0.0	105.33 100.0
0.63			0.09	0.1	105.24 99.9
0.4			0.23	0.3	105.01 99.7
0.2			1.96	2.2	103.05 97.8
0.063			63.68	62.6	39.37 37.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	62.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	2.1		37.4
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	60.4		



REMARKS

SAND CONTAINS SOME ORGANIC MATTER

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0442

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	75.71
Hygroscopic moisture, W (%)	0.6
Tested and dried soil mass, m (g)	75.29
Particle density (Mg/m ³)	2.659

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+-2E-03x3+1E-01x2+-2.172x+16.1582
Meniscus correction (Cm)	0.0005

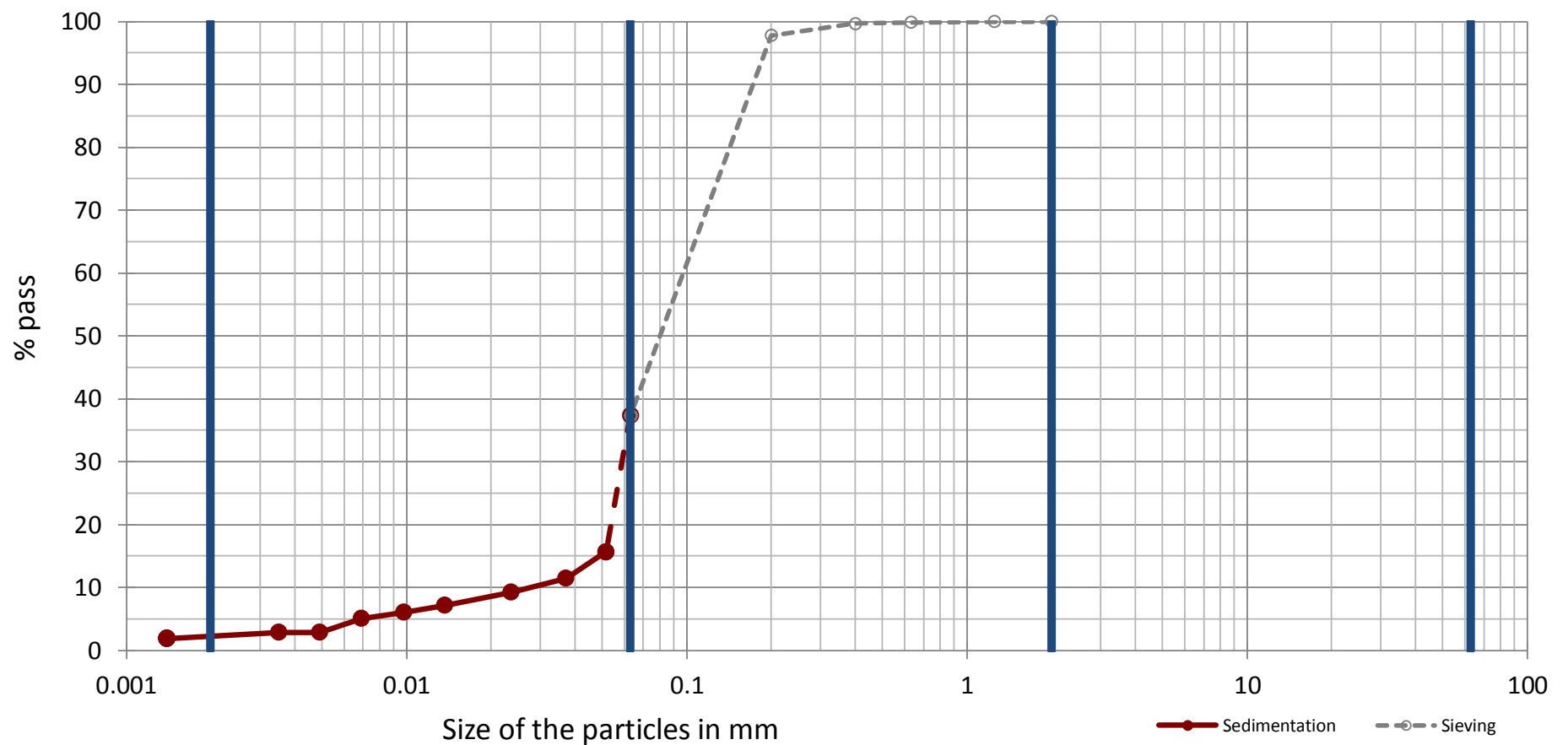
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	23	1.0115	11.5	155.1	7.4	0.0517	15.7
2	23	1.0095	9.5	159.8	5.4	0.0371	11.4
5	23	1.0085	8.5	162.2	4.4	0.0236	9.3
15	23	1.0075	7.5	164.6	3.4	0.0137	7.2
30	23	1.0070	7	165.8	2.9	0.0098	6.1
60	23	1.0065	6.5	166.9	2.4	0.0069	5.0
120	23	1.0055	5.5	169.3	1.4	0.0049	2.9
240	23	1.0055	5.5	169.3	1.4	0.0035	2.9
1440	23	1.0050	5	170.5	0.9	0.0014	1.8

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	37.4
Silt, between 0.063 and 0.002 mm (%)	35.4
Clay, smaller than 0.002 mm (%)	2.0

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 02/10/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0442

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 24-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.201 g

Equipment:

RESULT: **11.1 g/kg (total)**
9.6 g/kg (organic)

MUFLA OVEN ETI HD150
PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0443

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_5 C_5.6
Top depth, m	0.1
Bottom depth, m	0.25
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light olive brown (2.5Y 5/4) medium SAND with occasional fine sand, rare fine gravel, frequent amorphous organic matter blackish zones, and occasional shell fragments	0.1	
	0.25	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0443

PHOTOGRAPHIC RECORD



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0443

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	113.42
Tare + soil + water (g)	241.60
Tare + soil (g)	220.86
Water (g)	20.74
Soil (g)	107.44
Moisture, w (%)	19.3

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	19.3

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	99.10
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.97
Dry density (Mg/m ³)	1.65

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	1.97
Dry density (Mg/m³)	1.65

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.3
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	186.1590
Soil mass, M1 (g)	12.3950
Particle density, G20°C (Mg/m ³)	2.675

Operator: GUILLEM MASSALLÉ
Test final date: 27/09/2019

Results	
Particle density (Mg/m³)	2.675

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0443

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

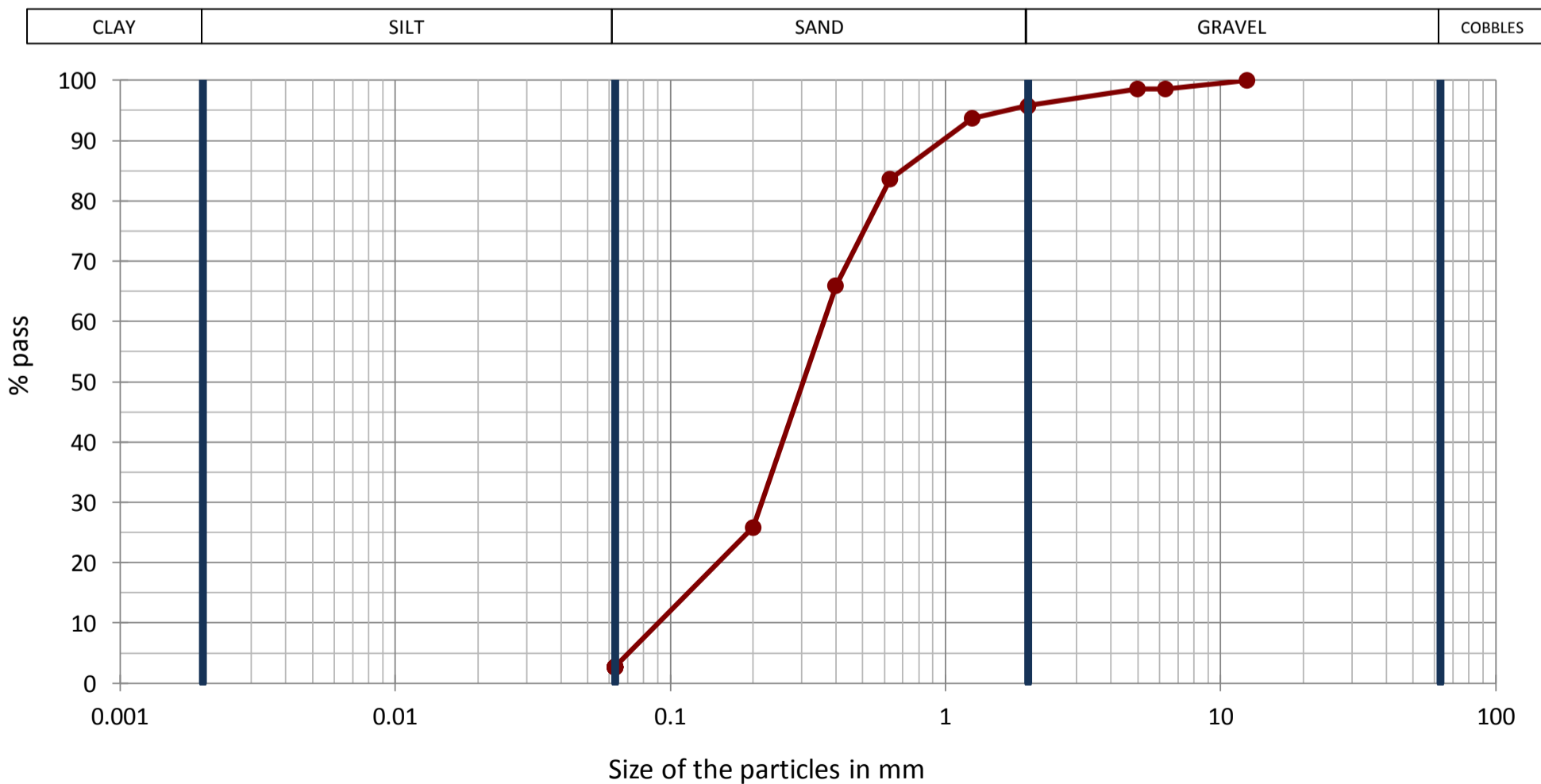
Previous calculations
 Total dried sample (g) **107.41**

 Hygrosc. moisture, % (fraction<2 mm) **0.1**
 Corr. parameter, f (fraction<2 mm) **0.9988**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
12.5		0.00	0.0	107.28	100.0
6.3		1.46	1.4	105.82	98.6
5		0.02	1.4	105.80	98.6
2		2.99	4.2	102.81	95.8
1.25		2.33	6.3	100.48	93.7
0.63		10.75	16.4	89.73	83.6
0.4		18.90	34.0	70.83	66.0
0.2		43.00	74.1	27.83	25.9
0.063		24.94	97.3	2.89	2.7

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	4.2	% SAND	2-0.063 mm	93.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	12.2		
	% Medium gravel	20-6.3 mm	1.4	% Medium sand	0.63-0.2 mm	57.7		2.7
	% Fine gravel	6.3-2 mm	2.8	% Fine sand	0.2-0.063 mm	23.2		



REMARKS

GRAVEL AND COARSE SAND CONTAIN SHELL FRAGMENTS

Report num.: CB0019-19-0005
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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0443

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 26-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.035 g

Equipment:

RESULT: **3.1 g/kg (total)**

MUFLA OVEN ETI HD150

1.1 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0444

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_5 C_5.5
Top depth, m	0.5
Bottom depth, m	0.8
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	30
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	grSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive gray (5Y 4/2) gravelly fine to medium SAND with rare clay pockets and rare fibrous wood fragments. Gravel is coarse to medium and contains flint nodules and some shell fragments.	0.5	
	0.8	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THE SAMPLE CONTAINS MEDIUM AND COARSE GRAVEL

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0444



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0444

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	109.68
Tare + soil + water (g)	221.40
Tare + soil (g)	210.91
Water (g)	10.49
Soil (g)	101.23
Moisture, w (%)	10.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	10.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	87.94
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.75
Dry density (Mg/m ³)	1.59

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	1.75
Dry density (Mg/m³)	1.59

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	183.6330
Soil mass, M1 (g)	10.5450
Particle density, G20°C (Mg/m ³)	2.648

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.648

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0444

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

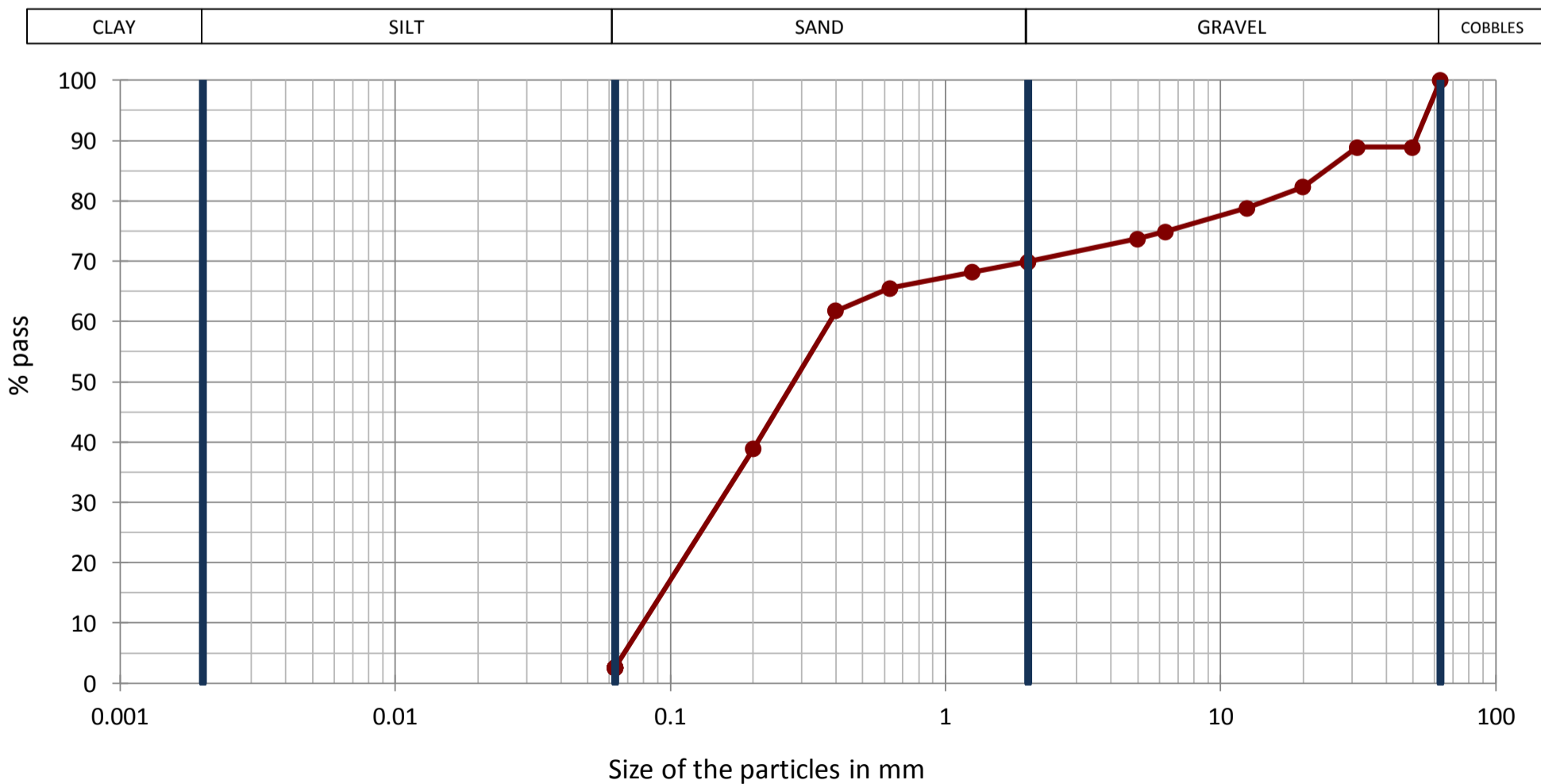
Total dried sample (g)	2176.35
M. > 2mm, washed and dried (g)	654.54
M. < 2 mm, dried tested (g)	103.40
M. < 2 mm, dried tested (g)	103.25
M. < 2 mm, dried total (g)	1519.57
Total dried sample (g)	2174.11
Hygros. moisture, % (fraction<2 mm)	0.1
Corr. parameter, f (fraction<2 mm)	0.9985
Corr. parameter, f2 (fraction<2 mm)	14.7177

Results

Sieves	Retained sieves		Pass total sample		
	Aperture mm	Partial g	Total g	Total %	g
63		0.00	0.0	2174.11	100.0
50		242.06	11.1	1932.05	88.9
31.5		0.00	11.1	1932.05	88.9
20		143.80	17.7	1788.25	82.3
12.5		74.78	21.2	1713.47	78.8
6.3		84.25	25.1	1629.22	74.9
5		27.11	26.3	1602.11	73.7
2		82.54	30.1	1519.57	69.9
1.25	2.43		31.8	1483.81	68.2
0.63	4.12		34.5	1423.17	65.5
0.4	5.35		38.2	1344.43	61.8
0.2	33.91		61.1	845.36	38.9
0.063	53.65		97.4	55.75	2.6

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	30.1	% SAND	2-0.063 mm	67.3	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	17.7	% Coarse sand	2-0.63 mm	4.4		
	% Medium gravel	20-6.3 mm	7.4	% Medium sand	0.63-0.2 mm	26.6		2.6
	% Fine gravel	6.3-2 mm	5.0	% Fine sand	0.2-0.063 mm	36.3		



REMARKS

COARSE GRAVEL IS COMPOSED OF A FLINT NODULE. FINE AND MEDIUM GRAVEL CONTAINS SOME SHELL FRAGMENTS AND SOME FLINT NODULES. MEDIUM AND COARES SAND ALSO CONTAINS SOME SHELL FRAGMENTS.

Report num.: CB0019-19-0005
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Sample reference

MB19-0444

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 13-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.588 g

Equipment:

RESULT: **5.2 g/kg (total)**
4.5 g/kg (organic)

MUFLA OVEN ETI HD150
PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0445

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_5 C_5.4
Top depth, m	2.14
Bottom depth, m	2.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	36
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark gray (5Y 3/1) fine SAND with some silt and rare clay pockets and occasional organic matter blackish zones	2.14	
	2.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0445



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0445

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.15
Tare + soil + water (g)	223.15
Tare + soil (g)	200.47
Water (g)	22.68
Soil (g)	89.32
Moisture, w (%)	25.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	25.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	92.69
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.85
Dry density (Mg/m ³)	1.48

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	1.85
Dry density (Mg/m³)	1.48

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.4
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0302
Pyc. mass + soil + water at test temp. M2 (g)	185.1230
Soil mass, M1 (g)	11.3650
Particle density, G20°C (Mg/m ³)	2.660

Operator: GUILLEM MASSALLÉ
Test final date: 27/09/2019

Results	
Particle density (Mg/m³)	2.660

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0445

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

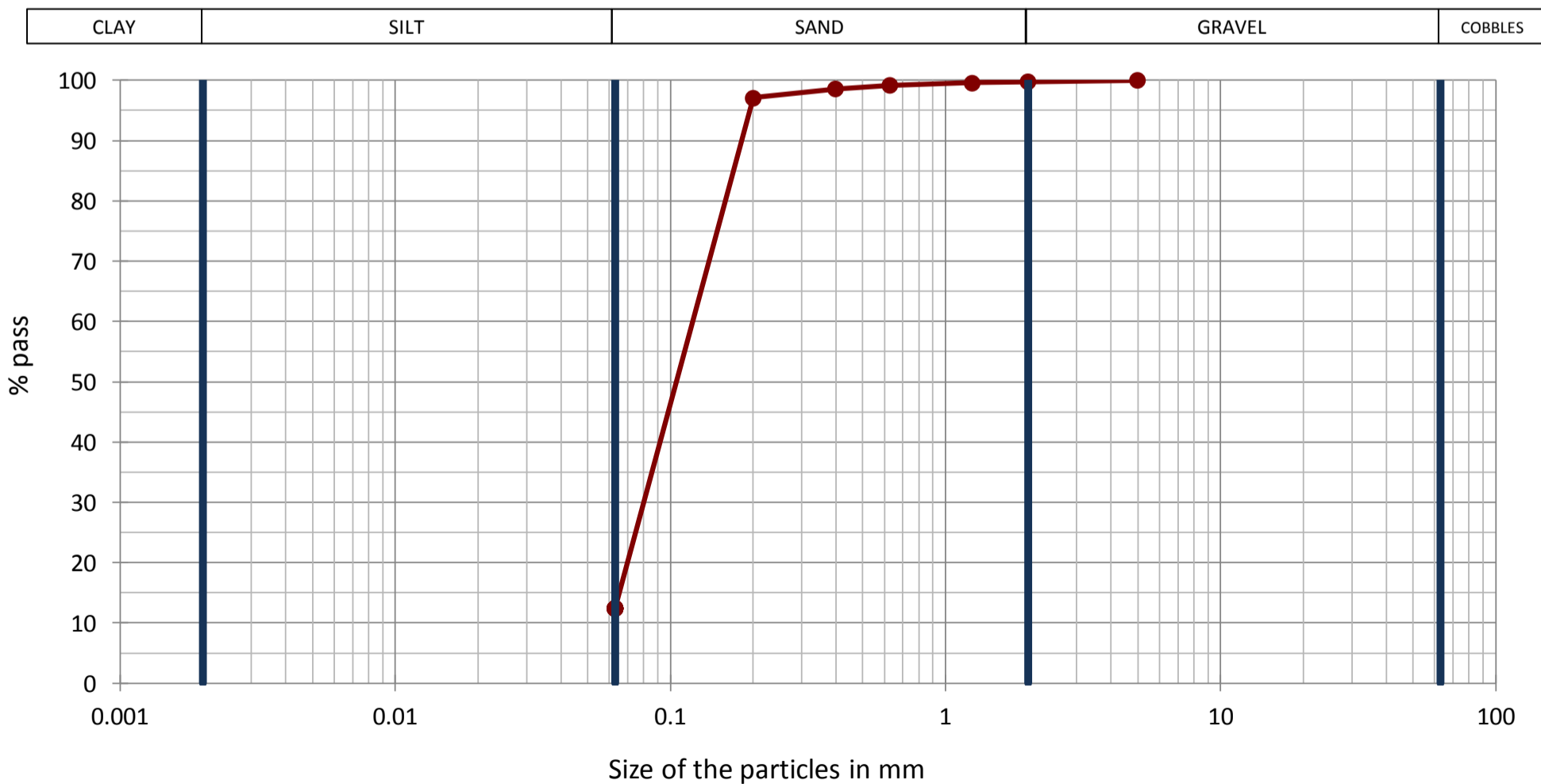
Previous calculations
 Total dried sample (g) **105.15**

 Hygrosc. moisture, % (fraction<2 mm) **0.6**
 Corr. parameter, f (fraction<2 mm) **0.9944**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
5			0.00	0.0	104.56
2			0.23	0.2	104.33
1.25			0.16	0.4	104.17
0.63			0.46	0.8	103.71
0.4			0.61	1.4	103.10
0.2			1.62	2.9	101.48
0.063			88.40	87.5	13.08
					100.0
					99.8
					99.6
					99.2
					98.6
					97.1
					12.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.2	% SAND	2-0.063 mm	87.3	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.6		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	2.1		12.5
	% Fine gravel	6.3-2 mm	0.2	% Fine sand	0.2-0.063 mm	84.6		



REMARKS

GRAVEL IS COMPOSED OF ORGANIC MATTER. SAND ALSO CONTAINS ORGANIC MATTER AND SOME MICAS.

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0445

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	99.8
Tested soil mass, mw (g)	75.20
Hygroscopic moisture, W (%)	0.6
Tested and dried soil mass, m (g)	74.78
Particle density (Mg/m ³)	2.660

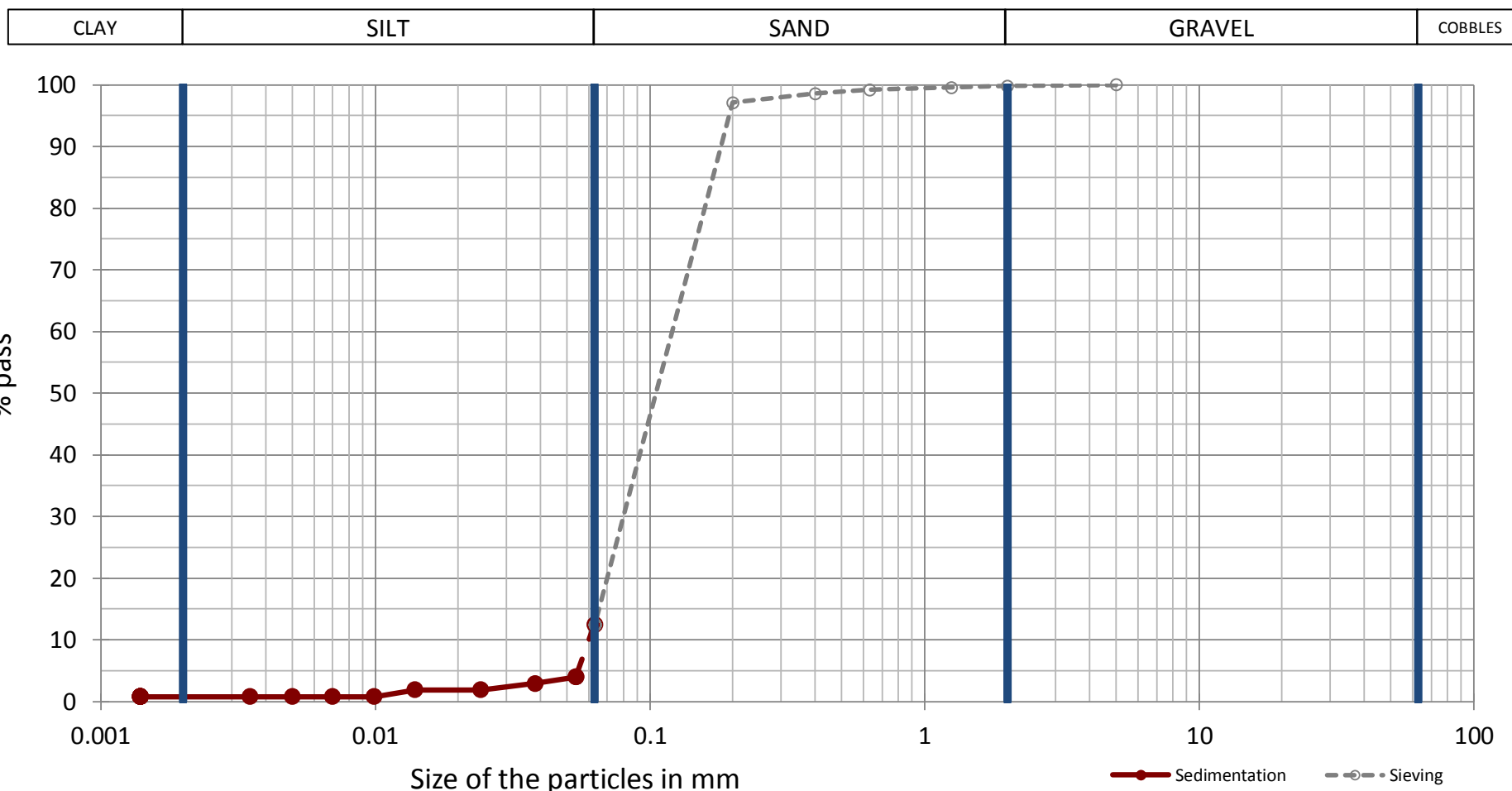
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	23	1.0060	6	168.1	1.9	0.0538	4.0
2	23	1.0055	5.5	169.3	1.4	0.0382	2.9
5	23	1.0050	5	170.5	0.9	0.0242	1.8
15	23	1.0050	5	170.5	0.9	0.0140	1.8
30	23	1.0045	4.5	171.7	0.4	0.0099	0.8
60	23	1.0045	4.5	171.7	0.4	0.0070	0.8
120	23	1.0045	4.5	171.7	0.4	0.0050	0.8
240	23	1.0045	4.5	171.7	0.4	0.0035	0.8
1440	23	1.0045	4.5	171.7	0.4	0.0014	0.8

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	12.5
Silt, between 0.063 and 0.002 mm (%)	11.7
Clay, smaller than 0.002 mm (%)	0.8



REMARKS

Operator: ALEX VANCELLS

Test final date: 02/10/2019

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0445

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Specimen dimensions

Specimen length (cm)	7.643
Specimen diameter (cm)	3.833
Specimen area (cm ²)	11.54
Specimen volume (cm ³)	88.20

Prior saturation process

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	22

Test data

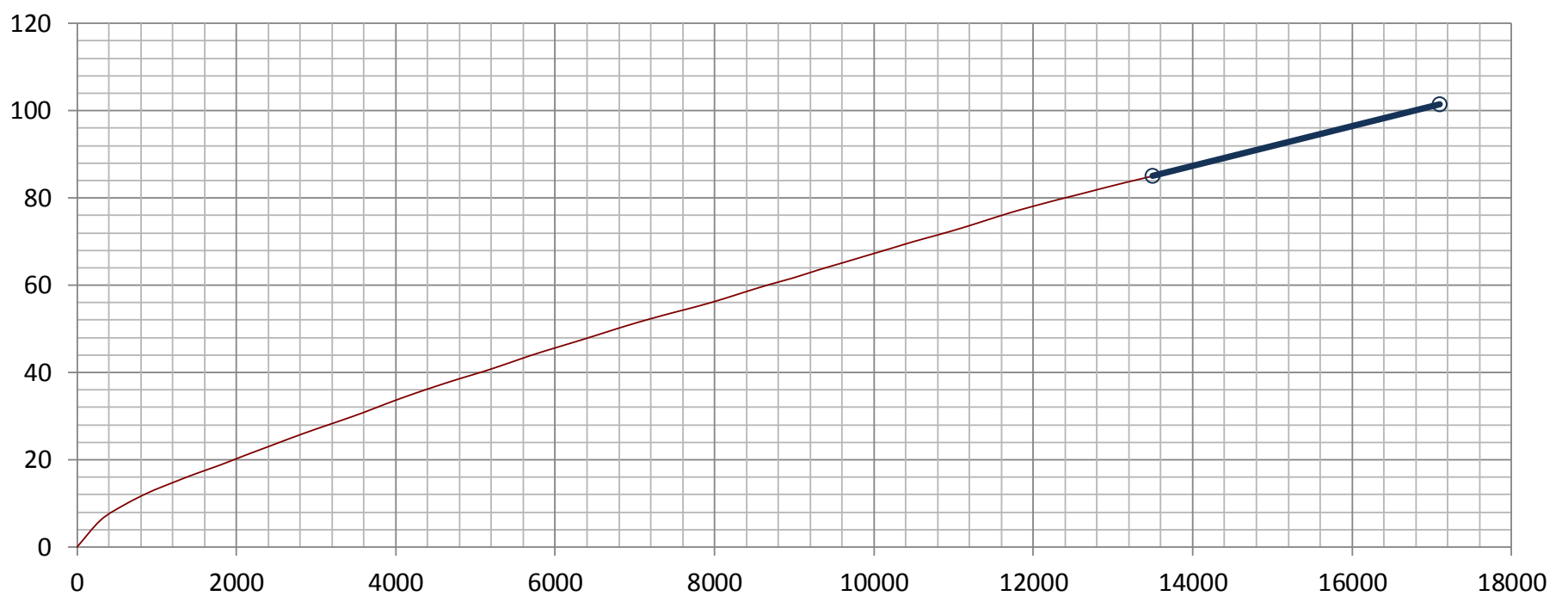
Soil weight (g)	177.22
Dry soil weight (g)	143.77
Initial moisture content (%)	23.1
Initial bulk density (Mg/m ³)	2.01
Initial dry density (Mg/m ³)	1.63
Initial void index, e ₀	0.6319
Initial saturation degree (%)	97.24
Final moisture content (%)	24.0
Final bulk density (Mg/m ³)	2.02
Final dry density (Mg/m ³)	1.63

Pressures applied during test excution

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results

Permeability constant, K (cm/s)	1.51E-05
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REMARKS

Operator: **MARC COLOMER**

Test final date: 02/10/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0445

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 26-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.013 g

Equipment:

RESULT: **26.7 g/kg (total)**

MUFLA OVEN ETI HD150

25.6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0446

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_5 C_5.3
Top depth, m	2.82
Bottom depth, m	3.05
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	23
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark gray (5Y 3/1) fine SAND with rare clay pockets and frequent amorphous organic matter milimetrical layers	2.82	
	3.05	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0446



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0446

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.31
Tare + soil + water (g)	207.23
Tare + soil (g)	189.40
Water (g)	17.83
Soil (g)	78.09
Moisture, w (%)	22.8

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	22.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	96.15
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.91
Dry density (Mg/m ³)	1.56

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	1.91
Dry density (Mg/m³)	1.56

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.4
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0302
Pyc. mass + soil + water at test temp. M2 (g)	184.6740
Soil mass, M1 (g)	10.6390
Particle density, G20°C (Mg/m ³)	2.663

Operator: GUILLEM MASSALLÉ
Test final date: 13/09/2019

Results	
Particle density (Mg/m³)	2.663

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0446

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

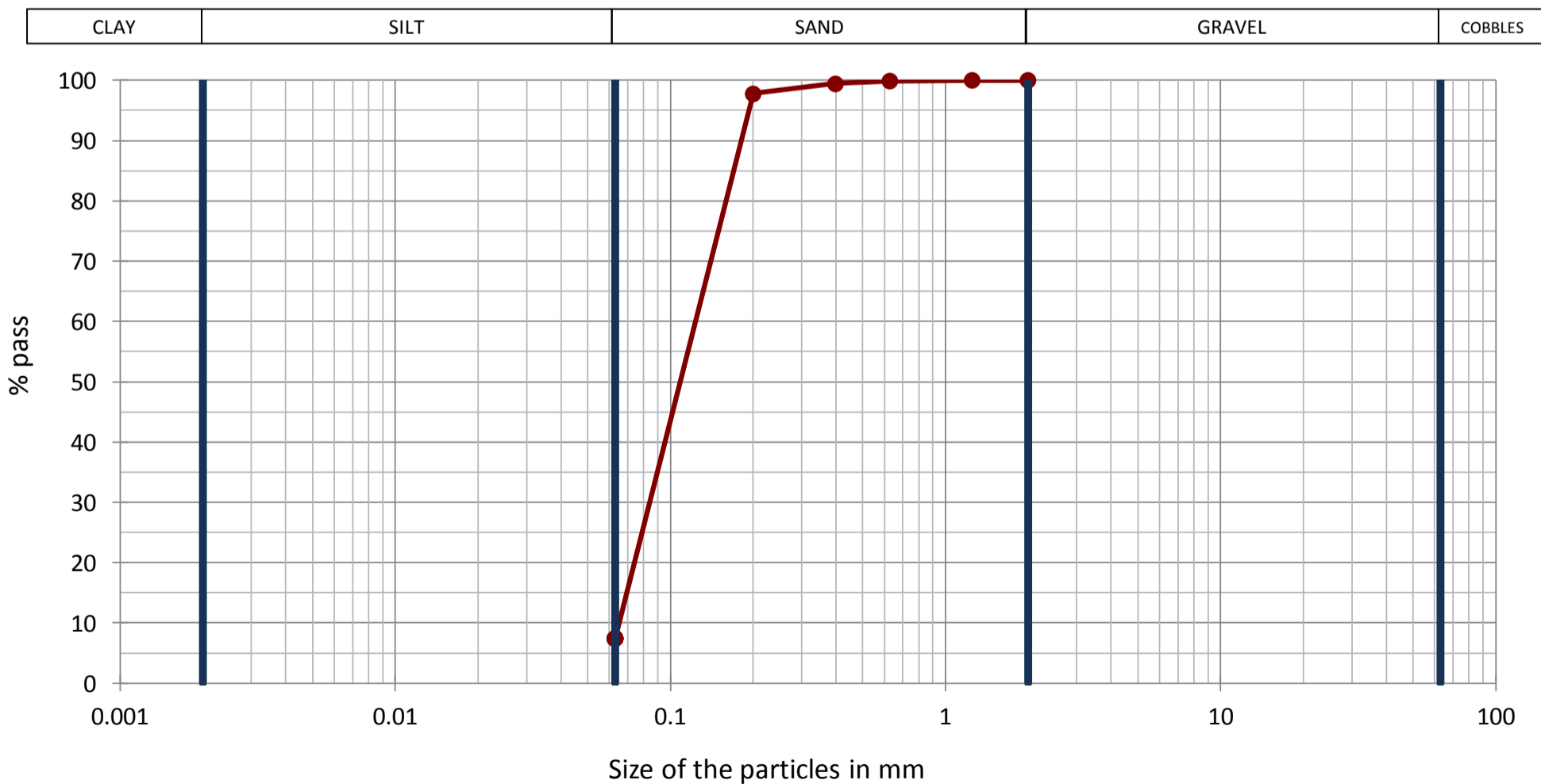
Previous calculations
 Total dried sample (g) **109.98**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9977**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
2		0.00	0.0	109.73	100.0
1.25		0.01	0.0	109.72	100.0
0.63		0.09	0.1	109.63	99.9
0.4		0.48	0.5	109.15	99.5
0.2		1.85	2.2	107.30	97.8
0.063		99.20	92.6	8.10	7.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	92.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	2.1		7.4
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	90.4		



REMARKS

SAND CONTAINS SOME ORGANIC MATTER

Report num.: CB0019-19-0005
Edition date:

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SOIL CHEMICAL ANALYSIS

Sample reference

MB19-0446

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 13-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.227 g

Equipment:

RESULT: **5.8 g/kg (total)**
4.2 g/kg (organic)

MUFLA OVEN ETI HD150
PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0446

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6082
Soil mass, g	1265
Minimum density, Mg/m³	1.27

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6405
Soil mass, g	1588
Maximum density, Mg/m³	1.59

Relative density	
Dry density, Mg/m ³	1.56
Relative density, %	91

REMARKS

Operator: ALEX VANCELLS

Date final test: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0447

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_5 C_5.2
Top depth, m	3.91
Bottom depth, m	4.05
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	14
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
--------------------	------

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark gray (5Y 3/1) silty fine SAND with frequent amorphous organic matter milimetrical layers and micas	3.91	
	4.05	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0447



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0447

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0225	

Data of soil moisture content test	
Tare (g)	111.51
Tare + soil + water (g)	202.90
Tare + soil (g)	185.54
Water (g)	17.36
Soil (g)	74.03
Moisture, w (%)	23.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	23.4

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	96.97
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.93
Dry density (Mg/m ³)	1.56

Operator: MARC COLOMER
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	1.93
Dry density (Mg/m³)	1.56

Equipment	
100 ml PYCNOMETER ALAMO V5573	
BALANCE GIBERTINI CRYSTAL 500 CAL	
DIGITAL THERMOMETER TESTO 5601110	
CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115	

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.4
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6391
Pyc. mass + soil + water at test temp. M2 (g)	185.0080
Soil mass, M1 (g)	10.1530
Particle density, G20°C (Mg/m ³)	2.683

Operator: GUILLEM MASSALLÉ
Test final date: 13/09/2019

Results	
Particle density (Mg/m³)	2.683

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0447

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

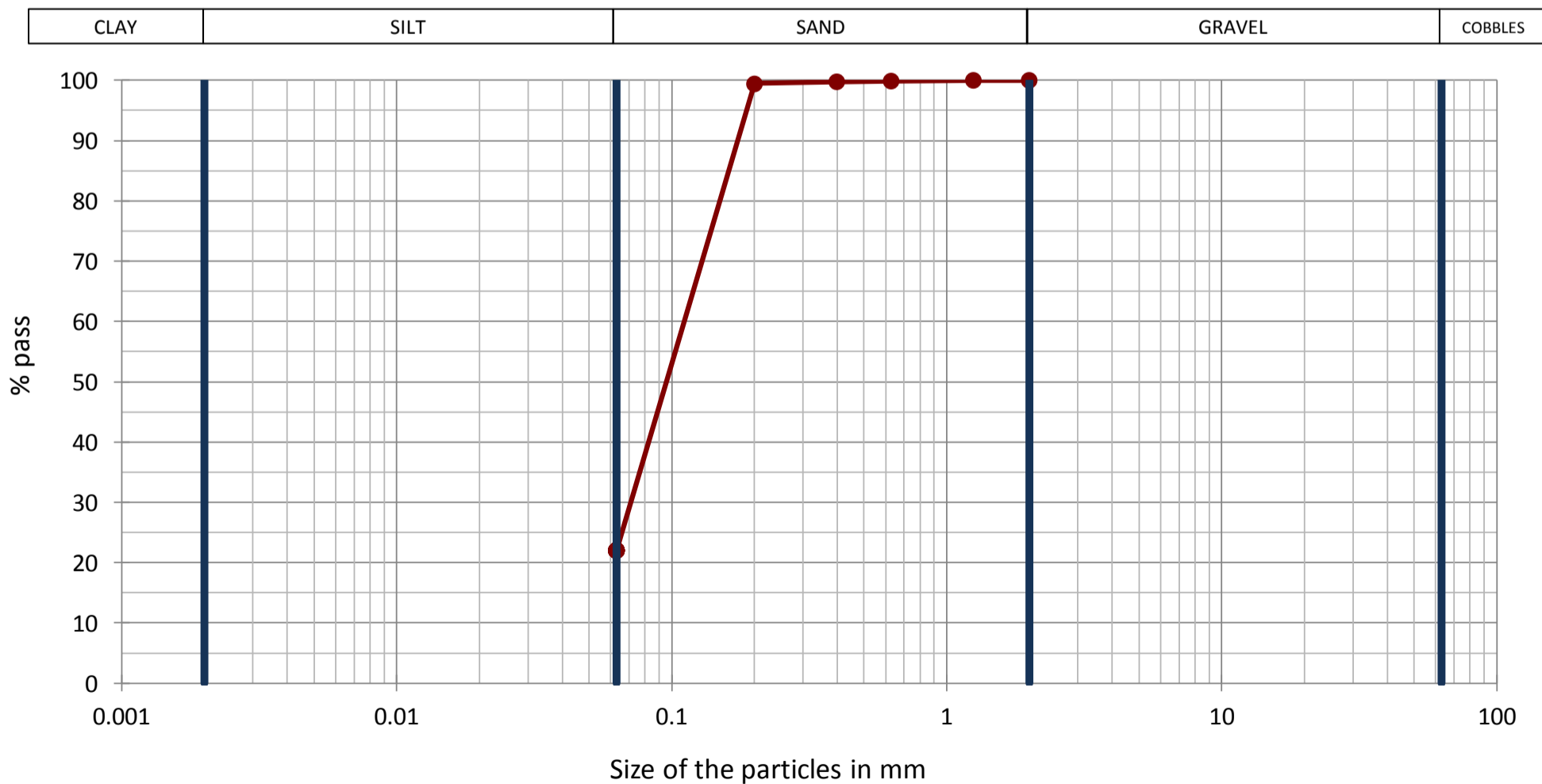
Previous calculations
 Total dried sample (g) **107.47**

 Hygrosc. moisture, % (fraction<2 mm) **0.8**
 Corr. parameter, f (fraction<2 mm) **0.9919**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
2		0.00	0.0	106.60	100.0
1.25		0.02	0.0	106.58	100.0
0.63		0.10	0.1	106.48	99.9
0.4		0.10	0.2	106.38	99.8
0.2		0.33	0.5	106.05	99.5
0.063		82.62	78.0	23.43	22.0

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	78.0	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.4		22.0
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	77.5		



REMARKS

SAND CONTAINS SOME ORGANIC MATTER. FINE AND MEDIUM SAND ALSO CONTAINS SOME MICAS.

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0447

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	76.08
Hygroscopic moisture, W (%)	0.8
Tested and dried soil mass, m (g)	75.46
Particle density (Mg/m ³)	2.683

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582
Meniscus correction (Cm)	0.0005

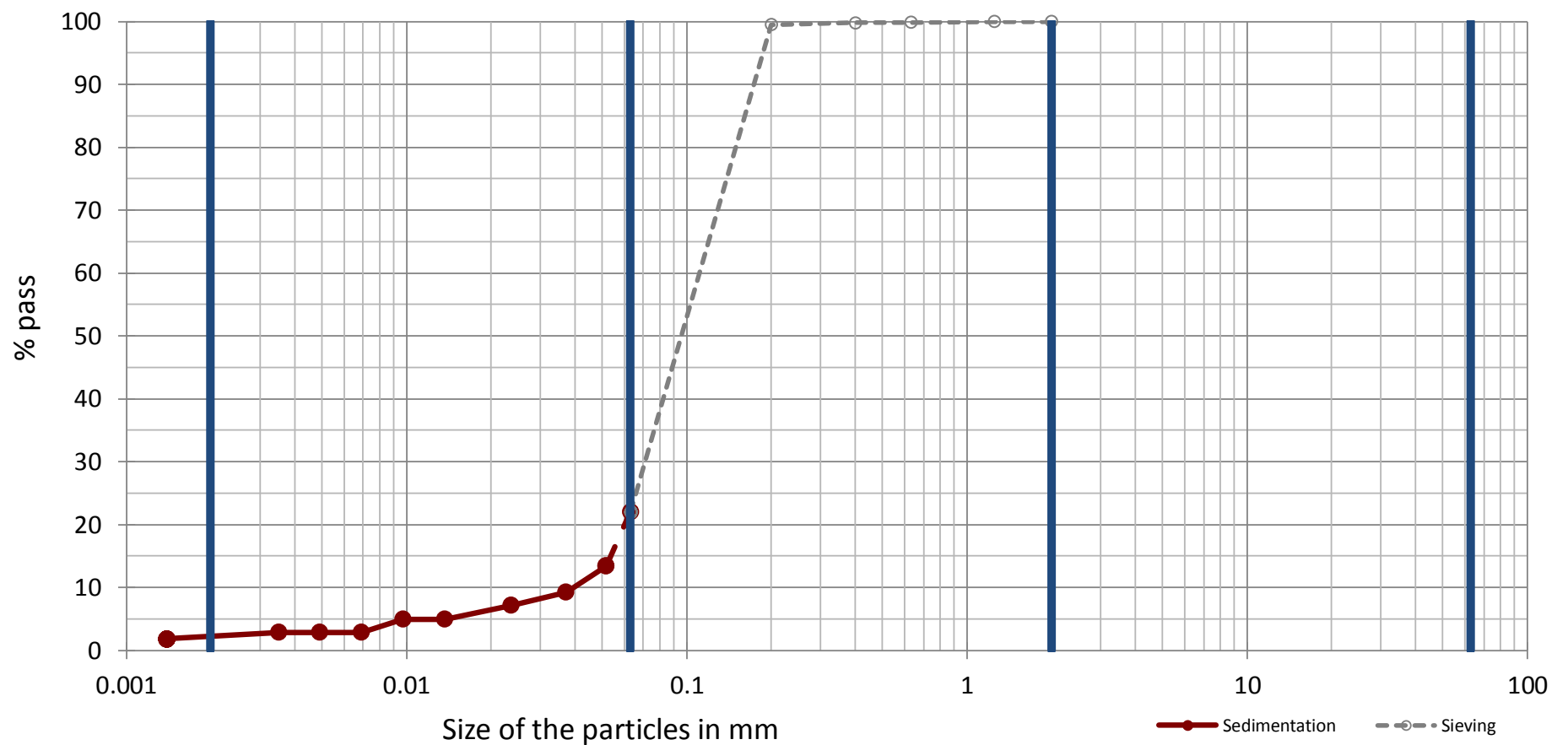
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	23	1.0105	10.5	157.4	6.4	0.0517	13.4
2	23	1.0085	8.5	162.2	4.4	0.0371	9.2
5	23	1.0075	7.5	164.6	3.4	0.0236	7.1
15	23	1.0065	6.5	166.9	2.4	0.0137	5.0
30	23	1.0065	6.5	166.9	2.4	0.0097	5.0
60	23	1.0055	5.5	169.3	1.4	0.0069	2.9
120	23	1.0055	5.5	169.3	1.4	0.0049	2.9
240	23	1.0055	5.5	169.3	1.4	0.0035	2.9
1440	23	1.0050	5	170.5	0.9	0.0014	1.8

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	22.0
Silt, between 0.063 and 0.002 mm (%)	20.1
Clay, smaller than 0.002 mm (%)	1.9

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 24/09/2019

Report num.: CB0019-19-0005
Edition date:

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6 / 6

SOIL CHEMICAL ANALYSIS

Sample reference

MB19-0447

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 13-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.366 g

Equipment:

RESULT: **9.6 g/kg (total)**

MUFLA OVEN ETI HD150

8.6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0448

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_5 C_5.1
Top depth, m	4.92
Bottom depth, m	5.1
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	18
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark gray (5Y 3/1) silty fine SAND with occasional amorphous organic blackish zones	4.92	
	5.1	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0448



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0448

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.88
Tare + soil + water (g)	205.21
Tare + soil (g)	187.84
Water (g)	17.37
Soil (g)	75.96
Moisture, w (%)	22.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	22.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	98.99
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.97
Dry density (Mg/m ³)	1.60

Operator: MARC COLOMER
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	1.97
Dry density (Mg/m³)	1.60

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.4
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2313
Pyc. mass + soil + water at test temp. M2 (g)	184.8230
Soil mass, M1 (g)	10.5350
Particle density, G20°C (Mg/m ³)	2.677

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.677

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0448

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

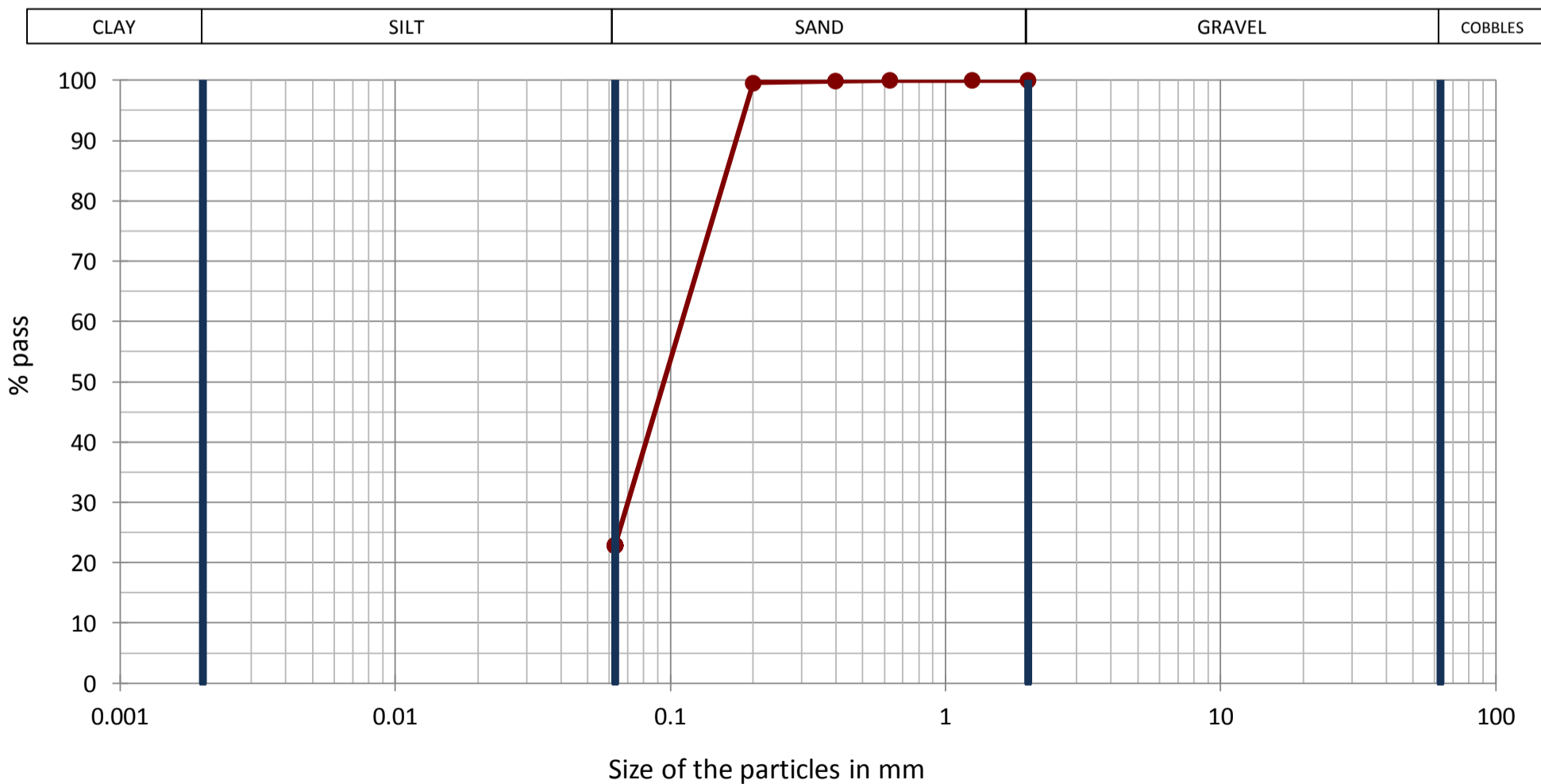
Previous calculations
 Total dried sample (g) **102.96**

 Hygrosc. moisture, % (fraction<2 mm) **0.5**
 Corr. parameter, f (fraction<2 mm) **0.9947**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2			0.00	0.0	102.41 100.0
1.25			0.02	0.0	102.39 100.0
0.63			0.02	0.0	102.37 100.0
0.4			0.08	0.1	102.29 99.9
0.2			0.28	0.4	102.01 99.6
0.063			78.51	77.1	23.50 22.9

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	77.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.4		22.9
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	76.7		



REMARKS

SAND CONTAINS SOME ORGANIC MATTER. FINE AND MEDIUM SAND ALSO CONTAINS SOME MICAS.

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0448

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	77.64
Hygroscopic moisture, W (%)	0.5
Tested and dried soil mass, m (g)	77.23
Particle density (Mg/m ³)	2.677

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582
Meniscus correction (Cm)	0.0005

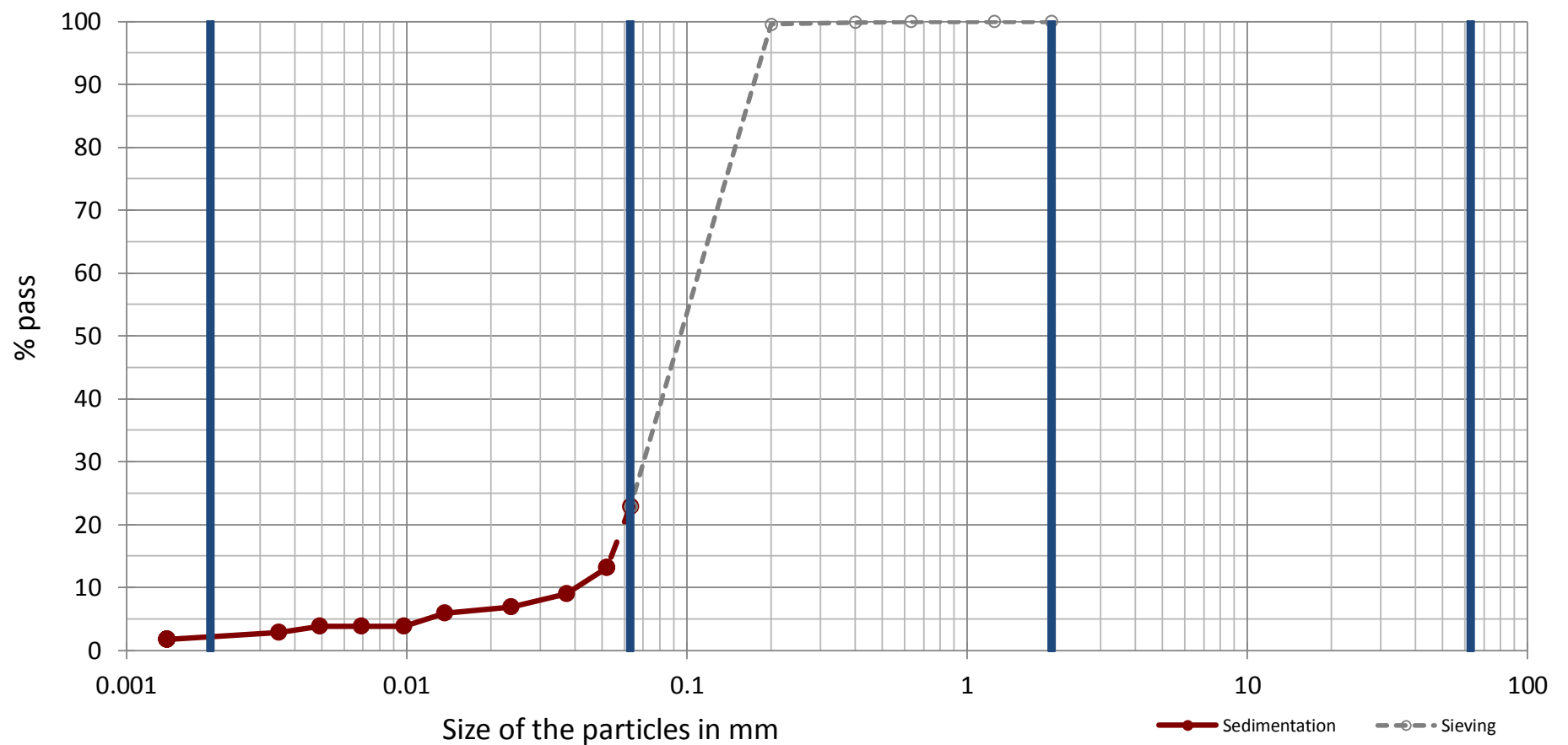
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	23	1.0105	10.5	157.4	6.4	0.0518	13.2
2	23	1.0085	8.5	162.2	4.4	0.0372	9.0
5	23	1.0075	7.5	164.6	3.4	0.0237	7.0
15	23	1.0070	7	165.8	2.9	0.0137	5.9
30	23	1.0060	6	168.1	1.9	0.0098	3.9
60	23	1.0060	6	168.1	1.9	0.0069	3.9
120	23	1.0060	6	168.1	1.9	0.0049	3.9
240	23	1.0055	5.5	169.3	1.4	0.0035	2.8
1440	23	1.0050	5	170.5	0.9	0.0014	1.8

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	22.9
Silt, between 0.063 and 0.002 mm (%)	20.8
Clay, smaller than 0.002 mm (%)	2.1

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 24/09/2019

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0448

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 16-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.377 g

Equipment:

RESULT: **11.3 g/kg (total)**

MUFLA OVEN ETI HD150

10.9 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0449

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_4 C_4.6
Top depth, m	0.27
Bottom depth, m	0.4
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Black (5Y 2.5/1) silty fine SAND with rare fine to medium gravel and occasional shell fragments	0.27	
	0.4	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0449



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0449

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	106.43
Tare + soil + water (g)	210.17
Tare + soil (g)	194.02
Water (g)	16.15
Soil (g)	87.59
Moisture, w (%)	18.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	18.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	101.78
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.03
Dry density (Mg/m ³)	1.71

Operator: MARC COLOMER
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	2.03
Dry density (Mg/m³)	1.71

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.4
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0525
Pyc. mass + soil + water at test temp. M2 (g)	183.5850
Soil mass, M1 (g)	10.4450
Particle density, G20°C (Mg/m ³)	2.673

Operator: GUILLEM MASSALLÉ
Test final date: 19/09/2019

Results	
Particle density (Mg/m³)	2.673

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0449

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

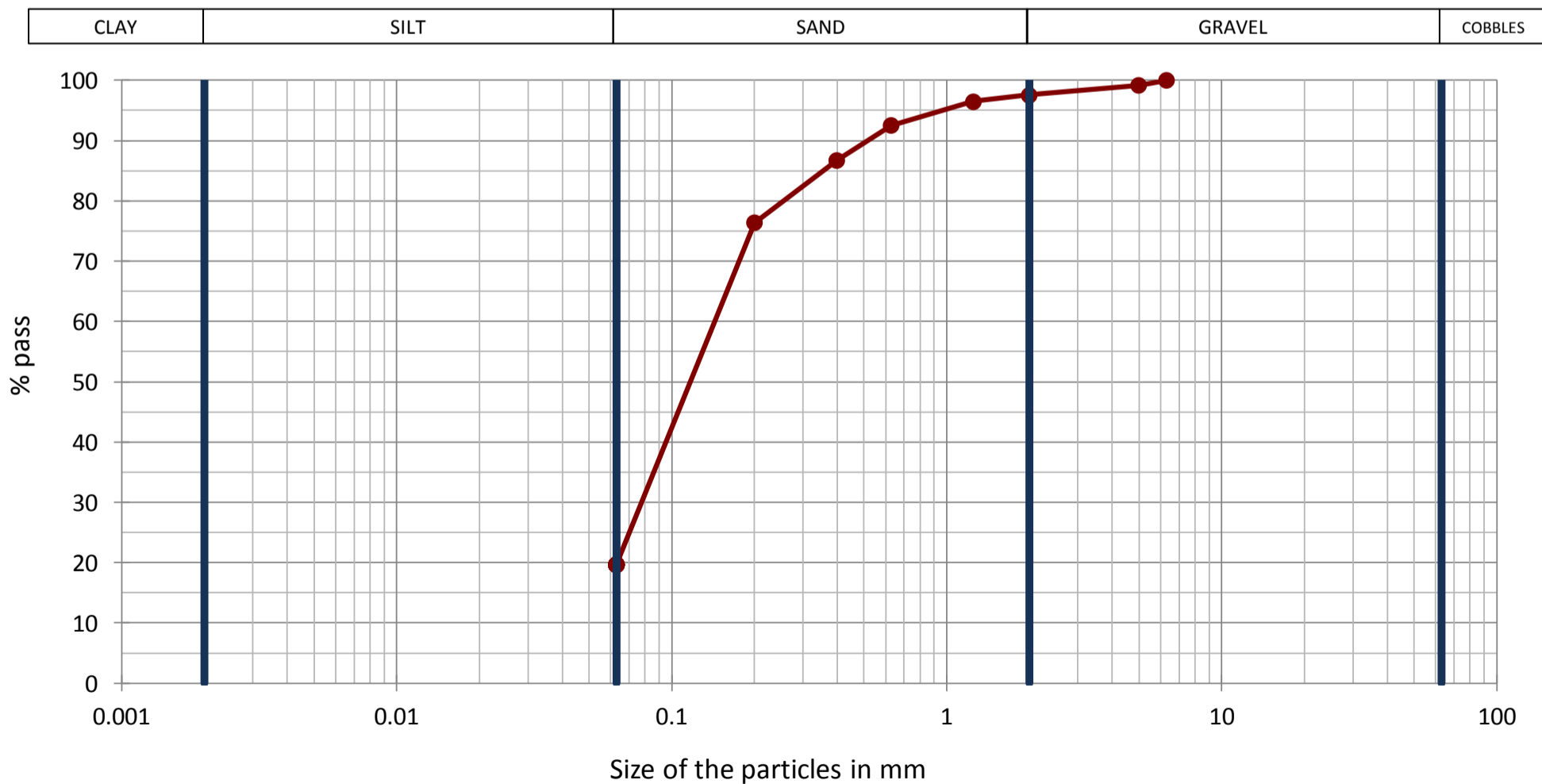
Previous calculations
 Total dried sample (g) **105.34**

 Hygrosc. moisture, % (fraction < 2 mm) **0.4**
 Corr. parameter, f (fraction < 2 mm) **0.9961**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
6.3		0.00	0.0	104.94	100.0
5		0.83	0.8	104.11	99.2
2		1.71	2.4	102.40	97.6
1.25		1.17	3.5	101.23	96.5
0.63		4.13	7.5	97.10	92.5
0.4		5.96	13.2	91.14	86.8
0.2		10.96	23.6	80.18	76.4
0.063		59.50	80.3	20.68	19.7

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	2.4	% SAND	2-0.063 mm	77.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	5.1	19.7	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	16.1		
	% Fine gravel	6.3-2 mm	2.4	% Fine sand	0.2-0.063 mm	56.7		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0449

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	97.6
Tested soil mass, mw (g)	75.00
Hygroscopic moisture, W (%)	0.4
Tested and dried soil mass, m (g)	74.71
Particle density (Mg/m ³)	2.673

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582
Meniscus correction (Cm)	0.0005

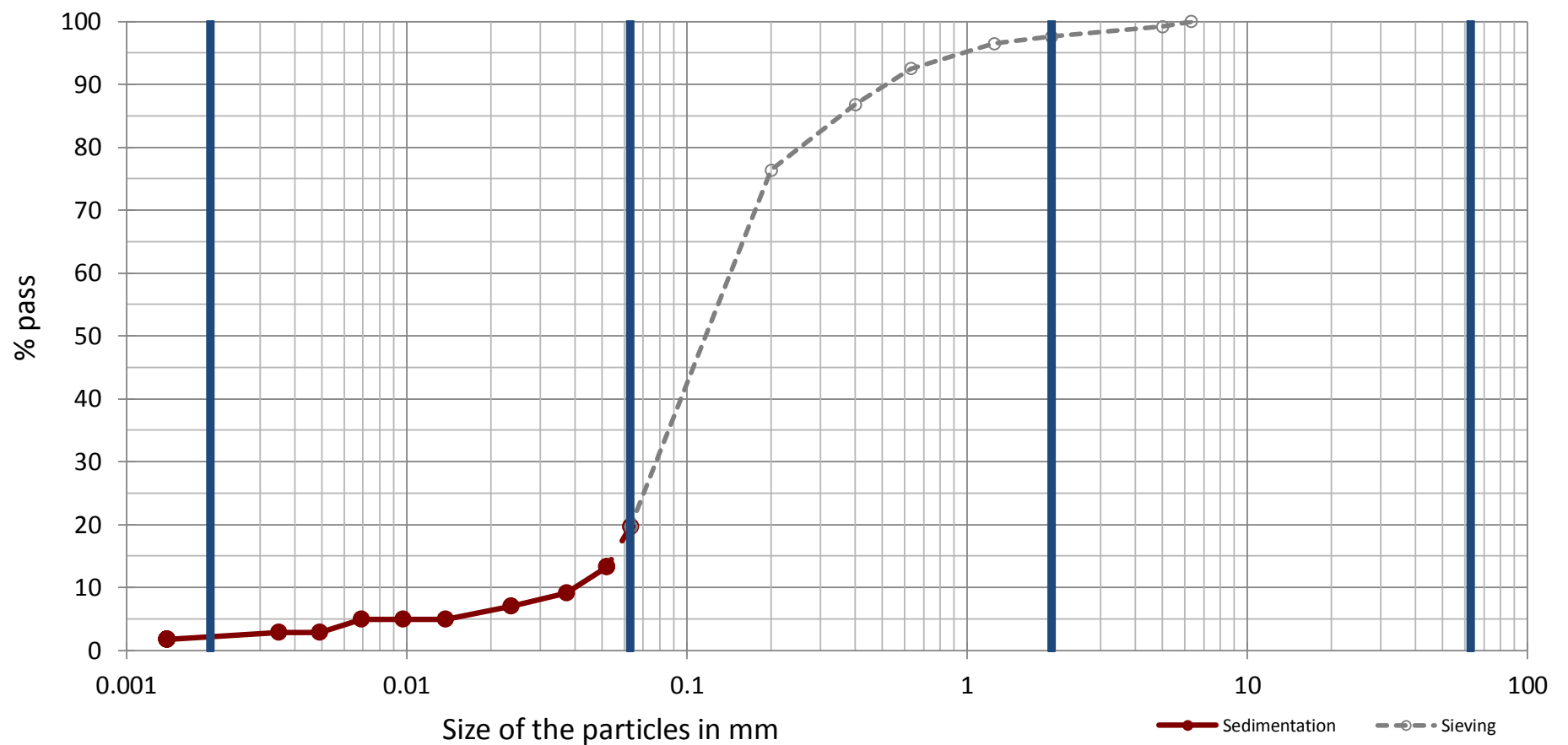
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	23	1.0105	10.5	157.4	6.4	0.0518	13.3
2	23	1.0085	8.5	162.2	4.4	0.0372	9.1
5	23	1.0075	7.5	164.6	3.4	0.0237	7.0
15	23	1.0065	6.5	166.9	2.4	0.0138	4.9
30	23	1.0065	6.5	166.9	2.4	0.0097	4.9
60	23	1.0065	6.5	166.9	2.4	0.0069	4.9
120	23	1.0055	5.5	169.3	1.4	0.0049	2.8
240	23	1.0055	5.5	169.3	1.4	0.0035	2.8
1440	23	1.0050	5	170.5	0.9	0.0014	1.8

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	19.7
Silt, between 0.063 and 0.002 mm (%)	17.7
Clay, smaller than 0.002 mm (%)	2.0

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 24/09/2019

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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SOIL CHEMICAL ANALYSIS

Sample reference

MB19-0449

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 02-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.31 g

Equipment:

RESULT: **6.5 g/kg (total)**

MUFLA OVEN ETI HD150

5.4 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0450

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_4 C_4.5
Top depth, m	1.2
Bottom depth, m	1.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	30
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Black (5Y 2.5/1) silty fine SAND with rare fine gravel	1.2	
	1.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0450



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0450

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0225	

Data of soil moisture content test	
Tare (g)	111.13
Tare + soil + water (g)	238.28
Tare + soil (g)	219.64
Water (g)	18.64
Soil (g)	108.51
Moisture, w (%)	17.2

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	17.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	106.15
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.11
Dry density (Mg/m ³)	1.80

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	2.11
Dry density (Mg/m³)	1.80

Equipment	
100 ml PYCNOMETER ALAMO V5573	
BALANCE GIBERTINI CRYSTAL 500 CAL	
DIGITAL THERMOMETER TESTO 5601110	
CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115	

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.3
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	187.4820
Soil mass, M1 (g)	14.1120
Particle density, G20°C (Mg/m ³)	2.664

Operator: GUILLEM MASSALLÉ
Test final date: 27/09/2019

Results	
Particle density (Mg/m³)	2.664

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0450

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

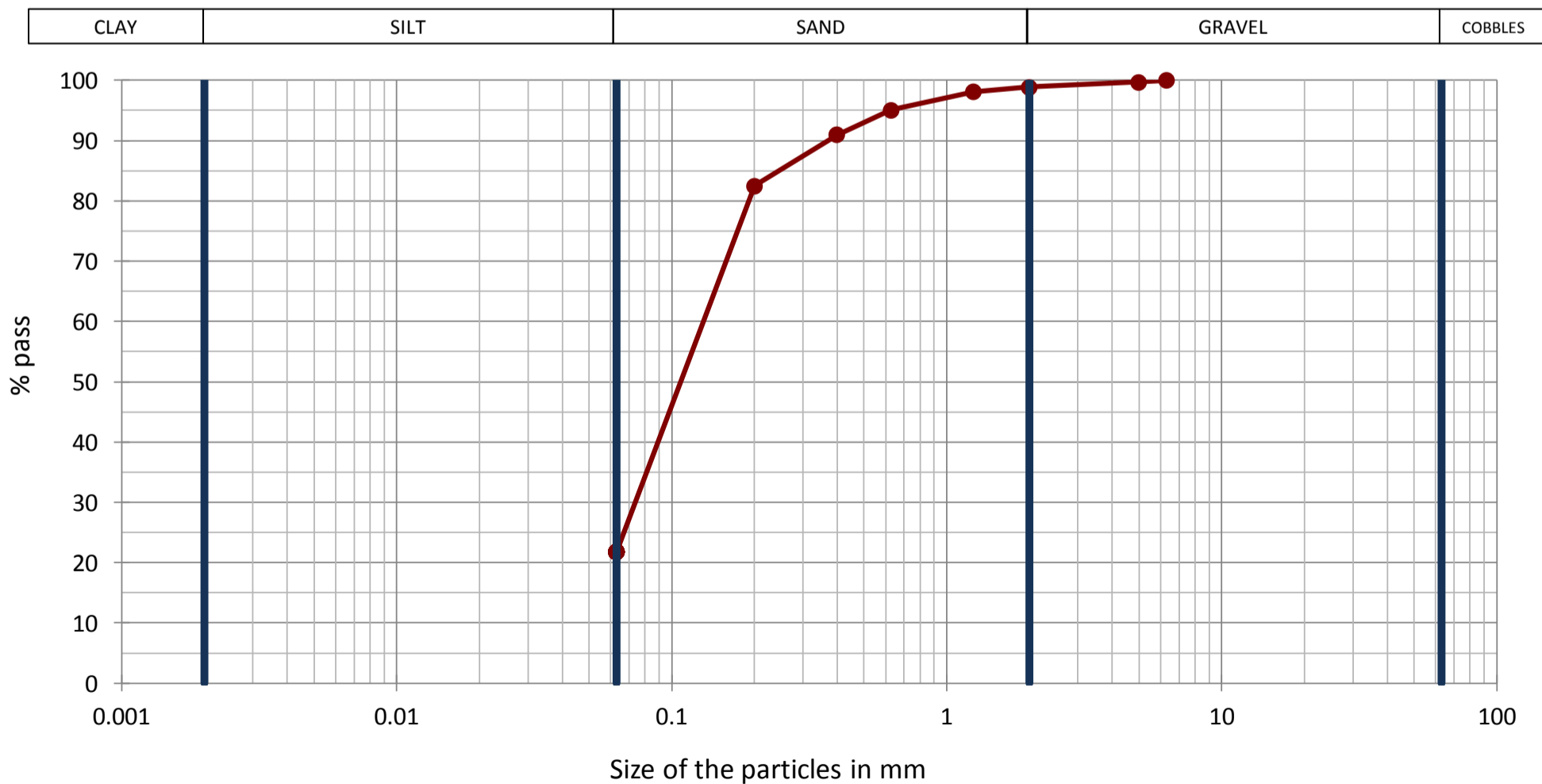
Previous calculations
 Total dried sample (g) **105.58**

 Hygrosc. moisture, % (fraction<2 mm) **0.4**
 Corr. parameter, f (fraction<2 mm) **0.9960**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
6.3		0.00	0.0	105.17	100.0
5		0.29	0.3	104.88	99.7
2		0.84	1.1	104.04	98.9
1.25		0.82	1.9	103.22	98.1
0.63		3.19	4.9	100.03	95.1
0.4		4.35	9.0	95.68	91.0
0.2		8.90	17.5	86.78	82.5
0.063		63.82	78.2	22.96	21.8

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	1.1	% SAND	2-0.063 mm	77.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	3.8		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	12.6		21.8
	% Fine gravel	6.3-2 mm	1.1	% Fine sand	0.2-0.063 mm	60.7		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0450

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	98.9
Tested soil mass, mw (g)	75.16
Hygroscopic moisture, W (%)	0.4
Tested and dried soil mass, m (g)	74.86
Particle density (Mg/m ³)	2.664

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

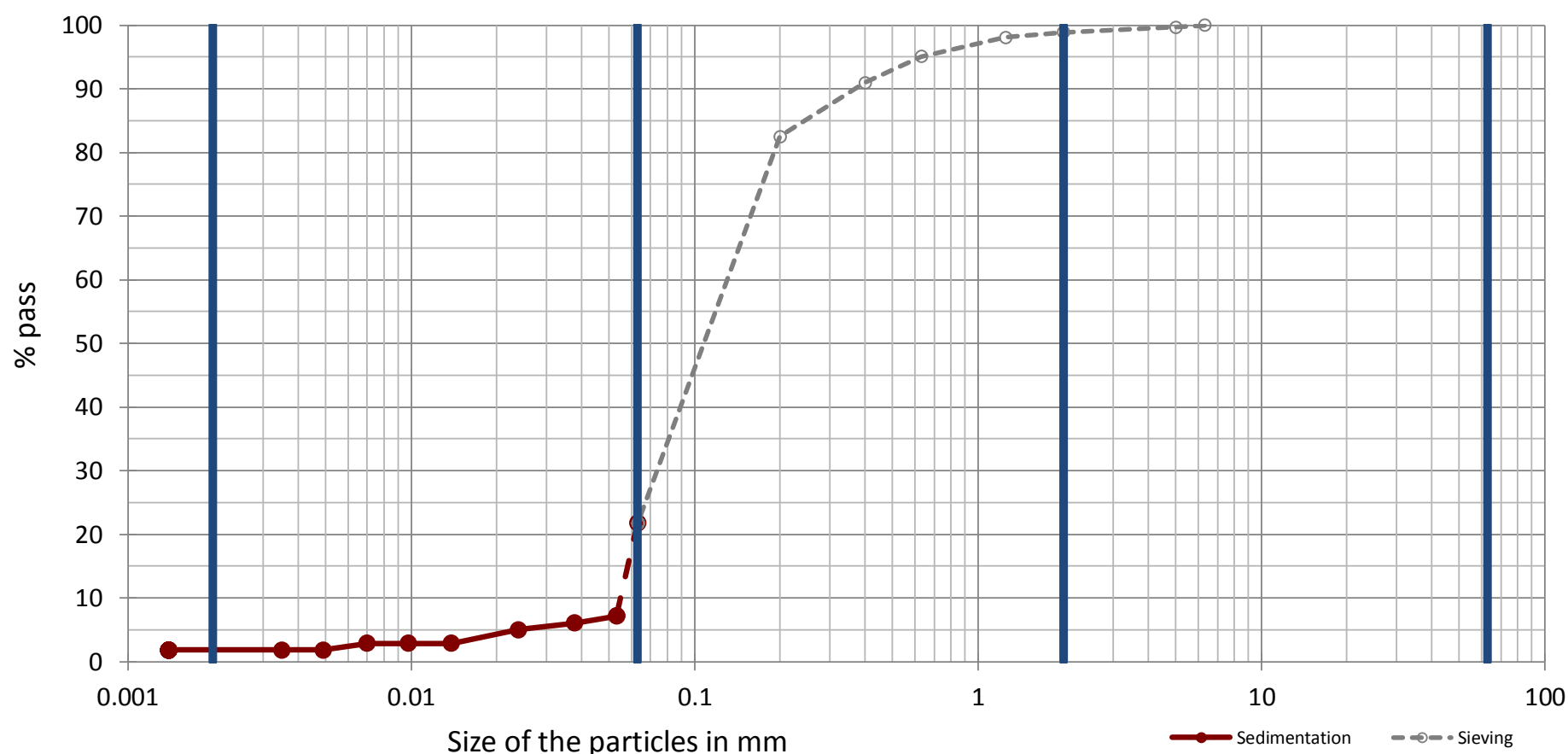
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	23	1.0075	7.5	164.6	3.4	0.0531	7.1
2	23	1.0070	7	165.8	2.9	0.0377	6.1
5	23	1.0065	6.5	166.9	2.4	0.0239	5.0
15	23	1.0055	5.5	169.3	1.4	0.0139	2.9
30	23	1.0055	5.5	169.3	1.4	0.0098	2.9
60	23	1.0055	5.5	169.3	1.4	0.0070	2.9
120	23	1.0050	5	170.5	0.9	0.0049	1.8
240	23	1.0050	5	170.5	0.9	0.0035	1.8
1440	23	1.0050	5	170.5	0.9	0.0014	1.8

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	21.8
Silt, between 0.063 and 0.002 mm (%)	19.9
Clay, smaller than 0.002 mm (%)	1.9

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 02/10/2019

Report num.: CB0019-19-0005
Edition date:

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SOIL CHEMICAL ANALYSIS

Sample reference

MB19-0450

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 26-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.445 g

Equipment:

RESULT: **6.2 g/kg (total)**
5.2 g/kg (organic)

MUFLA OVEN ETI HD150
PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0451

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_4 C_4.4
Top depth, m	2.1
Bottom depth, m	2.22
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	8
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive gray (5Y 3/2) fine SAND with occasional silt rare fine gravel, rare medium sand pockets and occasional amorphous organic matter blackish zones.	2.1	
	2.22	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0451



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0451

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.18
Tare + soil + water (g)	212.36
Tare + soil (g)	196.39
Water (g)	15.97
Soil (g)	92.21
Moisture, w (%)	17.3

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	17.3

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	101.61
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.02
Dry density (Mg/m ³)	1.72

Operator: MARC COLOMER
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	2.02
Dry density (Mg/m³)	1.72

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.5
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0302
Pyc. mass + soil + water at test temp. M2 (g)	186.1160
Soil mass, M1 (g)	12.8940
Particle density, G20°C (Mg/m ³)	2.680

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.680

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0451

PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

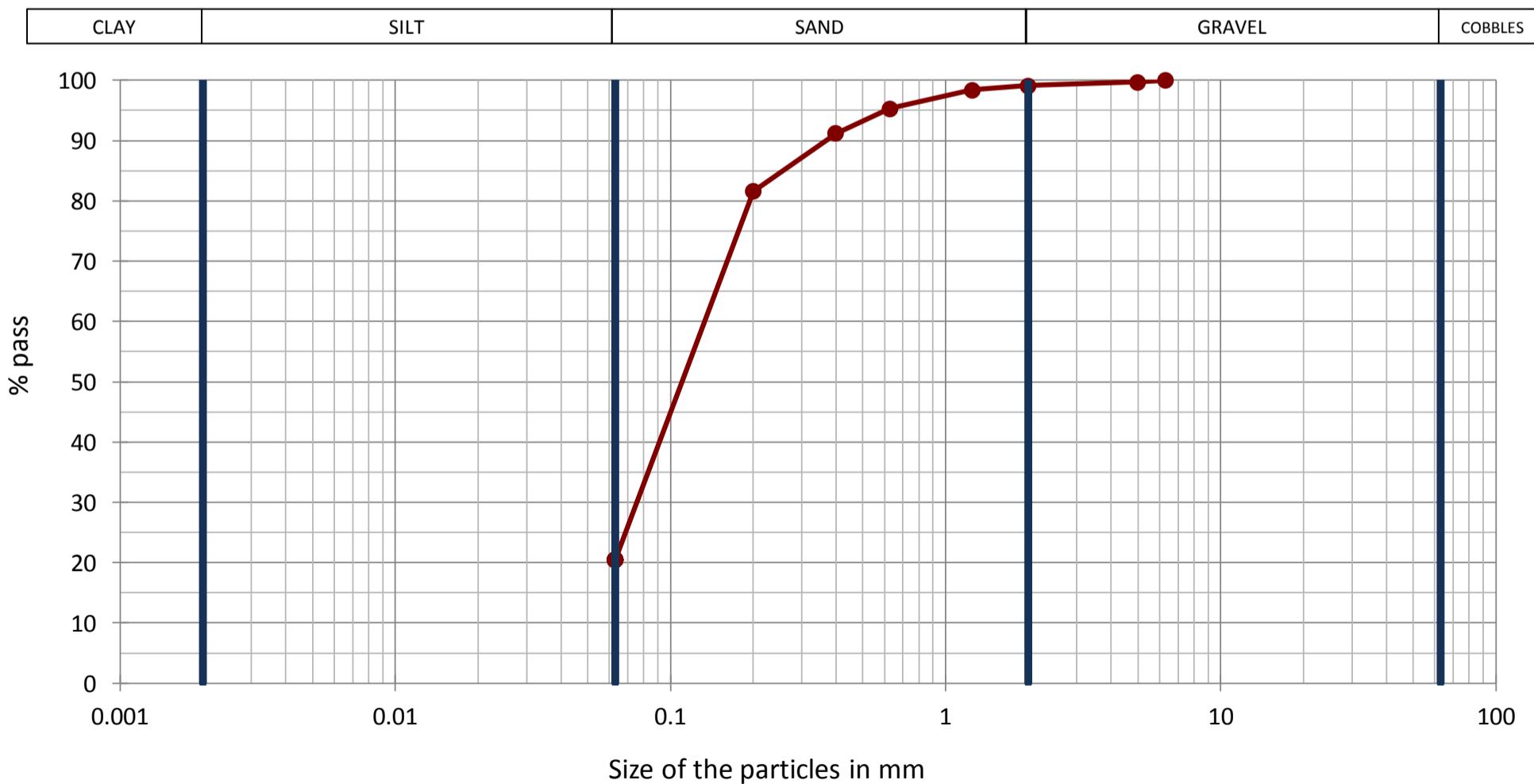
Previous calculations
 Total dried sample (g) **104.76**

 Hygrosc. moisture, % (fraction<2 mm) **0.5**
 Corr. parameter, f (fraction<2 mm) **0.9952**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
6.3		0.00	0.0	104.26	100.0
5		0.36	0.3	103.90	99.7
2		0.56	0.9	103.34	99.1
1.25		0.80	1.6	102.54	98.4
0.63		3.16	4.7	99.38	95.3
0.4		4.32	8.8	95.06	91.2
0.2		10.02	18.4	85.04	81.6
0.063		63.68	79.5	21.36	20.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.9	% SAND	2-0.063 mm	78.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	3.8		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	13.7		20.5
	% Fine gravel	6.3-2 mm	0.9	% Fine sand	0.2-0.063 mm	61.1		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0451

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	99.1
Tested soil mass, mw (g)	75.68
Hygroscopic moisture, W (%)	0.5
Tested and dried soil mass, m (g)	75.32
Particle density (Mg/m ³)	2.680

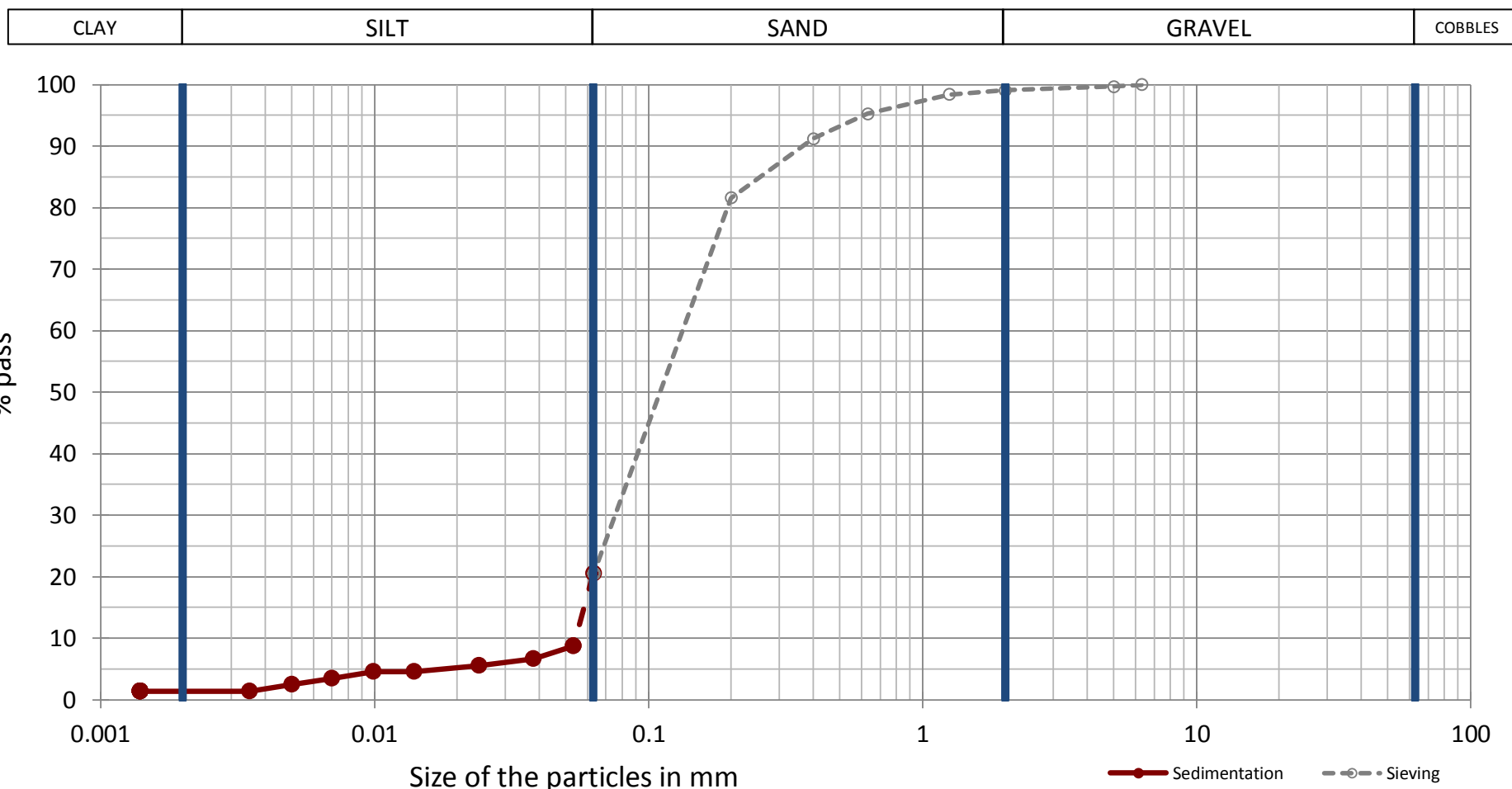
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	22	1.0080	8	163.4	4.2	0.0533	8.8
2	22	1.0070	7	165.8	3.2	0.0380	6.7
5	22	1.0065	6.5	166.9	2.7	0.0241	5.6
15	22	1.0060	6	168.1	2.2	0.0140	4.6
30	22	1.0060	6	168.1	2.2	0.0099	4.6
60	22	1.0055	5.5	169.3	1.7	0.0070	3.5
120	22	1.0050	5	170.5	1.2	0.0050	2.5
240	22	1.0045	4.5	171.7	0.7	0.0035	1.4
1440	22	1.0045	4.5	171.7	0.7	0.0014	1.4

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	20.5
Silt, between 0.063 and 0.002 mm (%)	18.9
Clay, smaller than 0.002 mm (%)	1.6



REMARKS

Operator: ALEX VANCELLS

Test final date: 23/10/2019

Report num.: CB0019-19-0005
Edition date:

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6 / 6

Sample reference

MB19-0451

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Predrying temperature:	60 °C	Test final date:	08-10-19
Mean of analyzed soil mass:	10.357 g	Calcination temperature:	450 °C
RESULT:	4.6 g/kg (total)	Equipment:	MUFLA OVEN ETI HD150
	4.3 g/kg (organic)		PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0452

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_4 C_4.3
Top depth, m	2.8
Bottom depth, m	2.9
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark olive gray (5Y 3/2) silty fine SAND with rare fine gravel, occasional medium sand pockets and occasional amorphous organic matter blackish zones	2.8	
	2.9	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0452



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0452

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	109.64
Tare + soil + water (g)	216.39
Tare + soil (g)	200.90
Water (g)	15.49
Soil (g)	91.26
Moisture, w (%)	17.0

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	17.0

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	105.13
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.09
Dry density (Mg/m ³)	1.79

Operator: MARC COLOMER
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	2.09
Dry density (Mg/m³)	1.79

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	186.2190
Soil mass, M1 (g)	13.1330
Particle density, G20°C (Mg/m ³)	2.642

Operator: GUILLEM MASSALLÉ
Test final date: 19/09/2019

Results	
Particle density (Mg/m³)	2.642

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0452

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

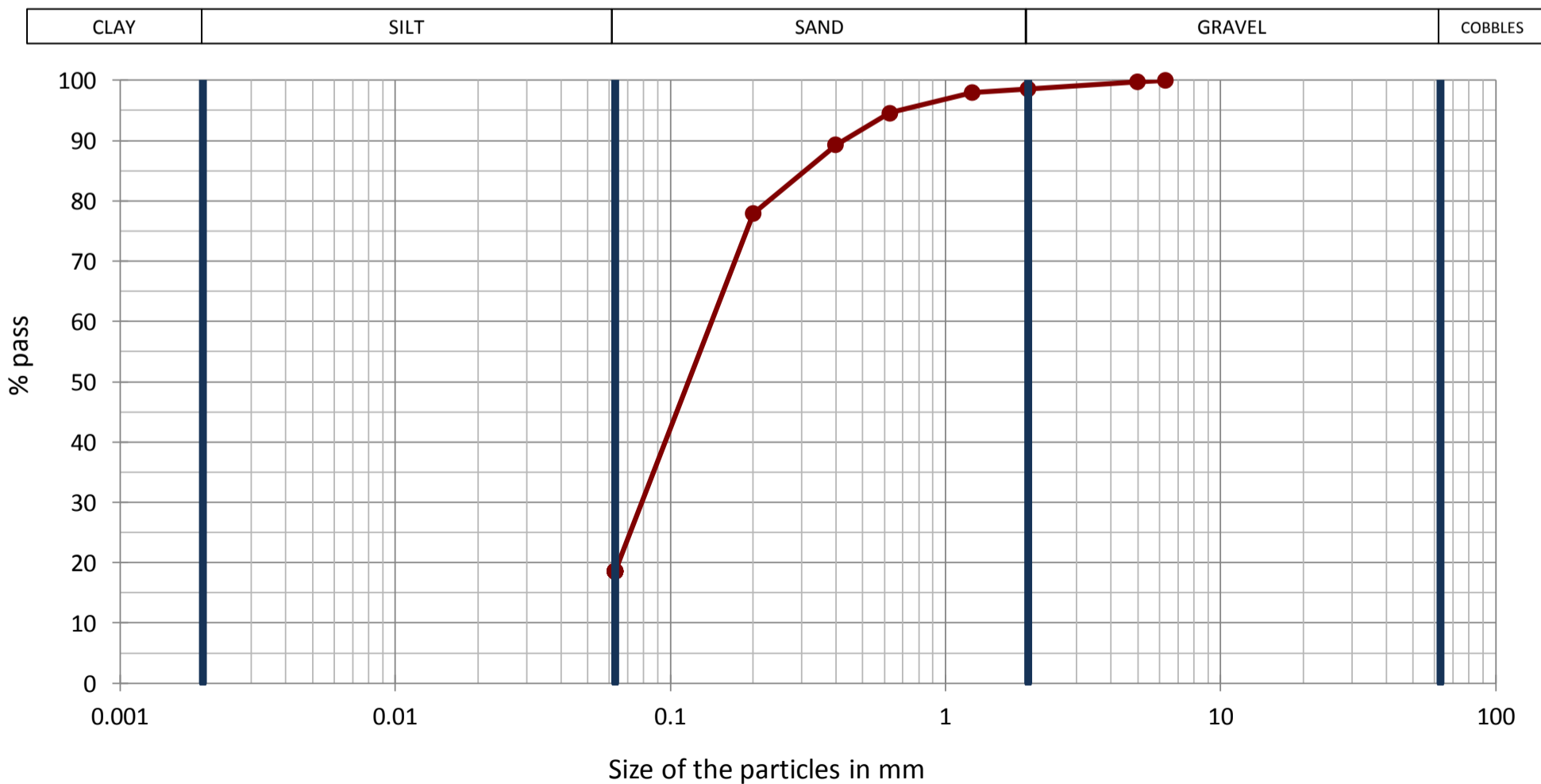
Previous calculations
 Total dried sample (g) **106.71**

 Hygrosc. moisture, % (fraction<2 mm) **0.3**
 Corr. parameter, f (fraction<2 mm) **0.9966**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
6.3		0.00	0.0	106.35	100.0
5		0.26	0.2	106.09	99.8
2		1.20	1.4	104.89	98.6
1.25		0.66	2.0	104.23	98.0
0.63		3.61	5.4	100.62	94.6
0.4		5.65	10.7	94.97	89.3
0.2		12.11	22.1	82.86	77.9
0.063		63.08	81.4	19.78	18.6

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	1.4	% SAND	2-0.063 mm	80.0	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	4.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	16.7		18.6
	% Fine gravel	6.3-2 mm	1.4	% Fine sand	0.2-0.063 mm	59.3		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0452

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	98.6
Tested soil mass, mw (g)	75.11
Hygroscopic moisture, W (%)	0.3
Tested and dried soil mass, m (g)	74.85
Particle density (Mg/m ³)	2.642

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

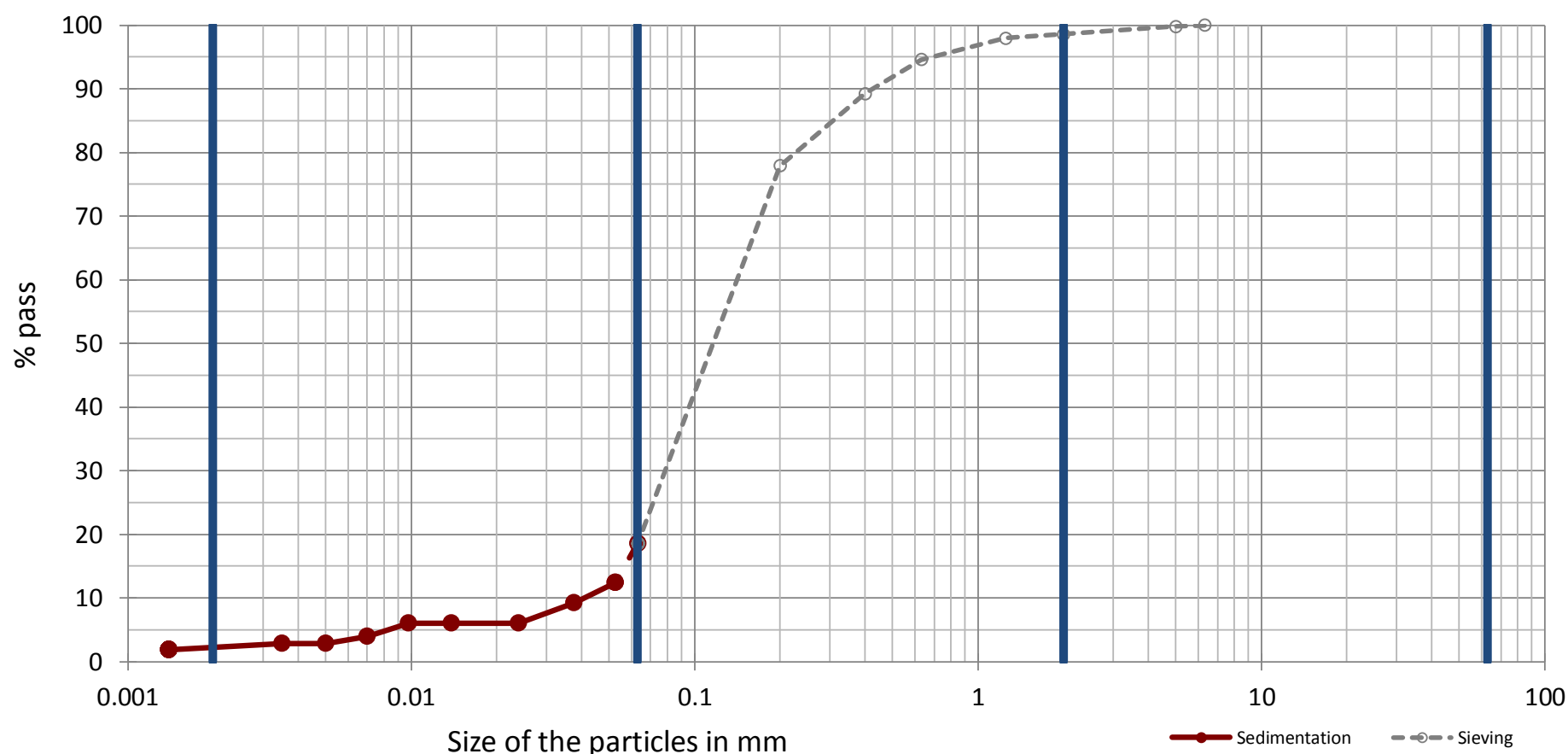
Test tube data	
Area of the inner section (A), mm ²	2933.99

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	23	1.0100	10	158.6	5.9	0.0525	12.4
2	23	1.0085	8.5	162.2	4.4	0.0375	9.2
5	23	1.0070	7	165.8	2.9	0.0240	6.1
15	23	1.0070	7	165.8	2.9	0.0139	6.1
30	23	1.0070	7	165.8	2.9	0.0098	6.1
60	23	1.0060	6	168.1	1.9	0.0070	3.9
120	23	1.0055	5.5	169.3	1.4	0.0050	2.9
240	23	1.0055	5.5	169.3	1.4	0.0035	2.9
1440	23	1.0050	5	170.5	0.9	0.0014	1.8

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	18.6
Silt, between 0.063 and 0.002 mm (%)	16.6
Clay, smaller than 0.002 mm (%)	2.0

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 24/09/2019

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0452

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 20-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.02 g

Equipment:

RESULT: **5.2 g/kg (total)**

MUFLA OVEN ETI HD150

5.2 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0453

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_4 C_4.2
Top depth, m	4
Bottom depth, m	4.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	50
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark olive gray (5Y 3/2) fine SAND with rare fine gravel, rare medium sand pockets and occasional amorphous organic matter blackish zones.	4	
	4.5	From 4.20m to 4.50m: RESERVED FOR ADVANCED TESTING

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at RUSSELL GEOTECHNICAL INNOVATION report and at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0453



REMARKS

Operator: ALEX VANCELLS

Date: 20/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0453

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.70
Tare + soil + water (g)	230.72
Tare + soil (g)	211.84
Water (g)	18.88
Soil (g)	107.14
Moisture, w (%)	17.6

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	17.6

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	103.16
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.05
Dry density (Mg/m ³)	1.74

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	2.05
Dry density (Mg/m³)	1.74

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0454

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_4 C_4.1
Top depth, m	5.3
Bottom depth, m	5.4
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	20-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	siSa
--------------------	------

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark olive gray (5Y 3/2) silty fine SAND with rare fine gravel, rare medium sand pockets and occasional amorphous organic matter blackish zones	5.3	
	5.4	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0454



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 20/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0454

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	107.62
Tare + soil + water (g)	238.13
Tare + soil (g)	218.67
Water (g)	19.46
Soil (g)	111.05
Moisture, w (%)	17.5

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Moisture content, w (%)	17.5

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	102.89
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.05
Dry density (Mg/m ³)	1.74

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	2.05
Dry density (Mg/m³)	1.74

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	189.1950
Soil mass, M1 (g)	17.5740
Particle density, G20°C (Mg/m ³)	2.649

