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Title	**MEDIN data guideline for the recording of offshore geotechnical site investigation data**
MEDIN Discipline	Marine geology and geophysics
Author(s)	A. Lewall, D. Higgs, V. Terente, G. Ellery (Cathie Associates Ltd.)
Document Owner	S. Gaffney
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Summary	This guideline defines good practice for recording offshore geotechnical site investigation data
Keywords	Geotechnics, Site Investigation, Oedometer, OED, Triaxial, Triax, CPT, Cone Penetration Test, SPT, Standard Penetration Test, PSD, particle size distribution

Change history		
Version	**Date**	**Change**
1.0	18/03/2016	First draft of document
1.1	30/03/2016	Feedback sent to Cathie Associates from MEDIN Standards Working Group on first draft
2.0	08/04/2016	Comments incorporated by Cathie Associates
2.1	13/04/2016	Updated field added by Cathie Associates
2.2	04/05/2016	Vertical accuracy changed to ‘conditional’ by MEDIN
2.3	31/05/2016	Added links to vocabularies M16, M17 and M18
2.4	12/07/2016	Addition of section about .AGS metadata

1 Introduction

1.1 What are MEDIN compliant data?

There are 3 requirements to ensure that that offshore geotechnical site investigation data are recorded in a way that is MEDIN compliant:

1) **Users supply General Metadata about the data –** *This may be included in a survey/cruise report or as separate metadata - See Appendix A*
2) **Users supply Detailed Metadata about the data –** *This may be included in a survey/cruise report or as additional metadata – See Appendix B*
3) **The data are in a format that MEDIN accepts –** *See Appendix C*

Example of a MEDIN compliant offshore geotechnical site investigation dataset:

A file containing General Metadata (*Appendix A*)

A Survey Report that contains Detailed Metadata (*Appendix B*)

Sample Data supplied in .AGS format and metadata in Excel format (*Appendix C*)

1.2 Scope

This guideline covers the recording of offshore geotechnical site investigation data including cone penetration testing (CPT), sample acquisition by seabed and downhole methods, in-situ testing, and more standard laboratory testing. Due to the diverse and specific requirements, it is not practicable to provide detailed coverage for all specialist testing. In these cases, the user must exercise their engineering judgement and discretion to ensure that all the specifics that would be needed to reproduce the test are recorded in the general style and ethos of the MEDIN standard.

1.3 Data Archiving