Operator: GUILLEM MASSALLÉ
Test final date: 19/09/2019

Results	
Particle density (Mg/m³)	2.649

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0454

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

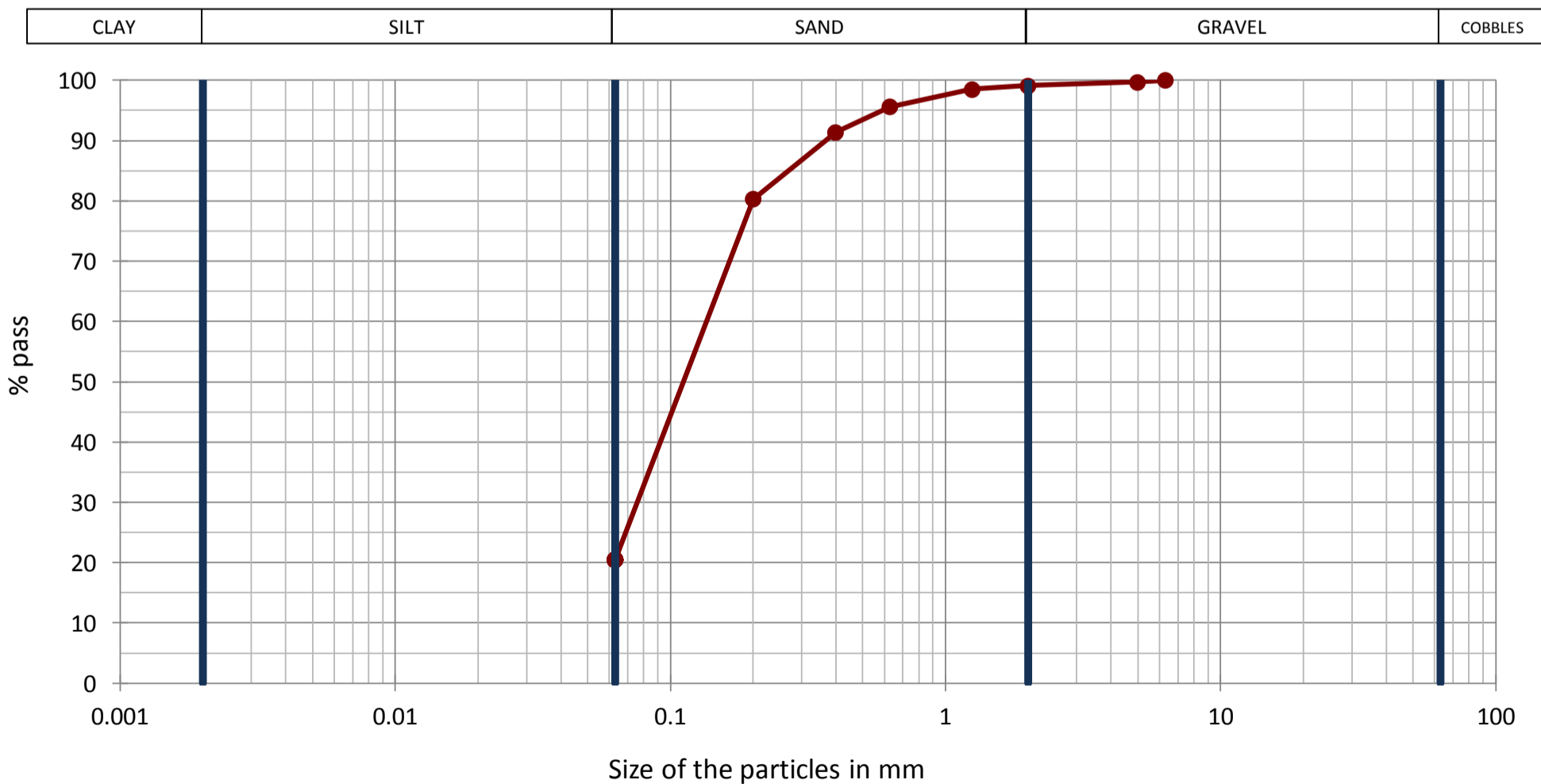
Previous calculations
 Total dried sample (g) **104.74**

 Hygrosc. moisture, % (fraction < 2 mm) **0.4**
 Corr. parameter, f (fraction < 2 mm) **0.9962**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
6.3		0.00	0.0	104.35	100.0
5		0.33	0.3	104.02	99.7
2		0.56	0.9	103.46	99.1
1.25		0.70	1.5	102.76	98.5
0.63		2.95	4.4	99.81	95.6
0.4		4.47	8.6	95.34	91.4
0.2		11.53	19.7	83.81	80.3
0.063		62.38	79.5	21.43	20.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.9	% SAND	2-0.063 mm	78.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	3.5		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	15.3		20.5
	% Fine gravel	6.3-2 mm	0.9	% Fine sand	0.2-0.063 mm	59.8		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0454

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	99.1
Tested soil mass, mw (g)	75.21
Hygroscopic moisture, W (%)	0.4
Tested and dried soil mass, m (g)	74.93
Particle density (Mg/m ³)	2.649

Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	y=-2.3782x+182.41
Eq. dispersant correc. (Cd)	y=1E-05x4+2E-03x3+1E-01x2+2.172x+16.1582
Meniscus correction (Cm)	0.0005

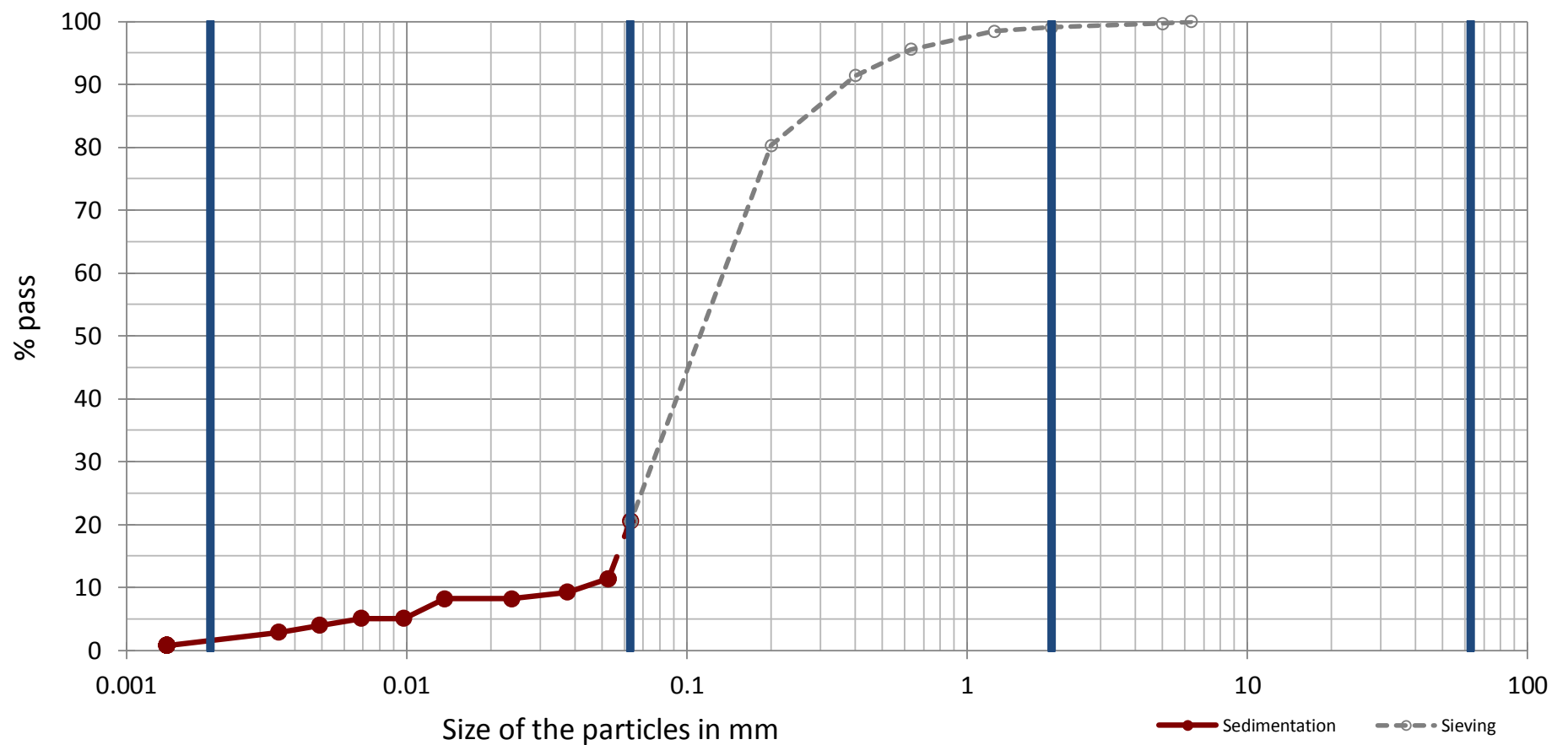
Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	23	1.0095	9.5	159.8	5.4	0.0526	11.4
2	23	1.0085	8.5	162.2	4.4	0.0375	9.3
5	23	1.0080	8	163.4	3.9	0.0238	8.2
15	23	1.0080	8	163.4	3.9	0.0137	8.2
30	23	1.0065	6.5	166.9	2.4	0.0098	5.0
60	23	1.0065	6.5	166.9	2.4	0.0069	5.0
120	23	1.0060	6	168.1	1.9	0.0049	4.0
240	23	1.0055	5.5	169.3	1.4	0.0035	2.9
1440	23	1.0045	4.5	171.7	0.4	0.0014	0.8

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil Rh=(R'h-1)*1000
Hr -	Efective depth
R -	Real reading suspension soil R=Rh+Cm+Ct-Cd
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	20.5
Silt, between 0.063 and 0.002 mm (%)	19.1
Clay, smaller than 0.002 mm (%)	1.4

CLAY	SILT	SAND	GRAVEL	COBBLES
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REMARKS

Operator: ALEX VANCELLS

Test final date: 24/09/2019

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0454

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 20-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.006 g

Equipment:

RESULT: **5.7 g/kg (total)**

MUFLA OVEN ETI HD150

5.1 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0455

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_3 C_3.3
Top depth, m	0.16
Bottom depth, m	0.32
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	16
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	21-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive brown (2.5Y 4/3) medium to fine SAND with frequent amorphous organic and occasional shell fragments	0.16	
	0.32	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE TO PERFORM THE TEST

Report num.: CB0019-19-0005
Edition date:

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www.igeotest.com
Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0455



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 21/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0455

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	112.90
Tare + soil + water (g)	238.86
Tare + soil (g)	219.08
Water (g)	19.78
Soil (g)	106.18
Moisture, w (%)	18.6

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Moisture content, w (%)	18.6

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	98.68
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.96
Dry density (Mg/m ³)	1.65

Operator: MARC COLOMER
Test final date: 21/06/2019

Results	
Bulk density (Mg/m³)	1.96
Dry density (Mg/m³)	1.65

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.3
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	185.4870
Soil mass, M1 (g)	13.5560
Particle density, G20°C (Mg/m ³)	2.637

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.637

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0455

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

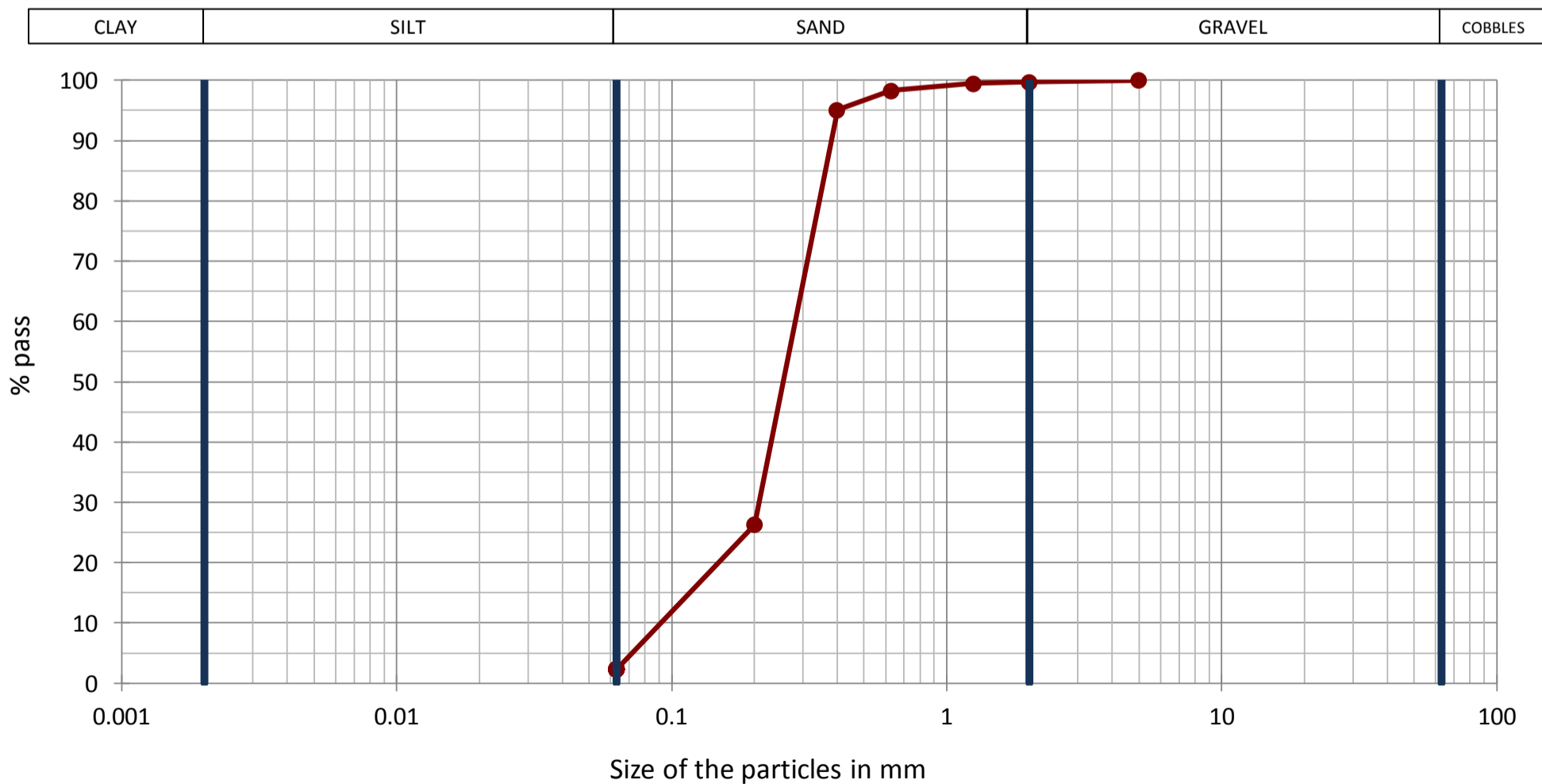
Previous calculations
 Total dried sample (g) **104.37**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9984**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
5			0.00	0.0	104.20
2			0.33	0.3	103.87
1.25			0.23	0.5	103.64
0.63			1.26	1.7	102.38
0.4			3.25	4.9	99.13
0.2			71.76	73.7	27.37
0.063			24.97	97.7	2.40
					100.0
					99.7
					99.5
					98.3
					95.1
					26.3
					2.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.3	% SAND	2-0.063 mm	97.4	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.4		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	72.0		2.3
	% Fine gravel	6.3-2 mm	0.3	% Fine sand	0.2-0.063 mm	24.0		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. MEDIUM AND COARSE SAND ALSO CONTAINS SOME SHELL FRAGMENTS.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

MB19-0455

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 16-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.675 g

Equipment:

RESULT: **5.8 g/kg (total)**

MUFLA OVEN ETI HD150

4.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 19-09-19

Mean of analyzed soil mass: 5.006 g

Equipment:

RESULT: **11.1 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

MB19-0456

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_3 C_3.2
Top depth, m	0.77
Bottom depth, m	1.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	73
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	21-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB./RUSSELL GEOT. INNOV.

Soil type

USCS classification	MH
ISO classification	CI

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) clayey SILT.	0.77	
	1.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
FALL CONE TEST - ISO 17892-6:2017
UNCONSOLIDATED UNDRAINED TRIAXIAL TEST, UU 1.5' - ISO 17892-8:2018
INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

SEE ADVANCED TESTING RESULTS IN RUSSELL GEOTECHNICAL INNOVATIONS REPORT

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0456



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 21/06/2019

Report num.: CB0019-19-0005
Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0456

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	98.16
Tare + soil + water (g)	173.21
Tare + soil (g)	153.25
Water (g)	19.96
Soil (g)	55.09
Moisture, w (%)	36.2

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Moisture content, w (%)	36.2

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	92.85
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.85
Dry density (Mg/m ³)	1.36

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Bulk density (Mg/m³)	1.85
Dry density (Mg/m³)	1.36

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	185.2290
Soil mass, M1 (g)	11.0520
Particle density, G20°C (Mg/m ³)	2.714

Operator: GUILLEM MASSALLÉ
Test final date: 27/09/2019

Results	
Particle density (Mg/m³)	2.714

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0456

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

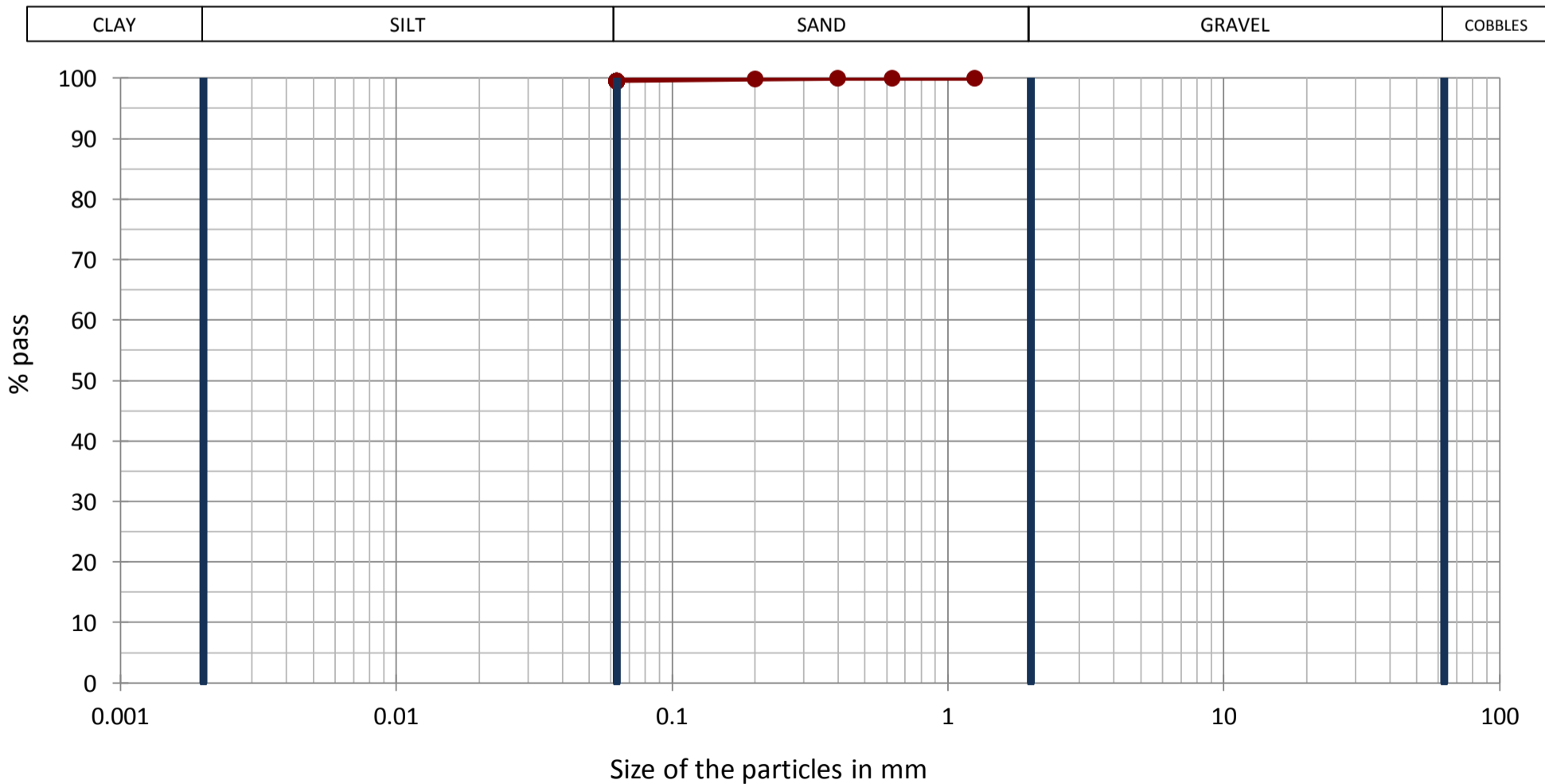
Previous calculations
 Total dried sample (g) **104.81**

 Hygrosc. moisture, % (fraction<2 mm) **3.8**
 Corr. parameter, f (fraction<2 mm) **0.9637**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
1.25		0.00	0.0	101.01	100.0
0.63		0.01	0.0	101.00	100.0
0.4		0.02	0.0	100.98	100.0
0.2		0.10	0.1	100.88	99.9
0.063		0.25	0.4	100.63	99.6

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	0.4	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		99.6
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.1		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	0.3		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0456

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Hydrometer data
Bulb volume, V (ml) 47.77
Eq. scale calibration $y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd) $y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm) 0.0005

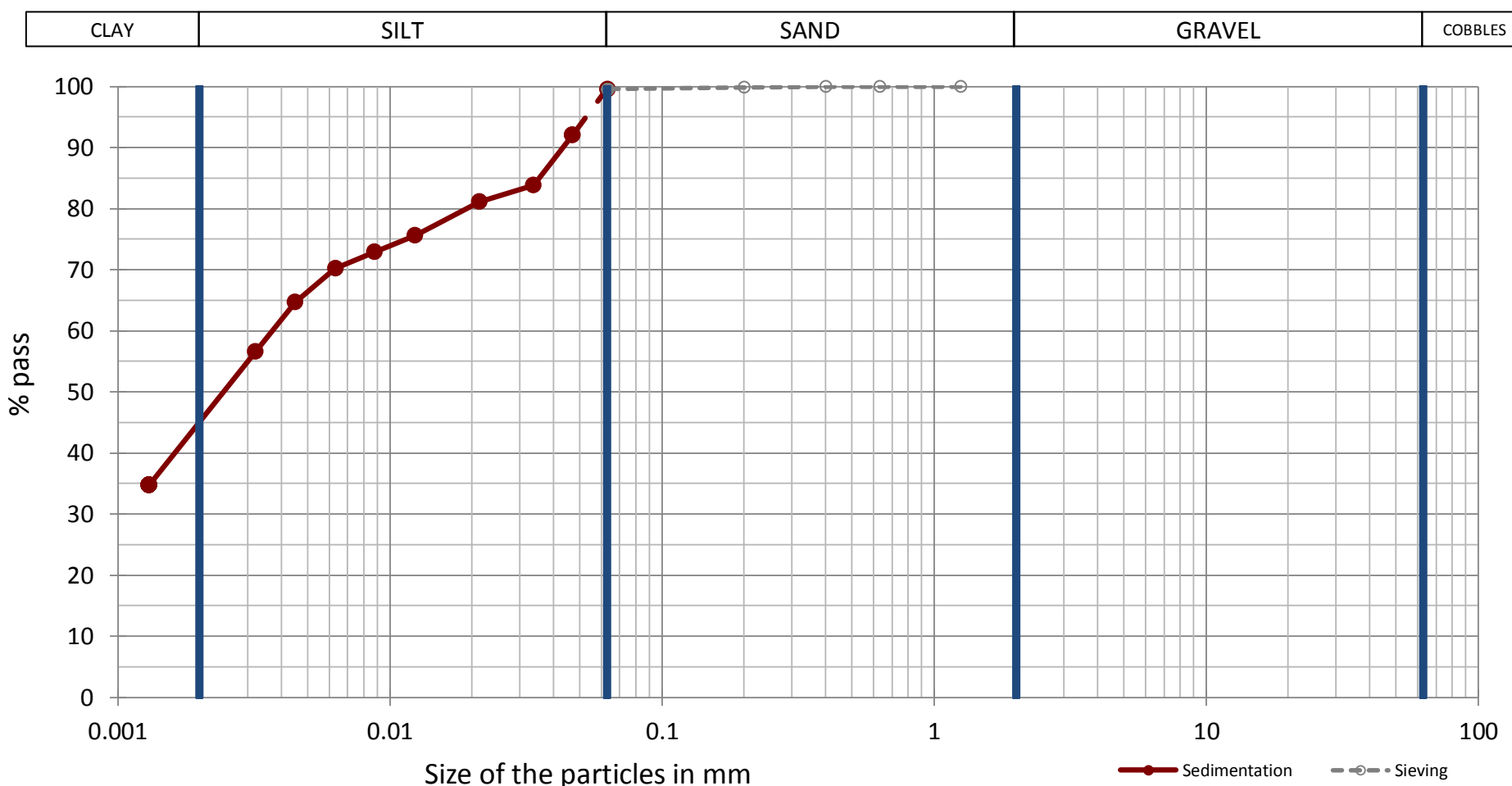
Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	30.11
Hygrosopic moisture, W (%)	3.8
Tested and dried soil mass, m (g)	29.02
Particle density (Mg/m ³)	2.714

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	23	1.0210	21	132.5	16.9	0.0470	92.0
2	23	1.0195	19.5	136.0	15.4	0.0337	83.8
5	23	1.0190	19	137.2	14.9	0.0214	81.1
15	23	1.0180	18	139.6	13.9	0.0124	75.6
30	23	1.0175	17.5	140.8	13.4	0.0088	72.9
60	23	1.0170	17	142.0	12.9	0.0063	70.2
120	23	1.0160	16	144.4	11.9	0.0045	64.7
240	23	1.0145	14.5	147.9	10.4	0.0032	56.5
1440	23	1.0105	10.5	157.4	6.4	0.0013	34.7

Test tube data	
Area of the inner section (A), mm ²	2933.99

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	99.6
Silt, between 0.063 and 0.002 mm (%)	56.8
Clay, smaller than 0.002 mm (%)	42.8



REMARKS

Operator: ALEX VANCELLS

Test final date: 02/10/2019

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0456

DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data

Type of cone used	80 g/30°			
Cone penetration (mm)	19.585	22.335	20.85	17.125
Water (g)	4.51	4.86	4.59	4.22
Mass moist soil + cont. (g)	39.94	40.60	40.25	41.25
Mass dry soil + cont. (g)	35.43	35.74	35.66	37.03
Mass container (g)	28.72	28.91	29.01	30.34
Soil (g)	6.71	6.83	6.65	6.69
Water content (%)	67.2	71.2	69.0	63.1

Equipment

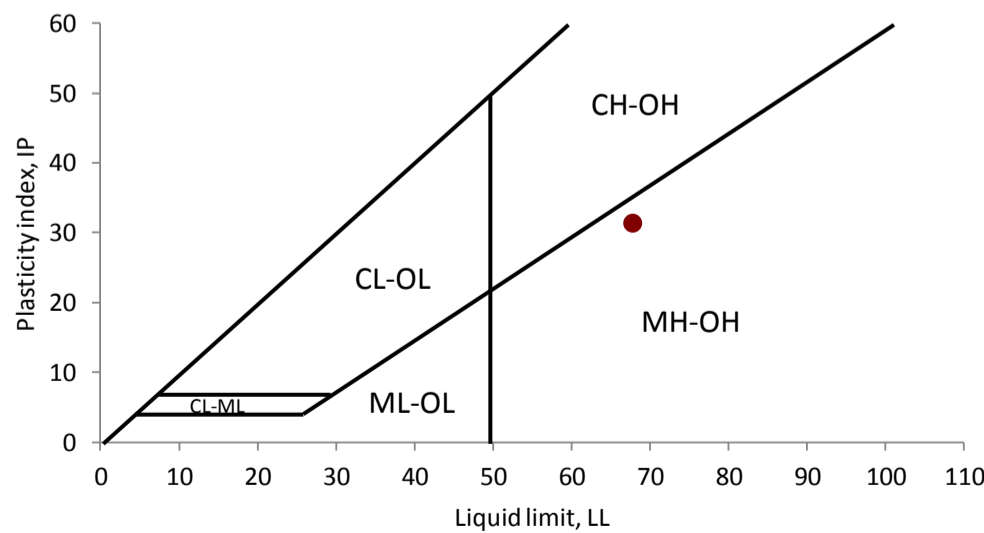
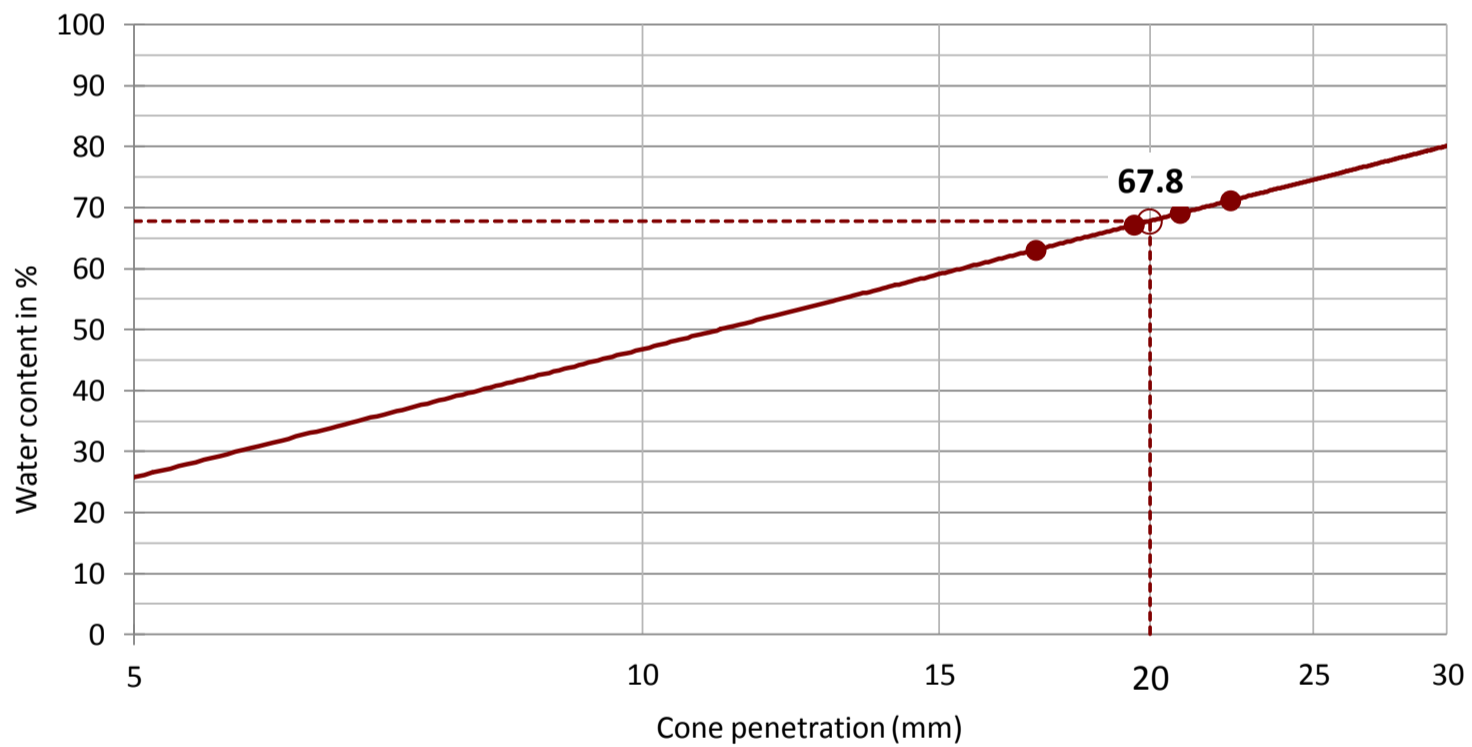
PENETROMETER MATEST B057-11
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Plastic Limit data

Water (g)	1.55	1.42		
Mass moist soil + cont. (g)	29.32	29.17		
Mass dry soil + cont. (g)	27.77	27.75		
Mass container (g)	23.52	23.85		
Soil (g)	4.25	3.90		
Water content (%)	36.5	36.4		

Results

Liquid limit, LL	67.8
Plastic limit, LP	36.4
Plasticity index, IP	31.4
Natural water content (%)	36.2
Liquidity index, IL	0.0
Consistency index, IC	1.0



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0456

Equipment	
MECACISA 1.5' TRIAXIAL CHAMBER PRESSURE SYSTEM MECACISA 220004 TRIAXIAL LOAD FRAME MECACISA 210715 ELEC. DEF. TRANSD. SCHREIBER SM260 PC WITH SOFTWARE MECASOFT	

Test type	Unconsolidated Undrained (UU)
Soil conditions	UNDISTURBED

Soil sample data	
Specimen number	I
Initial length (cm)	7.610
Initial diameter (cm)	3.845
Initial area (cm ²)	11.611
Initial volume (cm ³)	88.360
Initial moisture content (%)	37.6
Final moisture content (%)	34.0
Initial bulk density (Mg/m ³)	1.84
Initial dry density (Mg/m ³)	1.34
Initial saturation degree (%)	99.5
Particle density (Mg/m ³)	2.714

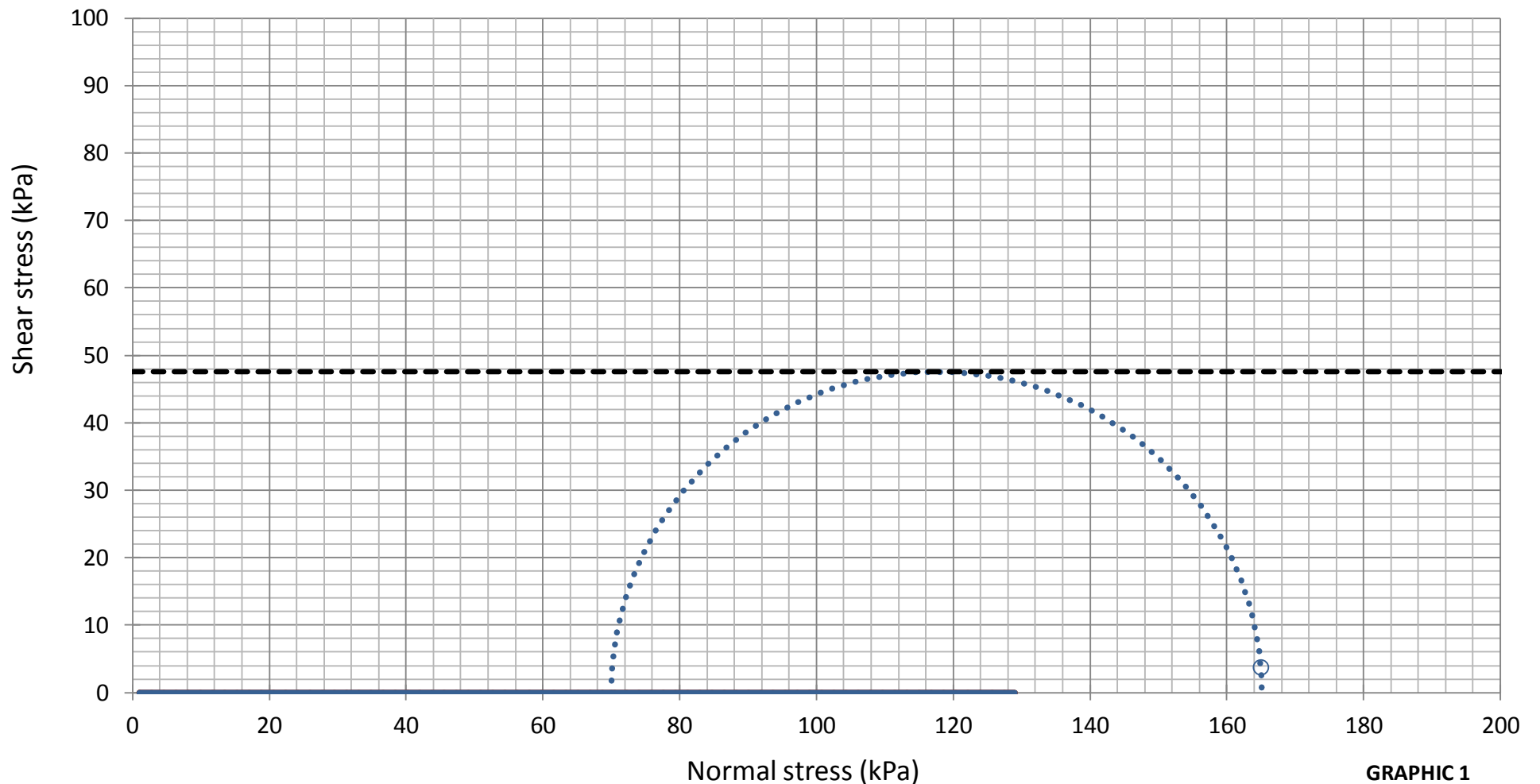
Prior saturation process	
Saturation prior to test	NO

Failure test results	
Specimen number	I
σ ₁ (kPa)	165.1
σ ₃ (kPa)	70.0
(σ ₁ -σ ₃)/2 (kPa)	47.6
(σ ₁ +σ ₃)/2 (kPa)	117.6

Test data and results	
Chamber pressure (kPa)	70
Back pressure, u _b (kPa)	0
Rate of axial displ. (mm/min)	0.9189
Major principal stress (kPa)	95.1
Failure stress (kPa)	95.1
Failure strain (%)	13.0

Estimate total	
Φ _u (°)	0.0
C _u (kPa)	47
C _u (kp/cm ²)	0.48

Graphic symbols						
	I total	II total	III total			



REMARKS

THE REMOULDED TRIAXIAL TEST COULD NOT BE PERFORMED, AS THE SPECIMEN BROKE DURING DISMOULDING DUE TO ITS STIFFNESS

Operator: ALEX VANCELLS

Test final date: 25/09/2019

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292

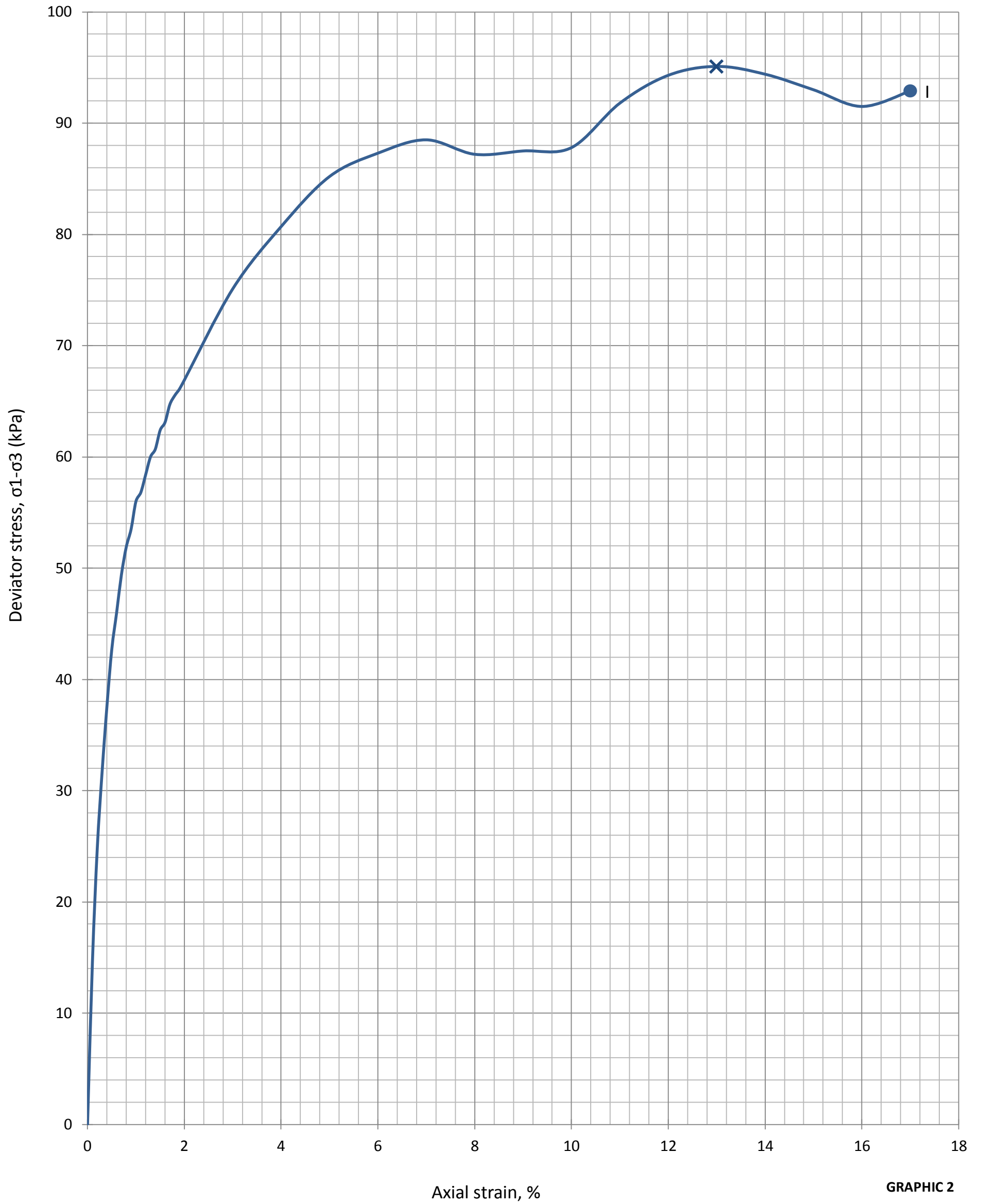


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Sample reference

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0456



GRAPHIC 2



Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0456

Failure process data summary

	Time sg	Deform. %	$(\sigma_1 - \sigma_3)_m$ kPa	$(\Delta\sigma_1)_m$ kPa	$(\Delta\sigma_1)_{fp}$ kPa	$(\sigma_1 - \sigma_3)$ kPa	u-ub kPa	ϵ_1	σ_1 kPa	σ'_1 kPa	σ'_3 kPa	Coeff. A	$(\sigma_1 + \sigma_3)/2$ kPa	$(\sigma_1 - \sigma_3)/2$ kPa	$(\sigma'_1 + \sigma'_3)/2$ kPa	$(\sigma'_1 - \sigma'_3)/2$ kPa
Specimen	0	0	0.0	0.0	0.0	0.0		0.000	70.0				70.0	0.0		
I	5	0.101	14.6	0.0	0.0	14.6		0.001	84.6				77.3	7.3		
Chamber pressure	14	0.301	31.8	0.1	0.0	31.7		0.003	101.7				85.9	15.9		
σ_3 , kPa	24	0.501	42.8	0.1	0.0	42.7		0.005	112.7				91.4	21.4		
70	34	0.7	49.6	0.2	0.0	49.4		0.007	119.4				94.7	24.7		
Back pressure	44	0.9	53.8	0.3	0.0	53.5		0.009	123.5				96.8	26.8		
u_b , kPa	54	1.101	57.1	0.3	0.0	56.8		0.011	126.8				98.4	28.4		
0	59	1.201	58.7	0.3	0.0	58.4		0.012	128.4				99.2	29.2		
σ'_3 , kPa	69	1.401	61.1	0.4	0.0	60.7		0.014	130.7				100.4	30.4		
70	79	1.601	63.6	0.5	0.0	63.1		0.016	133.1				101.6	31.6		
Rate of axial displ.	89	1.8	66.0	0.5	0.0	65.5		0.018	135.5				102.8	32.8		
mm/min	99	2	67.5	0.6	0.0	66.9		0.020	136.9				103.5	33.5		
0.9189	203	4	81.9	1.2	0.0	80.7		0.040	150.7				110.4	40.4		
	257	5	86.7	1.5	0.0	85.2		0.050	155.2				112.6	42.6		
	356	7	90.5	2.0	0.0	88.5		0.070	158.5				114.3	44.3		
	456	9	90.1	2.6	0.0	87.5		0.090	157.5				113.8	43.8		
	561	11	95.0	3.2	0.0	91.8		0.110	161.8				115.9	45.9		
	663	13	98.9	3.8	0.0	95.1		0.130	165.1				117.6	47.6		
	761	15	97.4	4.4	0.0	93.0		0.150	163.0				116.5	46.5		
	864	17	97.9	5.0	0.0	92.9		0.170	162.9				116.5	46.5		
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																

Report num.:	CB0019-19-0005
Edition date:	

Sample reference

INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019

MB19-0456

Test data	
Employee ring type	FIXED
Height (cm)	1.963
Diameter (cm)	5.043
Volume (cm ³)	39.20
Ring weight (g)	106.82
Ring+soil weight (g)	177.28
Ini. weight wet soil (g)	70.46
Soil part. density (Mg/m ³)	2.714
Initial moisture content (%)	36.5
Initial bulk density (Mg/m ³)	1.80
Initial dry density (Mg/m ³)	1.32
Initial saturation degree (%)	93.80
Final moisture content (%)	33.8
Final bulk density (Mg/m ³)	1.89
Final dry density (Mg/m ³)	1.41

Equipment	
OEDOMETER MATEST S260 (PLACE 3)	
DATA ACQ. MODULE MECATEST-16	
ELECT. TRANSD. LVDT SOLARTRON AX/5/S	

Soil conditions	UNDISTURBED
-----------------	-------------

Swelling Pressure Test	
Swelling Pressure (kPa)	< 20
(kg/cm ²)	< 0.2

Results	
Initial void ratio, e ₀	1.0561
Final void ratio, e _f	0.9142
Solid height, H _s (cm)	0.9547
Final height pore, H _{ps} (cm)	0.8728

Results																
Press. stage	Load date	Final time	Instant. settlement	Read. t= 8 sg	L ₀ (Casag. met.)	Final reading	Final sample height	Void ratio at L ₀	Final void ratio	Compr. ind. (*)	Swelling ind. (*)	Constr. mod. E _{oed} kPa	Compr. coef. a _v 1/kPa	Cons. coef. c _v cm ² /s	Compr. coef. m _v 1/kPa	Sec. cons. coef. C _α
kPa		sg	mm	mm	mm	mm	cm	e _{L0}	e _f	c _c	c _s					
20	24-09-19	86 740	0.069	0.069	0.066	0.102	1.9529	1.0492	1.0455					6.45E-03		0.00E+00
40	25-09-19	86 462	0.013	0.119	0.114	0.190	1.9440	1.0442	1.0362	0.0309		4 399	4.65E-04	1.23E-03	2.27E-04	2.96E-04
80	26-09-19	86 405	0.058	0.265	0.249	0.433	1.9197	1.0301	1.0108	0.0844		3 207	6.35E-04	1.12E-03	3.12E-04	1.08E-03
150	27-09-19	232 486	0.107	0.565	0.540	0.834	1.8796	0.9996	0.9688	0.1538		3 351	6.00E-04	6.99E-04	2.98E-04	6.20E-04
300	30-09-19	86 896	0.088	0.914	0.922	1.428	1.8202	0.9595	0.9066	0.2066		4 748	4.15E-04	6.00E-04	2.11E-04	1.80E-03
600	01-10-19	86 475	0.110	1.551	1.538	2.156	1.7474	0.8950	0.8303	0.2535		7 496	2.54E-04	2.22E-04	1.33E-04	3.18E-03
1000	02-10-19	88 109	0.036	2.194	2.192	2.706	1.6924	0.8265	0.7727	0.2596		12 710	1.44E-04	1.52E-04	7.87E-05	3.02E-03
1500	03-10-19	88 933	0.021	2.739	2.727	3.164	1.6466	0.7705	0.7247	0.2726		18 466	9.60E-05	1.21E-04	5.42E-05	3.43E-03
600	04-10-19	258 649	-0.035	3.115	3.129	2.809	1.6821	0.7284	0.7619		0.0935	41 727	4.13E-05		2.40E-05	
150	07-10-19	86 589	-0.048	2.749	2.761	2.093	1.7537	0.7670	0.8369		0.1246	10 571	1.67E-04		9.46E-05	
20	08-10-19	86 924	-0.018	2.061	2.075	1.355	1.8275	0.8388	0.9142		0.0883	3 089	5.95E-04		3.24E-04	

NOTE: Compression index (C_c) and swelling index (C_s), such as constrained modules (E_{oed}) and compressibility coefficient (a_v), are estimated between a pressure step and the immediately preceding as a first approximation, taking for calculatin the obtained void ratio values in the end of the considered pressure stage.

REMARKS

SWELLING PRESSURE IS DETERMINED APPLYING SUCCESSIVE PRESSURE STAGES. ONCE REACHED THE EQUILIBRIUM SITUATION THE TEST CONTINUES WITH THE PRESSURE STAGE IMMEDIATELY SUPERIOR TO THE SWELLING PRESSURE

Operator: ALEX VANCELLS

Test final date: 10/10/2019

Report num.: CB0019-19-0005
 Edition date:

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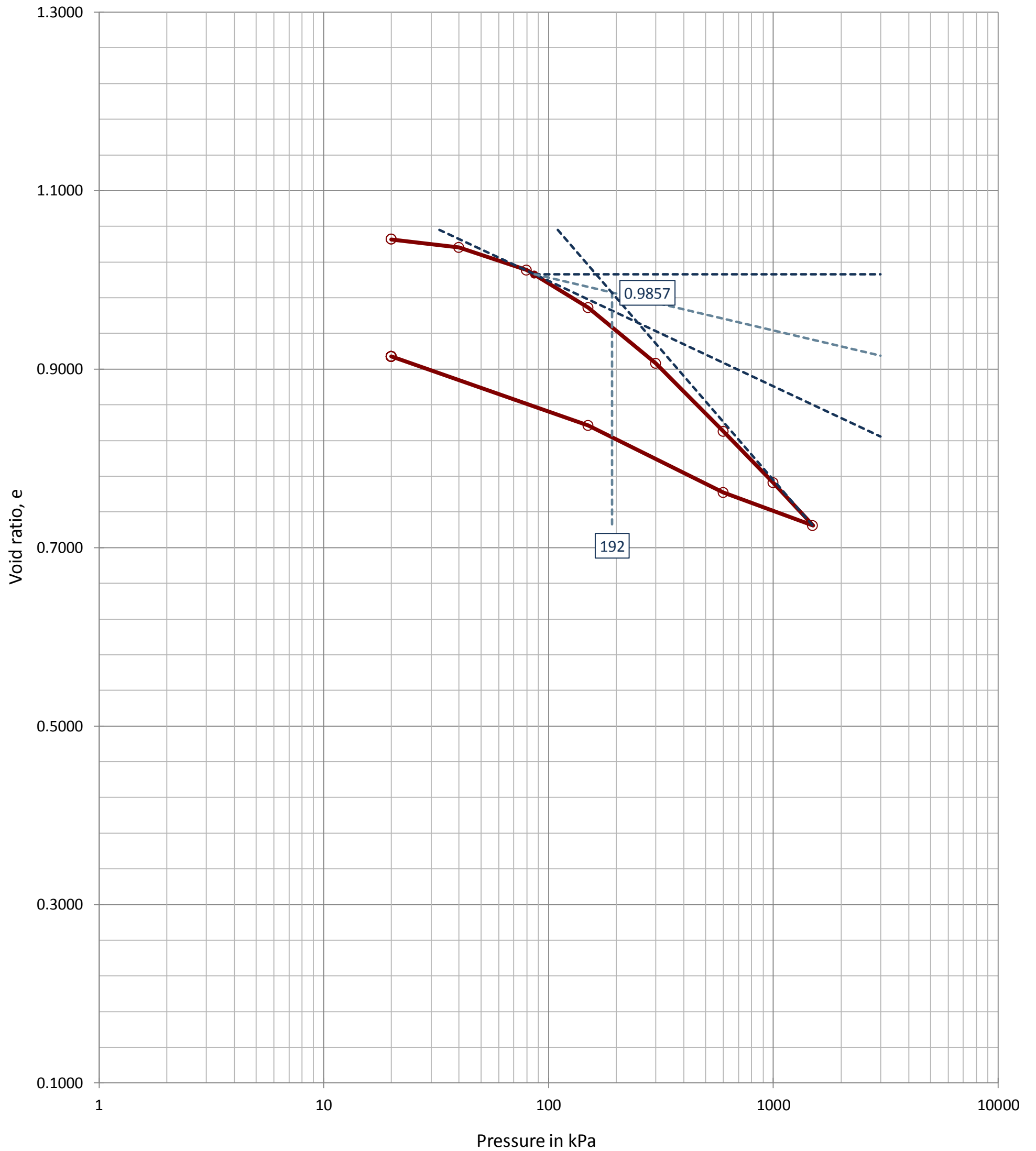
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INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
OEDOMETRIC CURVE

Sample reference
MB19-0456

Initial void ratio	1.0561
Final void ratio	0.9142
Initial moisture content (%)	36.5
Final moisture content (%)	33.8

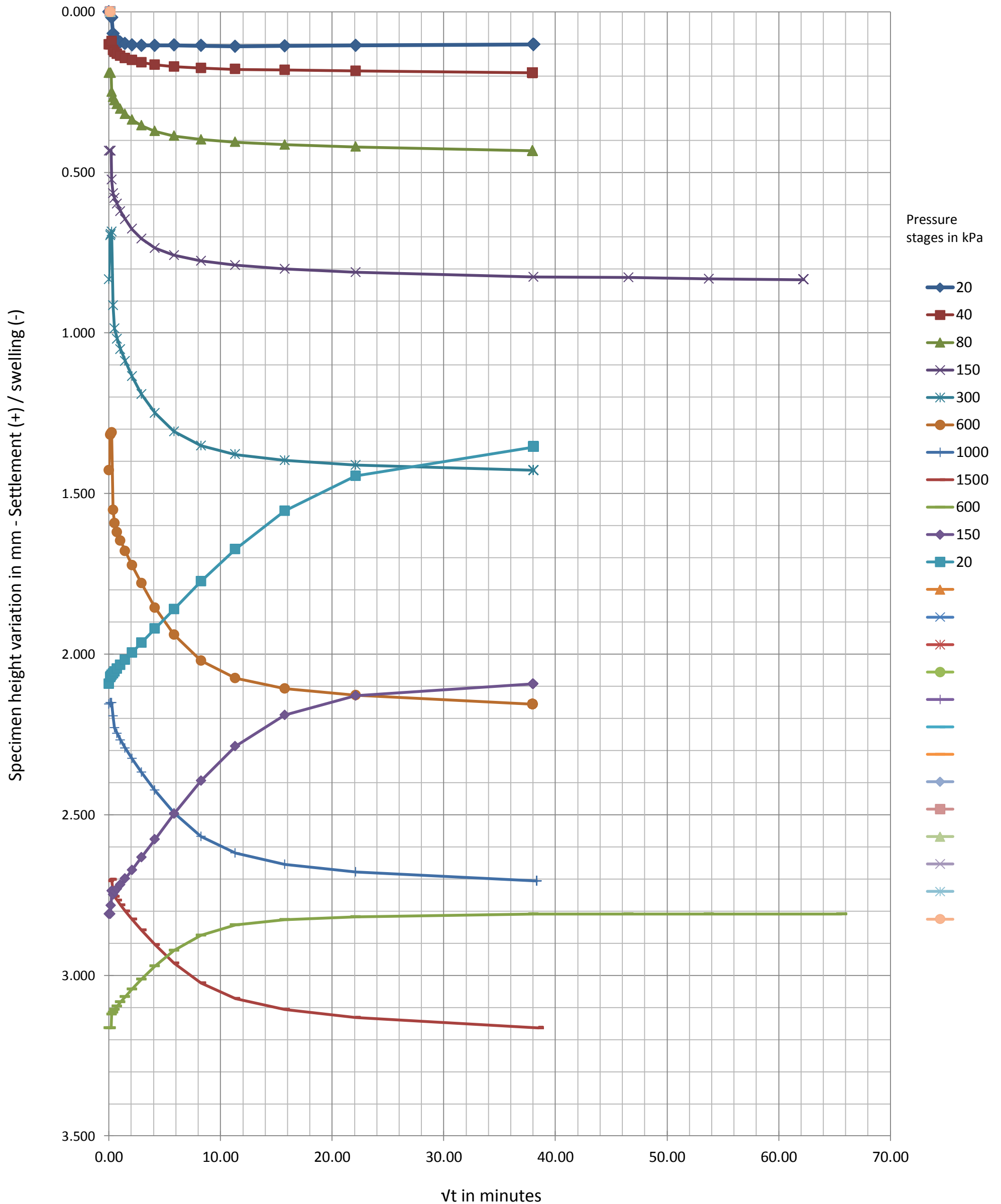
Preconsolidation pres., σ'_p (kPa)	192
Void ratio	0.9857
Determination method	Casagrande
Compression index, cc	0.2921



INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

Sample reference

MB19-0456



Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

Sample reference

MB19-0456

Pressure stages

Pressure stage (kPa)	20	40	Specimen diameter (cm)	5.043
L0 (Casagrande method)	0.066	0.114	Specimen initial height (cm)	1.963

Date	Date
24-sep-19	25-sep-19

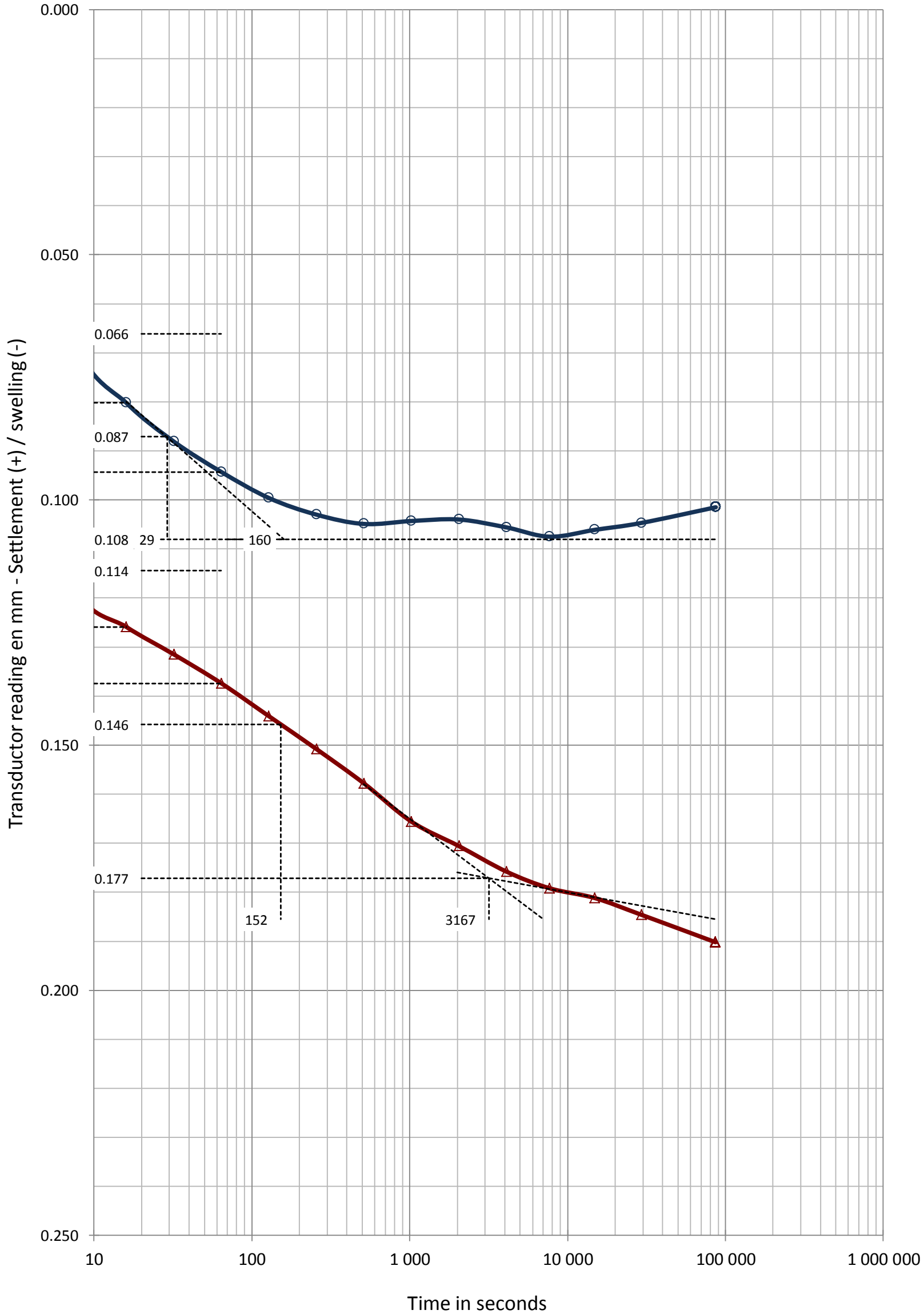
Pressure (kPa) Pressure (kPa)

20 40

Readings Void Readings Void
 Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e

1	-0.015	1.0577	1	0.102	1.0455
2	-0.015	1.0577	2	0.101	1.0455
4	0.018	1.0543	4	0.092	1.0466
8	0.069	1.0489	8	0.119	1.0437
16	0.080	1.0477	16	0.126	1.0430
32	0.088	1.0469	32	0.132	1.0424
64	0.094	1.0463	64	0.137	1.0418
128	0.100	1.0457	128	0.144	1.0410
256	0.103	1.0454	256	0.151	1.0403
512	0.105	1.0452	512	0.158	1.0396
1 024	0.104	1.0452	1 024	0.166	1.0388
2 048	0.104	1.0452	2 048	0.171	1.0383
4 096	0.106	1.0451	4 096	0.176	1.0377
7 696	0.108	1.0449	7 696	0.179	1.0374
14 896	0.106	1.0450	14 896	0.181	1.0372
29 296	0.105	1.0452	29 296	0.185	1.0368
86 740	0.102	1.0455	86 462	0.190	1.0362



Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

Sample reference

MB19-0456

Pressure stages

Pressure stage (kPa)	80	150	Specimen diameter (cm)	5.043
L0 (Casagrande method)	0.249	0.540	Specimen initial height (cm)	1.963

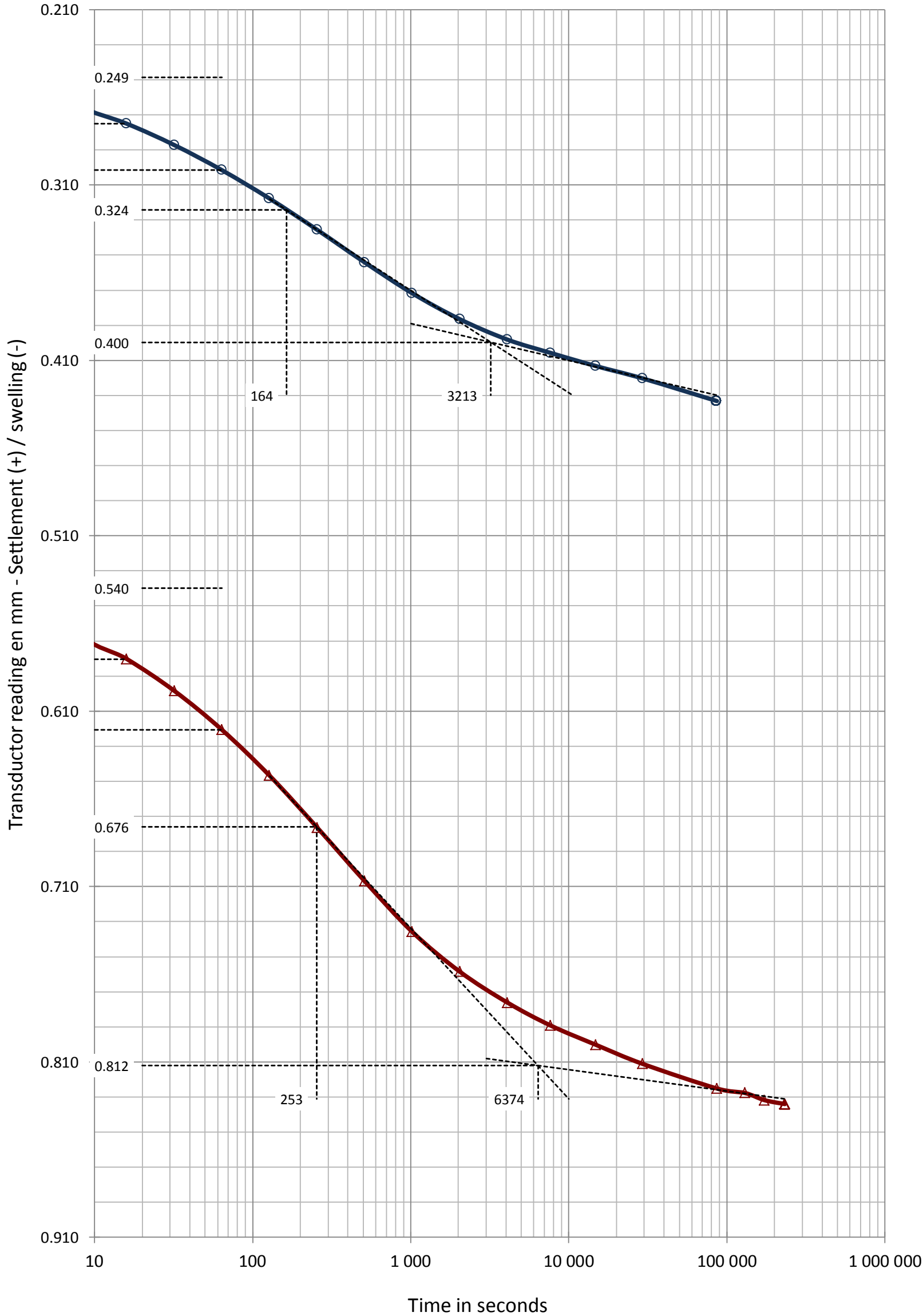
Date	Date
26-sep-19	27-sep-19

Pressure (kPa) Pressure (kPa)

80 **150**

Readings Void ratio
 Settlement (+) e Settlement (+) e

sg mm e sg mm e



sg	mm	e	sg	mm	e
0	0.190	1.0362	0	0.433	1.0108
1	0.190	1.0362	1	0.433	1.0108
2	0.190	1.0362	2	0.433	1.0108
4	0.249	1.0301	4	0.524	1.0013
8	0.265	1.0284	8	0.565	0.9969
16	0.275	1.0273	16	0.580	0.9954
32	0.287	1.0261	32	0.599	0.9935
64	0.302	1.0246	64	0.621	0.9911
128	0.318	1.0229	128	0.647	0.9884
256	0.336	1.0210	256	0.676	0.9853
512	0.354	1.0190	512	0.707	0.9821
1 024	0.372	1.0172	1 024	0.736	0.9791
2 048	0.387	1.0156	2 048	0.759	0.9767
4 096	0.398	1.0144	4 096	0.776	0.9748
7 696	0.406	1.0136	7 696	0.789	0.9735
14 896	0.413	1.0129	14 896	0.800	0.9723
29 296	0.420	1.0121	29 296	0.811	0.9712
86 405	0.433	1.0108	86 405	0.825	0.9697
			130 096	0.828	0.9694
			173 296	0.832	0.9690
			232 486	0.834	0.9688

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

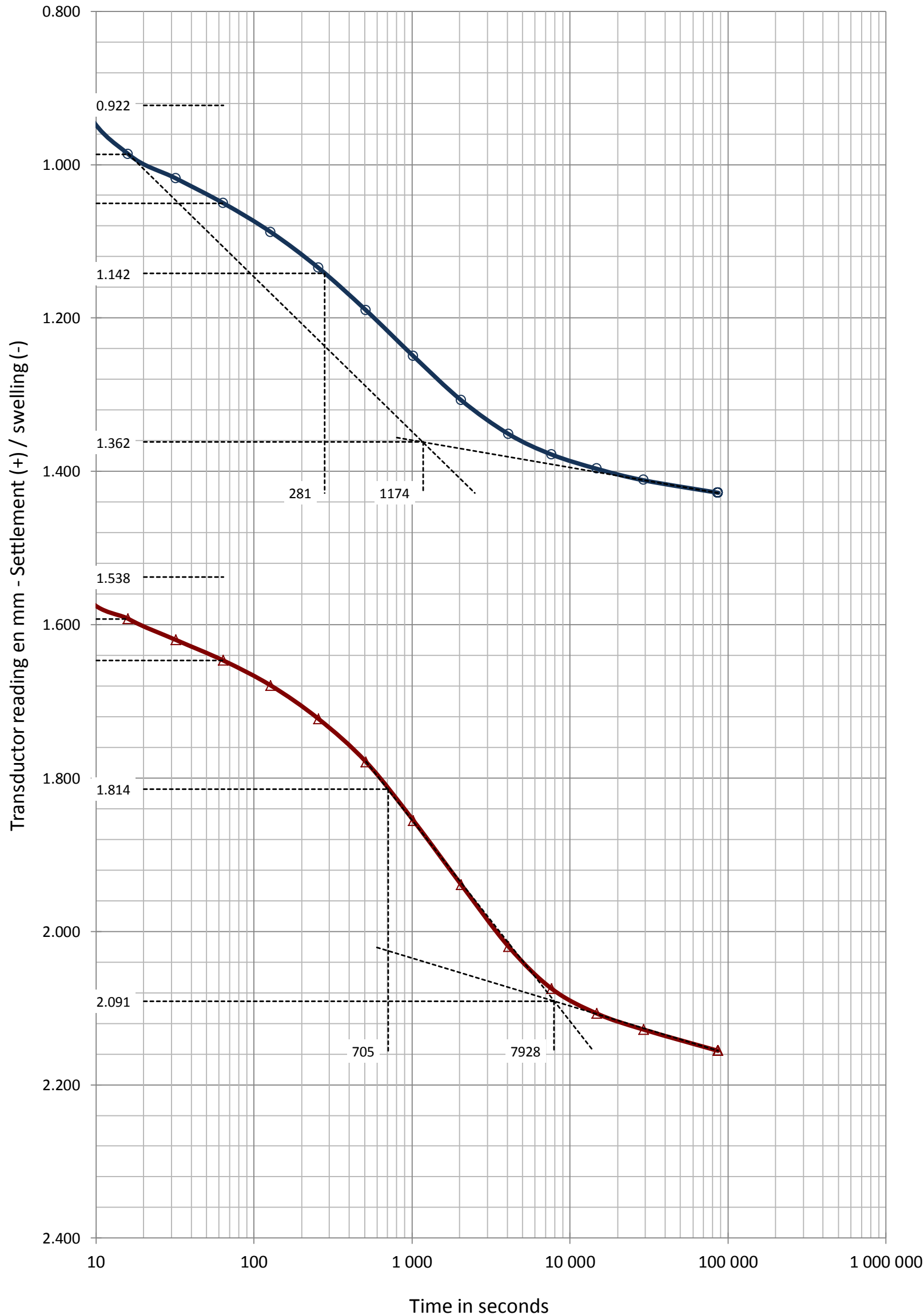
Sample reference

MB19-0456

Pressure stages

Pressure stage (kPa)	300	600	Specimen diameter (cm)	5.043
L0 (Casagrande method)	0.922	1.538	Specimen initial height (cm)	1.963

Date		Date			
30-sep-19		01-oct-19			
Pressure (kPa)		Pressure (kPa)			
300		600			
Readings	Void ratio	Readings	Void ratio		
Settlement (+)		Settlement (+)			
sg	mm	e			
0	0.834	0.9688	0	1.428	0.9066
1	0.696	0.9833	1	1.317	0.9182
2	0.692	0.9837	2	1.314	0.9185
4	0.685	0.9844	4	1.310	0.9189
8	0.914	0.9604	8	1.551	0.8936
16	0.986	0.9528	16	1.592	0.8893
32	1.018	0.9495	32	1.620	0.8865
64	1.050	0.9461	64	1.647	0.8836
128	1.088	0.9422	128	1.680	0.8802
256	1.135	0.9373	256	1.723	0.8757
512	1.190	0.9315	512	1.779	0.8698
1 024	1.250	0.9252	1 024	1.856	0.8617
2 048	1.307	0.9192	2 048	1.939	0.8530
4 096	1.352	0.9146	4 096	2.020	0.8445
7 696	1.378	0.9118	7 696	2.075	0.8388
14 896	1.397	0.9098	14 896	2.107	0.8354
29 296	1.412	0.9083	29 296	2.128	0.8332
86 896	1.428	0.9066	86 475	2.156	0.8303



Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

Sample reference

MB19-0456

Pressure stages

Pressure stage (kPa)	1000	1500	Specimen diameter (cm)	5.043
L0 (Casagrande method)	2.192	2.727	Specimen initial height (cm)	1.963

Date	Date
02-oct-19	03-oct-19

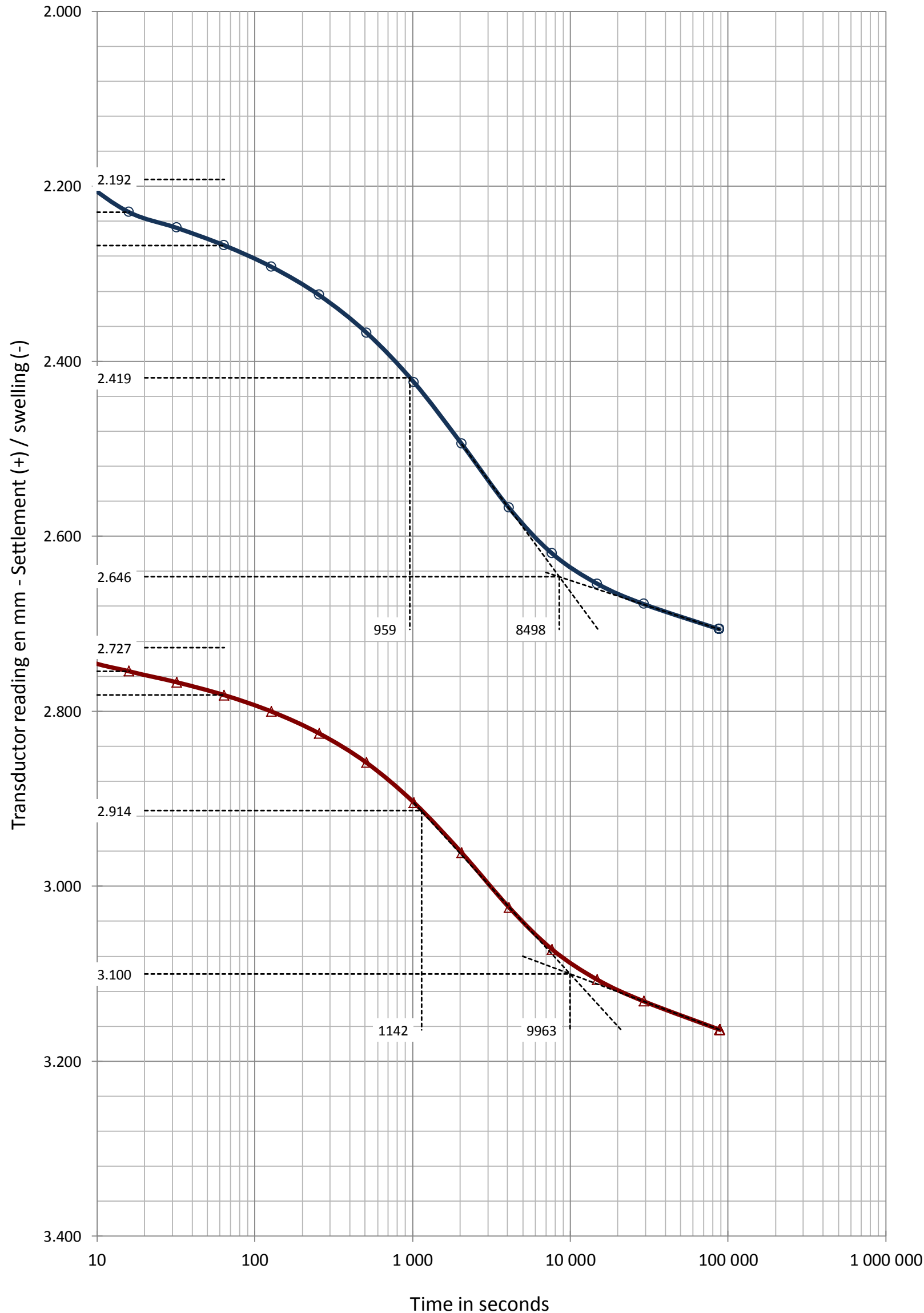
Pressure (kPa) Pressure (kPa)

1000 **1500**

Readings: Void Readings: Void
 Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e

0	2.156	0.8303	0	2.706	0.7727
1	2.152	0.8307	1	2.702	0.7731
2	2.152	0.8307	2	2.702	0.7731
4	2.152	0.8307	4	2.702	0.7731
8	2.194	0.8264	8	2.739	0.7692
16	2.230	0.8226	16	2.754	0.7676
32	2.248	0.8207	32	2.767	0.7663
64	2.268	0.8186	64	2.782	0.7648
128	2.292	0.8160	128	2.801	0.7628
256	2.325	0.8127	256	2.825	0.7602
512	2.368	0.8081	512	2.859	0.7567
1 024	2.424	0.8022	1 024	2.905	0.7519
2 048	2.495	0.7949	2 048	2.962	0.7459
4 096	2.568	0.7872	4 096	3.024	0.7394
7 696	2.620	0.7817	7 696	3.073	0.7343
14 896	2.655	0.7781	14 896	3.107	0.7307
29 296	2.678	0.7757	29 296	3.132	0.7281
88 109	2.706	0.7727	88 933	3.164	0.7247



Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

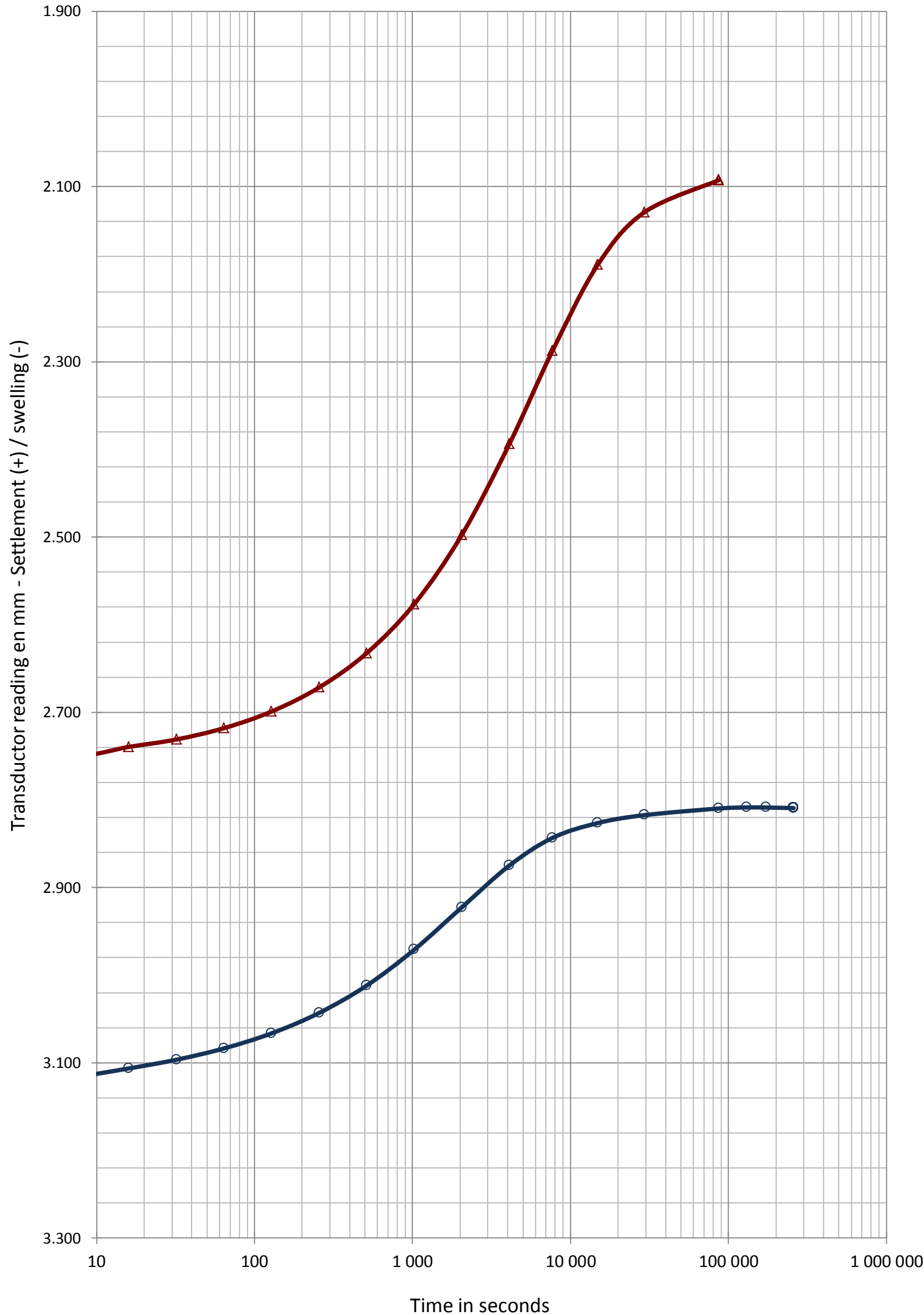
Sample reference

MB19-0456

Pressure stages

Pressure stage (kPa)	600	150	Specimen diameter (cm)	5.043
L0 (Casagrande method)	3.129	2.761	Specimen initial height (cm)	1.963

Date	Date
04-oct-19	07-oct-19



Pressure (kPa) Pressure (kPa)

600 **150**

Readings: Void ratio
 Settlement (+) Settlement (+)

sg mm e sg mm e

0	3.164	0.7247	0	2.809	0.7619
1	3.164	0.7247	1	2.809	0.7619
2	3.164	0.7247	2	2.783	0.7647
4	3.121	0.7292	4	2.737	0.7695
8	3.115	0.7298	8	2.749	0.7682
16	3.106	0.7308	16	2.740	0.7692
32	3.097	0.7318	32	2.731	0.7701
64	3.084	0.7332	64	2.718	0.7714
128	3.066	0.7350	128	2.699	0.7734
256	3.043	0.7374	256	2.672	0.7763
512	3.012	0.7407	512	2.633	0.7804
1 024	2.971	0.7449	1 024	2.577	0.7863
2 048	2.923	0.7500	2 048	2.498	0.7945
4 096	2.875	0.7550	4 096	2.394	0.8054
7 696	2.843	0.7583	7 696	2.288	0.8165
14 896	2.826	0.7601	14 896	2.189	0.8268
29 296	2.817	0.7610	29 296	2.130	0.8331
86 896	2.810	0.7618	86 589	2.093	0.8369
130 096	2.809	0.7620			
173 296	2.809	0.7619			
258 649	2.809	0.7619			

Operator:

Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

Sample reference

MB19-0456

Pressure stages

Pressure stage (kPa) **20** Specimen diameter (cm) **5.043**
 L0 (Casagrande method) **2.075** Specimen initial height (cm) **1.963**

Date Date

08-oct-19

Pressure (kPa) Pressure (kPa)

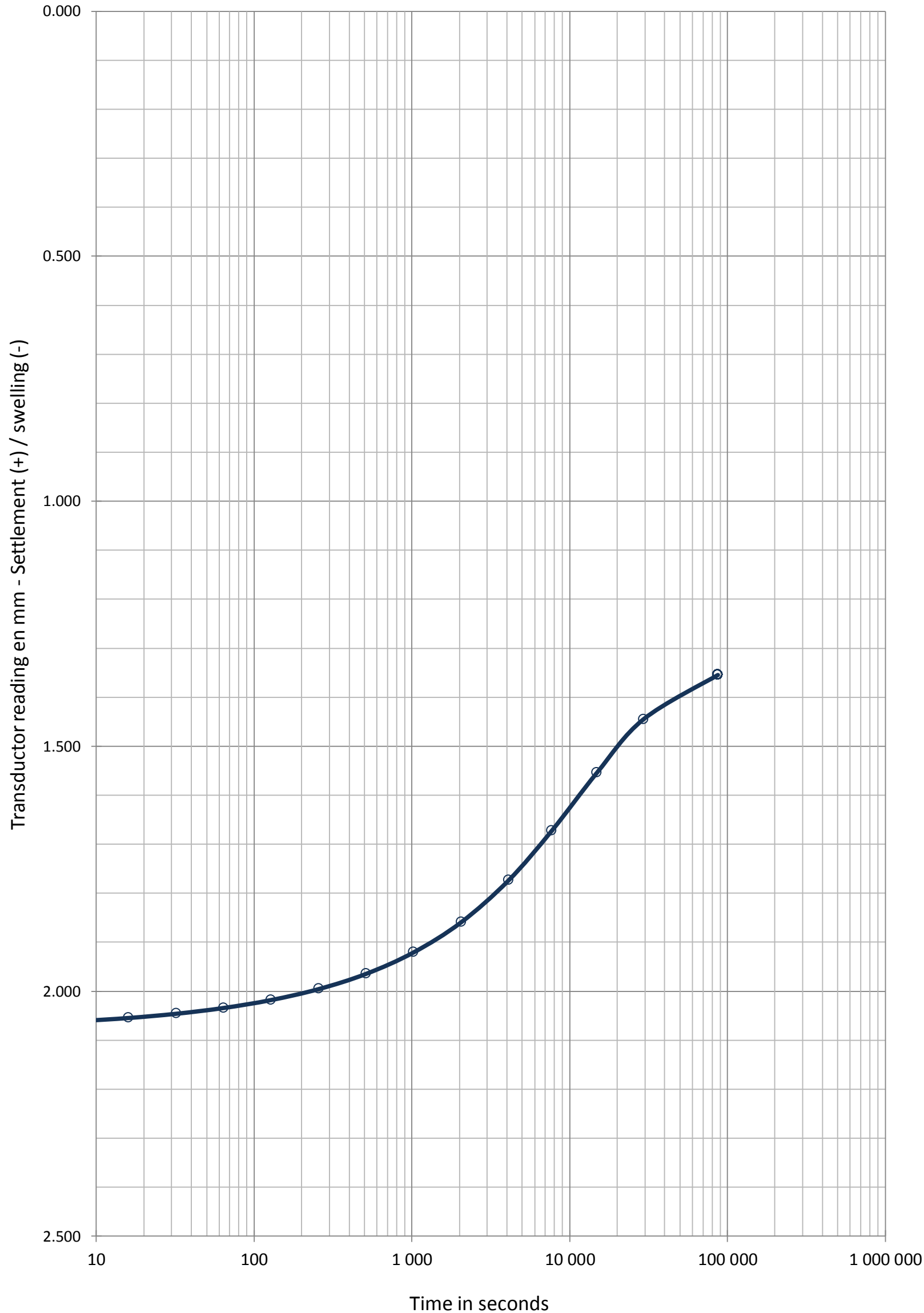
20

Readings Void Readings Void

Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e

0	2.093	0.8369			
1	2.073	0.8390			
2	2.069	0.8395			
4	2.065	0.8398			
8	2.061	0.8403			
16	2.055	0.8409			
32	2.046	0.8418			
64	2.034	0.8431			
128	2.018	0.8448			
256	1.996	0.8471			
512	1.965	0.8504			
1 024	1.921	0.8549			
2 048	1.860	0.8614			
4 096	1.774	0.8703			
7 696	1.673	0.8809			
14 896	1.554	0.8934			
29 296	1.445	0.9048			
86 924	1.355	0.9142			



Report num.:	CB0019-19-0005
Edition date:	

FALL CONE TEST - ISO 17892-6:2017

Sample reference

MB19-0456

Equipment
PENETROMETER MATEST B057-11

Legend of symbols
cu Calculated Undrained Shear Strength (kPa)
cu(corr) Corrected Undrained Shear Strength (kPa)
cur Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	67.8	4.34	4.12	3.85	3.83	4.035	400	30	241	196	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	241
Corrected Undrained Shear Strength, cu(corr) (kPa)	196

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	5.02	4.87	4.73	4.93	4.888	400	30	131	
1	1	4.73	4.76	5.03	4.85	4.843	400	30	134	
1	3	4.85	4.82	5.26	4.37	4.825	400	30	135	
1	7	4.82	4.2	4.62	4.98	4.655	400	30	145	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	131

Thixotropy	
Loss at remoulding (%)	46
Recovery after 1 day (%)	3
Recovery after 7 days (%)	13

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

Report num.: CB0019-19-0005
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20 / 20

Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0456

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 26-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.056 g

Equipment:

RESULT: **86.4 g/kg (total)**

MUFLA OVEN ETI HD150

73.2 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 27-09-19

Mean of analyzed soil mass: 0.961 g

Equipment:

RESULT: **110.2 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0457

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_3 C_3.1
Top depth, m	1.9
Bottom depth, m	2.05
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	21-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) CLAY	1.9	
	2.05	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

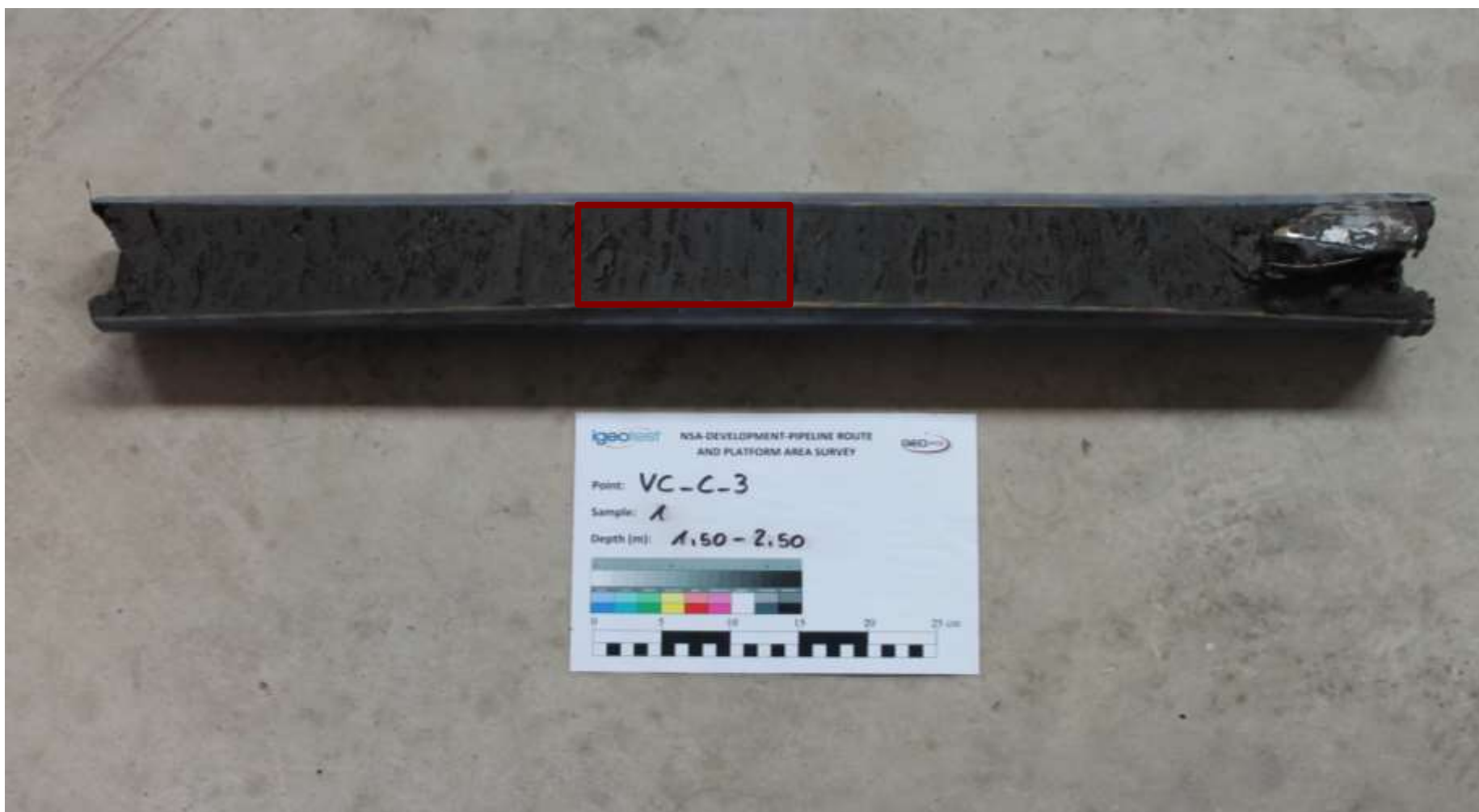
REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0457



REMARKS

Operator: ALEX VANCELLS

Date: 21/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0457

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	111.85
Tare + soil + water (g)	175.85
Tare + soil (g)	160.13
Water (g)	15.72
Soil (g)	48.28
Moisture, w (%)	32.6

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Moisture content, w (%)	32.6

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	94.93
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.89
Dry density (Mg/m ³)	1.43

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Bulk density (Mg/m³)	1.89
Dry density (Mg/m³)	1.43

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0457

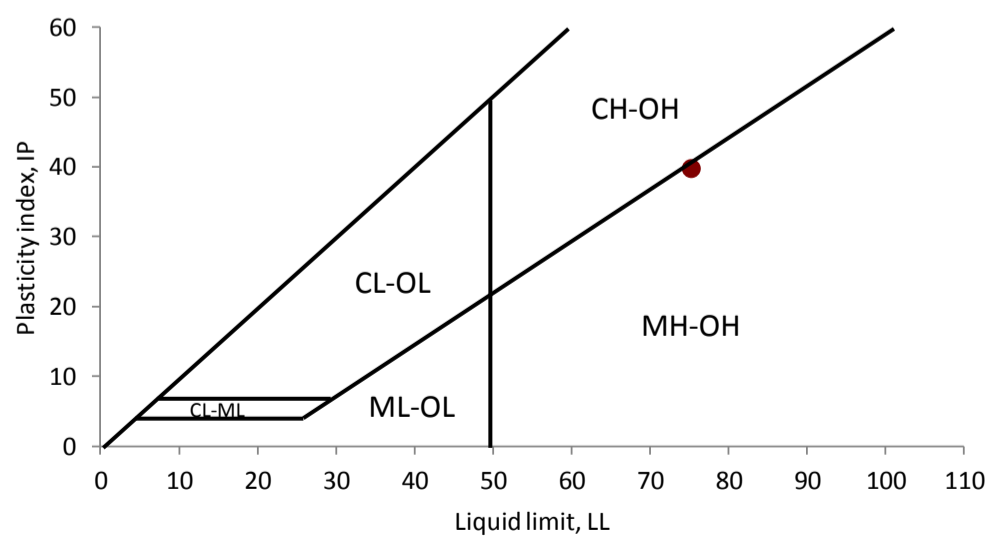
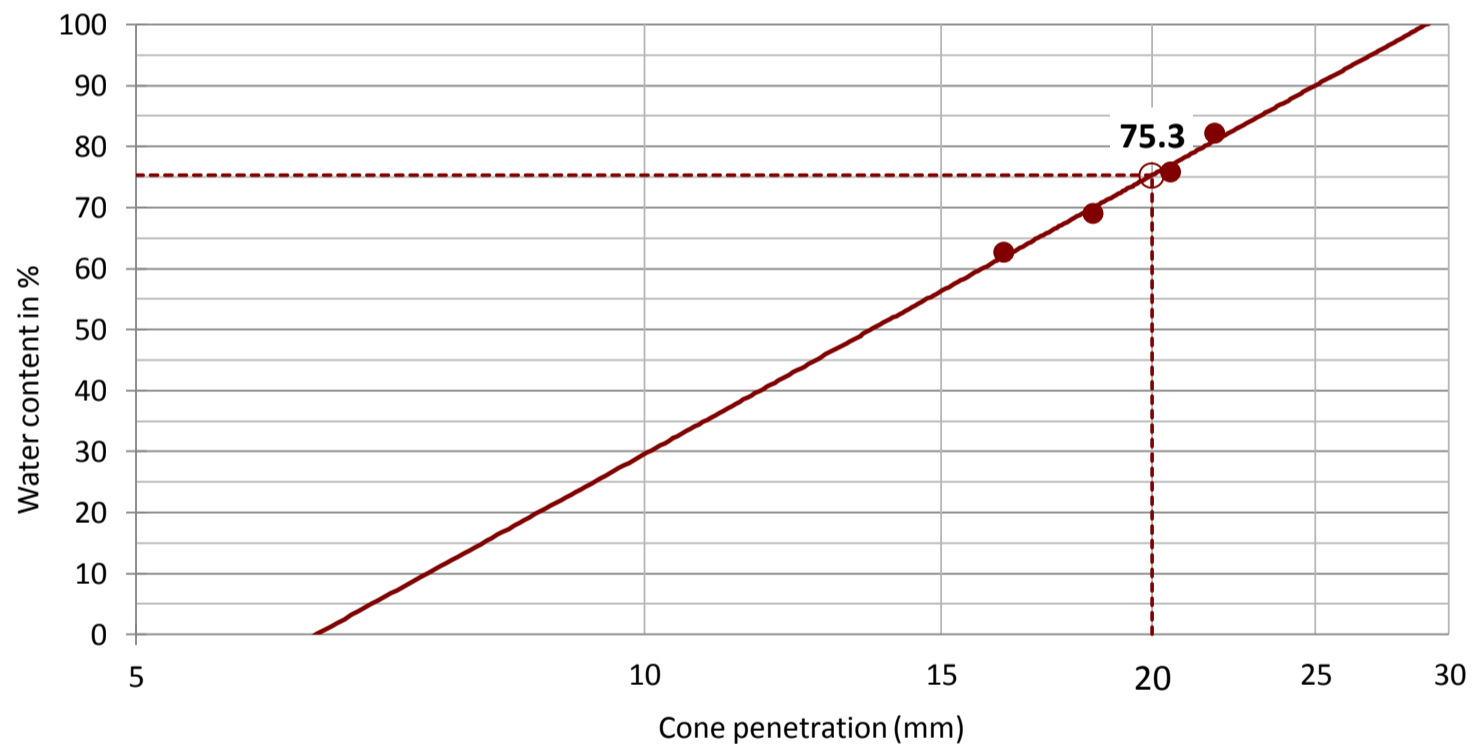
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	18.45	20.51	16.34	21.8
Water (g)	6.50	9.75	6.38	7.02
Mass moist soil + cont. (g)	47.04	51.33	48.27	47.63
Mass dry soil + cont. (g)	40.54	41.58	41.89	40.61
Mass container (g)	31.13	28.72	31.71	32.07
Soil (g)	9.41	12.86	10.18	8.54
Water content (%)	69.1	75.8	62.7	82.2

Equipment

Plastic Limit data				
Water (g)	1.75	1.62		
Mass moist soil + cont. (g)	30.97	31.25		
Mass dry soil + cont. (g)	29.22	29.63		
Mass container (g)	24.30	25.07		
Soil (g)	4.92	4.56		
Water content (%)	35.6	35.5		

Results	
Liquid limit, LL	75.3
Plastic limit, LP	35.5
Plasticity index, IP	39.8
Natural water content (%)	32.6
Liquidity index, IL	-0.1
Consistency index, IC	1.1



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0458

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_3BIS C_3BIS.2
Top depth, m	0.15
Bottom depth, m	0.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	21-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive brown (2.5Y 4/3) medium SAND with frequent amorphous organic, occasional shell fragments and polychaetes (specifically Lanice conchilega)	0.15	
	0.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE TO PERFORM THE TEST

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0458



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 21/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0458

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	108.70
Tare + soil + water (g)	207.78
Tare + soil (g)	192.02
Water (g)	15.76
Soil (g)	83.32
Moisture, w (%)	18.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Moisture content, w (%)	18.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	97.98
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.95
Dry density (Mg/m ³)	1.64

Operator: MARC COLOMER
Test final date: 21/06/2019

Results	
Bulk density (Mg/m³)	1.95
Dry density (Mg/m³)	1.64

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.4
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3721
Pyc. mass + soil + water at test temp. M2 (g)	185.2100
Soil mass, M1 (g)	10.9760
Particle density, G20°C (Mg/m ³)	2.653

Operator: GUILLEM MASSALLÉ
Test final date: 16/09/2019

Results	
Particle density (Mg/m³)	2.653

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0458

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

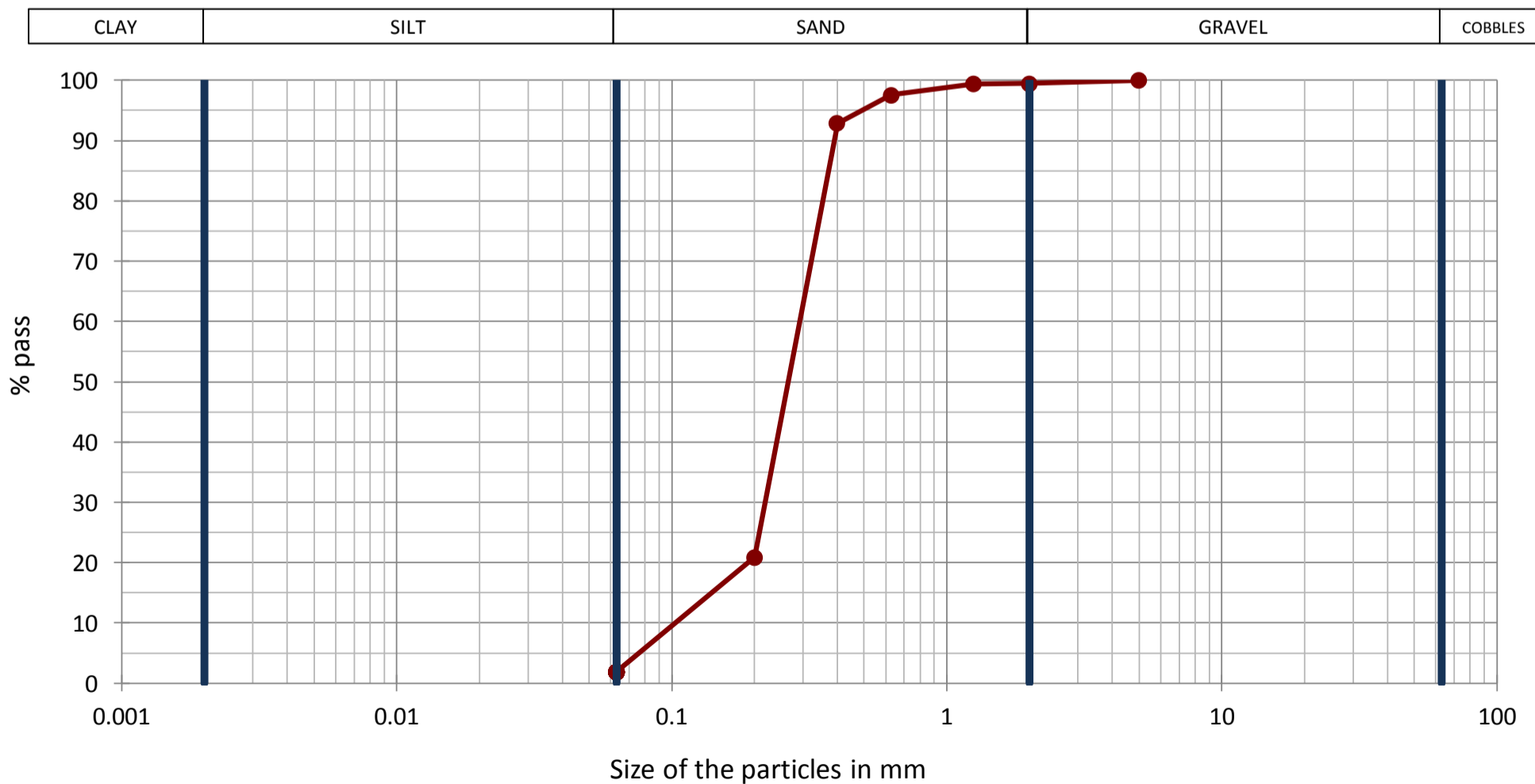
Previous calculations
 Total dried sample (g) **105.59**

 Hygrosc. moisture, % (fraction<2 mm) **0.1**
 Corr. parameter, f (fraction<2 mm) **0.9989**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
5			0.00	0.0	105.47
2			0.49	0.5	104.98
1.25			0.19	0.6	104.79
0.63			1.85	2.4	102.94
0.4			4.95	7.1	97.99
0.2			75.93	79.1	22.06
0.063			20.03	98.1	2.03
					100.0
					99.5
					99.4
					97.6
					92.9
					20.9
					1.9

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.5	% SAND	2-0.063 mm	97.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.9		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	76.7		1.9
	% Fine gravel	6.3-2 mm	0.5	% Fine sand	0.2-0.063 mm	19.0		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. MEDIUM AND COARSE SAND ALSO CONTAINS SOME SHELL FRAGMENTS.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0458

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 16-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.219 g

Equipment:

RESULT: **5.8 g/kg (total)**

MUFLA OVEN ETI HD150

3.7 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 20-09-19

Mean of analyzed soil mass: 4.457 g

Equipment:

RESULT: **17.8 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0459

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3Bis C3Bis.1
Top depth, m	1.1
Bottom depth, m	1.4
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	30
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	21-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) clayey SILT.	1.1	

1.4

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
 FALL CONE TEST - ISO 17892-6:2017

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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www.igeotest.com
Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0459



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 21/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0459

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0225	

Data of soil moisture content test	
Tare (g)	103.10
Tare + soil + water (g)	172.46
Tare + soil (g)	155.53
Water (g)	16.93
Soil (g)	52.43
Moisture, w (%)	32.3

Drying temperature (°C) 105

Operator: GUILLEM MASSALLÉ
Test final date: 25/06/2019

Results	
Moisture content, w (%)	32.3

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	91.88
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.83
Dry density (Mg/m ³)	1.38

Operator: MARC COLOMER
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.83
Dry density (Mg/m³)	1.38

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0459

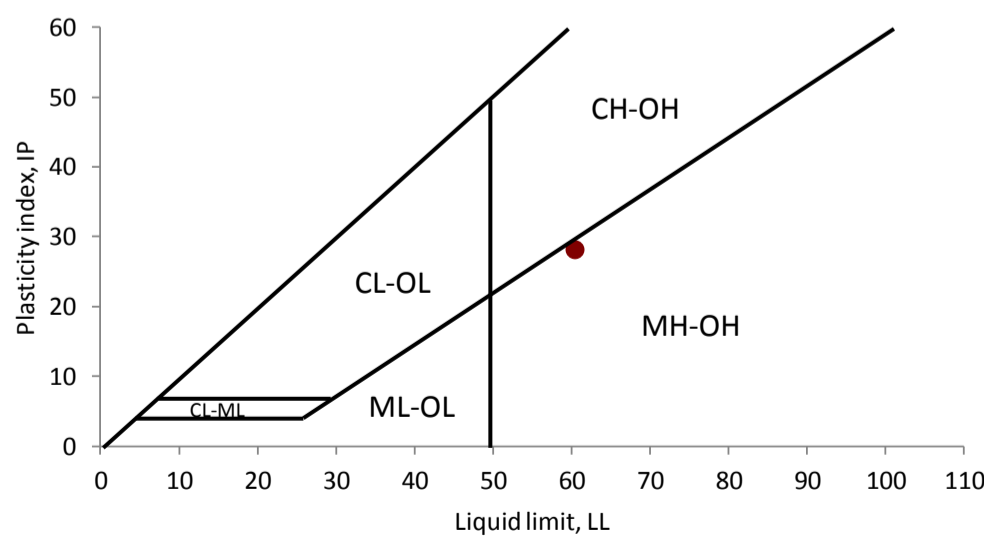
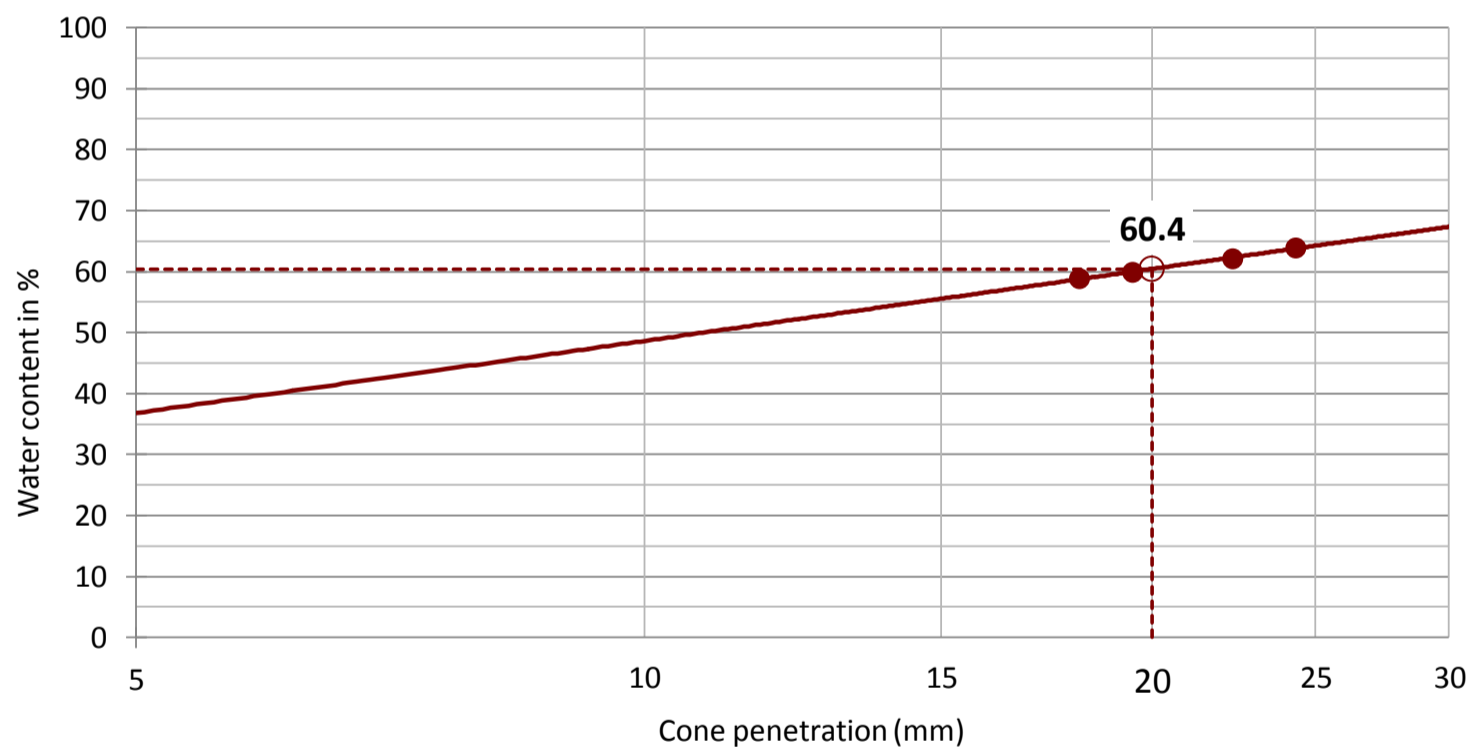
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	18.107	24.33	22.325	19.48
Water (g)	5.00	6.89	6.46	5.52
Mass moist soil + cont. (g)	44.64	46.58	45.87	44.58
Mass dry soil + cont. (g)	39.64	39.69	39.41	39.06
Mass container (g)	31.14	28.91	29.01	29.85
Soil (g)	8.50	10.78	10.40	9.21
Water content (%)	58.8	63.9	62.1	59.9

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data				
Water (g)	1.25	1.27		
Mass moist soil + cont. (g)	30.23	29.56		
Mass dry soil + cont. (g)	28.98	28.29		
Mass container (g)	25.09	24.39		
Soil (g)	3.89	3.90		
Water content (%)	32.1	32.6		

Results	
Liquid limit, LL	60.4
Plastic limit, LP	32.3
Plasticity index, IP	28.1
Natural water content (%)	32.3
Liquidity index, IL	0.0
Consistency index, IC	1.0



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

FALL CONE TEST - ISO 17892-6:2017

Sample reference

MB19-0459

Equipment
PENETROMETER MATEST B057-11

Legend of symbols
cu Calculated Undrained Shear Strength (kPa)
cu(corr) Corrected Undrained Shear Strength (kPa)
cur Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	60.4	4.16	4.02	3.91	4.36	4.113	400	30	232	199	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	232
Corrected Undrained Shear Strength, cu(corr) (kPa)	199

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	4.91	5.03	4.73	4.96	4.908	400	30	130	
1	1	4.82	4.75	5.01	4.71	4.823	400	30	135	
1	3	4.79	4.81	4.48	5.15	4.808	400	30	136	
1	7	4.25	4.8	4.59	4.88	4.63	400	30	146	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	130

Thixotropy	
Loss at remoulding (%)	44
Recovery after 1 day (%)	5
Recovery after 7 days (%)	16

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

Operator: ALEX VANCELLS

Test final date: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0460

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_2 C_2.3
Top depth, m	0.25
Bottom depth, m	0.35
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	21-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Light olive gray (2.5Y 5/4) medium SAND with rare amorphous organic matter blackish zones and occasional shell fragments and polychaetes (specifically Lanice conchilega)	0.25	
	0.35	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0460



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 21/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0460

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	103.22
Tare + soil + water (g)	204.94
Tare + soil (g)	201.36
Water (g)	3.58
Soil (g)	98.14
Moisture, w (%)	3.6

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Moisture content, w (%)	3.6

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	81.43
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.62
Dry density (Mg/m ³)	1.56

Operator: ALEX VANCELLS
Test final date: 20/06/2019

Results	
Bulk density (Mg/m³)	1.62
Dry density (Mg/m³)	1.56

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.4
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0302
Pyc. mass + soil + water at test temp. M2 (g)	187.3780
Soil mass, M1 (g)	14.9600
Particle density, G20°C (Mg/m ³)	2.664

Operator: GUILLEM MASSALLÉ
Test final date: 16/09/2019

Results	
Particle density (Mg/m³)	2.664

REMARKS

MOISTURE CONTENT IS VERY LOW. A MOISTURE LOSS MAY OCCUR BETWEEN RECOVERY AND SAMPLE SPLITTING.

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0460

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

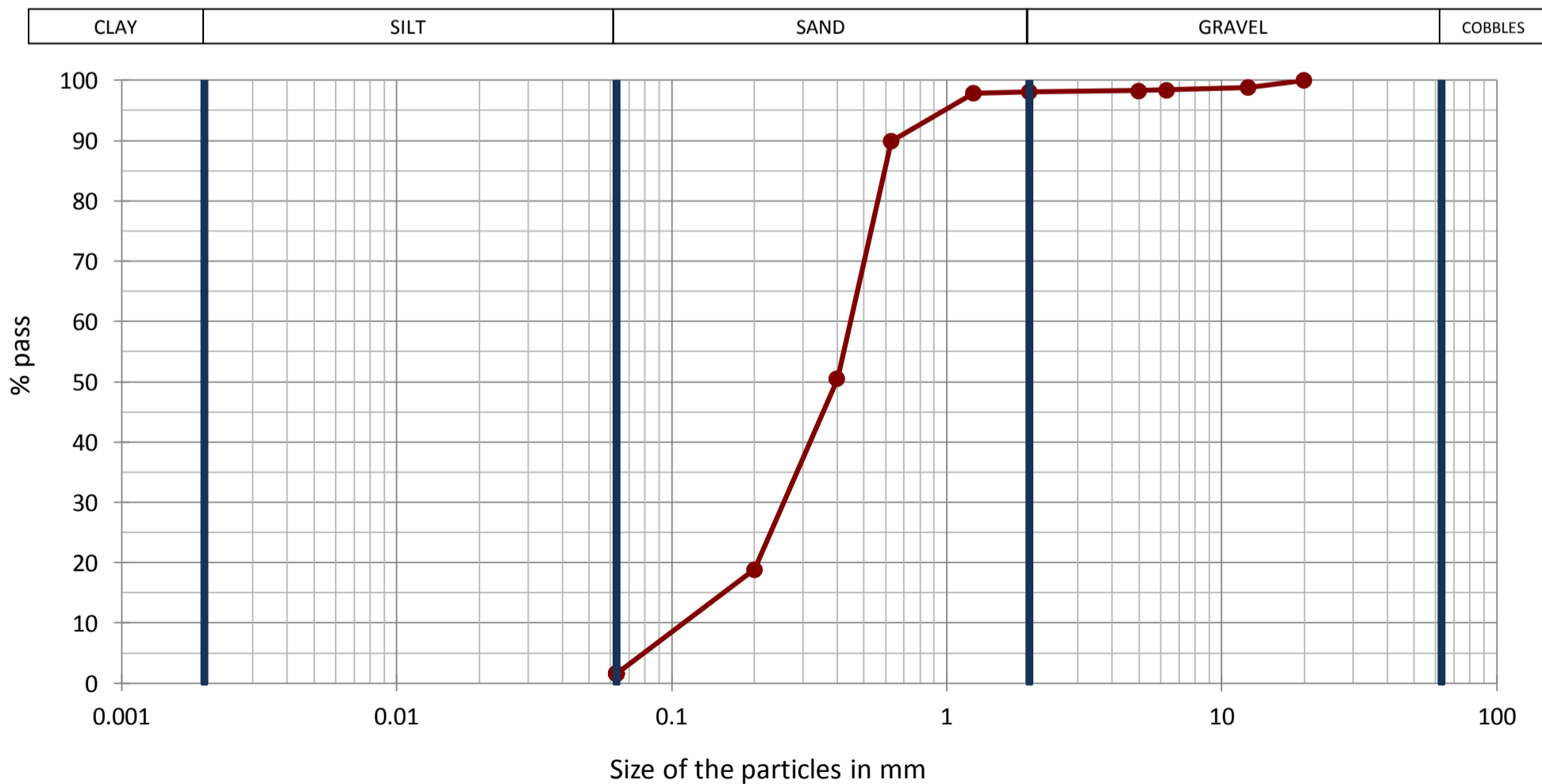
Previous calculations
 Total dried sample (g) **106.96**

 Hygrosc. moisture, % (fraction<2 mm) **0.1**
 Corr. parameter, f (fraction<2 mm) **0.9992**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
20		0.00	0.0	106.88	100.0
12.5		1.31	1.2	105.57	98.8
6.3		0.43	1.6	105.14	98.4
5		0.08	1.7	105.06	98.3
2		0.25	1.9	104.81	98.1
1.25		0.13	2.1	104.68	97.9
0.63		8.55	10.1	96.13	89.9
0.4		42.18	49.5	53.95	50.5
0.2		33.71	81.1	20.24	18.9
0.063		18.57	98.4	1.67	1.6

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	1.9	% SAND	2-0.063 mm	96.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	8.2		
	% Medium gravel	20-6.3 mm	1.6	% Medium sand	0.63-0.2 mm	71.0		1.6
	% Fine gravel	6.3-2 mm	0.3	% Fine sand	0.2-0.063 mm	17.3		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SOME SHELL FRAGMENTS.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0460

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 16-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 11.536 g

Equipment:

RESULT: **2.8 g/kg (total)**

MUFLA OVEN ETI HD150

0.2 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 18-09-19

Mean of analyzed soil mass: 4.013 g

Equipment:

RESULT: **21.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

MB19-0461

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_2 C_2.2
Top depth, m	1.4
Bottom depth, m	2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	60
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	21-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB./RUSSELL GEOT. INNOV.

Soil type

USCS classification	MH
ISO classification	siCl

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) clayey SILT with rare brownish pockets	1.4	
		1.65:2.00 m: RESERVED FOR ADVANCED TESTING

2

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
FALL CONE TEST - ISO 17892-6:2017
UNCONSOLIDATED UNDRAINED TRIAXIAL TEST, UU 1.5' - ISO 17892-8:2018
INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

SEE ADVANCED TESTING RESULTS IN RUSSELL GEOTECHNICAL INNOVATIONS REPORT

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0461



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 21/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0461

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.51
Tare + soil + water (g)	181.10
Tare + soil (g)	159.74
Water (g)	21.36
Soil (g)	55.23
Moisture, w (%)	38.7

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Moisture content, w (%)	38.7

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	90.22
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.80
Dry density (Mg/m ³)	1.30

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Bulk density (Mg/m³)	1.80
Dry density (Mg/m³)	1.30

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	184.2870
Soil mass, M1 (g)	11.4760
Particle density, G20°C (Mg/m ³)	2.694

Operator: GUILLEM MASSALLÉ
Test final date: 27/09/2019

Results	
Particle density (Mg/m³)	2.694

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0461

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

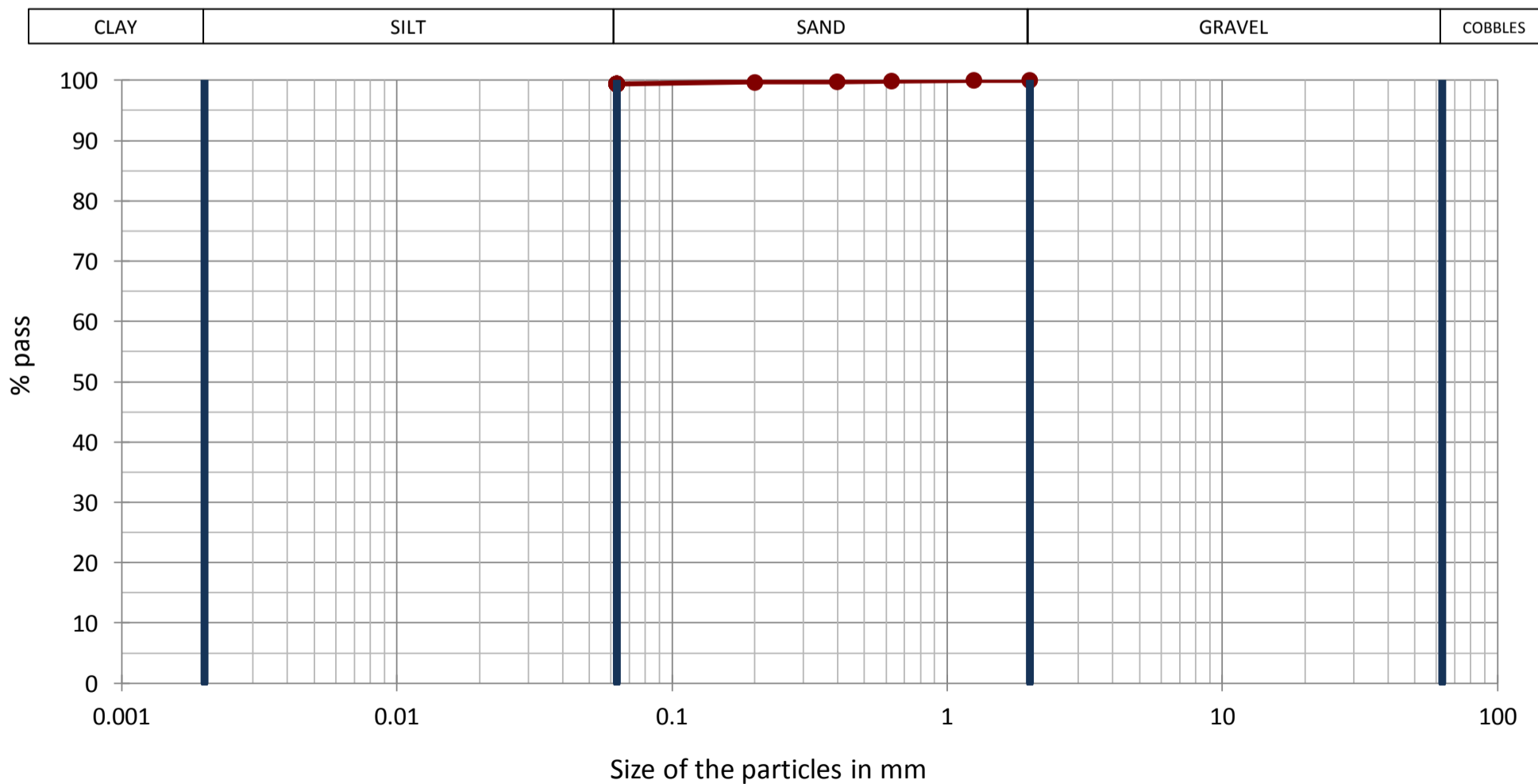
Previous calculations
 Total dried sample (g) **103.65**

 Hygrosc. moisture, % (fraction<2 mm) **3.7**
 Corr. parameter, f (fraction<2 mm) **0.9643**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
2		0.00	0.0	99.95	100.0
1.25		0.01	0.0	99.94	100.0
0.63		0.04	0.1	99.90	99.9
0.4		0.10	0.2	99.80	99.8
0.2		0.11	0.3	99.69	99.7
0.063		0.31	0.6	99.38	99.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	0.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1	99.4	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.2		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	0.3		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0461

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Hydrometer data
Bulb volume, V (ml) 47.77
Eq. scale calibration $y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd) $y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm) 0.0005

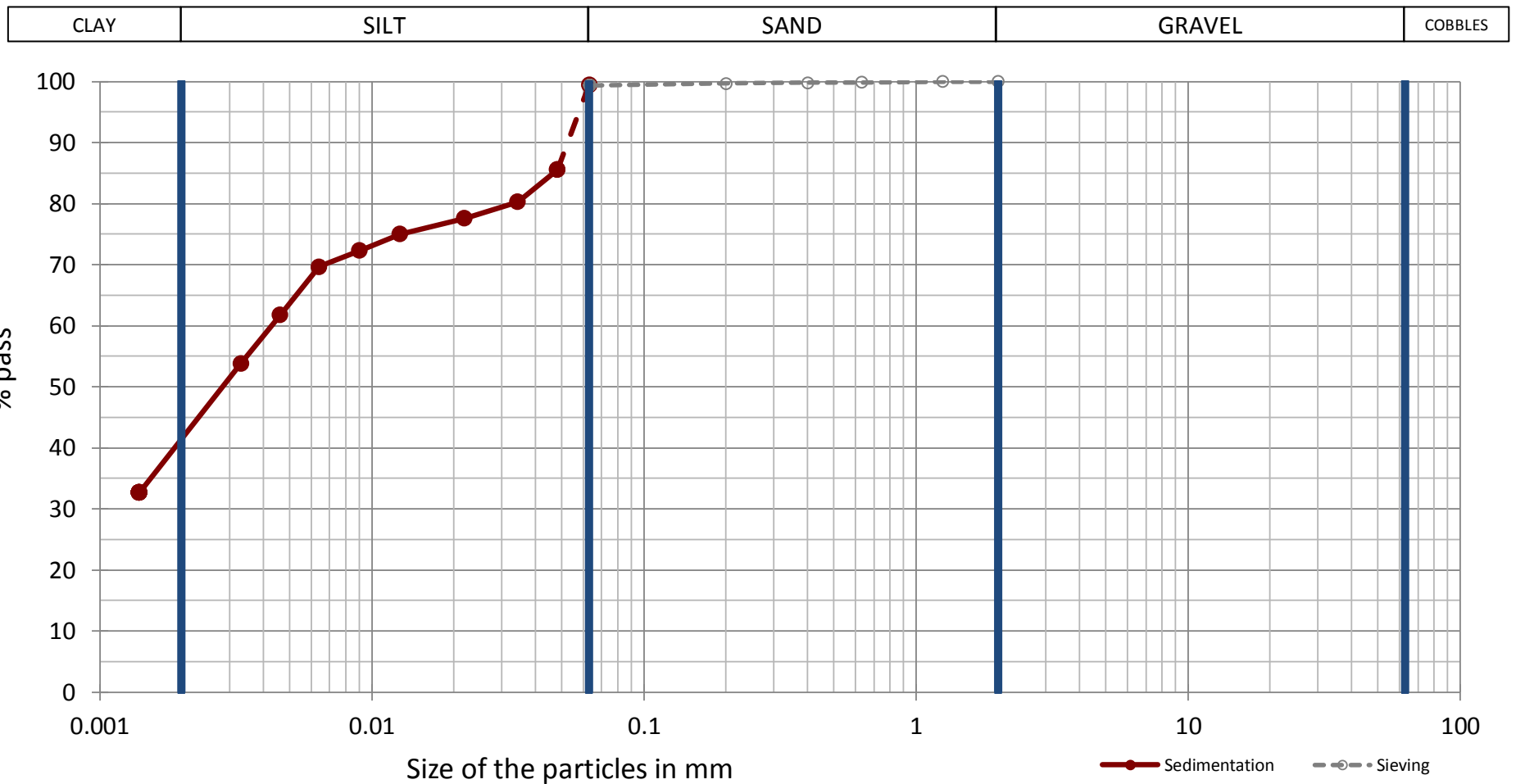
Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	22	1.0200	20	134.8	16.2	0.0482	85.5
2	22	1.0190	19	137.2	15.2	0.0344	80.2
5	22	1.0185	18.5	138.4	14.7	0.0219	77.6
15	22	1.0180	18	139.6	14.2	0.0127	75.0
30	22	1.0175	17.5	140.8	13.7	0.0090	72.3
60	22	1.0170	17	142.0	13.2	0.0064	69.7
120	22	1.0155	15.5	145.5	11.7	0.0046	61.7
240	22	1.0140	14	149.1	10.2	0.0033	53.8
1440	22	1.0100	10	158.6	6.2	0.0014	32.6

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	31.18
Hygrosopic moisture, W (%)	3.7
Tested and dried soil mass, m (g)	30.07
Particle density (Mg/m ³)	2.694

Test tube data	
Area of the inner section (A), mm ²	2931.60

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	99.4
Silt, between 0.063 and 0.002 mm (%)	60.1
Clay, smaller than 0.002 mm (%)	39.3



REMARKS

Operator: ALEX VANCELLS

Test final date: 08/10/2019

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0461

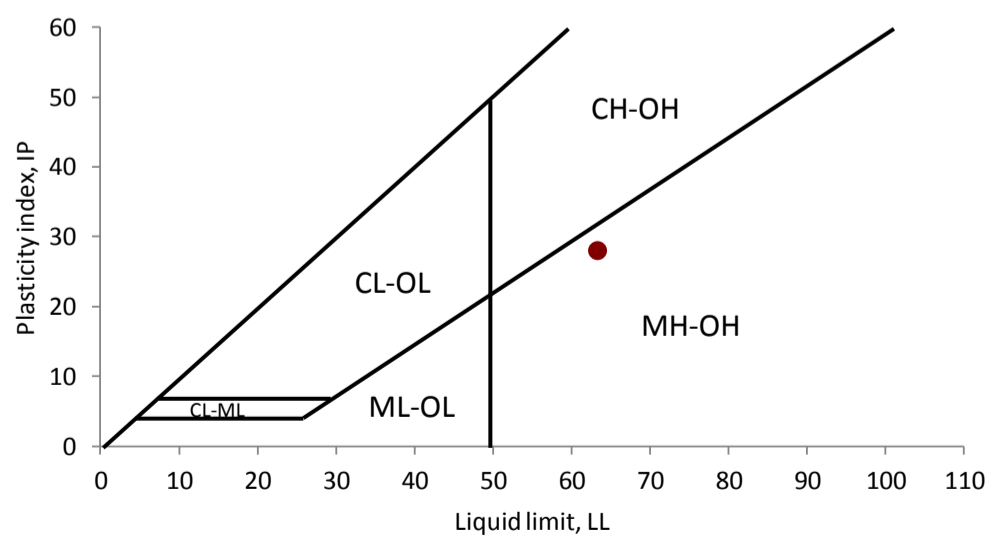
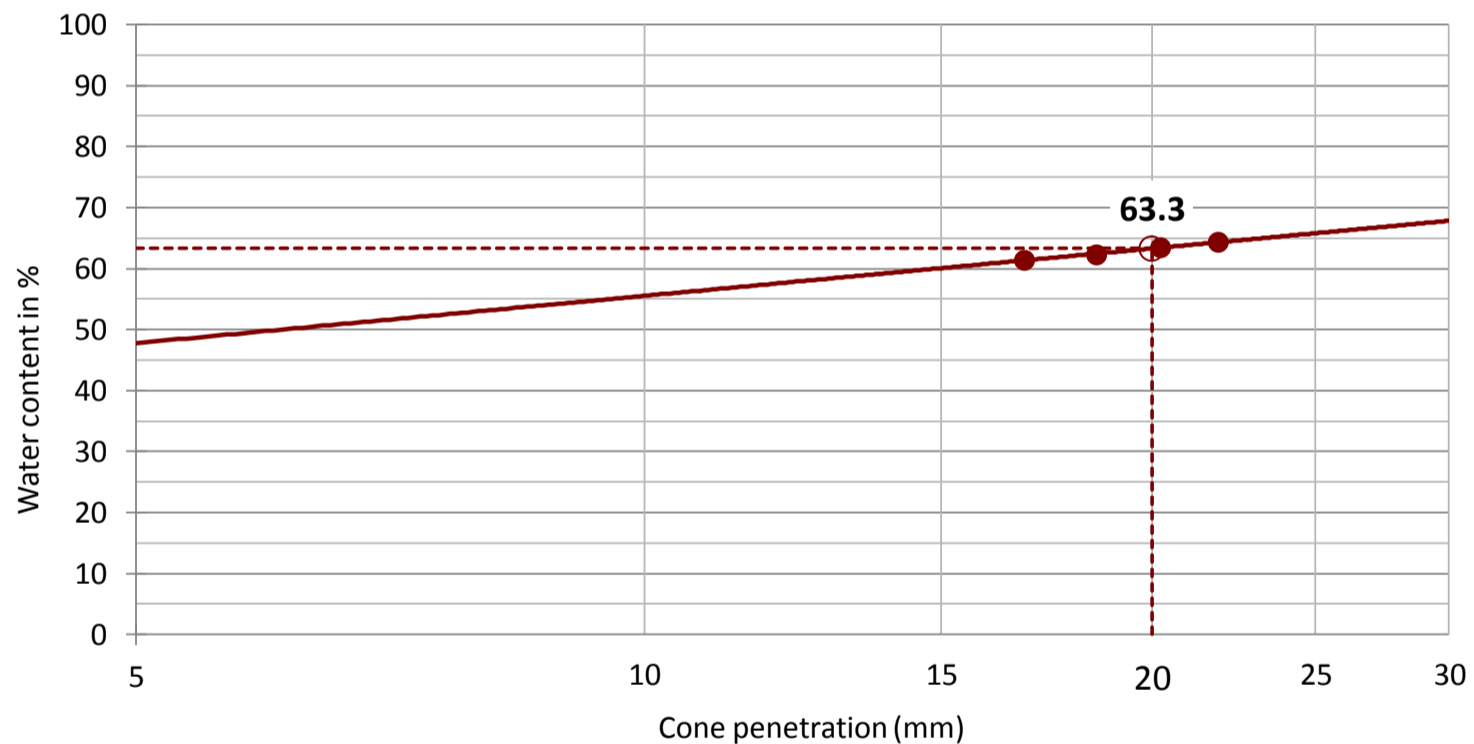
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	20.245	16.81	18.55	21.89
Water (g)	4.38	4.61	4.62	4.43
Mass moist soil + cont. (g)	42.41	43.45	43.01	42.84
Mass dry soil + cont. (g)	38.03	38.84	38.39	38.41
Mass container (g)	31.13	31.33	30.98	31.52
Soil (g)	6.90	7.51	7.41	6.89
Water content (%)	63.5	61.4	62.3	64.3

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data				
Water (g)	1.20	1.37		
Mass moist soil + cont. (g)	28.76	29.62		
Mass dry soil + cont. (g)	27.56	28.25		
Mass container (g)	24.15	24.39		
Soil (g)	3.41	3.86		
Water content (%)	35.2	35.5		

Results	
Liquid limit, LL	63.3
Plastic limit, LP	35.3
Plasticity index, IP	28.0
Natural water content (%)	38.7
Liquidity index, IL	0.1
Consistency index, IC	0.9



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0461

Equipment	
MECACISA 1.5' TRIAXIAL CHAMBER PRESSURE SYSTEM MECACISA 220004 TRIAXIAL LOAD FRAME MECACISA 210715 ELEC. DEF. TRANSD. SCHREIBER SM260 PC WITH SOFTWARE MECASOFT	

Test type	Unconsolidated Undrained (UU)
Soil conditions	UNDISTURBED

Soil sample data	
Specimen number	I
Initial length (cm)	7.640
Initial diameter (cm)	3.867
Initial area (cm ²)	11.745
Initial volume (cm ³)	89.732
Initial moisture content (%)	39.6
Final moisture content (%)	38.4
Initial bulk density (Mg/m ³)	1.80
Initial dry density (Mg/m ³)	1.29
Initial saturation degree (%)	98.0
Particle density (Mg/m ³)	2.694

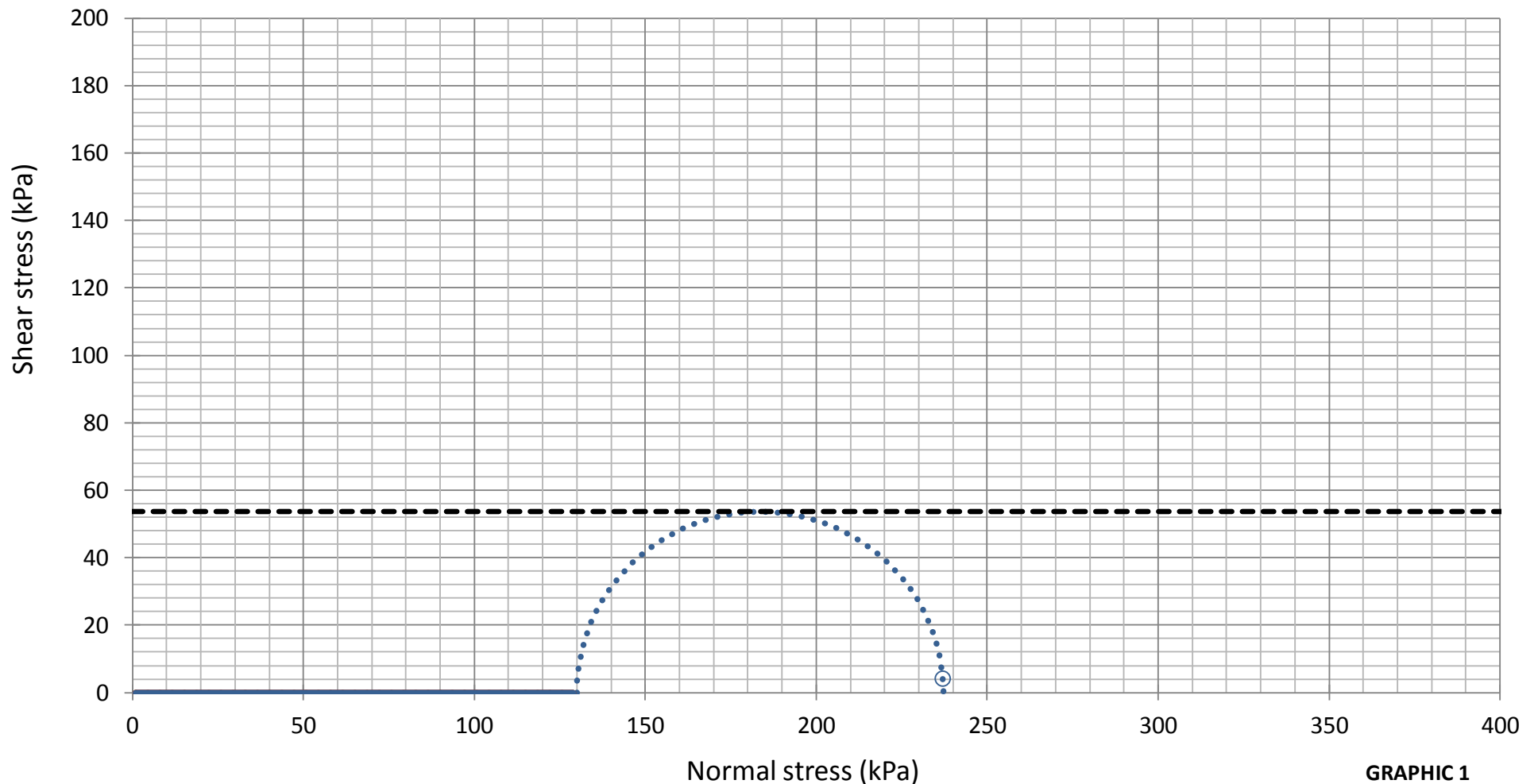
Prior saturation process	
Saturation prior to test	NO

Failure test results	
Specimen number	I
σ ₁ (kPa)	237.2
σ ₃ (kPa)	130.0
(σ ₁ -σ ₃)/2 (kPa)	53.6
(σ ₁ +σ ₃)/2 (kPa)	183.6

Test data and results	
Chamber pressure (kPa)	130
Back pressure, u _b (kPa)	0
Rate of axial displ. (mm/min)	0.8887
Major principal stress (kPa)	107.2
Failure stress (kPa)	107.2
Failure strain (%)	15.0

Estimate total	
Φ _u (°)	0.0
C _u (kPa)	54
C _u (kp/cm ²)	0.55

Graphic symbols						
	I total	II total	III total			



GRAPHIC 1

REMARKS

THE REMOULDED TRIAXIAL TEST COULD NOT BE PERFORMED, AS THE SPECIMEN BROKE DURING DISMOULDING DUE TO ITS STIFFNESS

Operator: ALEX VANCELLS

Test final date: 25/09/2019

Report num.: CB0019-19-0005
Edition date:

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www.igeotest.com
Reg. Num. LECCE L0600292

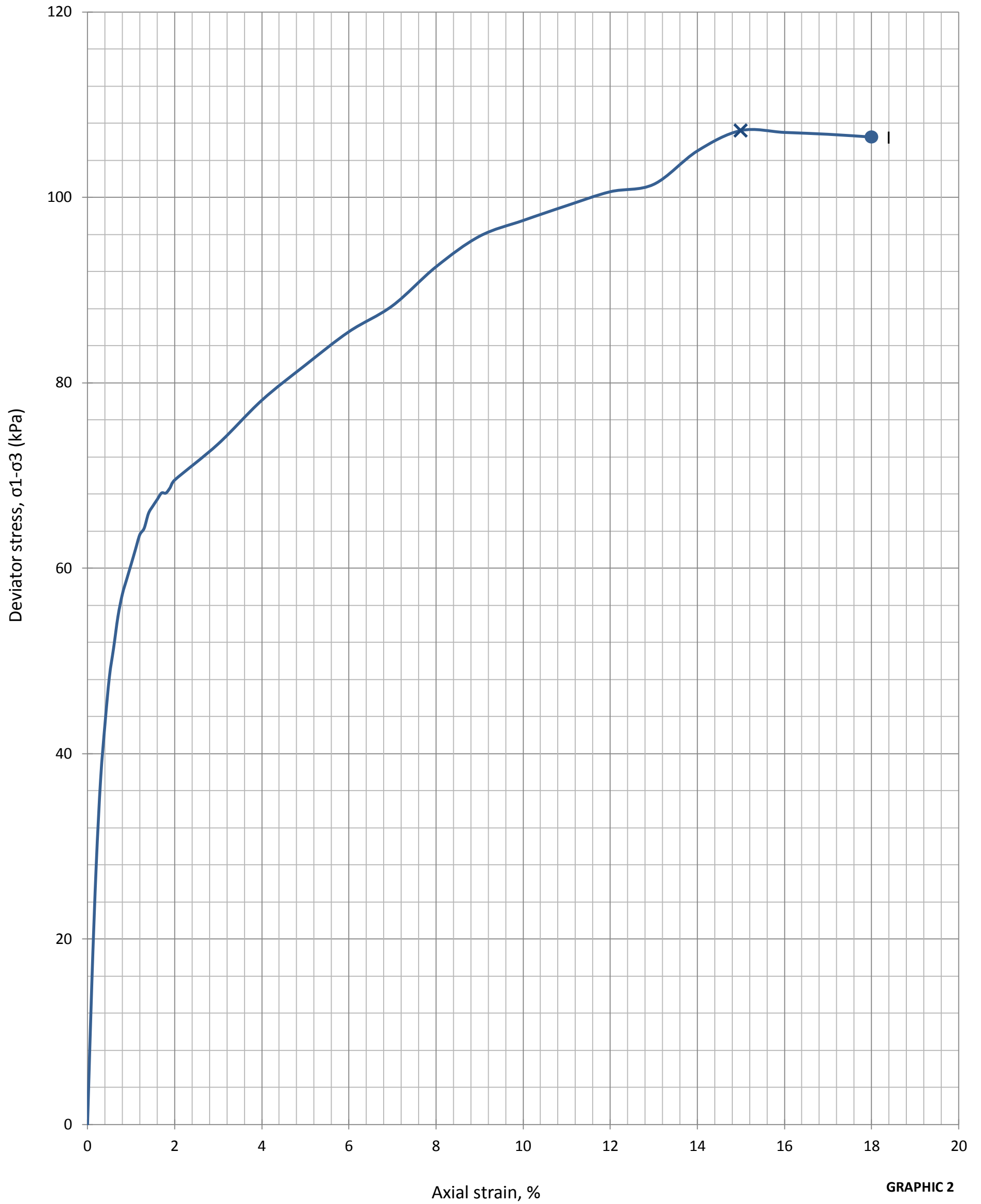


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Sample reference

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0461



GRAPHIC 2



Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0461

Failure process data summary

	Time sg	Deform. %	$(\sigma_1 - \sigma_3)_m$ kPa	$(\Delta\sigma_1)_m$ kPa	$(\Delta\sigma_1)_{fp}$ kPa	$(\sigma_1 - \sigma_3)$ kPa	u-ub kPa	ϵ_1	σ_1 kPa	σ'_1 kPa	σ'_3 kPa	Coeff. A	$(\sigma_1 + \sigma_3)/2$ kPa	$(\sigma_1 - \sigma_3)/2$ kPa	$(\sigma'_1 + \sigma'_3)/2$ kPa	$(\sigma'_1 - \sigma'_3)/2$ kPa
Specimen	0	0	0.0	0.0	0.0	0.0		0.000	130.0				130.0	0.0		
I	6	0.099	15.3	0.0	0.0	15.3		0.001	145.3				137.7	7.7		
Chamber pressure	16	0.3	37.3	0.1	0.0	37.2		0.003	167.2				148.6	18.6		
σ_3 , kPa	26	0.5	48.3	0.1	0.0	48.2		0.005	178.2				154.1	24.1		
130	36	0.699	55.0	0.2	0.0	54.8		0.007	184.8				157.4	27.4		
Back pressure	46	0.899	59.1	0.3	0.0	58.8		0.009	188.8				159.4	29.4		
u_b , kPa	56	1.099	62.3	0.3	0.0	62.0		0.011	192.0				161.0	31.0		
0	66	1.3	64.7	0.4	0.0	64.3		0.013	194.3				162.2	32.2		
σ'_3 , kPa	76	1.5	67.1	0.4	0.0	66.7		0.015	196.7				163.4	33.4		
130	86	1.699	68.6	0.5	0.0	68.1		0.017	198.1				164.1	34.1		
Rate of axial displ.	91	1.8	68.6	0.5	0.0	68.1		0.018	198.1				164.1	34.1		
mm/min	101	2	70.1	0.6	0.0	69.5		0.020	199.5				164.8	34.8		
0.8887	209	4	79.3	1.2	0.0	78.1		0.040	208.1				169.1	39.1		
	308	6	87.2	1.7	0.0	85.5		0.060	215.5				172.8	42.8		
	408	8	94.8	2.3	0.0	92.5		0.080	222.5				176.3	46.3		
	514	10	100.4	2.9	0.0	97.5		0.100	227.5				178.8	48.8		
	617	12	104.1	3.5	0.0	100.6		0.120	230.6				180.3	50.3		
	716	14	109.1	4.1	0.0	105.0		0.140	235.0				182.5	52.5		
	819	16	111.6	4.6	0.0	107.0		0.160	237.0				183.5	53.5		
	925	18	111.7	5.2	0.0	106.5		0.180	236.5				183.3	53.3		
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																

Report num.:	CB0019-19-0005
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INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019

MB19-0461

Test data	
Employee ring type	FIXED
Height (cm)	2.000
Diameter (cm)	5.020
Volume (cm ³)	39.58
Ring weight (g)	86.44
Ring+soil weight (g)	158.88
Ini. weight wet soil (g)	72.44
Soil part. density (Mg/m ³)	2.694
Initial moisture content (%)	38.8
Initial bulk density (Mg/m ³)	1.83
Initial dry density (Mg/m ³)	1.32
Initial saturation degree (%)	100.00
Final moisture content (%)	35.5
Final bulk density (Mg/m ³)	1.86
Final dry density (Mg/m ³)	1.37

Equipment	
OEDOMETER PROETI S0110 (PLACE 4)	
DATA ACQ. MODULE MECATEST-16	
ELECT. TRANSD. NOVOTECHNIK TR-10	

Soil conditions	UNDISTURBED
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Swelling Pressure Test	
Swelling Pressure (kPa)	< 20
(kg/cm ²)	< 0.2

Results	
Initial void ratio, e ₀	1.0409
Final void ratio, e _f	0.9556
Solid height, H _s (cm)	0.9800
Final height pore, H _{ps} (cm)	0.9365

Results																
Press. stage	Load date	Final time	Instant. settlement	Read. t= 8 sg	L ₀ (Casag. met.)	Final reading	Final sample height	Void ratio at L ₀	Final void ratio	Compr. ind. (*)	Swelling ind. (*)	Constr. mod. E _{oed} kPa	Compr. coef. a _v 1/kPa	Cons. coef. c _v cm ² /s	Compr. coef. m _v 1/kPa	Sec. cons. coef. C _α
kPa		sg	mm	mm	mm	mm	cm	e _{L0}	e _f	c _c	c _s					
20	24-09-19	102 849	0.027	0.027	0.028	0.026	1.9974	1.0380	1.0381							
40	25-09-19	86 524	0.005	0.033	0.031	0.075	1.9926	1.0377	1.0332	0.0163		8 319	2.45E-04	8.83E-04	1.20E-04	3.45E-04
80	26-09-19	86 457	0.026	0.107	0.101	0.248	1.9753	1.0305	1.0156	0.0585		4 621	4.40E-04	4.41E-04	2.16E-04	5.29E-04
150	27-09-19	232 509	0.045	0.306	0.292	0.546	1.9455	1.0110	0.9852	0.1114		4 641	4.34E-04	3.88E-04	2.15E-04	3.91E-04
300	30-09-19	86 896	0.004	0.575	0.549	1.039	1.8961	0.9848	0.9348	0.1674		5 908	3.36E-04	4.86E-04	1.69E-04	1.50E-03
600	01-10-19	86 479	0.050	1.101	1.089	1.613	1.8387	0.9297	0.8762	0.1947		9 905	1.95E-04	4.64E-04	1.01E-04	1.74E-03
1000	02-10-19	87 926	0.020	1.661	1.633	2.106	1.7894	0.8742	0.8259	0.2267		14 920	1.26E-04	3.07E-04	6.70E-05	2.23E-03
1500	03-10-19	89 159	0.016	2.144	2.122	2.554	1.7446	0.8243	0.7802	0.2595		19 977	9.14E-05	2.59E-04	5.01E-05	2.80E-03
600	04-10-19	258 561	-0.031	2.503	2.522	2.234	1.7766	0.7834	0.8128		0.0819	49 147	3.62E-05		2.03E-05	
150	07-10-19	86 636	-0.052	2.146	2.182	1.531	1.8469	0.8181	0.8846		0.1193	11 362	1.60E-04		8.80E-05	
20	08-10-19	87 003	-0.025	1.451	1.506	0.835	1.9165	0.8872	0.9556		0.0811	3 451	5.46E-04		2.90E-04	

NOTE: Compression index (C_c) and swelling index (C_s), such as constrained modules (E_{oed}) and compressibility coefficient (a_v), are estimated between a pressure step and the immediately preceding as a first approximation, taking for calculatin the obtained void ratio values in the end of the considered pressure stage.

REMARKS

SWELLING PRESSURE IS DETERMINED APPLYING SUCCESSIVE PRESSURE STAGES. ONCE REACHED THE EQUILIBRIUM SITUATION THE TEST CONTINUES WITH THE PRESSURE STAGE IMMEDIATELY SUPERIOR TO THE SWELLING PRESSURE

Operator: ALEX VANCELLS

Test final date: 10/10/2019

Report num.: CB0019-19-0005
 Edition date:

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 Reg. Num. LECCE L0600292



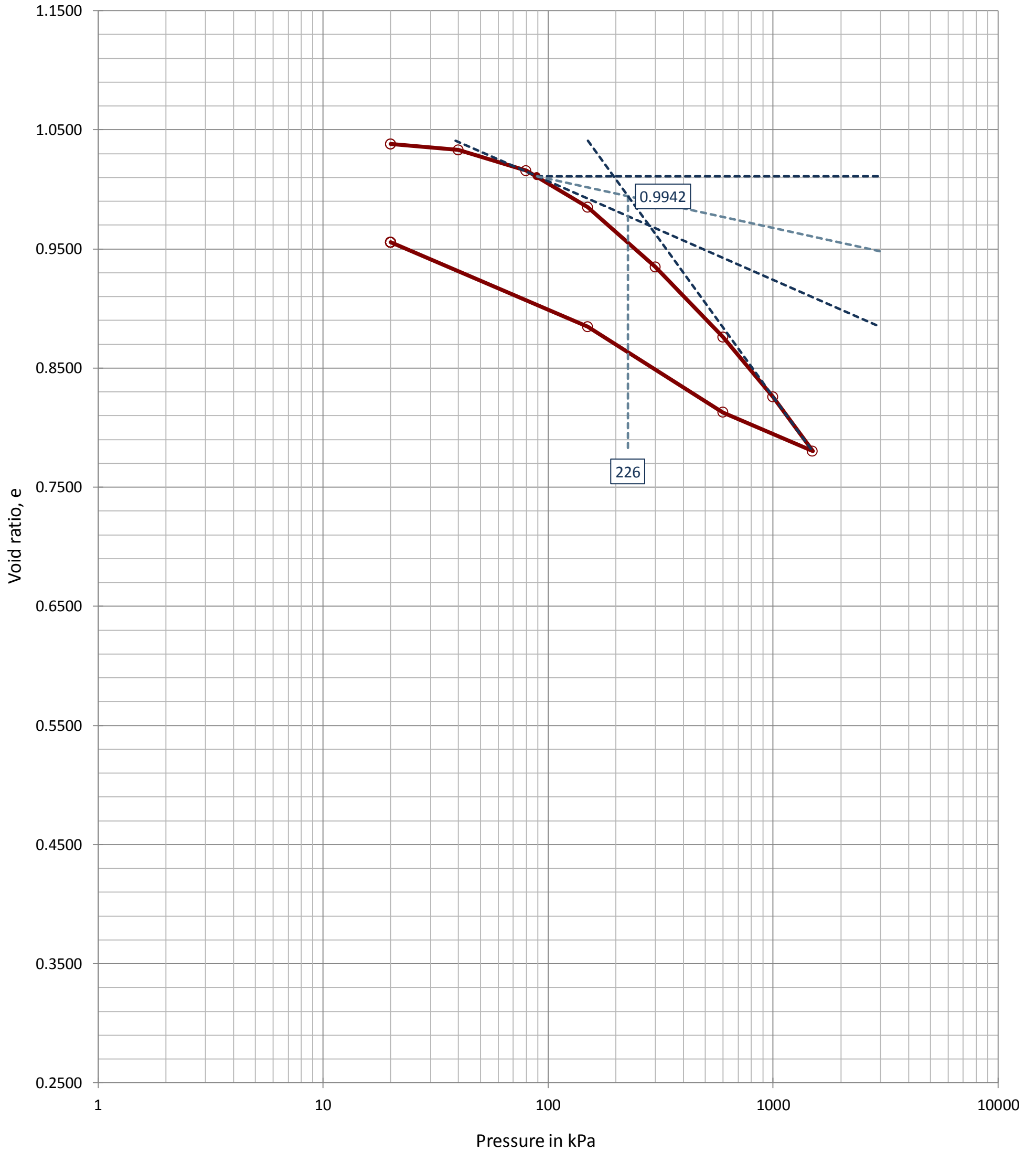
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INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
OEDOMETRIC CURVE

Sample reference
MB19-0461

Initial void ratio	1.0409
Final void ratio	0.9556
Initial moisture content (%)	38.8
Final moisture content (%)	35.5

Preconsolidation pres., σ'_p (kPa)	226
Void ratio	0.9942
Determination method	Casagrande
Compression index, cc	0.2607

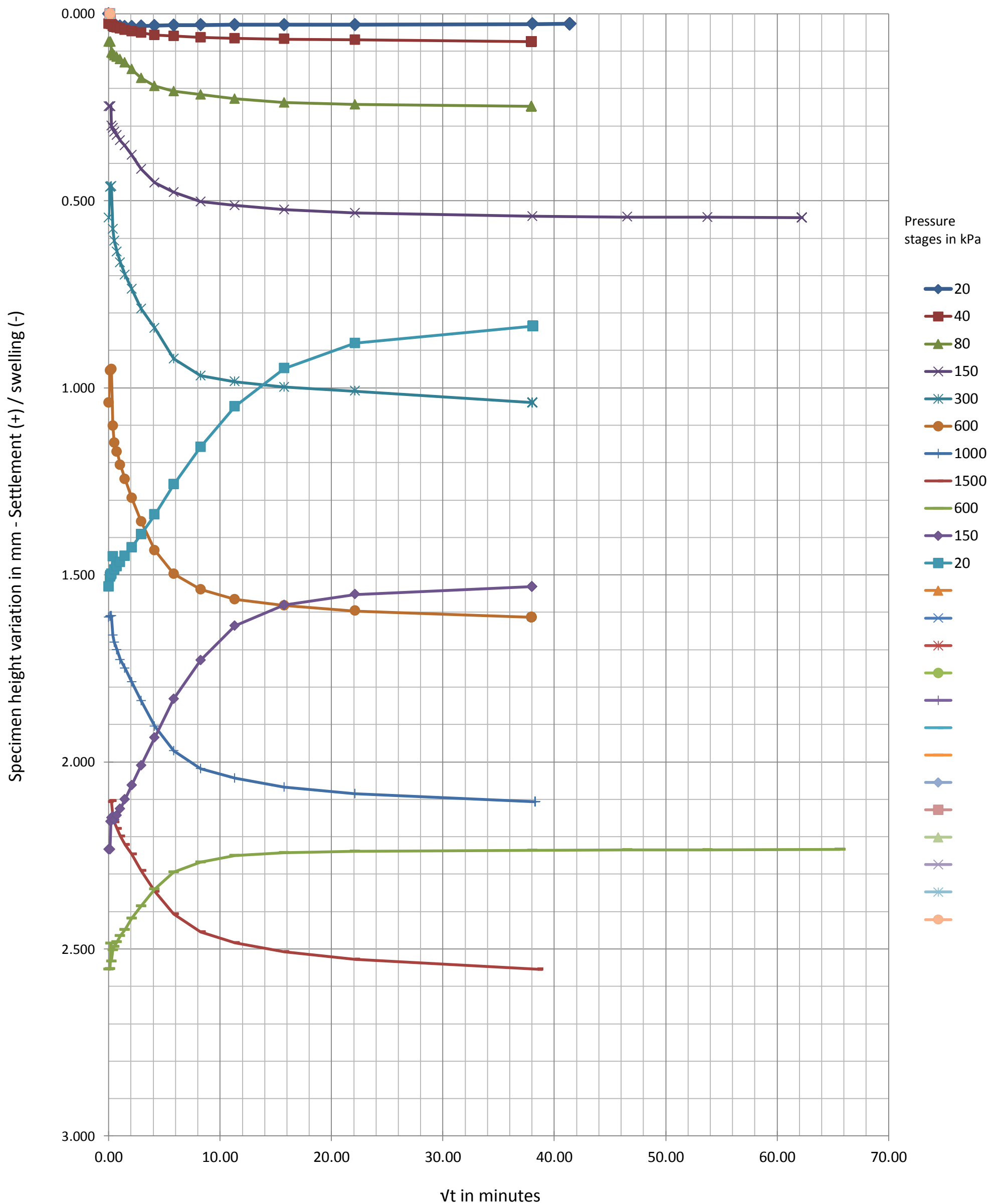


Report num.: CB0019-19-0005
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INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019

CONSOLIDATION CURVES

MB19-0461



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CONSOLIDATION CURVES

Sample reference

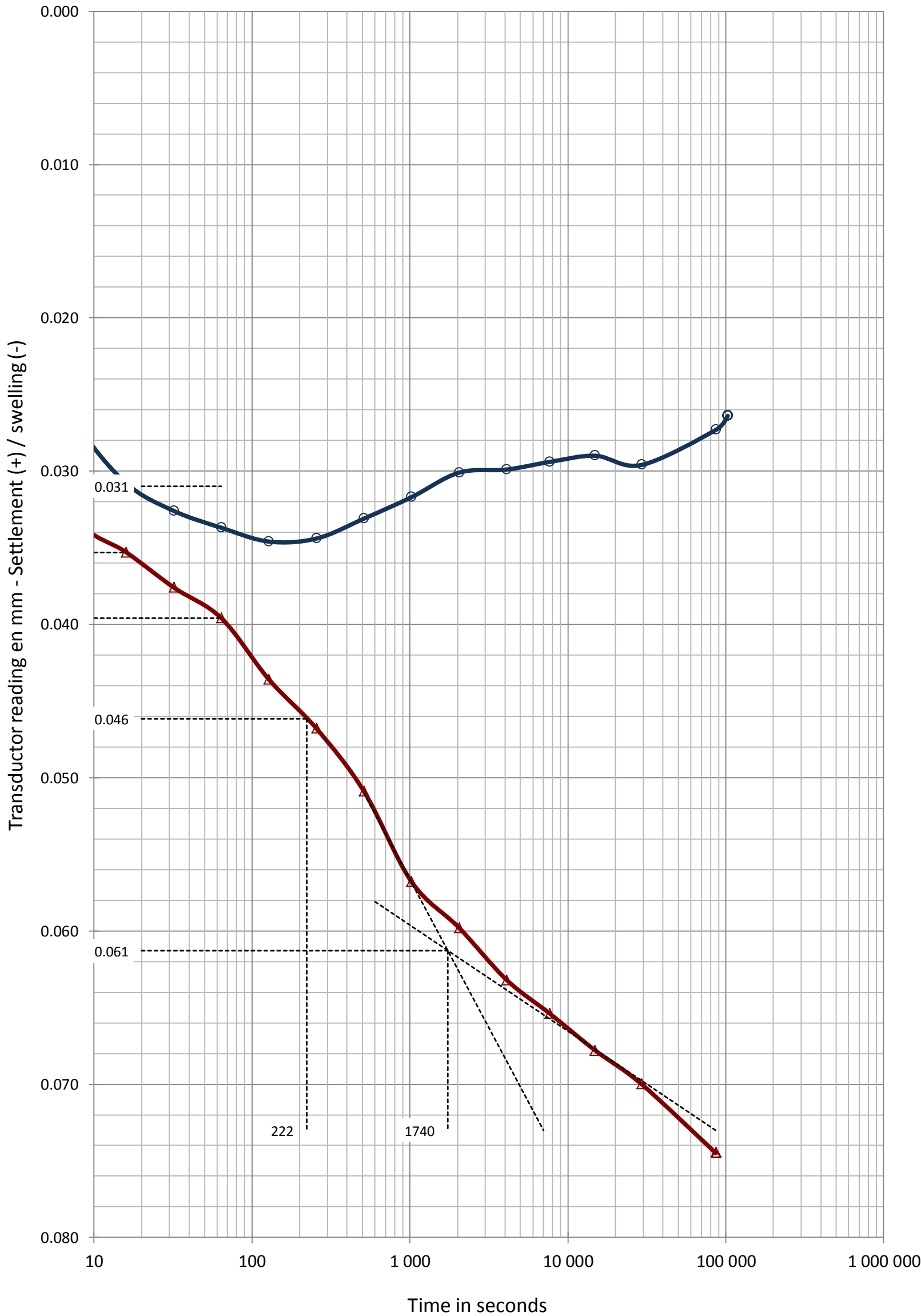
MB19-0461

Pressure stages

Pressure stage (kPa)	20	40	Specimen diameter (cm)	5.020
L0 (Casagrande method)	0.028	0.031	Specimen initial height (cm)	2.000

Date	Date
24-sep-19	25-sep-19

Pressure (kPa)	Pressure (kPa)
20	40



Readings			Readings		
Settlement (+)	Void ratio		Settlement (+)	Void ratio	
sg	mm	e	sg	mm	e
1	-0.007	1.0415	1	0.027	1.0381
2	-0.007	1.0415	2	0.016	1.0392
4	0.022	1.0386	4	0.028	1.0380
8	0.027	1.0381	8	0.033	1.0374
16	0.031	1.0377	16	0.035	1.0372
32	0.033	1.0375	32	0.038	1.0370
64	0.034	1.0374	64	0.040	1.0368
128	0.035	1.0373	128	0.044	1.0364
256	0.034	1.0373	256	0.047	1.0360
512	0.033	1.0374	512	0.051	1.0356
1 024	0.032	1.0376	1 024	0.057	1.0350
2 048	0.030	1.0377	2 048	0.060	1.0347
4 096	0.030	1.0378	4 096	0.063	1.0344
7 696	0.029	1.0378	7 696	0.065	1.0341
14 896	0.029	1.0379	14 896	0.068	1.0339
29 296	0.030	1.0378	29 296	0.070	1.0337
86 896	0.027	1.0380	86 524	0.075	1.0332
102 849	0.026	1.0381			

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INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

Sample reference

MB19-0461

Pressure stages

Pressure stage (kPa)	80	150	Specimen diameter (cm)	5.020
L0 (Casagrande method)	0.101	0.292	Specimen initial height (cm)	2.000

Date	Date
26-sep-19	27-sep-19

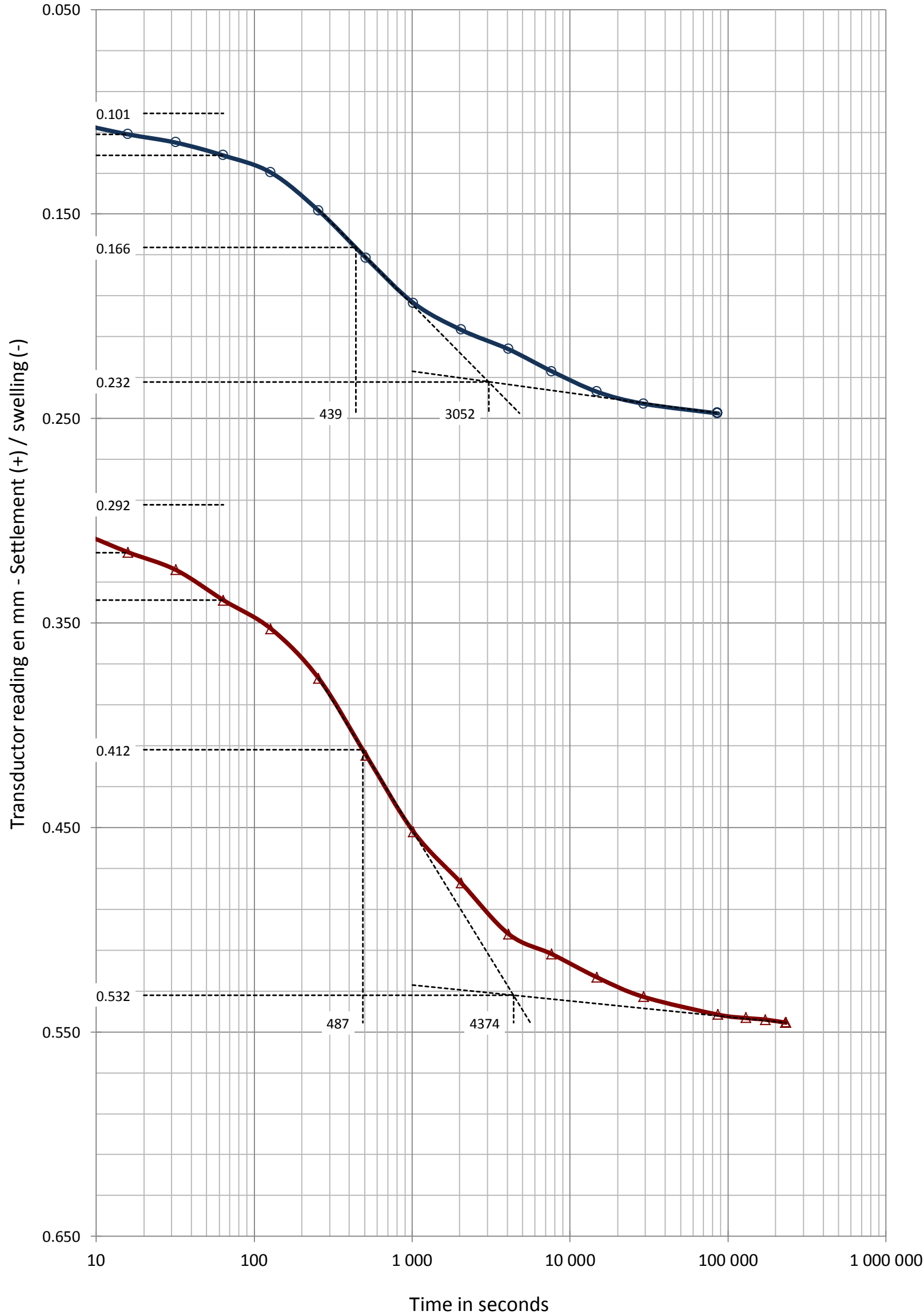
Pressure (kPa) Pressure (kPa)

80 **150**

Readings Void ratio
Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e

0	0.075	1.0332	0	0.248	1.0156
1	0.074	1.0332	1	0.248	1.0155
2	0.075	1.0332	2	0.248	1.0155
4	0.104	1.0302	4	0.300	1.0102
8	0.107	1.0299	8	0.306	1.0096
16	0.111	1.0295	16	0.316	1.0086
32	0.115	1.0291	32	0.324	1.0077
64	0.121	1.0284	64	0.339	1.0062
128	0.130	1.0276	128	0.353	1.0048
256	0.148	1.0257	256	0.377	1.0023
512	0.172	1.0233	512	0.415	0.9985
1 024	0.194	1.0211	1 024	0.452	0.9947
2 048	0.207	1.0197	2 048	0.477	0.9921
4 096	0.216	1.0188	4 096	0.502	0.9896
7 696	0.227	1.0177	7 696	0.512	0.9886
14 896	0.237	1.0166	14 896	0.523	0.9874
29 296	0.243	1.0160	29 296	0.533	0.9864
86 457	0.248	1.0156	86 896	0.542	0.9856
			130 096	0.543	0.9854
			173 296	0.544	0.9853
			232 509	0.546	0.9852



Report num.: CB0019-19-0005
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INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

Sample reference

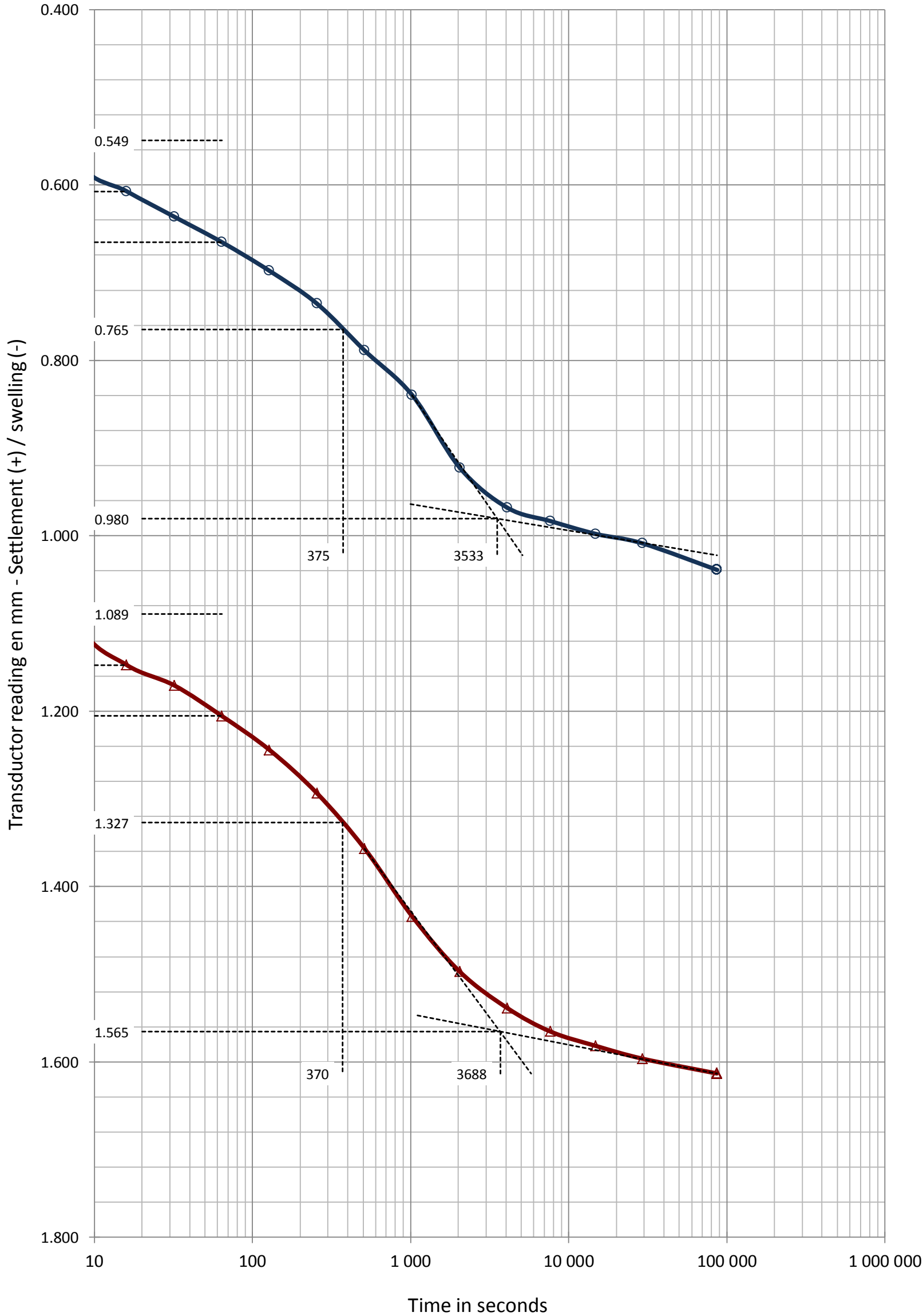
MB19-0461

Pressure stages

Pressure stage (kPa)	300	600	Specimen diameter (cm)	5.020
L0 (Casagrande method)	0.549	1.089	Specimen initial height (cm)	2.000

Date	Date
30-sep-19	01-oct-19

Pressure (kPa)	Pressure (kPa)
300	600



Readings	Void ratio	Readings	Void ratio
Settlement (+)		Settlement (+)	
sg	mm	sg	mm
0	0.546	0	1.039
1	0.463	1	0.954
2	0.462	2	0.953
4	0.461	4	0.950
8	0.575	8	1.101
16	0.607	16	1.147
32	0.636	32	1.171
64	0.665	64	1.206
128	0.698	128	1.244
256	0.736	256	1.294
512	0.789	512	1.357
1 024	0.840	1 024	1.434
2 048	0.923	2 048	1.497
4 096	0.968	4 096	1.539
7 696	0.983	7 696	1.566
14 896	0.998	14 896	1.582
29 296	1.009	29 296	1.596
86 896	1.039	86 479	1.613

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INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

Sample reference

MB19-0461

Pressure stages

Pressure stage (kPa)	1000	1500	Specimen diameter (cm)	5.020
L0 (Casagrande method)	1.633	2.122	Specimen initial height (cm)	2.000

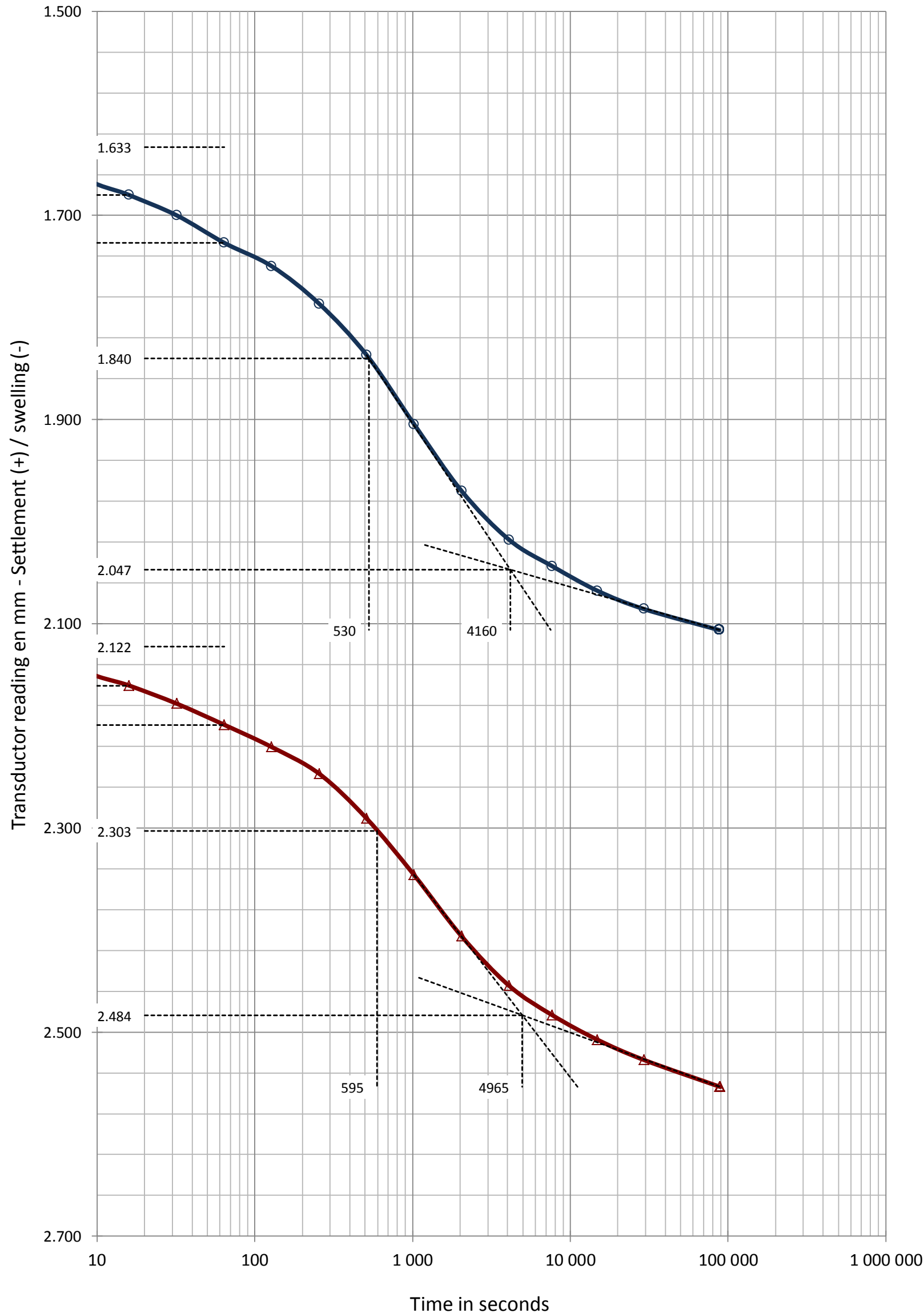
Date	Date
02-oct-19	03-oct-19

Pressure (kPa) Pressure (kPa)

1000 **1500**

Readings: Void ratio
 Settlement (+) Settlement (+)

sg mm e sg mm e



sg	mm	e	sg	mm	e
0	1.613	0.8762	0	2.106	0.8259
1	1.611	0.8765	1	2.104	0.8262
2	1.610	0.8765	2	2.104	0.8262
4	1.610	0.8765	4	2.104	0.8262
8	1.661	0.8713	8	2.144	0.8220
16	1.680	0.8694	16	2.161	0.8203
32	1.700	0.8673	32	2.178	0.8185
64	1.727	0.8646	64	2.199	0.8164
128	1.750	0.8623	128	2.221	0.8142
256	1.787	0.8585	256	2.247	0.8115
512	1.837	0.8534	512	2.291	0.8071
1 024	1.905	0.8465	1 024	2.346	0.8014
2 048	1.970	0.8398	2 048	2.406	0.7953
4 096	2.018	0.8349	4 096	2.455	0.7903
7 696	2.044	0.8323	7 696	2.484	0.7874
14 896	2.068	0.8298	14 896	2.508	0.7849
29 296	2.086	0.8280	29 296	2.527	0.7829
87 926	2.106	0.8259	87 926	2.554	0.7802

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INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

Sample reference

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Pressure stages

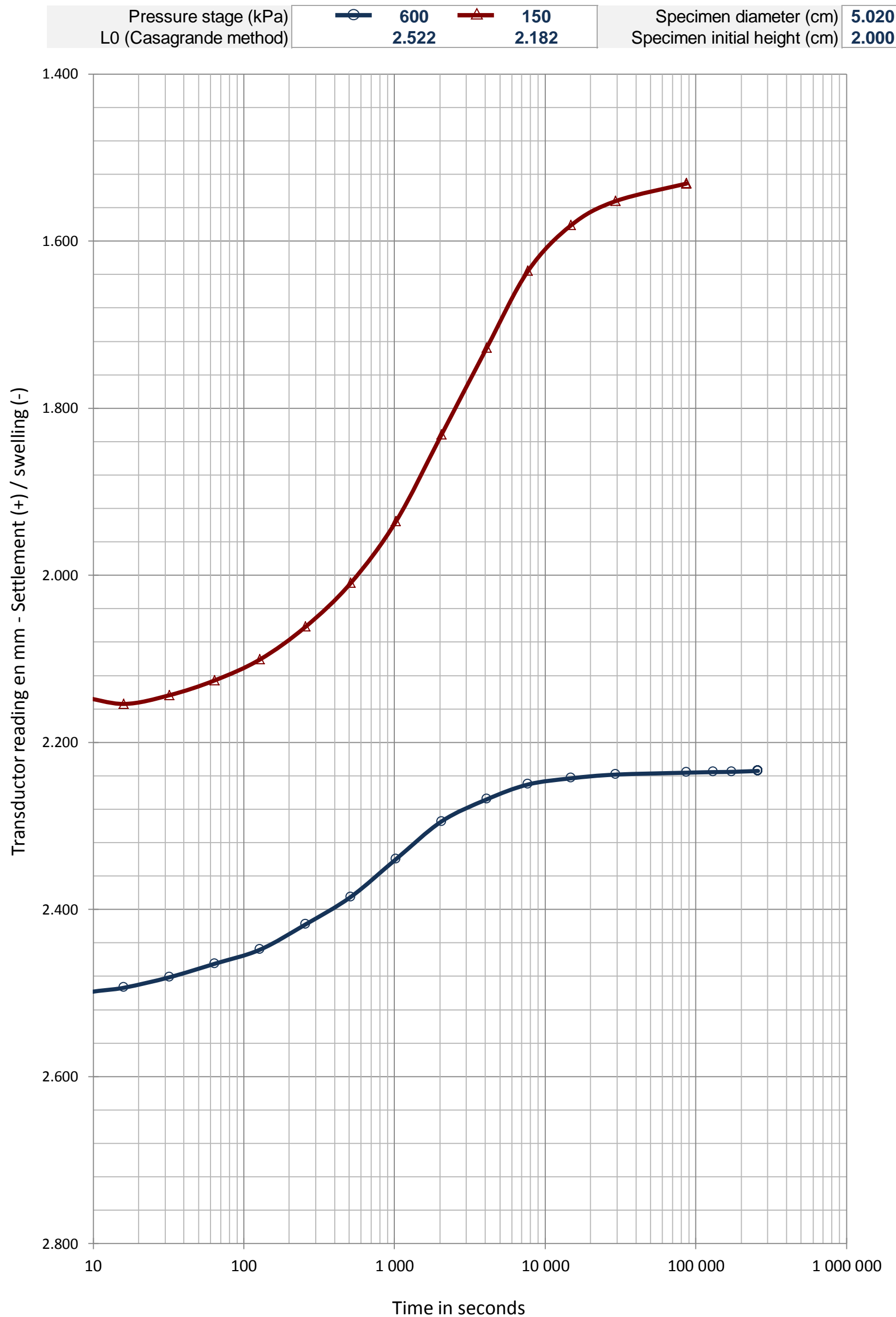
Date	Date
04-oct-19	07-oct-19

Pressure (kPa) Pressure (kPa)

600 **150**

Readings: Void ratio
 Settlement (+) Settlement (+)

sg	mm	e	sg	mm	e
0	2.554	0.7802	0	2.234	0.8128
1	2.554	0.7802	1	2.234	0.8128
2	2.485	0.7873	2	2.160	0.8204
4	2.532	0.7824	4	2.149	0.8215
8	2.503	0.7854	8	2.146	0.8219
16	2.494	0.7864	16	2.154	0.8210
32	2.481	0.7876	32	2.144	0.8221
64	2.465	0.7893	64	2.126	0.8239
128	2.448	0.7910	128	2.101	0.8265
256	2.418	0.7941	256	2.062	0.8304
512	2.385	0.7974	512	2.009	0.8358
1 024	2.340	0.8021	1 024	1.935	0.8433
2 048	2.295	0.8067	2 048	1.832	0.8539
4 096	2.268	0.8094	4 096	1.728	0.8645
7 696	2.250	0.8112	7 696	1.636	0.8739
14 896	2.243	0.8119	14 896	1.581	0.8795
29 296	2.239	0.8124	29 296	1.552	0.8824
86 896	2.236	0.8126	86 636	1.531	0.8846
130 096	2.236	0.8127			
173 296	2.235	0.8127			
258 561	2.234	0.8128			



Operator:

Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - UNE-EN ISO 17892-5:2019
CONSOLIDATION CURVES

Sample reference

MB19-0461

Pressure stages

Pressure stage (kPa) **20** Specimen diameter (cm) **5.020**
 L0 (Casagrande method) **1.506** Specimen initial height (cm) **2.000**

Date Date

08-oct-19

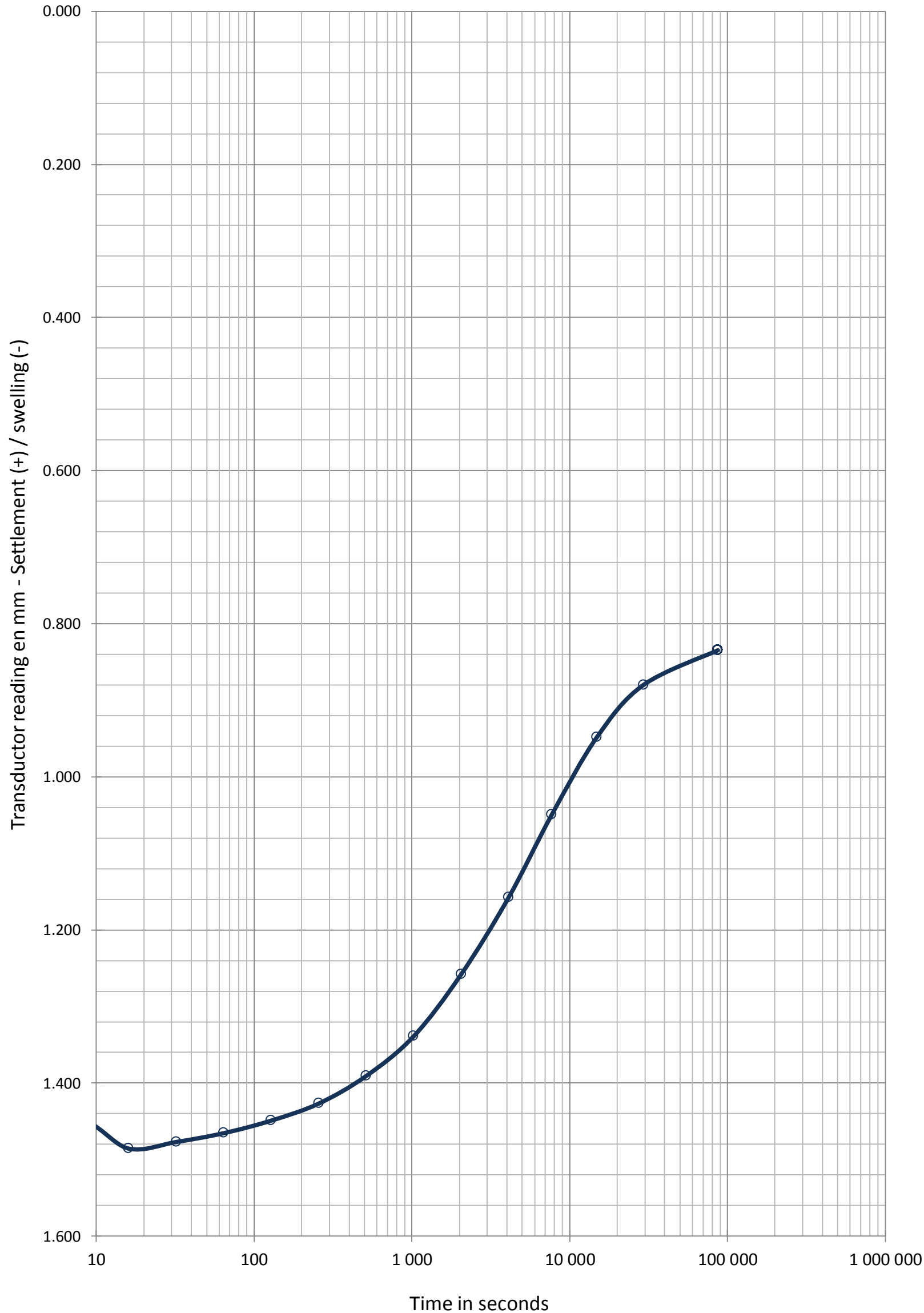
Pressure (kPa) Pressure (kPa)

20

Readings Void Readings Void
 Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e

0	1.531	0.8846			
1	1.505	0.8872			
2	1.501	0.8877			
4	1.497	0.8880			
8	1.451	0.8928			
16	1.486	0.8892			
32	1.477	0.8901			
64	1.466	0.8913			
128	1.449	0.8929			
256	1.427	0.8952			
512	1.391	0.8989			
1 024	1.339	0.9042			
2 048	1.258	0.9124			
4 096	1.158	0.9227			
7 696	1.050	0.9337			
14 896	0.948	0.9441			
29 296	0.880	0.9510			
87 003	0.835	0.9556			



Report num.:	CB0019-19-0005
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FALL CONE TEST - ISO 17892-6:2017

MB19-0461

Equipment
PENETROMETER MATEST B057-11

Legend of symbols	
cu	Calculated Undrained Shear Strength (kPa)
cu(corr)	Corrected Undrained Shear Strength (kPa)
cur	Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	63.3	4.32	4.85	4.48	4.57	4.555	400	30	189	159	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	189
Corrected Undrained Shear Strength, cu(corr) (kPa)	159

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	5.05	4.68	5.1	5.43	5.065	400	30	122	
1	1	4.22	4.25	4.26	4.23	4.24	400	30	175	
1	3	4.21	4.29	4.01	4.2	4.178	400	30	180	
1	7	4.07	4.14	4.15	4.22	4.145	400	30	183	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	122

Thixotropy	
Loss at remoulding (%)	35
Recovery after 1 day (%)	79
Recovery after 7 days (%)	91

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm WITH THE EXCEPTION OF THE REMOULDED SAMPLE AT 0 DAYS, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

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Reg. Num. LECCE L0600292



20 / 20

Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0461

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 27-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.609 g

Equipment:

RESULT: **87.3 g/kg (total)**

MUFLA OVEN ETI HD150

78.9 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 27-09-19

Mean of analyzed soil mass: 1.084 g

Equipment:

RESULT: **70.1 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0462

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_2 C_2.1
Top depth, m	2.6
Bottom depth, m	2.71
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	21-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) clayey SILT with rare brownish pockets.	2.6	
	2.71	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



2 / 4

Sample reference

PHOTOGRAPHIC RECORD

MB19-0462



REMARKS

Operator: ALEX VANCELLS

Date: 21/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0462

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.34
Tare + soil + water (g)	167.82
Tare + soil (g)	150.11
Water (g)	17.71
Soil (g)	45.77
Moisture, w (%)	38.7

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Moisture content, w (%)	38.7

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data					
Soil weight (g)	92.74				
Lower side of prismatic sample, B (cm)					
Largest side of prismatic sample, H (cm)					
Length, L (cm)	3.540	4.703	4.050	3.563	10.037
Diameter of cylindrical sample, D (cm)	4.250	6.187	5.175	4.265	3.203
Soil volume (cm ³)	50.22	141.39	85.19	50.91	80.89
Bulk density (Mg/m ³)	1.85				
Dry density (Mg/m ³)	1.33				

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Bulk density (Mg/m³)	1.85
Dry density (Mg/m³)	1.33

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0462

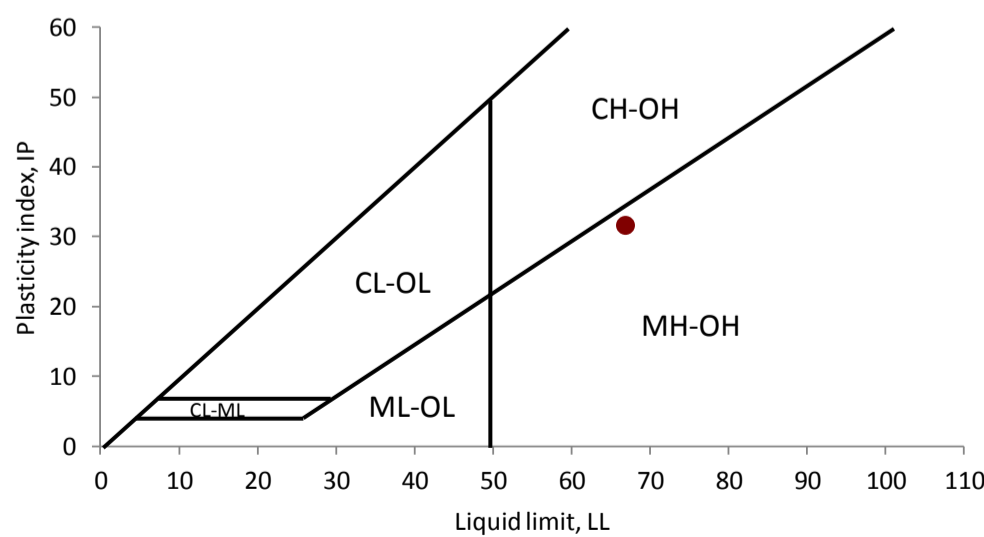
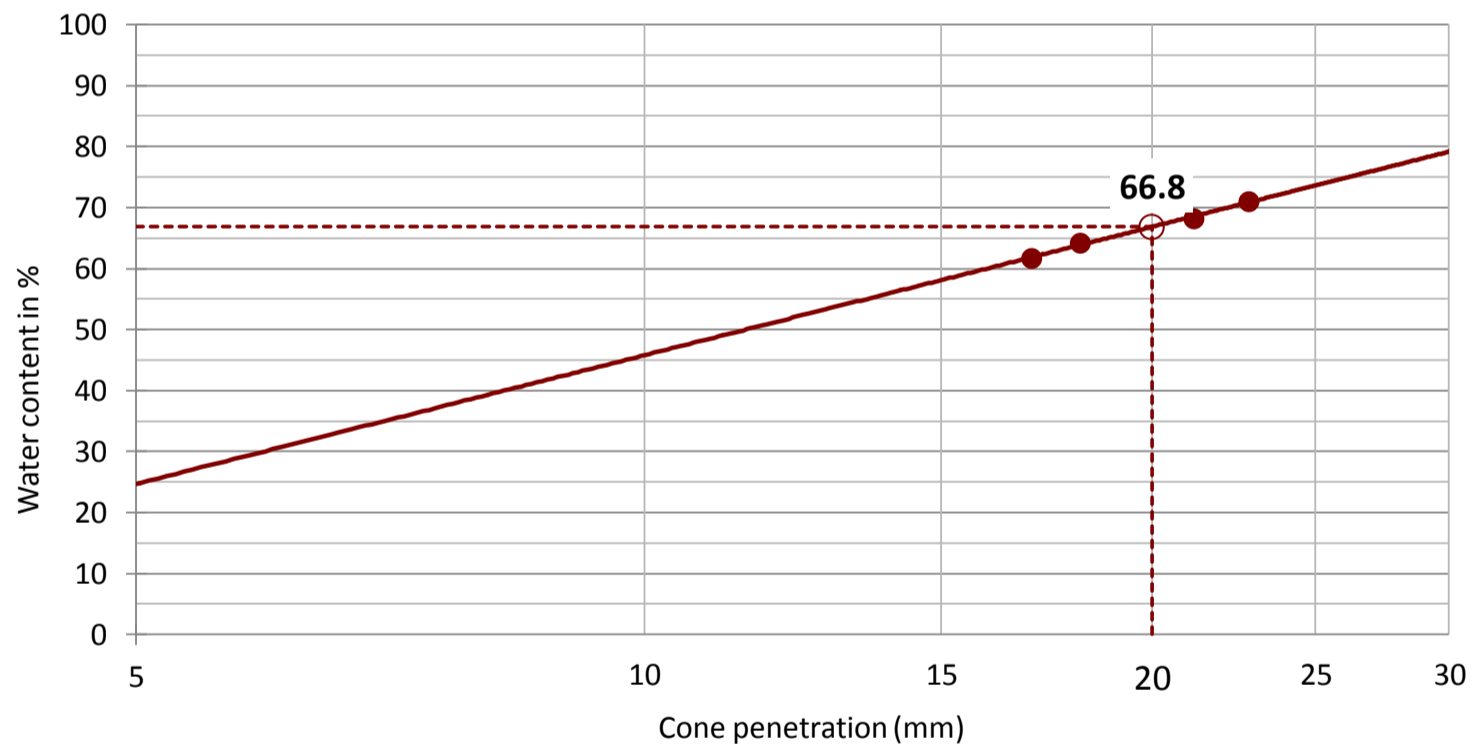
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	18.14	21.175	22.84	16.975
Water (g)	10.71	11.89	3.70	3.92
Mass moist soil + cont. (g)	193.72	219.78	181.25	192.64
Mass dry soil + cont. (g)	183.01	207.89	177.55	188.72
Mass container (g)	166.34	190.47	172.34	182.36
Soil (g)	16.67	17.42	5.21	6.36
Water content (%)	64.2	68.3	71.0	61.6

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data				
Water (g)	1.73	1.88		
Mass moist soil + cont. (g)	31.10	31.60		
Mass dry soil + cont. (g)	29.37	29.72		
Mass container (g)	24.46	24.38		
Soil (g)	4.91	5.34		
Water content (%)	35.2	35.2		

Results	
Liquid limit, LL	66.8
Plastic limit, LP	35.2
Plasticity index, IP	31.6
Natural water content (%)	38.7
Liquidity index, IL	0.1
Consistency index, IC	0.9



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0463

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_1 C_1.3
Top depth, m	0.89
Bottom depth, m	1.05
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	16
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	21-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark grayish brown (2.5Y 3/2) slightly sandy SILT with occasional clay pockets.	0.89	
	1.05	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

Geotechnical laboratory
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Reg. Num. LECCE L0600292



2 / 4

Sample reference

PHOTOGRAPHIC RECORD

MB19-0463



REMARKS

Operator: ALEX VANCELLS

Date: 21/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0463

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0228

Data of soil moisture content test	
Tare (g)	112.74
Tare + soil + water (g)	200.08
Tare + soil (g)	186.50
Water (g)	13.58
Soil (g)	73.76
Moisture, w (%)	18.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Moisture content, w (%)	18.4

Equipment

Bulk density test data	
Soil weight (g)	102.46
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.04
Dry density (Mg/m ³)	1.72

Operator: ALEX VANCELLS
Test final date: 21/06/2019

Results	
Bulk density (Mg/m³)	2.04
Dry density (Mg/m³)	1.72

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0463

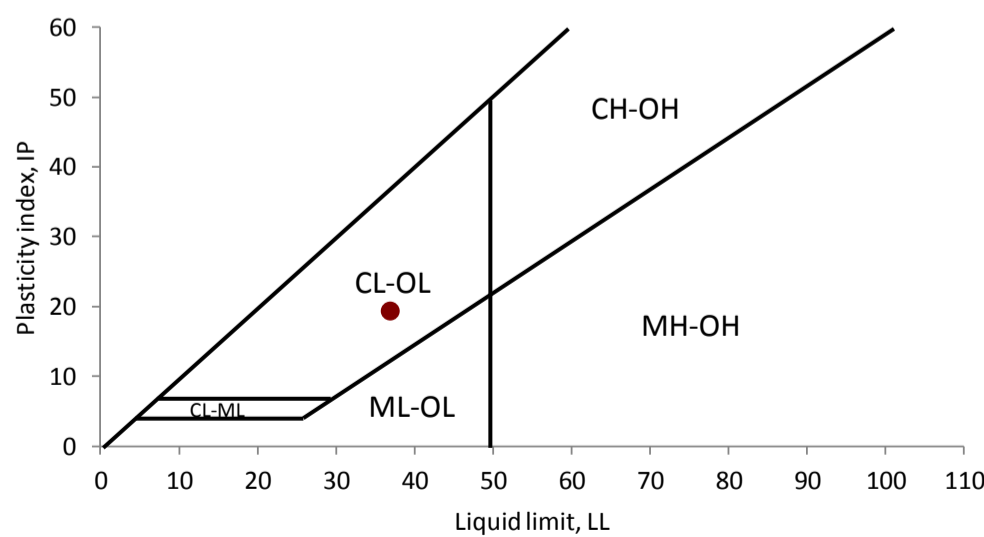
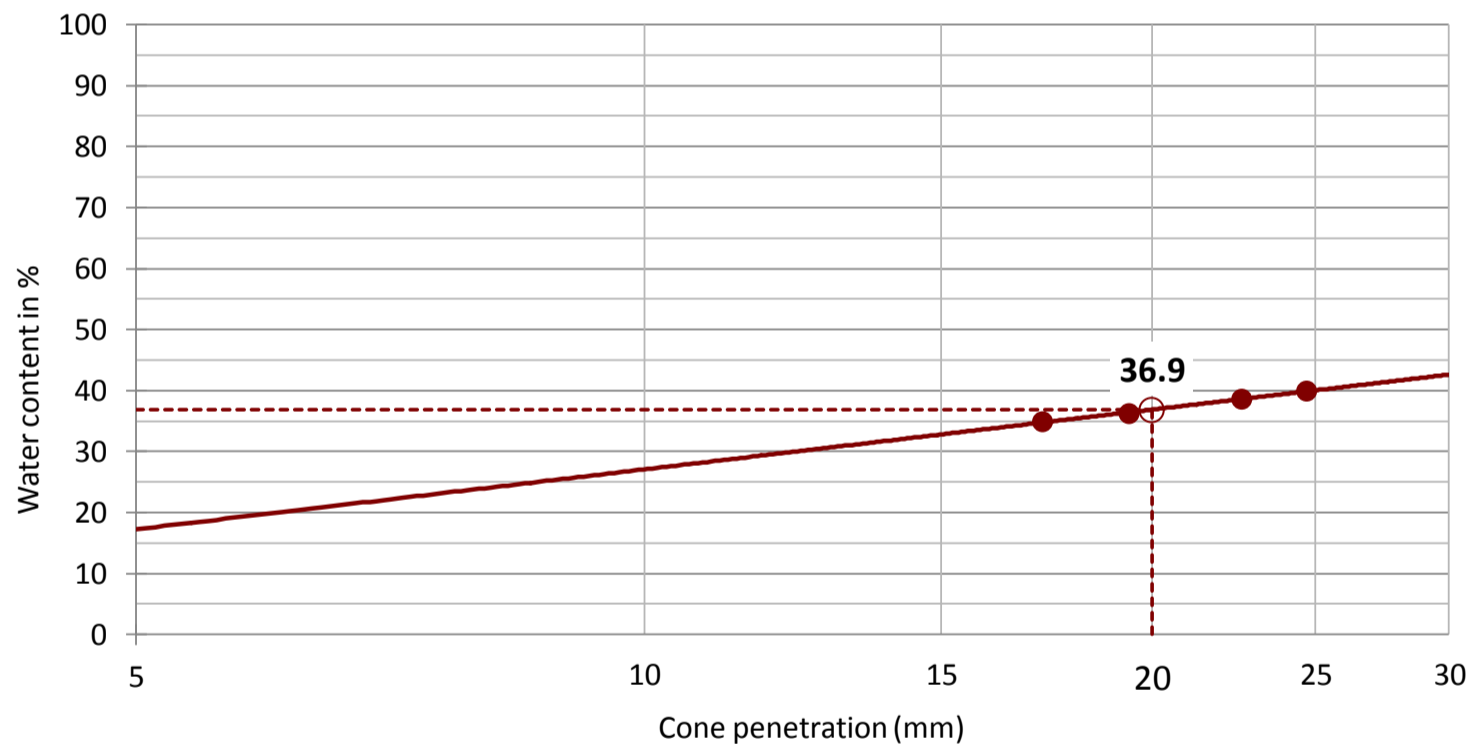
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	24.705	19.385	17.215	22.61
Water (g)	4.20	3.57	3.17	3.80
Mass moist soil + cont. (g)	38.87	36.95	36.28	37.83
Mass dry soil + cont. (g)	34.67	33.38	33.11	34.03
Mass container (g)	24.16	23.52	24.03	24.18
Soil (g)	10.51	9.86	9.08	9.85
Water content (%)	40.0	36.2	34.9	38.6

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data		
Water (g)	1.13	1.14
Mass moist soil + cont. (g)	32.17	30.63
Mass dry soil + cont. (g)	31.04	29.49
Mass container (g)	24.59	23.01
Soil (g)	6.45	6.48
Water content (%)	17.5	17.6

Results	
Liquid limit, LL	36.9
Plastic limit, LP	17.6
Plasticity index, IP	19.3
Natural water content (%)	18.4
Liquidity index, IL	0.0
Consistency index, IC	1.0



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

MB19-0464

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_1 C_1.2
Top depth, m	1.8
Bottom depth, m	2.2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	40
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

USCS classification	CL
ISO classification	sasiCl
AASHTO classification	A-6 (15)

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) clayey SILT with frequent fine sand pockets.	1.8	
	2.2	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
FALL CONE TEST - ISO 17892-6:2017
UNCONSOLIDATED UNDRAINED TRIAXIAL TEST, UU 1.5' - ISO 17892-8:2018
INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0464



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0464

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	109.69
Tare + soil + water (g)	173.13
Tare + soil (g)	158.18
Water (g)	14.95
Soil (g)	48.49
Moisture, w (%)	30.8

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	30.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.72
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.91
Dry density (Mg/m ³)	1.46

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.91
Dry density (Mg/m³)	1.46

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.5
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2313
Pyc. mass + soil + water at test temp. M2 (g)	185.8640
Soil mass, M1 (g)	12.0110
Particle density, G20°C (Mg/m ³)	2.747

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.747

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0464

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

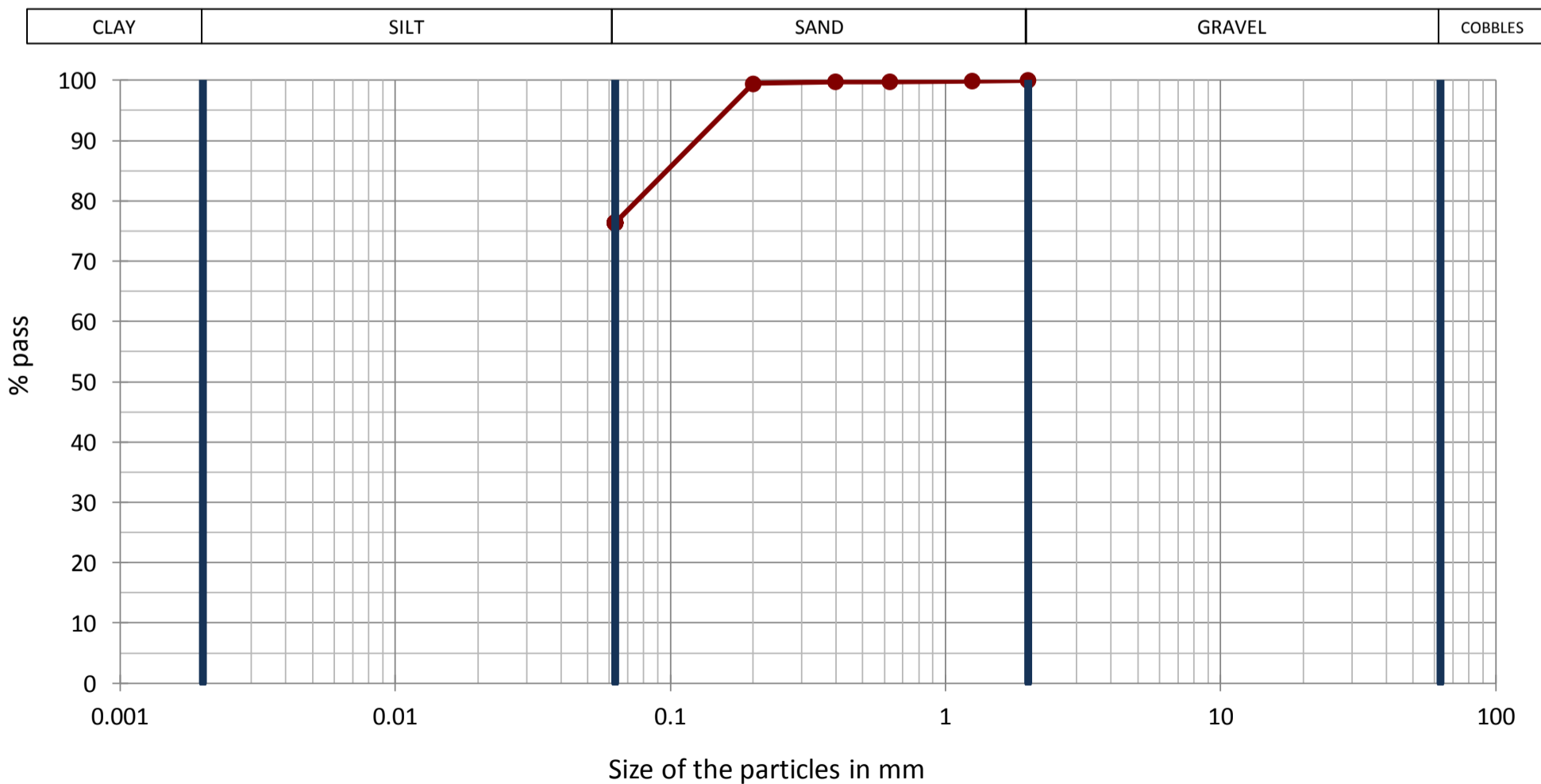
Previous calculations
 Total dried sample (g) **102.48**

 Hygrosc. moisture, % (fraction<2 mm) **2.8**
 Corr. parameter, f (fraction<2 mm) **0.9732**

Results					
Sieves Aperture mm	Retained sieves		Pass total sample		
	Partial g	Total g	Total %	g	%
2		0.00	0.0	99.73	100.0
1.25		0.06	0.1	99.67	99.9
0.63		0.09	0.2	99.58	99.8
0.4		0.09	0.2	99.49	99.8
0.2		0.28	0.5	99.21	99.5
0.063		23.05	23.6	76.16	76.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	23.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.2	76.4	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.3		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	23.1		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0464

Equipment
HYDROMETER PROETI S0075
HIGH-VELOCITY STIRRER PROETI S0081
BALANCE RADWAG PS4500.R1
CONSTANT-TEMPERATURE BATH PROETI S0065

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	32.85
Hygrosopic moisture, W (%)	2.8
Tested and dried soil mass, m (g)	31.97
Particle density (Mg/m ³)	2.747

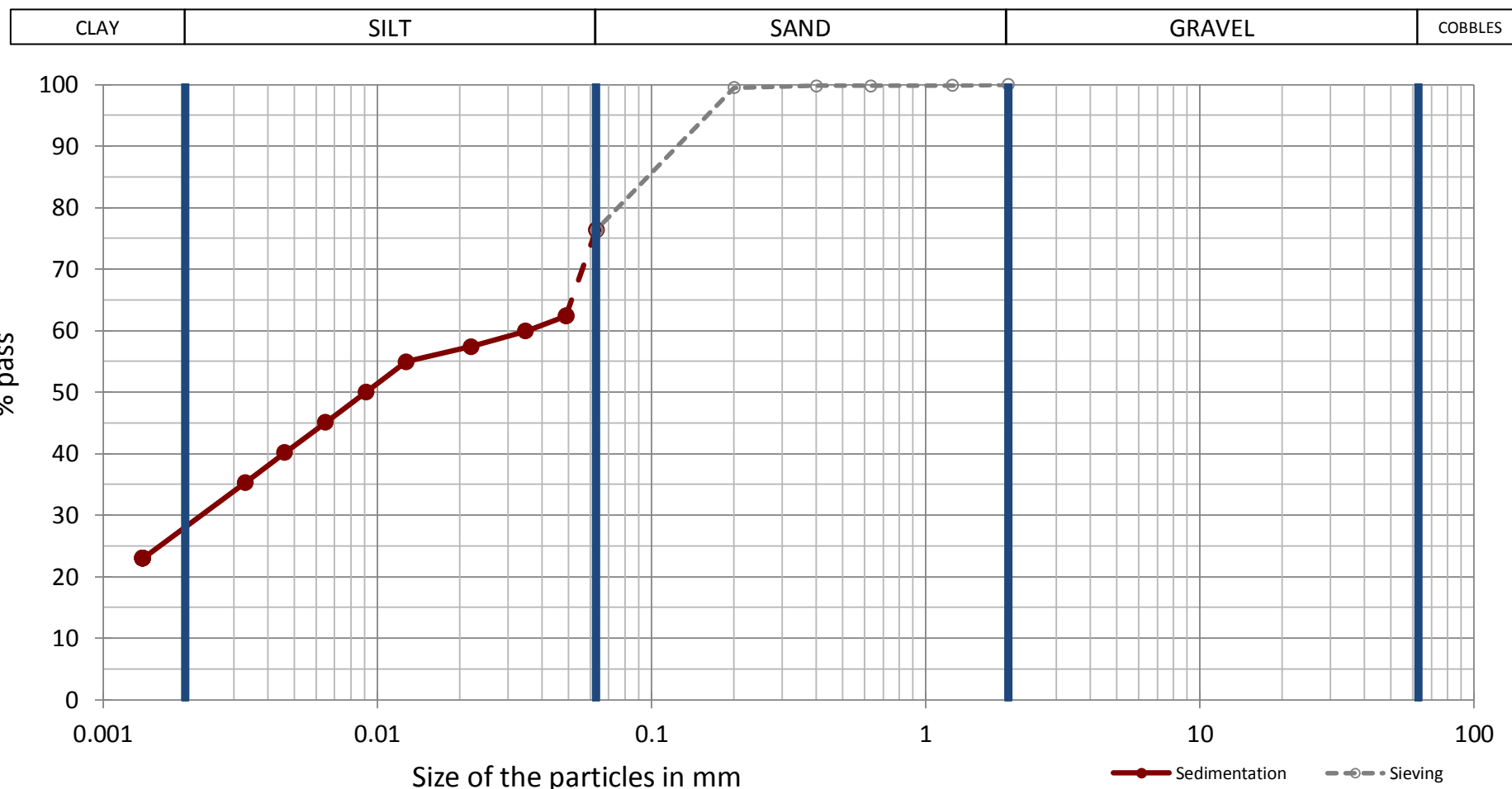
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	22	1.0165	16.5	143.2	12.7	0.0489	62.3
2	22	1.0160	16	144.4	12.2	0.0348	59.9
5	22	1.0155	15.5	145.5	11.7	0.0221	57.4
15	22	1.0150	15	146.7	11.2	0.0128	54.9
30	22	1.0140	14	149.1	10.2	0.0091	50.0
60	22	1.0130	13	151.5	9.2	0.0065	45.1
120	22	1.0120	12	153.9	8.2	0.0046	40.2
240	22	1.0110	11	156.2	7.2	0.0033	35.3
1440	22	1.0085	8.5	162.2	4.7	0.0014	23.0

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	76.4
Silt, between 0.063 and 0.002 mm (%)	49.5
Clay, smaller than 0.002 mm (%)	26.9



REMARKS

Operator: ALEX VANCELLS

Test final date: 23/10/2019

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0464

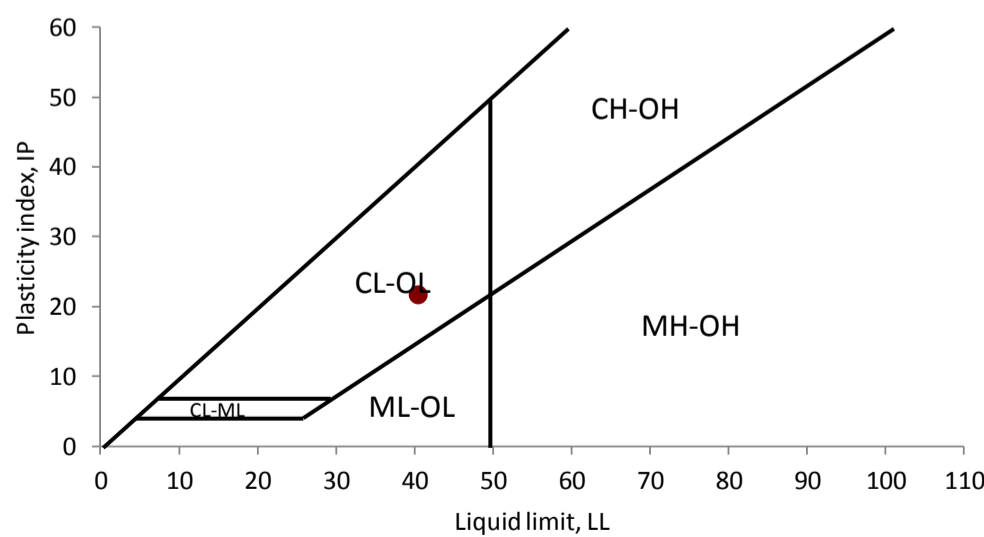
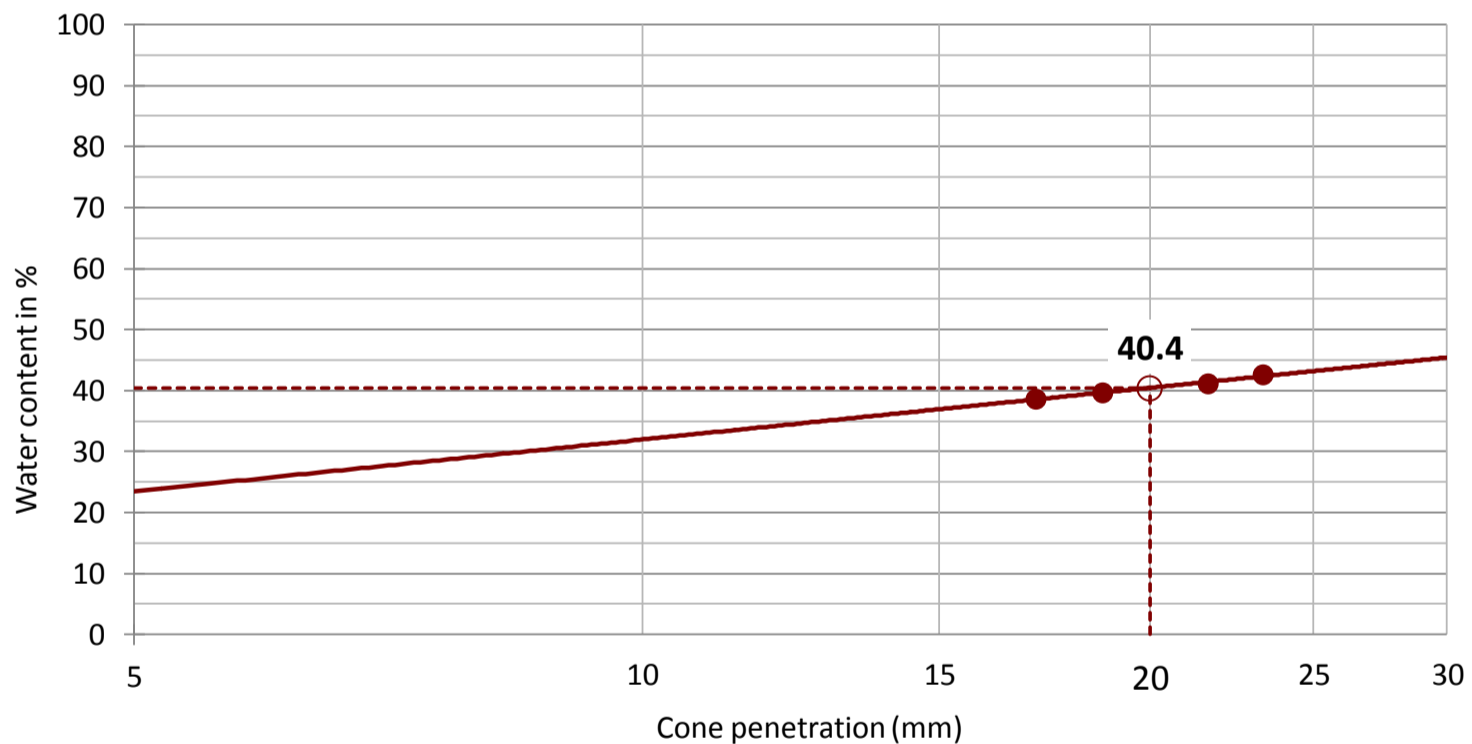
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	17.11	23.335	18.76	21.64
Water (g)	3.50	4.06	3.83	3.61
Mass moist soil + cont. (g)	41.08	44.91	41.74	42.64
Mass dry soil + cont. (g)	37.58	40.85	37.91	39.03
Mass container (g)	28.52	31.32	28.25	30.24
Soil (g)	9.06	9.53	9.66	8.79
Water content (%)	38.6	42.6	39.6	41.1

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0225

Plastic Limit data				
Water (g)	0.81	0.81		
Mass moist soil + cont. (g)	28.67	29.53		
Mass dry soil + cont. (g)	27.86	28.72		
Mass container (g)	23.52	24.39		
Soil (g)	4.34	4.33		
Water content (%)	18.7	18.7		

Results	
Liquid limit, LL	40.4
Plastic limit, LP	18.7
Plasticity index, IP	21.7
Natural water content (%)	30.8
Liquidity index, IL	0.6
Consistency index, IC	0.4



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0464

Equipment	
MECACISA 1.5' TRIAXIAL CHAMBER PRESSURE SYSTEM MECACISA 220004 TRIAXIAL LOAD FRAME MECACISA 210715 ELEC. DEF. TRANSD. SCHREIBER SM260 PC WITH SOFTWARE MECASOFT PORE PRES. SENS. AEP RTP1	

Test type	Unconsolidated Undrained (UU)
Soil conditions	UNDISTURBED

Soil sample data	
Specimen number	I
Initial length (cm)	7.675
Initial diameter (cm)	3.885
Initial area (cm ²)	11.854
Initial volume (cm ³)	90.979
Initial moisture content (%)	21.4
Final moisture content (%)	21.6
Initial bulk density (Mg/m ³)	2.10
Initial dry density (Mg/m ³)	1.73
Initial saturation degree (%)	100.0
Particle density (Mg/m ³)	2.747

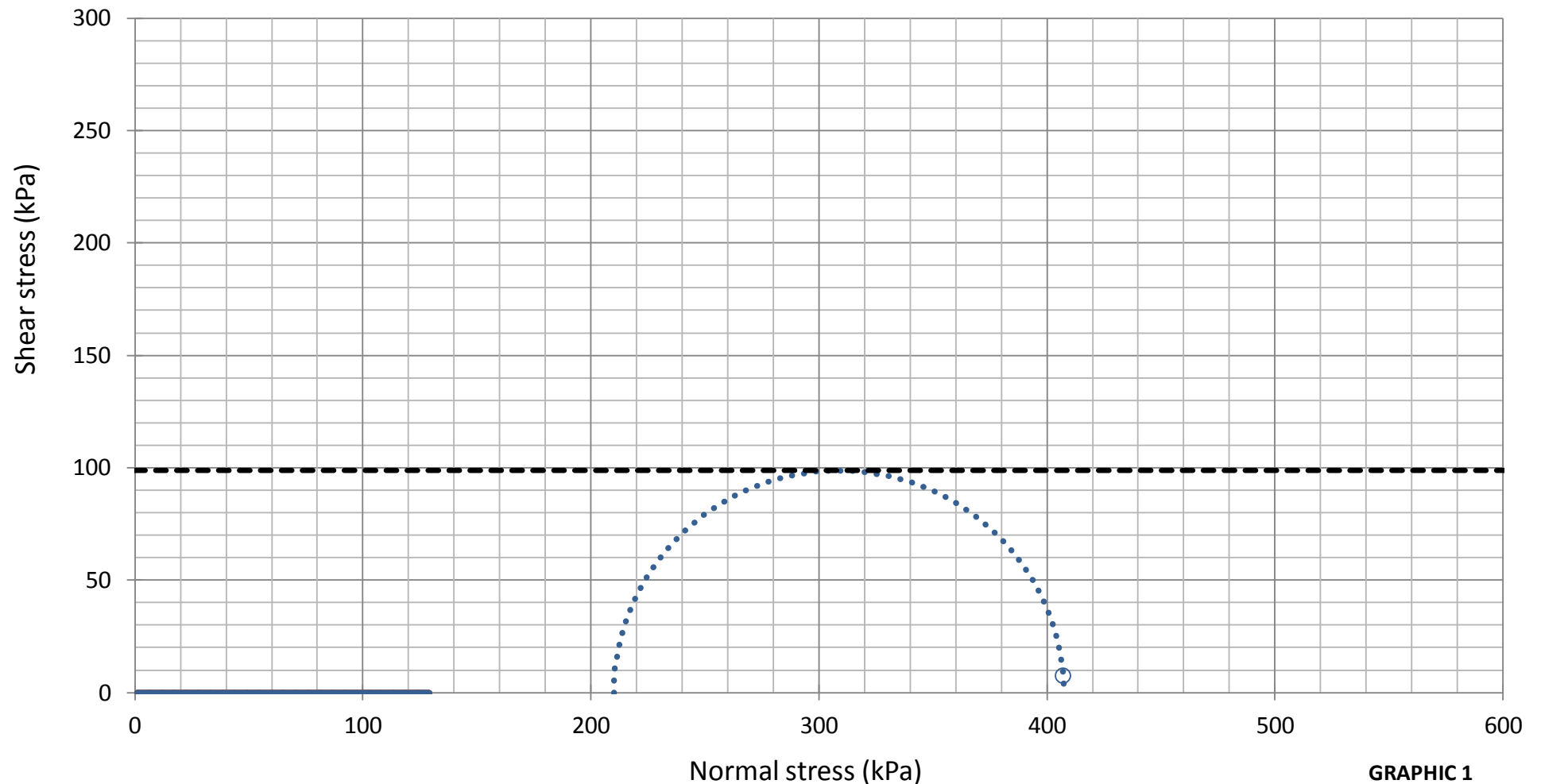
Prior saturation process	
Saturation prior to test	NO

Failure test results	
Specimen number	I
σ ₁ (kPa)	407.4
σ ₃ (kPa)	210.0
(σ ₁ -σ ₃)/2 (kPa)	98.7
(σ ₁ +σ ₃)/2 (kPa)	308.7

Test data and results	
Chamber pressure (kPa)	210
Back pressure, u _b (kPa)	0
Rate of axial displ. (mm/min)	0.8930
Major principal stress (kPa)	208.6
Failure stress (kPa)	197.4
Failure strain (%)	14.9

Estimate total	
Φ _u (°)	0.0
C _u (kPa)	99
C _u (kp/cm ²)	1.01

Graphic symbols						
	I total	II total	III total			



GRAPHIC 1

REMARKS

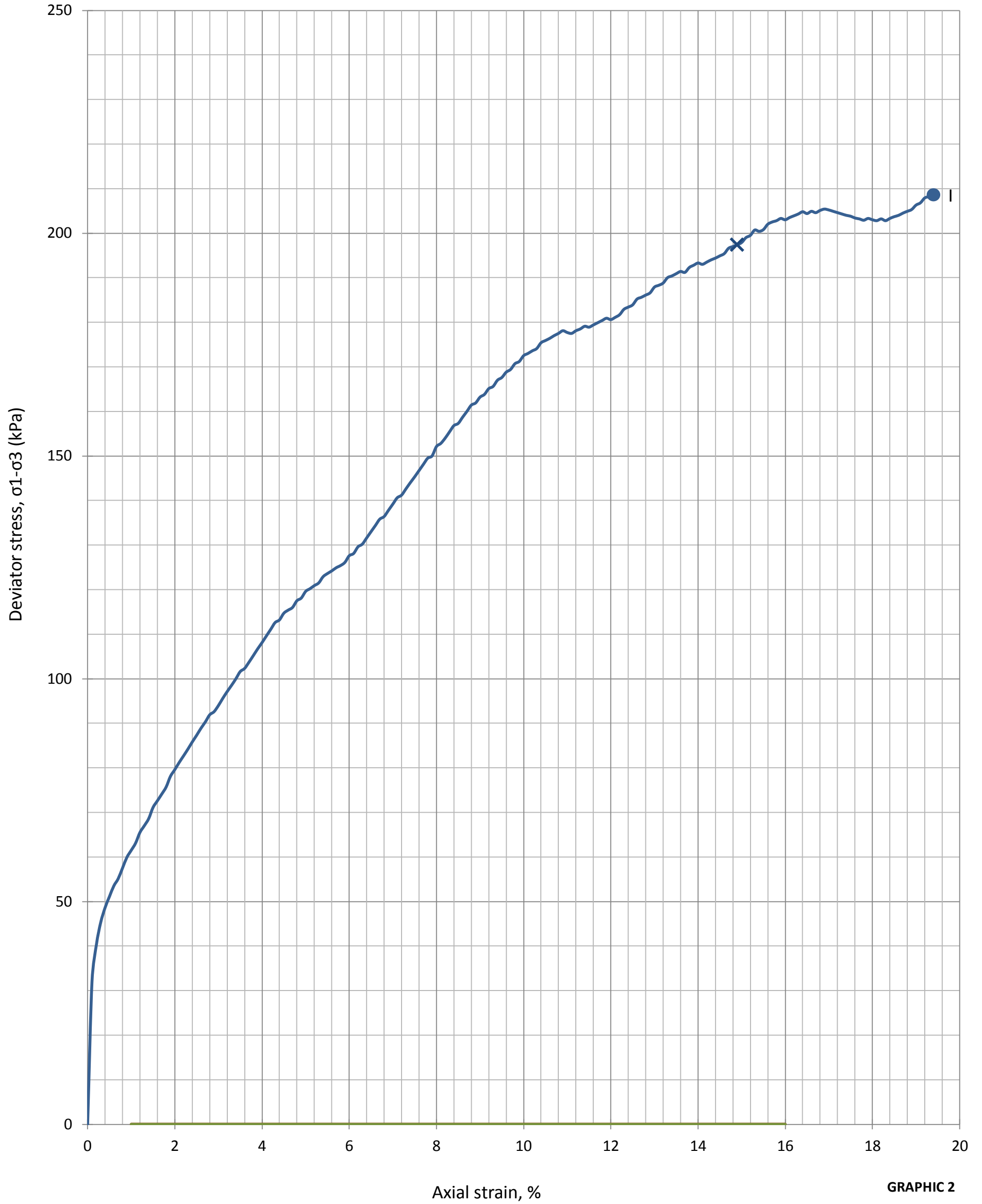
Operator: ALEX VANCELLS

Test final date: 10/10/2019

Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0464



GRAPHIC 2



Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0464

Failure process data summary

	Time sg	Deform. %	$(\sigma_1 - \sigma_3)_m$ kPa	$(\Delta\sigma_1)_m$ kPa	$(\Delta\sigma_1)_{fp}$ kPa	$(\sigma_1 - \sigma_3)$ kPa	u-ub kPa	ϵ_1	σ_1 kPa	σ'_1 kPa	σ'_3 kPa	Coeff. A	$(\sigma_1 + \sigma_3)/2$ kPa	$(\sigma_1 - \sigma_3)/2$ kPa	$(\sigma'_1 + \sigma'_3)/2$ kPa	$(\sigma'_1 - \sigma'_3)/2$ kPa
Specimen	0	0	0.0	0.0	0.0	0.0		0.000	210.0				210.0	0.0		
I	51	1.001	61.8	0.3	0.0	61.5		0.010	271.5				240.8	30.8		
Chamber pressure	102	2	80.2	0.6	0.0	79.6		0.020	289.6				249.8	39.8		
σ_3 , kPa	156	3.001	94.9	0.9	0.0	94.0		0.030	304.0				257.0	47.0		
210	210	4	109.3	1.2	0.0	108.1		0.040	318.1				264.1	54.1		
Back pressure	265	5.1	121.7	1.5	0.0	120.2		0.051	330.2				270.1	60.1		
u_b , kPa	314	6.1	129.9	1.8	0.0	128.1		0.061	338.1				274.1	64.1		
0	365	7.1	142.6	2.0	0.0	140.6		0.071	350.6				280.3	70.3		
σ'_3 , kPa	416	8.1	155.1	2.3	0.0	152.8		0.081	362.8				286.4	76.4		
210	469	9.1	166.4	2.6	0.0	163.8		0.091	373.8				291.9	81.9		
Rate of axial displ.	529	10.201	176.5	2.9	0.0	173.6		0.102	383.6				296.8	86.8		
mm/min	580	11.2	181.3	3.2	0.0	178.1		0.112	388.1				299.1	89.1		
0.8930	629	12.201	185.2	3.5	0.0	181.7		0.122	391.7				300.9	90.9		
	679	13.2	192.6	3.8	0.0	188.8		0.132	398.8				304.4	94.4		
	730	14.201	197.6	4.1	0.0	193.5		0.142	403.5				306.8	96.8		
	788	15.3	205.1	4.4	0.0	200.7		0.153	410.7				310.4	100.4		
	842	16.3	209.0	4.7	0.0	204.3		0.163	414.3				312.2	102.2		
	894	17.3	209.3	5.0	0.0	204.3		0.173	414.3				312.2	102.2		
	943	18.3	208.1	5.3	0.0	202.8		0.183	412.8				311.4	101.4		
	998	19.401	214.2	5.6	0.0	208.6		0.194	418.6				314.3	104.3		
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																

Report num.:	CB0019-19-0005
Edition date:	

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017

MB19-0464

Test data	
Employee ring type	FIXED
Height (cm)	1.963
Diameter (cm)	5.430
Volume (cm ³)	45.46
Ring weight (g)	106.86
Ring+soil weight (g)	184.19
Ini. weight wet soil (g)	77.33
Soil part. density (Mg/m ³)	2.747
Initial moisture content (%)	21.3
Initial bulk density (Mg/m ³)	1.70
Initial dry density (Mg/m ³)	1.40
Initial saturation degree (%)	60.82
Final moisture content (%)	27.0
Final bulk density (Mg/m ³)	2.00
Final dry density (Mg/m ³)	1.57

Equipment
OEDOMETER MATEST S260 (PLACE 3)
DATA ACQ. MODULE MECATEST-16
ELECT. TRANSD. LVDT SOLARTRON AX/5/S

Soil conditions
UNDISTURBED

Results	
Initial void ratio, e ₀	0.9621
Final void ratio, e _f	0.7428
Solid height, H _s (cm)	1.0005
Final height pore, H _{ps} (cm)	0.7432

Results																
Press. stage	Load date	Final time	Instant. settlement	Read. t= 8 sg	L ₀ (Casag. met.)	Final reading	Final sample height	Void ratio at L ₀	Final void ratio	Compr. ind. (*)	Swelling ind. (*)	Constr. mod. E _{oed}	Compr. coef. a _v	Cons. coef. c _v	Compr. coef. m _v	Sec. cons. coef. C _α
kPa		sg	mm	mm	mm	mm	cm	e _{L0}	e _f	c _c	c _s	kPa	1/kPa	cm ² /s)	1/kPa	C _α
20	09-10-19	87 073	0.255	0.255	0.232	0.445	1.9185	0.9389	0.9176					2.67E-03		8.77E-04
40	10-10-19	87 593	0.015	0.471	0.460	0.617	1.9013	0.9160	0.9003	0.0575		2 217	8.65E-04	9.43E-04	4.51E-04	1.34E-03
80	11-10-19	248 033	0.087	0.724	0.704	0.908	1.8722	0.8917	0.8713	0.0963		2 621	7.25E-04	1.24E-03	3.82E-04	1.19E-03
150	14-10-19	87 185	0.099	1.028	1.007	1.222	1.8408	0.8614	0.8399	0.1150		4 172	4.49E-04	2.11E-03	2.40E-04	1.62E-03
300	15-10-19	87 047	0.045	1.307	1.267	1.608	1.8022	0.8354	0.8013	0.1282		7 150	2.57E-04	7.47E-03	1.40E-04	1.61E-03
600	16-10-19	105 612	0.067	1.538	1.675	2.013	1.7617	0.7946	0.7608	0.1345		13 343	1.35E-04	7.08E-03	7.49E-05	1.52E-03
1000	17-10-19	89 755	0.046	2.071	2.059	2.301	1.7329	0.7562	0.7321	0.1294		24 541	7.18E-05	7.27E-03	4.07E-05	1.92E-03
1500	18-10-19	235 052	0.031	2.343	2.332	2.551	1.7080	0.7289	0.7071	0.1420		34 642	5.00E-05	5.59E-03	2.89E-05	1.82E-03
600	21-10-19	86 531	-0.055	2.498	2.496	2.481	1.7149	0.7126	0.7141		0.0176	219 484	7.78E-06		4.56E-06	
150	22-10-19	87 043	-0.096	2.379	2.385	2.359	1.7271	0.7237	0.7263		0.0203	63 225	2.71E-05		1.58E-05	
20	23-10-19	86 443	-0.025	2.319	2.334	2.193	1.7437	0.7288	0.7428		0.0189	13 601	1.27E-04		7.35E-05	

NOTE: Compression index (C_c) and swelling index (C_s), such as constrained modules (E_{oed}) and compressibility coefficient (a_v), are estimated between a pressure step and the immediately preceding as a first approximation, taking for calculatin the obtained void ratio values in the end of the considered pressure stage.

REMARKS

Operator: ALEX VANCELLS

Test final date: 24/10/2019

Report num.: CB0019-19-0005
 Edition date:

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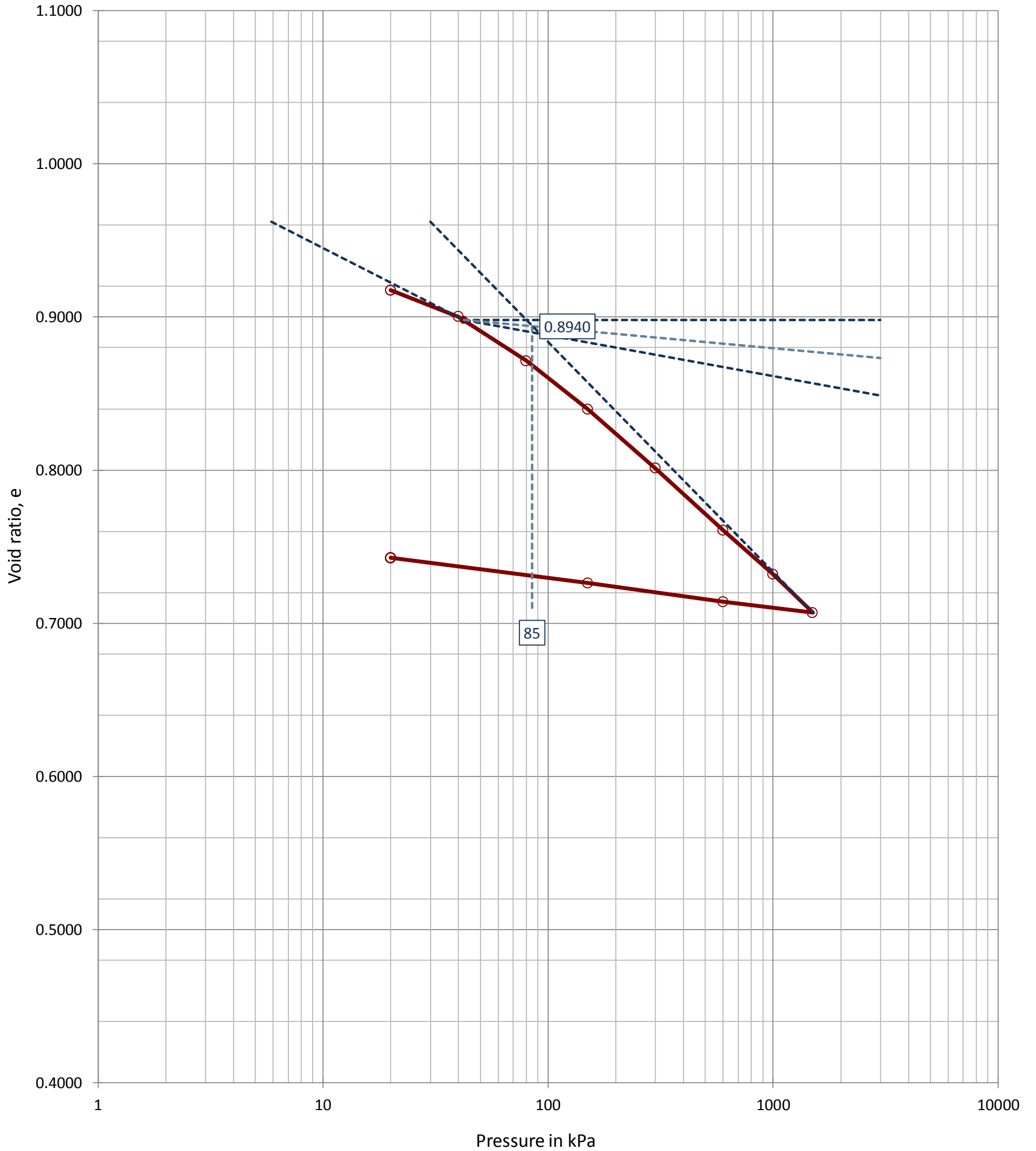
11 / 20

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
OEDOMETRIC CURVE

Sample reference
MB19-0464

Initial void ratio	0.9621
Final void ratio	0.7428
Initial moisture content (%)	21.3
Final moisture content (%)	27.0

Preconsolidation pres., σ'_p (kPa)	85
Void ratio	0.8940
Determination method	Casagrande
Compression index, cc	0.1501



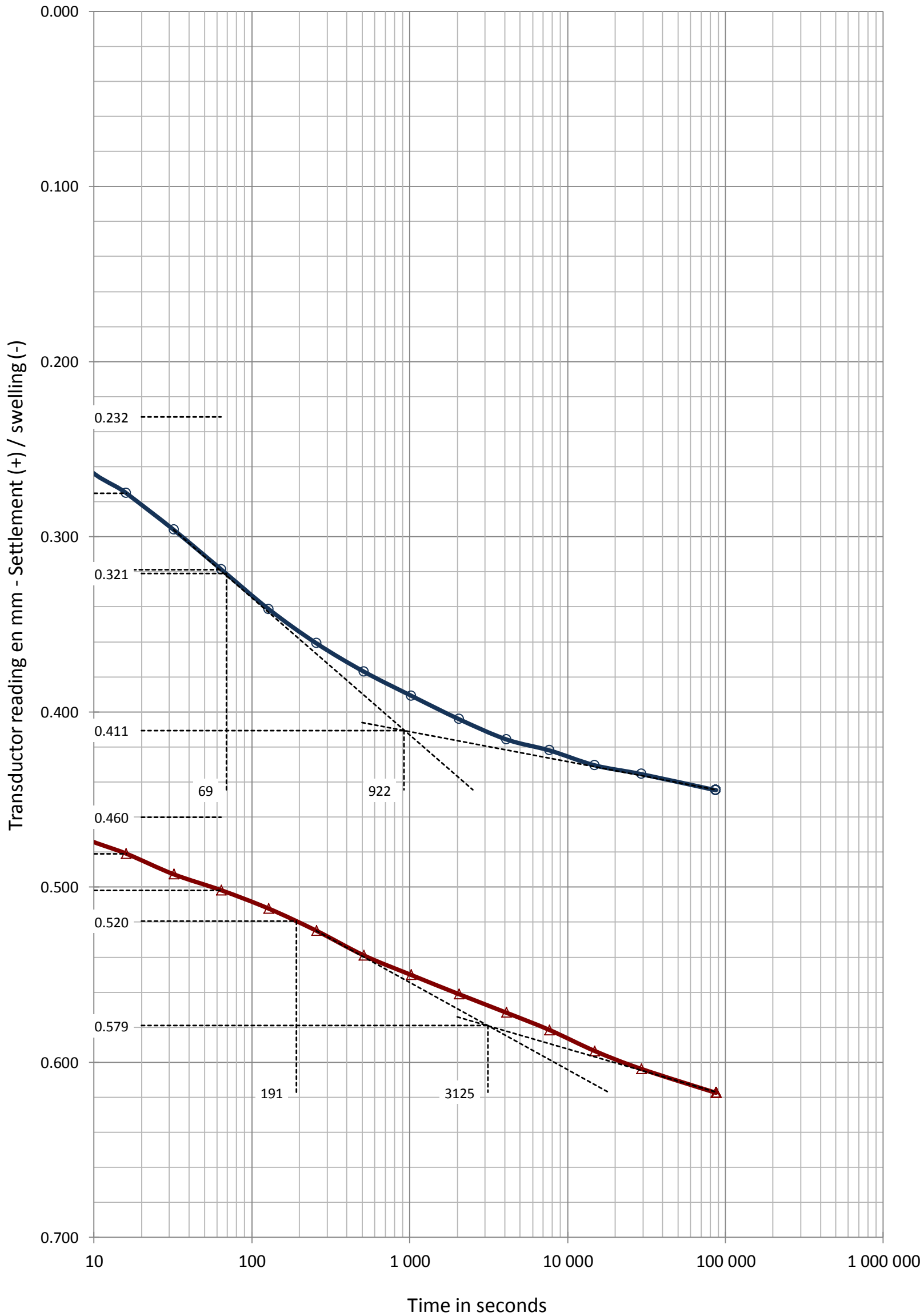
Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference
MB19-0464

Pressure stage (kPa)	20	40	Specimen diameter (cm)	5.430
L0 (Casagrande method)	0.232	0.460	Specimen initial height (cm)	1.963

Pressure stages	
Date	Date
09-oct-19	10-oct-19



Pressure (kPa)		Pressure (kPa)			
20		40			
Readings	Void ratio	Readings	Void ratio		
Settlement (+)		Settlement (+)			
sg	mm	sg	mm		
1	0.011	0.9609	1	0.445	0.9176
2	0.012	0.9608	2	0.436	0.9185
4	0.197	0.9424	4	0.453	0.9168
8	0.255	0.9366	8	0.471	0.9150
16	0.275	0.9345	16	0.481	0.9140
32	0.296	0.9324	32	0.493	0.9128
64	0.319	0.9302	64	0.502	0.9119
128	0.341	0.9279	128	0.512	0.9108
256	0.361	0.9260	256	0.525	0.9096
512	0.377	0.9243	512	0.539	0.9081
1 024	0.391	0.9230	1 024	0.550	0.9070
2 048	0.404	0.9216	2 048	0.561	0.9059
4 096	0.416	0.9205	4 096	0.572	0.9049
7 696	0.422	0.9198	7 696	0.582	0.9039
14 896	0.431	0.9190	14 896	0.594	0.9027
29 296	0.436	0.9185	29 296	0.604	0.9017
86 896	0.445	0.9176	86 896	0.617	0.9003
87 073	0.445	0.9176	87 593	0.617	0.9003

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 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0464

Pressure stages

Pressure stage (kPa)	80	150	Specimen diameter (cm)	5.430
L0 (Casagrande method)	0.704	1.007	Specimen initial height (cm)	1.963

Date	Date
11-oct-19	14-oct-19

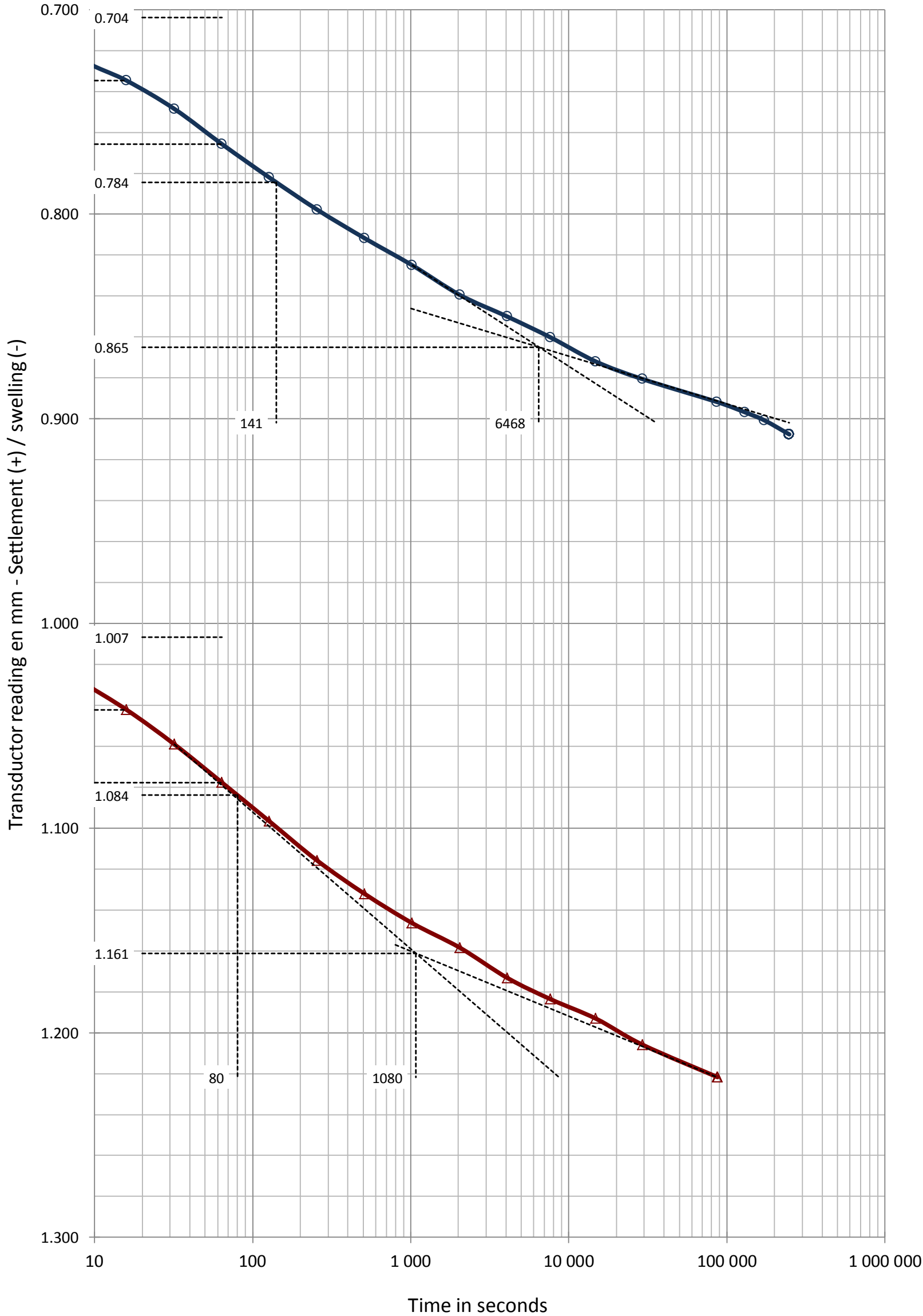
Pressure (kPa) Pressure (kPa)

80 **150**

Readings Void ratio
 Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e

0	0.617	0.9003	0	0.908	0.8713
1	0.617	0.9003	1	0.908	0.8713
2	0.617	0.9003	2	0.908	0.8713
4	0.703	0.8917	4	1.016	0.8605
8	0.724	0.8897	8	1.028	0.8593
16	0.735	0.8886	16	1.042	0.8578
32	0.749	0.8872	32	1.059	0.8562
64	0.766	0.8855	64	1.078	0.8543
128	0.782	0.8838	128	1.097	0.8524
256	0.798	0.8823	256	1.116	0.8505
512	0.812	0.8809	512	1.132	0.8489
1 024	0.825	0.8796	1 024	1.147	0.8474
2 048	0.840	0.8781	2 048	1.159	0.8462
4 096	0.850	0.8771	4 096	1.173	0.8447
7 696	0.860	0.8760	7 696	1.184	0.8437
14 896	0.872	0.8749	14 896	1.193	0.8428
29 296	0.881	0.8740	29 296	1.206	0.8415
86 896	0.892	0.8729	87 185	1.222	0.8399
130 096	0.897	0.8724			
173 296	0.901	0.8720			
248 033	0.908	0.8713			



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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0464

Pressure stages

Pressure stage (kPa)	300	600	Specimen diameter (cm)	5.430
L0 (Casagrande method)	1.267	1.675	Specimen initial height (cm)	1.963

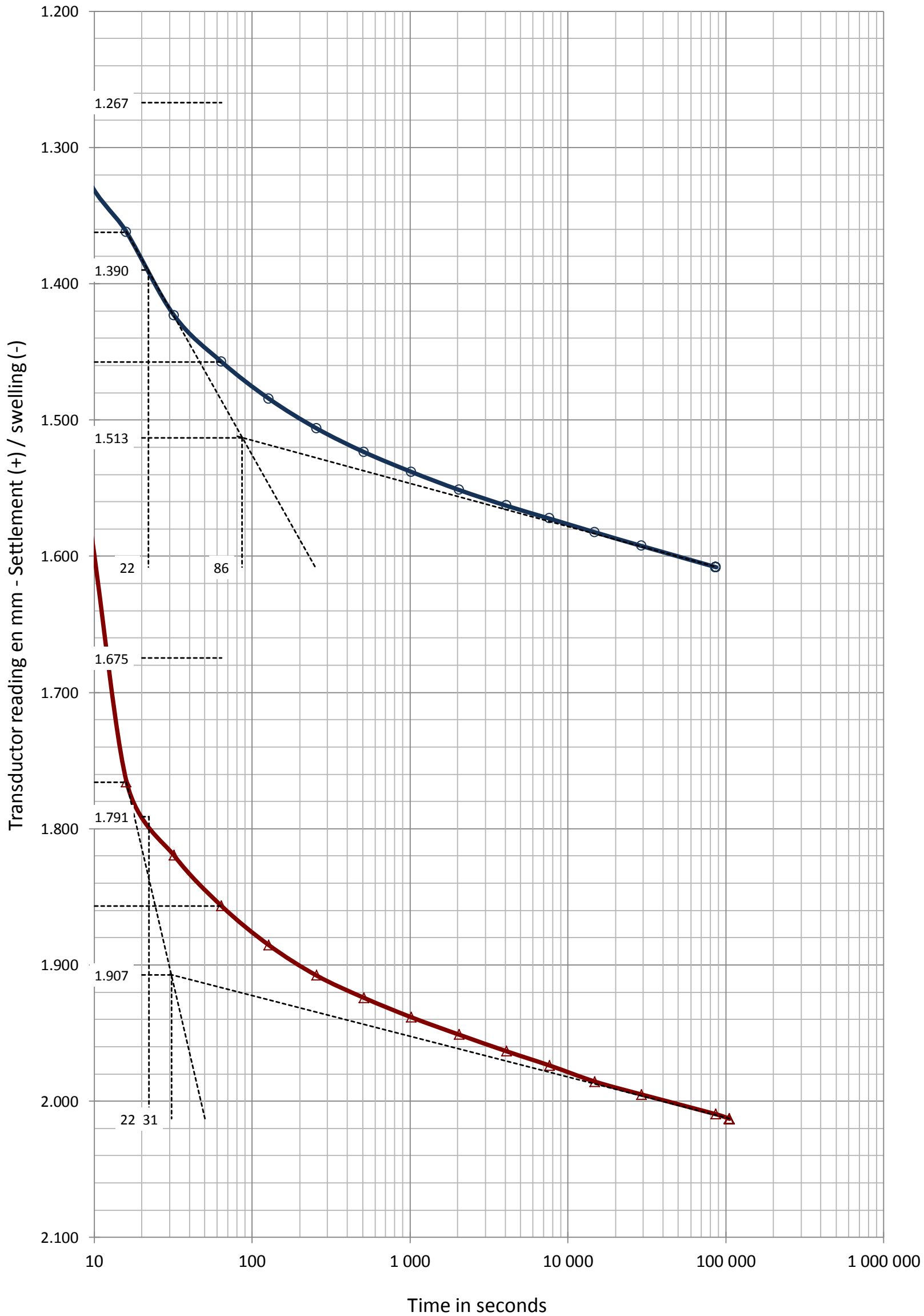
Date	Date
15-oct-19	16-oct-19

Pressure (kPa) Pressure (kPa)

300 **600**

Readings Void ratio
 Settlement (+) e Settlement (+) e

sg	mm	e	sg	mm	e
0	1.222	0.8399	0	1.608	0.8013
1	1.204	0.8417	1	1.608	0.8013
2	1.160	0.8461	2	1.598	0.8023
4	1.146	0.8475	4	1.549	0.8072
8	1.307	0.8314	8	1.538	0.8083
16	1.362	0.8259	16	1.766	0.7855
32	1.423	0.8198	32	1.820	0.7801
64	1.457	0.8164	64	1.857	0.7764
128	1.485	0.8136	128	1.886	0.7736
256	1.506	0.8115	256	1.908	0.7713
512	1.524	0.8097	512	1.924	0.7697
1 024	1.538	0.8083	1 024	1.939	0.7683
2 048	1.551	0.8070	2 048	1.951	0.7670
4 096	1.563	0.8058	4 096	1.963	0.7658
7 696	1.573	0.8048	7 696	1.974	0.7647
14 896	1.583	0.8038	14 896	1.986	0.7635
29 296	1.593	0.8028	29 296	1.995	0.7626
87 047	1.608	0.8013	86 896	2.010	0.7612
			105 612	2.013	0.7608



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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0464

Pressure stages

Pressure stage (kPa)	1000	1500	Specimen diameter (cm)	5.430
L0 (Casagrande method)	2.059	2.332	Specimen initial height (cm)	1.963

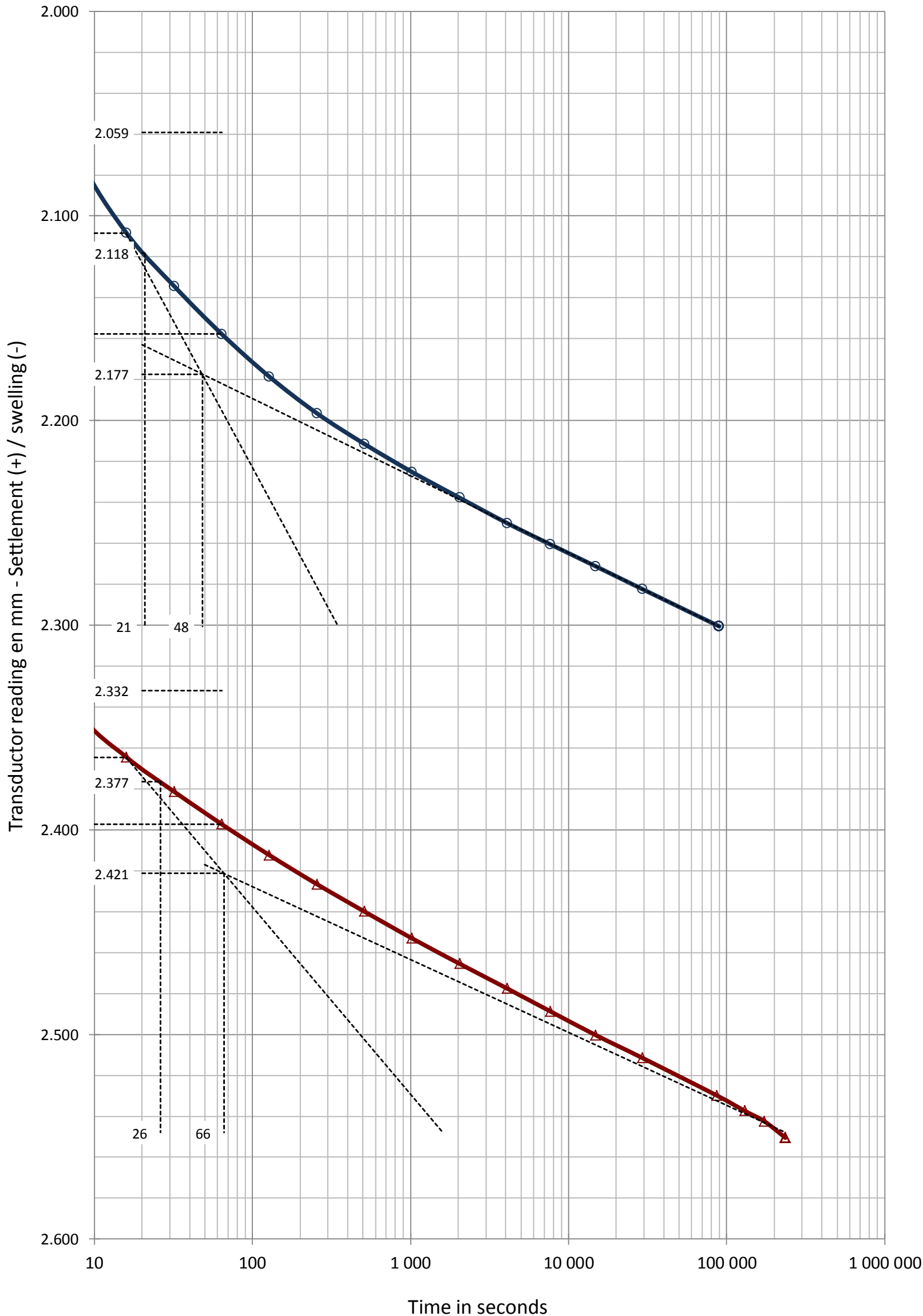
Date	Date
17-oct-19	18-oct-19

Pressure (kPa) Pressure (kPa)

1000 **1500**

Readings: Void ratio
 Settlement (+) Settlement (+)

sg mm e sg mm e



sg	mm	e	sg	mm	e
0	2.013	0.7608	0	2.301	0.7321
1	2.013	0.7608	1	2.297	0.7324
2	2.012	0.7609	2	2.296	0.7325
4	2.010	0.7611	4	2.296	0.7325
8	2.071	0.7550	8	2.343	0.7279
16	2.109	0.7513	16	2.365	0.7257
32	2.134	0.7487	32	2.381	0.7240
64	2.158	0.7463	64	2.397	0.7224
128	2.179	0.7443	128	2.412	0.7209
256	2.197	0.7425	256	2.427	0.7195
512	2.212	0.7410	512	2.440	0.7181
1 024	2.225	0.7396	1 024	2.453	0.7168
2 048	2.238	0.7384	2 048	2.466	0.7156
4 096	2.250	0.7371	4 096	2.478	0.7144
7 696	2.261	0.7361	7 696	2.489	0.7133
14 896	2.271	0.7350	14 896	2.500	0.7121
29 296	2.282	0.7339	29 296	2.512	0.7110
89 755	2.301	0.7321	86 896	2.530	0.7092
			130 096	2.537	0.7084
			173 296	2.543	0.7079
			235 052	2.551	0.7071

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 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

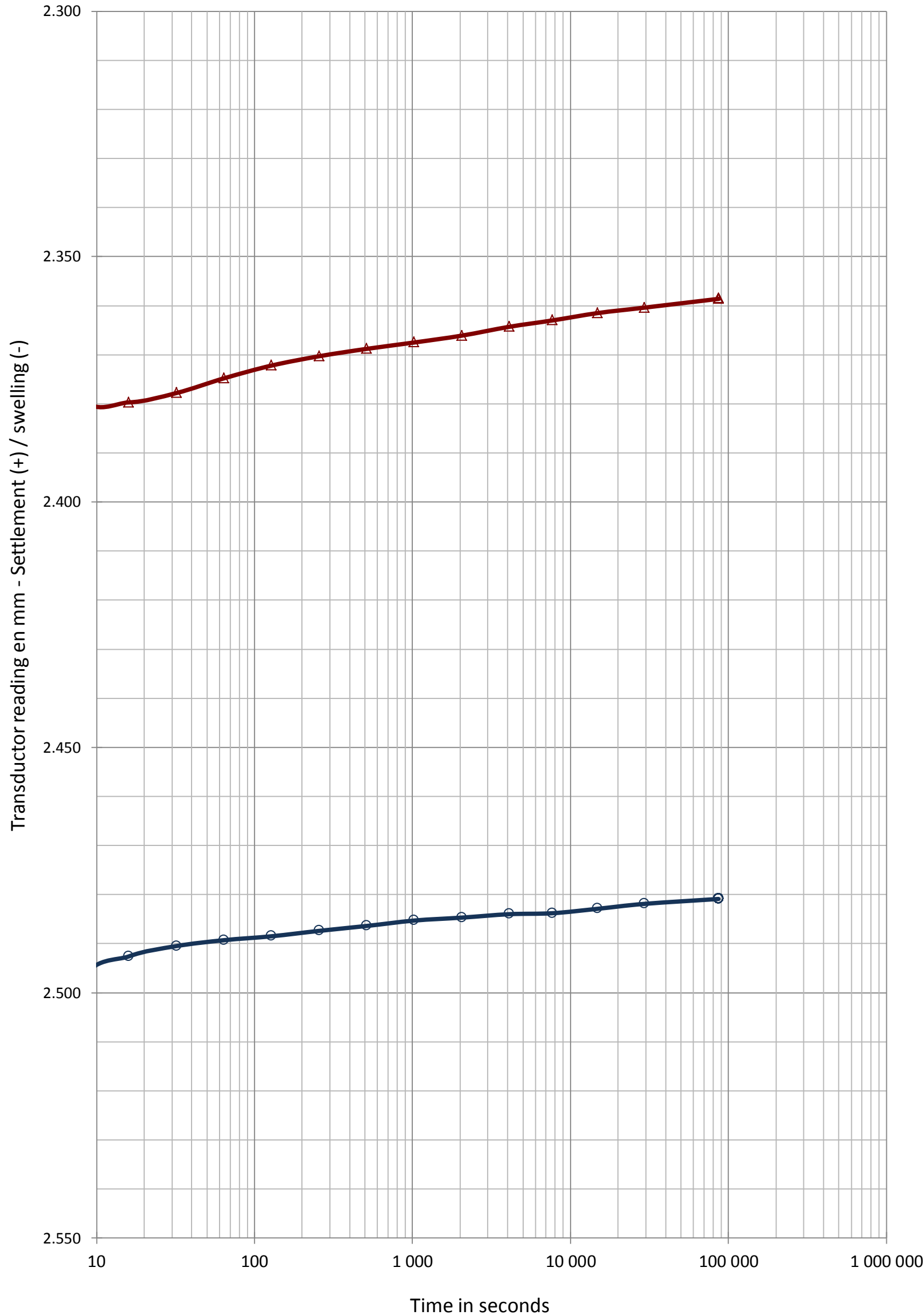
Sample reference

MB19-0464

Pressure stages

Date	Date
21-oct-19	22-oct-19

Pressure stage (kPa)	600	150	Specimen diameter (cm)	5.430
L0 (Casagrande method)	2.496	2.385	Specimen initial height (cm)	1.963



Pressure (kPa) 600			Pressure (kPa) 150		
Readings	Void ratio		Readings	Void ratio	
Settlement (+)			Settlement (+)		
sg	mm	e	sg	mm	e
0	2.551	0.7071	0	2.481	0.7141
1	2.550	0.7071	1	2.481	0.7141
2	2.550	0.7071	2	2.400	0.7221
4	2.530	0.7091	4	2.352	0.7269
8	2.498	0.7124	8	2.379	0.7243
16	2.493	0.7129	16	2.380	0.7242
32	2.491	0.7131	32	2.378	0.7244
64	2.489	0.7132	64	2.375	0.7247
128	2.489	0.7133	128	2.372	0.7249
256	2.487	0.7134	256	2.370	0.7251
512	2.486	0.7135	512	2.369	0.7253
1 024	2.485	0.7136	1 024	2.368	0.7254
2 048	2.485	0.7137	2 048	2.366	0.7255
4 096	2.484	0.7137	4 096	2.364	0.7257
7 696	2.484	0.7138	7 696	2.363	0.7258
14 896	2.483	0.7139	14 896	2.362	0.7260
29 296	2.482	0.7140	29 296	2.360	0.7261
86 531	2.481	0.7141	87 043	2.359	0.7263

Operator:

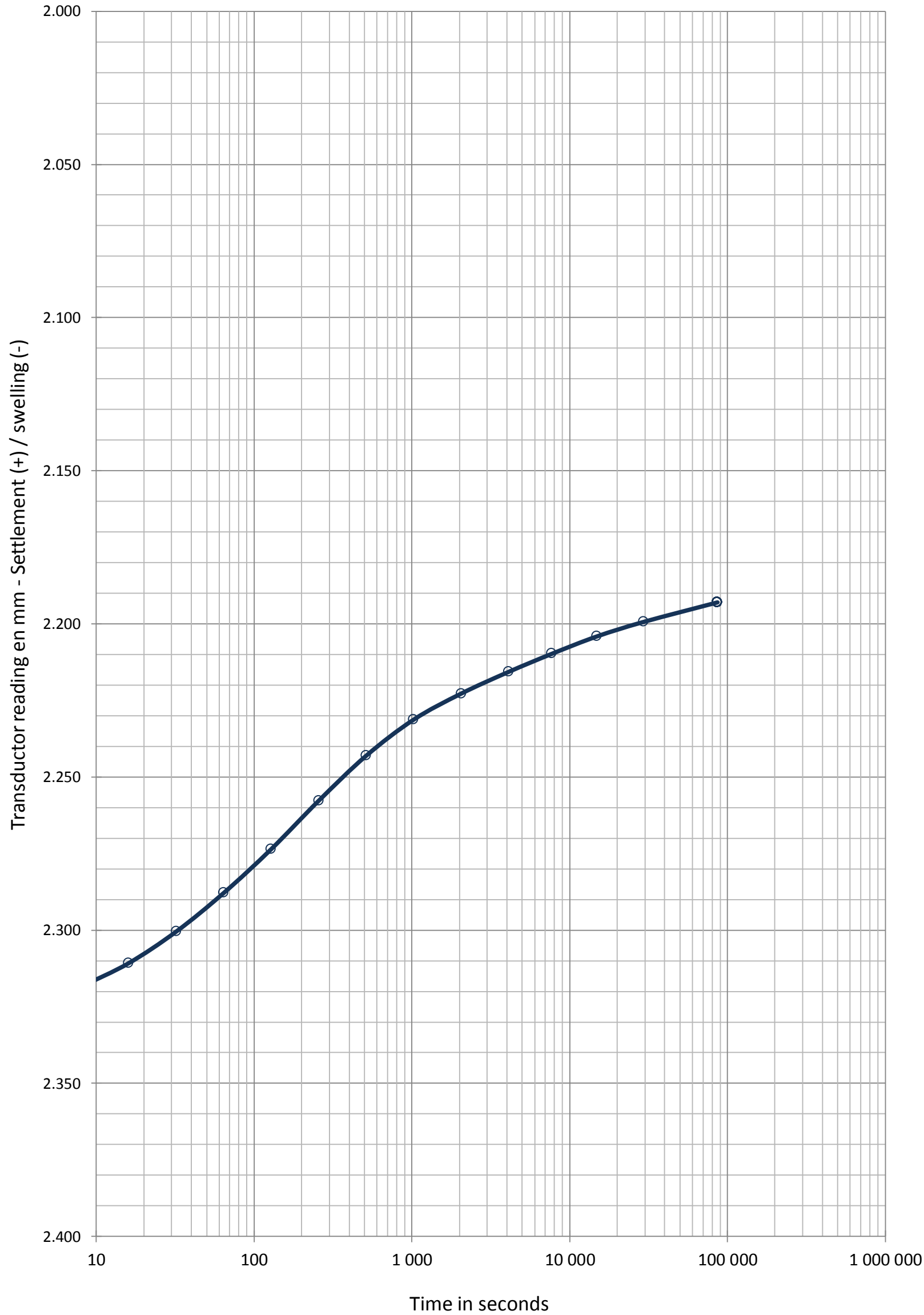
Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference
MB19-0464

Pressure stage (kPa) **20** Specimen diameter (cm) **5.430**
 L0 (Casagrande method) **2.334** Specimen initial height (cm) **1.963**

Pressure stages
 Date Date
 23-oct-19



Pressure (kPa)	Pressure (kPa)
20	
Readings	Readings
Settlement (+)	Settlement (+)
sg	sg
mm	mm
e	e
0	2.359
1	2.359
2	2.359
4	2.327
8	2.319
16	2.311
32	2.301
64	2.288
128	2.274
256	2.258
512	2.243
1 024	2.231
2 048	2.223
4 096	2.216
7 696	2.210
14 896	2.204
29 296	2.199
86 443	2.193

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FALL CONE TEST - ISO 17892-6:2017

MB19-0464

Equipment
PENETROMETER MATEST B057-11

Legend of symbols
cu Calculated Undrained Shear Strength (kPa)
cu(corr) Corrected Undrained Shear Strength (kPa)
cur Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	40.4	5.71	5.12	5.98	5.32	5.533	400	30	128	132	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	128
Corrected Undrained Shear Strength, cu(corr) (kPa)	132

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	6.84	6.16	6.25	6.85	6.525	400	30	74	
1	1	5.9	6.33	5.84	5.16	5.808	400	30	93	
1	3	5.85	5.53	4.91	5.06	5.338	400	30	110	
1	7	4.99	5.6	5.7	5.24	5.383	400	30	108	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	74

Thixotropy	
Loss at remoulding (%)	42
Recovery after 1 day (%)	35
Recovery after 7 days (%)	63

REMARKS

Report num.: CB0019-19-0005
Edition date:

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www.igeotest.com
Reg. Num. LECCE L0600292



20 / 20

Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0464

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 09-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.013 g

Equipment:

RESULT: **93.2 g/kg (total)**

MUFLA OVEN ETI HD150

87.2 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 3.076 g

Equipment:

RESULT: **49.8 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0465

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C_1 C_1.1
Top depth, m	2.75
Bottom depth, m	2.9
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	10-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark grayish brown (2.5Y 3/2) silty fine SAND with frequent clay pockets and millimetrical to centimetrical layers.	2.75	
	2.9	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0465



REMARKS

Operator: ALEX VANCELLS

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0465

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.71
Tare + soil + water (g)	201.75
Tare + soil (g)	184.88
Water (g)	16.87
Soil (g)	80.17
Moisture, w (%)	21.0

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	21.0

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	102.62
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.04
Dry density (Mg/m ³)	1.69

Operator: MARC COLOMER
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	2.04
Dry density (Mg/m³)	1.69

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0466

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_15 P_15.5
Top depth, m	0.1
Bottom depth, m	0.2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine to medium SAND with frequent shell fragments (fine to medium gravel sized)	0.1	
	0.2	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE TO PERFORM THE TEST

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0466



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0466

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	113.43
Tare + soil + water (g)	237.44
Tare + soil (g)	216.80
Water (g)	20.64
Soil (g)	103.37
Moisture, w (%)	20.0

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	20.0

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.02
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.89
Dry density (Mg/m ³)	1.58

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.89
Dry density (Mg/m³)	1.58

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	185.3960
Soil mass, M1 (g)	11.7940
Particle density, G20°C (Mg/m ³)	2.648

Operator: MARC COLOMER
Test final date: 05/09/2019

Results	
Particle density (Mg/m³)	2.648

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0466

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

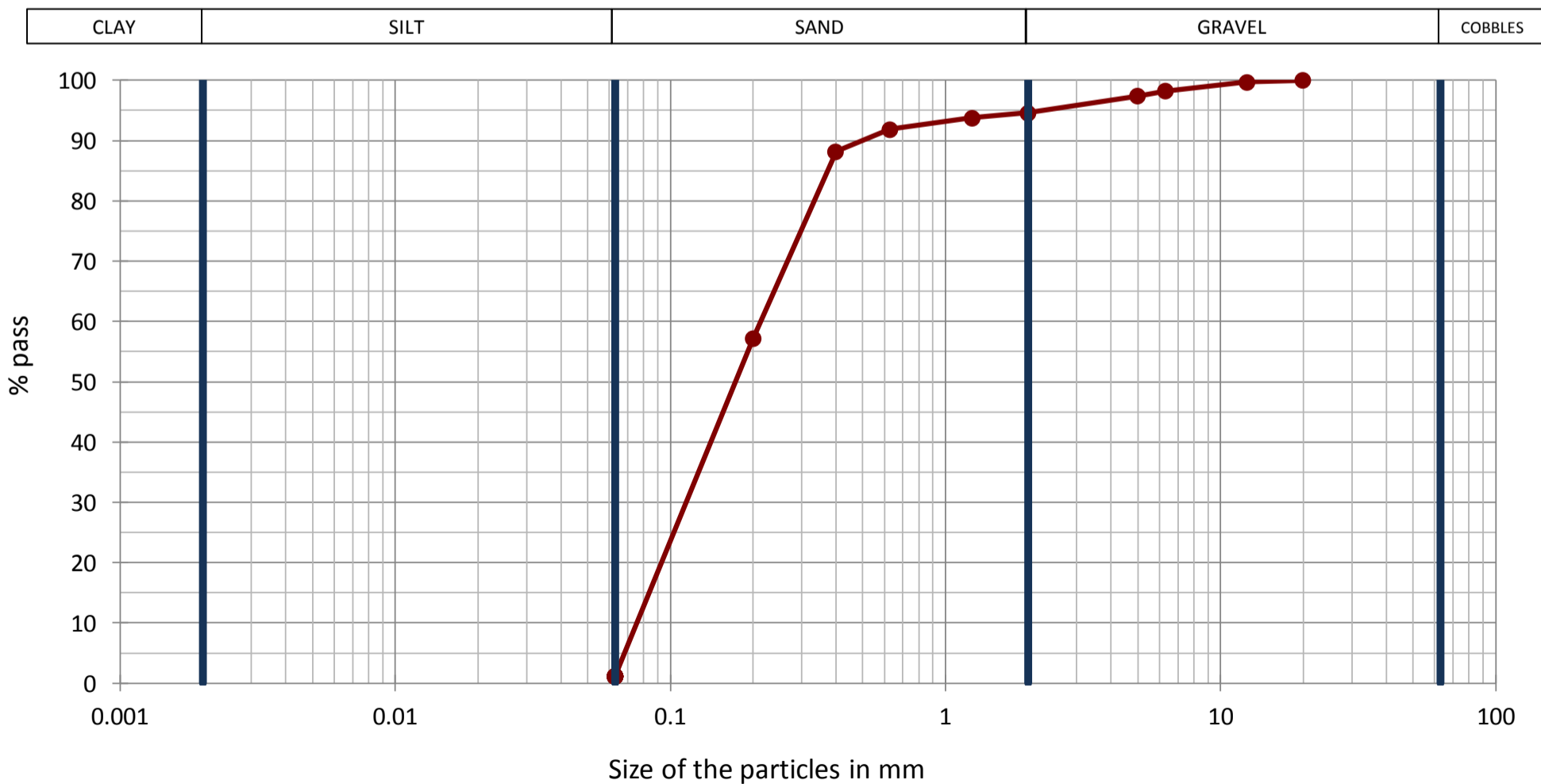
Total dried sample (g)	964.79
M. > 2mm, washed and dried (g)	52.18
M. < 2 mm, dried tested (g)	106.12
M. < 2 mm, dried tested (g)	105.90
M. < 2 mm, dried total (g)	910.69
Total dried sample (g)	962.87
Hygros. moisture, % (fraction<2 mm)	0.2
Corr. parameter, f (fraction<2 mm)	0.9979
Corr. parameter, f2 (fraction<2 mm)	8.5998

Results

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
20			0.00	0.0	962.87	100.0
12.5			2.79	0.3	960.08	99.7
6.3			14.40	1.8	945.68	98.2
5			7.70	2.6	937.98	97.4
2			27.29	5.4	910.69	94.6
1.25	0.93			6.2	902.69	93.8
0.63	2.08			8.1	884.81	91.9
0.4	4.14			11.8	849.20	88.2
0.2	34.75			42.8	550.36	57.2
0.063	62.60			98.8	12.01	1.2

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	5.4	% SAND	2-0.063 mm	93.4	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	2.7		
	% Medium gravel	20-6.3 mm	1.8	% Medium sand	0.63-0.2 mm	34.7		1.2
	% Fine gravel	6.3-2 mm	3.6	% Fine sand	0.2-0.063 mm	56.0		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. MEDIUM AND COARSE SAND ALSO CONTAINS SHELL FRAGMENTS.

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Sample reference

MB19-0466

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: ALEX VANCELLS

Test final date: 05-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.335 g

Equipment:

RESULT: **3.4 g/kg (total)**

MUFLA OVEN ETI HD150

0.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 17-09-19

Mean of analyzed soil mass: 3.031 g

Equipment:

RESULT: **24.5 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0467

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_15 P_15.4
Top depth, m	1.08
Bottom depth, m	1.21
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine to medium SAND with rare clay pockets, rare amorphous organic matter blackish zones and rare shell fragments	1.08	
	1.21	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0467



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0467

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.18
Tare + soil + water (g)	208.47
Tare + soil (g)	190.90
Water (g)	17.57
Soil (g)	86.72
Moisture, w (%)	20.3

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	20.3

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	91.66
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.83
Dry density (Mg/m ³)	1.52

Operator: MARC COLOMER
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.83
Dry density (Mg/m³)	1.52

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	185.2030
Soil mass, M1 (g)	10.9730
Particle density, G20°C (Mg/m ³)	2.633

Operator: MARC COLOMER
Test final date: 05/09/2019

Results	
Particle density (Mg/m³)	2.633

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0467

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

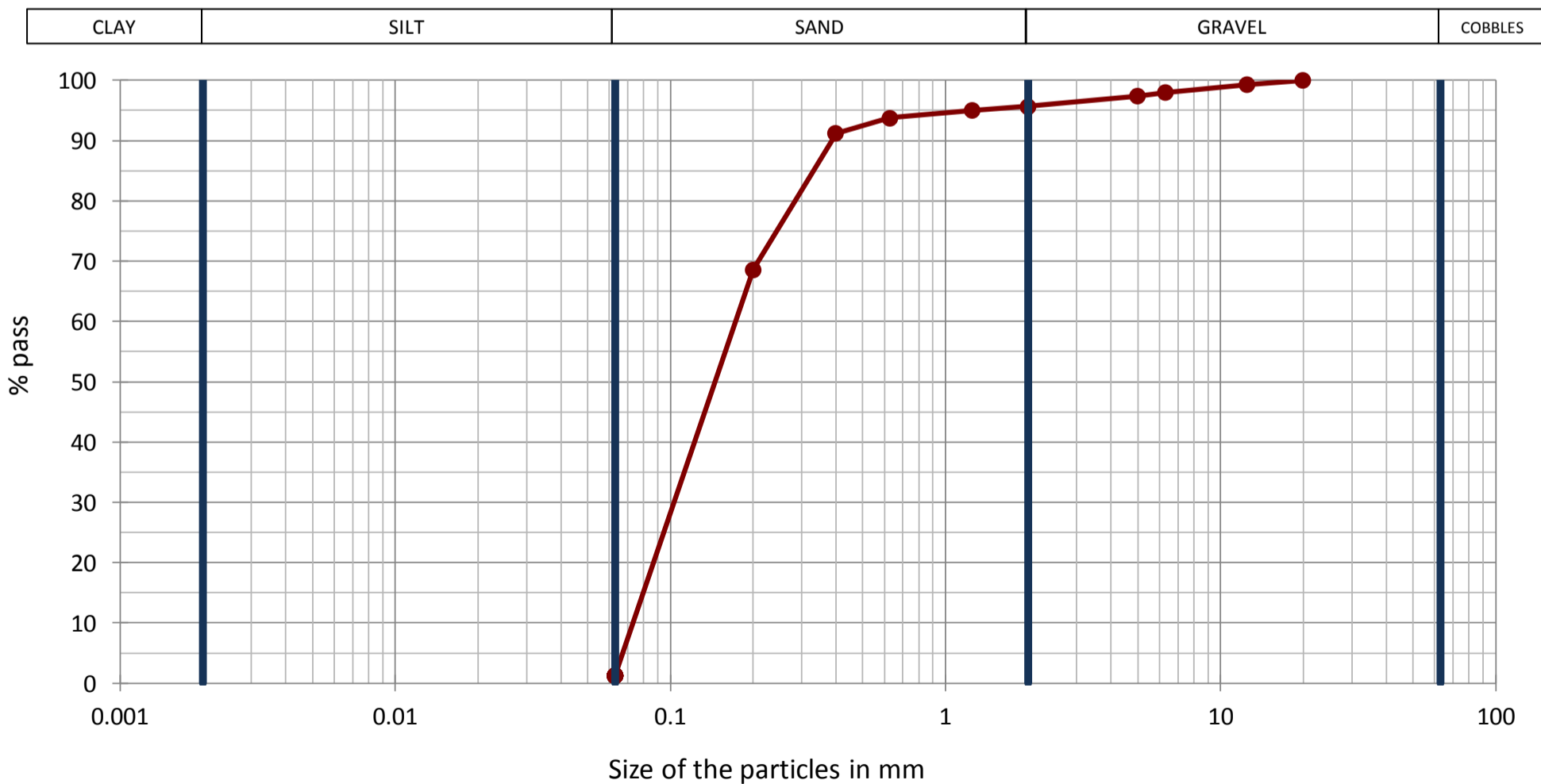
Total dried sample (g)	1202.64
M. > 2mm, washed and dried (g)	51.64
M. < 2 mm, dried tested (g)	105.04
M. < 2 mm, dried tested (g)	104.91
M. < 2 mm, dried total (g)	1149.59
Total dried sample (g)	1201.23
Hygros. moisture, % (fraction<2 mm)	0.1
Corr. parameter, f (fraction<2 mm)	0.9988
Corr. parameter, f2 (fraction<2 mm)	10.9577

Results

Sieves	Retained sieves			Pass total sample		
	Aperture mm	Partial g	Total g	Total %	g	%
20			0.00	0.0	1201.23	100.0
12.5			8.16	0.7	1193.07	99.3
6.3			16.35	2.0	1176.72	98.0
5			6.81	2.6	1169.91	97.4
2			20.32	4.3	1149.59	95.7
1.25	0.72			5.0	1141.70	95.0
0.63	1.37			6.2	1126.68	93.8
0.4	2.83			8.8	1095.67	91.2
0.2	24.81			31.4	823.81	68.6
0.063	73.72			98.7	16.01	1.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	4.3	% SAND	2-0.063 mm	94.4	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.9		
	% Medium gravel	20-6.3 mm	2.0	% Medium sand	0.63-0.2 mm	25.2		1.3
	% Fine gravel	6.3-2 mm	2.3	% Fine sand	0.2-0.063 mm	67.3		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. MEDIUM AND COARSE SAND ALSO CONTAINS SHELL FRAGMENTS.

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Sample reference

MB19-0467

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: ALEX VANCELLS

Test final date: 05-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.255 g

Equipment:

RESULT: **4.2 g/kg (total)**

MUFLA OVEN ETI HD150

0.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 17-09-19

Mean of analyzed soil mass: 2.577 g

Equipment:

RESULT: **31.2 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0468

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_15 P_15.3
Top depth, m	2.2
Bottom depth, m	2.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	30
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare clay pockets, rare amorphous organic matter blackish zones and rare shell fragments	2.2	
	2.5	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0468



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0468

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.14
Tare + soil + water (g)	224.59
Tare + soil (g)	204.87
Water (g)	19.72
Soil (g)	93.73
Moisture, w (%)	21.0

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	21.0

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	98.30
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.96
Dry density (Mg/m ³)	1.62

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.96
Dry density (Mg/m³)	1.62

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	185.5990
Soil mass, M1 (g)	12.0880
Particle density, G20°C (Mg/m ³)	2.660

Operator: GUILLEM MASSALLÉ
Test final date: 04/09/2019

Results	
Particle density (Mg/m³)	2.660

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0468

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

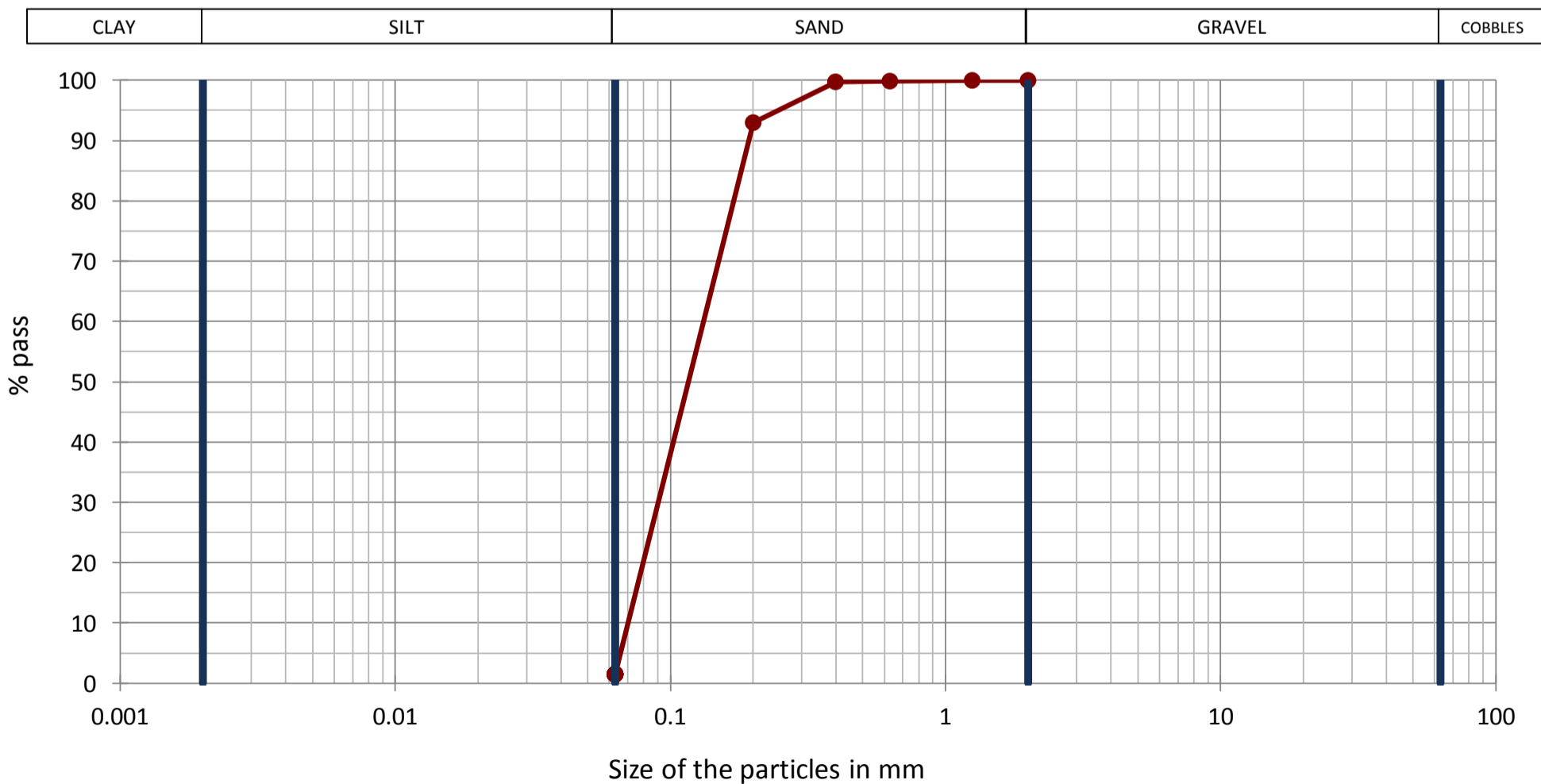
Previous calculations
 Total dried sample (g) **102.24**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9981**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2		0.00	0.0	102.04	100.0
1.25		0.02	0.0	102.02	100.0
0.63		0.04	0.1	101.98	99.9
0.4		0.14	0.2	101.84	99.8
0.2		6.98	7.0	94.86	93.0
0.063		93.32	98.5	1.54	1.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	6.9		1.5
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	91.5		



REMARKS

SAND CONTAINS SOME SHELL FRAGMENTS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0468

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Specimen dimensions

Specimen length (cm)	7.810
Specimen diameter (cm)	3.830
Specimen area (cm ²)	11.52
Specimen volume (cm ³)	89.97

Prior saturation process

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	16

Test data

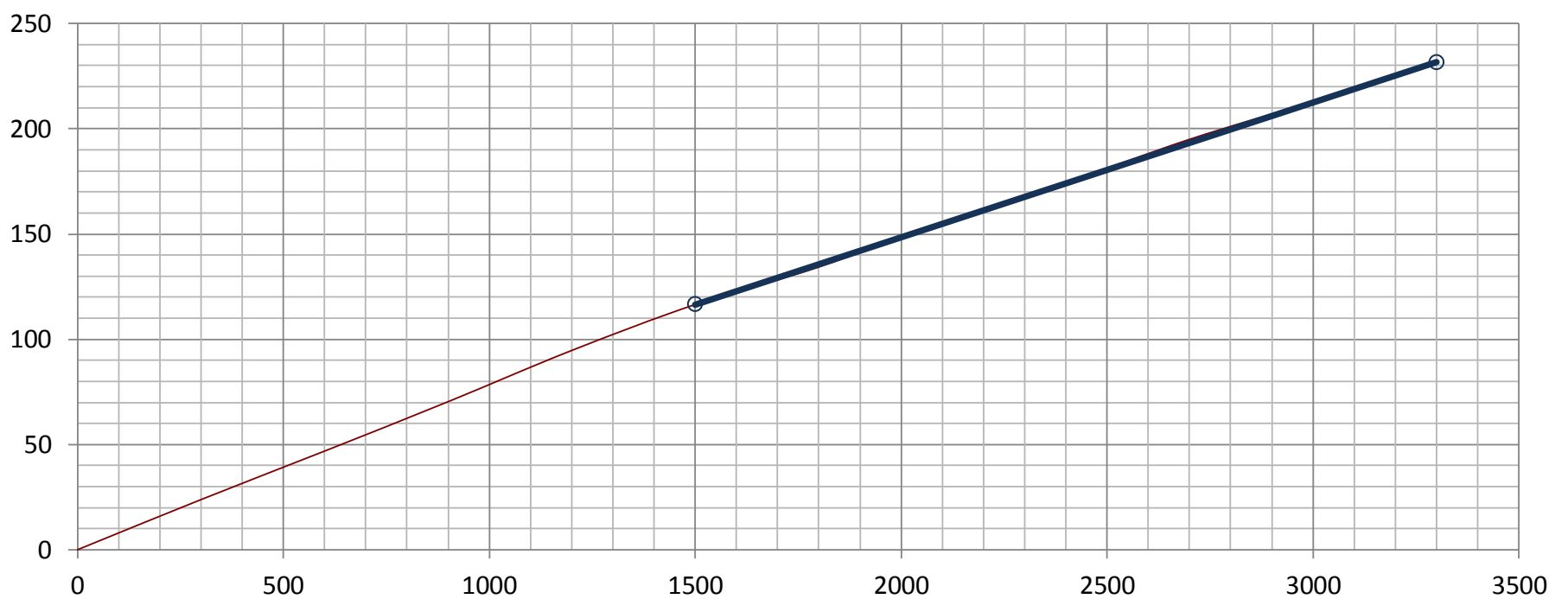
Soil weight (g)	167.84
Dry soil weight (g)	139.45
Initial moisture content (%)	20.7
Initial bulk density (Mg/m ³)	1.87
Initial dry density (Mg/m ³)	1.55
Initial void index, e ₀	0.7161
Initial saturation degree (%)	76.89
Final moisture content (%)	22.5
Final bulk density (Mg/m ³)	1.90
Final dry density (Mg/m ³)	1.55

Pressures applied during test execution

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results

Permeability constant, K (cm/s) 2.17E-04



REMARKS

Operator: GUILLEM MASSALLÉ

Test final date: 13/09/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0468

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 04-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.189 g

Equipment:

RESULT: **5.1 g/kg (total)**

MUFLA OVEN ETI HD150

0.2 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 17-09-19

Mean of analyzed soil mass: 2.179 g

Equipment:

RESULT: **41.1 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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7 / 7

DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993

Sample reference

MB19-0468

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6194
Soil mass, g	1377
Minimum density, Mg/m³	1.38

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6454
Soil mass, g	1637
Maximum density, Mg/m³	1.64

Relative density	
Dry density, Mg/m ³	1.62
Relative density, %	92

REMARKS

Operator: ALEX VANCELLS

Date final test: 03/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0469

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_15 P_15.2
Top depth, m	3.18
Bottom depth, m	3.31
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare clay pockets, rare amorphous organic matter blackish pockets and rare shell fragments	3.18	
	3.31	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
#N/A
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0469



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0469

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	109.60
Tare + soil + water (g)	207.16
Tare + soil (g)	189.98
Water (g)	17.18
Soil (g)	80.38
Moisture, w (%)	21.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	21.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	97.80
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.95
Dry density (Mg/m ³)	1.61

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.95
Dry density (Mg/m³)	1.61

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	185.1050
Soil mass, M1 (g)	10.7670
Particle density, G20°C (Mg/m ³)	2.652

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.652

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0469

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

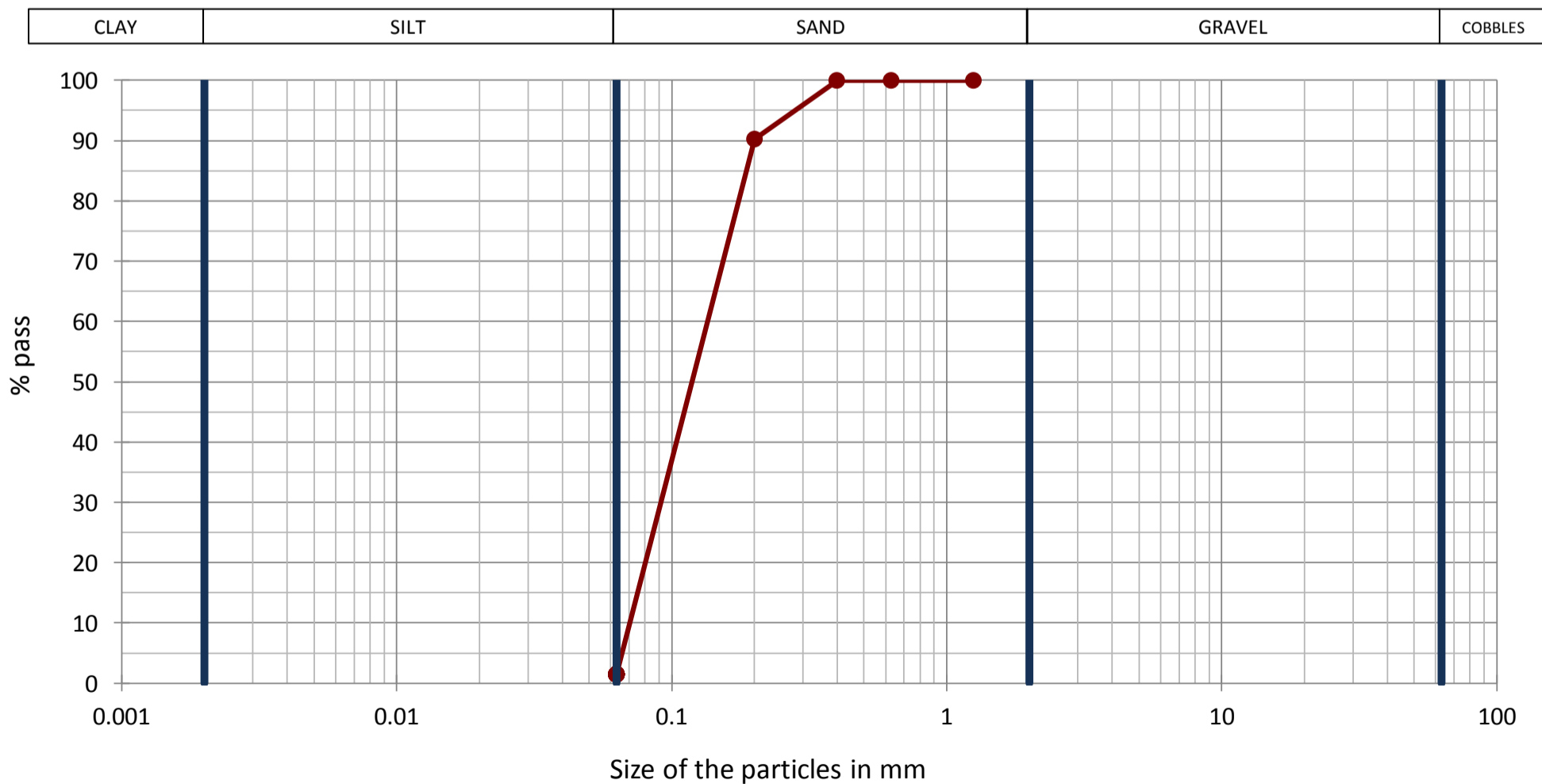
Previous calculations
 Total dried sample (g) **105.14**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9980**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
1.25		0.00	0.0	104.93	100.0
0.63		0.01	0.0	104.92	100.0
0.4		0.02	0.0	104.90	100.0
0.2		10.18	9.7	94.72	90.3
0.063		93.10	98.5	1.62	1.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0	1.5	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	9.7		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	88.8		



REMARKS

SAND CONTAINS SOME SHELL FRAGMENTS

Report num.: CB0019-19-0005
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Sample reference

MB19-0469

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-08-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.285 g

Equipment:

RESULT: **4.5 g/kg (total)**

MUFLA OVEN ETI HD150

2.7 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-08-19

Mean of analyzed soil mass: 9.81 g

Equipment:

RESULT: **15.4 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0470

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_15 P_15.1
Top depth, m	4.15
Bottom depth, m	4.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare clay pockets, rare amorphous organic matter blackish zones and rare shell fragments	4.15	
	4.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0470



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0470

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	107.65
Tare + soil + water (g)	205.01
Tare + soil (g)	187.46
Water (g)	17.55
Soil (g)	79.81
Moisture, w (%)	22.0

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	22.0

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.58
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.90
Dry density (Mg/m ³)	1.56

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.90
Dry density (Mg/m³)	1.56

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	19.8
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6749
Pyc. mass + soil + water at test temp. M2 (g)	185.4270
Soil mass, M1 (g)	10.8830
Particle density, G20°C (Mg/m ³)	2.625

Operator: MARC COLOMER
Test final date: 05/09/2019

Results	
Particle density (Mg/m³)	2.625

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0470

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

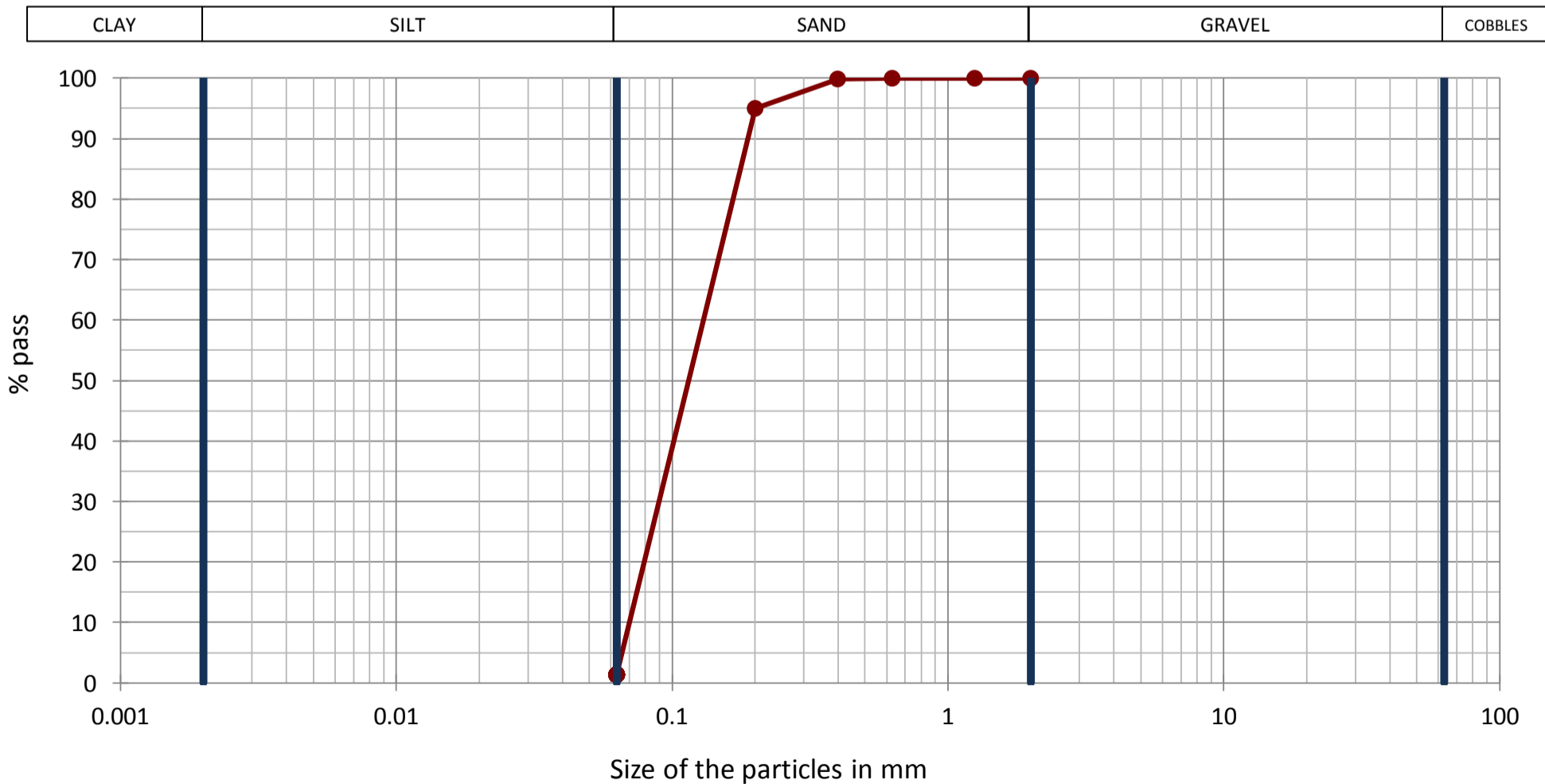
Previous calculations
 Total dried sample (g) **103.29**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9984**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2		0.00	0.0	103.13	100.0
1.25		0.02	0.0	103.11	100.0
0.63		0.03	0.0	103.08	100.0
0.4		0.08	0.1	103.00	99.9
0.2		4.98	5.0	98.02	95.0
0.063		96.59	98.6	1.43	1.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	5.0		1.4
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	93.6		



REMARKS

LA ARENA MEDIA Y GRUESA CONTIENE FRAGMENTOS DE CONCHAS

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Sample reference

MB19-0470

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 05-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.961 g

Equipment:

RESULT: **3.5 g/kg (total)**

MUFLA OVEN ETI HD150

2 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 17-09-19

Mean of analyzed soil mass: 4.067 g

Equipment:

RESULT: **12.5 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0471

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_14 P_14.6
Top depth, m	0.12
Bottom depth, m	0.25
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) fine to medium SAND with frequent gravel sized shell fragments and frequent amorphous organic matter blackish zones. Distinctive smell.	0.12	
	0.25	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0471



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0471

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.53
Tare + soil + water (g)	245.63
Tare + soil (g)	224.27
Water (g)	21.36
Soil (g)	112.74
Moisture, w (%)	18.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	18.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	88.15
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.76
Dry density (Mg/m ³)	1.48

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.76
Dry density (Mg/m³)	1.48

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	185.5150
Soil mass, M1 (g)	10.9970
Particle density, G20°C (Mg/m ³)	2.652

Operator: GUILLEM MASSALLÉ
Test final date: 01/10/2019

Results	
Particle density (Mg/m³)	2.652

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0471

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

Previous calculations

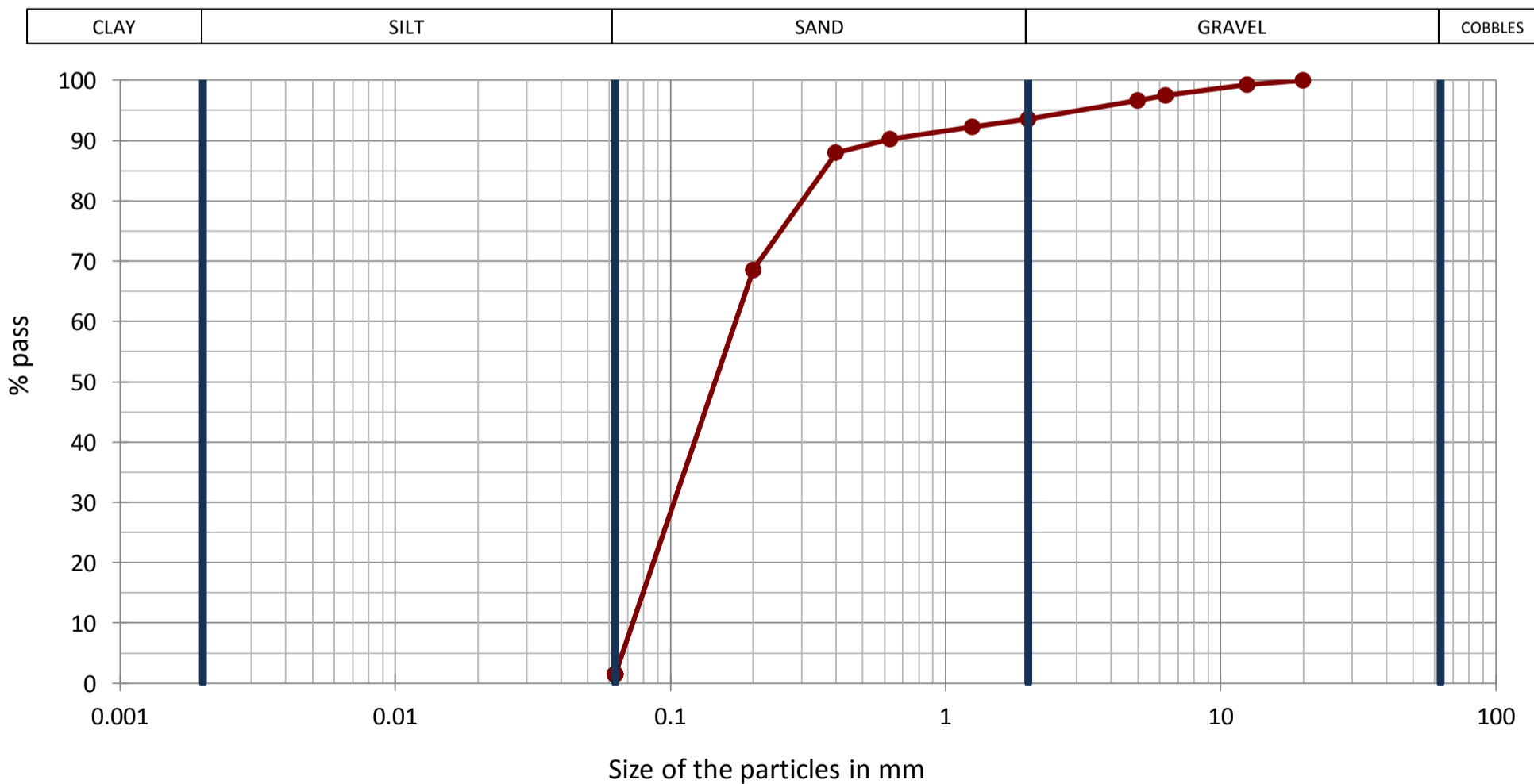
Total dried sample (g)	991.78
M. > 2mm, washed and dried (g)	63.26
M. < 2 mm, dried tested (g)	103.42
M. < 2 mm, dried tested (g)	103.29
M. < 2 mm, dried total (g)	927.33
Total dried sample (g)	990.59
Hygros. moisture, % (fraction<2 mm)	0.1
Corr. parameter, f (fraction<2 mm)	0.9987
Corr. parameter, f2 (fraction<2 mm)	8.9781

Results

Sieves	Retained sieves			Pass total sample		
	Aperture mm	Partial g	Total g	Total %	g	%
20			0.00	0.0	990.59	100.0
12.5			7.06	0.7	983.53	99.3
6.3			18.20	2.5	965.33	97.5
5			7.08	3.3	958.25	96.7
2			30.92	6.4	927.33	93.6
1.25	1.43			7.7	914.49	92.3
0.63	2.21			9.7	894.65	90.3
0.4	2.58			12.0	871.49	88.0
0.2	21.34			31.4	679.89	68.6
0.063	74.07			98.5	14.88	1.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	6.4	% SAND	2-0.063 mm	92.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	3.3	1.5	
	% Medium gravel	20-6.3 mm	2.5	% Medium sand	0.63-0.2 mm	21.7		
	% Fine gravel	6.3-2 mm	3.9	% Fine sand	0.2-0.063 mm	67.1		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SHELL FRAGMENTS.

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Sample reference

MB19-0471

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.132 g

Equipment:

RESULT: **3.8 g/kg (total)**

MUFLA OVEN ETI HD150

0 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass: 2.972 g

Equipment:

RESULT: **37.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0472

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_14 P_14.5
Top depth, m	0.7
Bottom depth, m	0.85
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive gray (5Y 5/2) medium to fine SAND with frequent shell fragments (some of them gravel sized).	0.7	
	0.85	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0472



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0472

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.32
Tare + soil + water (g)	214.86
Tare + soil (g)	196.13
Water (g)	18.73
Soil (g)	84.81
Moisture, w (%)	22.1

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	22.1

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	99.51
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.98
Dry density (Mg/m ³)	1.62

Operator: MARC COLOMER
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.98
Dry density (Mg/m³)	1.62

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	185.7790
Soil mass, M1 (g)	11.4020
Particle density, G20°C (Mg/m ³)	2.659

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.659

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0472

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

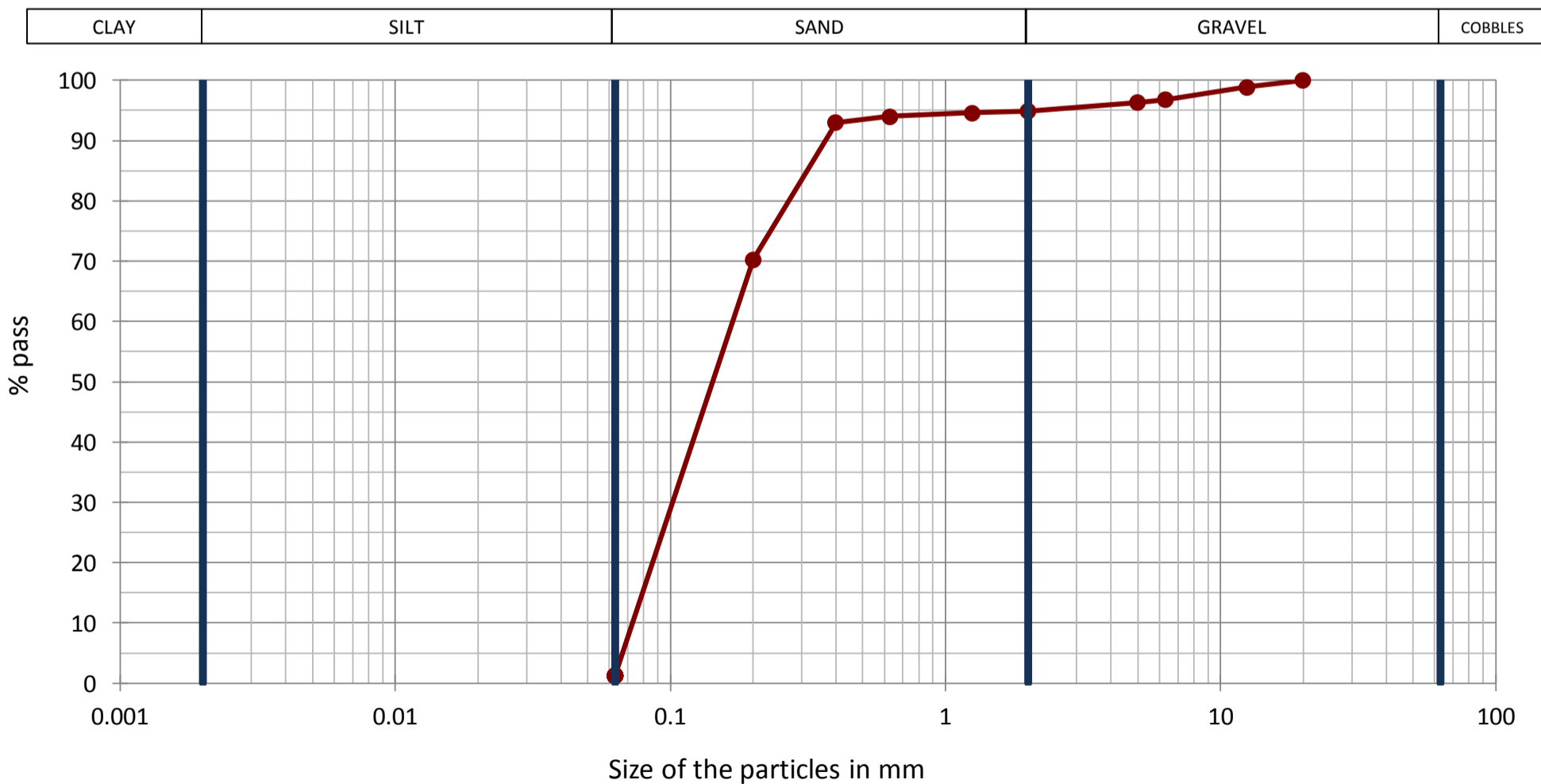
Total dried sample (g)	1003.72
M. > 2mm, washed and dried (g)	50.77
M. < 2 mm, dried tested (g)	102.43
M. < 2 mm, dried tested (g)	102.24
M. < 2 mm, dried total (g)	951.20
Total dried sample (g)	1001.97
Hygros. moisture, % (fraction<2 mm)	0.2
Corr. parameter, f (fraction<2 mm)	0.9982
Corr. parameter, f2 (fraction<2 mm)	9.3034

Results

Sieves	Retained sieves			Pass total sample		
	Aperture mm	Partial g	Total g	Total %	g	%
20			0.00	0.0	1001.97	100.0
12.5			10.59	1.1	991.38	98.9
6.3			21.16	3.2	970.22	96.8
5			5.36	3.7	964.86	96.3
2			13.66	5.1	951.20	94.9
1.25	0.40			5.4	947.48	94.6
0.63	0.59			6.0	941.99	94.0
0.4	1.05			7.0	932.22	93.0
0.2	24.51			29.7	704.19	70.3
0.063	74.28			98.7	13.13	1.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	5.1	% SAND	2-0.063 mm	93.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.9		
	% Medium gravel	20-6.3 mm	3.2	% Medium sand	0.63-0.2 mm	23.7		1.3
	% Fine gravel	6.3-2 mm	1.9	% Fine sand	0.2-0.063 mm	69.0		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SOME SHELL FRAGMENTS.

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Sample reference

MB19-0472

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 02-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.811 g

Equipment:

RESULT: **4.3 g/kg (total)**

MUFLA OVEN ETI HD150

1.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-08-19

Mean of analyzed soil mass: 8.572 g

Equipment:

RESULT: **23.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0473

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_14 P_14.4
Top depth, m	2.05
Bottom depth, m	2.4
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	35
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with occasional shell fragments (medium to coarse sand sized)	2.05	
	2.4	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0473



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0473

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.86
Tare + soil + water (g)	226.10
Tare + soil (g)	206.36
Water (g)	19.74
Soil (g)	94.50
Moisture, w (%)	20.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	20.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	92.74
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.85
Dry density (Mg/m ³)	1.53

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.85
Dry density (Mg/m³)	1.53

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	185.8200
Soil mass, M1 (g)	12.1010
Particle density, G20°C (Mg/m ³)	2.671

Operator: GUILLEM MASSALLÉ
Test final date: 05/09/2019

Results	
Particle density (Mg/m³)	2.671

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0473

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

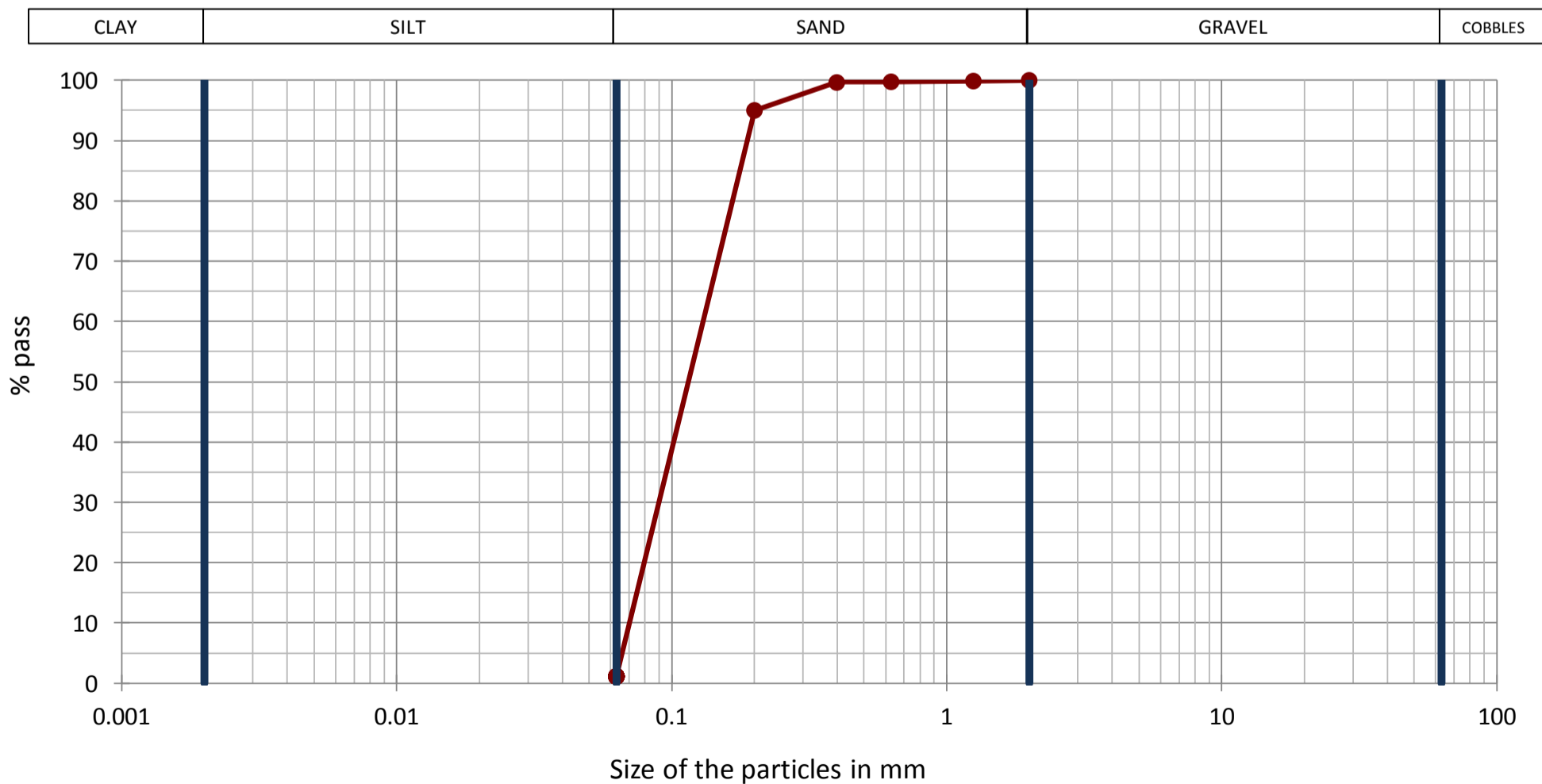
Previous calculations
 Total dried sample (g) **105.34**

 Hygrosc. moisture, % (fraction < 2 mm) **0.2**
 Corr. parameter, f (fraction < 2 mm) **0.9985**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
2			0.00	0.0	105.18	100.0
1.25			0.10	0.1	105.08	99.9
0.63			0.07	0.2	105.01	99.8
0.4			0.16	0.3	104.85	99.7
0.2			4.96	5.0	99.89	95.0
0.063			98.67	98.8	1.22	1.2

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.8	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.2		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	4.8		1.2
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	93.8		



REMARKS

MEDIUM AND COARSE SAND CONTAINS SHELL FRAGMENTS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0473

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Specimen dimensions

Specimen length (cm)	7.610
Specimen diameter (cm)	3.890
Specimen area (cm ²)	11.88
Specimen volume (cm ³)	90.41

Prior saturation process

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	17

Test data

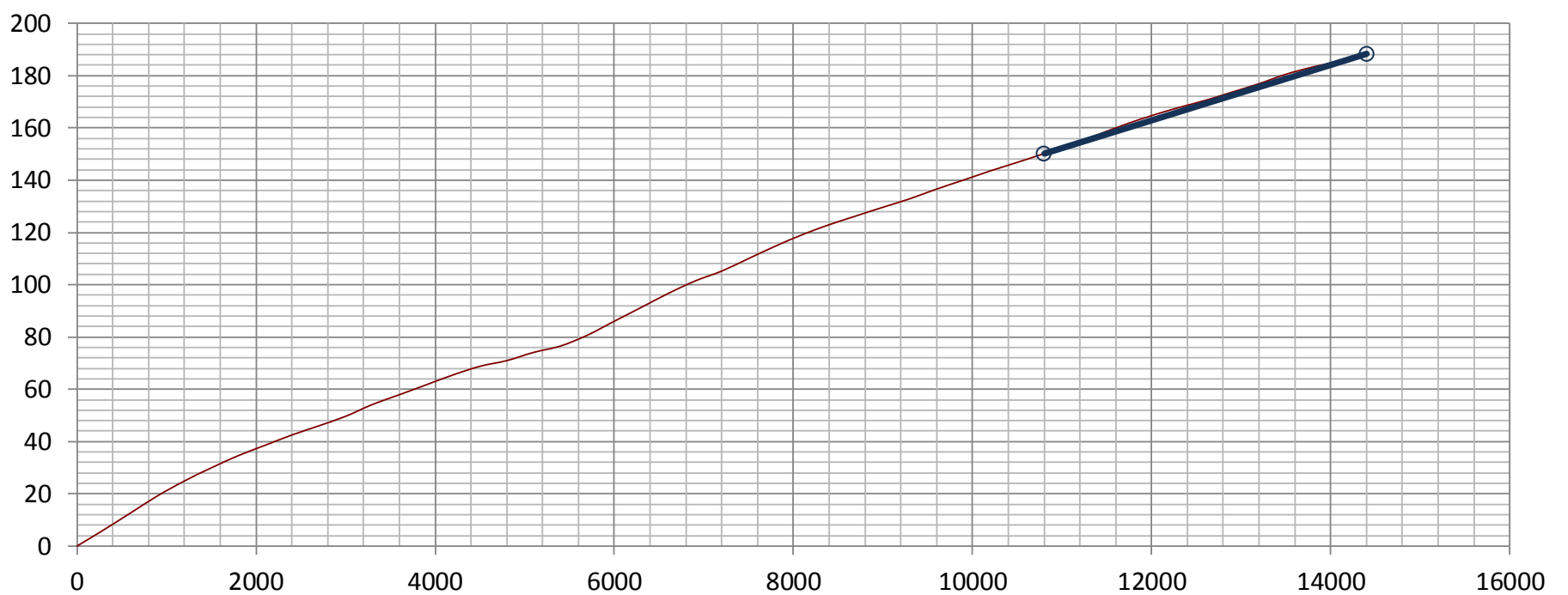
Soil weight (g)	181.38
Dry soil weight (g)	151.89
Initial moisture content (%)	20.0
Initial bulk density (Mg/m ³)	2.01
Initial dry density (Mg/m ³)	1.68
Initial void index, e ₀	0.5899
Initial saturation degree (%)	90.56
Final moisture content (%)	22.5
Final bulk density (Mg/m ³)	2.06
Final dry density (Mg/m ³)	1.68

Pressures applied during test execution

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results

Permeability constant, K (cm/s) 3.39E-05



REMARKS

Operator: ALEX VANCELLS

Test final date: 16/09/2019

Report num.: CB0019-19-0005
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Sample reference

MB19-0473

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 02-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.334 g

Equipment:

RESULT: **3.2 g/kg (total)**

MUFLA OVEN ETI HD150

2.4 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 17-09-19

Mean of analyzed soil mass: 12.083 g

Equipment:

RESULT: **6.4 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0473

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6211
Soil mass, g	1394
Minimum density, Mg/m³	1.40

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6503
Soil mass, g	1686
Maximum density, Mg/m³	1.69

Relative density	
Dry density, Mg/m ³	1.53
Relative density, %	45

REMARKS

Operator: JOAN SAHUN

Date final test: 04/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0474

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_14 P_14.3
Top depth, m	2.9
Bottom depth, m	3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with occasional medium sand, rare milimetrical clay pockets and occasional shell fragments (medium sand to medium gravel sized).	2.9	

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CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0474



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0474

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	105.78
Tare + soil + water (g)	223.92
Tare + soil (g)	205.47
Water (g)	18.45
Soil (g)	99.69
Moisture, w (%)	18.5

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	18.5

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.93
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.91
Dry density (Mg/m ³)	1.61

Operator: MARC COLOMER
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.91
Dry density (Mg/m³)	1.61

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	185.3540
Soil mass, M1 (g)	10.6710
Particle density, G20°C (Mg/m ³)	2.680

Operator: GUILLEM MASSALLÉ
Test final date: 04/09/2019

Results	
Particle density (Mg/m³)	2.680

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0474

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

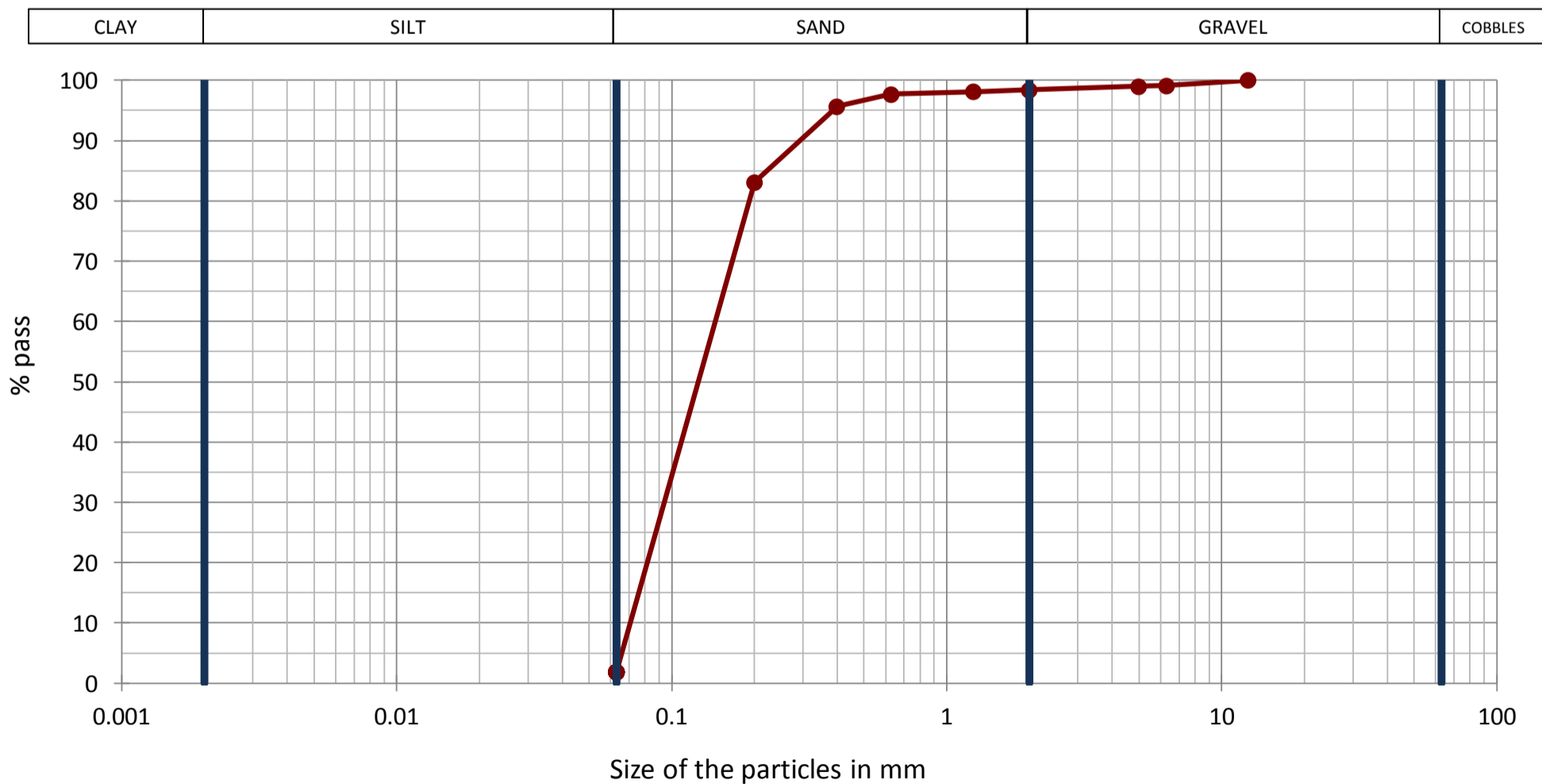
Previous calculations
 Total dried sample (g) **103.72**

 Hygrosc. moisture, % (fraction < 2 mm) **0.1**
 Corr. parameter, f (fraction < 2 mm) **0.9987**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
12.5		0.00	0.0	103.58	100.0
6.3		0.93	0.9	102.65	99.1
5		0.09	1.0	102.56	99.0
2		0.66	1.6	101.90	98.4
1.25		0.30	1.9	101.60	98.1
0.63		0.44	2.3	101.16	97.7
0.4		2.01	4.3	99.15	95.7
0.2		13.06	16.9	86.09	83.1
0.063		84.09	98.1	2.00	1.9

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	1.6	% SAND	2-0.063 mm	96.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.7	1.9	
	% Medium gravel	20-6.3 mm	0.9	% Medium sand	0.63-0.2 mm	14.6		
	% Fine gravel	6.3-2 mm	0.7	% Fine sand	0.2-0.063 mm	81.2		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SHELL FRAGMENTS AND RARE ORGANIC MATTER.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0474

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 04-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.294 g

Equipment:

RESULT: **3.9 g/kg (total)**

MUFLA OVEN ETI HD150

0 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: GUILLEM MASSALLÉ

Test final date: 17-09-19

Mean of analyzed soil mass: 2.177 g

Equipment:

RESULT: **41.2 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0474

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6279
Soil mass, g	1462
Minimum density, Mg/m³	1.47

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6525
Soil mass, g	1708
Maximum density, Mg/m³	1.71

Relative density	
Dry density, Mg/m ³	1.61
Relative density, %	58

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0475

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_14 P_14.2
Top depth, m	4.1
Bottom depth, m	4.25
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) medium to fine SAND with frequent shell fragments (gravel sized)	4.1	
	4.25	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0475



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0475

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	106.79
Tare + soil + water (g)	253.85
Tare + soil (g)	234.94
Water (g)	18.91
Soil (g)	128.15
Moisture, w (%)	14.8

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	14.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	88.28
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.76
Dry density (Mg/m ³)	1.53

Operator: ALEX VANCELLS
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.76
Dry density (Mg/m³)	1.53

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	183.5480
Soil mass, M1 (g)	10.3940
Particle density, G20°C (Mg/m ³)	2.654

Operator: GUILLEM MASSALLÉ
Test final date: 04/09/2019

Results	
Particle density (Mg/m³)	2.654

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0475

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

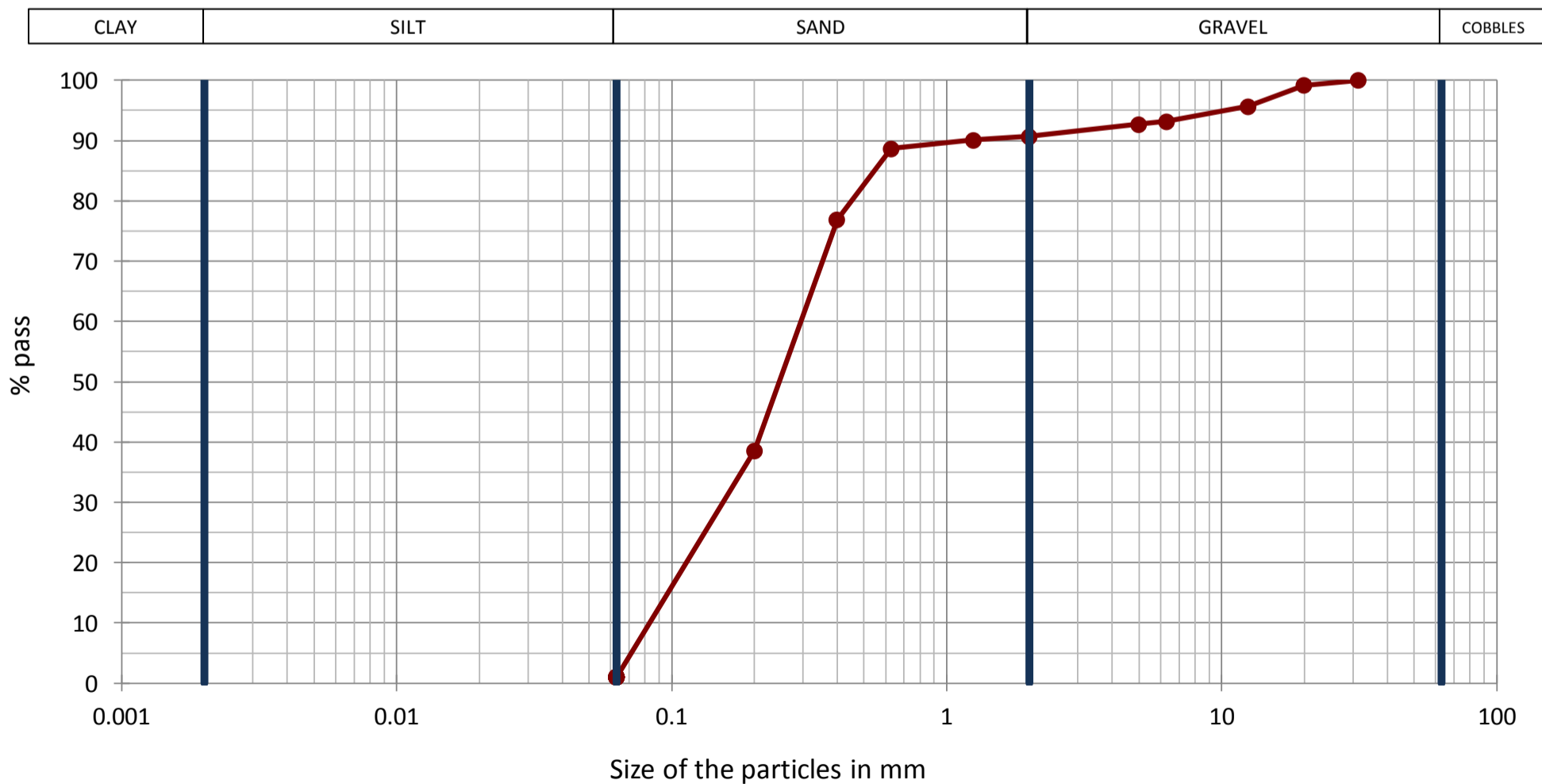
Total dried sample (g)	1556.56
M. > 2mm, washed and dried (g)	144.54
M. < 2 mm, dried tested (g)	106.75
M. < 2 mm, dried tested (g)	106.66
M. < 2 mm, dried total (g)	1410.83
Total dried sample (g)	1555.37
Hygros. moisture, % (fraction<2 mm)	0.1
Corr. parameter, f (fraction<2 mm)	0.9992
Corr. parameter, f2 (fraction<2 mm)	13.2274

Results

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
31.5			0.00	0.0	1555.37	100.0
20			12.33	0.8	1543.04	99.2
12.5			54.27	4.3	1488.77	95.7
6.3			39.89	6.8	1448.88	93.2
5			7.63	7.3	1441.25	92.7
2			30.42	9.3	1410.83	90.7
1.25	0.76			9.9	1400.78	90.1
0.63	1.62			11.3	1379.35	88.7
0.4	13.91			23.1	1195.36	76.9
0.2	44.96			61.4	600.66	38.6
0.063	44.21			99.0	15.87	1.0

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	9.3	% SAND	2-0.063 mm	89.7	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.8	% Coarse sand	2-0.63 mm	2.0	1.0	
	% Medium gravel	20-6.3 mm	6.0	% Medium sand	0.63-0.2 mm	50.1		
	% Fine gravel	6.3-2 mm	2.5	% Fine sand	0.2-0.063 mm	37.6		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. COARSE SAND ALSO CONTAINS SHELL FRAGMENTS. FINE AND MEDIUM SAND CONTAINS RARE ORGANIC MATTER.

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0475

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 04-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.161 g

Equipment:

RESULT: **3.8 g/kg (total)**

MUFLA OVEN ETI HD150

0.8 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 03-09-19

Mean of analyzed soil mass: 6.958 g

Equipment:

RESULT: **24.8 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993

Sample reference

MB19-0475

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6345
Soil mass, g	1528
Minimum density, Mg/m³	1.53

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6609
Soil mass, g	1792
Maximum density, Mg/m³	1.80

Relative density	
Dry density, Mg/m ³	1.53
Relative density, %	0

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0476

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_14 P_14.1
Top depth, m	5.1
Bottom depth, m	5.2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	25-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) medium to fine SAND with frequent shell fragments (gravel sized).	5.1	

5.2

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0476



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 25/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0476

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.09
Tare + soil + water (g)	219.55
Tare + soil (g)	204.75
Water (g)	14.80
Soil (g)	93.66
Moisture, w (%)	15.8

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Moisture content, w (%)	15.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	96.80
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.93
Dry density (Mg/m ³)	1.67

Operator: MARC COLOMER
Test final date: 25/06/2019

Results	
Bulk density (Mg/m³)	1.93
Dry density (Mg/m³)	1.67

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	19.8
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0880
Pyc. mass + soil + water at test temp. M2 (g)	184.3060
Soil mass, M1 (g)	11.5890
Particle density, G20°C (Mg/m ³)	2.647

Operator: MARC COLOMER
Test final date: 05/09/2019

Results	
Particle density (Mg/m³)	2.647

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0476

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

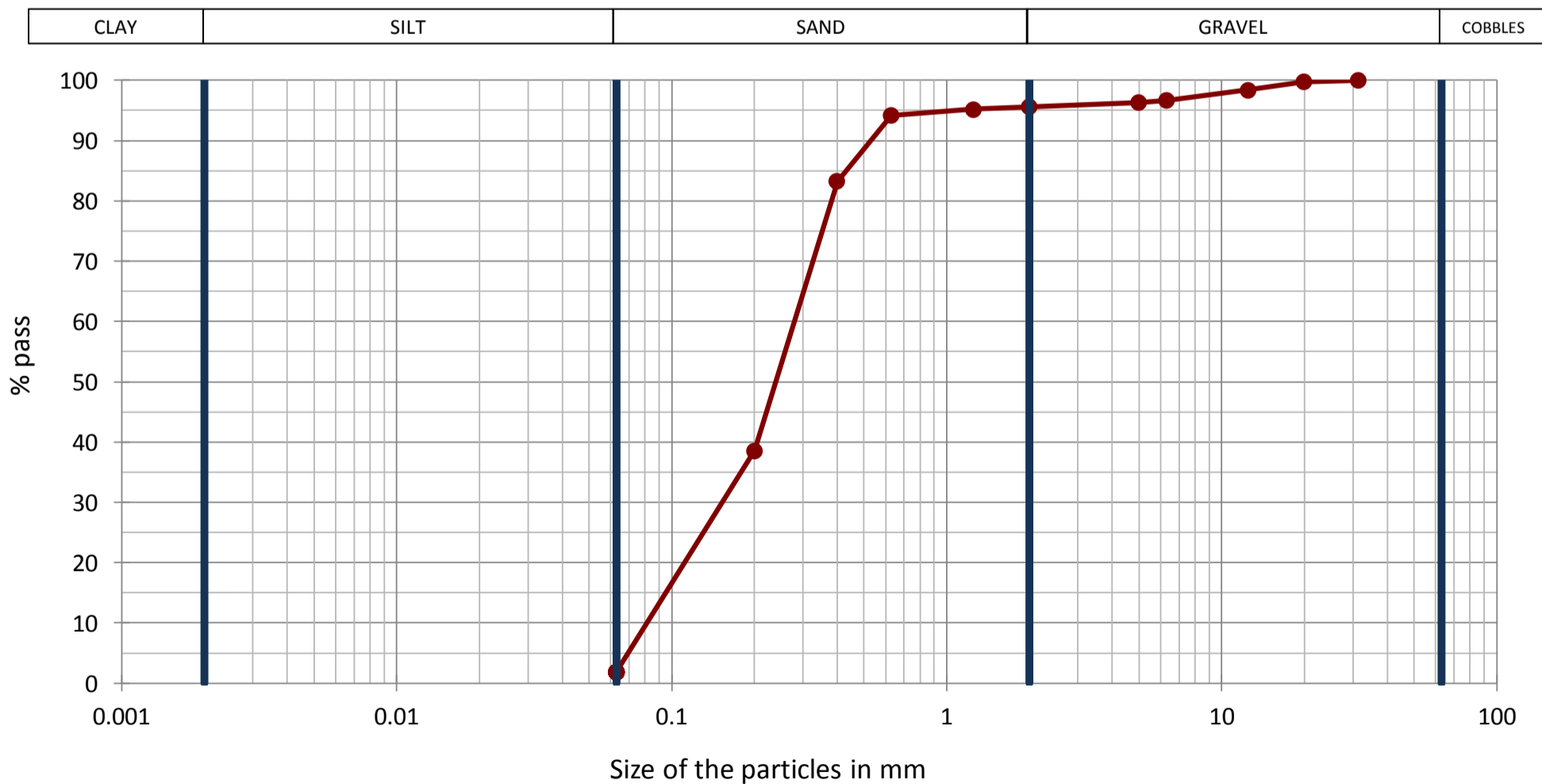
Total dried sample (g)	1262.24
M. > 2mm, washed and dried (g)	55.25
M. < 2 mm, dried tested (g)	104.69
M. < 2 mm, dried tested (g)	104.57
M. < 2 mm, dried total (g)	1205.56
Total dried sample (g)	1260.81
Hygros. moisture, % (fraction<2 mm)	0.1
Corr. parameter, f (fraction<2 mm)	0.9988
Corr. parameter, f2 (fraction<2 mm)	11.5292

Results

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
31.5			0.00	0.0	1260.81	100.0
20			2.32	0.2	1258.49	99.8
12.5			18.37	1.6	1240.12	98.4
6.3			21.29	3.3	1218.83	96.7
5			4.08	3.7	1214.75	96.3
2			9.19	4.4	1205.56	95.6
1.25	0.43			4.8	1200.60	95.2
0.63	1.10			5.8	1187.92	94.2
0.4	11.92			16.7	1050.49	83.3
0.2	48.90			61.4	486.71	38.6
0.063	40.11			98.1	24.28	1.9

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	4.4	% SAND	2-0.063 mm	93.7	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.2	% Coarse sand	2-0.63 mm	1.4		
	% Medium gravel	20-6.3 mm	3.1	% Medium sand	0.63-0.2 mm	55.6		1.9
	% Fine gravel	6.3-2 mm	1.1	% Fine sand	0.2-0.063 mm	36.7		



REMARKS

GRAVEL AND COARSE SAND ARE COMPOSED OF SHELL FRAGMENTS. MEDIUM SAND ALSO CONTAINS SOME SHELL FRAGMENTS.

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Sample reference

MB19-0476

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 06-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 11.338 g

Equipment:

RESULT: **2.8 g/kg (total)**

MUFLA OVEN ETI HD150

1.6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 17-09-19

Mean of analyzed soil mass: 9.973 g

Equipment:

RESULT: **10.2 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0477

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_13 P_13.6
Top depth, m	0.1
Bottom depth, m	0.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	20
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) fine SAND with rare fines, frequent amorphous organic matter zones and occasional shell fragments	0.1	
	0.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

SAMPLE IS NOT SUITABLE TO PERFORM A PERMEABILITY TEST. THE PROGRAMMED PERMEABILITY TEST WILL BE DONE ON THE SAMPLE MB19-0478. THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE TO PERFORM THE TEST.

The information contained in this report affects exclusively to the following test sheets with the same sample reference number

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0477

PHOTOGRAPHIC RECORD



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0477

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.71
Tare + soil + water (g)	203.64
Tare + soil (g)	187.72
Water (g)	15.92
Soil (g)	76.01
Moisture, w (%)	20.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	20.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	99.50
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.98
Dry density (Mg/m ³)	1.64

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.98
Dry density (Mg/m³)	1.64

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	19.9
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.4079
Pyc. mass + soil + water at test temp. M2 (g)	184.7130
Soil mass, M1 (g)	10.1340
Particle density, G20°C (Mg/m ³)	2.637

Operator: GUILLEM MASSALLÉ
Test final date: 04/09/2019

Results	
Particle density (Mg/m³)	2.637

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0477

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

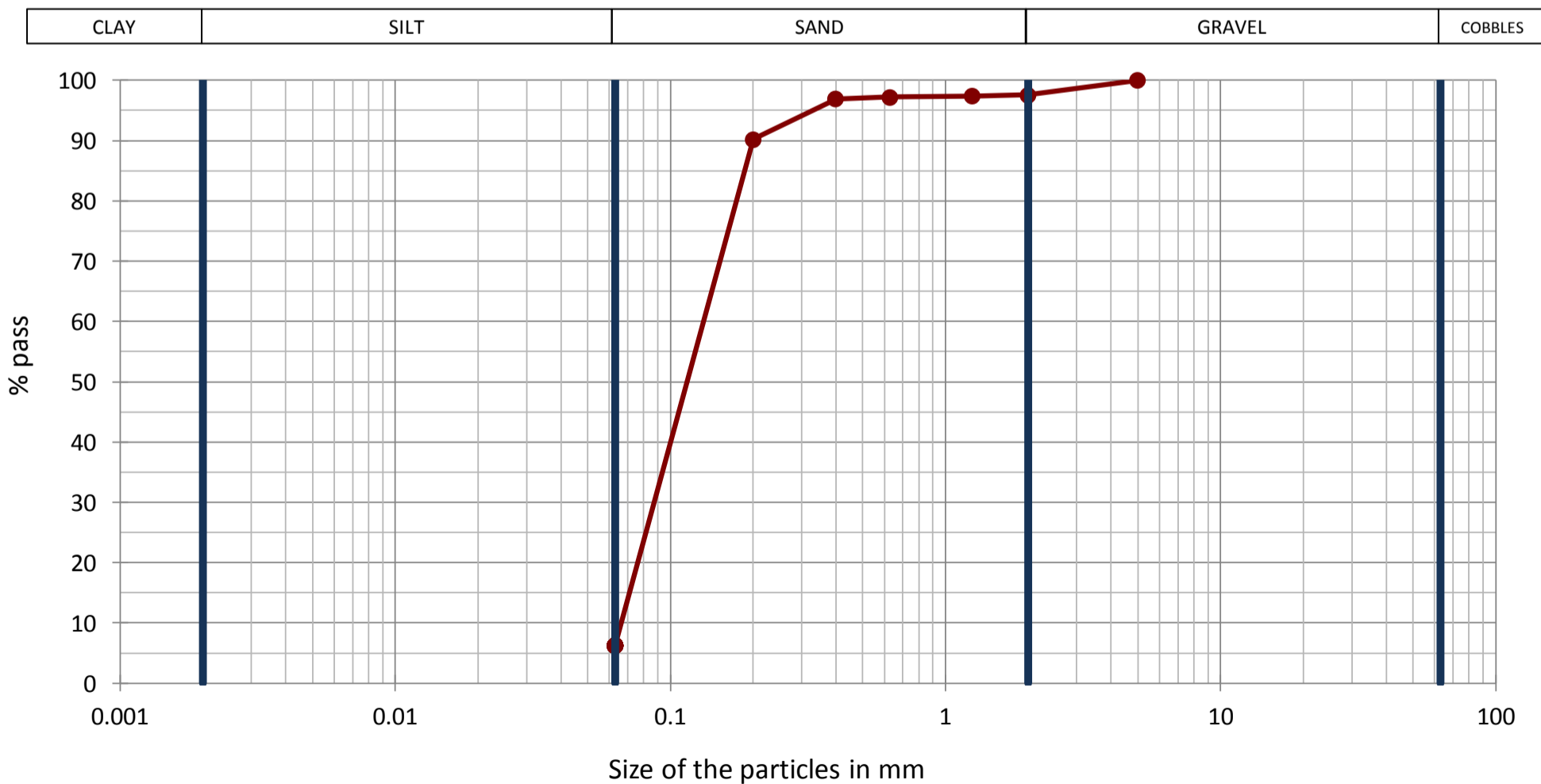
Previous calculations
 Total dried sample (g) **106.35**

 Hygrosc. moisture, % (fraction<2 mm) **0.3**
 Corr. parameter, f (fraction<2 mm) **0.9966**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
5		0.00	0.0	105.99	100.0
2		2.59	2.4	103.40	97.6
1.25		0.16	2.6	103.24	97.4
0.63		0.25	2.8	102.99	97.2
0.4		0.30	3.1	102.69	96.9
0.2		7.06	9.8	95.63	90.2
0.063		88.92	93.7	6.71	6.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	2.4	% SAND	2-0.063 mm	91.3	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.4	6.3	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	7.0		
	% Fine gravel	6.3-2 mm	2.4	% Fine sand	0.2-0.063 mm	83.9		



REMARKS

GRAVEL AND COARSE SAND ARE COMPOSED OF SHELL FRAGMENTS. MEDIUM SAND ALSO CONTAINS SHELL FRAGMENTS.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0477

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 03-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 11.367 g

Equipment:

RESULT: **7 g/kg (total)**

MUFLA OVEN ETI HD150

1.4 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: GUILLEM MASSALLÉ

Test final date: 03-09-19

Mean of analyzed soil mass: 4.443 g

Equipment:

RESULT: **46.4 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0478

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_13 P_13.5
Top depth, m	0.85
Bottom depth, m	1.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	45
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Black (2.5Y 2.5/1) fine SAND.	0.85	

1.3

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0478



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
 Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0478

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	105.31
Tare + soil + water (g)	212.05
Tare + soil (g)	192.86
Water (g)	19.19
Soil (g)	87.55
Moisture, w (%)	21.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	21.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	90.28
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.80
Dry density (Mg/m ³)	1.48

Operator: MARC COLOMER
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.80
Dry density (Mg/m³)	1.48

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	184.6130
Soil mass, M1 (g)	10.2170
Particle density, G20°C (Mg/m ³)	2.652

Operator: GUILLEM MASSALLÉ
Test final date: 04/09/2019

Results	
Particle density (Mg/m³)	2.652

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0478

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

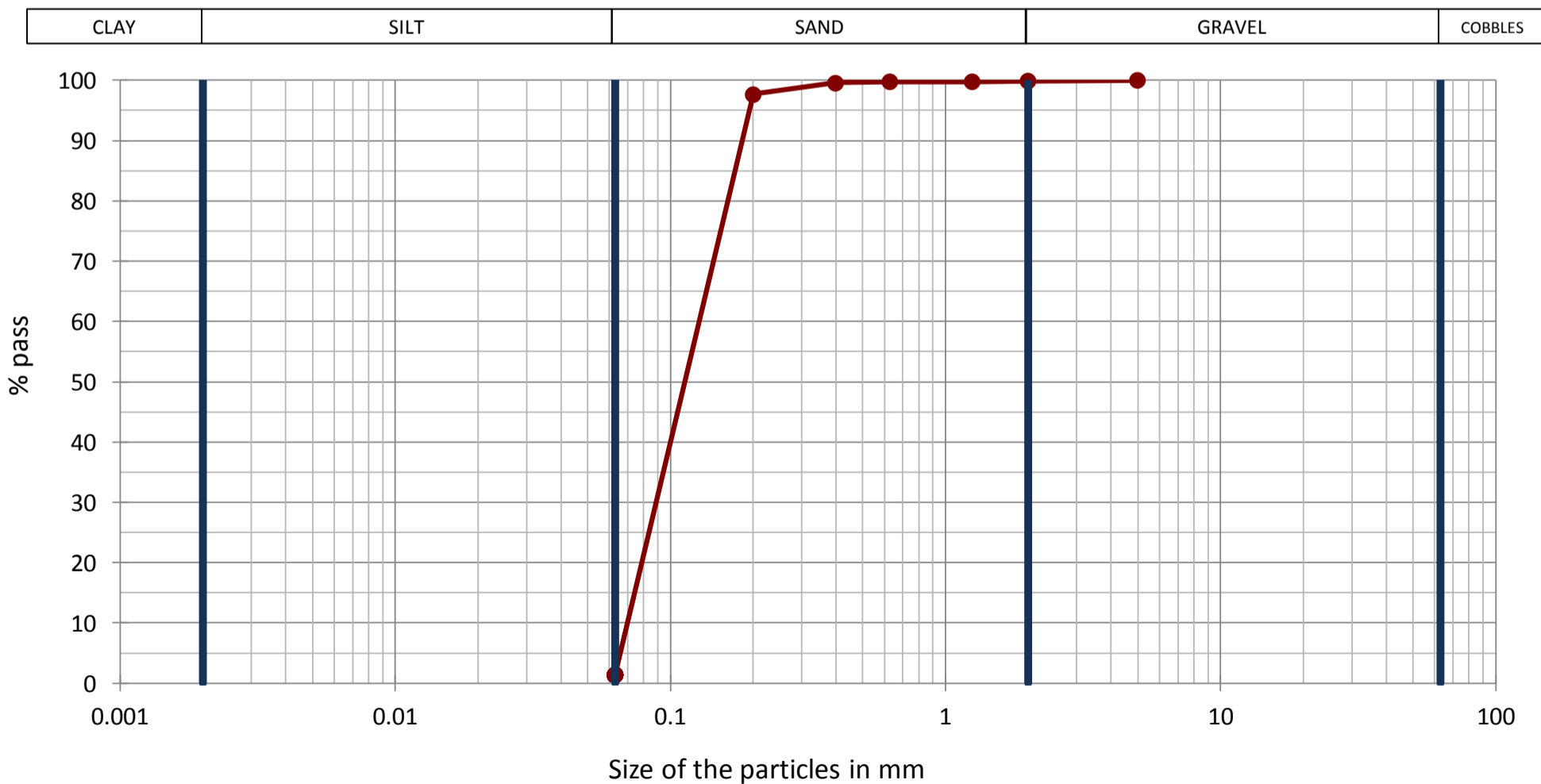
Previous calculations
 Total dried sample (g) **106.09**

 Hygrosc. moisture, % (fraction<2 mm) **0.3**
 Corr. parameter, f (fraction<2 mm) **0.9973**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
5			0.00	0.0	105.81
2			0.14	0.1	105.67
1.25			0.03	0.2	105.64
0.63			0.08	0.2	105.56
0.4			0.13	0.4	105.43
0.2			2.09	2.3	103.34
0.063			101.90	98.6	1.44
					100.0
					99.9
					99.8
					99.8
					99.6
					97.7
					1.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.1	% SAND	2-0.063 mm	98.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	2.1		1.4
	% Fine gravel	6.3-2 mm	0.1	% Fine sand	0.2-0.063 mm	96.3		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. COARSE SAND ALSO CONTAINS SHELL FRAGMENTS.

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0478

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

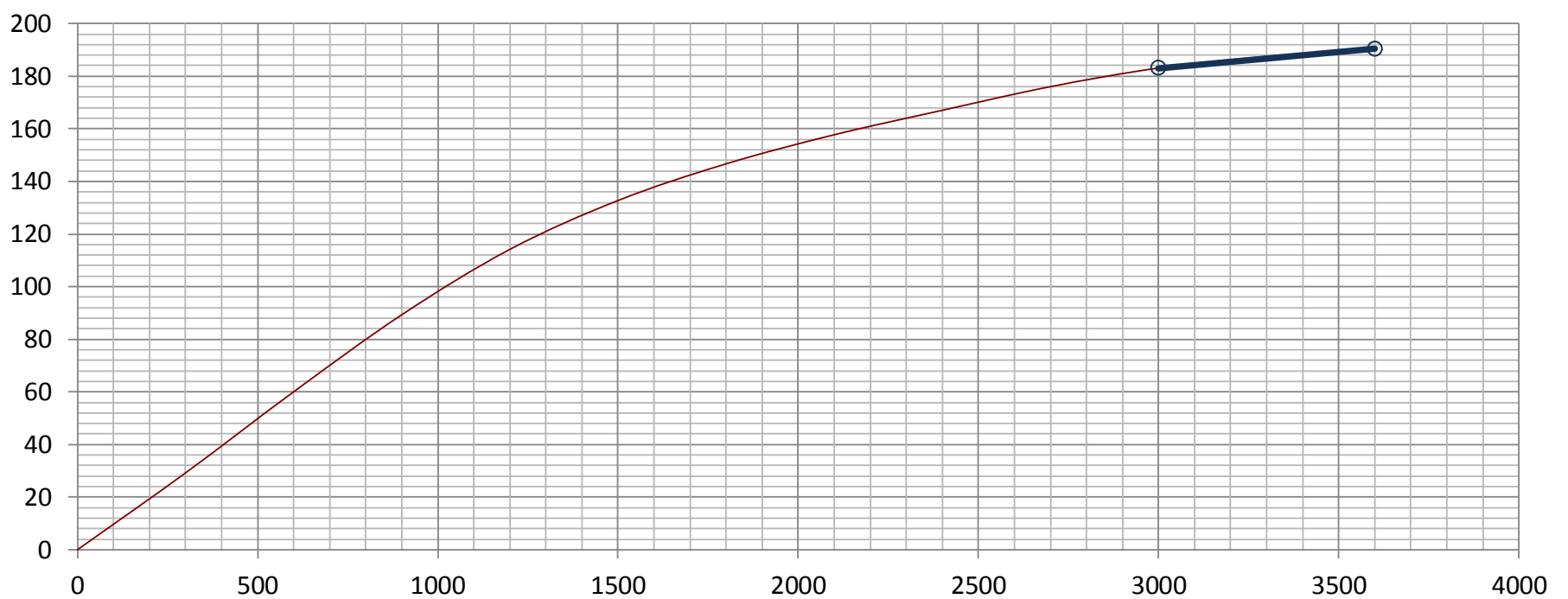
Specimen dimensions	
Specimen length (cm)	7.725
Specimen diameter (cm)	3.925
Specimen area (cm ²)	12.10
Specimen volume (cm ³)	93.47

Prior saturation process	
Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	20

Test data	
Soil weight (g)	189.47
Dry soil weight (g)	156.09
Initial moisture content (%)	21.8
Initial bulk density (Mg/m ³)	2.03
Initial dry density (Mg/m ³)	1.67
Initial void index, e ₀	0.5880
Initial saturation degree (%)	98.32
Final moisture content (%)	22.7
Final bulk density (Mg/m ³)	2.05
Final dry density (Mg/m ³)	1.67

Pressures applied during test excution	
Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results
Permeability constant, K (cm/s) 3.93E-05



REMARKS

Operator: ALEX VANCELLS

Test final date: 06/09/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0478

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 03-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.616 g

Equipment:

RESULT: **4.7 g/kg (total)**

MUFLA OVEN ETI HD150

1.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 03-09-19

Mean of analyzed soil mass: 7.531 g

Equipment:

RESULT: **26.5 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993

Sample reference

MB19-0478

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4796
Mould+soil mass, g	6251
Soil mass, g	1455
Minimum density, Mg/m³	1.46

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4796
Mould+soil mass, g	6473
Soil mass, g	1677
Maximum density, Mg/m³	1.68

Relative density	
Dry density, Mg/m ³	1.48
Relative density, %	9

REMARKS

Operator: ALEX VANCELLS

Date final test: 09/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0479

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_13 P_13.4
Top depth, m	2.1
Bottom depth, m	2.2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare amorphous millimetrical organic matter spots and rare shell fragments	2.1	
	2.2	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0479



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0479

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	113.02
Tare + soil + water (g)	220.09
Tare + soil (g)	200.13
Water (g)	19.96
Soil (g)	87.11
Moisture, w (%)	22.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	22.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	93.72
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.87
Dry density (Mg/m ³)	1.52

Operator: MARC COLOMER
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.87
Dry density (Mg/m³)	1.52

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	187.1070
Soil mass, M1 (g)	13.5300
Particle density, G20°C (Mg/m ³)	2.659

Operator: GUILLEM MASSALLÉ
Test final date: 03/09/2019

Results	
Particle density (Mg/m³)	2.659

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0479

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

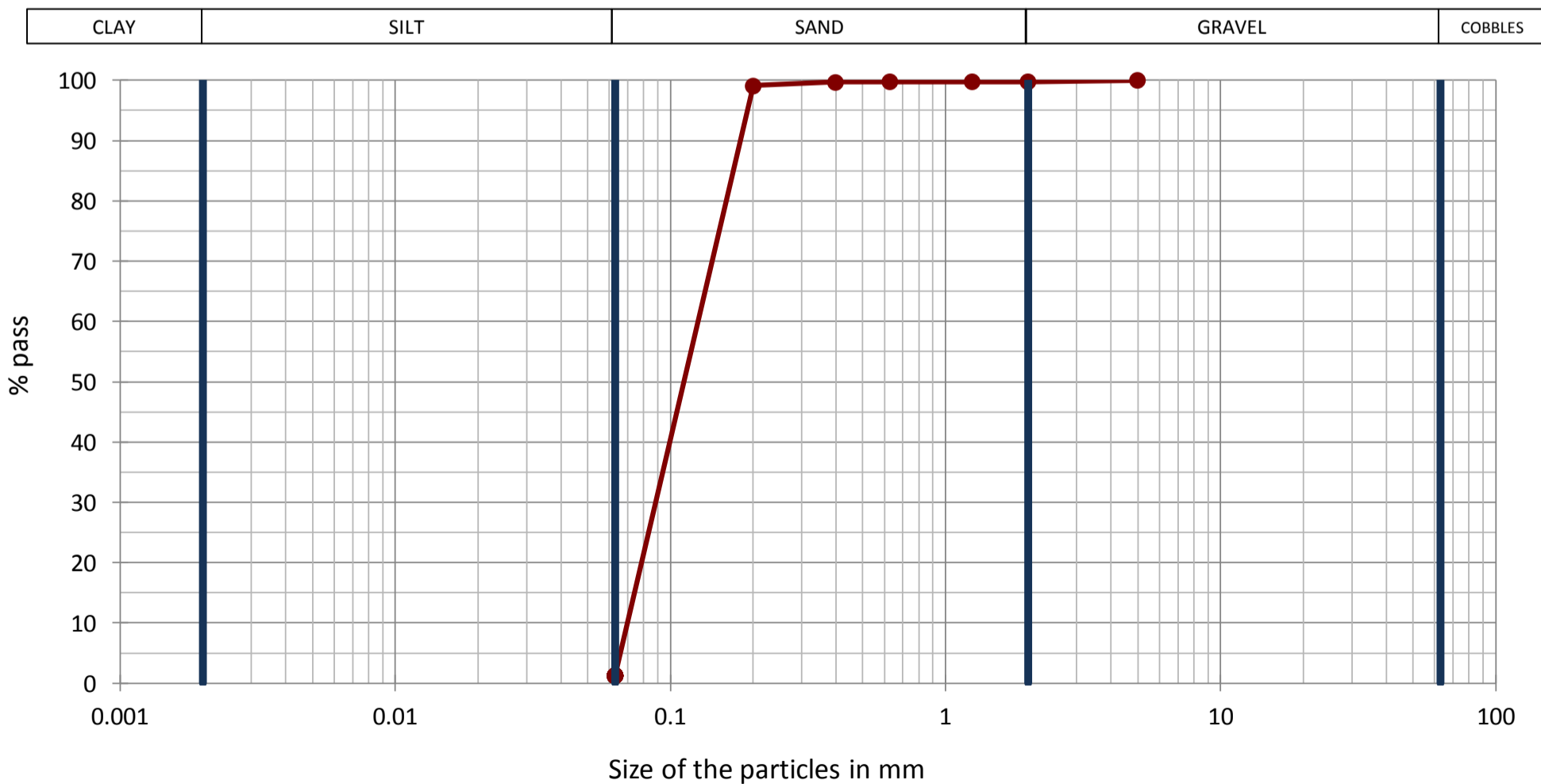
Previous calculations
 Total dried sample (g) **103.82**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9983**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
5		0.00	0.0	103.64	100.0
2		0.16	0.2	103.48	99.8
1.25		0.01	0.2	103.47	99.8
0.63		0.02	0.2	103.45	99.8
0.4		0.08	0.3	103.37	99.7
0.2		0.65	0.9	102.72	99.1
0.063		101.39	98.7	1.33	1.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.2	% SAND	2-0.063 mm	98.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	0.7		1.3
	% Fine gravel	6.3-2 mm	0.2	% Fine sand	0.2-0.063 mm	97.8		



REMARKS

GRAVEL AND COARSE SAND ARE COMPOSED OF SHELL FRAGMENTS. MEDIUM SAND ALSO CONTAINS SHELL FRAGMENTS.

Report num.: CB0019-19-0005
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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0479

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 03-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.572 g

Equipment:

RESULT: **4.8 g/kg (total)**

MUFLA OVEN ETI HD150

1.7 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 03-09-19

Mean of analyzed soil mass: 8.27 g

Equipment:

RESULT: **26 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0480

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_13 P_13.3
Top depth, m	2.9
Bottom depth, m	3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare amorphous millimetrical organic matter spots and rare shell fragments (medium sand to fine gravel sized)	2.9	

3

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0480



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0480

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.46
Tare + soil + water (g)	215.62
Tare + soil (g)	198.81
Water (g)	16.81
Soil (g)	87.35
Moisture, w (%)	19.2

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	19.2

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.64
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.90
Dry density (Mg/m ³)	1.59

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.90
Dry density (Mg/m³)	1.59

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	187.9690
Soil mass, M1 (g)	15.9090
Particle density, G20°C (Mg/m ³)	2.652

Operator: GUILLEM MASSALLÉ
Test final date: 06/09/2019

Results	
Particle density (Mg/m³)	2.652

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0480

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

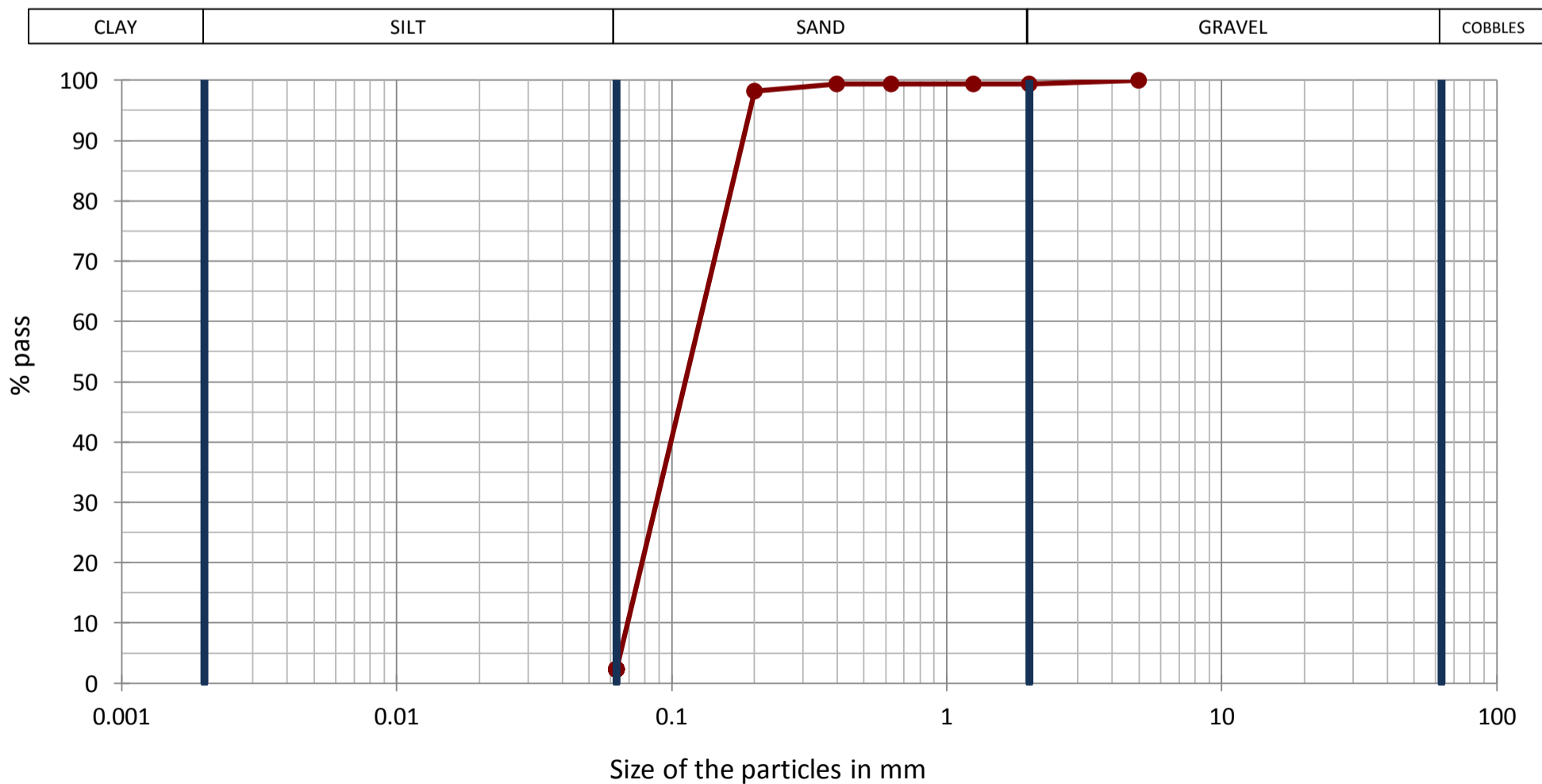
Previous calculations
 Total dried sample (g) **105.50**

 Hygrosc. moisture, % (fraction<2 mm) **0.1**
 Corr. parameter, f (fraction<2 mm) **0.9991**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
5		0.00	0.0	105.40	100.0
2		0.59	0.6	104.81	99.4
1.25		0.02	0.6	104.79	99.4
0.63		0.01	0.6	104.78	99.4
0.4		0.03	0.6	104.75	99.4
0.2		1.21	1.8	103.54	98.2
0.063		101.14	97.7	2.40	2.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.6	% SAND	2-0.063 mm	97.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0	2.3	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	1.2		
	% Fine gravel	6.3-2 mm	0.6	% Fine sand	0.2-0.063 mm	95.9		



REMARKS

GRAVEL AND COARSE SAND ARE COMPOSED OF SHELL FRAGMENTS. MEDIUM SAND ALSO CONTAINS SOME SHELL FRAGMENTS.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

MB19-0480

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 06-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.185 g

Equipment:

RESULT: **4.4 g/kg (total)**

MUFLA OVEN ETI HD150

2.2 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 17-09-19

Mean of analyzed soil mass: 4.802 g

Equipment:

RESULT: **18.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0480

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6150
Soil mass, g	1333
Minimum density, Mg/m³	1.34

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6448
Soil mass, g	1631
Maximum density, Mg/m³	1.64

Relative density	
Dry density, Mg/m ³	1.59
Relative density, %	83

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0481

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_13 P_13.2
Top depth, m	4
Bottom depth, m	4.1
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare amorphous millimetrical organic matter spots and rare shell fragments (medium to coarse sand sized)	4	

4.1

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0481



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0481

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	106.63
Tare + soil + water (g)	238.14
Tare + soil (g)	216.98
Water (g)	21.16
Soil (g)	110.35
Moisture, w (%)	19.2

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	19.2

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	96.35
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.92
Dry density (Mg/m ³)	1.61

Operator: MARC COLOMER
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.92
Dry density (Mg/m³)	1.61

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	186.7070
Soil mass, M1 (g)	12.8780
Particle density, G20°C (Mg/m ³)	2.663

Operator: GUILLEM MASSALLÉ
Test final date: 06/09/2019

Results	
Particle density (Mg/m³)	2.663

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0481

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

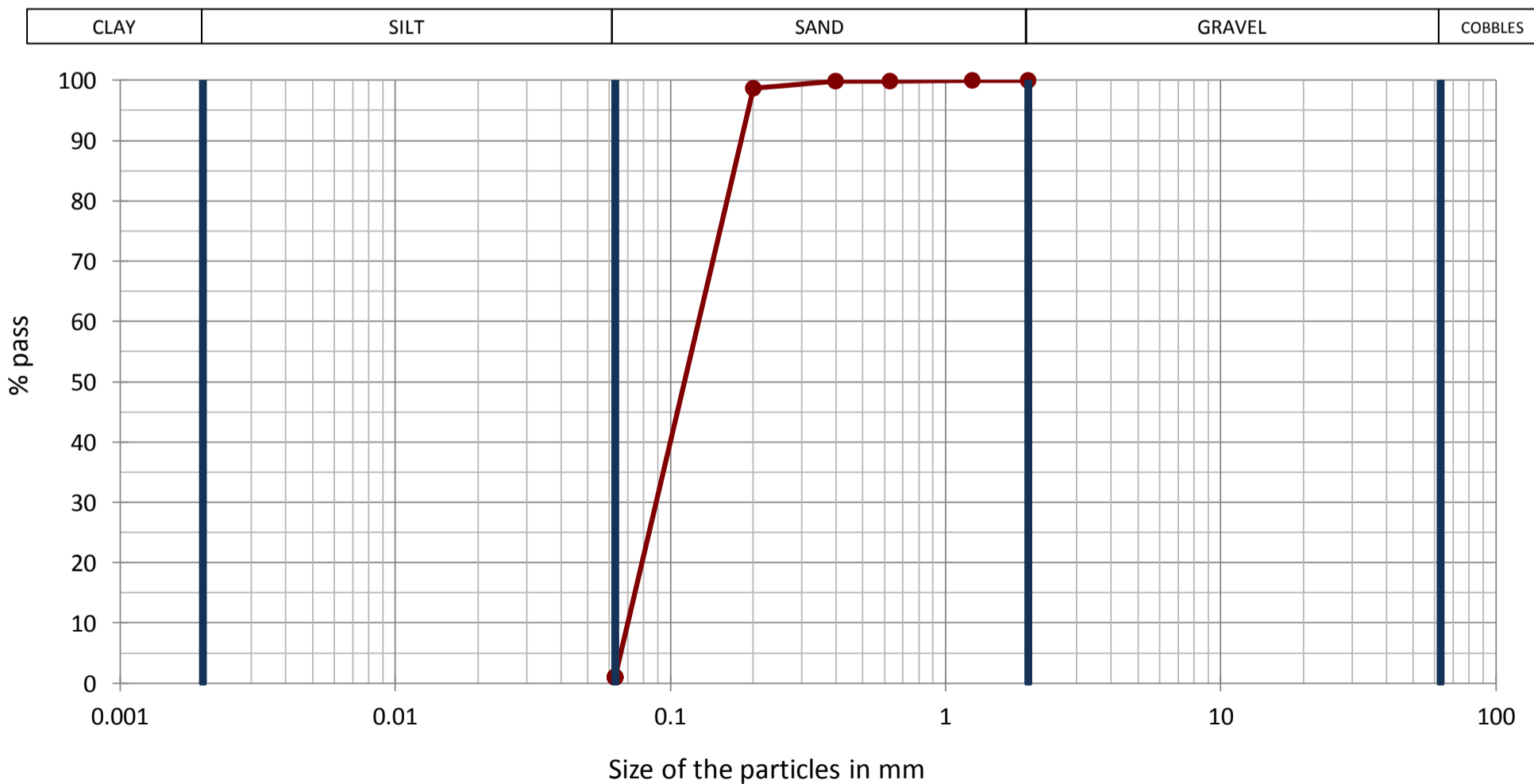
Previous calculations
 Total dried sample (g) **106.19**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9983**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
2			0.00	0.0	106.01	100.0
1.25			0.05	0.0	105.96	100.0
0.63			0.01	0.1	105.95	99.9
0.4			0.03	0.1	105.92	99.9
0.2			1.28	1.3	104.64	98.7
0.063			103.43	98.9	1.21	1.1

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	1.2		1.1
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	97.6		



REMARKS

MEDIUM AND COARSE SAND CONTAINS SHELL FRAGMENTS

Report num.: CB0019-19-0005
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Sample reference

MB19-0481

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 06-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.393 g

Equipment:

RESULT: **3.1 g/kg (total)**

MUFLA OVEN ETI HD150

1.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 17-09-19

Mean of analyzed soil mass: 5.401 g

Equipment:

RESULT: **13.1 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0482

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_13 P_13.1
Top depth, m	5.03
Bottom depth, m	5.2
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	17
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine to medium SAND with rare clay pockets and frequent shell fragments	5.03	

5.2

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
 DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
 DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
 DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Sample reference

MB19-0482

PHOTOGRAPHIC RECORD



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0482

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	108.34
Tare + soil + water (g)	235.60
Tare + soil (g)	215.34
Water (g)	20.26
Soil (g)	107.00
Moisture, w (%)	18.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	18.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	97.77
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.95
Dry density (Mg/m ³)	1.64

Operator: MARC COLOMER
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.95
Dry density (Mg/m³)	1.64

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	185.5950
Soil mass, M1 (g)	11.5440
Particle density, G20°C (Mg/m ³)	2.656

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.656

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0482

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

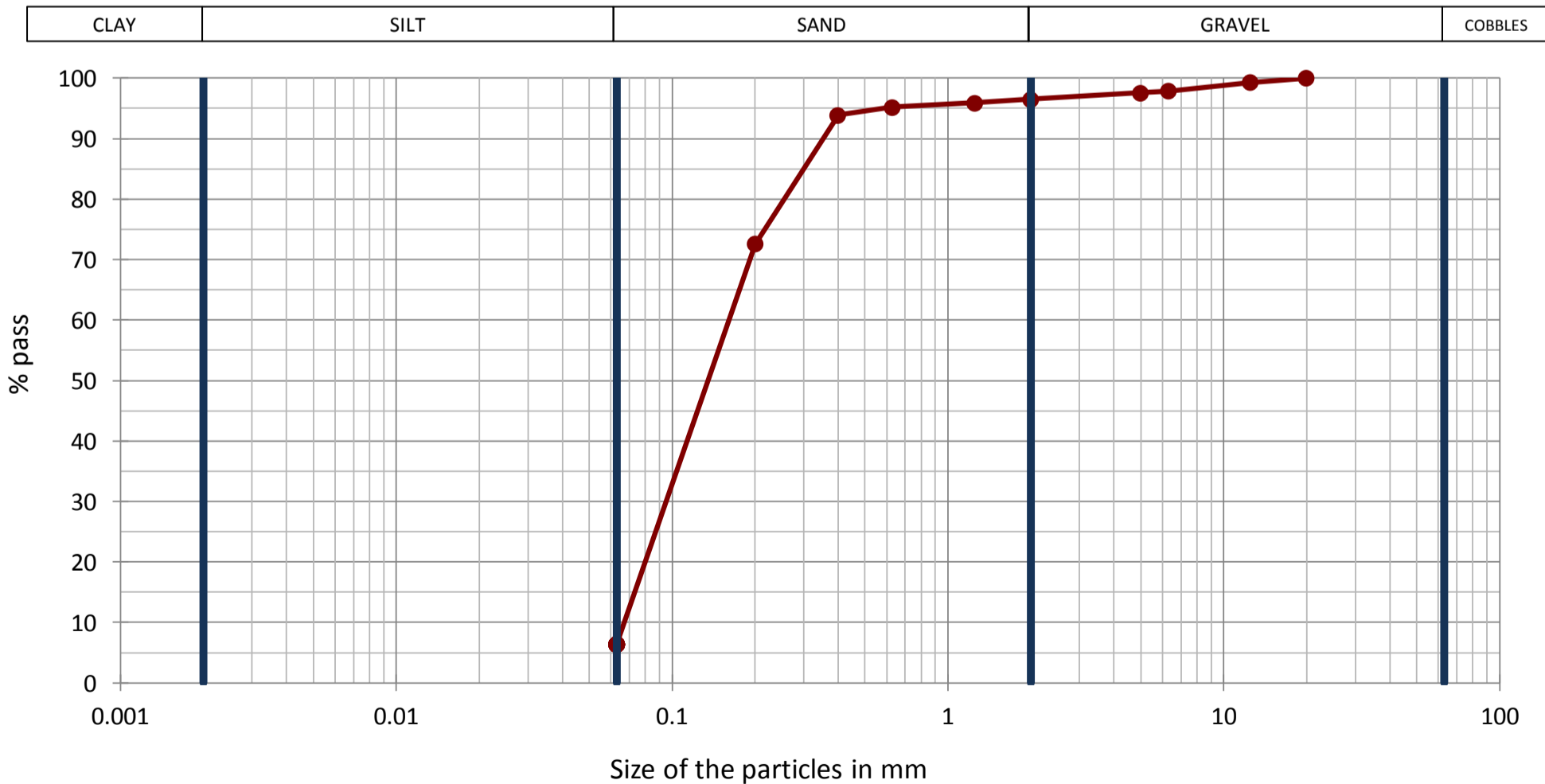
Total dried sample (g)	1327.85
M. > 2mm, washed and dried (g)	45.79
M. < 2 mm, dried tested (g)	104.92
M. < 2 mm, dried tested (g)	104.72
M. < 2 mm, dried total (g)	1279.58
Total dried sample (g)	1325.37
Hygros. moisture, % (fraction<2 mm)	0.2
Corr. parameter, f (fraction<2 mm)	0.9981
Corr. parameter, f2 (fraction<2 mm)	12.2194

Results

Sieves	Retained sieves			Pass total sample		
	Aperture mm	Partial g	Total g	Total %	g	%
20			0.00	0.0	1325.37	100.0
12.5			9.82	0.7	1315.55	99.3
6.3			18.10	2.1	1297.45	97.9
5			3.39	2.4	1294.06	97.6
2			14.48	3.5	1279.58	96.5
1.25	0.72			4.1	1270.78	95.9
0.63	0.74			4.8	1261.74	95.2
0.4	1.36			6.1	1245.12	93.9
0.2	23.12			27.4	962.61	72.6
0.063	71.83			93.6	84.89	6.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	3.5	% SAND	2-0.063 mm	90.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.3		
	% Medium gravel	20-6.3 mm	2.1	% Medium sand	0.63-0.2 mm	22.6		6.4
	% Fine gravel	6.3-2 mm	1.4	% Fine sand	0.2-0.063 mm	66.2		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SOME SHELL FRAGMENTS.

Report num.: CB0019-19-0005
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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0482

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 06-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.794 g

Equipment:

RESULT: **6 g/kg (total)**

MUFLA OVEN ETI HD150

4 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 17-09-19

Mean of analyzed soil mass: 4.885 g

Equipment:

RESULT: **17 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0482

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6250
Soil mass, g	1433
Minimum density, Mg/m³	1.44

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6539
Soil mass, g	1722
Maximum density, Mg/m³	1.73

Relative density	
Dry density, Mg/m ³	1.64
Relative density, %	69

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0483

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_12 P_12.4
Top depth, m	0
Bottom depth, m	0.14
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	14
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	grSa
--------------------	------

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive brown (2.5Y 4/3) fine to medium SAND with occasional fine to medium gravel frequent shell fragments (some of them fine to medium gravel sized).	0	

0.14

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE TO PERFORM THE TEST

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0483



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0483

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.64
Tare + soil + water (g)	240.75
Tare + soil (g)	223.20
Water (g)	17.55
Soil (g)	118.56
Moisture, w (%)	14.8

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	14.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	85.92
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.71
Dry density (Mg/m ³)	1.49

Operator: MARC COLOMER
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.71
Dry density (Mg/m³)	1.49

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	186.4300
Soil mass, M1 (g)	12.8090
Particle density, G20°C (Mg/m ³)	2.681

Operator: GUILLEM MASSALLÉ
Test final date: 03/09/2019

Results	
Particle density (Mg/m³)	2.681

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0483

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

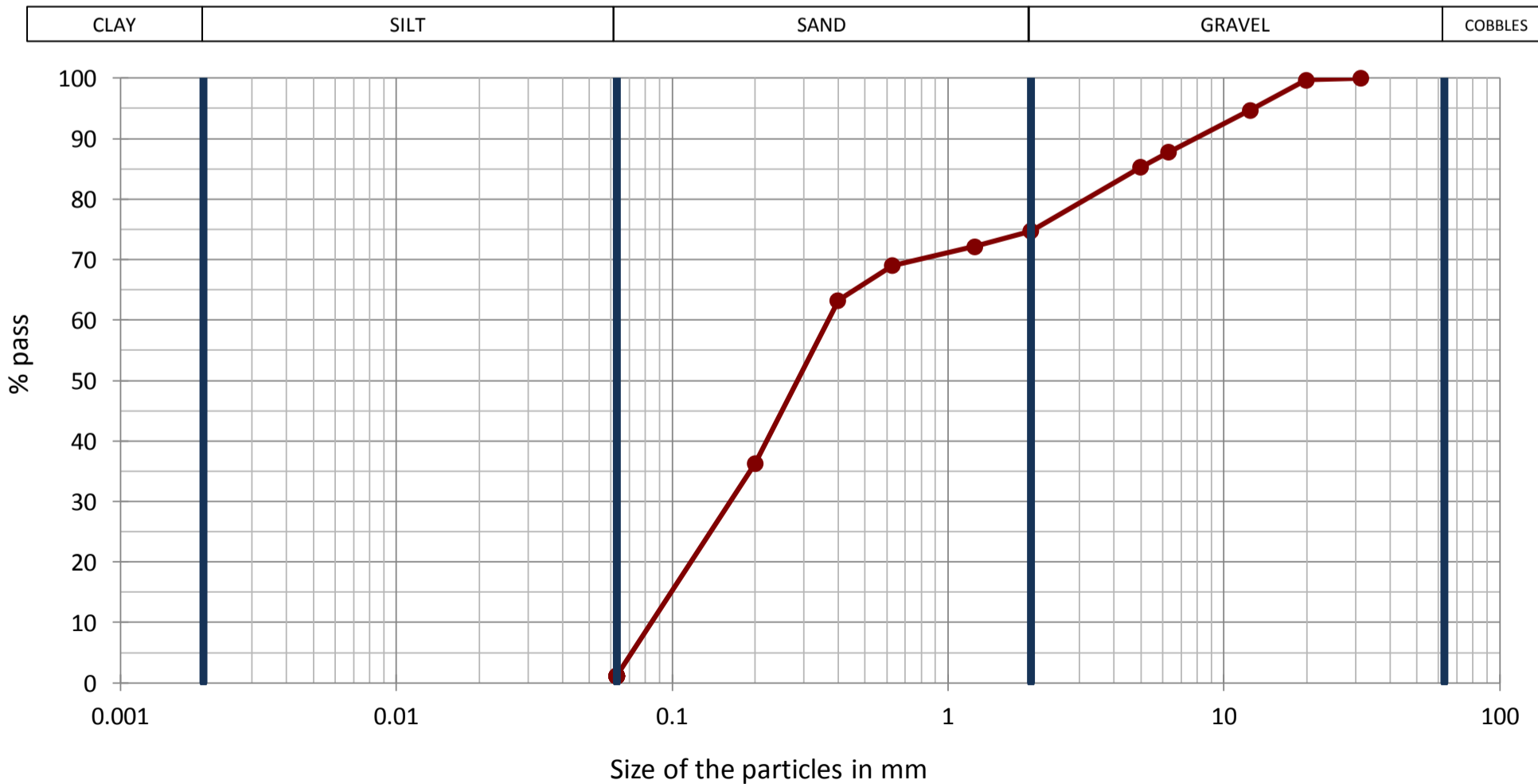
Total dried sample (g)	1129.46
M. > 2mm, washed and dried (g)	285.25
M. < 2 mm, dried tested (g)	104.05
M. < 2 mm, dried tested (g)	103.85
M. < 2 mm, dried total (g)	842.61
Total dried sample (g)	1127.86
Hygros. moisture, % (fraction<2 mm)	0.2
Corr. parameter, f (fraction<2 mm)	0.9981
Corr. parameter, f2 (fraction<2 mm)	8.1135

Results

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
31.5			0.00	0.0	1127.86	100.0
20			3.00	0.3	1124.86	99.7
12.5			56.23	5.3	1068.63	94.7
6.3			78.10	12.2	990.53	87.8
5			28.20	14.7	962.33	85.3
2			119.72	25.3	842.61	74.7
1.25	3.54			27.8	813.89	72.2
0.63	4.43			31.0	777.95	69.0
0.4	7.94			36.7	713.53	63.3
0.2	37.43			63.7	409.84	36.3
0.063	48.80			98.8	13.90	1.2

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	25.3	% SAND	2-0.063 mm	73.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.3	% Coarse sand	2-0.63 mm	5.7		
	% Medium gravel	20-6.3 mm	11.9	% Medium sand	0.63-0.2 mm	32.7		1.2
	% Fine gravel	6.3-2 mm	13.1	% Fine sand	0.2-0.063 mm	35.1		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. COARSE SAND ALSO CONTAINS SHELL FRAGMENTS.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0483

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 03-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 11.535 g

Equipment:

RESULT: **5.2 g/kg (total)**

MUFLA OVEN ETI HD150

0 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: GUILLEM MASSALLÉ

Test final date: 03-09-19

Mean of analyzed soil mass: 2.75 g

Equipment:

RESULT: **78.1 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0484

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_12 P_12.3
Top depth, m	1.15
Bottom depth, m	1.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/2) fine SAND with rare clay pockets and rare shell fragments	1.15	
	1.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
#N/A
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0484



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0484

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	108.60
Tare + soil + water (g)	210.94
Tare + soil (g)	193.44
Water (g)	17.50
Soil (g)	84.84
Moisture, w (%)	20.6

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	20.6

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.94
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.91
Dry density (Mg/m ³)	1.58

Operator: ALEX VANCELLS
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.91
Dry density (Mg/m³)	1.58

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	19.8
Water density at test temp., δwTi (Mg/m ³)	0.9983
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0658
Pyc. mass + soil + water at test temp. M2 (g)	185.3780
Soil mass, M1 (g)	11.7410
Particle density, G20°C (Mg/m ³)	2.642

Operator: GUILLEM MASSALLÉ
Test final date: 03/09/2019

Results	
Particle density (Mg/m³)	2.642

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0484

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

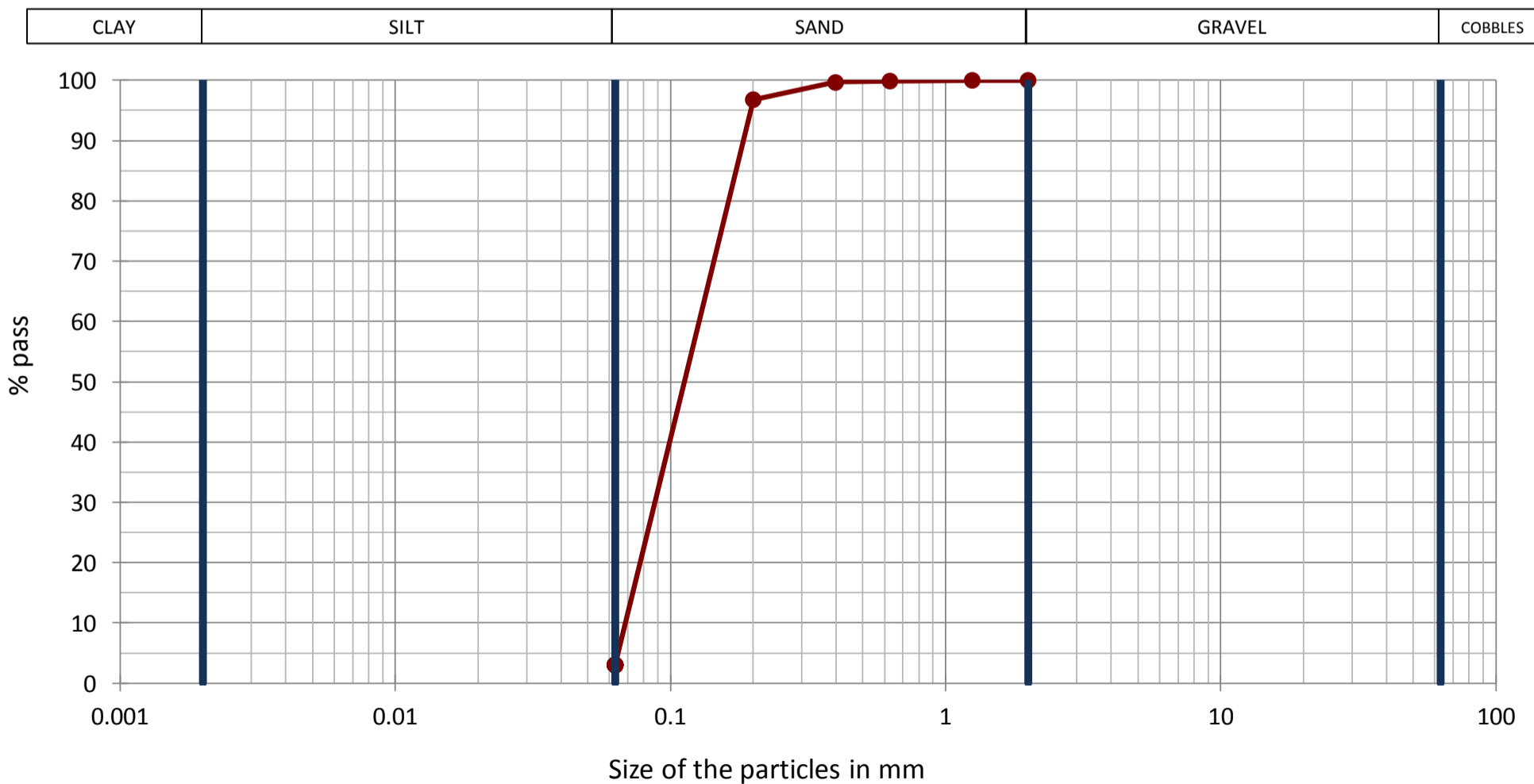
Previous calculations
 Total dried sample (g) **105.92**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9976**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2			0.00	0.0	105.67 100.0
1.25			0.04	0.0	105.63 100.0
0.63			0.11	0.1	105.52 99.9
0.4			0.14	0.3	105.38 99.7
0.2			3.04	3.2	102.34 96.8
0.063			99.02	96.9	3.32 3.1

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	96.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	3.1		3.1
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	93.7		



REMARKS

SAND CONTAINS SOME SHELL FRAGMENTS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0484

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 02-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.352 g

Equipment:

RESULT: **6 g/kg (total)**

MUFLA OVEN ETI HD150

2.6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 30-08-19

Mean of analyzed soil mass: 7.661 g

Equipment:

RESULT: **28.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0485

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_12 P_12.2
Top depth, m	2
Bottom depth, m	2.4
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	40
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/2) fine SAND with rare clay pockets and rare shell fragments	2	
	2.4	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0485

PHOTOGRAPHIC RECORD



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0485

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	105.03
Tare + soil + water (g)	241.53
Tare + soil (g)	219.00
Water (g)	22.53
Soil (g)	113.97
Moisture, w (%)	19.8

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	19.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.36
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.90
Dry density (Mg/m ³)	1.59

Operator: MARC COLOMER
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.90
Dry density (Mg/m³)	1.59

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	186.8360
Soil mass, M1 (g)	13.6210
Particle density, G20°C (Mg/m ³)	2.705

Operator: GUILLEM MASSALLÉ
Test final date: 03/09/2019

Results	
Particle density (Mg/m³)	2.705

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0485

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

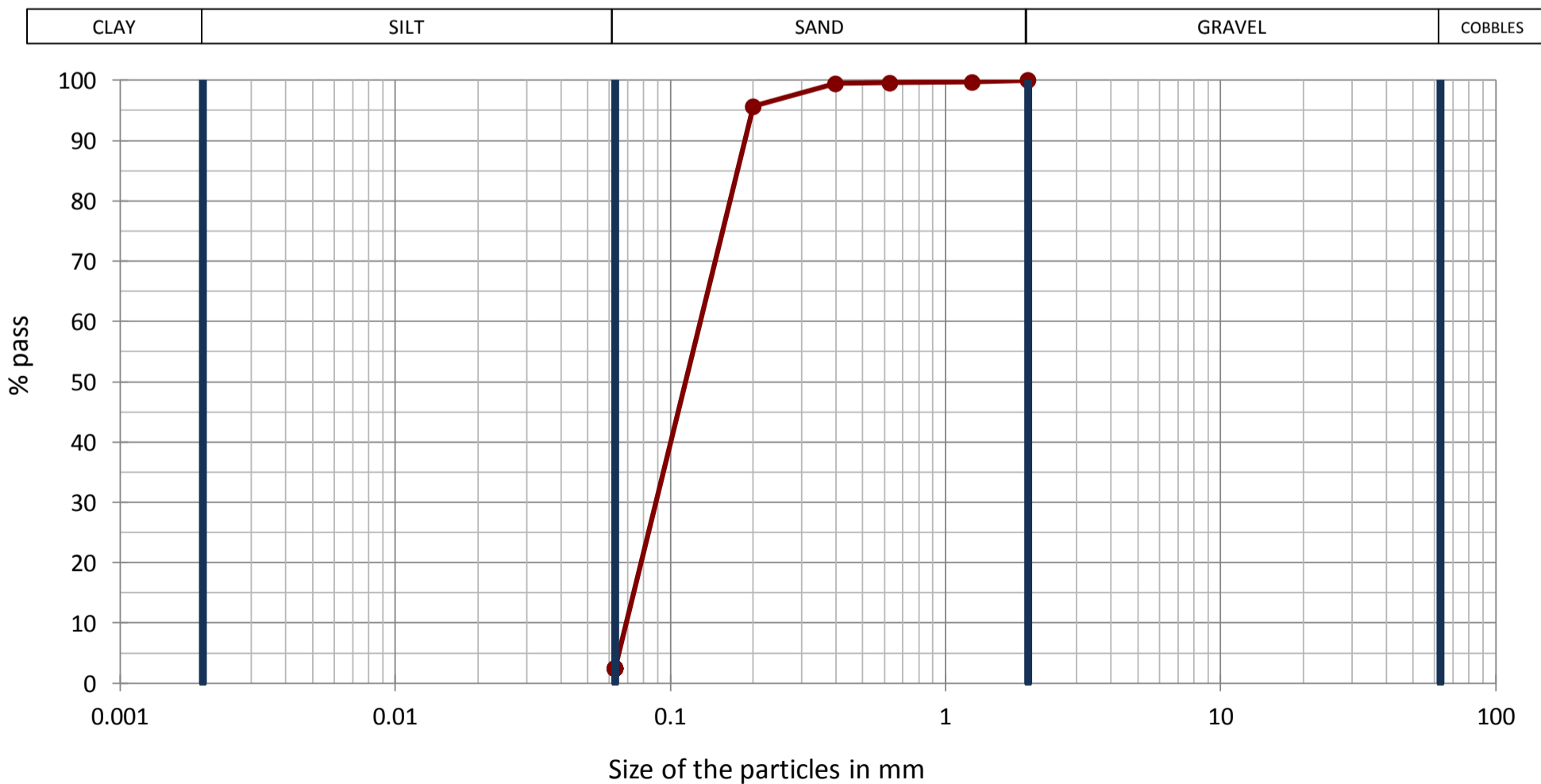
Previous calculations
 Total dried sample (g) **105.50**

 Hygrosc. moisture, % (fraction<2 mm) **0.3**
 Corr. parameter, f (fraction<2 mm) **0.9967**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2			0.00	0.0	105.15
1.25			0.32	0.3	104.83
0.63			0.10	0.4	104.73
0.4			0.11	0.5	104.62
0.2			4.04	4.3	100.58
0.063			97.97	97.5	2.61
					100.0
					99.7
					99.6
					99.5
					95.7
					2.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	97.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.4		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	3.9		2.5
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	93.2		



REMARKS

SAND CONTAINS SOME SHELL FRAGMENTS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0485

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Specimen dimensions

Specimen length (cm)	7.700
Specimen diameter (cm)	3.830
Specimen area (cm ²)	11.52
Specimen volume (cm ³)	88.70

Prior saturation process

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	18

Test data

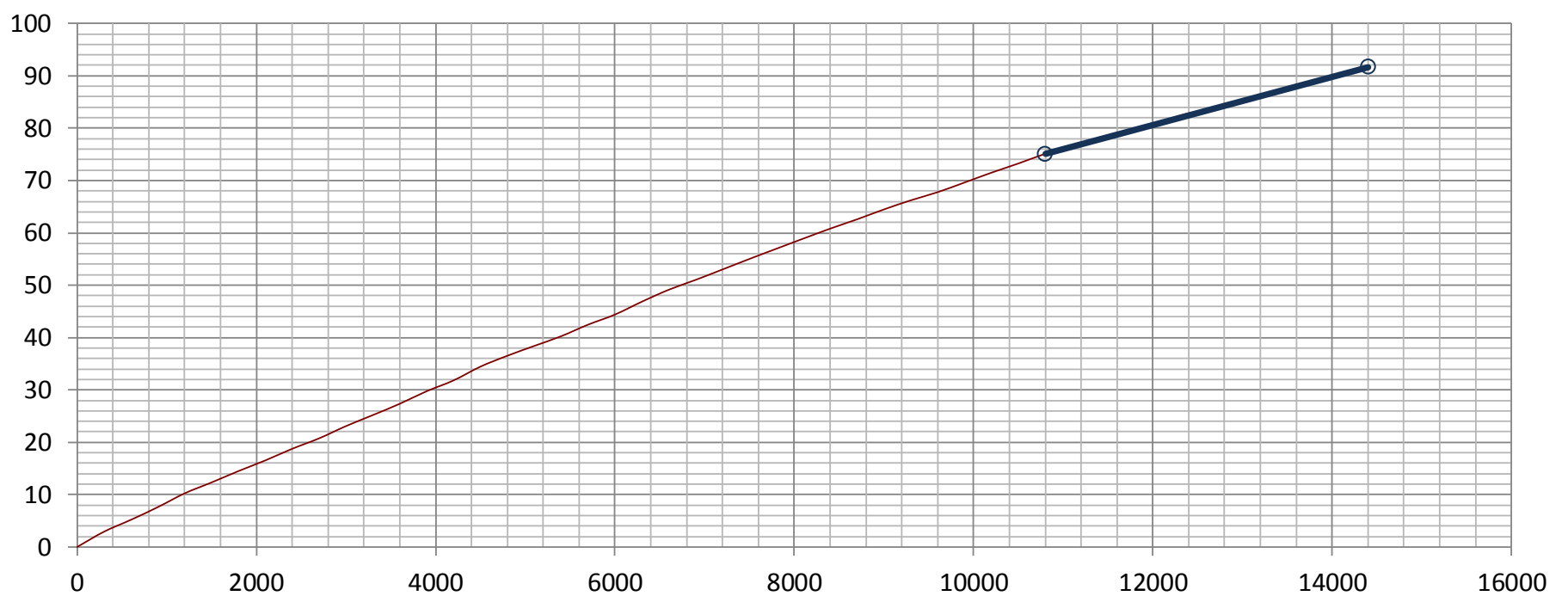
Soil weight (g)	178.83
Dry soil weight (g)	145.47
Initial moisture content (%)	22.9
Initial bulk density (Mg/m ³)	2.02
Initial dry density (Mg/m ³)	1.64
Initial void index, e ₀	0.6494
Initial saturation degree (%)	95.39
Final moisture content (%)	24.0
Final bulk density (Mg/m ³)	2.03
Final dry density (Mg/m ³)	1.64

Pressures applied during test execution

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results

Permeability constant, K (cm/s) 1.54E-05



REMARKS

A GRAVEL SIZED SHELL FRAGMENT WAS DETECTED INSIDE THE SPECIMEN AFTER TESTING

Operator: ALEX VANCELLS

Test final date: 04/09/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0485

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 02-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.386 g

Equipment:

RESULT: **4.2 g/kg (total)**

MUFLA OVEN ETI HD150

0.9 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-08-19

Mean of analyzed soil mass: 9.31 g

Equipment:

RESULT: **27.2 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0485

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6183
Soil mass, g	1366
Minimum density, Mg/m³	1.37

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6456
Soil mass, g	1639
Maximum density, Mg/m³	1.64

Relative density	
Dry density, Mg/m ³	1.59
Relative density, %	81

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0486

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_12 P_12.1
Top depth, m	2.93
Bottom depth, m	3.07
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	14
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/2) fine SAND with rare clay pockets and rare shell fragments	2.93	
	3.07	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0486



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0486

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	98.50
Tare + soil + water (g)	249.42
Tare + soil (g)	221.83
Water (g)	27.59
Soil (g)	123.33
Moisture, w (%)	22.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	22.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	98.25
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.96
Dry density (Mg/m ³)	1.60

Operator: MARC COLOMER
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.96
Dry density (Mg/m³)	1.60

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	185.6190
Soil mass, M1 (g)	13.7290
Particle density, G20°C (Mg/m ³)	2.649

Operator: GUILLEM MASSALLÉ
Test final date: 03/09/2019

Results	
Particle density (Mg/m³)	2.649

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0486

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

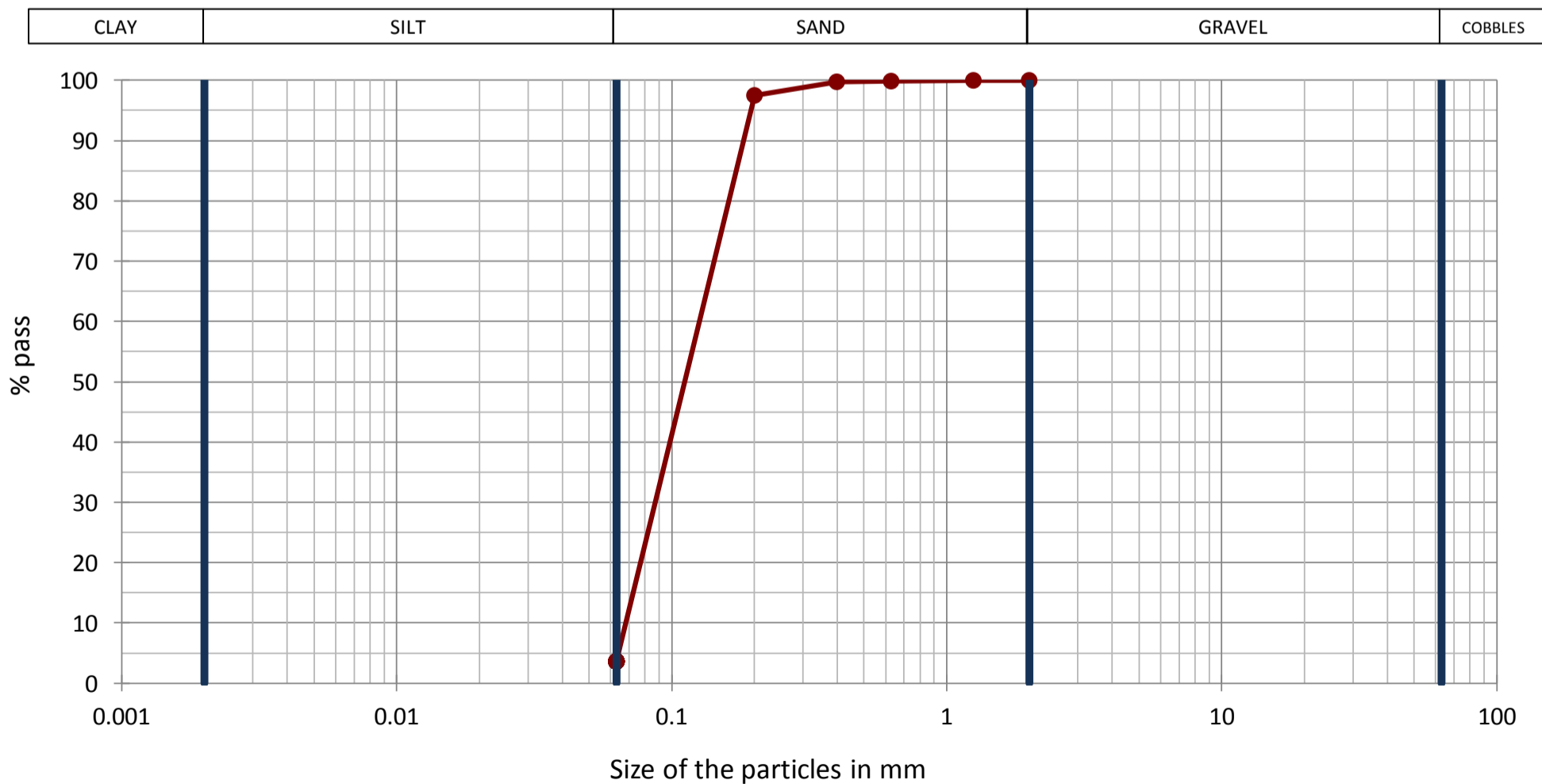
Previous calculations
 Total dried sample (g) **102.78**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9983**

Results					
Sieves Aperture mm	Retained sieves		Pass total sample		
	Partial g	Total g	Total %	g	%
2		0.00	0.0	102.61	100.0
1.25		0.05	0.0	102.56	100.0
0.63		0.03	0.1	102.53	99.9
0.4		0.08	0.2	102.45	99.8
0.2		2.41	2.5	100.04	97.5
0.063		96.27	96.3	3.77	3.7

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	96.3	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	2.4		3.7
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	93.8		



REMARKS

SAND CONTAINS SOME SHELL FRAGMENTS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0486

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 02-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.004 g

Equipment:

RESULT: **5.8 g/kg (total)**

MUFLA OVEN ETI HD150

2.3 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-08-19

Mean of analyzed soil mass: 7.001 g

Equipment:

RESULT: **28.9 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0487

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_11 P_11.3
Top depth, m	0.1
Bottom depth, m	0.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	20
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	26-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine to medium SAND with rare clay millimetrical pockets, rare amorphous organic matter pockets and occasional shell fragments	0.1	
	0.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE TO PERFORM THE TEST

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0487



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 26/06/2019

Report num.: CB0019-19-0005
 Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0487

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	98.32
Tare + soil + water (g)	206.14
Tare + soil (g)	189.85
Water (g)	16.29
Soil (g)	91.53
Moisture, w (%)	17.8

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Moisture content, w (%)	17.8

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	96.63
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.92
Dry density (Mg/m ³)	1.63

Operator: MARC COLOMER
Test final date: 26/06/2019

Results	
Bulk density (Mg/m³)	1.92
Dry density (Mg/m³)	1.63

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.3
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	183.7540
Soil mass, M1 (g)	10.7730
Particle density, G20°C (Mg/m ³)	2.634

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.634

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

MB19-0487

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

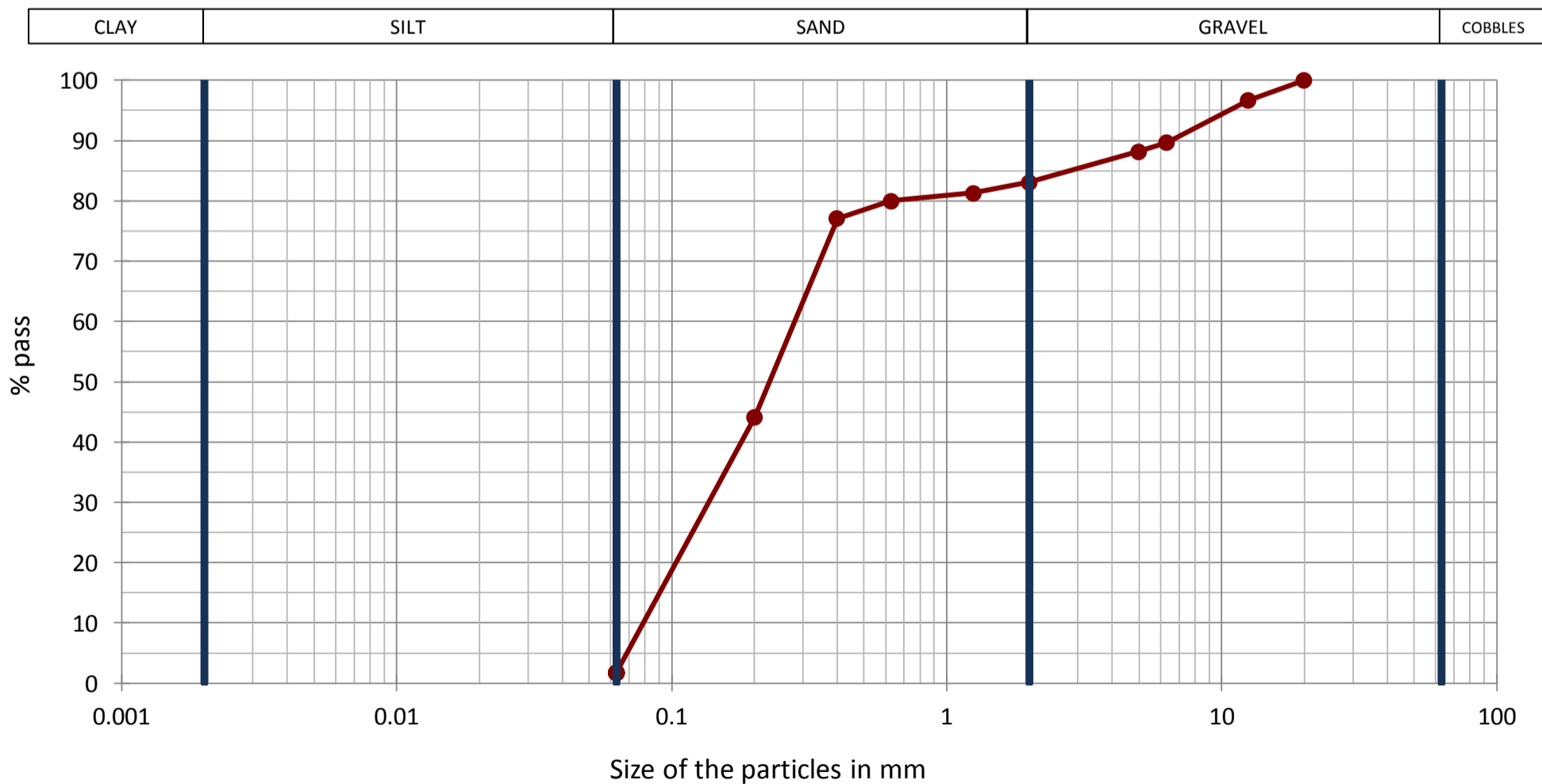
Total dried sample (g)	1233.06
M. > 2mm, washed and dried (g)	207.69
M. < 2 mm, dried tested (g)	106.40
M. < 2 mm, dried tested (g)	106.21
M. < 2 mm, dried total (g)	1023.53
Total dried sample (g)	1231.22
Hygros. moisture, % (fraction<2 mm)	0.2
Corr. parameter, f (fraction<2 mm)	0.9982
Corr. parameter, f2 (fraction<2 mm)	9.6369

Results

Sieves Aperture mm	Retained sieves		Pass total sample		
	Partial g	Total g	Total %	g	%
20		0.00	0.0	1231.22	100.0
12.5		40.89	3.3	1190.33	96.7
6.3		85.51	10.3	1104.82	89.7
5		19.19	11.8	1085.63	88.2
2		62.10	16.9	1023.53	83.1
1.25	2.31		18.7	1001.27	81.3
0.63	1.74		20.0	984.50	80.0
0.4	3.70		22.9	948.84	77.1
0.2	42.17		55.9	542.45	44.1
0.063	54.03		98.2	21.77	1.8

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	16.9	% SAND	2-0.063 mm	81.3	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	3.1		
	% Medium gravel	20-6.3 mm	10.3	% Medium sand	0.63-0.2 mm	35.9		1.8
	% Fine gravel	6.3-2 mm	6.6	% Fine sand	0.2-0.063 mm	42.3		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS AND CONTAINS A COAL FRAGMENT. SAND ALSO CONTAINS SHELL FRAGMENTS.

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Sample reference

MB19-0487

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 29-08-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.253 g

Equipment:

RESULT: **4.5 g/kg (total)**

MUFLA OVEN ETI HD150

0 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: MARIEL DEVINCENZI

Test final date: 28-08-19

Mean of analyzed soil mass: 5.068 g

Equipment:

RESULT: **43.6 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0488

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_11 P_11.2
Top depth, m	0.88
Bottom depth, m	1.09
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	21
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	27-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	grSa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine to medium SAND with frequent shell fragments (some of them medium sand to medium gravel sized)	0.88	
	1.09	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0488



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 27/06/2019

Report num.: CB0019-19-0005
Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0488

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.34
Tare + soil + water (g)	201.78
Tare + soil (g)	190.33
Water (g)	11.45
Soil (g)	85.99
Moisture, w (%)	13.3

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Moisture content, w (%)	13.3

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	84.84
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.69
Dry density (Mg/m ³)	1.49

Operator:
Test final date:

Results	
Bulk density (Mg/m³)	1.69
Dry density (Mg/m³)	1.49

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	183.3830
Soil mass, M1 (g)	10.1050
Particle density, G20°C (Mg/m ³)	2.666

Operator: GUILLEM MASSALLÉ
Test final date: 29/08/2019

Results	
Particle density (Mg/m³)	2.666

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0488

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

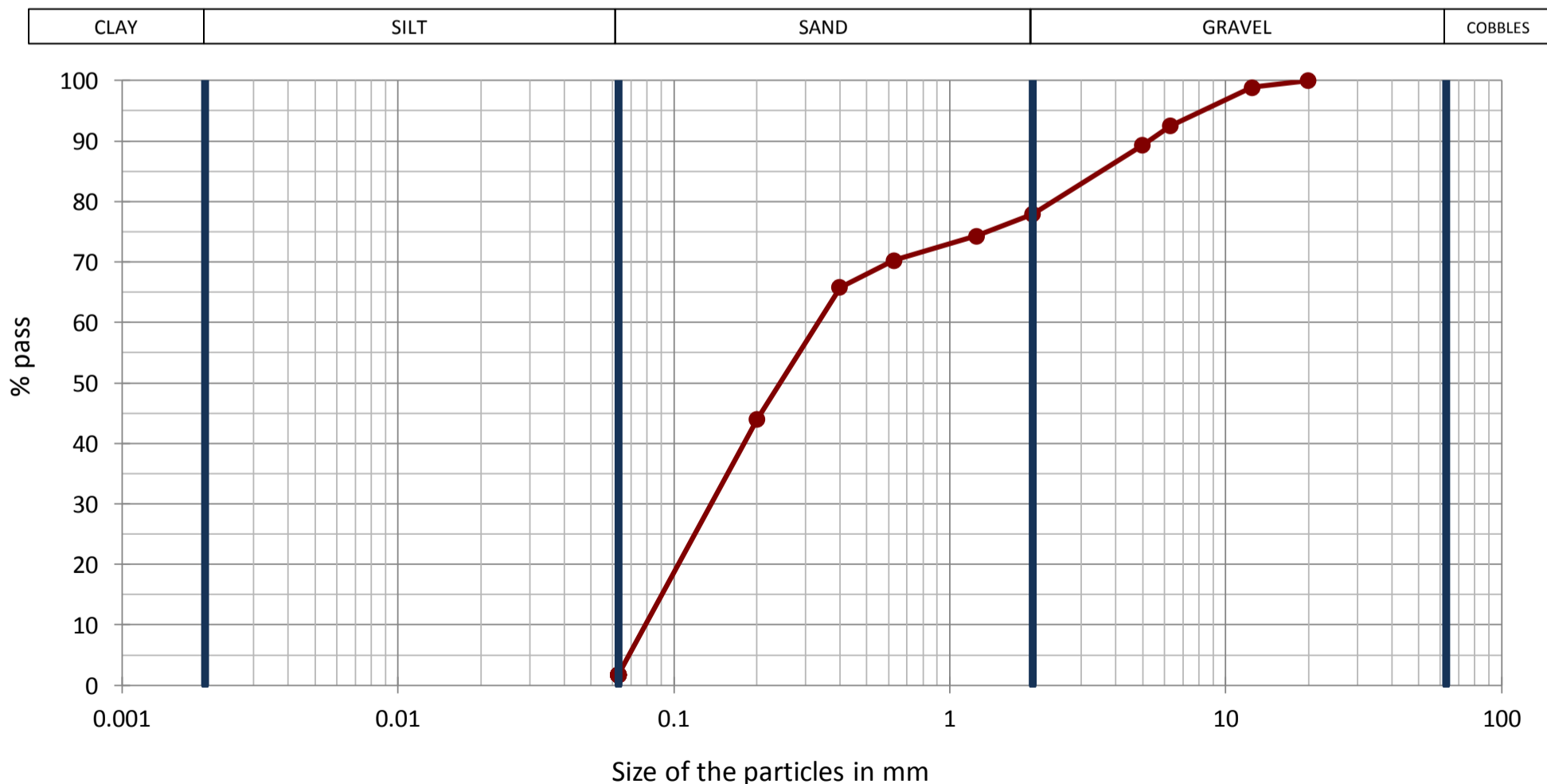
Total dried sample (g)	1210.86
M. > 2mm, washed and dried (g)	266.92
M. < 2 mm, dried tested (g)	102.72
M. < 2 mm, dried tested (g)	102.51
M. < 2 mm, dried total (g)	942.03
Total dried sample (g)	1208.95
Hygros. moisture, % (fraction<2 mm)	0.2
Corr. parameter, f (fraction<2 mm)	0.9980
Corr. parameter, f2 (fraction<2 mm)	9.1894

Results

Sieves Aperture mm	Retained sieves		Pass total sample		
	Partial g	Total g	Total %	g	%
20		0.00	0.0	1208.95	100.0
12.5		12.73	1.1	1196.22	98.9
6.3		78.04	7.5	1118.18	92.5
5		38.51	10.7	1079.67	89.3
2		137.64	22.1	942.03	77.9
1.25	4.75		25.7	898.38	74.3
0.63	5.33		29.7	849.40	70.3
0.4	5.83		34.2	795.82	65.8
0.2	28.73		56.0	531.81	44.0
0.063	55.49		98.2	21.89	1.8

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	22.1	% SAND	2-0.063 mm	76.1	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	7.6		
	% Medium gravel	20-6.3 mm	7.5	% Medium sand	0.63-0.2 mm	26.3		1.8
	% Fine gravel	6.3-2 mm	14.6	% Fine sand	0.2-0.063 mm	42.2		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SHELL FRAGMENTS.

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Sample reference

MB19-0488

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 04-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.69 g

Equipment:

RESULT: **5.2 g/kg (total)**

MUFLA OVEN ETI HD150

0 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 03-09-19

Mean of analyzed soil mass: 2.095 g

Equipment:

RESULT: **117.8 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0488

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6301
Soil mass, g	1484
Minimum density, Mg/m³	1.49

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6543
Soil mass, g	1726
Maximum density, Mg/m³	1.73

Relative density	
Dry density, Mg/m ³	1.49
Relative density, %	0

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0489

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_11 P_11.1
Top depth, m	2
Bottom depth, m	2.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	30
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	27-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare shell fragments	2	
	2.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
 DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
 DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
 DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
 DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Sample reference

MB19-0489

PHOTOGRAPHIC RECORD



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 27/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0489

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	103.11
Tare + soil + water (g)	230.49
Tare + soil (g)	207.84
Water (g)	22.65
Soil (g)	104.73
Moisture, w (%)	21.6

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Moisture content, w (%)	21.6

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	92.46
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.84
Dry density (Mg/m ³)	1.51

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Bulk density (Mg/m³)	1.84
Dry density (Mg/m³)	1.51

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	185.1620
Soil mass, M1 (g)	11.0830
Particle density, G20°C (Mg/m ³)	2.658

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.658

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0489

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

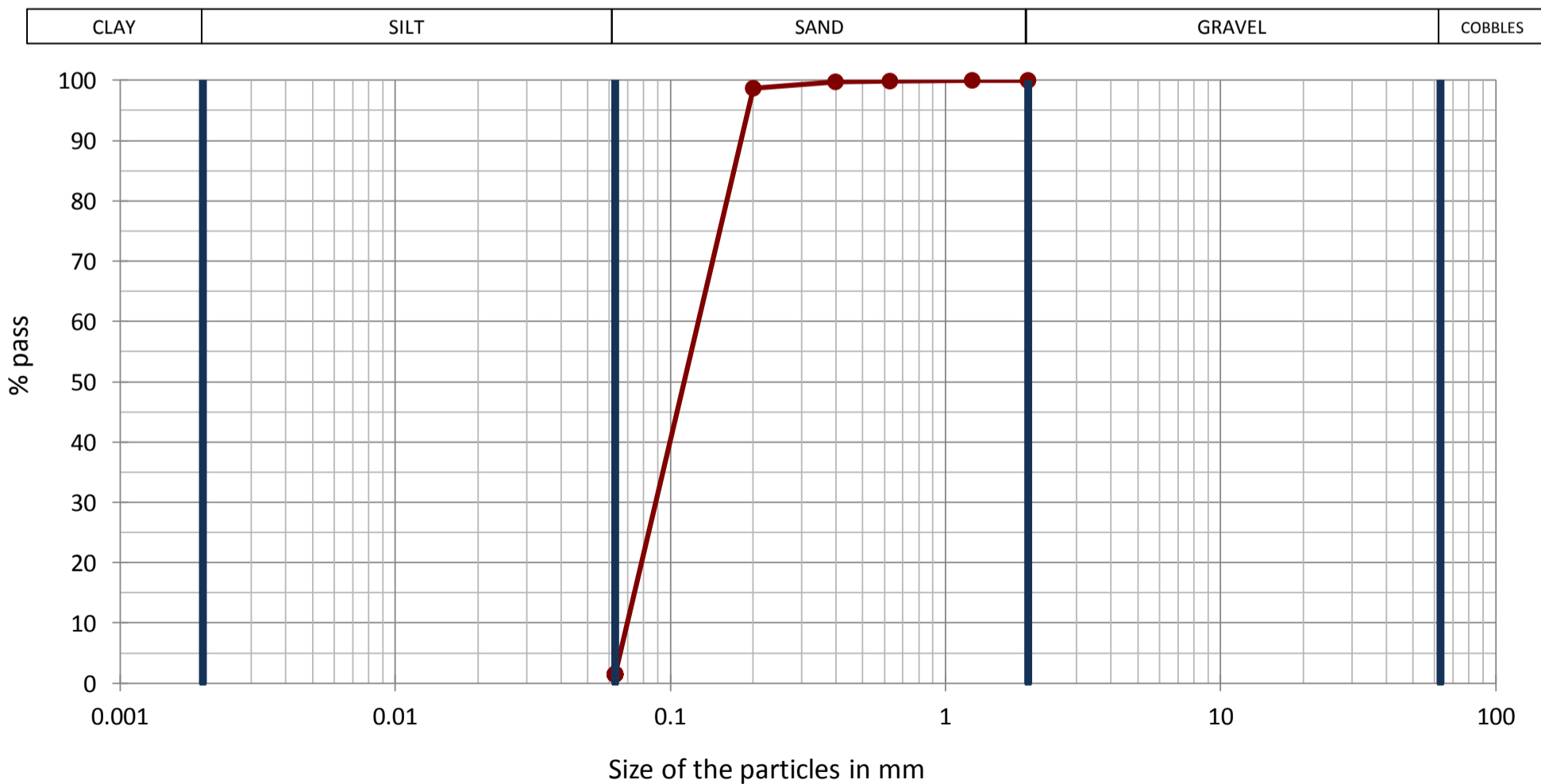
Previous calculations
 Total dried sample (g) **101.97**

 Hygrosc. moisture, % (fraction<2 mm) **0.3**
 Corr. parameter, f (fraction<2 mm) **0.9967**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2		0.00	0.0	101.63	100.0
1.25		0.01	0.0	101.62	100.0
0.63		0.06	0.1	101.56	99.9
0.4		0.09	0.2	101.47	99.8
0.2		1.20	1.3	100.27	98.7
0.063		98.71	98.5	1.56	1.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	1.2		1.5
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	97.2		



REMARKS

COARSE SAND CONTAINS SOME SHELL FRAGMENTS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0489

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Specimen dimensions

Specimen length (cm)	7.665
Specimen diameter (cm)	3.880
Specimen area (cm ²)	11.82
Specimen volume (cm ³)	90.60

Prior saturation process

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	16

Test data

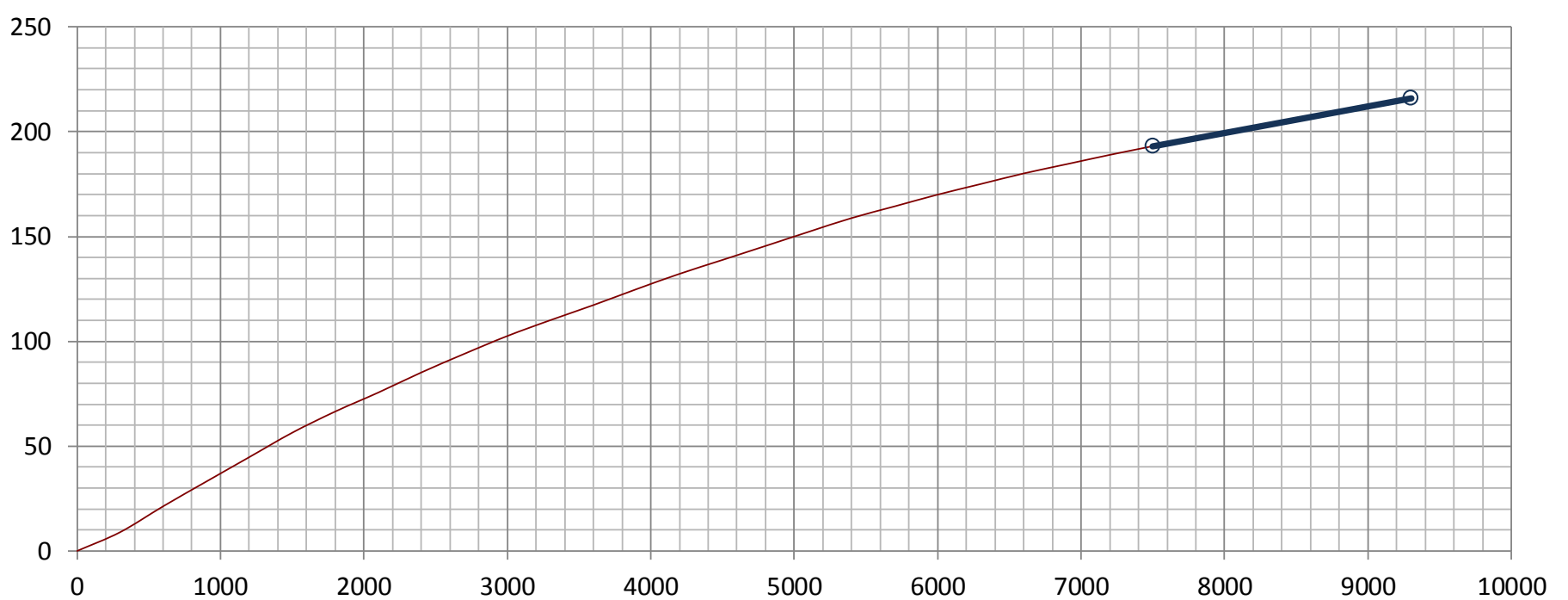
Soil weight (g)	182.70
Dry soil weight (g)	152.21
Initial moisture content (%)	19.9
Initial bulk density (Mg/m ³)	2.02
Initial dry density (Mg/m ³)	1.68
Initial void index, e ₀	0.5821
Initial saturation degree (%)	90.86
Final moisture content (%)	22.4
Final bulk density (Mg/m ³)	2.06
Final dry density (Mg/m ³)	1.68

Pressures applied during test execution

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results

Permeability constant, K (cm/s) 4.14E-05



REMARKS

Operator: GUILLEM MASSALLÉ

Test final date: 30/08/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0489

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-08-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.562 g

Equipment:

RESULT: **4.4 g/kg (total)**

MUFLA OVEN ETI HD150

1 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: MARIEL DEVINCENZI

Test final date: 28-08-19

Mean of analyzed soil mass: 6.16 g

Equipment:

RESULT: **28.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993

Sample reference

MB19-0489

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6172
Soil mass, g	1355
Minimum density, Mg/m³	1.36

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6473
Soil mass, g	1656
Maximum density, Mg/m³	1.66

Relative density	
Dry density, Mg/m ³	1.51
Relative density, %	50

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0490

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_11BIS P_11BIS.5
Top depth, m	0.05
Bottom depth, m	0.18
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	27-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) medium to fine SAND with frequent shell fragments (coarse sand to medium gravel sized)	0.05	
	0.18	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE TO PERFORM THE TEST

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0490



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 27/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0490

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.81
Tare + soil + water (g)	209.57
Tare + soil (g)	203.11
Water (g)	6.46
Soil (g)	91.30
Moisture, w (%)	7.1

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Moisture content, w (%)	7.1

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	73.84
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.47
Dry density (Mg/m ³)	1.37

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Bulk density (Mg/m³)	1.47
Dry density (Mg/m³)	1.37

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.4
Water density at test temp., δwTi (Mg/m ³)	0.9981
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3721
Pyc. mass + soil + water at test temp. M2 (g)	186.1290
Soil mass, M1 (g)	12.4320
Particle density, G20°C (Mg/m ³)	2.659

Operator: GUILLEM MASSALLÉ
Test final date: 13/09/2019

Results	
Particle density (Mg/m³)	2.659

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0490

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

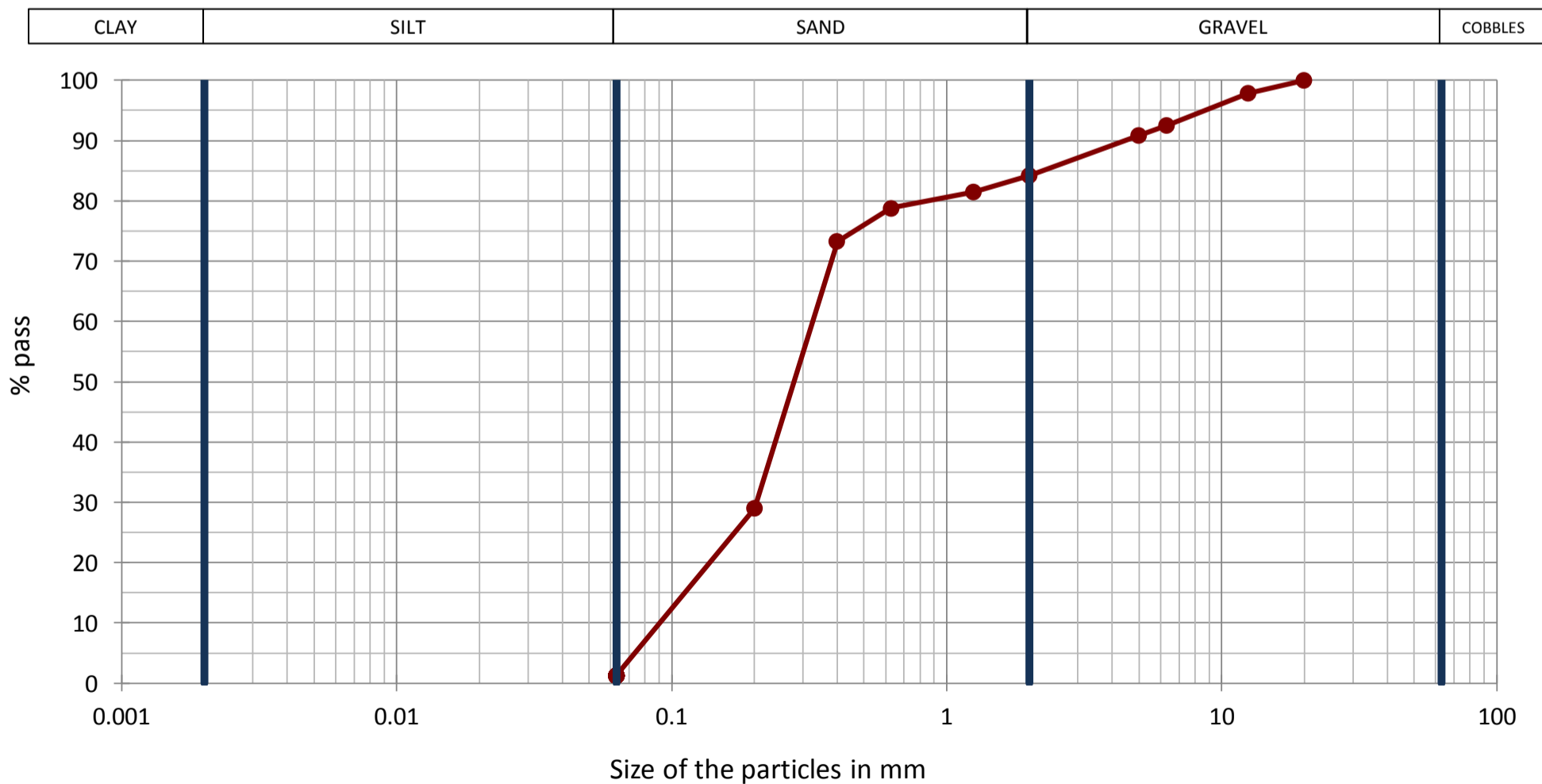
Total dried sample (g)	833.42
M. > 2mm, washed and dried (g)	131.78
M. < 2 mm, dried tested (g)	103.66
M. < 2 mm, dried tested (g)	103.66
M. < 2 mm, dried total (g)	701.64
Total dried sample (g)	833.42
Corr. parameter, f2 (fraction<2 mm)	6.7687

Results

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
20			0.00	0.0	833.42	100.0
12.5			17.80	2.1	815.62	97.9
6.3			45.05	7.5	770.57	92.5
5			12.95	9.1	757.62	90.9
2			55.98	15.8	701.64	84.2
1.25	3.27			18.5	679.51	81.5
0.63	3.37			21.2	656.70	78.8
0.4	6.75			26.7	611.01	73.3
0.2	54.57			71.0	241.64	29.0
0.063	34.16			98.7	10.42	1.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	15.8	% SAND	2-0.063 mm	82.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	5.4		
	% Medium gravel	20-6.3 mm	7.5	% Medium sand	0.63-0.2 mm	49.8		1.3
	% Fine gravel	6.3-2 mm	8.3	% Fine sand	0.2-0.063 mm	27.7		



REMARKS

GRAVEL AND COARSE SAND ARE COMPOSED OF SHELL FRAGMENTS. MEDIUM SAND ALSO CONTAINS SOME SHELL FRAGMENTS.

Report num.: CB0019-19-0005
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Sample reference

MB19-0490

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 13-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.993 g

Equipment:

RESULT: **3.7 g/kg (total)**

MUFLA OVEN ETI HD150

0 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 30-08-19

Mean of analyzed soil mass: 3.134 g

Equipment:

RESULT: **34.8 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0491

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_11BIS P_11BIS.4
Top depth, m	1
Bottom depth, m	1.15
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	27-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/1) fine SAND with occasional amorphous organic matter and frequent shell fragments (fine to medium gravel sized)	1	

1.15

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0491



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 27/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0491

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	112.88
Tare + soil + water (g)	217.41
Tare + soil (g)	200.28
Water (g)	17.13
Soil (g)	87.40
Moisture, w (%)	19.6

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Moisture content, w (%)	19.6

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.22
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.90
Dry density (Mg/m ³)	1.59

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Bulk density (Mg/m³)	1.90
Dry density (Mg/m³)	1.59

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	9
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.6570
Pyc. mass + soil + water at test temp. M2 (g)	184.9550
Soil mass, M1 (g)	10.0280
Particle density, G20°C (Mg/m ³)	2.684

Operator: GUILLEM MASSALLÉ
Test final date: 29/08/2019

Results	
Particle density (Mg/m³)	2.684

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0491

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

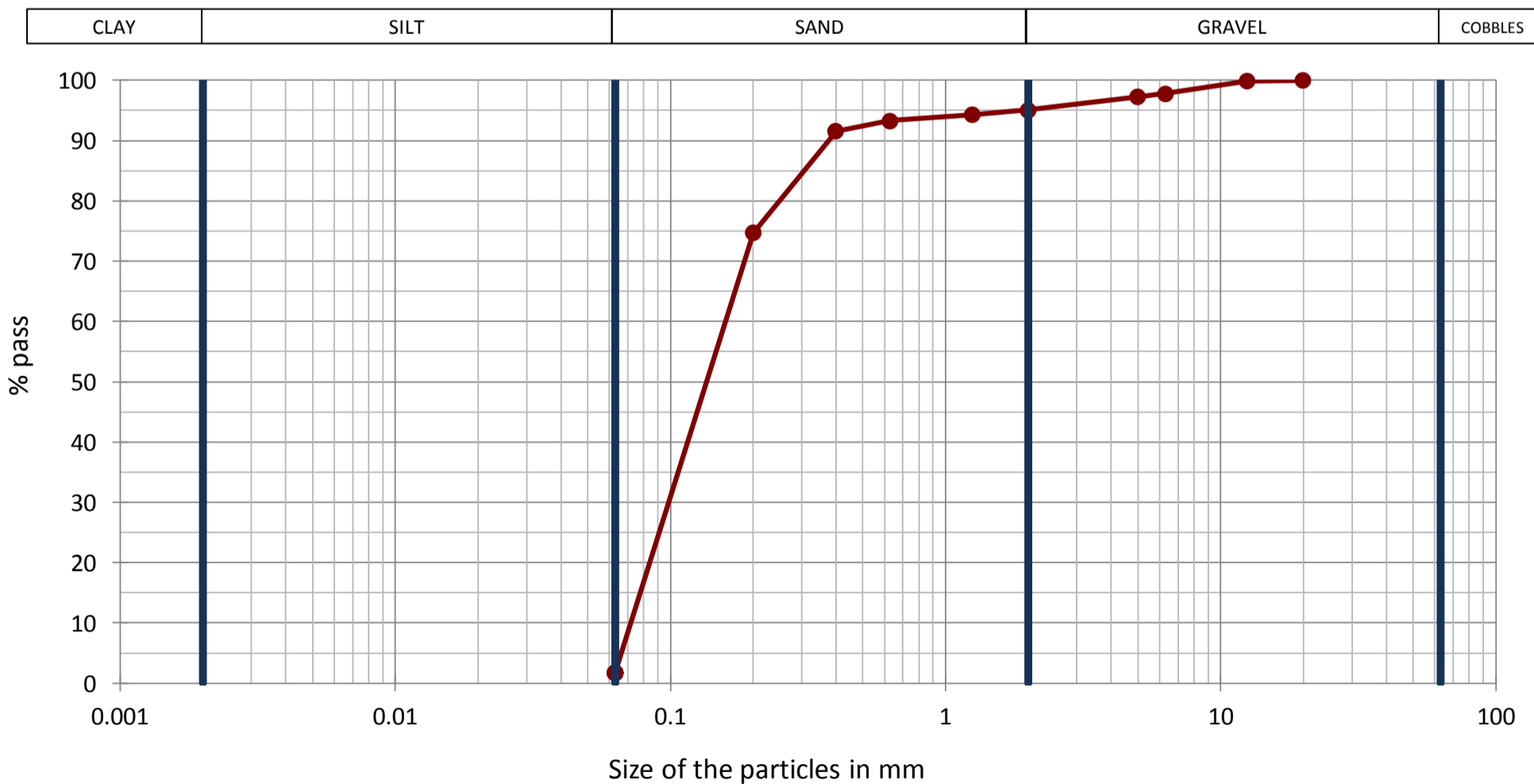
Total dried sample (g)	976.16
M. > 2mm, washed and dried (g)	48.16
M. < 2 mm, dried tested (g)	104.21
M. < 2 mm, dried tested (g)	103.91
M. < 2 mm, dried total (g)	925.36
Total dried sample (g)	973.52
Hygros. moisture, % (fraction<2 mm)	0.3
Corr. parameter, f (fraction<2 mm)	0.9972
Corr. parameter, f2 (fraction<2 mm)	8.9051

Results

Sieves	Retained sieves			Pass total sample		
	Aperture mm	Partial g	Total g	Total %	g	%
20			0.00	0.0	973.52	100.0
12.5			1.28	0.1	972.24	99.9
6.3			20.13	2.2	952.11	97.8
5			5.26	2.7	946.85	97.3
2			21.49	4.9	925.36	95.1
1.25	0.81			5.7	918.15	94.3
0.63	1.08			6.7	908.53	93.3
0.4	1.88			8.4	891.79	91.6
0.2	18.48			25.3	727.22	74.7
0.063	79.71			98.2	17.40	1.8

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm		% SAND	2-0.063 mm		% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.8		
	% Medium gravel	20-6.3 mm	2.2	% Medium sand	0.63-0.2 mm	18.6		1.8
	% Fine gravel	6.3-2 mm	2.7	% Fine sand	0.2-0.063 mm	72.9		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SHELL FRAGMENTS.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0491

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 29-08-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.005 g

Equipment:

RESULT: **4.5 g/kg (total)**

MUFLA OVEN ETI HD150

0 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 28-08-19

Mean of analyzed soil mass: 4.974 g

Equipment:

RESULT: **38.2 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0491

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6283
Soil mass, g	1466
Minimum density, Mg/m³	1.47

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6514
Soil mass, g	1697
Maximum density, Mg/m³	1.70

Relative density	
Dry density, Mg/m ³	1.59
Relative density, %	52

REMARKS

Operator: JOAN SAHUN

Date final test: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0492

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_11BIS P_11BIS.3
Top depth, m	2.35
Bottom depth, m	2.7
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	35
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	27-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare amorphous organic matter millimetrical pockets and rare shell fragments	2.35	
	2.7	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0492



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 27/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0492

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	108.65
Tare + soil + water (g)	210.62
Tare + soil (g)	192.25
Water (g)	18.37
Soil (g)	83.60
Moisture, w (%)	22.0

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Moisture content, w (%)	22.0

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.22
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.90
Dry density (Mg/m ³)	1.56

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Bulk density (Mg/m³)	1.90
Dry density (Mg/m³)	1.56

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	184.6690
Soil mass, M1 (g)	10.0320
Particle density, G20°C (Mg/m ³)	2.668

Operator: GUILLEM MASSALLÉ
Test final date: 29/08/2019

Results	
Particle density (Mg/m³)	2.668

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0492

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

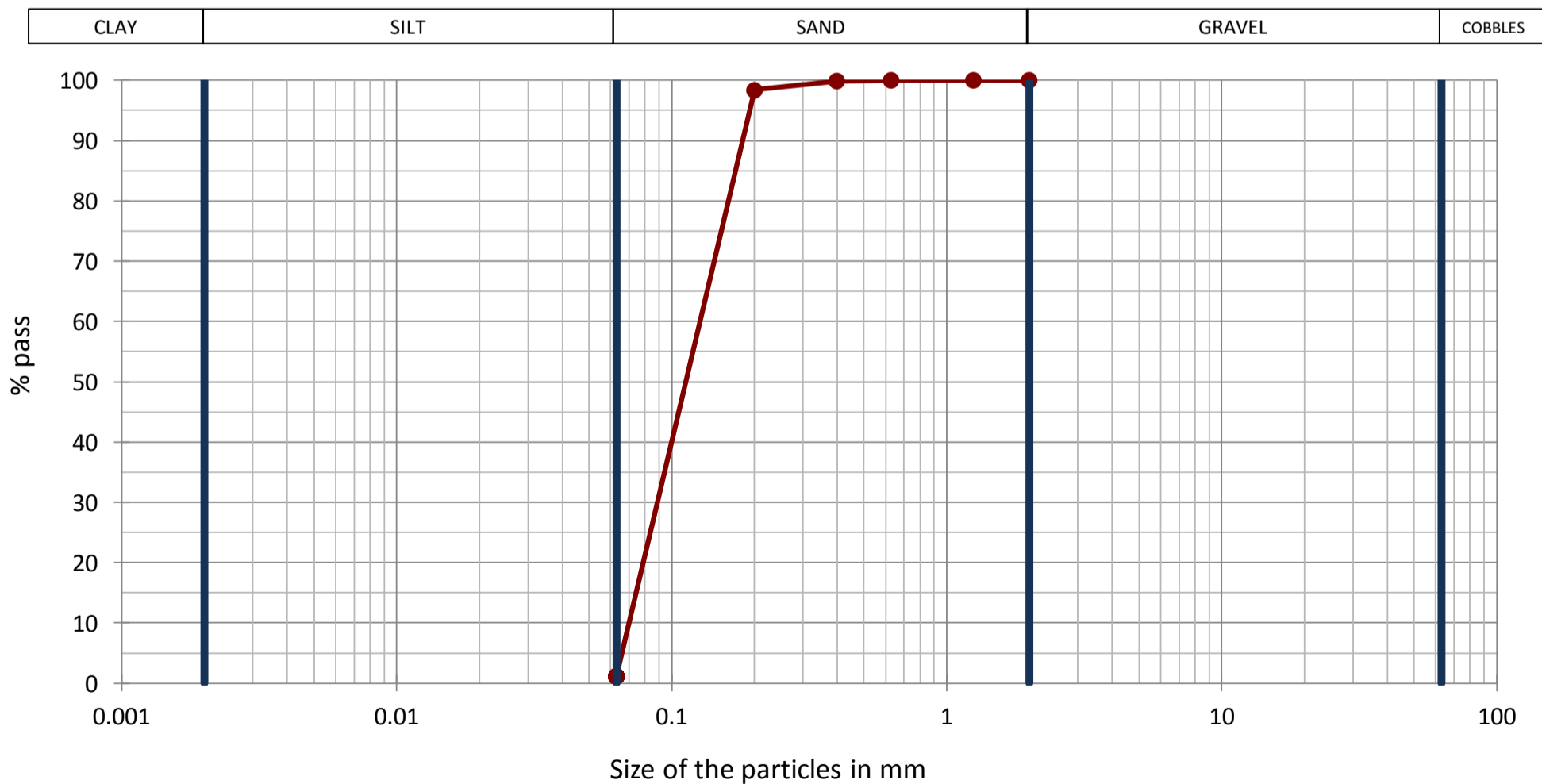
Previous calculations
 Total dried sample (g) **102.56**

 Hygrosc. moisture, % (fraction<2 mm) **0.3**
 Corr. parameter, f (fraction<2 mm) **0.9967**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
2		0.00	0.0	102.22	100.0
1.25		0.02	0.0	102.20	100.0
0.63		0.02	0.0	102.18	100.0
0.4		0.02	0.1	102.16	99.9
0.2		1.55	1.6	100.61	98.4
0.063		99.42	98.8	1.19	1.2

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.8	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	1.6		1.2
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	97.2		



REMARKS

SAND CONTAINS SHELL FRAGMENTS AND RARE ORGANIC MATTER

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PERMEABILITY BY CONSTANT AND FALLING HEAD - ISO 17892-11:2019

Sample reference

MB19-0492

Soil conditions **UNDISTURBED**

Equipment
 TRIAXIAL CHAMBER MECACISA 1.5'
 PRESSURE SYSTEM MECACISA 220004
 PC WITH SOFTWARE MECASOFT

Specimen dimensions

Specimen length (cm)	7.628
Specimen diameter (cm)	3.710
Specimen area (cm ²)	10.81
Specimen volume (cm ³)	82.46

Prior saturation process

Chamber pressure (bar)	6.3
Back pressure (bar)	6
Saturation time (hours)	20

Test data

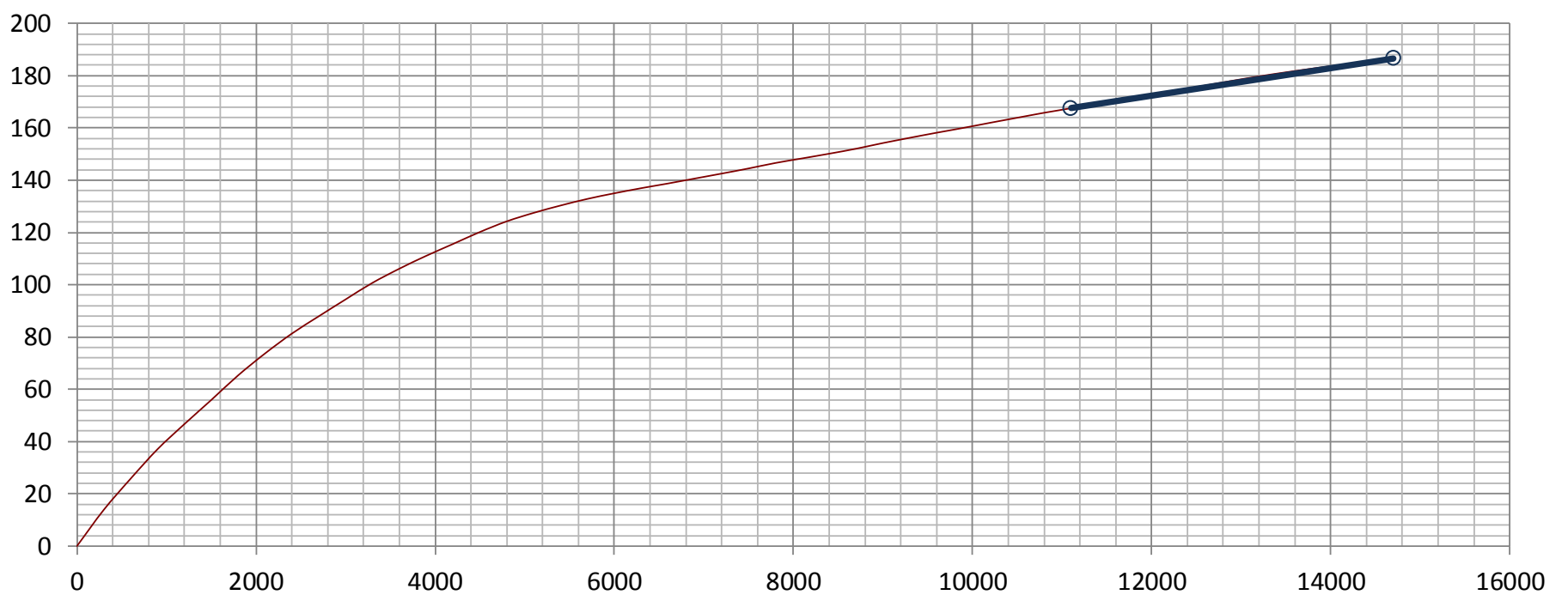
Soil weight (g)	177.24
Dry soil weight (g)	147.60
Initial moisture content (%)	20.1
Initial bulk density (Mg/m ³)	2.15
Initial dry density (Mg/m ³)	1.79
Initial void index, e ₀	0.4905
Initial saturation degree (%)	109.33
Final moisture content (%)	22.7
Final bulk density (Mg/m ³)	2.20
Final dry density (Mg/m ³)	1.79

Pressures applied during test execution

Chamber pressure (bar)	7.5
Lower back pressure (bar)	7
Upper back pressure (bar)	6.8
Pressure gradient (bar)	0.2

Results

Permeability constant, K (cm/s) 1.87E-05



REMARKS

Operator: ALEX VANCELLS

Test final date: 29/08/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0492

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 29-08-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.006 g

Equipment:

RESULT: **4.2 g/kg (total)**

MUFLA OVEN ETI HD150

1 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 28-08-19

Mean of analyzed soil mass: 7.03 g

Equipment:

RESULT: **26.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0492

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6215
Soil mass, g	1398
Minimum density, Mg/m³	1.40

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6499
Soil mass, g	1682
Maximum density, Mg/m³	1.69

Relative density	
Dry density, Mg/m ³	1.56
Relative density, %	55

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0493

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_11BIS P_11BIS.2
Top depth, m	3.55
Bottom depth, m	3.7
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	27-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with occasional medium sand with frequent shell fragments (some of them medium sand to medium gravel sized)	3.55	
	3.7	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
 DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
 DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
 DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0493



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 27/06/2019

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0493

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	103.25
Tare + soil + water (g)	215.86
Tare + soil (g)	199.14
Water (g)	16.72
Soil (g)	95.89
Moisture, w (%)	17.4

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Moisture content, w (%)	17.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	94.87
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.89
Dry density (Mg/m ³)	1.61

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Bulk density (Mg/m³)	1.89
Dry density (Mg/m³)	1.61

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	184.3890
Soil mass, M1 (g)	10.1300
Particle density, G20°C (Mg/m ³)	2.669

Operator: GUILLEM MASSALLÉ
Test final date: 29/08/2019

Results	
Particle density (Mg/m³)	2.669

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0493

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

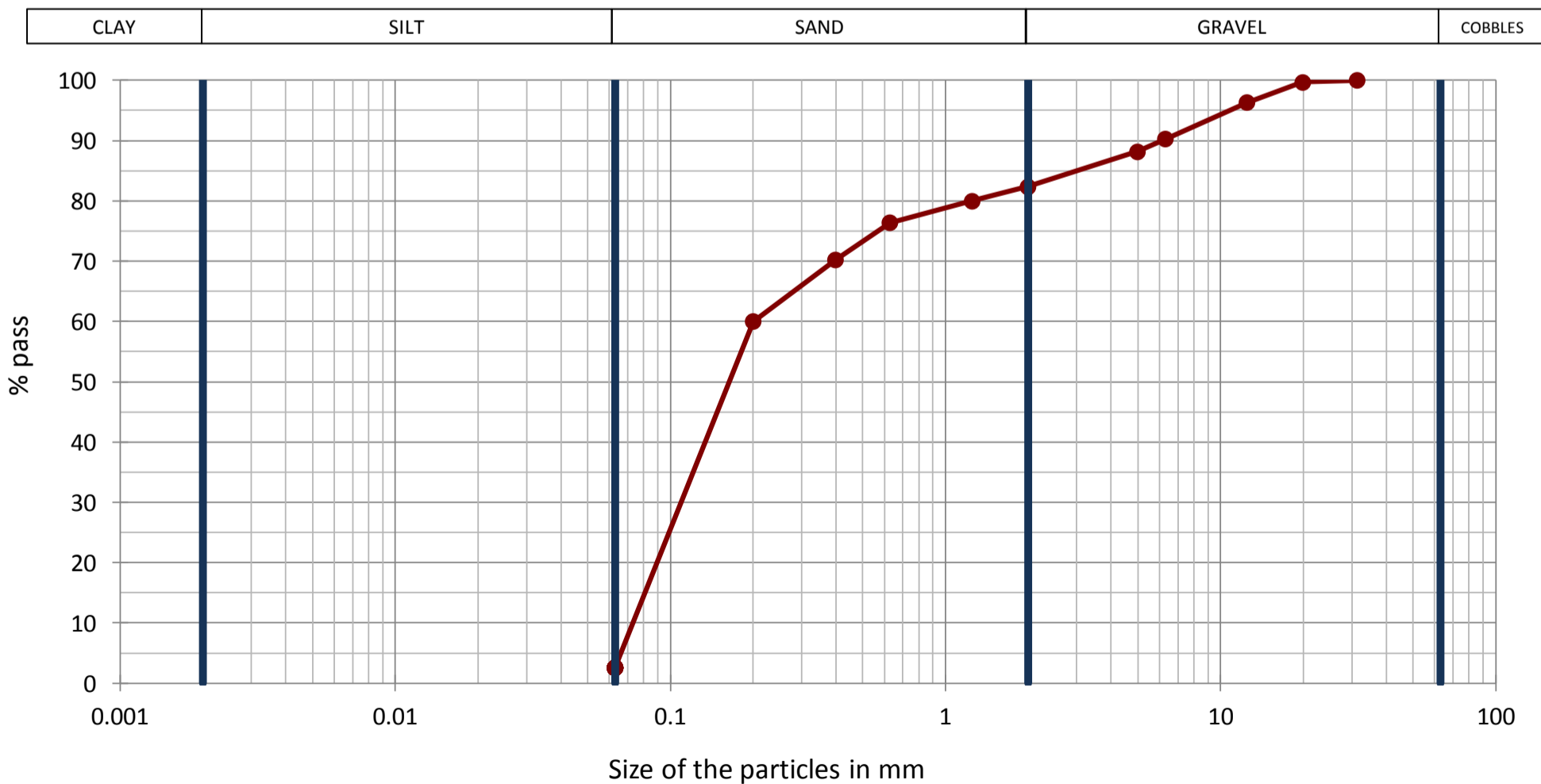
Total dried sample (g)	1542.44
M. > 2mm, washed and dried (g)	271.94
M. < 2 mm, dried tested (g)	105.62
M. < 2 mm, dried tested (g)	105.58
M. < 2 mm, dried total (g)	1269.96
Total dried sample (g)	1541.90
Hygros. moisture, % (fraction<2 mm)	0.0
Corr. parameter, f (fraction<2 mm)	0.9996
Corr. parameter, f2 (fraction<2 mm)	12.0290

Results

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
31.5			0.00	0.0	1541.90	100.0
20			5.23	0.3	1536.67	99.7
12.5			51.94	3.7	1484.73	96.3
6.3			92.76	9.7	1391.97	90.3
5			32.42	11.8	1359.55	88.2
2			89.59	17.6	1269.96	82.4
1.25	3.04			20.0	1233.39	80.0
0.63	4.66			23.6	1177.34	76.4
0.4	7.79			29.7	1083.63	70.3
0.2	13.19			40.0	924.97	60.0
0.063	73.51			97.4	40.72	2.6

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	17.6	% SAND	2-0.063 mm	79.8	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.3	% Coarse sand	2-0.63 mm	6.0		
	% Medium gravel	20-6.3 mm	9.4	% Medium sand	0.63-0.2 mm	16.4		2.6
	% Fine gravel	6.3-2 mm	7.9	% Fine sand	0.2-0.063 mm	57.4		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SHELL FRAGMENTS.

Report num.: CB0019-19-0005
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Sample reference

MB19-0493

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-08-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 11.08 g

Equipment:

RESULT: **5.1 g/kg (total)**

MUFLA OVEN ETI HD150

0 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: MARIEL DEVINCENZI

Test final date: 28-08-19

Mean of analyzed soil mass: 2.637 g

Equipment:

RESULT: **70.1 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0493

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6256
Soil mass, g	1439
Minimum density, Mg/m³	1.44

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6512
Soil mass, g	1695
Maximum density, Mg/m³	1.70

Relative density	
Dry density, Mg/m ³	1.61
Relative density, %	65

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0494

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_11BIS P_11BIS.1
Top depth, m	4.3
Bottom depth, m	4.4
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	11-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	27-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare clay millimetrical pockets, rare amorphous organic matter pockets and rare shell fragments	4.3	
	4.4	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0494



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 27/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0494

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	122.78
Tare + soil + water (g)	218.59
Tare + soil (g)	200.45
Water (g)	18.14
Soil (g)	77.67
Moisture, w (%)	23.4

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Moisture content, w (%)	23.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	97.27
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.94
Dry density (Mg/m ³)	1.57

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Bulk density (Mg/m³)	1.94
Dry density (Mg/m³)	1.57

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	184.5370
Soil mass, M1 (g)	10.0440
Particle density, G20°C (Mg/m ³)	2.676

Operator: GUILLEM MASSALLÉ
Test final date: 29/08/2019

Results	
Particle density (Mg/m³)	2.676

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0494

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

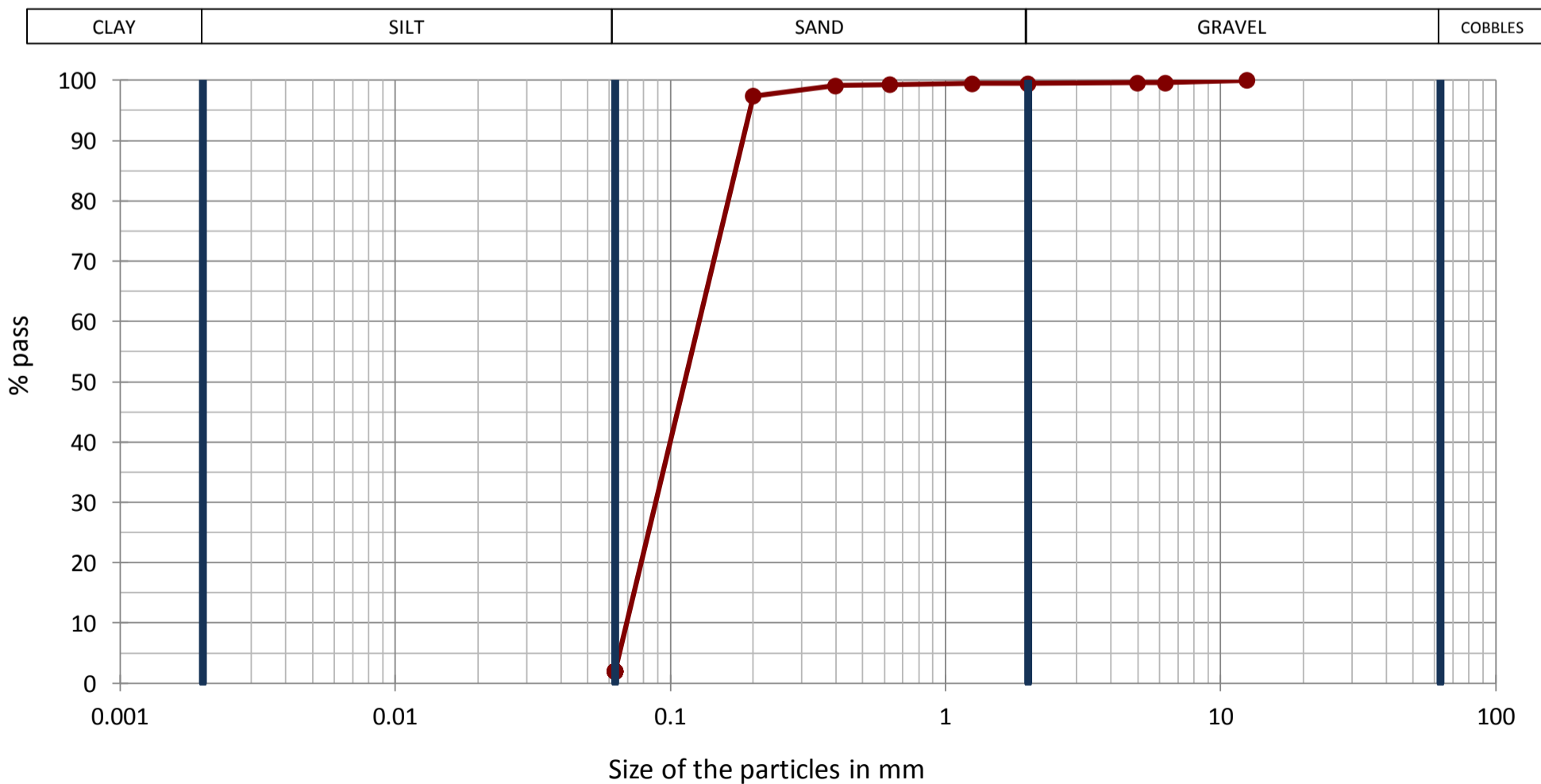
Previous calculations
 Total dried sample (g) **103.09**

 Hygrosc. moisture, % (fraction < 2 mm) **0.2**
 Corr. parameter, f (fraction < 2 mm) **0.9984**

Results					
Sieves Aperture mm	Retained sieves		Pass total sample		
	Partial g	Total g	Total %	g	%
12.5		0.00	0.0	102.93	100.0
6.3		0.42	0.4	102.51	99.6
5		0.00	0.4	102.51	99.6
2		0.06	0.5	102.45	99.5
1.25		0.03	0.5	102.42	99.5
0.63		0.18	0.7	102.24	99.3
0.4		0.26	0.9	101.98	99.1
0.2		1.74	2.6	100.24	97.4
0.063		98.14	98.0	2.10	2.0

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.5	% SAND	2-0.063 mm	97.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.2		
	% Medium gravel	20-6.3 mm	0.4	% Medium sand	0.63-0.2 mm	1.9		2.0
	% Fine gravel	6.3-2 mm	0.1	% Fine sand	0.2-0.063 mm	95.4		



REMARKS

GRAVEL AND COARSE SAND ARE COMPOSED OF SHELL FRAGMENTS. MEDIUM SAND CONTAINS RARE SHELL FRAGMENTS AND MICA.
 FINE SAND CONTAINS MICA

Operator: GUILLEM MASSALLÉ

Test final date: 28/08/2019
 724/854

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0494

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 29-08-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.009 g

Equipment:

RESULT: **4.3 g/kg (total)**

MUFLA OVEN ETI HD150

1 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: GUILLEM MASSALLÉ

Test final date: 28-08-19

Mean of analyzed soil mass: 9.861 g

Equipment:

RESULT: **27.3 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993

Sample reference

MB19-0494

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6153
Soil mass, g	1336
Minimum density, Mg/m³	1.34

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6439
Soil mass, g	1622
Maximum density, Mg/m³	1.63

Relative density	
Dry density, Mg/m ³	1.57
Relative density, %	79

REMARKS

Operator: ALEX VANCELLS

Date final test: 21/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0495

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_10 P_10.5
Top depth, m	0.1
Bottom depth, m	0.23
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	27-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) to very dark gray (2.5Y 3/1) medium to fine SAND with occasional amorphous organic matter blackish pockets, and frequent shell fragments (some of them medium sand to medium gravel sized) and polychaetes (specifically Lanice conchilega)	0.1	
	0.23	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

THE MINIMUM AND MAXIMUM DENSITIES COULD NOT BE DETERMINED BECAUSE THERE IS NOT ENOUGH SAMPLE TO PERFORM THE TEST

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0495



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 27/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0495

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	112.51
Tare + soil + water (g)	232.31
Tare + soil (g)	215.71
Water (g)	16.60
Soil (g)	103.20
Moisture, w (%)	16.1

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Moisture content, w (%)	16.1

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	89.23
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.78
Dry density (Mg/m ³)	1.53

Operator: ALEX VANCELLS
Test final date: 27/06/2019

Results	
Bulk density (Mg/m³)	1.78
Dry density (Mg/m³)	1.53

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	186.2210
Soil mass, M1 (g)	13.0450
Particle density, G20°C (Mg/m ³)	2.673

Operator: GUILLEM MASSALLÉ
Test final date: 02/09/2019

Results	
Particle density (Mg/m³)	2.673

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0495

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0225

Predrying temperature (°C) **60**

Previous calculations

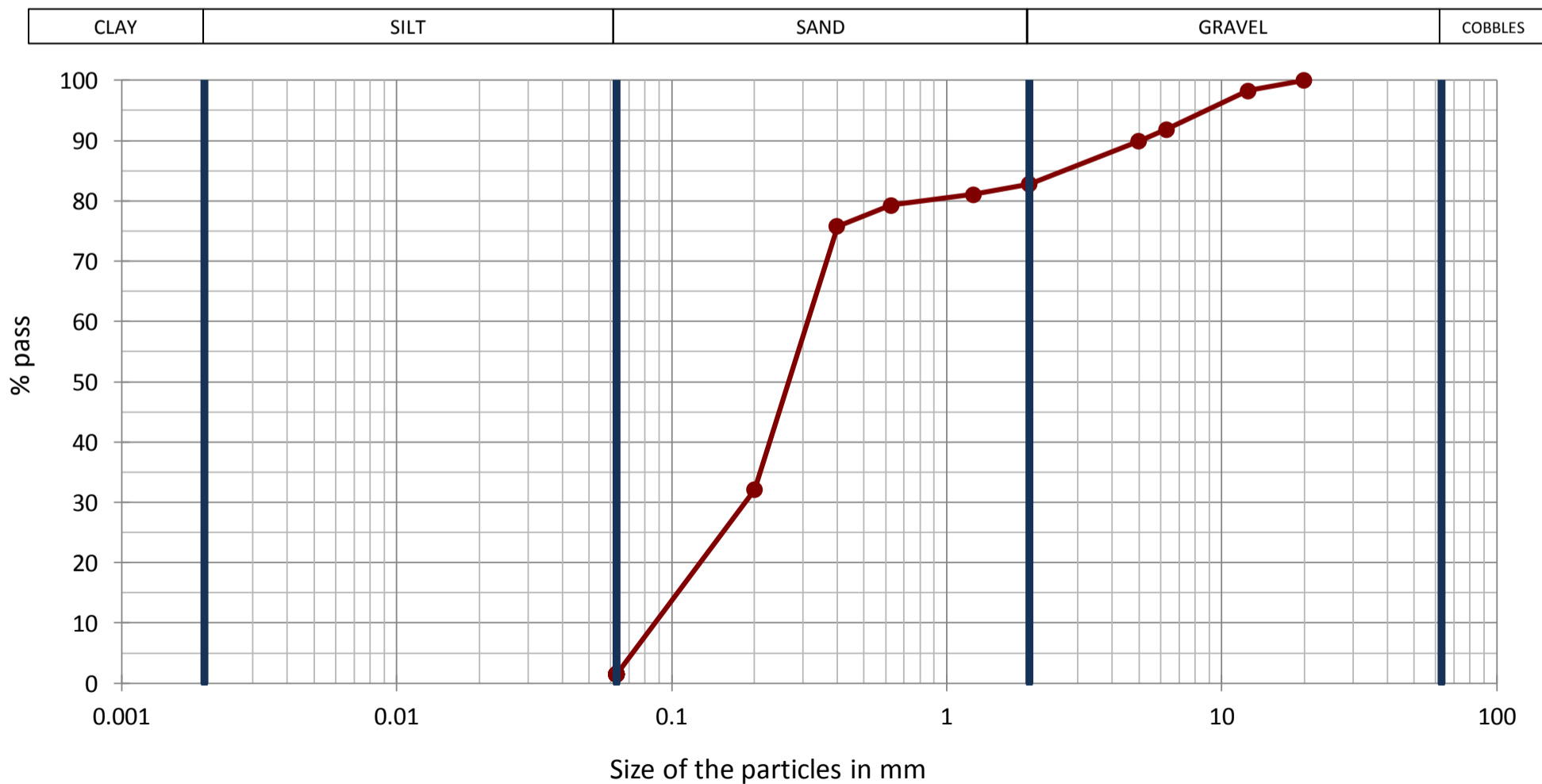
Total dried sample (g)	1281.44
M. > 2mm, washed and dried (g)	220.39
M. < 2 mm, dried tested (g)	104.66
M. < 2 mm, dried tested (g)	104.45
M. < 2 mm, dried total (g)	1058.91
Total dried sample (g)	1279.30
Hygros. moisture, % (fraction<2 mm)	0.2
Corr. parameter, f (fraction<2 mm)	0.9980
Corr. parameter, f2 (fraction<2 mm)	10.1381

Results

Sieves	Retained sieves			Pass total sample		
	Aperture mm	Partial g	Total g	Total %	g	%
20			0.00	0.0	1279.30	100.0
12.5			22.10	1.7	1257.20	98.3
6.3			80.91	8.1	1176.29	91.9
5			26.68	10.1	1149.61	89.9
2			90.70	17.2	1058.91	82.8
1.25	2.15			18.9	1037.12	81.1
0.63	2.19			20.7	1014.92	79.3
0.4	4.50			24.2	969.29	75.8
0.2	55.06			67.9	411.09	32.1
0.063	38.68			98.5	18.95	1.5

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	17.2	% SAND	2-0.063 mm	81.3	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	3.5		
	% Medium gravel	20-6.3 mm	8.1	% Medium sand	0.63-0.2 mm	47.2		1.5
	% Fine gravel	6.3-2 mm	9.1	% Fine sand	0.2-0.063 mm	30.6		



REMARKS

GRAVEL IS COMPOSED OF SHELL FRAGMENTS. SAND ALSO CONTAINS SHELL FRAGMENTS.

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Sample reference

MB19-0495

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-08-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.25 g

Equipment:

RESULT: **5.3 g/kg (total)**

MUFLA OVEN ETI HD150

0.5 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: MARIEL DEVINCENZI

Test final date: 28-08-19

Mean of analyzed soil mass: 4.229 g

Equipment:

RESULT: **39.7 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0496

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_10 P_10.4
Top depth, m	0.83
Bottom depth, m	0.97
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	14
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	28-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) to very dark gray (2.5Y 3/1) medium to fine SAND with occasional amorphous organic matter blackish zones, and frequent shell fragments coarse sand to medium gravel sized) and polychaetes (specifically Lanice condhilega)	0.83	
	0.97	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0496



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0496

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	98.54
Tare + soil + water (g)	227.68
Tare + soil (g)	209.47
Water (g)	18.21
Soil (g)	110.93
Moisture, w (%)	16.4

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Moisture content, w (%)	16.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	88.69
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.77
Dry density (Mg/m ³)	1.52

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Bulk density (Mg/m³)	1.77
Dry density (Mg/m³)	1.52

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	12
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	177.0703
Pyc. mass + soil + water at test temp. M2 (g)	186.1320
Soil mass, M1 (g)	14.5470
Particle density, G20°C (Mg/m ³)	2.651

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.651

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0496

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

Previous calculations

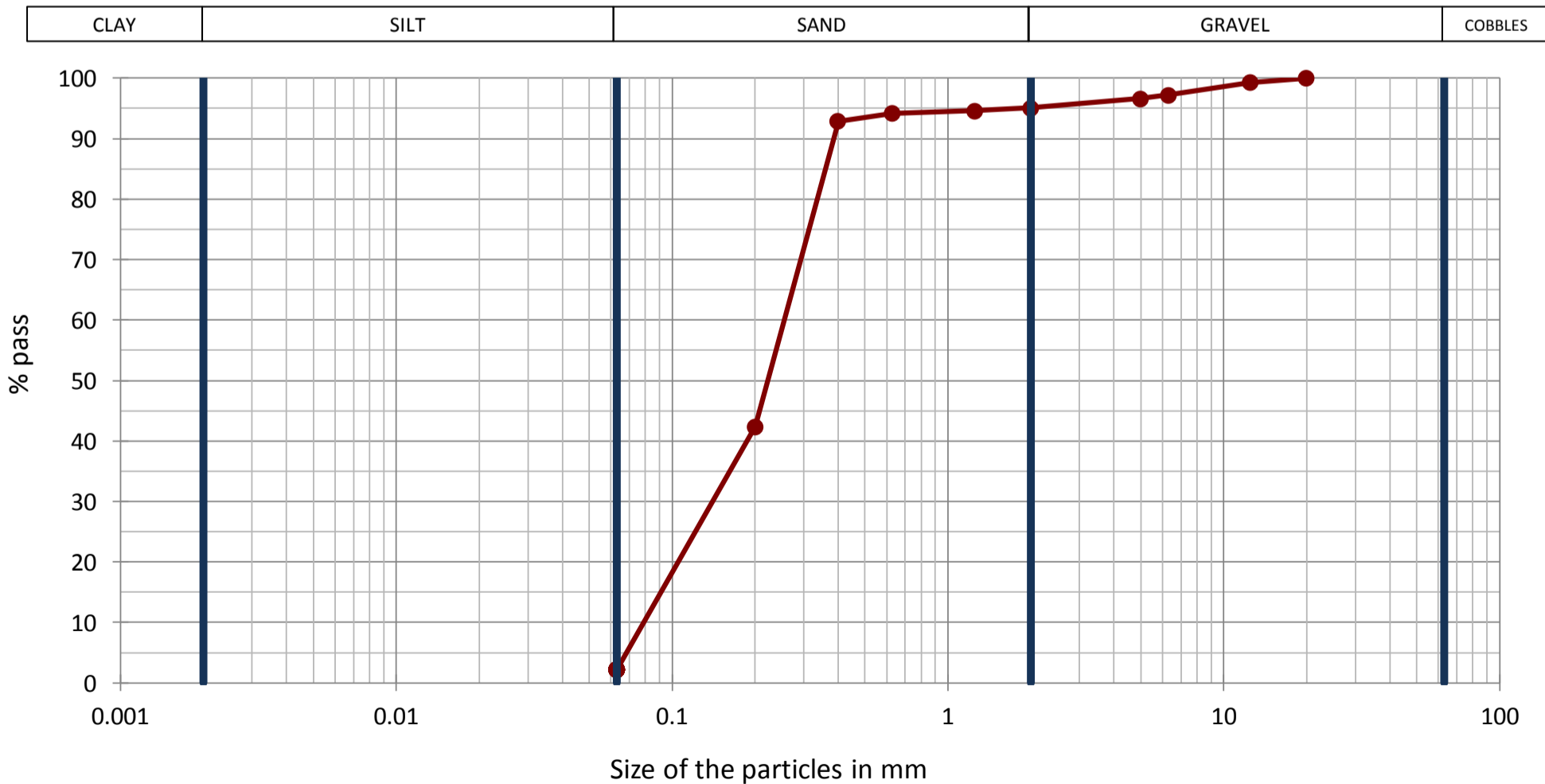
Total dried sample (g)	1306.72
M. > 2mm, washed and dried (g)	64.19
M. < 2 mm, dried tested (g)	104.06
M. < 2 mm, dried tested (g)	103.80
M. < 2 mm, dried total (g)	1239.48
Total dried sample (g)	1303.67
Hygros. moisture, % (fraction<2 mm)	0.2
Corr. parameter, f (fraction<2 mm)	0.9975
Corr. parameter, f2 (fraction<2 mm)	11.9405

Results

Sieves	Retained sieves			Pass total sample		
	Aperture mm	Partial g	Total g	Total %	g	%
20			0.00	0.0	1303.67	100.0
12.5			8.99	0.7	1294.68	99.3
6.3			27.84	2.8	1266.84	97.2
5			7.23	3.4	1259.61	96.6
2			20.13	4.9	1239.48	95.1
1.25	0.48			5.4	1233.75	94.6
0.63	0.46			5.8	1228.25	94.2
0.4	1.39			7.1	1211.66	92.9
0.2	55.20			57.6	552.54	42.4
0.063	43.86			97.8	28.83	2.2

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	4.9	% SAND	2-0.063 mm	92.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.9		
	% Medium gravel	20-6.3 mm	2.8	% Medium sand	0.63-0.2 mm	51.8		2.2
	% Fine gravel	6.3-2 mm	2.1	% Fine sand	0.2-0.063 mm	40.2		



REMARKS

GRAVEL AND COARSE SAND ARE COMPOSED OF SHELL FRAGMENTS

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Sample reference

MB19-0496

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Predrying temperature:	60 °C	Test final date:	03-10-19
Mean of analyzed soil mass:	10.142 g	Calcination temperature:	450 °C
RESULT:	2.8 g/kg (total)	Equipment:	MUFLA OVEN ETI HD150
	0.2 g/kg (organic)		PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass:	3 g	Equipment:	SCHEIBLER APPARATUS
RESULT:	21.3 g/kg		

REMARKS

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DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993

Sample reference

MB19-0496

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6261
Soil mass, g	1444
Minimum density, Mg/m³	1.45

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6565
Soil mass, g	1748
Maximum density, Mg/m³	1.75

Relative density	
Dry density, Mg/m ³	1.52
Relative density, %	23

REMARKS

Operator: ALEX VANCELLS

Date final test: 22/10/2018

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0497

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_10 P_10.3
Top depth, m	1.9
Bottom depth, m	2.03
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	28-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with rare millimetrical clay layers and rare shell fragments.	1.9	
	2.03	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
 DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
 DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
 DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0497



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

**DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015**

Sample reference

MB19-0497

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	107.73
Tare + soil + water (g)	225.39
Tare + soil (g)	205.07
Water (g)	20.32
Soil (g)	97.34
Moisture, w (%)	20.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Moisture content, w (%)	20.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	95.44
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.90
Dry density (Mg/m ³)	1.57

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Bulk density (Mg/m³)	1.90
Dry density (Mg/m³)	1.57

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	185.0840
Soil mass, M1 (g)	10.9810
Particle density, G20°C (Mg/m ³)	2.649

Operator: GUILLEM MASSALLÉ
Test final date: 01/10/2019

Results	
Particle density (Mg/m³)	2.649

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0497

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

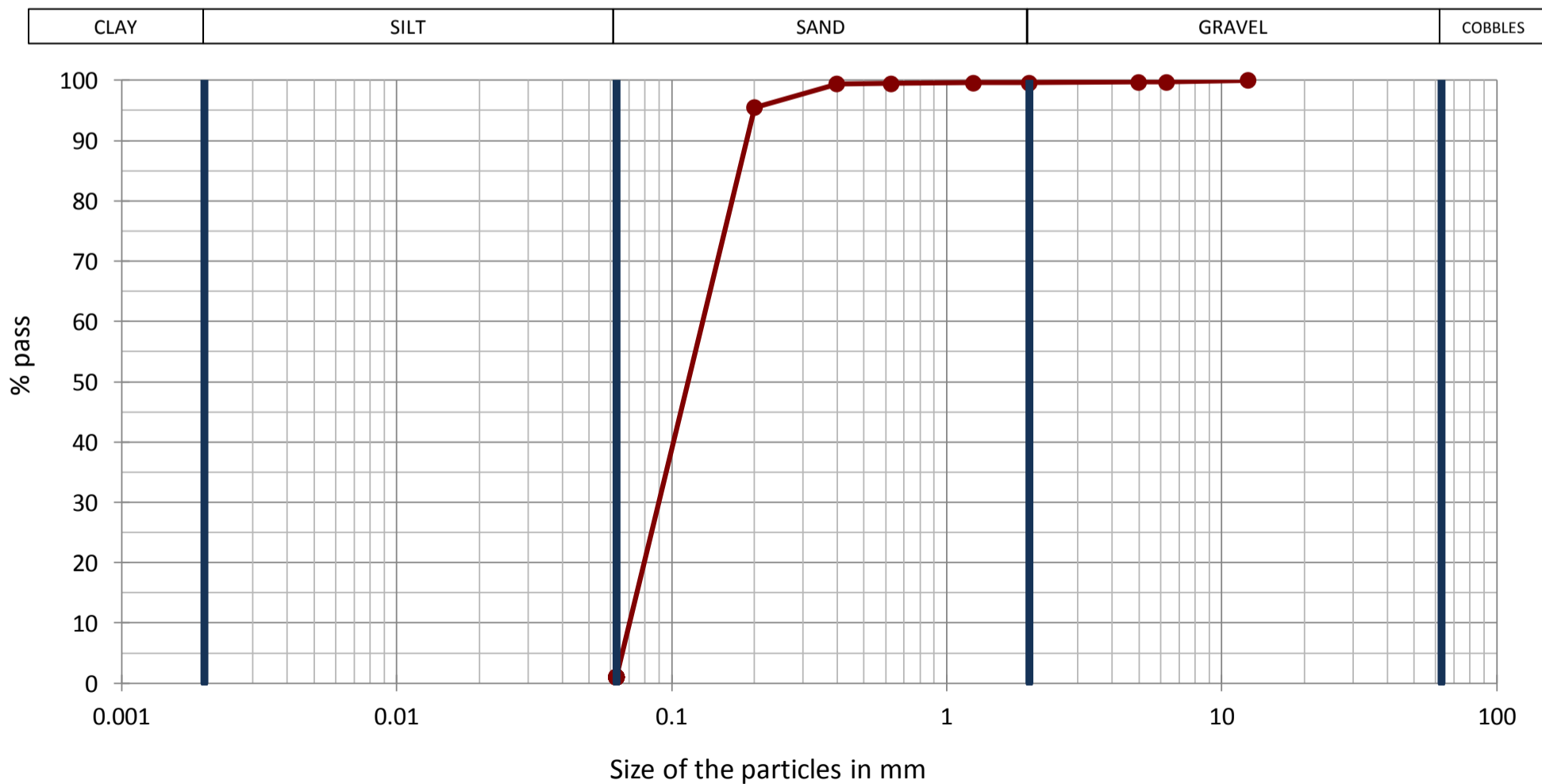
Previous calculations
 Total dried sample (g) **107.39**

 Hygrosc. moisture, % (fraction < 2 mm) **0.2**
 Corr. parameter, f (fraction < 2 mm) **0.9980**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
12.5		0.00	0.0	107.18	100.0
6.3		0.36	0.3	106.82	99.7
5		0.00	0.3	106.82	99.7
2		0.06	0.4	106.76	99.6
1.25		0.05	0.4	106.71	99.6
0.63		0.09	0.5	106.62	99.5
0.4		0.11	0.6	106.51	99.4
0.2		4.12	4.5	102.39	95.5
0.063		101.26	98.9	1.13	1.1

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.4	% SAND	2-0.063 mm	98.5	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.3	% Medium sand	0.63-0.2 mm	4.0		1.1
	% Fine gravel	6.3-2 mm	0.1	% Fine sand	0.2-0.063 mm	94.4		



REMARKS

GRAVEL AND COARSE SAND ARE COMPOSED OF SHELL FRAGMENTS

Report num.: CB0019-19-0005
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Sample reference

MB19-0497

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.049 g

Equipment:

RESULT: **3.8 g/kg (total)**

MUFLA OVEN ETI HD150

0.4 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass: 2.944 g

Equipment:

RESULT: **28 g/kg**

SCHEIBLER APPARATUS

REMARKS

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DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993

Sample reference

MB19-0497

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6274
Soil mass, g	1457
Minimum density, Mg/m³	1.46

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6450
Soil mass, g	1633
Maximum density, Mg/m³	1.64

Relative density	
Dry density, Mg/m ³	1.57
Relative density, %	61

REMARKS

Operator: JOAN SAHUN

Date final test: 25/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0498

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_10 P_10.2
Top depth, m	2.9
Bottom depth, m	3.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	40
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	28-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (5Y 4/1) fine SAND with rare millimetrical clay layers and occasional shell fragments.	2.9	
	3.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0498



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0498

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	97.65
Tare + soil + water (g)	243.79
Tare + soil (g)	217.57
Water (g)	26.22
Soil (g)	119.92
Moisture, w (%)	21.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Moisture content, w (%)	21.9

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	93.22
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.86
Dry density (Mg/m ³)	1.53

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Bulk density (Mg/m³)	1.86
Dry density (Mg/m³)	1.53

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0499

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_10 P_10.1
Top depth, m	4
Bottom depth, m	4.17
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	17
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	28-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Grayish brown (2.5Y 5/2) medium to coarse SAND with rare fibrous wood fragments and frequent shell fragments.	4	

4.17

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0499



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0499

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	104.18
Tare + soil + water (g)	261.39
Tare + soil (g)	242.64
Water (g)	18.75
Soil (g)	138.46
Moisture, w (%)	13.5

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Moisture content, w (%)	13.5

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	84.61
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.68
Dry density (Mg/m ³)	1.48

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Bulk density (Mg/m³)	1.68
Dry density (Mg/m³)	1.48

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	188.9140
Soil mass, M1 (g)	17.3280
Particle density, G20°C (Mg/m ³)	2.677

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.677

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0499

PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **105**

Previous calculations

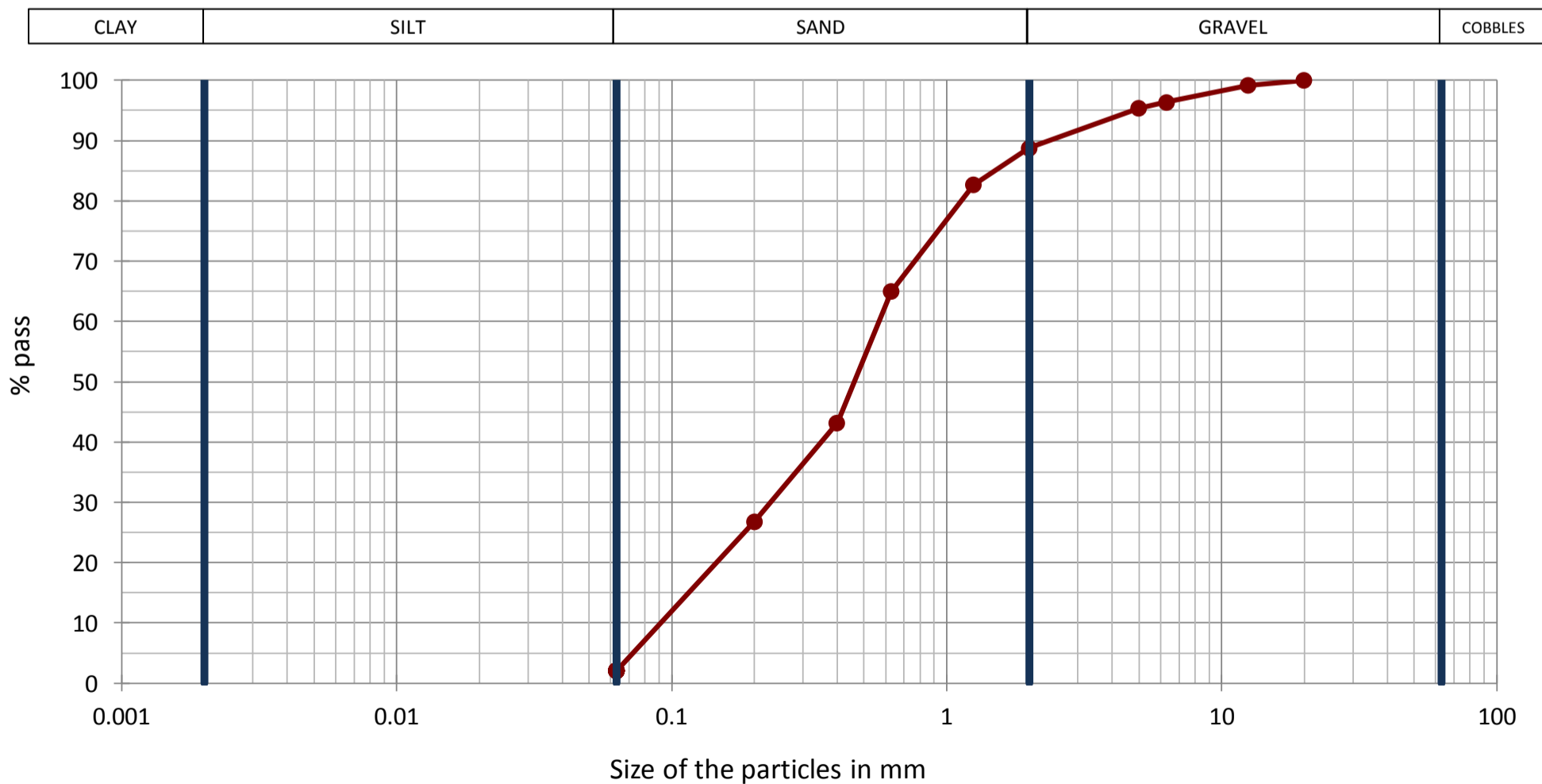
Total dried sample (g)	1492.74
M. > 2mm, washed and dried (g)	167.53
M. < 2 mm, dried tested (g)	107.33
M. < 2 mm, dried tested (g)	107.23
M. < 2 mm, dried total (g)	1324.02
Total dried sample (g)	1491.55
Hygros. moisture, % (fraction<2 mm)	0.1
Corr. parameter, f (fraction<2 mm)	0.9991
Corr. parameter, f2 (fraction<2 mm)	12.3471

Results

Sieves	Retained sieves			Pass total sample		
	Aperture mm	Partial g	Total g	Total %	g	%
20			0.00	0.0	1491.55	100.0
12.5			11.30	0.8	1480.25	99.2
6.3			41.72	3.6	1438.53	96.4
5			15.61	4.6	1422.92	95.4
2			98.90	11.2	1324.02	88.8
1.25	7.38			17.3	1232.90	82.7
0.63	21.34			35.0	969.41	65.0
0.4	26.36			56.8	643.94	43.2
0.2	19.83			73.2	399.10	26.8
0.063	29.80			97.9	31.16	2.1

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	11.2	% SAND	2-0.063 mm	86.7	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	23.8		
	% Medium gravel	20-6.3 mm	3.6	% Medium sand	0.63-0.2 mm	38.2		2.1
	% Fine gravel	6.3-2 mm	7.6	% Fine sand	0.2-0.063 mm	24.7		



REMARKS

GRAVEL COMPOSED OF SHELL FRAGMENTS

Report num.: CB0019-19-0005
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Sample reference

MB19-0499

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: ALEX VANCELLS

Test final date: 03-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.33 g

Equipment:

RESULT: **5.1 g/kg (total)**

MUFLA OVEN ETI HD150

0 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 0.524 g

Equipment:

RESULT: **182.9 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0499

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6271
Soil mass, g	1454
Minimum density, Mg/m³	1.46

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6534
Soil mass, g	1717
Maximum density, Mg/m³	1.72

Relative density	
Dry density, Mg/m ³	1.48
Relative density, %	8

REMARKS

Operator: ALEX VANCELLS

Date final test: 22/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0500

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_9 P_9.6
Top depth, m	0.23
Bottom depth, m	0.36
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	17
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	28-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very dark gray (2.5Y 3/1) fine SAND with frequent amorphous organic matter blackish zones and occasional shell fragments.	0.23	
	0.36	

CARRIED OUT TESTS

- DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
- DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
- DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
- PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995
- DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
- DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0500



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0500

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	108.37
Tare + soil + water (g)	229.32
Tare + soil (g)	210.48
Water (g)	18.84
Soil (g)	102.11
Moisture, w (%)	18.5

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Moisture content, w (%)	18.5

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	93.04
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.85
Dry density (Mg/m ³)	1.56

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Bulk density (Mg/m³)	1.85
Dry density (Mg/m³)	1.56

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.3
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	184.9210
Soil mass, M1 (g)	10.5220
Particle density, G20°C (Mg/m ³)	2.632

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.632

REMARKS

Report num.: CB0019-19-0005
 Edition date:

PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995

Sample reference
MB19-0500

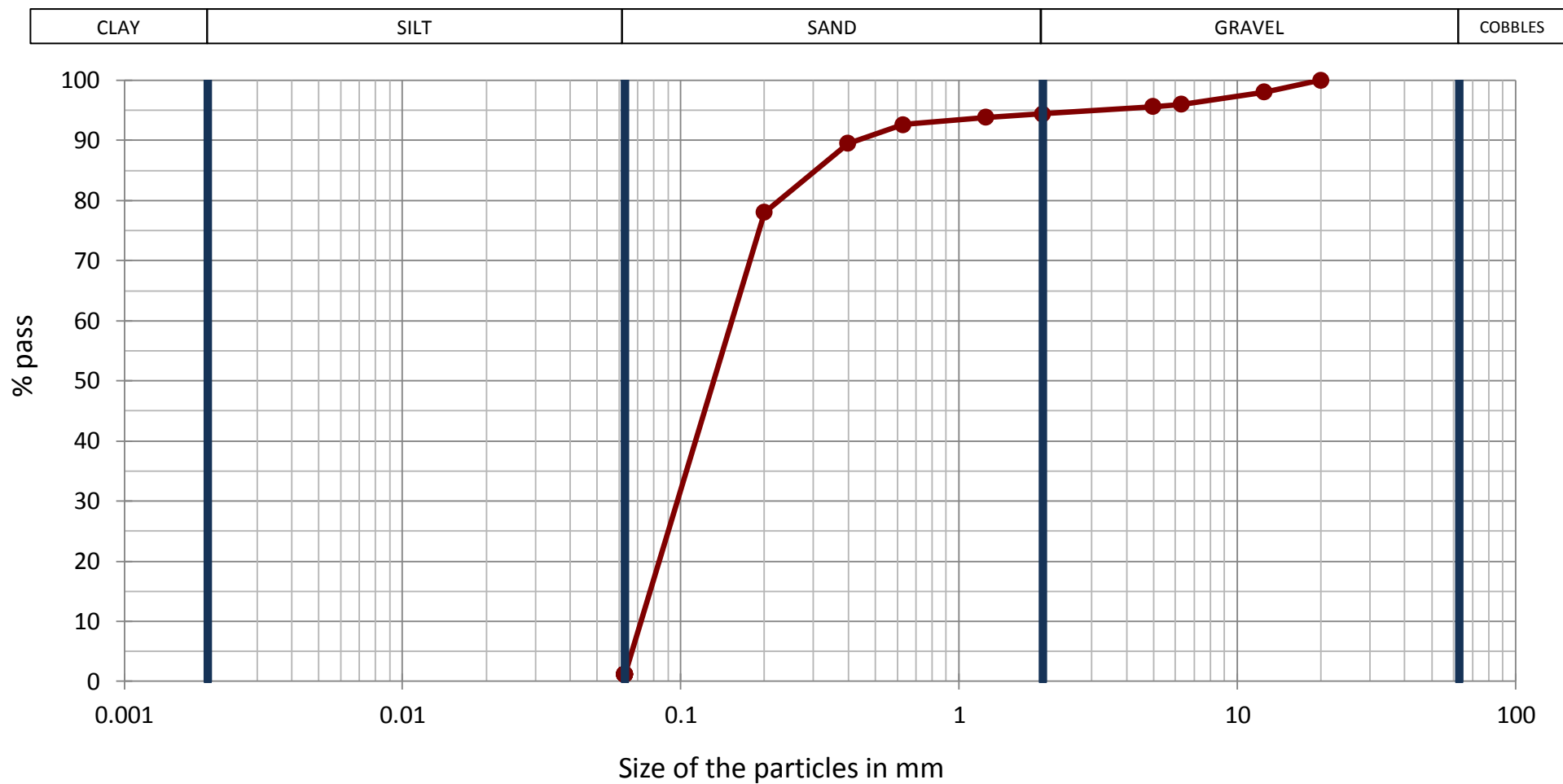
Equipment	
STANDARD SIEVE SERIES PROETI 203 mm	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Predrying temperature (°C)	105
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Previous calculations	
Total dried sample (g)	1499.93
M. > 2mm, washed and dried (g)	84.03
M. < 2 mm, dried tested (g)	104.45
M. < 2 mm, dried tested (g)	104.26
M. < 2 mm, dried total (g)	1413.28
Total dried sample (g)	1497.31
Hygros. moisture, % (fraction<2 mm)	0.2
Corr. parameter, f (fraction<2 mm)	0.9981
Corr. parameter, f2 (fraction<2 mm)	13.5558

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
20		0.00	0.0	1497.31	100.0
12.5		30.46	2.0	1466.85	98.0
6.3		28.74	4.0	1438.11	96.0
5		6.30	4.4	1431.81	95.6
2		18.53	5.6	1413.28	94.4
1.25	0.69		6.2	1403.92	93.8
0.63	1.23		7.4	1387.25	92.6
0.4	3.44		10.5	1340.62	89.5
0.2	12.74		22.0	1167.92	78.0
0.063	84.82		98.8	18.12	1.2

Soil type according to ISO 14688-2:2017							
% COBBLES > 63 mm	% GRAVEL	63-2 mm	5.6	% SAND	2-0.063 mm	93.2	% FINE <0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	1.8	1.2
	% Medium gravel	20-6.3 mm	4.0	% Medium sand	0.63-0.2 mm	14.6	
	% Fine gravel	6.3-2 mm	1.6	% Fine sand	0.2-0.063 mm	76.8	



REMARKS

GRAVEL COMPOSED OF SHELL FRAGMENTS.

Operator: ALEX VANCELLS

Test final date: 07/10/2019

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0500

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Predrying temperature:	60 °C	Calcination temperature:	450 °C
Mean of analyzed soil mass:	10.075 g	Equipment:	MUFLA OVEN ETI HD150
RESULT:	4.9 g/kg (total)		PORCELAIN CRUCIBLES 100 ml
	1.2 g/kg (organic)		

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass:	2.307 g	Equipment:	SCHEIBLER APPARATUS
RESULT:	30.7 g/kg		

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0501

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_9 P_9.5
Top depth, m	1.15
Bottom depth, m	1.5
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	35
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	28-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare clay millimetrical pockets and rare shell fragments.	1.15	

1.5

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0501



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0501

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	106.63
Tare + soil + water (g)	222.71
Tare + soil (g)	204.51
Water (g)	18.20
Soil (g)	97.88
Moisture, w (%)	18.6

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Moisture content, w (%)	18.6

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	95.64
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.90
Dry density (Mg/m ³)	1.60

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Bulk density (Mg/m³)	1.90
Dry density (Mg/m³)	1.60

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0502

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_9 P_9.4
Top depth, m	2.19
Bottom depth, m	2.31
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	12
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	28-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare shell fragments.	2.19	
	2.31	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0502



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0502

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.51
Tare + soil + water (g)	239.68
Tare + soil (g)	220.11
Water (g)	19.57
Soil (g)	108.60
Moisture, w (%)	18.0

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Moisture content, w (%)	18.0

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	91.88
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.83
Dry density (Mg/m ³)	1.55

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Bulk density (Mg/m³)	1.83
Dry density (Mg/m³)	1.55

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.3
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	185.7740
Soil mass, M1 (g)	12.1090
Particle density, G20°C (Mg/m ³)	2.641

Operator: ALEX VANCELLS
Test final date: 03/10/2019

Results	
Particle density (Mg/m³)	2.641

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0502

PARTICLE SIZE ANALYSIS BY SIEVING - UNE 103101:1995

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **105**

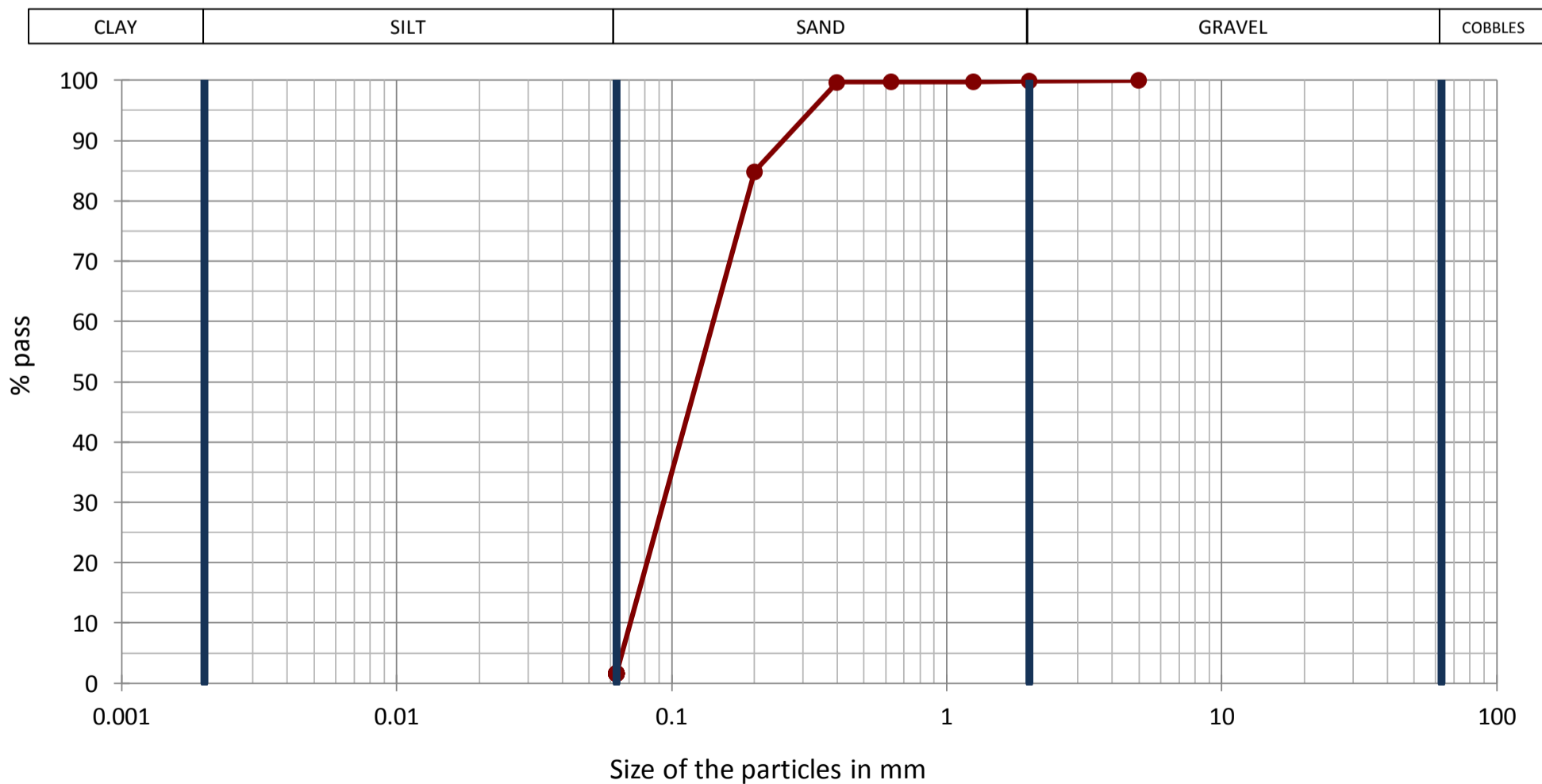
Previous calculations
 Total dried sample (g) **107.91**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9980**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
5		0.00	0.0	107.70	100.0
2		0.16	0.1	107.54	99.9
1.25		0.05	0.2	107.49	99.8
0.63		0.04	0.2	107.45	99.8
0.4		0.08	0.3	107.37	99.7
0.2		15.90	15.1	91.47	84.9
0.063		89.60	98.3	1.87	1.7

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.1	% SAND	2-0.063 mm	98.2	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	14.9		1.7
	% Fine gravel	6.3-2 mm	0.1	% Fine sand	0.2-0.063 mm	83.2		



REMARKS

Report num.: CB0019-19-0005
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SOIL CHEMICAL ANALYSIS

Sample reference

MB19-0502

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Predrying temperature:	60 °C	Test final date:	03-10-19
Mean of analyzed soil mass:	11.106 g	Calcination temperature:	450 °C
RESULT:	4 g/kg (total)	Equipment:	MUFLA OVEN ETI HD150
	1.8 g/kg (organic)		PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0502

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6262
Soil mass, g	1445
Minimum density, Mg/m³	1.45

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6471
Soil mass, g	1654
Maximum density, Mg/m³	1.66

Relative density	
Dry density, Mg/m ³	1.55
Relative density, %	48

REMARKS

Operator: JOAN SAHUN

Date final test: 25/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0503

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_9 P_9.3
Top depth, m	3.2
Bottom depth, m	3.33
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	13
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	28-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND with rare shell fragments	3.2	

3.33

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995

REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0503



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0503

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.19
Tare + soil + water (g)	244.47
Tare + soil (g)	222.07
Water (g)	22.40
Soil (g)	110.88
Moisture, w (%)	20.2

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 01/07/2019

Results	
Moisture content, w (%)	20.2

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	96.97
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.93
Dry density (Mg/m ³)	1.61

Operator: GUILLEM MASSALLÉ
Test final date: 28/06/2019

Results	
Bulk density (Mg/m³)	1.93
Dry density (Mg/m³)	1.61

Equipment

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	186.1460
Soil mass, M1 (g)	13.0020
Particle density, G20°C (Mg/m ³)	2.647

Operator:
Test final date:

Results	
Particle density (Mg/m³)	2.647

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0503

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

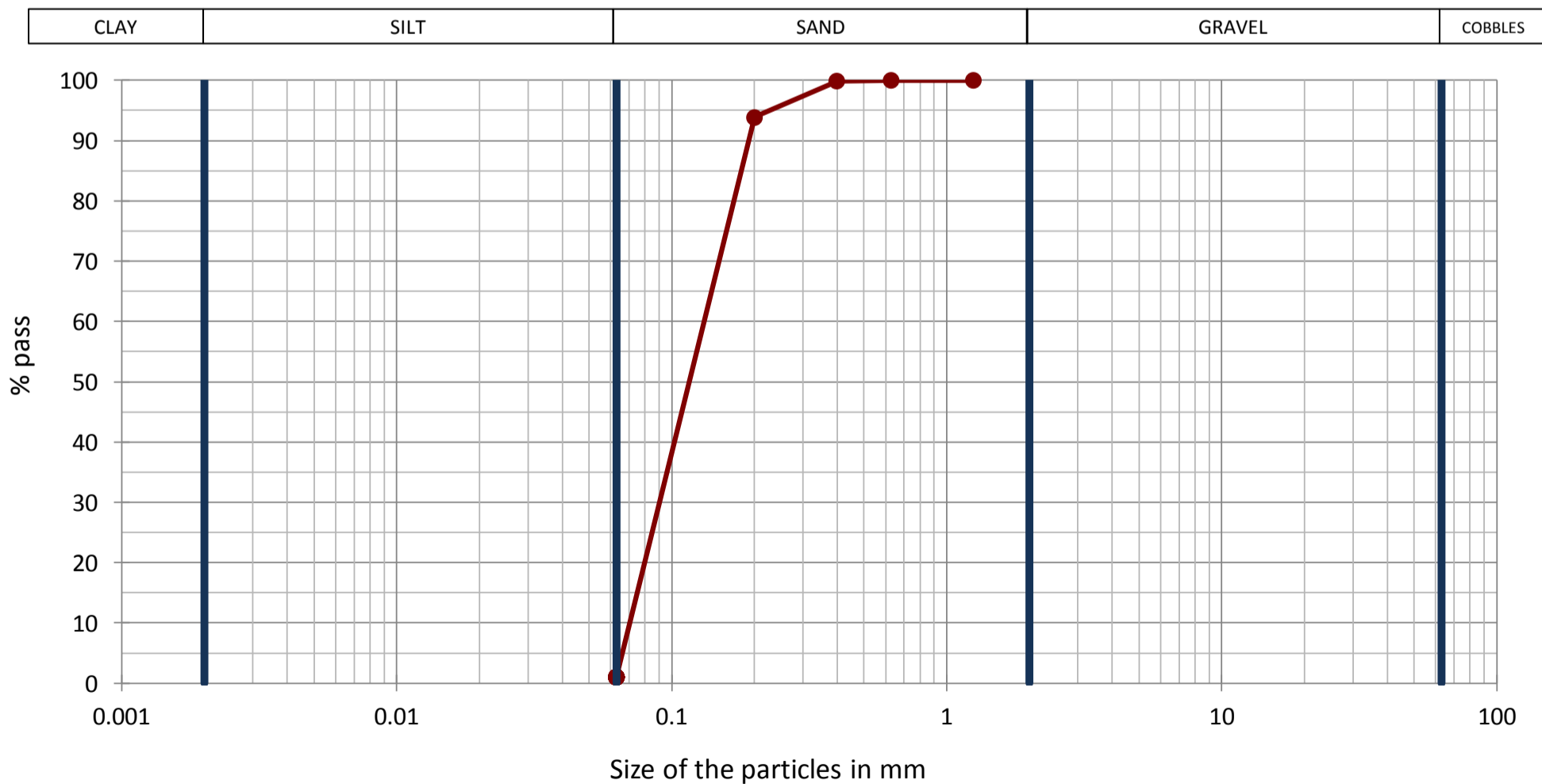
Previous calculations
 Total dried sample (g) **105.38**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9976**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
1.25			0.00	0.0	105.13	100.0
0.63			0.01	0.0	105.12	100.0
0.4			0.06	0.1	105.06	99.9
0.2			6.37	6.1	98.69	93.9
0.063			97.52	98.9	1.17	1.1

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.9	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	6.1		1.1
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	92.8		



REMARKS

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Sample reference

SOIL CHEMICAL ANALYSIS

MB19-0503

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 30-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.532 g

Equipment:

RESULT: **3.4 g/kg (total)**
0.4 g/kg (organic)

MUFLA OVEN ETI HD150
PORCELAIN CRUCIBLES 100 ml

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0504

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_9 P_9.2
Top depth, m	4.22
Bottom depth, m	4.37
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	28-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
--------------------	----

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND.	4.22	
	4.37	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0504



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0504

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	113.43
Tare + soil + water (g)	243.25
Tare + soil (g)	220.95
Water (g)	22.30
Soil (g)	107.52
Moisture, w (%)	20.7

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Moisture content, w (%)	20.7

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	97.16
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.93
Dry density (Mg/m ³)	1.60

Operator: GUILLEM MASSALLÉ
Test final date: 28/06/2019

Results	
Bulk density (Mg/m³)	1.93
Dry density (Mg/m³)	1.60

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	184.7070
Soil mass, M1 (g)	10.6920
Particle density, G20°C (Mg/m ³)	2.646

Operator: GUILLEM MASSALLÉ
Test final date: 01/10/2019

Results	
Particle density (Mg/m³)	2.646

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0504

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

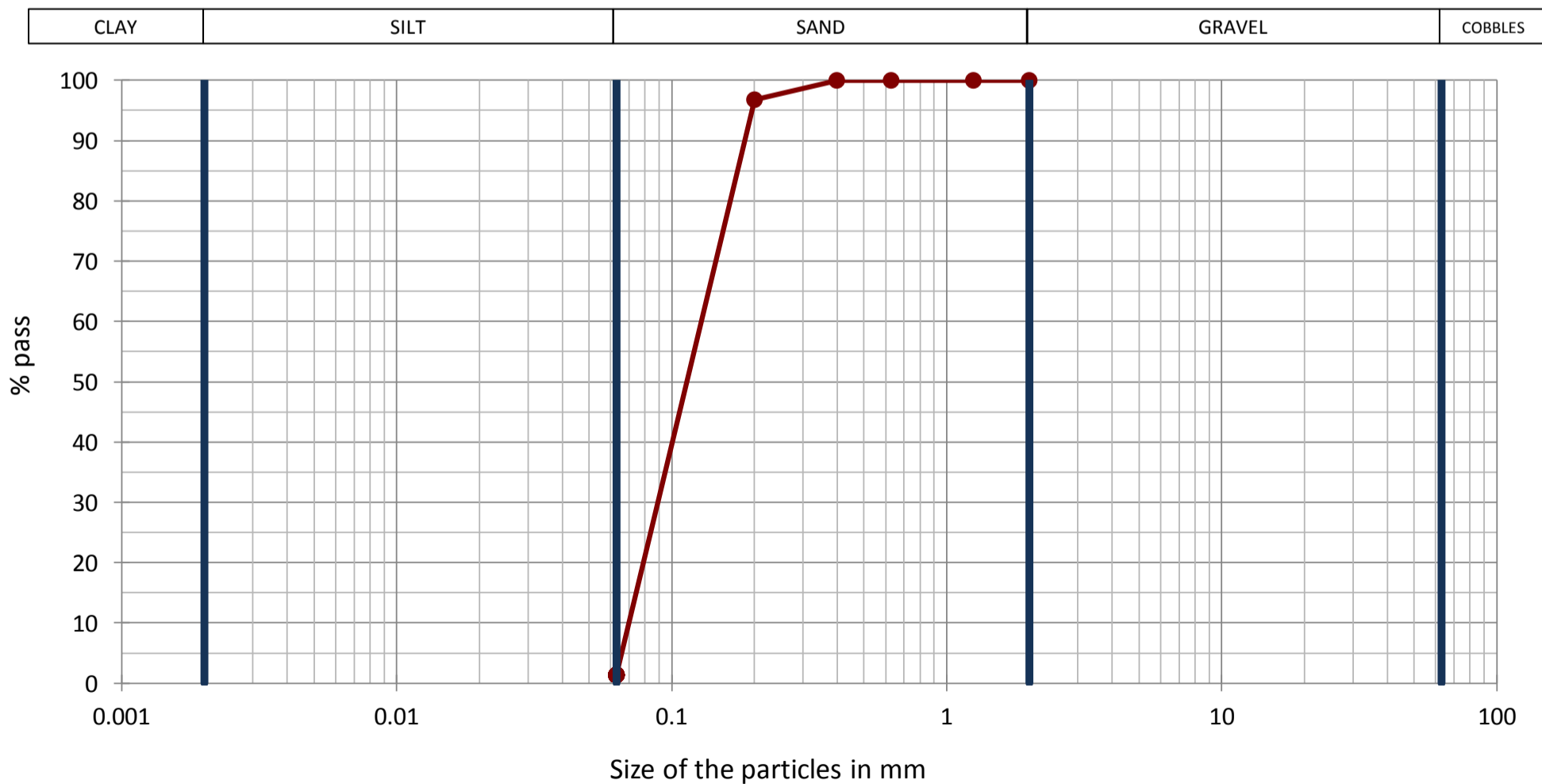
Previous calculations
 Total dried sample (g) **105.05**

 Hygrosc. moisture, % (fraction<2 mm) **0.1**
 Corr. parameter, f (fraction<2 mm) **0.9987**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
2		0.00	0.0	104.92	100.0
1.25		0.01	0.0	104.91	100.0
0.63		0.00	0.0	104.91	100.0
0.4		0.02	0.0	104.89	100.0
0.2		3.34	3.2	101.55	96.8
0.063		100.03	98.6	1.52	1.4

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	98.6	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0		
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	3.2		1.4
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	95.4		



REMARKS

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Sample reference

MB19-0504

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 30-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 11.103 g

Equipment:

RESULT: **3.3 g/kg (total)**

MUFLA OVEN ETI HD150

0.6 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 02-10-19

Mean of analyzed soil mass: 3.063 g

Equipment:

RESULT: **22.3 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0504

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6258
Soil mass, g	1441
Minimum density, Mg/m³	1.45

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6513
Soil mass, g	1696
Maximum density, Mg/m³	1.70

Relative density	
Dry density, Mg/m ³	1.60
Relative density, %	60

REMARKS

Operator: ALEX VANCELLS

Date final test:

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0505

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_P_9 P_9.1
Top depth, m	5.14
Bottom depth, m	5.29
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	12-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	28-6-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Gray (2.5Y 5/1) fine SAND.	5.14	

5.29

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0505



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 28/06/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0505

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.53
Tare + soil + water (g)	241.71
Tare + soil (g)	218.76
Water (g)	22.95
Soil (g)	107.23
Moisture, w (%)	21.4

Drying temperature (°C) 105

Operator: GUILLEM MASSALLÉ
Test final date: 01/07/2019

Results	
Moisture content, w (%)	21.4

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	94.30
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.88
Dry density (Mg/m ³)	1.55

Operator: MARC COLOMER
Test final date: 28/06/2019

Results	
Bulk density (Mg/m³)	1.88
Dry density (Mg/m³)	1.55

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	11
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9983
Pyc. mass when full of water at test temp., M3 (g)	178.2491
Pyc. mass + soil + water at test temp. M2 (g)	185.6140
Soil mass, M1 (g)	11.7870
Particle density, G20°C (Mg/m ³)	2.665

Operator: ALEX VANCELLS
Test final date: 01/10/2019

Results	
Particle density (Mg/m³)	2.665

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0505

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

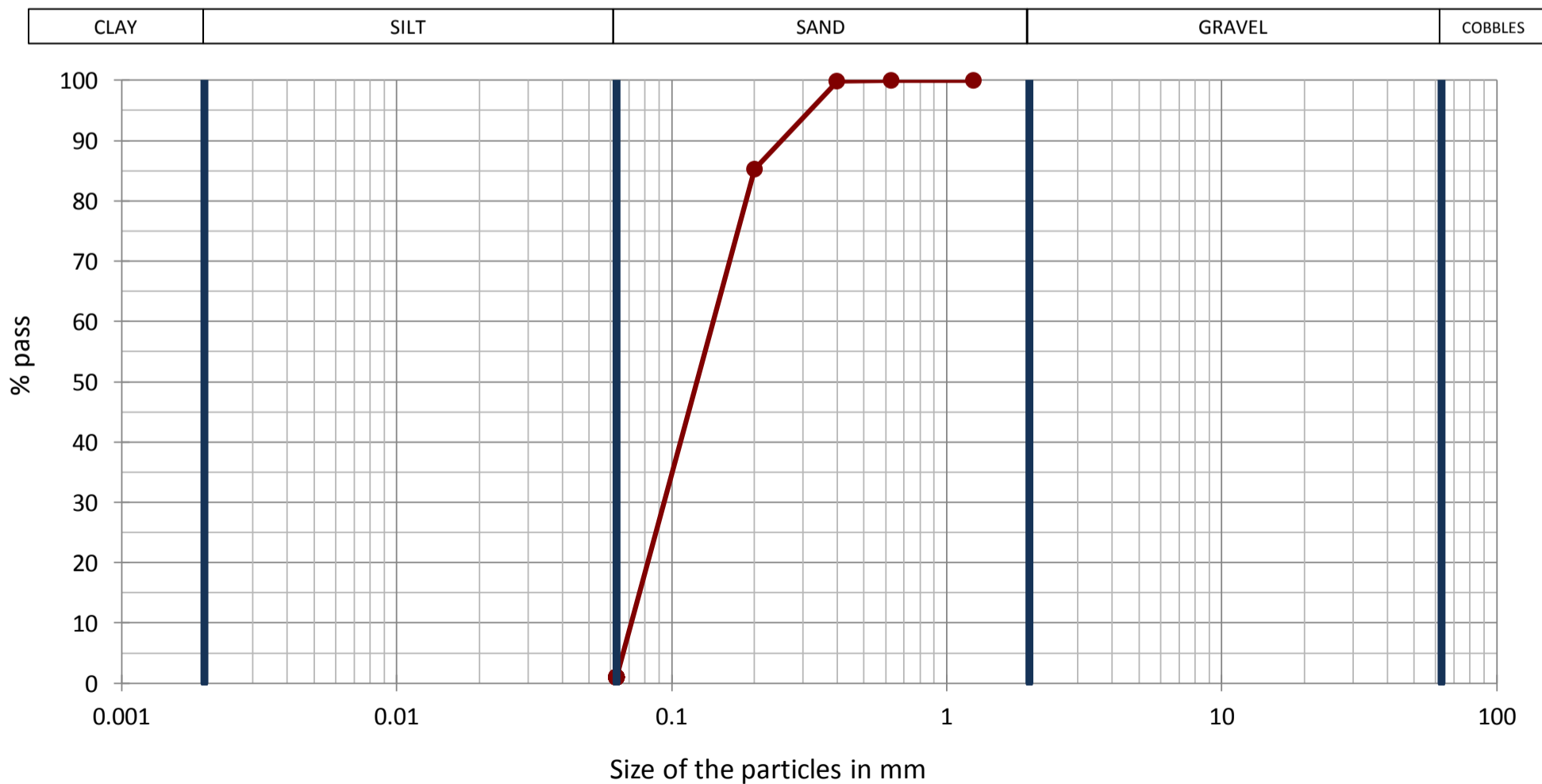
Previous calculations
 Total dried sample (g) **105.33**

 Hygrosc. moisture, % (fraction<2 mm) **0.2**
 Corr. parameter, f (fraction<2 mm) **0.9981**

Sieves	Retained sieves		Pass total sample			
	Aperture mm	Partial g	Total g	Total %	g	%
1.25			0.00	0.0	105.13	100.0
0.63			0.02	0.0	105.11	100.0
0.4			0.07	0.1	105.04	99.9
0.2			15.36	14.7	89.68	85.3
0.063			88.66	99.0	1.02	1.0

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	99.0	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.0	1.0	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	14.7		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	84.3		



REMARKS

Report num.: CB0019-19-0005
Edition date:

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Sample reference

MB19-0505

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Predrying temperature:	60 °C	Test final date:	07-10-19
Mean of analyzed soil mass:	10.231 g	Calcination temperature:	450 °C
RESULT:	2.9 g/kg (total)	Equipment:	MUFLA OVEN ETI HD150
	1.3 g/kg (organic)		PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator:	ALEX VANCELLS	Test final date:	23-10-19
Mean of analyzed soil mass:	4.047 g	Equipment:	SCHEIBLER APPARATUS
RESULT:	13.4 g/kg		

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0506

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_0 C3_0.6
Top depth, m	0.3
Bottom depth, m	0.48
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	18
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	1-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

ISO classification	Sa
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Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Olive brown (2.5Y 4/3) medium to fine SAND with occasional amorphous organic matter blackish zones and occasional shell fragments (medium sand to medium gravel sized).	0.3	
	0.48	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE 103105:1993 / UNE 103106:1993
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0506



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 01/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0506

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.90
Tare + soil + water (g)	211.16
Tare + soil (g)	194.24
Water (g)	16.92
Soil (g)	82.34
Moisture, w (%)	20.5

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 02/07/2019

Results	
Moisture content, w (%)	20.5

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	100.23
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.00
Dry density (Mg/m ³)	1.66

Operator: MARC COLOMER
Test final date: 02/07/2019

Results	
Bulk density (Mg/m³)	2.00
Dry density (Mg/m³)	1.66

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	186.9840
Soil mass, M1 (g)	13.8310
Particle density, G20°C (Mg/m ³)	2.636

Operator: ALEX VANCELLS
Test final date: 21/10/2019

Results	
Particle density (Mg/m³)	2.636

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0506

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

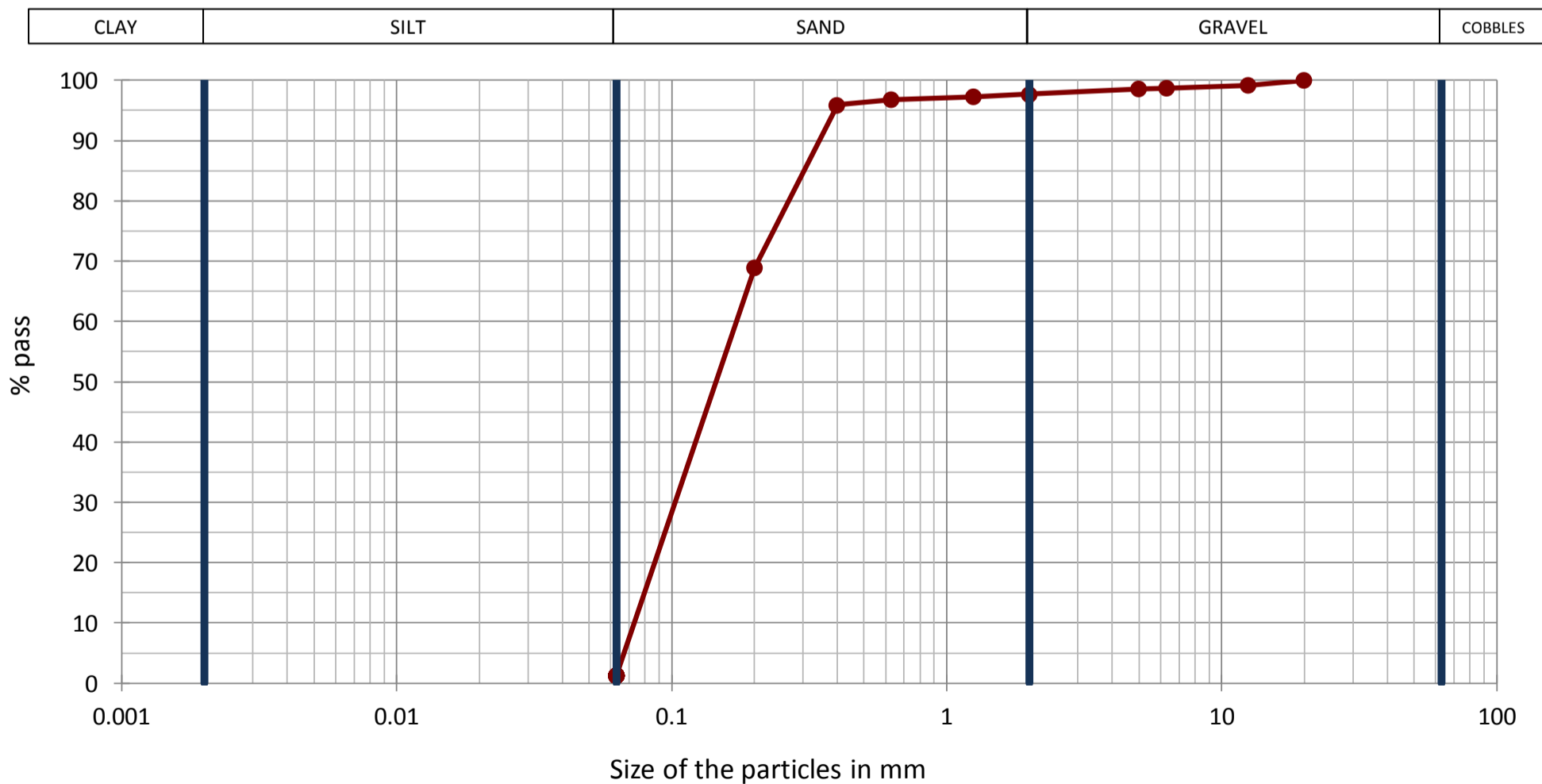
Previous calculations
 Total dried sample (g) **140.77**

 Hygrosc. moisture, % (fraction<2 mm) **0.3**
 Corr. parameter, f (fraction<2 mm) **0.9972**

Results					
Sieves	Retained sieves			Pass total sample	
	Aperture mm	Partial g	Total g	Total %	g
20		0.00	0.0	140.38	100.0
12.5		1.12	0.8	139.26	99.2
6.3		0.64	1.3	138.62	98.7
5		0.22	1.4	138.40	98.6
2		1.31	2.3	137.09	97.7
1.25		0.45	2.7	136.64	97.3
0.63		0.82	3.2	135.82	96.8
0.4		1.13	4.1	134.69	95.9
0.2		38.00	31.1	96.69	68.9
0.063		94.82	98.7	1.87	1.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	2.3	% SAND	2-0.063 mm	96.4	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.9		
	% Medium gravel	20-6.3 mm	1.3	% Medium sand	0.63-0.2 mm	27.9		1.3
	% Fine gravel	6.3-2 mm	1.0	% Fine sand	0.2-0.063 mm	67.6		



REMARKS

GRAVEL COMPOSED OF SHELL FRAGMENTS

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Sample reference

MB19-0506

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: ALEX VANCELLS

Test final date: 24-10-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.045 g

Equipment:

RESULT: **7 g/kg (total)**

MUFLA OVEN ETI HD150

4.1 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 23-10-19

Mean of analyzed soil mass: 1.017 g

Equipment:

RESULT: **24.5 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
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**DETERMINATION OF THE MINIMUM AND MAXIMUM DENSITIES OF A SAND - UNE
103105:1993 / UNE 103106:1993**

Sample reference

MB19-0506

Equipment	
BALANCE HGM-20K	
DRYING OVEN P0228	
COMPACTATION MOULD	
COMPACTATION RAMMER	

Minimum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6270
Soil mass, g	1453
Minimum density, Mg/m³	1.46

Maximum density	
Mould volume, cm ³	997.064
Mould mass, g	4817
Mould+soil mass, g	6474
Soil mass, g	1657
Maximum density, Mg/m³	1.66

Relative density	
Dry density, Mg/m ³	1.66
Relative density, %	100

REMARKS

Operator: JOAN SAHUN

Date final test: 25/10/2019

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0507

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_0 C3_0.5
Top depth, m	1.3
Bottom depth, m	1.45
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	1-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark grayish brown (2.5Y 4/2) coarse SAND with occasional fine to medium gravel and frequent shell fragments (gravel sized).	1.3	
	1.45	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
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Sample reference

PHOTOGRAPHIC RECORD

MB19-0507



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 01/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0507

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Drying temperature (°C) 105

Data of soil moisture content test	
Tare (g)	105.01
Tare + soil + water (g)	223.32
Tare + soil (g)	214.26
Water (g)	9.06
Soil (g)	109.25
Moisture, w (%)	8.3

Operator: ALEX VANCELLS
Test final date: 02/07/2018

Results	
Moisture content, w (%)	8.3

Equipment	
BALANCE RADWAG PS4500.R1	

Bulk density test data	
Soil weight (g)	86.94
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540 4.703 4.050 3.563 10.037
Diameter of cylindrical sample, D (cm)	4.250 6.187 5.175 4.265 3.203
Soil volume (cm ³)	50.22 141.39 85.19 50.91 80.89
Bulk density (Mg/m ³)	1.73
Dry density (Mg/m ³)	1.60

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Bulk density (Mg/m³)	1.73
Dry density (Mg/m³)	1.60

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0508

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_0 C3_0.4
Top depth, m	2.15
Bottom depth, m	2.55
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	40
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	1-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/1) fine SAND with occasional amorphous organic matter blackish spots.	2.15	
	2.55	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0508



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 01/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0508

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	104.58
Tare + soil + water (g)	208.21
Tare + soil (g)	188.96
Water (g)	19.25
Soil (g)	84.38
Moisture, w (%)	22.8

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 01/07/2019

Results	
Moisture content, w (%)	22.8

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	98.92
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.97
Dry density (Mg/m ³)	1.60

Operator: MARC COLOMER
Test final date: 01/07/2019

Results	
Bulk density (Mg/m³)	1.97
Dry density (Mg/m³)	1.60

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0509

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_0 C3_0.3
Top depth, m	3.2
Bottom depth, m	3.35
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	1-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/1) fine SAND with occasional amorphous organic matter blackish spots.	3.2	
	3.35	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

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Sample reference

PHOTOGRAPHIC RECORD

MB19-0509



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 01/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0509

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	107.64
Tare + soil + water (g)	218.40
Tare + soil (g)	199.67
Water (g)	18.73
Soil (g)	92.03
Moisture, w (%)	20.4

Drying temperature (°C) 105

Operator: MARC COLOMER
Test final date: 02/07/2019

Results	
Moisture content, w (%)	20.4

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	95.93
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.91
Dry density (Mg/m ³)	1.59

Operator: MARC COLOMER
Test final date: 01/07/2019

Results	
Bulk density (Mg/m³)	1.91
Dry density (Mg/m³)	1.59

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0510

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_0 C3_0.2
Top depth, m	4.1
Bottom depth, m	4.25
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	1-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/1) fine SAND with occasional amorphous organic matter blackish spots.	4.1	
	4.25	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
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PHOTOGRAPHIC RECORD

MB19-0510



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 01/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISITY - ISO 17892-2:2014

Sample reference

MB19-0510

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	111.58
Tare + soil + water (g)	223.10
Tare + soil (g)	204.59
Water (g)	18.51
Soil (g)	93.01
Moisture, w (%)	19.9

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 02/07/2019

Results	
Moisture content, w (%)	19.9

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	91.19
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.82
Dry density (Mg/m ³)	1.52

Operator: MARC COLOMER
Test final date: 01/07/2019

Results	
Bulk density (Mg/m³)	1.82
Dry density (Mg/m³)	1.52

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0511

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_0 C3_0.1
Top depth, m	5.2
Bottom depth, m	5.35
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	1-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Dark gray (2.5Y 4/1) fine SAND with occasional amorphous organic matter blackish spots.	5.2	
	5.35	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

REMARKS

See results at CEPASA report.

Report num.:	CB0019-19-0005
Edition date:	

PHOTOGRAPHIC RECORD

MB19-0511



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 01/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0511

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	98.14
Tare + soil + water (g)	209.71
Tare + soil (g)	190.23
Water (g)	19.48
Soil (g)	92.09
Moisture, w (%)	21.2

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 02/07/2019

Results	
Moisture content, w (%)	21.2

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	95.02
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.89
Dry density (Mg/m ³)	1.56

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Bulk density (Mg/m³)	1.89
Dry density (Mg/m³)	1.56

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0512

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_1 C3_1.3
Top depth, m	0.2
Bottom depth, m	0.3
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	10
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	1-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) clayey SILT with occasional fine to medium sand pockets.	0.2	
	0.3	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
 DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0512



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 01/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0512

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	105.30
Tare + soil + water (g)	190.03
Tare + soil (g)	171.11
Water (g)	18.92
Soil (g)	65.81
Moisture, w (%)	28.7

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 02/07/2019

Results	
Moisture content, w (%)	28.7

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	82.05
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.63
Dry density (Mg/m ³)	1.27

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Bulk density (Mg/m³)	1.63
Dry density (Mg/m³)	1.27

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0512

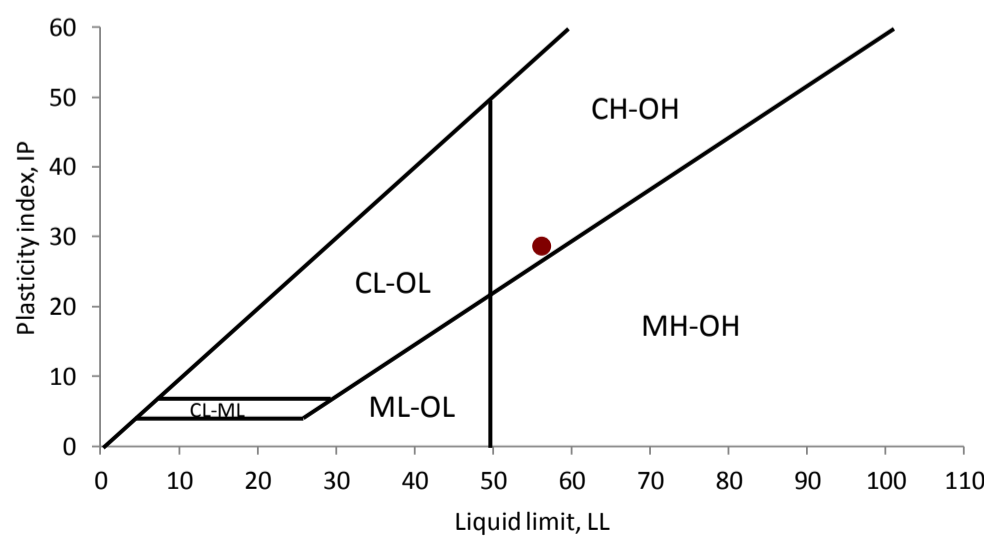
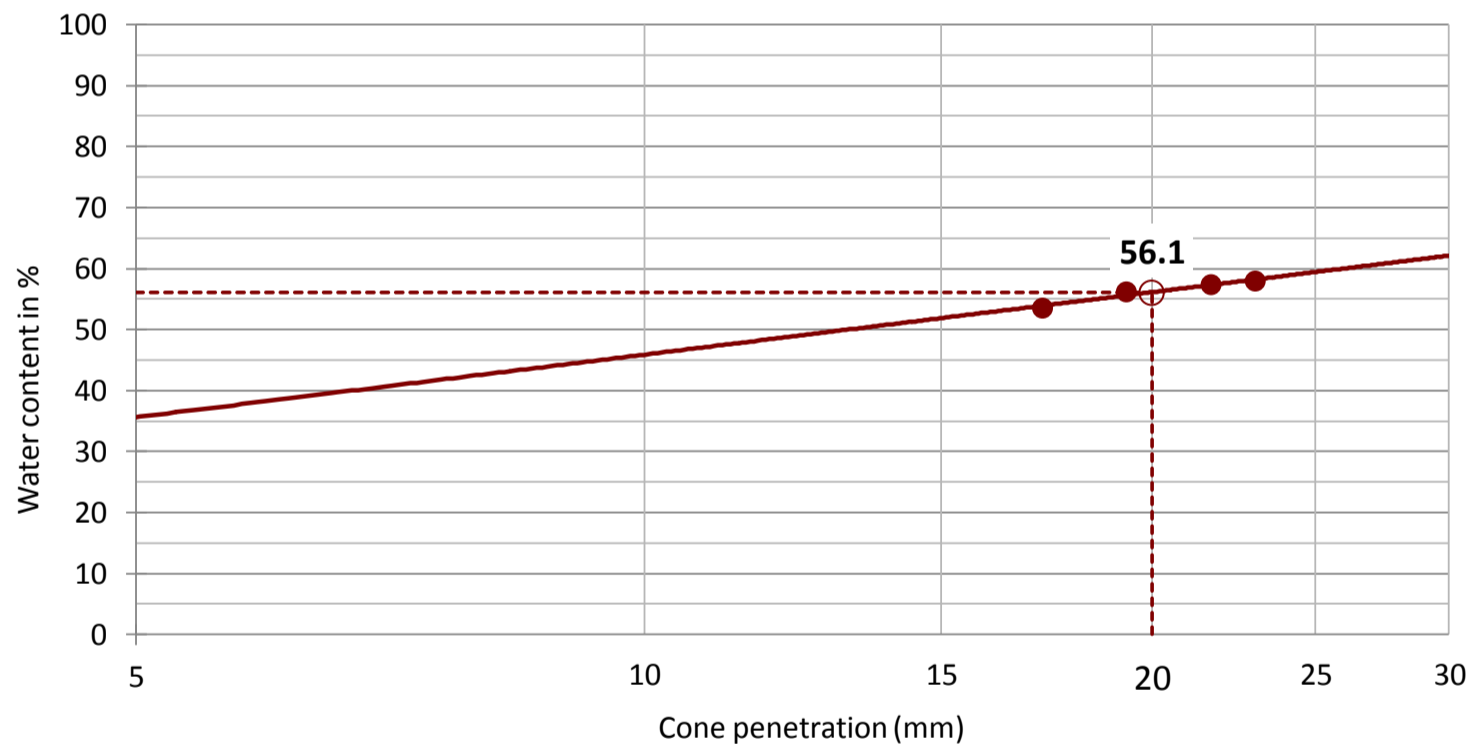
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	17.23	19.315	23.03	21.67
Water (g)	4.37	4.04	3.61	4.02
Mass moist soil + cont. (g)	35.76	35.24	33.77	34.81
Mass dry soil + cont. (g)	31.39	31.20	30.16	30.79
Mass container (g)	23.23	24.01	23.93	23.78
Soil (g)	8.16	7.19	6.23	7.01
Water content (%)	53.6	56.2	57.9	57.3

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data				
Water (g)	1.34	1.24		
Mass moist soil + cont. (g)	30.16	29.48		
Mass dry soil + cont. (g)	28.82	28.24		
Mass container (g)	23.95	23.70		
Soil (g)	4.87	4.54		
Water content (%)	27.5	27.3		

Results	
Liquid limit, LL	56.1
Plastic limit, LP	27.4
Plasticity index, IP	28.7
Natural water content (%)	28.7
Liquidity index, IL	0.0
Consistency index, IC	1.0



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

MB19-0513

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_1 C3_1.2
Top depth, m	0.78
Bottom depth, m	1.4
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	62
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	1-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB./RUSSELL GEOT. INNOV.

Soil type

USCS classification	CH
ISO classification	CI

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) clayey SILT with occasional fine sand pockets.	0.78	
	1.4	1.1-1.4 m: RESERVED FOR ADVANCED TESTING

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
 DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
 DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
 DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
 DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
 FALL CONE TEST - ISO 17892-6:2017
 UNCONSOLIDATED UNDRAINED TRIAXIAL TEST, UU 2' - ISO 17892-8:2018
 INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
 DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALISIS) - ISO 10694:1995
 DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

SEE ADVANCED TESTING RESULTS IN RUSSELL GEOTECHNICAL INNOVATIONS REPORT

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0513



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 01/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0513

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.13
Tare + soil + water (g)	187.09
Tare + soil (g)	169.58
Water (g)	17.51
Soil (g)	58.45
Moisture, w (%)	30.0

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 02/07/2019

Results	
Moisture content, w (%)	30.0

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	94.11
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.87
Dry density (Mg/m ³)	1.44

Operator: ALEX VANCELLS
Test final date: 01/07/2019

Results	
Bulk density (Mg/m³)	1.87
Dry density (Mg/m³)	1.44

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	7
Test temperature (°C)	20.2
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.3900
Pyc. mass + soil + water at test temp. M2 (g)	185.3880
Soil mass, M1 (g)	11.1390
Particle density, G20°C (Mg/m ³)	2.685

Operator: ALEX VANCELLS
Test final date: 01/10/2019

Results	
Particle density (Mg/m³)	2.685

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0513

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

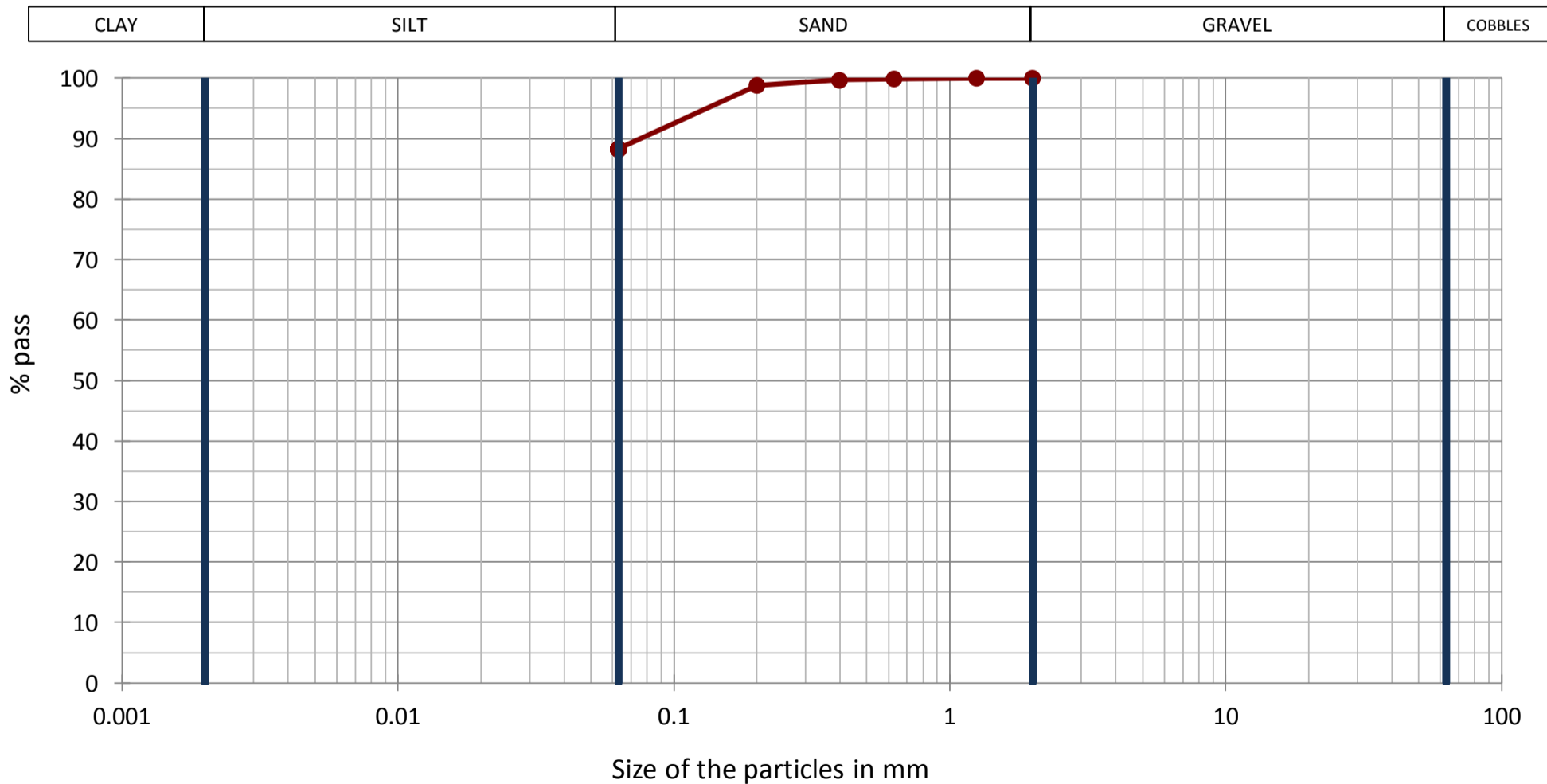
Previous calculations
 Total dried sample (g) **105.60**

 Hygrosc. moisture, % (fraction<2 mm) **2.9**
 Corr. parameter, f (fraction<2 mm) **0.9717**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
2		0.00	0.0	102.61	100.0
1.25		0.01	0.0	102.60	100.0
0.63		0.05	0.1	102.55	99.9
0.4		0.20	0.3	102.35	99.7
0.2		0.97	1.2	101.38	98.8
0.063		10.79	11.7	90.59	88.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	11.7	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.1	88.3	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	1.1		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	10.5		



REMARKS

SAND CONTAINS SOME ORGANIC MATTER

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0513

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1

Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	30.13
Hygroscopic moisture, W (%)	2.9
Tested and dried soil mass, m (g)	29.28
Particle density (Mg/m ³)	2.685

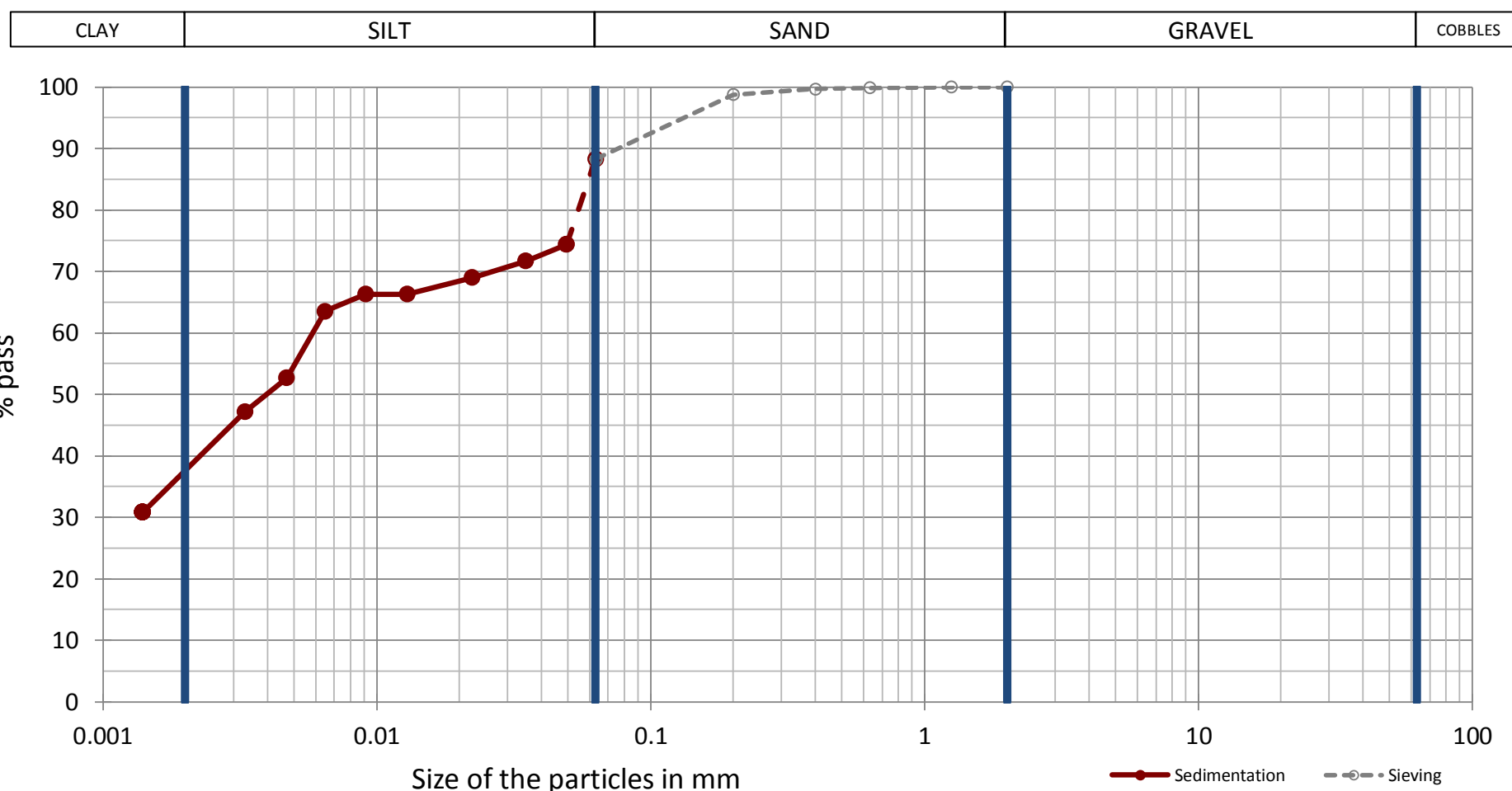
Hydrometer data	
Bulb volume, V (ml)	47.77
Eq. scale calibration	$y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd)	$y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm)	0.0005

Test tube data	
Area of the inner section (A), mm ²	2931.60

Test data and results							
t min	T °C	R'h g/cm ³	Rh	Hr mm	R	d mm	K %
1	22	1.0175	17.5	140.8	13.7	0.0494	74.4
2	22	1.0170	17	142.0	13.2	0.0351	71.7
5	22	1.0165	16.5	143.2	12.7	0.0223	69.0
15	22	1.0160	16	144.4	12.2	0.0129	66.2
30	22	1.0160	16	144.4	12.2	0.0091	66.2
60	22	1.0155	15.5	145.5	11.7	0.0065	63.5
120	22	1.0135	13.5	150.3	9.7	0.0047	52.6
240	22	1.0125	12.5	152.7	8.7	0.0033	47.2
1440	22	1.0095	9.5	159.8	5.7	0.0014	30.9

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	88.3
Silt, between 0.063 and 0.002 mm (%)	52.3
Clay, smaller than 0.002 mm (%)	36.0



REMARKS

Operator: ALEX VANCELLS

Test final date: 08/10/2019

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0513

DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data

Type of cone used	80 g/30°			
Cone penetration (mm)	21.305	18.275	15.83	24.12
Water (g)	4.01	5.16	4.55	4.37
Mass moist soil + cont. (g)	40.84	43.18	42.25	41.15
Mass dry soil + cont. (g)	36.83	38.02	37.70	36.78
Mass container (g)	29.67	28.51	28.96	29.25
Soil (g)	7.16	9.51	8.74	7.53
Water content (%)	56.0	54.3	52.1	58.0

Equipment

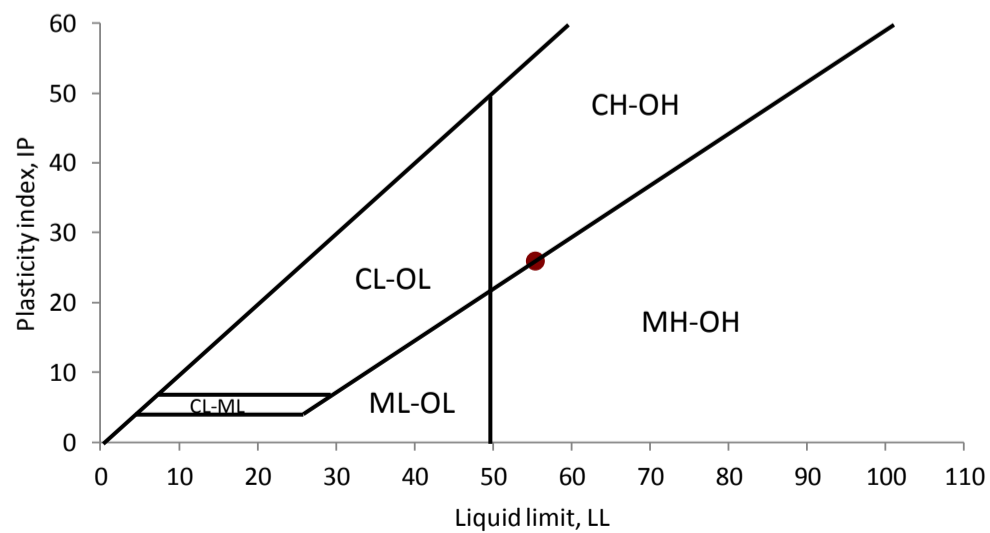
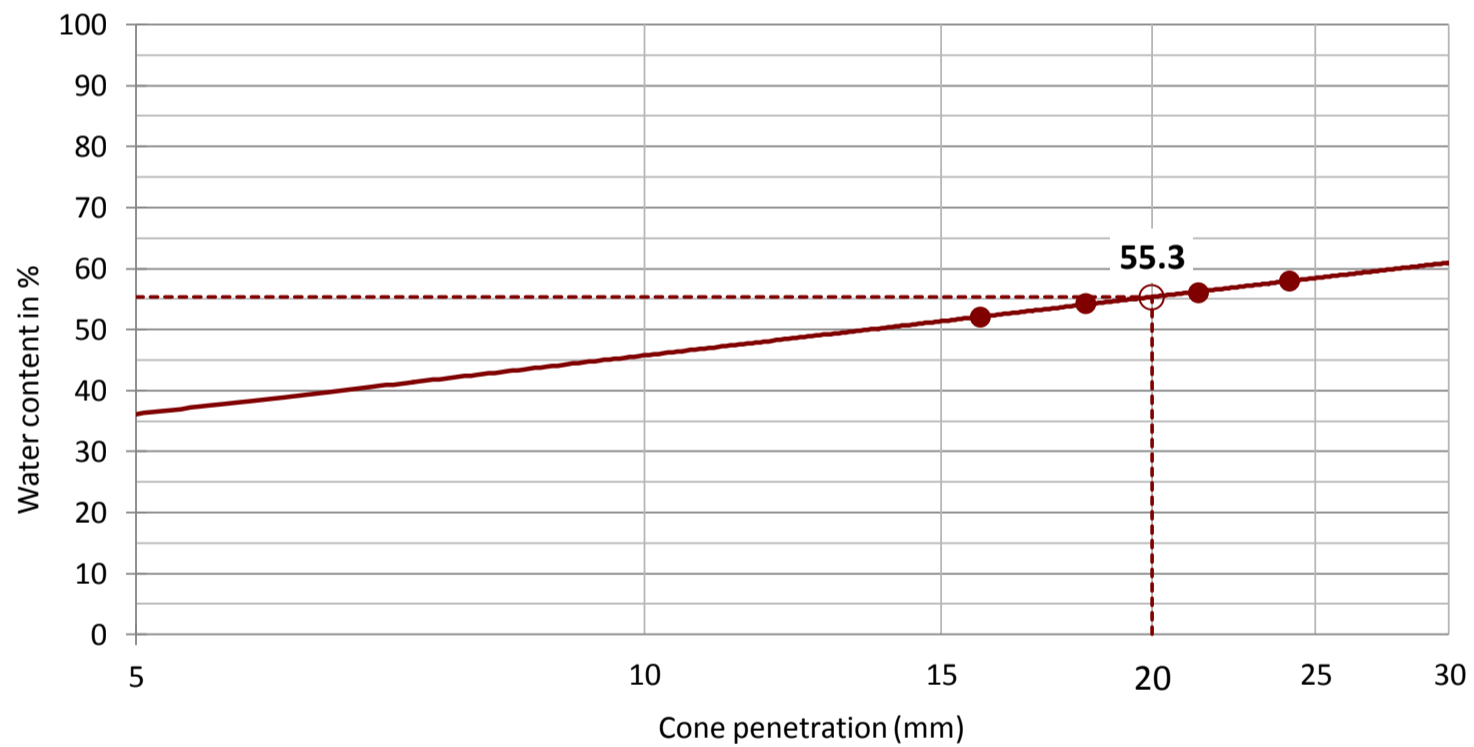
PENETROMETER MATEST B057-11
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Plastic Limit data

Water (g)	1.32	1.27			
Mass moist soil + cont. (g)	30.88	29.98			
Mass dry soil + cont. (g)	29.56	28.71			
Mass container (g)	25.07	24.40			
Soil (g)	4.49	4.31			
Water content (%)	29.4	29.5			

Results

Liquid limit, LL	55.3
Plastic limit, LP	29.4
Plasticity index, IP	25.9
Natural water content (%)	30.0
Liquidity index, IL	0.0
Consistency index, IC	1.0



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0513

Equipment	
MECACISA 1.5' TRIAXIAL CHAMBER PRESSURE SYSTEM MECACISA 220004 TRIAXIAL LOAD FRAME MECACISA 210715 ELEC. DEF. TRANSD. SCHREIBER SM260 PC WITH SOFTWARE MECASOFT	

Test type	Unconsolidated Undrained (UU)
Soil conditions	UNDISTURBED

Soil sample data	
Specimen number	I
Initial length (cm)	7.613
Initial diameter (cm)	4.065
Initial area (cm ²)	12.978
Initial volume (cm ³)	98.802
Initial moisture content (%)	29.2
Final moisture content (%)	33.8
Initial bulk density (Mg/m ³)	1.95
Initial dry density (Mg/m ³)	1.51
Initial saturation degree (%)	100.0
Particle density (Mg/m ³)	2.685

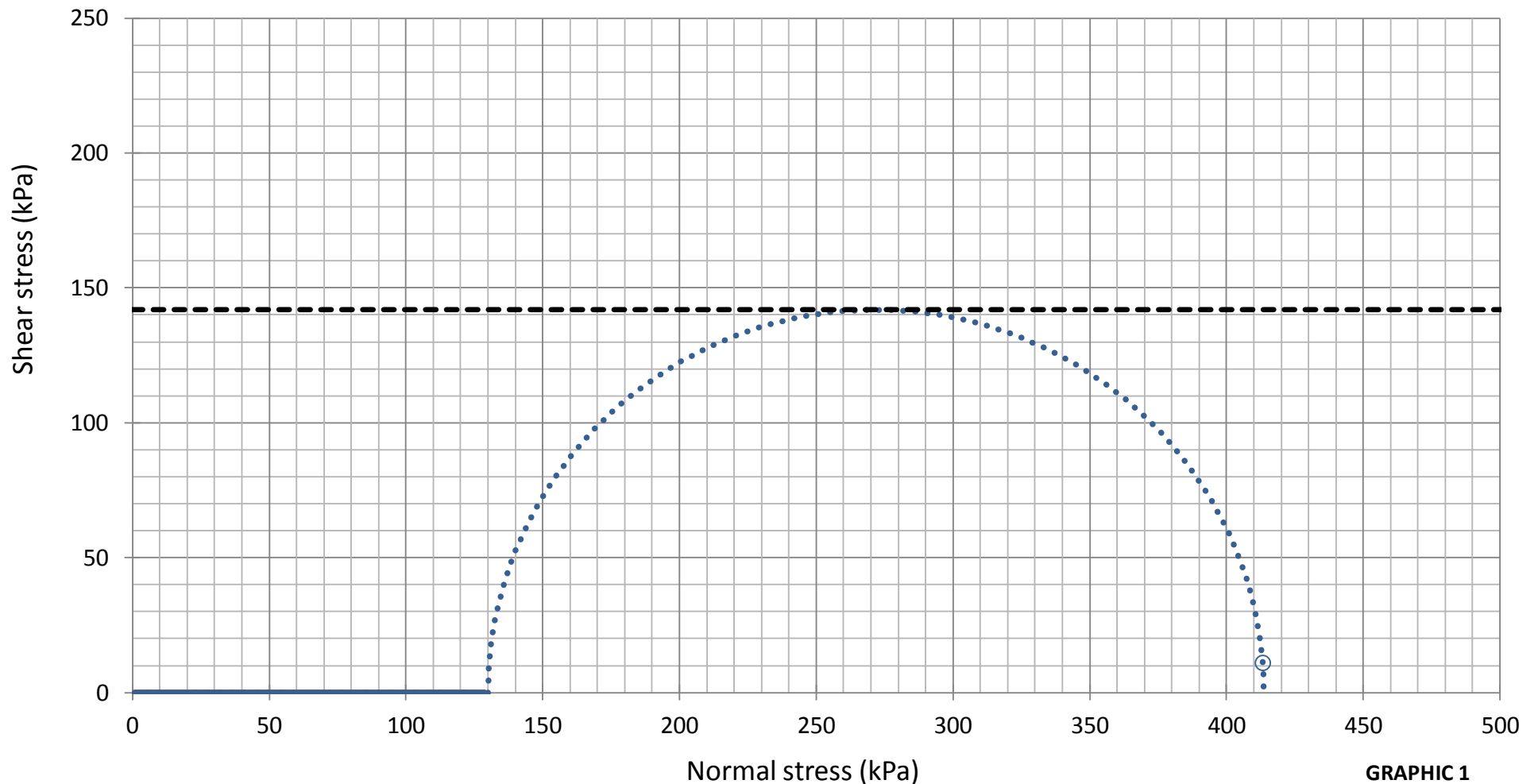
Prior saturation process	
Saturation prior to test	NO

Failure test results	
Specimen number	I
σ ₁ (kPa)	413.7
σ ₃ (kPa)	130.0
(σ ₁ -σ ₃)/2 (kPa)	141.9
(σ ₁ +σ ₃)/2 (kPa)	271.9

Test data and results	
Chamber pressure (kPa)	130
Back pressure, u _b (kPa)	0
Rate of axial displ. (mm/min)	0.8673
Major principal stress (kPa)	283.7
Failure stress (kPa)	283.7
Failure strain (%)	4.0

Estimate total	
Φ _u (°)	0.0
C _u (kPa)	142
C _u (kp/cm ²)	1.45

Graphic symbols						
	I total	II total	III total			



REMARKS

THE REMOULDED TRIAXIAL TEST COULD NOT BE PERFORMED, AS THE SPECIMEN BROKE DURING DISMOULDING DUE TO ITS STIFFNESS

Operator: ALEX VANCELLS

Test final date: 24/09/2019

Report num.: CB0019-19-0005
Edition date:

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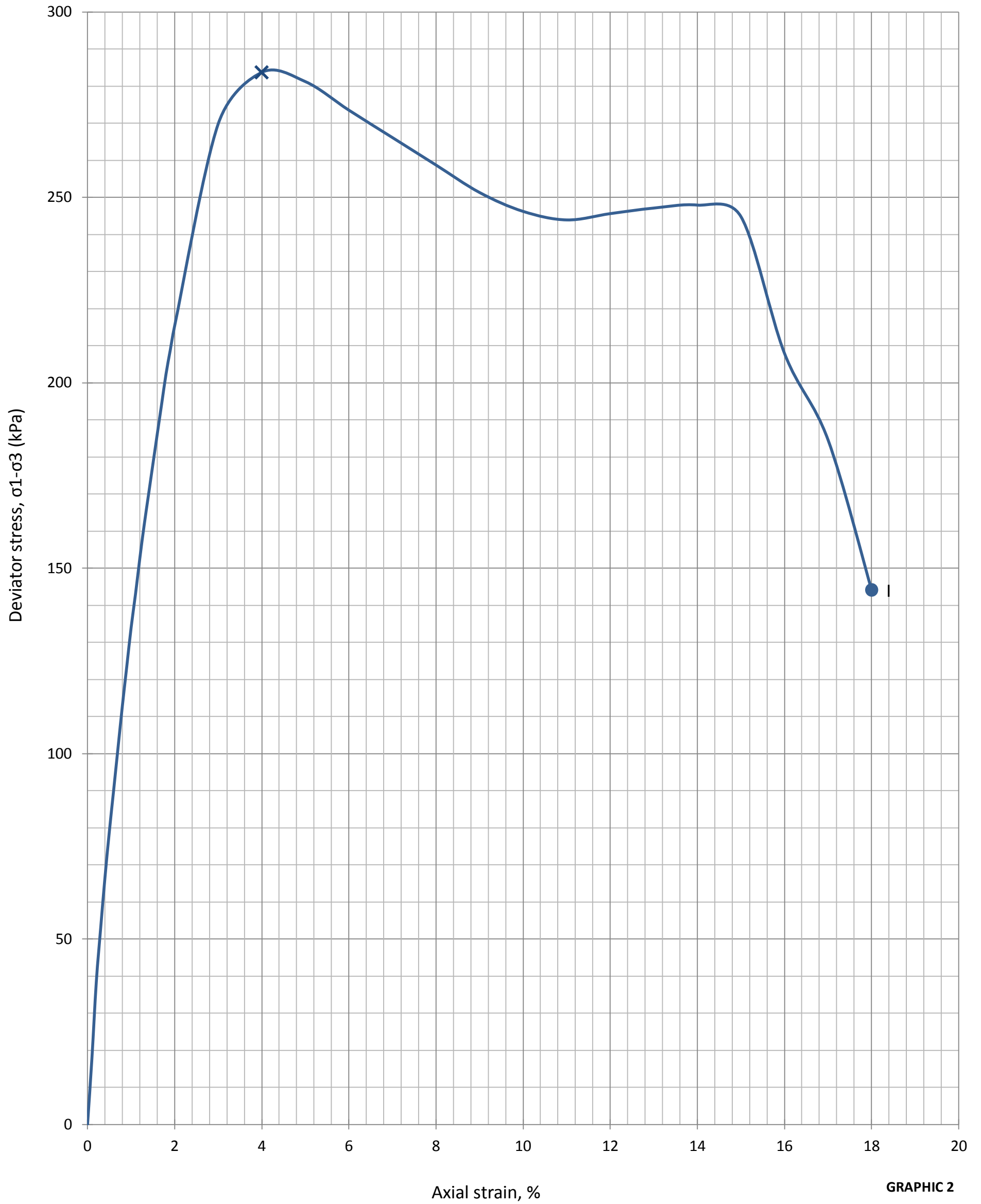


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Sample reference

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0513



GRAPHIC 2



Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018	Sample reference MB19-0513
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Failure process data summary

	Time sg	Deform. %	$(\sigma_1 - \sigma_3)_m$ kPa	$(\Delta\sigma_1)_m$ kPa	$(\Delta\sigma_1)_{fp}$ kPa	$(\sigma_1 - \sigma_3)$ kPa	u-ub kPa	ϵ_1	σ_1 kPa	σ'_1 kPa	σ'_3 kPa	Coeff. A	$(\sigma_1 + \sigma_3)/2$ kPa	$(\sigma_1 - \sigma_3)/2$ kPa	$(\sigma'_1 + \sigma'_3)/2$ kPa	$(\sigma'_1 - \sigma'_3)/2$ kPa
Specimen	0	0	0.0	0.0	0.0	0.0		0.000	130.0				130.0	0.0		
I	6	0.1	17.7	0.0	0.0	17.7		0.001	147.7				138.9	8.8		
Chamber pressure	17	0.301	53.0	0.1	0.0	52.9		0.003	182.9				156.5	26.5		
σ_3 , kPa	27	0.5	79.0	0.1	0.0	78.9		0.005	208.9				169.5	39.5		
130	37	0.7	101.8	0.2	0.0	101.6		0.007	231.6				180.8	50.8		
Back pressure	47	0.901	123.7	0.2	0.0	123.5		0.009	253.5				191.8	61.8		
u_b , kPa	58	1.101	143.3	0.3	0.0	143.0		0.011	273.0				201.5	71.5		
0	68	1.3	162.0	0.4	0.0	161.6		0.013	291.6				210.8	80.8		
σ'_3 , kPa	78	1.5	178.4	0.4	0.0	178.0		0.015	308.0				219.0	89.0		
130	89	1.701	194.7	0.5	0.0	194.2		0.017	324.2				227.1	97.1		
Rate of axial displ.	94	1.801	202.8	0.5	0.0	202.3		0.018	332.3				231.2	101.2		
mm/min	104	2.001	216.0	0.6	0.0	215.4		0.020	345.4				237.7	107.7		
0.8673	213	4.001	284.8	1.1	0.0	283.7		0.040	413.7				271.9	141.9		
	311	6	275.2	1.7	0.0	273.5		0.060	403.5				266.8	136.8		
	411	8.001	260.9	2.2	0.0	258.7		0.080	388.7				259.4	129.4		
	517	10.001	249.0	2.8	0.0	246.2		0.100	376.2				253.1	123.1		
	617	12.001	248.9	3.3	0.0	245.6		0.120	375.6				252.8	122.8		
	717	14.001	251.8	3.9	0.0	247.9		0.140	377.9				254.0	124.0		
	820	16.002	212.3	4.4	0.0	207.9		0.160	337.9				234.0	104.0		
	924	18.001	149.1	5.0	0.0	144.1		0.180	274.1				202.1	72.1		
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																

Report num.:	CB0019-19-0005
Edition date:	

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017

MB19-0513

Test data	
Employee ring type	FIXED
Height (cm)	2.000
Diameter (cm)	5.020
Volume (cm ³)	39.58
Ring weight (g)	86.43
Ring+soil weight (g)	160.88
Ini. weight wet soil (g)	74.45
Soil part. density (Mg/m ³)	2.685
Initial moisture content (%)	29.7
Initial bulk density (Mg/m ³)	1.88
Initial dry density (Mg/m ³)	1.45
Initial saturation degree (%)	93.63
Final moisture content (%)	28.3
Final bulk density (Mg/m ³)	1.96
Final dry density (Mg/m ³)	1.53

Equipment	
OEDOMETER PROETI S0110 (PLACE 5)	
DATA ACQ. MODULE MECATEST-16	
ELECT. TRANSD. NOVOTECHNIK TR-10	

Soil conditions	UNDISTURBED
-----------------	-------------

Swelling Pressure Test	
Swelling Pressure (kPa)	< 20
(kg/cm ²)	< 0.2

Results	
Initial void ratio, e ₀	0.8517
Final void ratio, e _f	0.7608
Solid height, H _s (cm)	1.0801
Final height pore, H _{ps} (cm)	0.8218

Results																
Press. stage	Load date	Final time	Instant. settleme nt	Read. t= 8 sg	L ₀ (Casag. met.)	Final reading	Final sample height	Void ratio at L ₀	Final void ratio	Compr. ind. (*)	Swelling ind. (*)	Constr. mod. E _{oed} kPa	Compr. coef. a _v 1/kPa	Cons. coef. c _v cm ² /s)	Compr. coef. m _v 1/kPa	Sec. cons. coef. C _α
kPa		sg	mm	mm	mm	mm	cm	e _{L0}	e _f	c _c	c _s					
20	23-09-19	86 961	0.045	0.045	0.045	0.040	1.9960	0.8476	0.8480							
40	24-09-19	86 525	0.014	0.058	0.054	0.109	1.9891	0.8466	0.8416	0.0213		5 775	3.20E-04	8.52E-04	1.73E-04	2.72E-04
80	25-09-19	86 544	0.052	0.166	0.162	0.300	1.9700	0.8367	0.8239	0.0588		4 162	4.43E-04	2.98E-04	2.40E-04	5.63E-04
150	26-09-19	86 470	0.066	0.385	0.366	0.605	1.9395	0.8178	0.7957	0.1033		4 527	4.03E-04	4.94E-04	2.21E-04	7.38E-04
300	27-09-19	232 029	0.107	0.682	0.711	1.130	1.8870	0.7858	0.7471	0.1614		5 542	3.24E-04	5.34E-04	1.80E-04	4.87E-04
600	30-09-19	96 896	0.105	1.036	1.234	1.803	1.8197	0.7374	0.6848	0.2070		8 413	2.08E-04	1.18E-03	1.19E-04	2.23E-03
1000	01-10-19	86 468	0.045	1.860	1.848	2.307	1.7693	0.6806	0.6381	0.2105		14 431	1.17E-04	2.85E-04	6.93E-05	2.66E-03
1500	02-10-19	87 439	0.015	2.339	2.322	2.752	1.7248	0.6367	0.5969	0.2340		19 880	8.24E-05	2.32E-04	5.03E-05	3.58E-03
600	03-10-19	89 672	-0.045	2.690	2.707	2.447	1.7553	0.6010	0.6251		0.0709	50 965	3.13E-05		1.96E-05	
150	04-10-19	258 560	-0.102	2.317	2.345	1.733	1.8267	0.6346	0.6913		0.1100	11 047	1.47E-04		9.05E-05	
20	07-10-19	86 949	-0.034	1.688	1.698	0.981	1.9019	0.6944	0.7608		0.0794	3 164	5.35E-04		3.16E-04	

NOTE: Compression index (C_c) and swelling index (C_s), such as constrained modules (E_{oed}) and compressibility coefficient (a_v), are estimated between a pressure step and the immediately preceding as a first approximation, taking for calculatin the obtained void ratio values in the end of the considered pressure stage.

REMARKS

SWELLING PRESSURE IS DETERMINED APPLYING SUCCESSIVE PRESSURE STAGES. ONCE REACHED THE EQUILIBRIUM SITUATION THE TEST CONTINUES WITH THE PRESSURE STAGE IMMEDIATELY SUPERIOR TO THE SWELLING PRESSURE

Operator: ALEX VANCELLS

Test final date: 09/10/2019

Report num.: CB0019-19-0005
 Edition date:

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 Reg. Num. LECCE L0600292



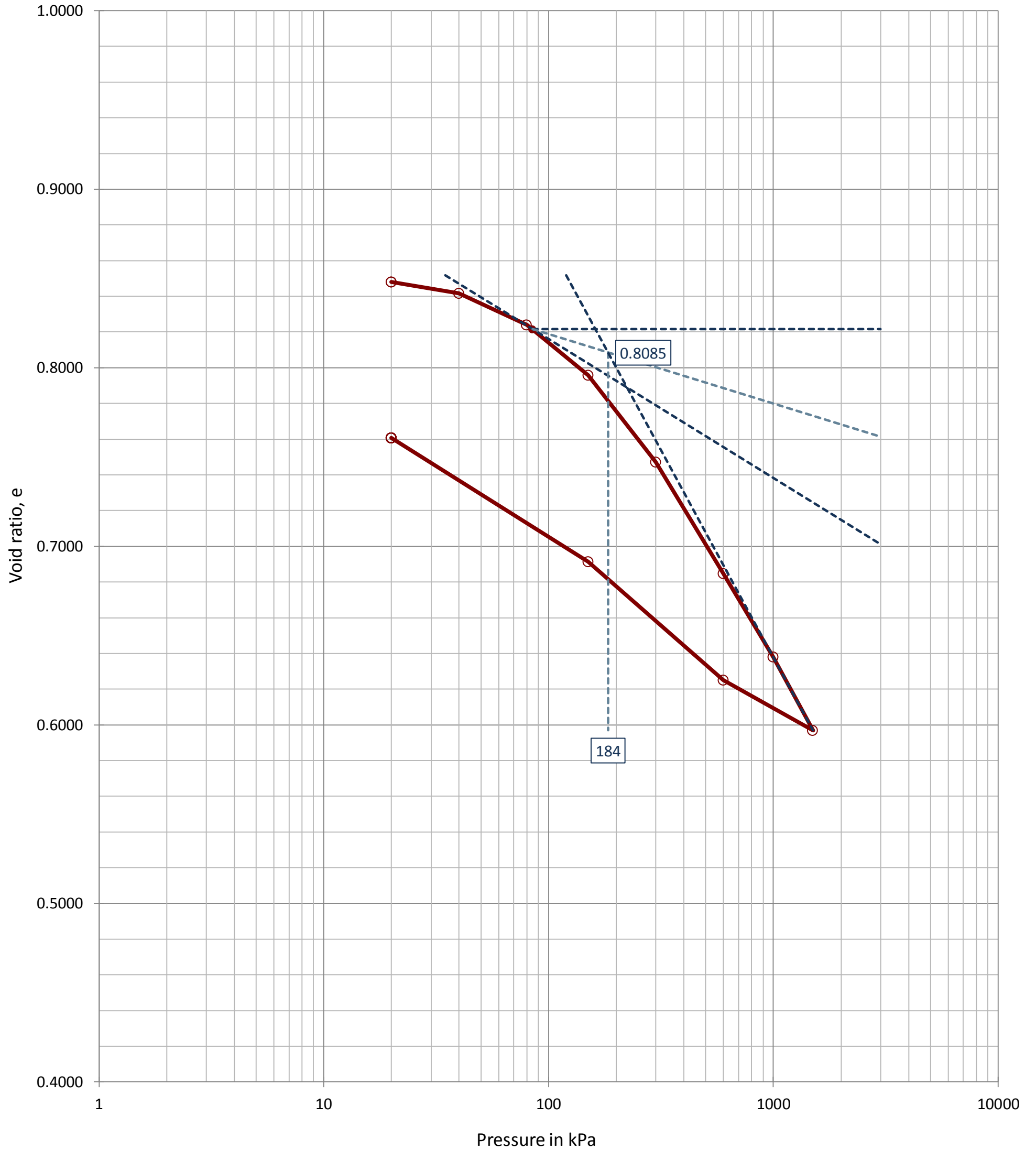
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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
OEDOMETRIC CURVE

Sample reference
MB19-0513

Initial void ratio	0.8517
Final void ratio	0.7608
Initial moisture content (%)	29.7
Final moisture content (%)	28.3

Preconsolidation pres., σ'_p (kPa)	184
Void ratio	0.8085
Determination method	Casagrande
Compression index, cc	0.2323



Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

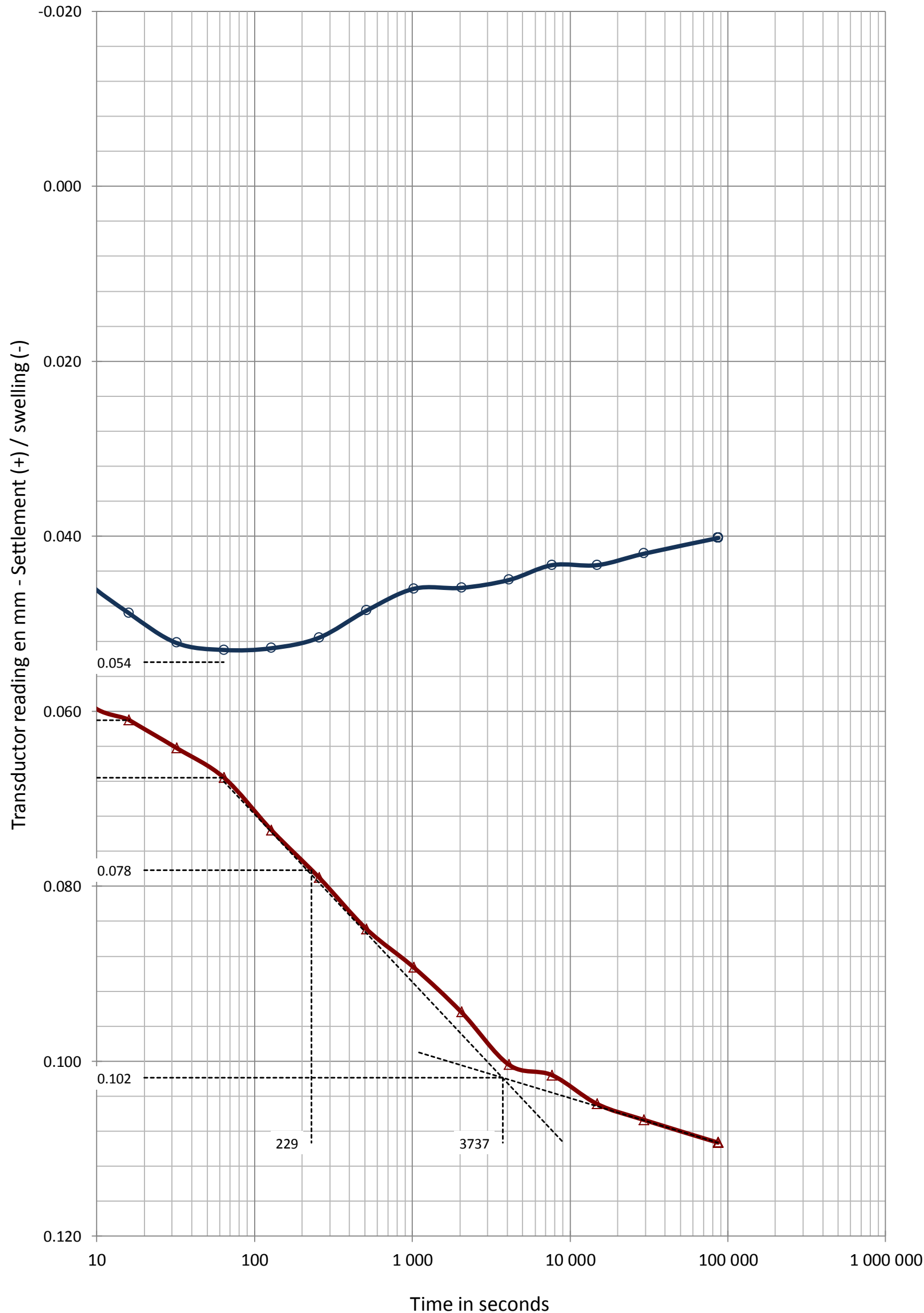
MB19-0513

Pressure stages

Pressure stage (kPa)	20	40	Specimen diameter (cm)	5.020
L0 (Casagrande method)	0.045	0.054	Specimen initial height (cm)	2.000

Date	Date
23-sep-19	24-sep-19

Pressure (kPa)	Pressure (kPa)
20	40



Readings	Void ratio	Readings	Void ratio
Settlement (+)		Settlement (+)	
sg	mm	sg	mm
1	-0.004	1	0.040
2	-0.003	2	0.027
4	0.038	4	0.034
8	0.045	8	0.058
16	0.049	16	0.061
32	0.052	32	0.064
64	0.053	64	0.068
128	0.053	128	0.074
256	0.052	256	0.079
512	0.049	512	0.085
1 024	0.046	1 024	0.089
2 048	0.046	2 048	0.094
4 096	0.045	4 096	0.100
7 696	0.043	7 696	0.102
14 896	0.043	14 896	0.105
29 296	0.042	29 296	0.107
86 961	0.040	86 525	0.109

Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

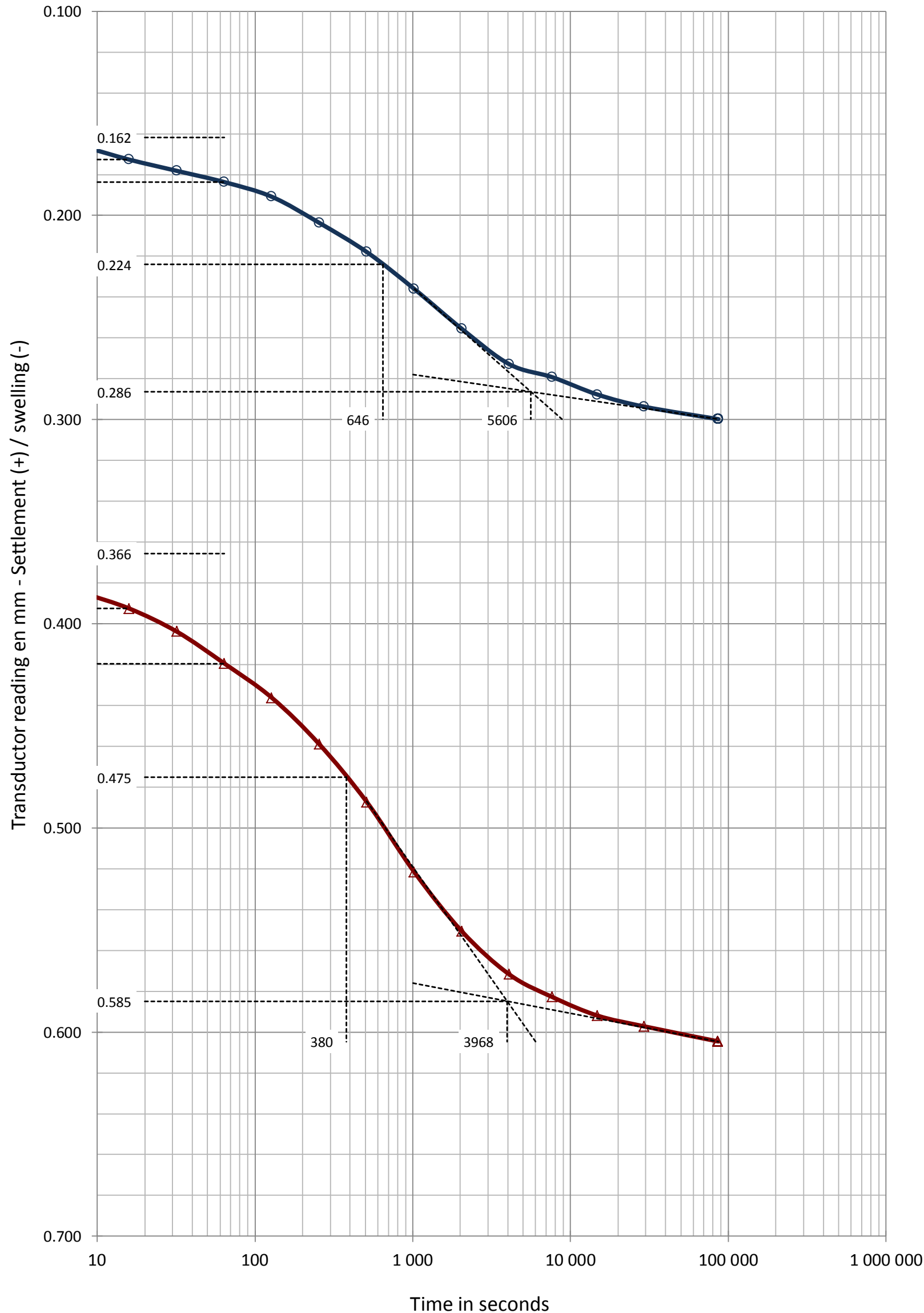
Sample reference

MB19-0513

Pressure stages

Pressure stage (kPa)	80	150	Specimen diameter (cm)	5.020
L0 (Casagrande method)	0.162	0.366	Specimen initial height (cm)	2.000

Date	Date
25-sep-19	26-sep-19



Pressure (kPa)

80 **150**

Readings: Void ratio
 Settlement (+) Settlement (+)

sg mm e sg mm e

0	0.109	0.8416	0	0.300	0.8239
1	0.109	0.8416	1	0.300	0.8239
2	0.109	0.8416	2	0.300	0.8239
4	0.162	0.8367	4	0.376	0.8168
8	0.166	0.8363	8	0.385	0.8161
16	0.173	0.8357	16	0.393	0.8153
32	0.178	0.8352	32	0.404	0.8143
64	0.184	0.8347	64	0.420	0.8128
128	0.191	0.8340	128	0.436	0.8113
256	0.204	0.8328	256	0.459	0.8092
512	0.218	0.8315	512	0.487	0.8066
1 024	0.236	0.8298	1 024	0.522	0.8034
2 048	0.256	0.8280	2 048	0.551	0.8007
4 096	0.273	0.8264	4 096	0.572	0.7987
7 696	0.279	0.8258	7 696	0.583	0.7977
14 896	0.288	0.8250	14 896	0.592	0.7969
29 296	0.294	0.8245	29 296	0.597	0.7964
86 544	0.300	0.8239	86 470	0.605	0.7957

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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

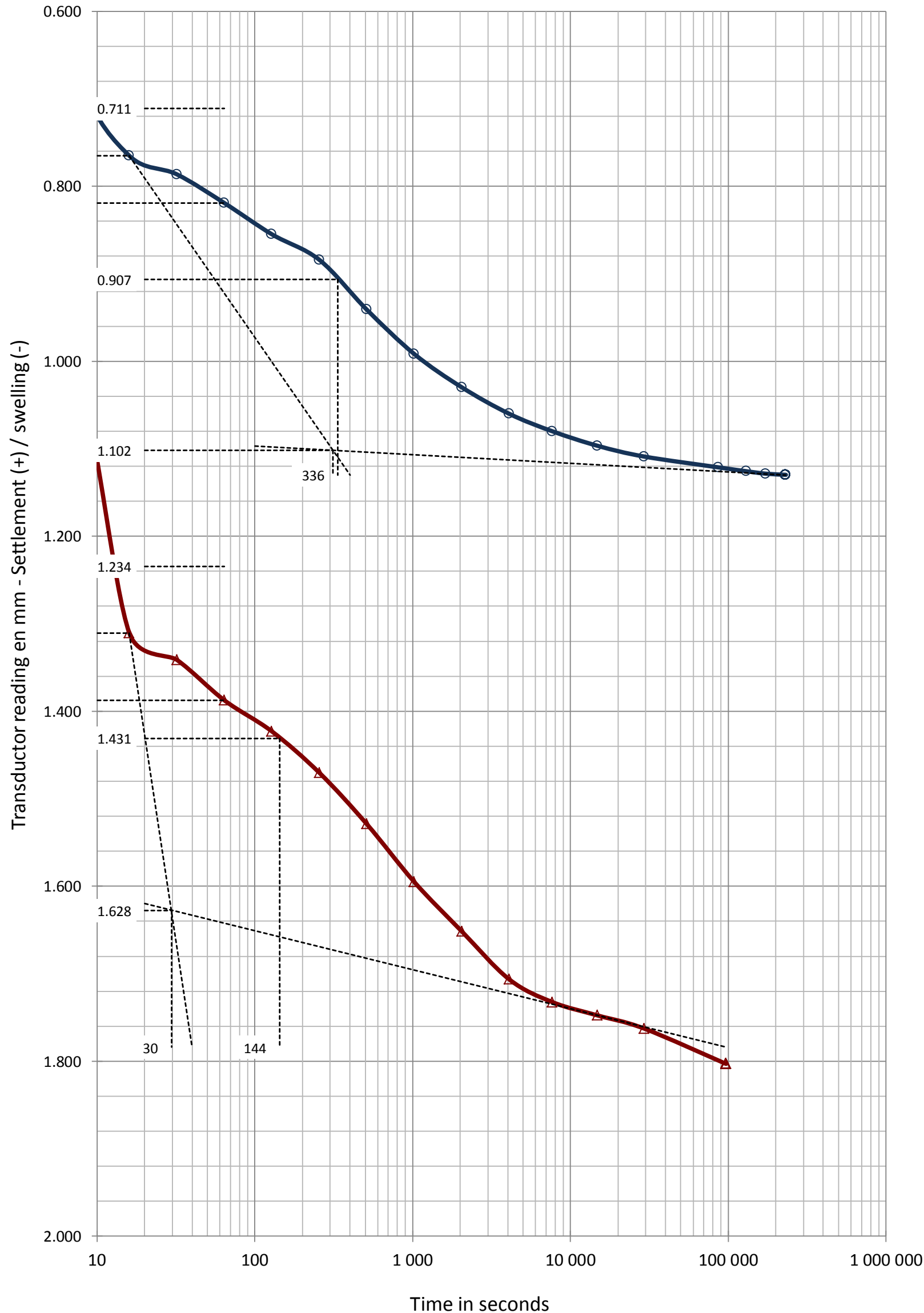
Sample reference

MB19-0513

Pressure stages

Date	Date
27-sep-19	30-sep-19

Pressure stage (kPa)	300	600	Specimen diameter (cm)	5.020
L0 (Casagrande method)	0.711	1.234	Specimen initial height (cm)	2.000



Pressure (kPa)		300		600	
Readings	Void ratio	Readings	Void ratio	Readings	Void ratio
Settlement (+)		Settlement (+)		Settlement (+)	
sg	mm	e	sg	mm	e
0	0.605	0.7957	0	1.130	0.7471
1	0.476	0.8077	1	1.024	0.7568
2	0.474	0.8078	2	1.023	0.7570
4	0.471	0.8081	4	1.018	0.7574
8	0.682	0.7886	8	1.036	0.7558
16	0.765	0.7808	16	1.311	0.7303
32	0.786	0.7789	32	1.341	0.7275
64	0.819	0.7758	64	1.388	0.7232
128	0.855	0.7725	128	1.423	0.7199
256	0.884	0.7698	256	1.470	0.7156
512	0.941	0.7645	512	1.529	0.7101
1 024	0.992	0.7599	1 024	1.595	0.7040
2 048	1.030	0.7563	2 048	1.652	0.6988
4 096	1.060	0.7535	4 096	1.707	0.6937
7 696	1.080	0.7517	7 696	1.733	0.6913
14 896	1.097	0.7501	14 896	1.748	0.6899
29 296	1.109	0.7490	29 296	1.763	0.6885
86 896	1.121	0.7479	96 896	1.803	0.6848
130 096	1.126	0.7475			
173 296	1.129	0.7472			
232 029	1.130	0.7471			

Report num.: CB0019-19-0005
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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

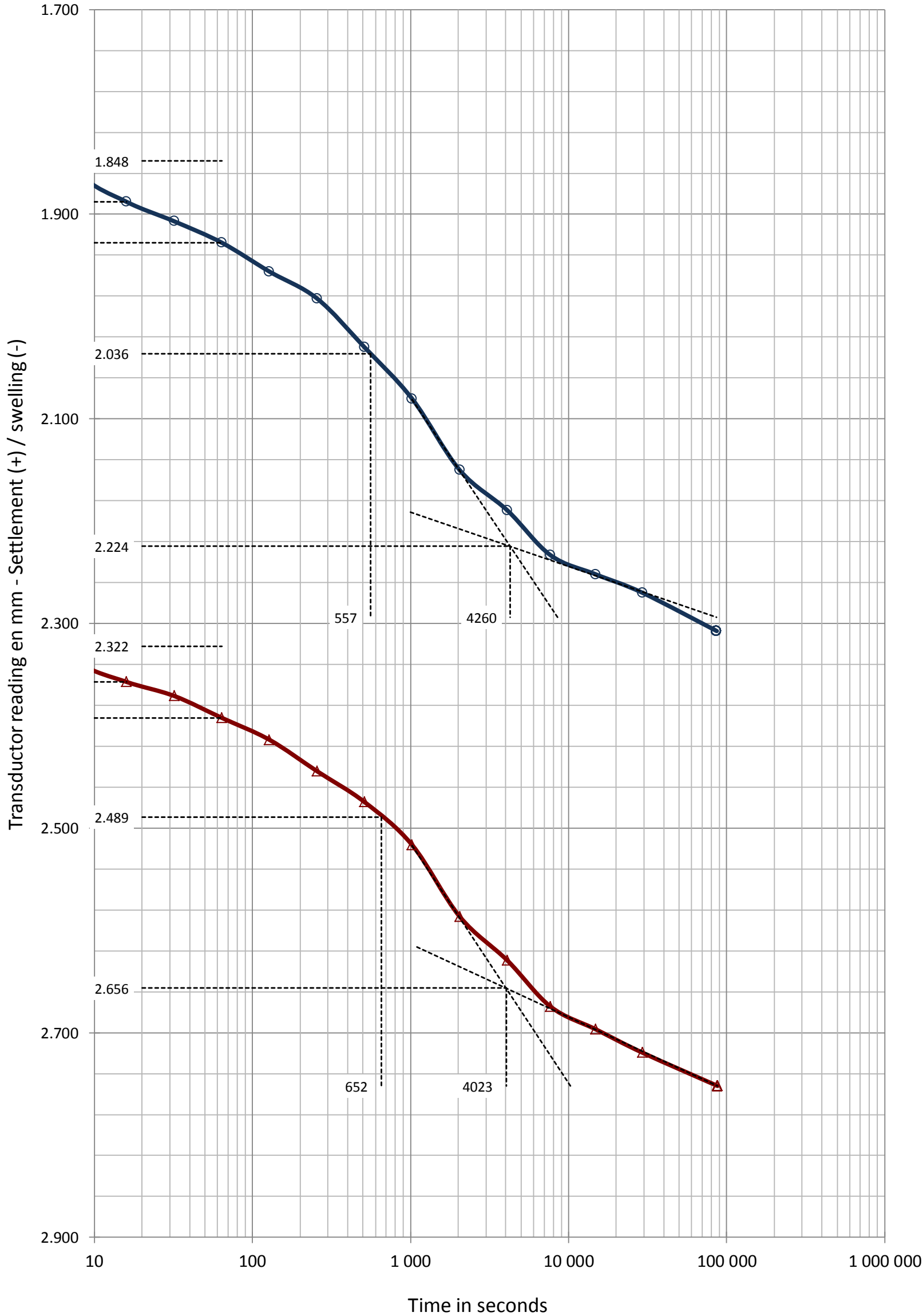
MB19-0513

Pressure stages

Pressure stage (kPa)	1000	1500	Specimen diameter (cm)	5.020
L0 (Casagrande method)	1.848	2.322	Specimen initial height (cm)	2.000

Date	Date
01-oct-19	02-oct-19

Pressure (kPa)	Pressure (kPa)
1000	1500



Readings	Void ratio	Readings	Void ratio
Settlement (+)		Settlement (+)	
sg	mm	sg	mm
0	1.803	0	2.307
1	1.797	1	2.299
2	1.797	2	2.299
4	1.797	4	2.299
8	1.860	8	2.339
16	1.888	16	2.357
32	1.907	32	2.371
64	1.928	64	2.392
128	1.956	128	2.414
256	1.982	256	2.444
512	2.030	512	2.475
1 024	2.081	1 024	2.517
2 048	2.150	2 048	2.587
4 096	2.190	4 096	2.629
7 696	2.233	7 696	2.675
14 896	2.252	14 896	2.697
29 296	2.270	29 296	2.720
86 468	2.307	87 439	2.752

Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

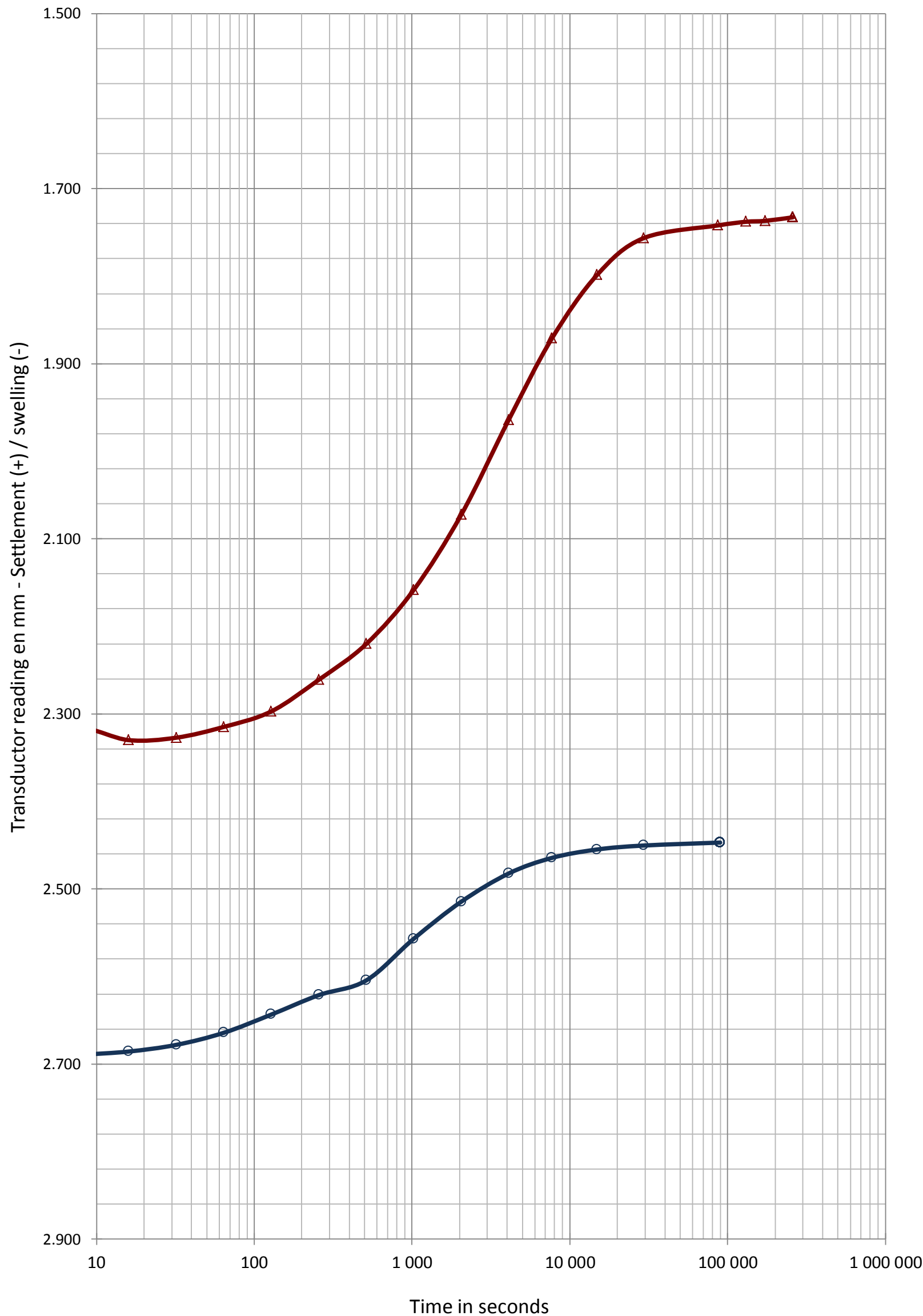
Sample reference

MB19-0513

Pressure stages

Pressure stage (kPa)	600	150	Specimen diameter (cm)	5.020
L0 (Casagrande method)	2.707	2.345	Specimen initial height (cm)	2.000

Date	Date
03-oct-19	04-oct-19



Pressure (kPa)

600 **150**

Readings: Void ratio
 Settlement (+) Settlement (+) Void ratio

sg mm e sg mm e

0	2.752	0.5969	0	2.447	0.6251
1	2.752	0.5969	1	2.447	0.6251
2	2.747	0.5973	2	2.357	0.6335
4	2.695	0.6022	4	2.330	0.6360
8	2.690	0.6027	8	2.317	0.6372
16	2.686	0.6030	16	2.330	0.6360
32	2.678	0.6037	32	2.327	0.6362
64	2.664	0.6050	64	2.315	0.6374
128	2.644	0.6069	128	2.297	0.6390
256	2.621	0.6090	256	2.261	0.6423
512	2.605	0.6105	512	2.220	0.6461
1 024	2.557	0.6150	1 024	2.158	0.6518
2 048	2.515	0.6189	2 048	2.073	0.6598
4 096	2.482	0.6219	4 096	1.964	0.6698
7 696	2.465	0.6235	7 696	1.871	0.6784
14 896	2.455	0.6244	14 896	1.799	0.6852
29 296	2.450	0.6248	29 296	1.757	0.6890
89 672	2.447	0.6251	86 896	1.742	0.6904
			130 096	1.738	0.6908
			173 296	1.737	0.6909
			258 560	1.733	0.6913

Operator:

Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0513

Pressure stages

Pressure stage (kPa) **20** Specimen diameter (cm) **5.020**
 L0 (Casagrande method) **1.698** Specimen initial height (cm) **2.000**

Date Date

07-oct-19

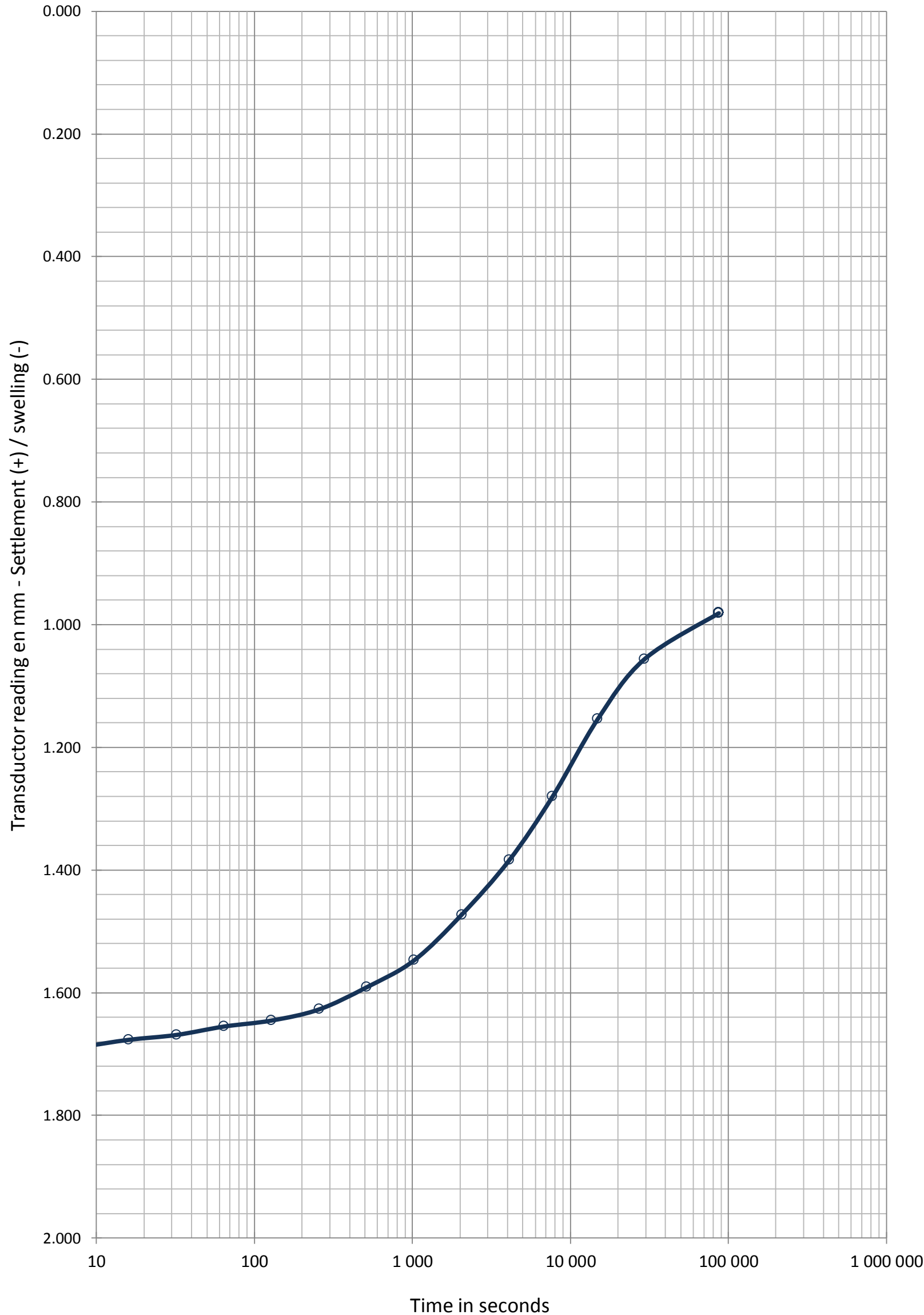
Pressure (kPa) Pressure (kPa)

20

Readings Void Readings Void
 Settlement (+) ratio Settlement (+) ratio

sg mm e sg mm e

0	1.733	0.6913			
1	1.733	0.6913			
2	1.707	0.6936			
4	1.691	0.6951			
8	1.688	0.6954			
16	1.677	0.6964			
32	1.669	0.6972			
64	1.655	0.6984			
128	1.645	0.6993			
256	1.627	0.7010			
512	1.591	0.7044			
1 024	1.547	0.7084			
2 048	1.473	0.7153			
4 096	1.384	0.7235			
7 696	1.281	0.7331			
14 896	1.154	0.7448			
29 296	1.057	0.7538			
86 949	0.981	0.7608			



Report num.:	CB0019-19-0005
Edition date:	

FALL CONE TEST - ISO 17892-6:2017

Sample reference

MB19-0513

Equipment
PENETROMETER MATEST B057-11

Legend of symbols
cu Calculated Undrained Shear Strength (kPa)
cu(corr) Corrected Undrained Shear Strength (kPa)
cur Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	55.3	4.77	4.66	3.56	4.66	4.413	400	30	201	179	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	201
Corrected Undrained Shear Strength, cu(corr) (kPa)	179

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	4.48	5.17	4.19	4.61	4.613	400	30	147	
1	1	4.56	4.65	4.58	4.54	4.583	400	30	149	
1	3	4.54	4.55	4.56	4.53	4.545	400	30	152	
1	7	4.1	5.02	4.46	4.38	4.49	400	30	156	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	147

Thixotropy	
Loss at remoulding (%)	27
Recovery after 1 day (%)	4
Recovery after 7 days (%)	17

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

Report num.: CB0019-19-0005
Edition date:

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e-mail: mail@igeotest.com
www.igeotest.com
Reg. Num. LECCE L0600292



20 / 20

Sample reference

MB19-0513

SOIL CHEMICAL ANALYSIS

*** DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995**

Operator: GUILLEM MASSALLÉ

Test final date: 27-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.787 g

Equipment:

RESULT: **76.9 g/kg (total)**

MUFLA OVEN ETI HD150

67.4 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

*** DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995**

Operator: ALEX VANCELLS

Test final date: 27-09-19

Mean of analyzed soil mass: 1.283 g

Equipment:

RESULT: **78.9 g/kg**

SCHEIBLER APPARATUS

REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0514

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_1 C3_1.1
Top depth, m	1.9
Bottom depth, m	2.05
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	1-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) clayey SILT.	1.9	
	2.05	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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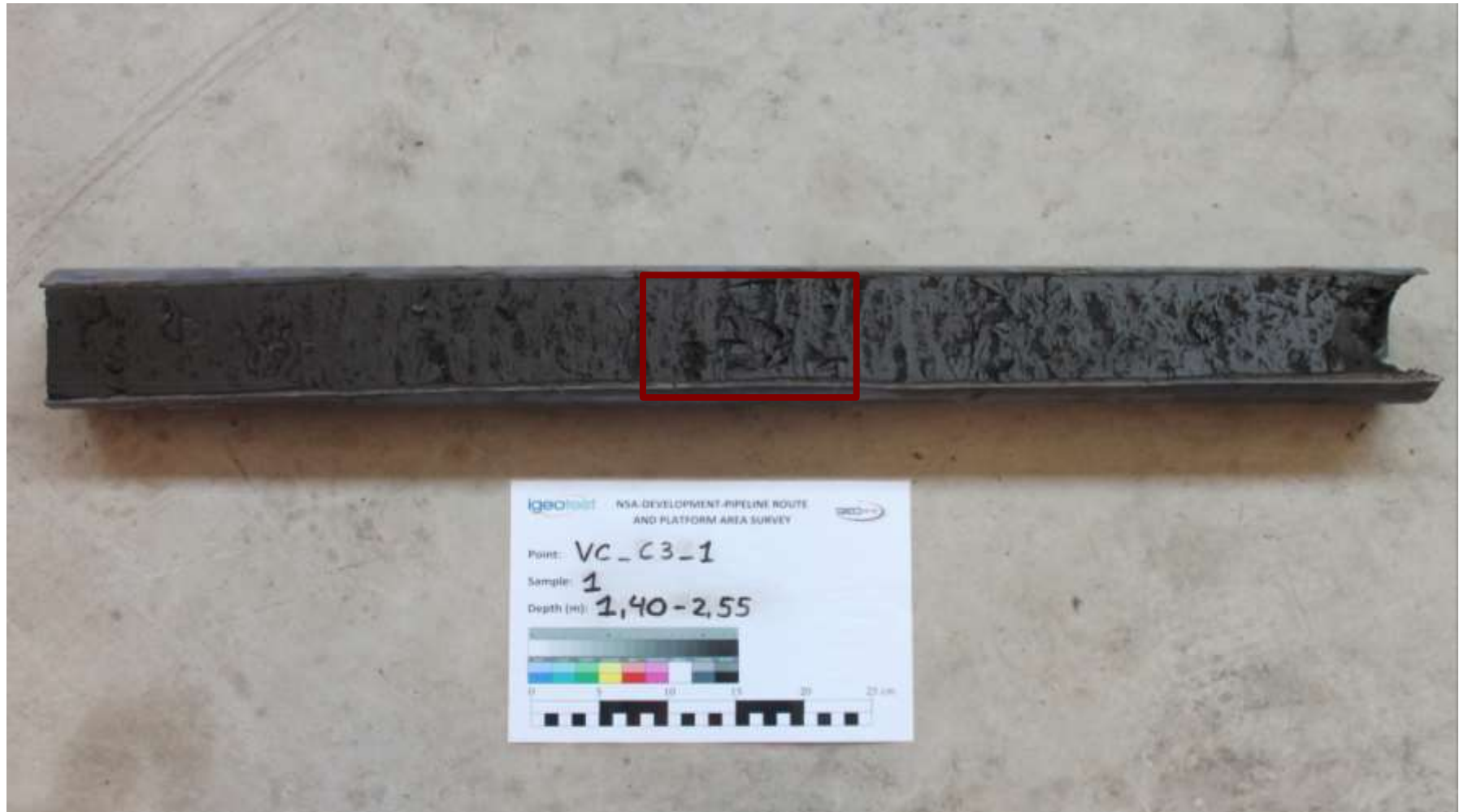


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Sample reference

PHOTOGRAPHIC RECORD

MB19-0514



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 01/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0514

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	106.44
Tare + soil + water (g)	183.68
Tare + soil (g)	165.18
Water (g)	18.50
Soil (g)	58.74
Moisture, w (%)	31.5

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 02/07/2019

Results	
Moisture content, w (%)	31.5

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	93.92
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.87
Dry density (Mg/m ³)	1.42

Operator: MARC COLOMER
Test final date: 01/07/2019

Results	
Bulk density (Mg/m³)	1.87
Dry density (Mg/m³)	1.42

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0514

DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data

Type of cone used	80 g/30°			
Cone penetration (mm)	19.525	22.34	24.03	17.65
Water (g)	5.23	10.31	4.91	4.05
Mass moist soil + cont. (g)	124.75	122.88	126.25	123.64
Mass dry soil + cont. (g)	119.52	112.57	121.34	119.59
Mass container (g)	109.46	93.36	112.45	111.54
Soil (g)	10.06	19.21	8.89	8.05
Water content (%)	52.0	53.7	55.2	50.3

Equipment

PENETROMETER MATEST B057-11
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

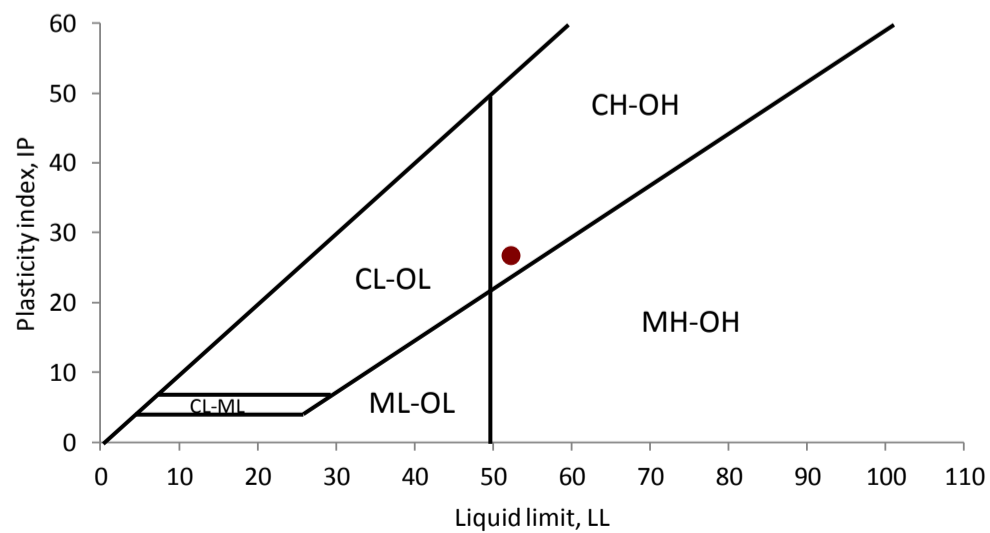
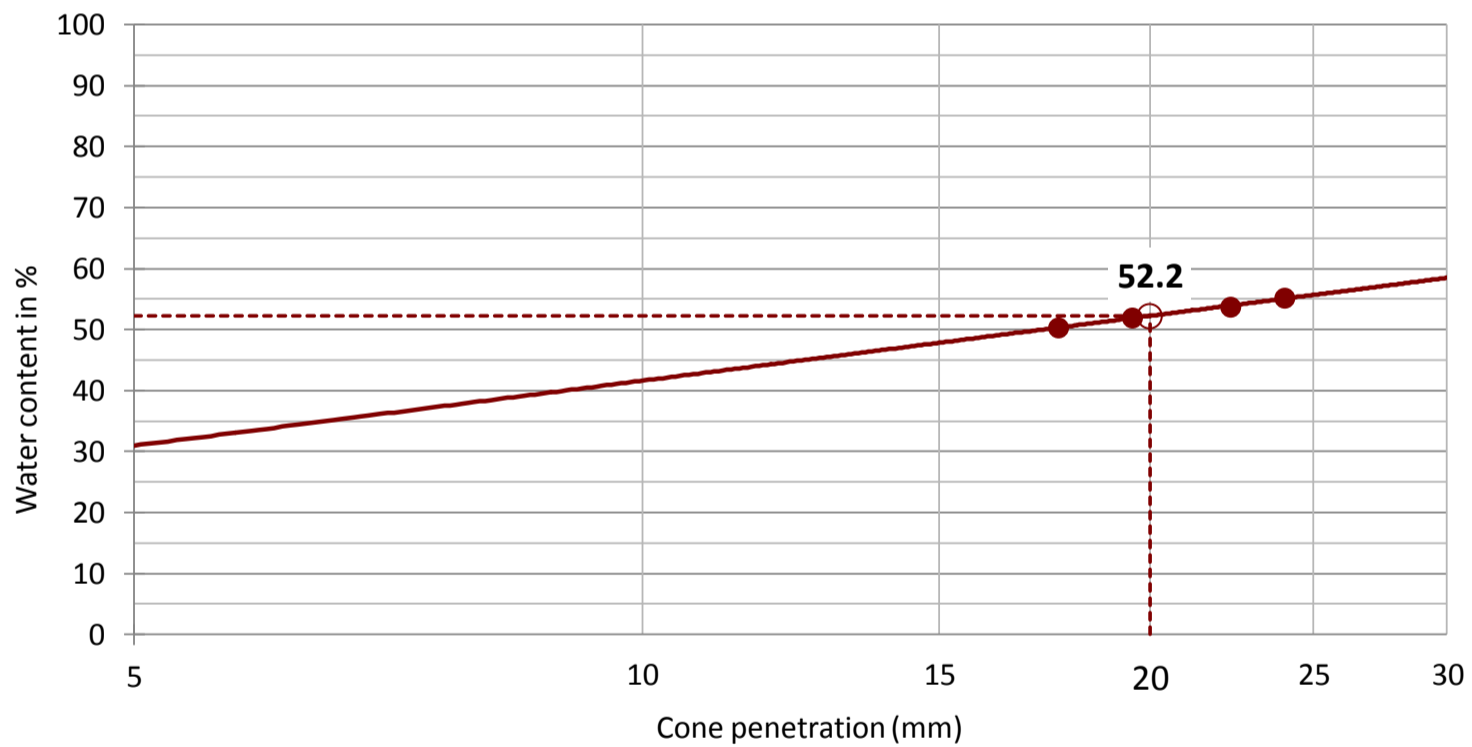
Plastic Limit data

Water (g)	1.46	1.16		
Mass moist soil + cont. (g)	32.26	29.87		
Mass dry soil + cont. (g)	30.80	28.71		
Mass container (g)	25.09	24.16		
Soil (g)	5.71	4.55		
Water content (%)	25.6	25.5		

Results

Liquid limit, LL 52.2
Plastic limit, LP 25.5
Plasticity index, IP 26.7

Natural water content (%) 31.5
 Liquidity index, IL 0.2
 Consistency index, IC 0.8



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0515

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_1Bis C3_1Bis.2
Top depth, m	0.45
Bottom depth, m	0.6
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	15
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	1-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB.

Soil type

--	--

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) clayey SILT with occasional fine to medium sand pockets.	0.45	
	0.6	

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

REMARKS

See results at CEPASA report.

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0515



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 01/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014

Sample reference

MB19-0515

Equipment	
BALANCE RADWAG PS4500.R1	
DRYING OVEN PROETI P0228	

Data of soil moisture content test	
Tare (g)	106.92
Tare + soil + water (g)	179.81
Tare + soil (g)	164.96
Water (g)	14.85
Soil (g)	58.04
Moisture, w (%)	25.6

Drying temperature (°C) 105

Operator: ALEX VANCELLS
Test final date: 02/07/2019

Results	
Moisture content, w (%)	25.6

Equipment	
BALANCE RADWAG PS4500.R1	
METALLIC CUTTING CILINDER	

Bulk density test data	
Soil weight (g)	93.07
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	1.85
Dry density (Mg/m ³)	1.47

Operator: ALEX VANCELLS
Test final date: 1/77/19

Results	
Bulk density (Mg/m³)	1.85
Dry density (Mg/m³)	1.47

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0515

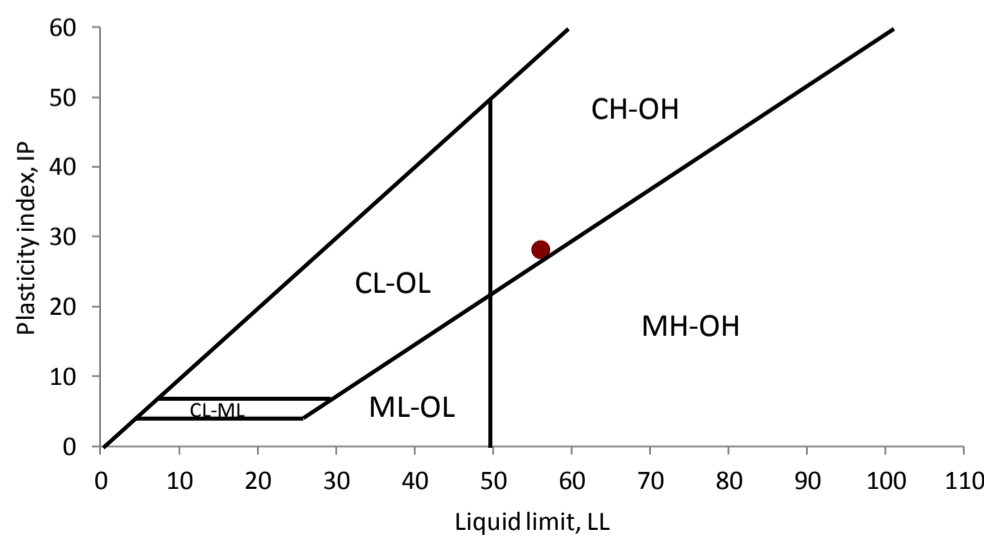
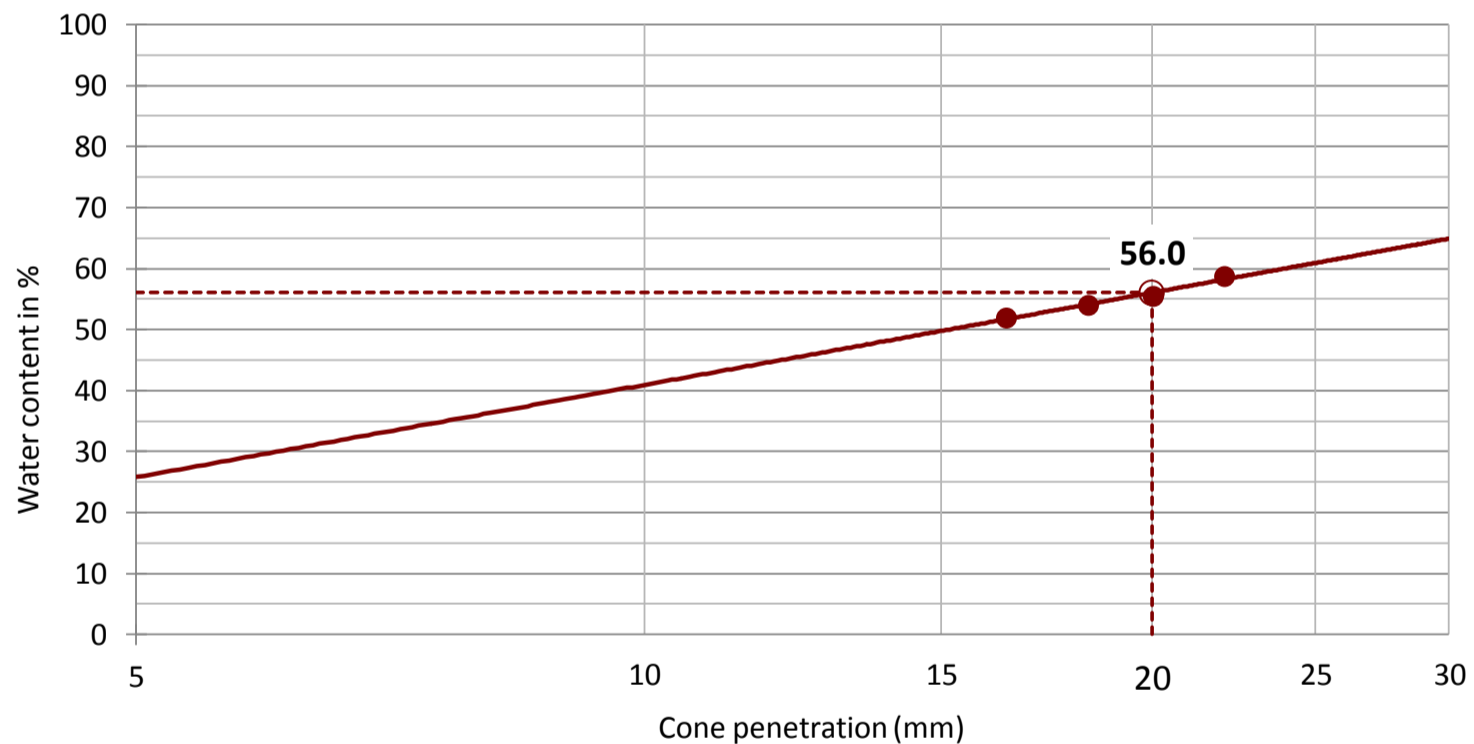
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	16.4	18.34	20.05	22.09
Water (g)	8.58	10.46	9.56	9.94
Mass moist soil + cont. (g)	173.81	183.07	193.31	192.75
Mass dry soil + cont. (g)	165.23	172.61	183.75	182.81
Mass container (g)	148.73	153.24	166.52	165.87
Soil (g)	16.50	19.37	17.23	16.94
Water content (%)	52.0	54.0	55.5	58.7

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data		
Water (g)	1.47	1.40
Mass moist soil + cont. (g)	30.95	30.27
Mass dry soil + cont. (g)	29.48	28.87
Mass container (g)	24.21	23.86
Soil (g)	5.27	5.01
Water content (%)	27.9	27.9

Results	
Liquid limit, LL	56.0
Plastic limit, LP	27.9
Plasticity index, IP	28.1
Natural water content (%)	25.6
Liquidity index, IL	-0.1
Consistency index, IC	1.1



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

OPENING AND DESCRIPTION OF THE SAMPLE IN LABORATORY - 900-01-I-LAB

Sample reference

MB19-0516

General data

Petitioner	
Client	GEO.XYZ Luxembourg S.A.
Project	N5A-DEVELOPMENT-PIPELINE ROUTE AND PLATFORM AREA SURVEY

Sample data

Client reference	
Situation	VC_C3_1BIS C3_1BIS.1
Top depth, m	1.2
Bottom depth, m	1.8
Sample type	VIBROCORE
Diameter, cm	11
Length, cm	60
Acquisition date	14-5-19
Reception date	20-5-19

Opening and preparation data

Opening date	2-7-19
Operator	GUILLEM MASSALLÉ
Type of opening	SAW
Storage	LABORATORY
Environment test	GEOTECHNICAL LAB./RUSSELL GEOT. INNOV.

Soil type

USCS classification	CH
ISO classification	siCl

Sample description

Lithology	Depth m	Observations P-penetrometer TV-torvane (kPa)
Very closely fissured black (5Y 2.5/1) clayey SILT with occasional fine to medium sand pockets. Plasticity is high.	1.2	
	1.8	1.45-1.80 m: RESERVED FOR ADVANCED TESTING

CARRIED OUT TESTS

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENSITY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016
DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018
FALL CONE TEST - ISO 17892-6:2017
UNCONSOLIDATED UNDRAINED TRIAXIAL TEST, UU 1.5' - ISO 17892-8:2018
INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995
DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

REMARKS

SEE ADVANCED TESTING RESULTS IN RUSSELL GEOTECHNICAL INNOVATIONS REPORT

Report num.: CB0019-19-0005
Edition date:

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Reg. Num. LECCE L0600292



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Sample reference

PHOTOGRAPHIC RECORD

MB19-0516



REMARKS

Operator: GUILLEM MASSALLÉ

Date: 02/07/2019

Report num.: CB0019-19-0005
 Edition date:

DETERMINATION OF WATER CONTENT - ISO 17892-1:2014
DETERMINATION OF BULK DENISTY - ISO 17892-2:2014
DETERMINATION OF PARTICLE DENSITY - ISO 17892-3:2015

Sample reference

MB19-0516

Equipment
BALANCE RADWAG PS4500.R1 DRYING OVEN PROETI P0225

Data of soil moisture content test	
Tare (g)	111.60
Tare + soil + water (g)	185.33
Tare + soil (g)	167.51
Water (g)	17.82
Soil (g)	55.91
Moisture, w (%)	31.9

Drying temperature (°C) 105

Operator: GUILLEM MASSALLÉ
Test final date: 03/07/2019

Results	
Moisture content, w (%)	31.9

Equipment
BALANCE RADWAG PS4500.R1 METALLIC CUTTING CILINDER

Bulk density test data	
Soil weight (g)	100.45
Lower side of prismatic sample, B (cm)	
Largest side of prismatic sample, H (cm)	
Length, L (cm)	3.540
Diameter of cylindrical sample, D (cm)	4.250
Soil volume (cm ³)	50.22
Bulk density (Mg/m ³)	2.00
Dry density (Mg/m ³)	1.52

Operator: MARC COLOMER
Test final date: 02/07/2019

Results	
Bulk density (Mg/m³)	2.00
Dry density (Mg/m³)	1.52

Equipment
100 ml PYCNOMETER ALAMO V5573 BALANCE GIBERTINI CRYSTAL 500 CAL DIGITAL THERMOMETER TESTO 5601110 CONSTANT-TEMPERATURE DIGITAL BATH PROETI V0115

Particle density test data	
Drying temperature (°C)	105
Pycnometer reference num.	8
Test temperature (°C)	20.1
Water density at test temp., δwTi (Mg/m ³)	0.9982
Temperature correction parameter, K1	0.9982
Pyc. mass when full of water at test temp., M3 (g)	178.0480
Pyc. mass + soil + water at test temp. M2 (g)	184.9170
Soil mass, M1 (g)	10.9430
Particle density, G20°C (Mg/m ³)	2.681

Operator: ALEX VANCELLS
Test final date: 01/10/2019

Results	
Particle density (Mg/m³)	2.681

REMARKS

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0516

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. SIEVING - ISO 17892-4:2016

Equipment
 STANDARD SIEVE SERIES PROETI 203 mm
 BALANCE RADWAG PS4500.R1
 DRYING OVEN PROETI P0228

Predrying temperature (°C) **60**

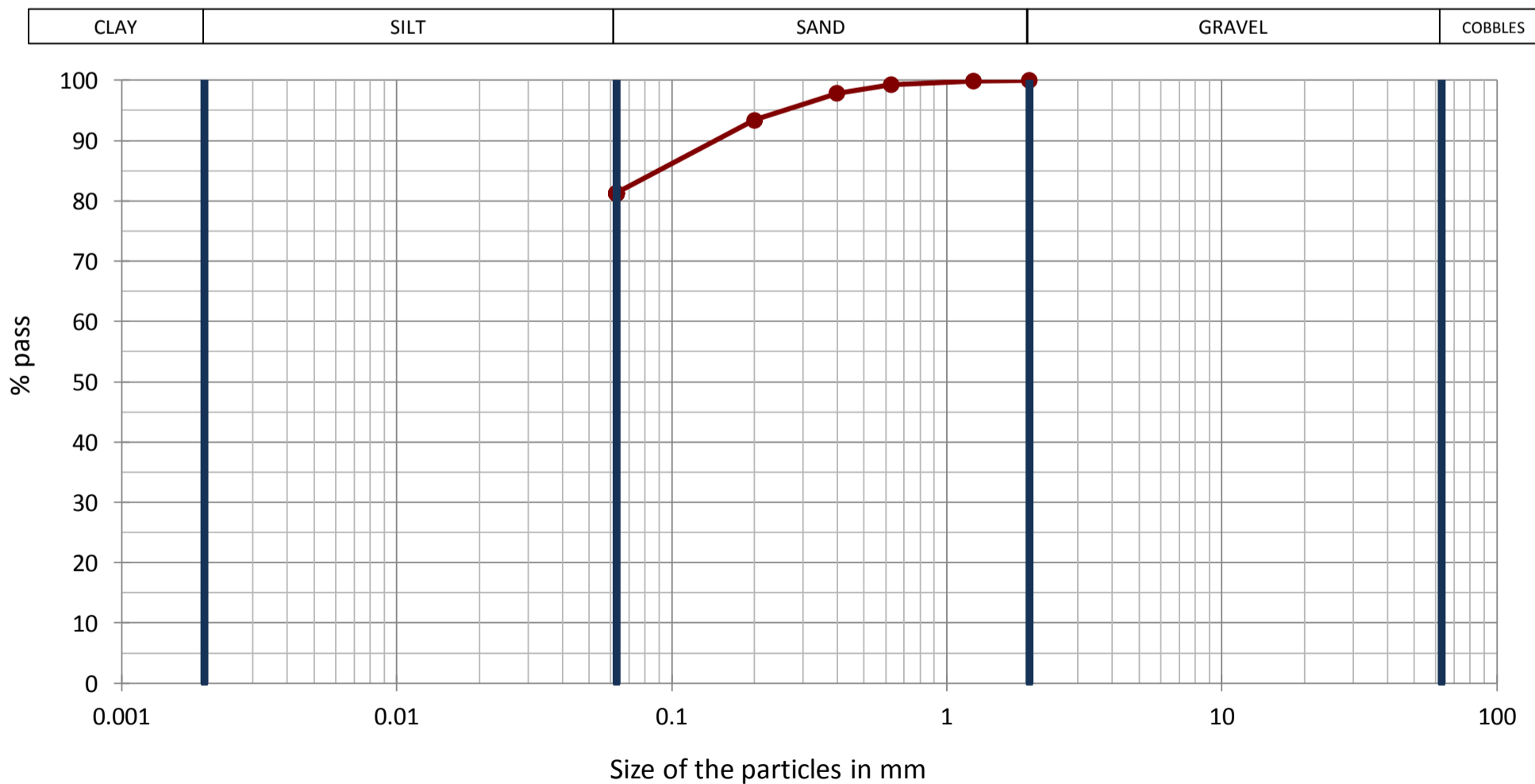
Previous calculations
 Total dried sample (g) **104.45**

 Hygrosc. moisture, % (fraction<2 mm) **2.6**
 Corr. parameter, f (fraction<2 mm) **0.9744**

Results					
Sieves Aperture mm	Retained sieves			Pass total sample	
	Partial g	Total g	Total %	g	%
2		0.00	0.0	101.77	100.0
1.25		0.07	0.1	101.70	99.9
0.63		0.69	0.7	101.01	99.3
0.4		1.33	2.1	99.68	97.9
0.2		4.65	6.6	95.03	93.4
0.063		12.32	18.7	82.71	81.3

Soil type according to ISO 14688-2:2017

% COBBLES > 63 mm	% GRAVEL	63-2 mm	0.0	% SAND	2-0.063 mm	18.7	% FINE	<0.063 mm
0.0	% Coarse gravel	63-20 mm	0.0	% Coarse sand	2-0.63 mm	0.7	81.3	
	% Medium gravel	20-6.3 mm	0.0	% Medium sand	0.63-0.2 mm	5.9		
	% Fine gravel	6.3-2 mm	0.0	% Fine sand	0.2-0.063 mm	12.1		



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

DETERMINATION OF PARTICLE SIZE DISTRIBUTION. HYDROMETER METHOD - ISO 17892-4:2016 Sample reference
MB19-0516

Equipment
HYDROMETER PROETI S0075 HIGH-VELOCITY STIRRER PROETI S0081 BALANCE RADWAG PS4500.R1 CONSTANT-TEMPERATURE BATH PROETI S0065

Hydrometer data
Bulb volume, V (ml) 47.77
Eq. scale calibration $y = -2.3782x + 182.41$
Eq. dispersant correc. (Cd) $y = 1E-05x^4 + 2E-03x^3 + 1E-01x^2 + 2.172x + 16.1582$
Meniscus correction (Cm) 0.0005

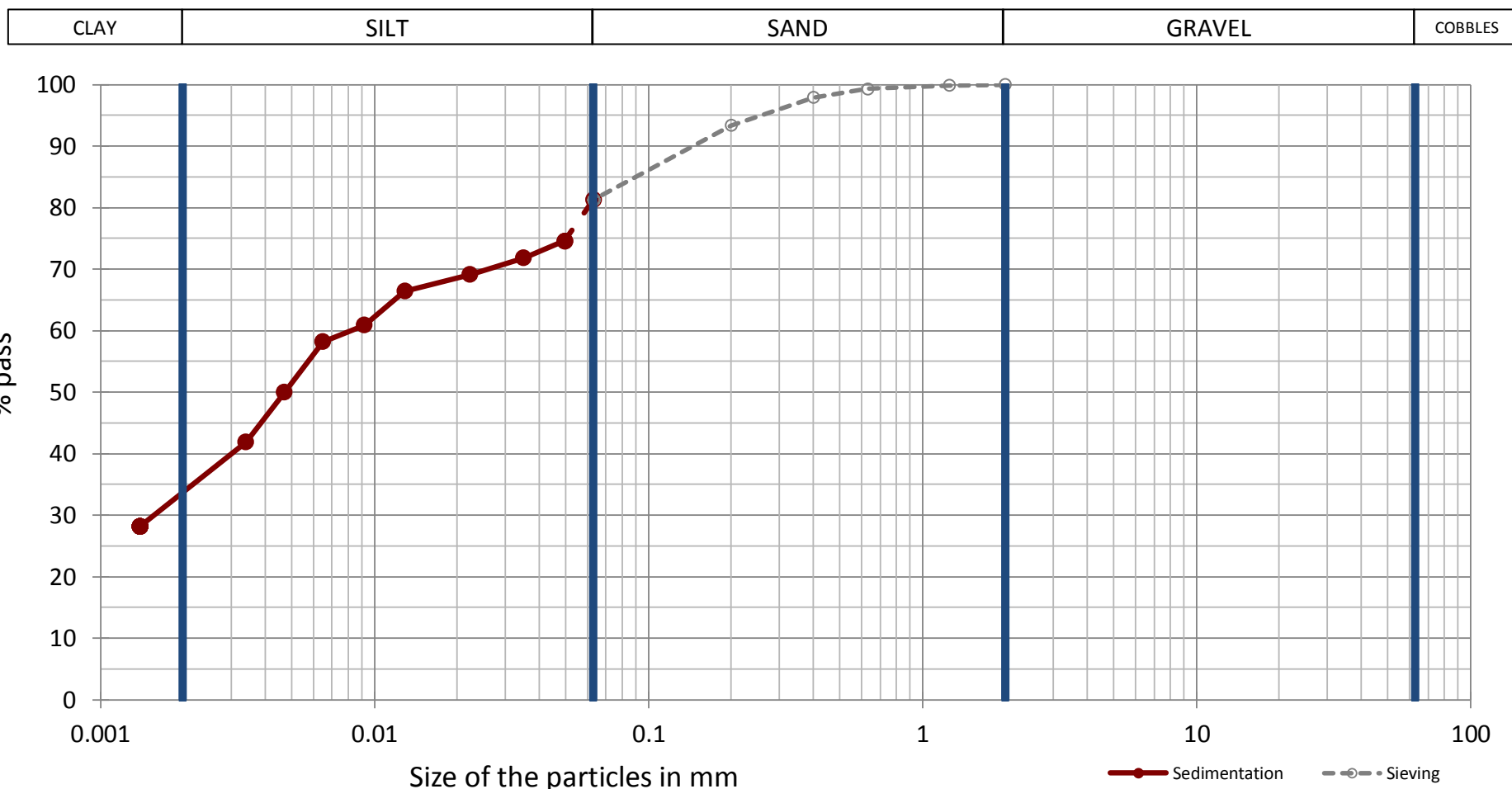
Sample data	
Percentage passing #2 mm (%)	100.0
Tested soil mass, mw (g)	30.01
Hygrosopic moisture, W (%)	2.6
Tested and dried soil mass, m (g)	29.24
Particle density (Mg/m ³)	2.681

Test data and results							
t min	T °C	R'h g/cm3	Rh	Hr mm	R	d mm	K %
1	22	1.0175	17.5	140.8	13.7	0.0495	74.6
2	22	1.0170	17	142.0	13.2	0.0351	71.8
5	22	1.0165	16.5	143.2	12.7	0.0223	69.1
15	22	1.0160	16	144.4	12.2	0.0129	66.4
30	22	1.0150	15	146.7	11.2	0.0092	60.9
60	22	1.0145	14.5	147.9	10.7	0.0065	58.2
120	22	1.0130	13	151.5	9.2	0.0047	50.0
240	22	1.0115	11.5	155.1	7.7	0.0034	41.8
1440	22	1.0090	9	161.0	5.2	0.0014	28.2

Test tube data	
Area of the inner section (A), mm ²	2931.60

Legend test data and results	
t -	Time
T -	Temperature
R'h -	Reading suspension soil on top of the meniscus
Rh -	Corrected reading suspension of soil $Rh = (R'h - 1) * 1000$
Hr -	Efective depth
R -	Real reading suspension soil $R = Rh + Cm + Ct - Cd$
d -	Equivalent particle diameter
K -	Percentage of particles smaller than d

Soil type according to ISO 14688-2:2017	
Particles smaller than 0.063 mm (%)	81.3
Silt, between 0.063 and 0.002 mm (%)	49.0
Clay, smaller than 0.002 mm (%)	32.3



REMARKS

Operator: ALEX VANCELLS

Test final date: 08/10/2019

Report num.: CB0019-19-0005
 Edition date:

Sample reference

MB19-0516

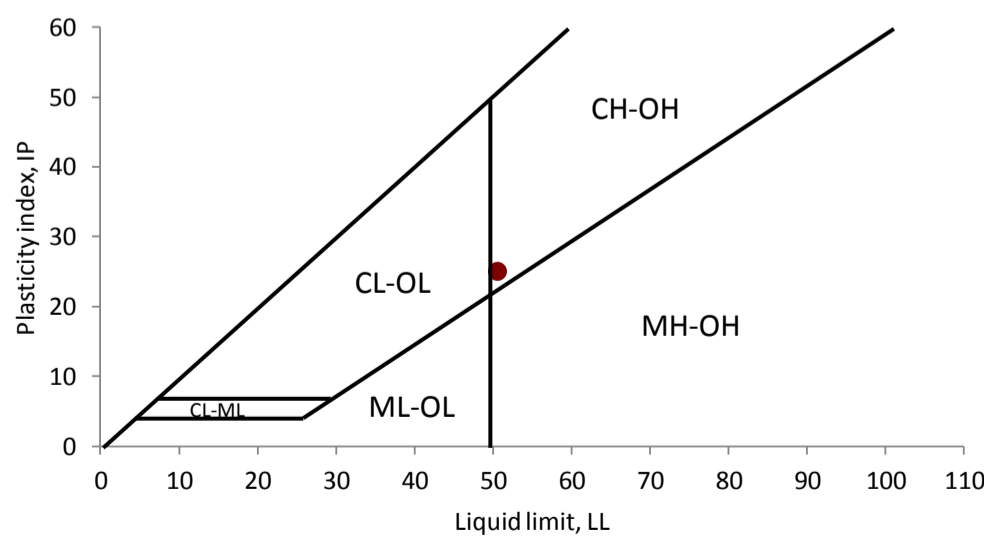
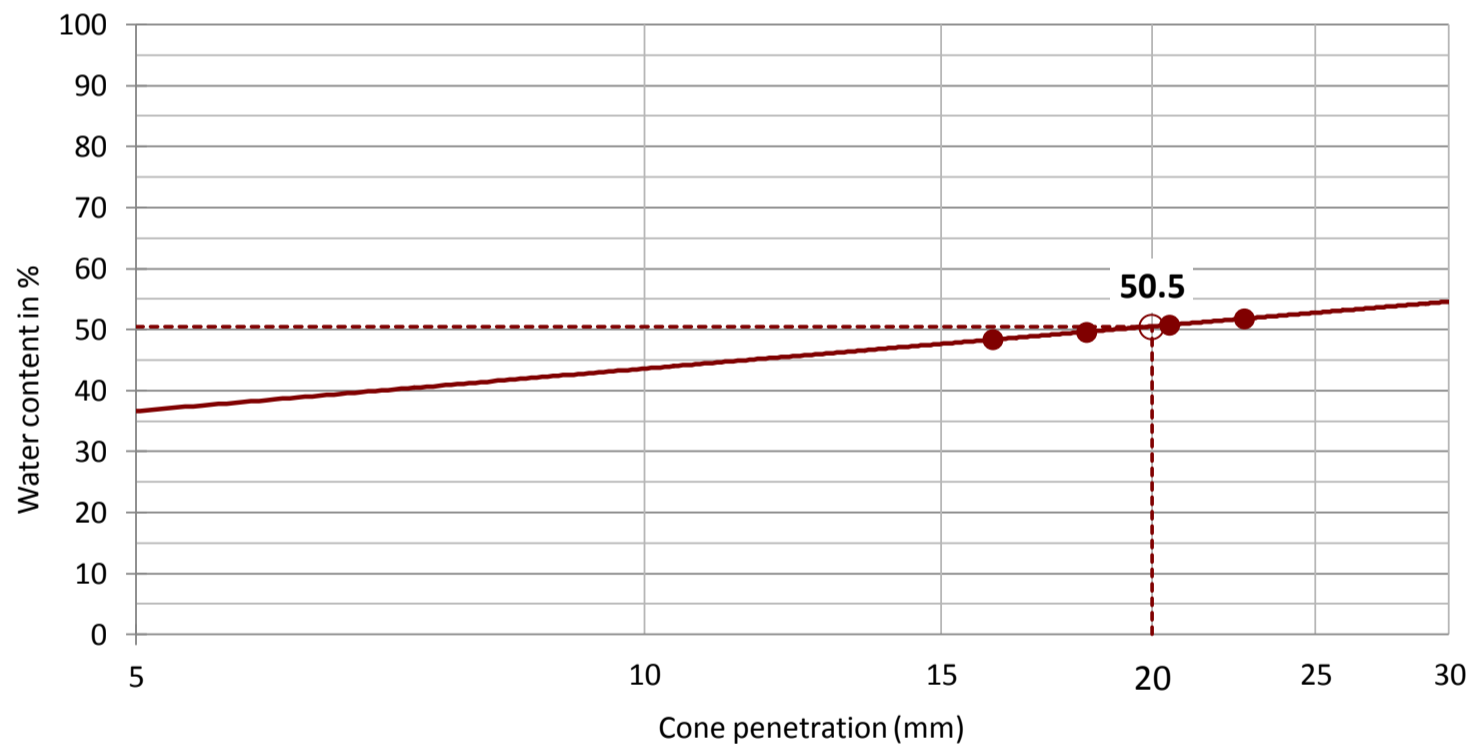
DETERMINATION OF LIQUID AND PLASTIC LIMITS - ISO 17892-12:2018

Liquid Limit according to the cone penetration method data				
Type of cone used	80 g/30°			
Cone penetration (mm)	20.485	16.095	18.3	22.68
Water (g)	5.55	4.50	5.06	5.06
Mass moist soil + cont. (g)	48.48	42.78	45.51	44.36
Mass dry soil + cont. (g)	42.93	38.28	40.45	39.30
Mass container (g)	31.98	28.98	30.25	29.54
Soil (g)	10.95	9.30	10.20	9.76
Water content (%)	50.7	48.4	49.6	51.8

Equipment
PENETROMETER MATEST B057-11
BALANCE RADWAG PS4500.R1
DRYING OVEN PROETI P0228

Plastic Limit data				
Water (g)	1.11	1.07		
Mass moist soil + cont. (g)	29.78	29.14		
Mass dry soil + cont. (g)	28.67	28.07		
Mass container (g)	24.30	23.88		
Soil (g)	4.37	4.19		
Water content (%)	25.4	25.5		

Results	
Liquid limit, LL	50.5
Plastic limit, LP	25.5
Plasticity index, IP	25.0
Natural water content (%)	31.9
Liquidity index, IL	0.3
Consistency index, IC	0.7



REMARKS

Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0516

Equipment	
MECACISA 1.5' TRIAXIAL CHAMBER PRESSURE SYSTEM MECACISA 220004 TRIAXIAL LOAD FRAME MECACISA 210715 ELEC. DEF. TRANSD. SCHREIBER SM260 PC WITH SOFTWARE MECASOFT	

Test type	Unconsolidated Undrained (UU)
Soil conditions	UNDISTURBED

Soil sample data	
Specimen number	I
Initial length (cm)	7.648
Initial diameter (cm)	3.900
Initial area (cm ²)	11.946
Initial volume (cm ³)	91.363
Initial moisture content (%)	25.1
Final moisture content (%)	25.5
Initial bulk density (Mg/m ³)	1.98
Initial dry density (Mg/m ³)	1.58
Initial saturation degree (%)	96.6
Particle density (Mg/m ³)	2.681

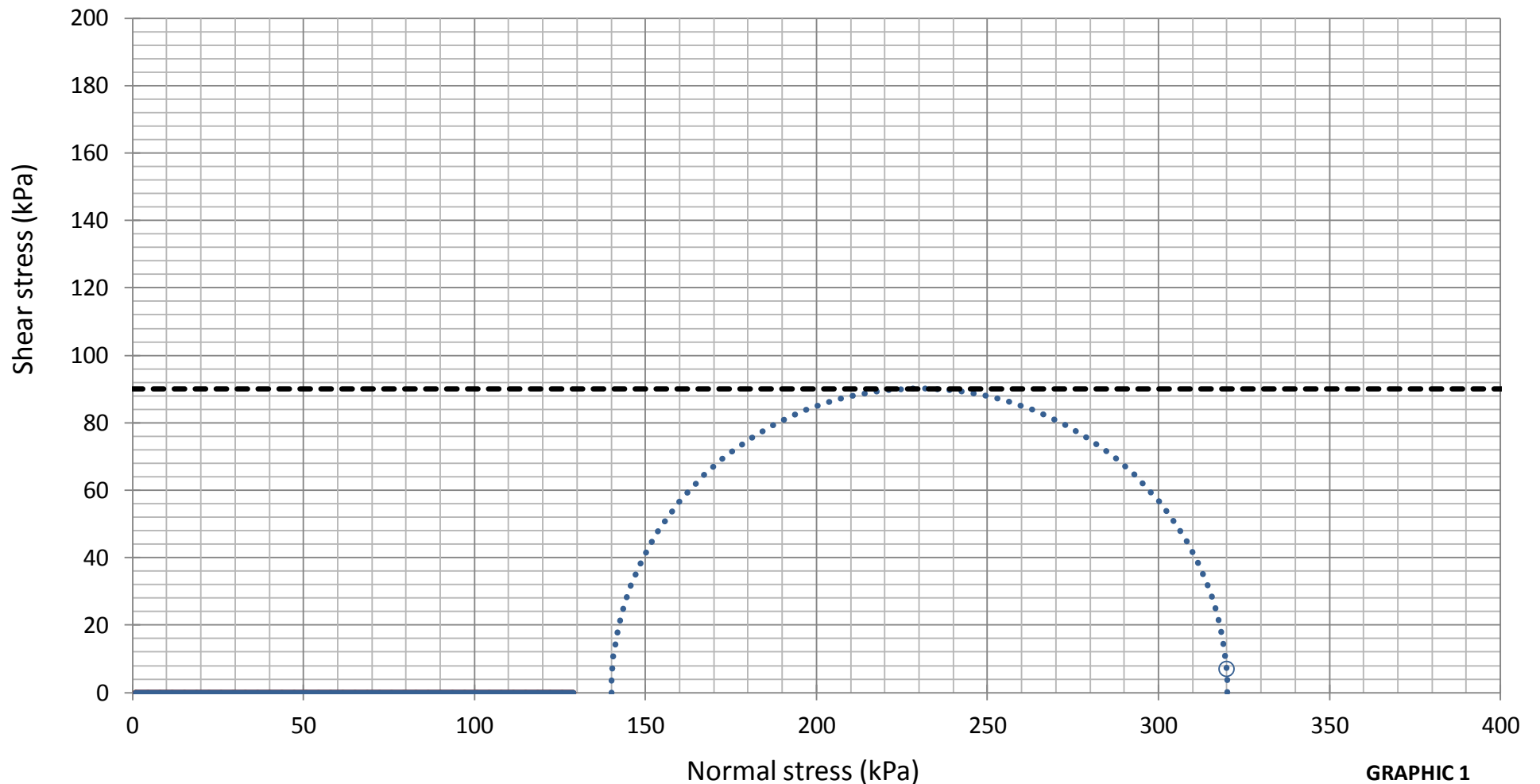
Prior saturation process	
Saturation prior to test	NO

Failure test results	
Specimen number	I
σ ₁ (kPa)	320.2
σ ₃ (kPa)	140.0
(σ ₁ -σ ₃)/2 (kPa)	90.1
(σ ₁ +σ ₃)/2 (kPa)	230.1

Test data and results	
Chamber pressure (kPa)	140
Back pressure, u _b (kPa)	0
Rate of axial displ. (mm/min)	0.9222
Major principal stress (kPa)	180.2
Failure stress (kPa)	180.2
Failure strain (%)	3.0

Estimate total	
Φ _u (°)	0.0
C _u (kPa)	90
C _u (kp/cm ²)	0.92

Graphic symbols						
	I total	II total	III total			



REMARKS

Operator: ALEX VANCELLS

Test final date: 24/09/2019

Report num.: CB0019-19-0005
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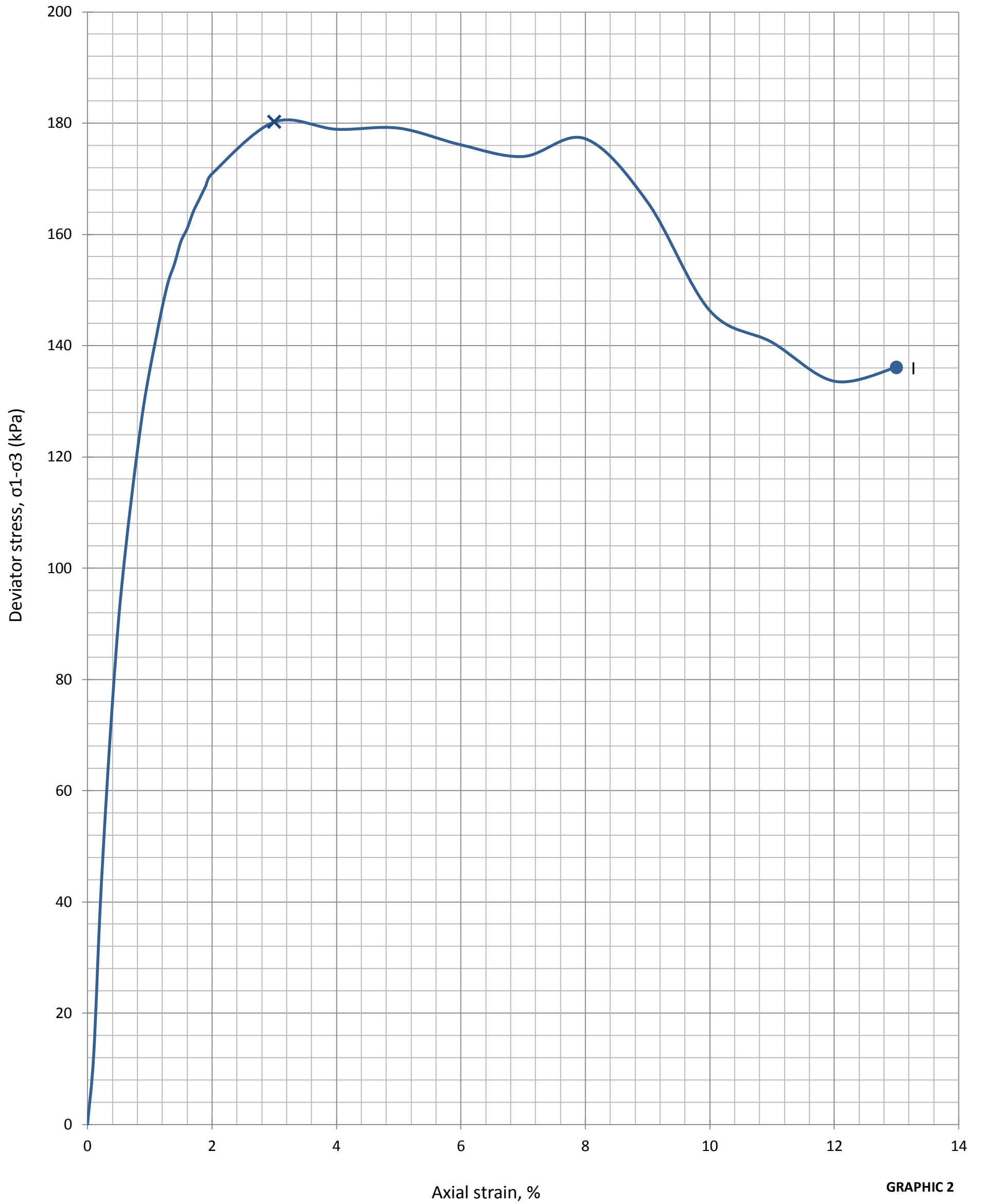


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Sample reference

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0516



GRAPHIC 2



Report num.:	CB0019-19-0005
Edition date:	

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST - ISO 17892-8:2018

MB19-0516

Failure process data summary

	Time sg	Deform. %	$(\sigma_1 - \sigma_3)_m$ kPa	$(\Delta\sigma_1)_m$ kPa	$(\Delta\sigma_1)_{fp}$ kPa	$(\sigma_1 - \sigma_3)$ kPa	u-ub kPa	ϵ_1	σ_1 kPa	σ'_1 kPa	σ'_3 kPa	Coeff. A	$(\sigma_1 + \sigma_3)/2$ kPa	$(\sigma_1 - \sigma_3)/2$ kPa	$(\sigma'_1 + \sigma'_3)/2$ kPa	$(\sigma'_1 - \sigma'_3)/2$ kPa
Specimen	0	0	0.0	0.0	0.0	0.0		0.000	140.0				140.0	0.0		
I	5	0.099	12.5	0.0	0.0	12.5		0.001	152.5				146.3	6.3		
Chamber pressure	15	0.299	58.4	0.1	0.0	58.3		0.003	198.3				169.2	29.2		
σ_3 , kPa	20	0.4	75.9	0.1	0.0	75.8		0.004	215.8				177.9	37.9		
140	30	0.6	102.4	0.2	0.0	102.2		0.006	242.2				191.1	51.1		
Back pressure	40	0.8	121.2	0.2	0.0	121.0		0.008	261.0				200.5	60.5		
u_b , kPa	45	0.9	129.4	0.3	0.0	129.1		0.009	269.1				204.6	64.6		
0	55	1.1	141.6	0.3	0.0	141.3		0.011	281.3				210.7	70.7		
σ'_3 , kPa	65	1.3	152.0	0.4	0.0	151.6		0.013	291.6				215.8	75.8		
140	69	1.4	155.2	0.4	0.0	154.8		0.014	294.8				217.4	77.4		
Rate of axial displ.	79	1.6	161.5	0.5	0.0	161.0		0.016	301.0				220.5	80.5		
mm/min	84	1.7	164.6	0.5	0.0	164.1		0.017	304.1				222.1	82.1		
0.9222	94	1.9	169.2	0.5	0.0	168.7		0.019	308.7				224.4	84.4		
	146	2.999	181.1	0.9	0.0	180.2		0.030	320.2				230.1	90.1		
	196	4	180.0	1.1	0.0	178.9		0.040	318.9				229.5	89.5		
	296	6	177.8	1.7	0.0	176.1		0.060	316.1				228.1	88.1		
	396	7.999	179.5	2.3	0.0	177.2		0.080	317.2				228.6	88.6		
	447	9	168.4	2.6	0.0	165.8		0.090	305.8				222.9	82.9		
	552	11	143.8	3.2	0.0	140.6		0.110	280.6				210.3	70.3		
	649	12.999	139.8	3.7	0.0	136.1		0.130	276.1				208.1	68.1		
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																
Specimen																
Chamber pressure																
σ_3 , kPa																
Back pressure																
u_b , kPa																
σ'_3 , kPa																
Rate of axial displ.																
mm/min																

Report num.:	CB0019-19-0005
Edition date:	

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017

Sample reference

MB19-0516

Test data	
Employee ring type	FIXED
Height (cm)	2.000
Diameter (cm)	5.020
Volume (cm ³)	39.58
Ring weight (g)	83.82
Ring+soil weight (g)	158.48
Ini. weight wet soil (g)	74.66
Soil part. density (Mg/m ³)	2.681
Initial moisture content (%)	26.8
Initial bulk density (Mg/m ³)	1.89
Initial dry density (Mg/m ³)	1.49
Initial saturation degree (%)	89.89
Final moisture content (%)	26.7
Final bulk density (Mg/m ³)	1.98
Final dry density (Mg/m ³)	1.56

Equipment	
OEDOMETER PROETI S0110 (PLACE 6)	
DATA ACQ. MODULE MECATEST-16	
ELECT. TRANSD. NOVOTECHNIK TR-10	

Soil conditions	UNDISTURBED
-----------------	-------------

Swelling Pressure Test	
Swelling Pressure (kPa)	70
(kg/cm ²)	0.7

Results	
Initial void ratio, e ₀	0.7993
Final void ratio, e _f	0.7149
Solid height, H _s (cm)	1.1115
Final height pore, H _{ps} (cm)	0.7946

Results																
Press. stage	Load date	Final time	Instant. settlement	Read. t= 8 sg	L ₀ (Casag. met.)	Final reading	Final sample height	Void ratio at L ₀	Final void ratio	Compr. ind. (*)	Swelling ind. (*)	Constr. mod. E _{oed} kPa	Compr. coef. a _v 1/kPa	Cons. coef. c _v cm ² /s	Compr. coef. m _v 1/kPa	Sec. cons. coef. C _α
kPa		sg	mm	mm	mm	mm	cm	e _{L0}	e _f	c _c	c _s					
70	23-09-19	95 959	-0.026	-0.026	-0.046	0.002	1.9998	0.8035	0.7992							
150	24-09-19	86 604	0.069	0.079	0.072	0.189	1.9811	0.7929	0.7823	0.0511		8 517	2.11E-04	6.08E-04	1.17E-04	7.74E-04
300	25-09-19	86 520	0.050	0.273	0.239	0.604	1.9396	0.7778	0.7450	0.1239		7 167	2.49E-04	1.57E-03	1.40E-04	1.13E-03
600	26-09-19	86 434	0.125	0.737	0.728	1.149	1.8851	0.7338	0.6960	0.1628		10 684	1.63E-04	4.57E-04	9.36E-05	1.52E-03
1000	27-09-19	232 076	0.061	1.224	1.210	1.619	1.8381	0.6905	0.6537	0.1907		16 038	1.06E-04	2.78E-04	6.24E-05	1.48E-03
1500	30-09-19	86 880	0.040	1.661	1.659	2.022	1.7978	0.6501	0.6175	0.2056		22 841	7.24E-05	2.24E-04	4.38E-05	2.04E-03
600	01-10-19	86 501	-0.029	1.975	1.993	1.769	1.8231	0.6201	0.6402		0.0570	64 130	2.52E-05		1.56E-05	
150	02-10-19	87 118	-0.064	1.681	1.705	1.207	1.8793	0.6459	0.6908		0.0840	14 587	1.12E-04		6.86E-05	
70	03-10-19	87 869	-0.028	1.177	1.179	0.939	1.9061	0.6933	0.7149		0.0728	5 613	3.01E-04		1.78E-04	

NOTE: Compression index (C_c) and swelling index (C_s), such as constrained modules (E_{oed}) and compressibility coefficient (a_v), are estimated between a pressure step and the immediately preceding as a first approximation, taking for calculatin the obtained void ratio values in the end of the considered pressure stage.

REMARKS

SWELLING PRESSURE IS DETERMINED APPLYING SUCCESSIVE PRESSURE STAGES. ONCE REACHED THE EQUILIBRIUM SITUATION THE TEST CONTINUES WITH THE PRESSURE STAGE IMMEDIATELY SUPERIOR TO THE SWELLING PRESSURE

Operator: ALEX VANCELLS

Test final date: 07/10/2019

Report num.: CB0019-19-0005
 Edition date:

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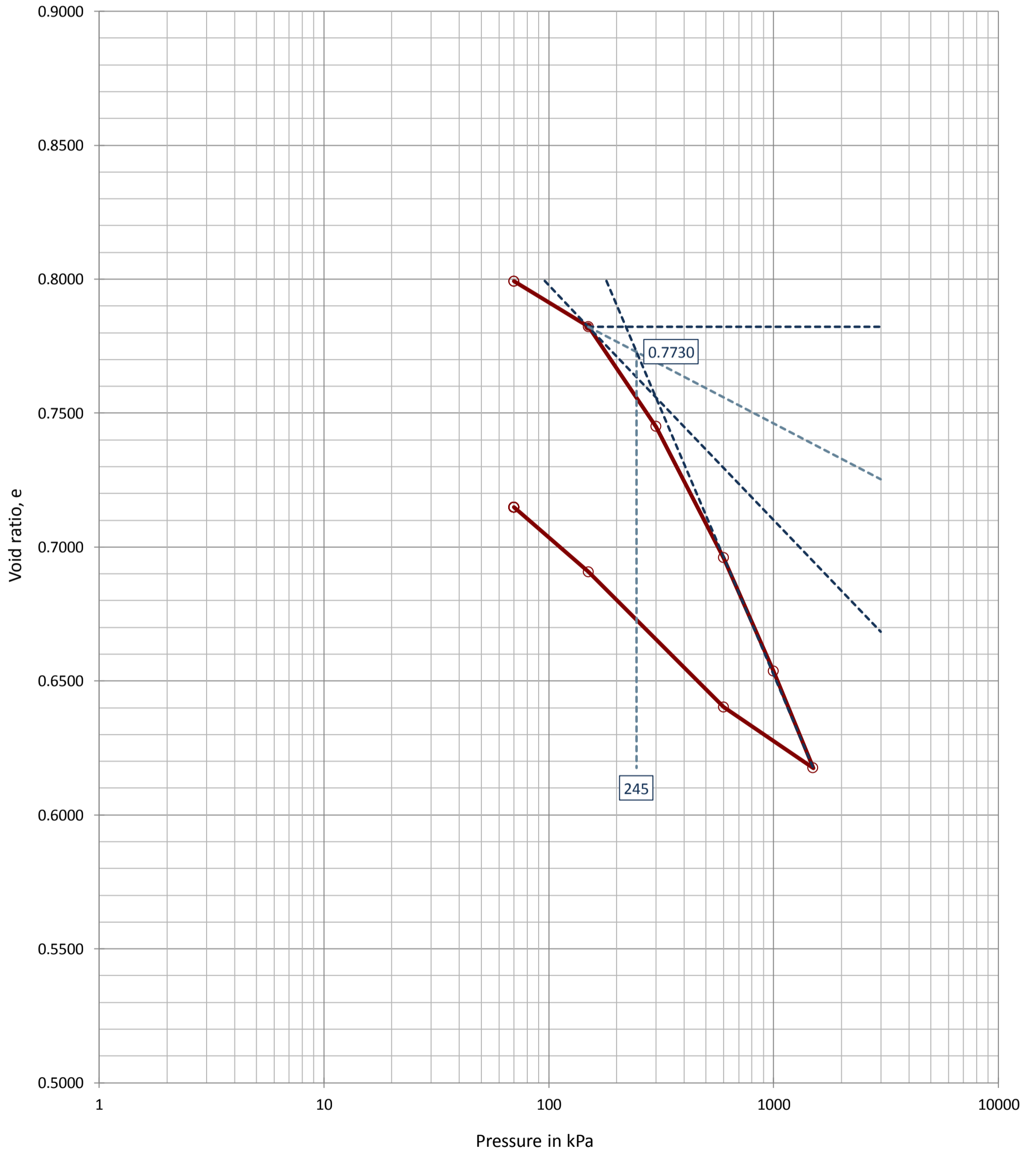
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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
OEDOMETRIC CURVE

Sample reference
MB19-0516

Initial void ratio	0.7993
Final void ratio	0.7149
Initial moisture content (%)	26.8
Final moisture content (%)	26.7

Preconsolidation pres., σ'_p (kPa)	245
Void ratio	0.7730
Determination method	Casagrande
Compression index, cc	0.1974



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 Edition date:

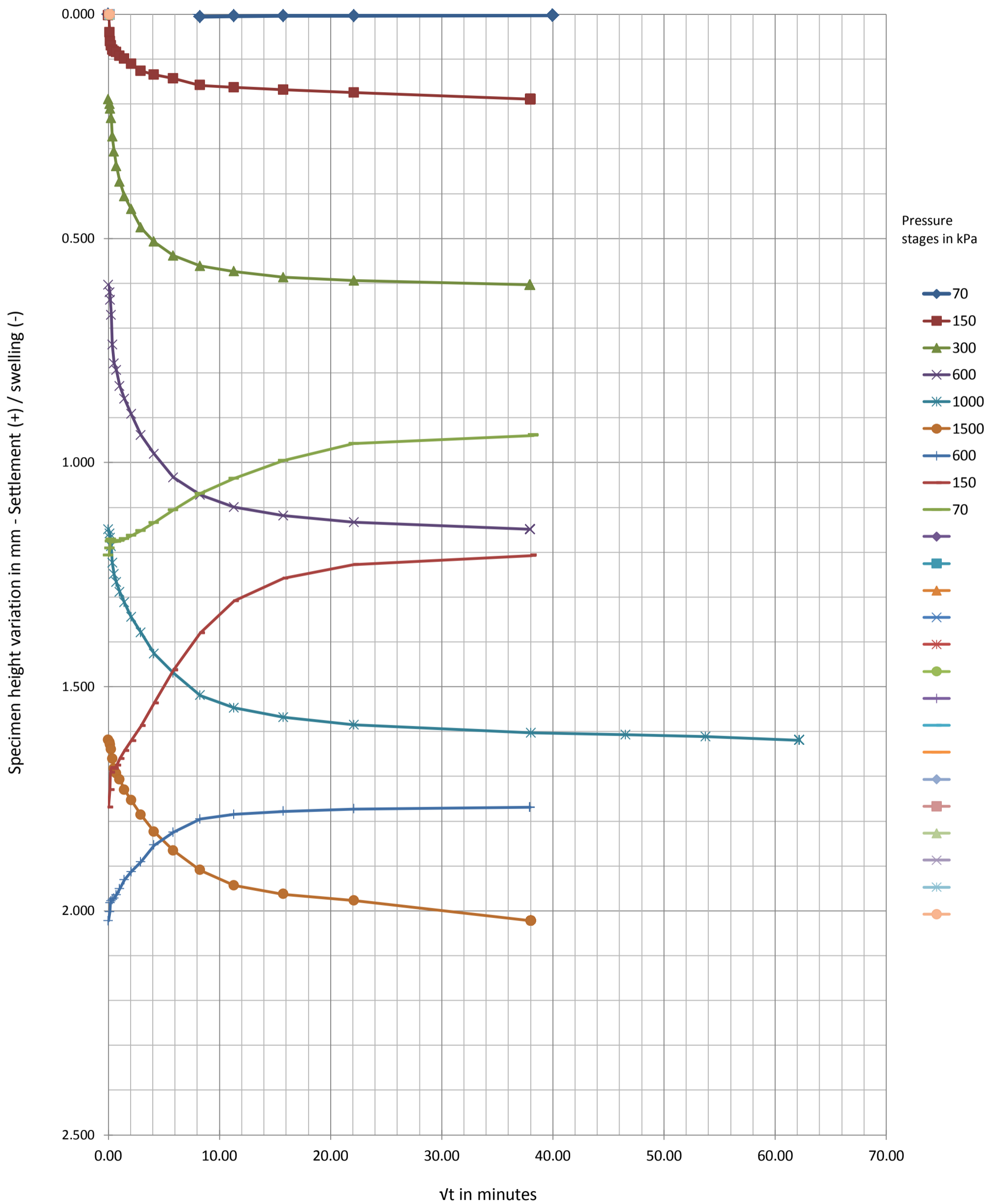
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 Reg. Num. LECCE L0600292



INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0516



Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

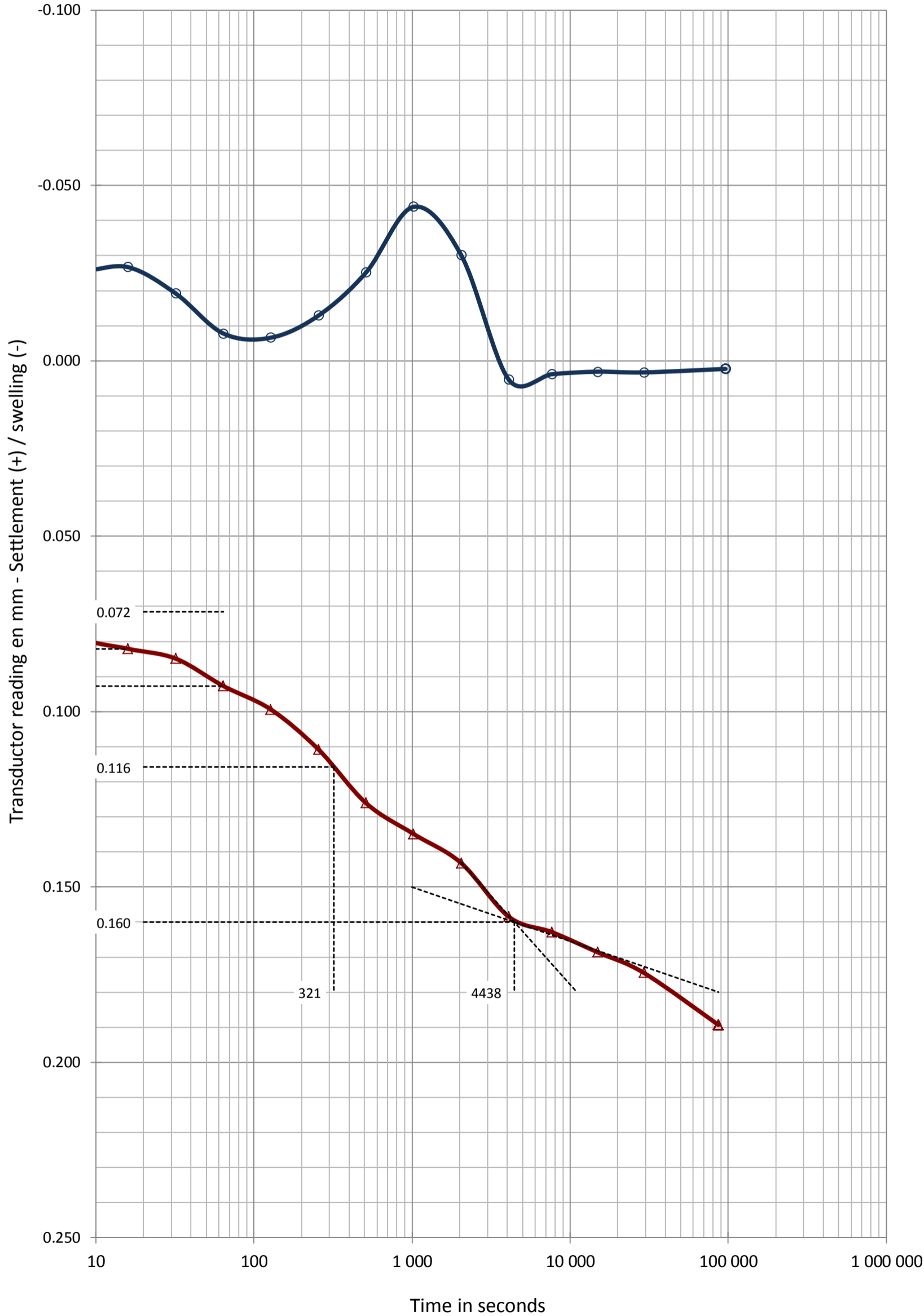
MB19-0516

Pressure stages

Pressure stage (kPa)	70	150	Specimen diameter (cm)	5.020
L0 (Casagrande method)	-0.046	0.072	Specimen initial height (cm)	2.000

Date	Date
23-sep-19	24-sep-19

Pressure (kPa)	Pressure (kPa)
70	150



Readings		Void ratio	Readings		Void ratio
Settlement (+)			Settlement (+)		
sg	mm	e	sg	mm	e
1	-0.013	0.8005	1	0.041	0.7957
2	-0.025	0.8016	2	0.060	0.7940
4	-0.028	0.8019	4	0.069	0.7931
8	-0.026	0.8017	8	0.079	0.7923
16	-0.027	0.8018	16	0.082	0.7920
32	-0.019	0.8011	32	0.085	0.7917
64	-0.008	0.8001	64	0.093	0.7910
128	-0.007	0.8000	128	0.099	0.7904
256	-0.013	0.8005	256	0.111	0.7894
512	-0.025	0.8016	512	0.126	0.7880
1 024	-0.044	0.8033	1 024	0.135	0.7872
2 048	-0.030	0.8021	2 048	0.143	0.7865
4 096	0.005	0.7989	4 096	0.159	0.7851
7 696	0.004	0.7990	7 696	0.163	0.7847
14 896	0.003	0.7991	14 896	0.169	0.7842
29 296	0.003	0.7991	29 296	0.175	0.7837
95 959	0.002	0.7992	86 604	0.189	0.7823

Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

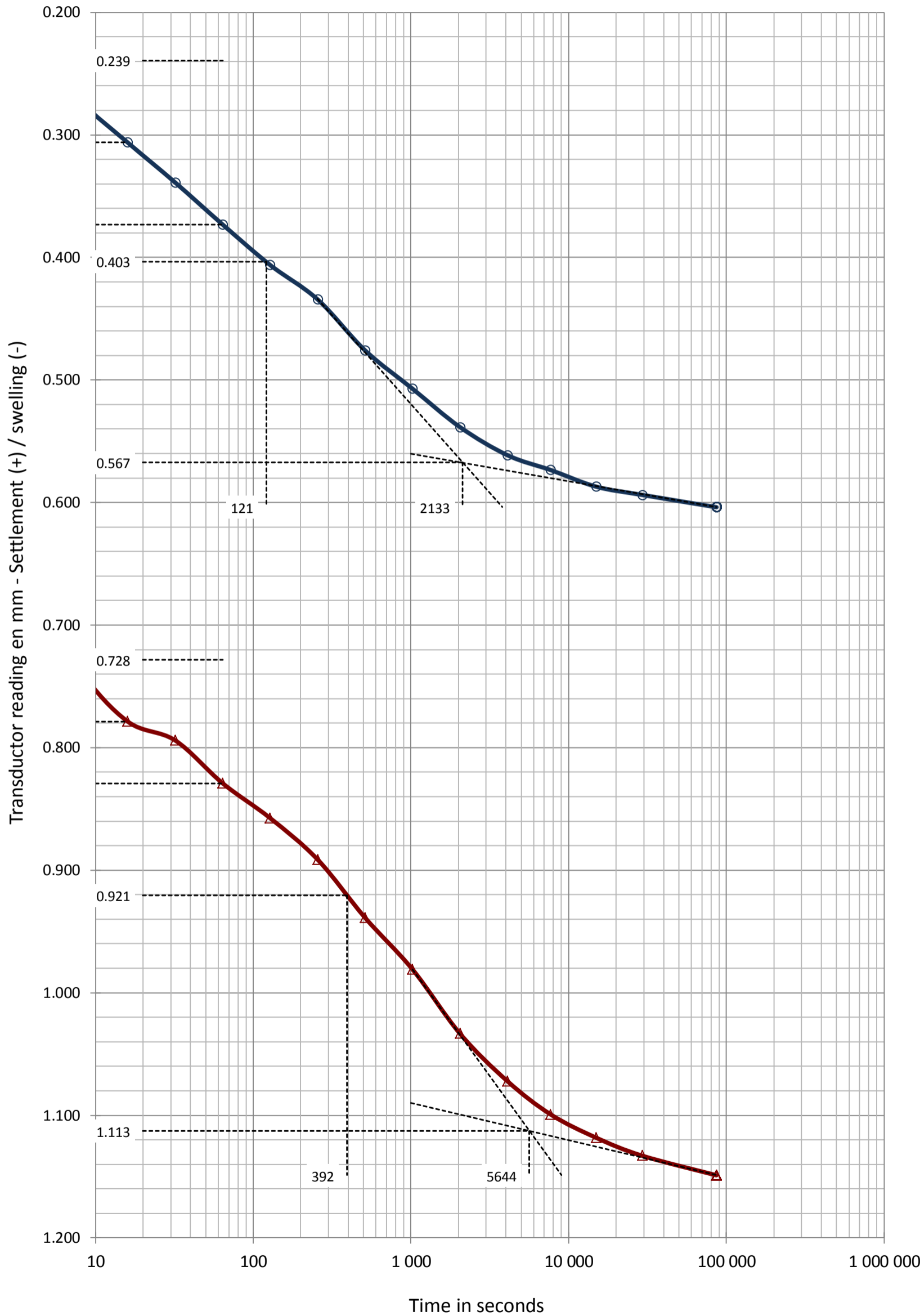
MB19-0516

Pressure stages

Pressure stage (kPa)	300	600	Specimen diameter (cm)	5.020
L0 (Casagrande method)	0.239	0.728	Specimen initial height (cm)	2.000

Date	Date
25-sep-19	26-sep-19

Pressure (kPa)	Pressure (kPa)
300	600



300			600		
Readings	Void ratio	Readings	Void ratio	Readings	Void ratio
Settlement (+)		Settlement (+)		Settlement (+)	
sg	mm	e	sg	mm	e
0	0.189	0.7823	0	0.604	0.7450
1	0.200	0.7814	1	0.621	0.7435
2	0.210	0.7805	2	0.637	0.7421
4	0.231	0.7786	4	0.670	0.7391
8	0.273	0.7748	8	0.737	0.7331
16	0.306	0.7718	16	0.779	0.7293
32	0.339	0.7689	32	0.794	0.7279
64	0.373	0.7658	64	0.829	0.7248
128	0.406	0.7628	128	0.858	0.7222
256	0.434	0.7603	256	0.891	0.7192
512	0.476	0.7566	512	0.939	0.7149
1 024	0.507	0.7537	1 024	0.981	0.7111
2 048	0.539	0.7509	2 048	1.033	0.7064
4 096	0.561	0.7489	4 096	1.072	0.7029
7 696	0.574	0.7478	7 696	1.099	0.7005
14 896	0.587	0.7466	14 896	1.118	0.6988
29 296	0.594	0.7459	29 296	1.133	0.6974
86 520	0.604	0.7450	86 434	1.149	0.6960

Report num.: CB0019-19-0005
 Edition date:

INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

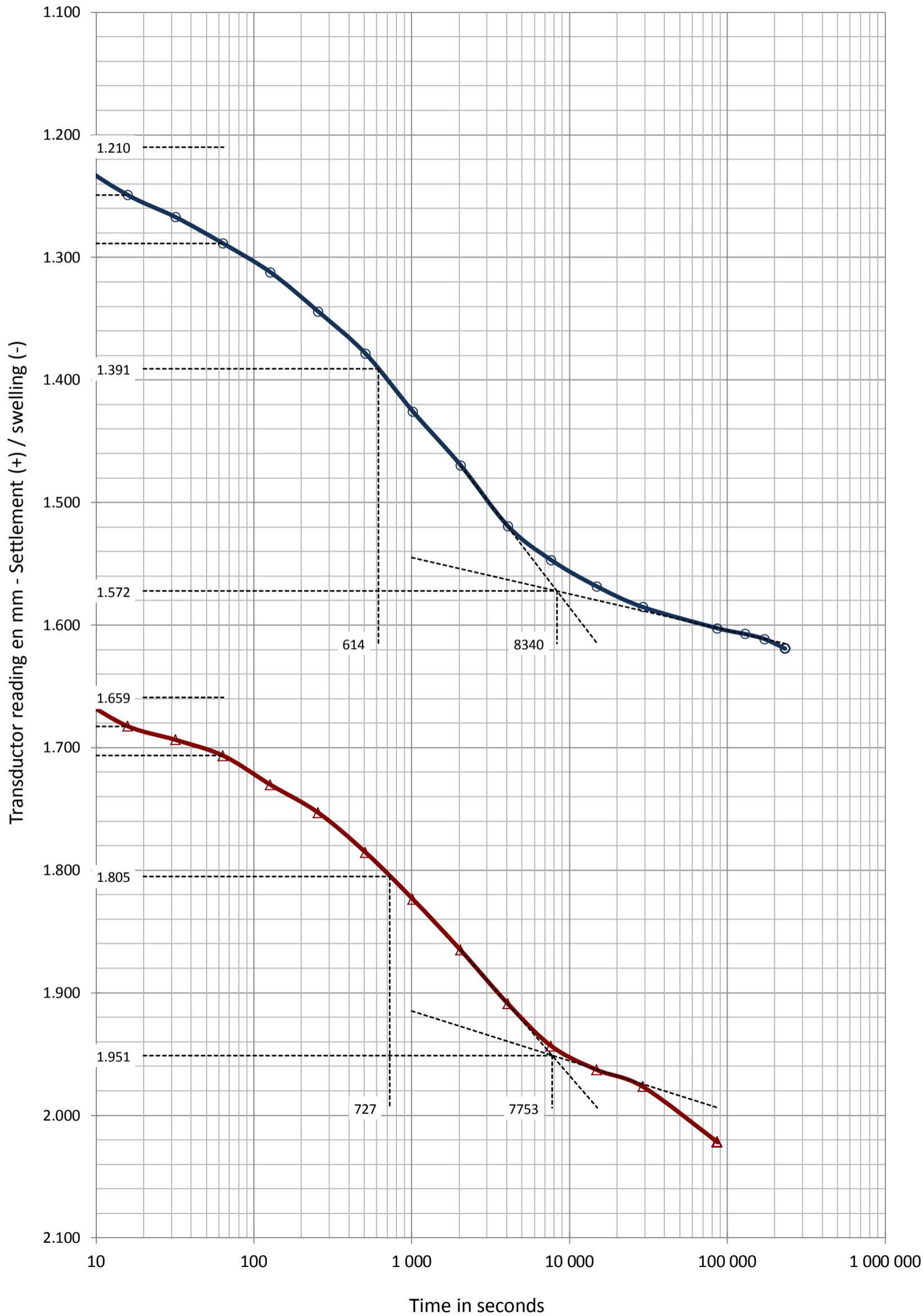
Sample reference

MB19-0516

Pressure stages

Pressure stage (kPa)	1000	1500	Specimen diameter (cm)	5.020
L0 (Casagrande method)	1.210	1.659	Specimen initial height (cm)	2.000

Date	Date				
27-sep-19	30-sep-19				
Pressure (kPa)	Pressure (kPa)				
1000	1500				
Readings	Readings				
Void ratio	Void ratio				
Settlement (+)	Settlement (+)				
sg	mm	e	sg	mm	e
0	1.149	0.6960	0	1.619	0.6537
1	1.158	0.6952	1	1.625	0.6532
2	1.168	0.6943	2	1.630	0.6527
4	1.186	0.6926	4	1.640	0.6518
8	1.224	0.6893	8	1.661	0.6499
16	1.249	0.6870	16	1.683	0.6480
32	1.267	0.6854	32	1.694	0.6470
64	1.289	0.6834	64	1.707	0.6458
128	1.312	0.6813	128	1.730	0.6437
256	1.344	0.6784	256	1.753	0.6416
512	1.379	0.6753	512	1.786	0.6387
1 024	1.426	0.6711	1 024	1.824	0.6353
2 048	1.470	0.6671	2 048	1.865	0.6315
4 096	1.520	0.6627	4 096	1.909	0.6276
7 696	1.547	0.6602	7 696	1.944	0.6245
14 896	1.568	0.6583	14 896	1.963	0.6228
29 296	1.585	0.6567	29 296	1.977	0.6215
86 896	1.603	0.6552	86 880	2.022	0.6175
130 096	1.607	0.6548			
173 296	1.612	0.6544			
232 076	1.619	0.6537			



Report num.: CB0019-19-0005
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INCREMENTAL LOADING OEDOMETER TEST - ISO 17892-5:2017
CONSOLIDATION CURVES

Sample reference

MB19-0516

Pressure stages

Pressure stage (kPa)	600	150	Specimen diameter (cm)	5.020
L0 (Casagrande method)	1.993	1.705	Specimen initial height (cm)	2.000

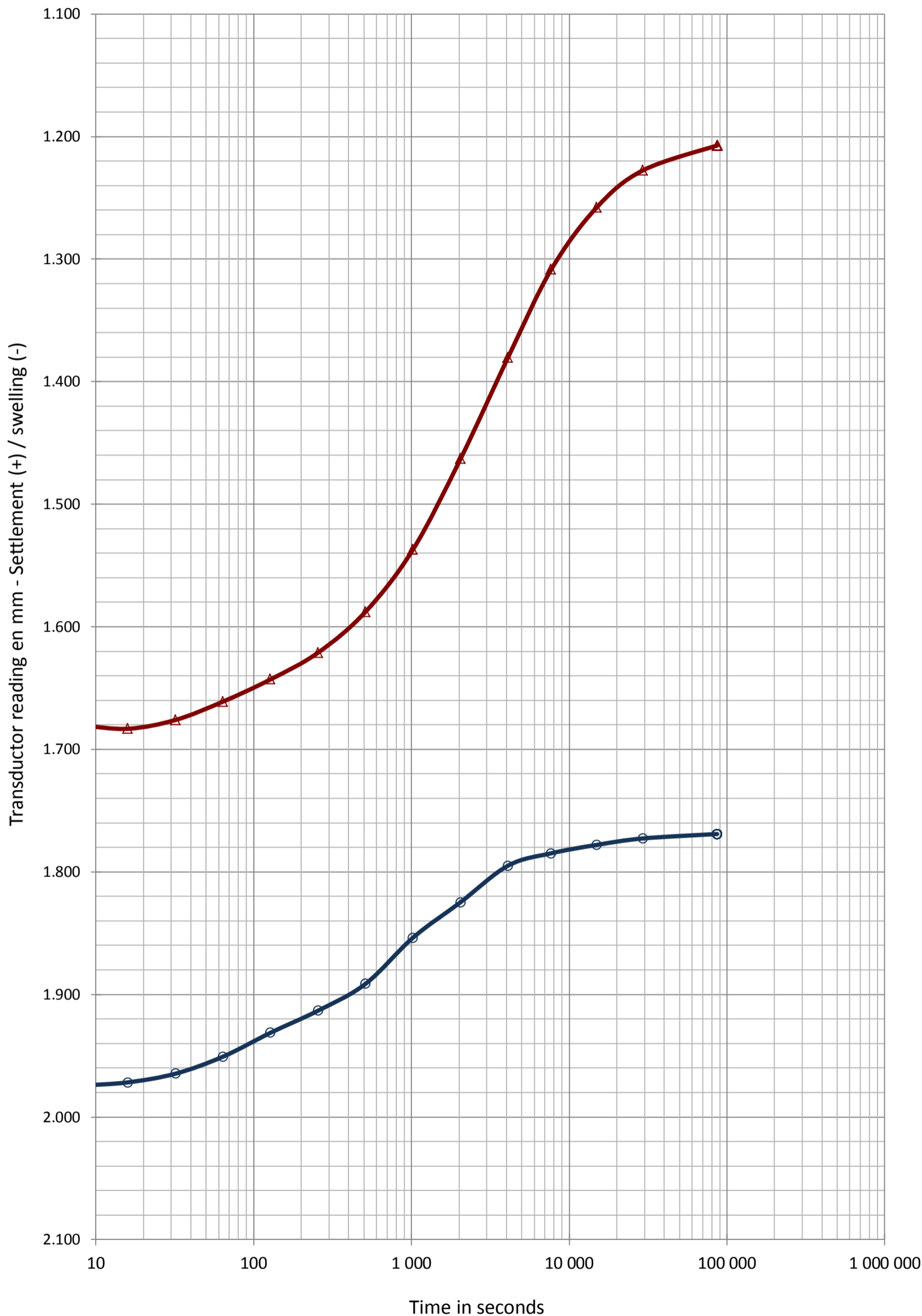
Date	Date
01-oct-19	02-oct-19

Pressure (kPa) Pressure (kPa)

600 **150**

Readings: Void ratio
 Settlement (+) Settlement (+)

sg mm e sg mm e



sg	mm	e	sg	mm	e
0	2.022	0.6175	0	1.769	0.6402
1	2.002	0.6192	1	1.730	0.6437
2	1.982	0.6210	2	1.691	0.6472
4	1.979	0.6213	4	1.681	0.6481
8	1.975	0.6217	8	1.681	0.6482
16	1.972	0.6220	16	1.683	0.6479
32	1.965	0.6226	32	1.676	0.6486
64	1.951	0.6239	64	1.661	0.6499
128	1.931	0.6256	128	1.643	0.6516
256	1.913	0.6272	256	1.621	0.6535
512	1.891	0.6292	512	1.588	0.6565
1 024	1.854	0.6326	1 024	1.537	0.6611
2 048	1.825	0.6352	2 048	1.463	0.6678
4 096	1.795	0.6379	4 096	1.380	0.6752
7 696	1.785	0.6388	7 696	1.308	0.6817
14 896	1.778	0.6394	14 896	1.258	0.6862
29 296	1.773	0.6399	29 296	1.228	0.6889
86 501	1.769	0.6402	87 118	1.207	0.6908

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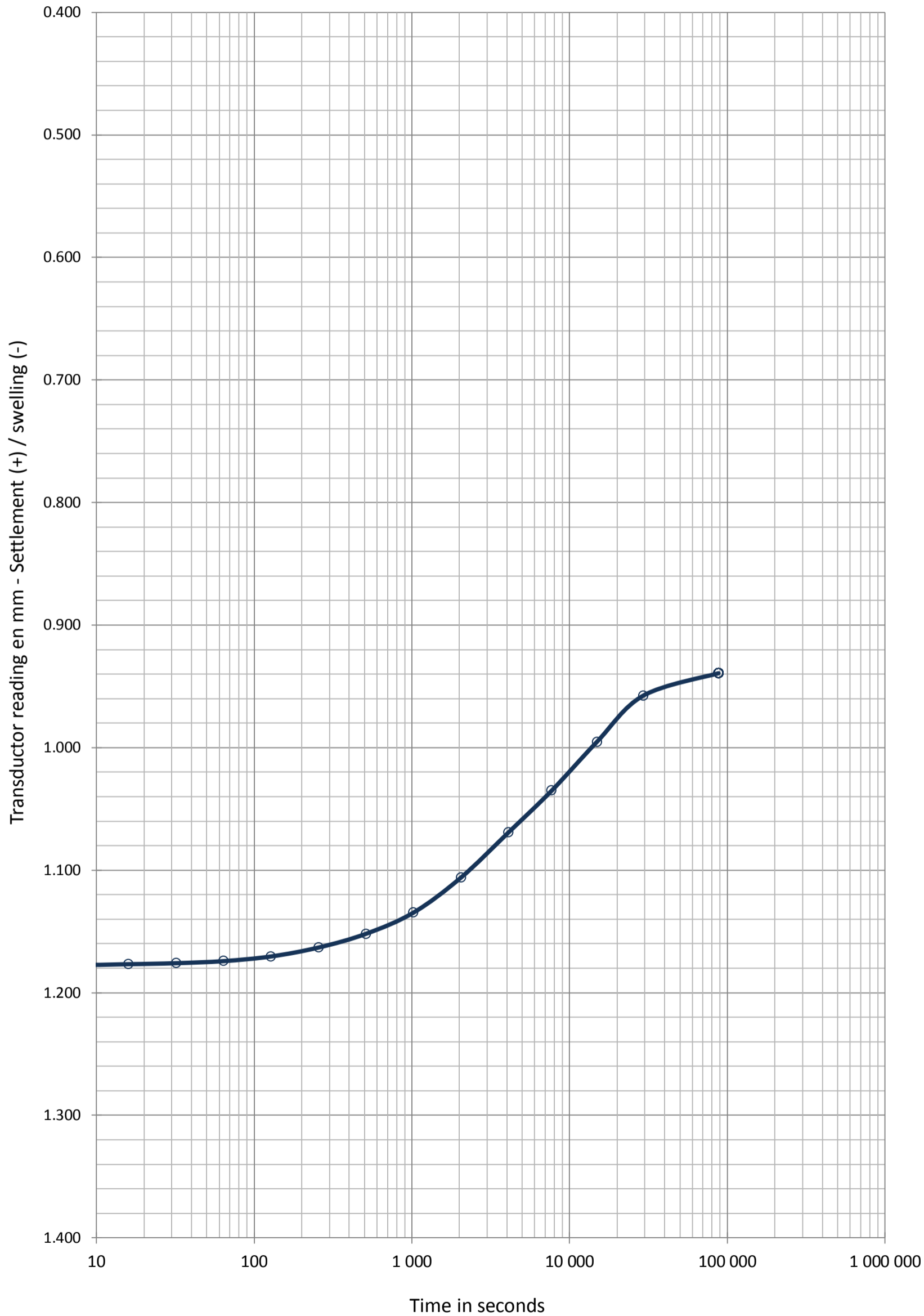
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CONSOLIDATION CURVES

Sample reference

MB19-0516

Pressure stages

Pressure stage (kPa) **70** Specimen diameter (cm) **5.020**
 L0 (Casagrande method) **1.179** Specimen initial height (cm) **2.000**



Date	Date
03-oct-19	
Pressure (kPa)	Pressure (kPa)
70	
Readings	Readings
Settlement (+)	Void ratio
sg	mm
e	e
0	1.207 0.6908
1	1.191 0.6922
2	1.175 0.6936
4	1.171 0.6940
8	1.177 0.6935
16	1.177 0.6935
32	1.176 0.6936
64	1.174 0.6937
128	1.170 0.6941
256	1.163 0.6947
512	1.152 0.6957
1 024	1.135 0.6973
2 048	1.106 0.6999
4 096	1.069 0.7032
7 696	1.035 0.7062
14 896	0.995 0.7098
29 296	0.958 0.7132
87 869	0.939 0.7149

Operator:

Report num.:	CB0019-19-0005
Edition date:	

FALL CONE TEST - ISO 17892-6:2017

MB19-0516

Equipment
PENETROMETER MATEST B057-11

Legend of symbols
cu Calculated Undrained Shear Strength (kPa)
cu(corr) Corrected Undrained Shear Strength (kPa)
cur Undrained Shear Strength on remoulded sample (kPa)

Test data on undisturbed sample												
Sample	Time days	Liquid Limit %	Penetration					Cone mass g	Cone tip ang. °	cu kPa	cu(corr) kPa	Notes
			i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm					
1	0	50.5	3.49	3.84	3.58	3.42	3.583	400	30	306	285	

Undisturbed sample mean results	
Calculated Undrained Shear Strength, cu (kPa)	306
Corrected Undrained Shear Strength, cu(corr) (kPa)	285

Test data on remoulded sample and thixotropy										
Sample	Time days	Penetration					Cone mass g	Cone tip ang. °	cur kPa	Notes
		i ₁ mm	i ₂ mm	i ₃ mm	i ₄ mm	i mm				
1	0	4.37	4.18	3.71	3.9	4.04	400	30	192	
1	1	3.67	3.49	3.7	3.94	3.7	400	30	229	
1	3	3.55	3.48	3.51	3.52	3.515	400	30	254	
1	7	3.3	3.62	3.65	3.34	3.478	400	30	259	

Remoulded sample mean results	
Undrained Shear Strength on remoulded sample, cur (kPa)	192

Thixotropy	
Loss at remoulding (%)	37
Recovery after 1 day (%)	32
Recovery after 7 days (%)	59

REMARKS

PENETRATIONS ARE LOWER THAN 5 mm, SO RESULTS ARE OUT OF STANDARD AND MAY BE TAKEN WITH DUE RESERVATIONS

Report num.: CB0019-19-0005
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19 / 19

Sample reference

MB19-0516

SOIL CHEMICAL ANALYSIS

* DETERMINATION OF ORGANIC AND TOTAL CARBON AFTER DRY COMBUSTION (ELEMENTARY ANALYSIS) - ISO 10694:1995

Operator: GUILLEM MASSALLÉ

Test final date: 27-09-19

Predrying temperature: 60 °C

Calcination temperature: 450 °C

Mean of analyzed soil mass: 10.251 g

Equipment:

RESULT: **69.9 g/kg (total)**

MUFLA OVEN ETI HD150

61.8 g/kg (organic)

PORCELAIN CRUCIBLES 100 ml

* DETERMINATION OF CARBONATE CONTENT - VOLUMETRIC METHOD - ISO 10693:1995

Operator: ALEX VANCELLS

Test final date: 27-09-19

Mean of analyzed soil mass: 1.459 g

Equipment:

RESULT: **67.3 g/kg**

SCHEIBLER APPARATUS

REMARKS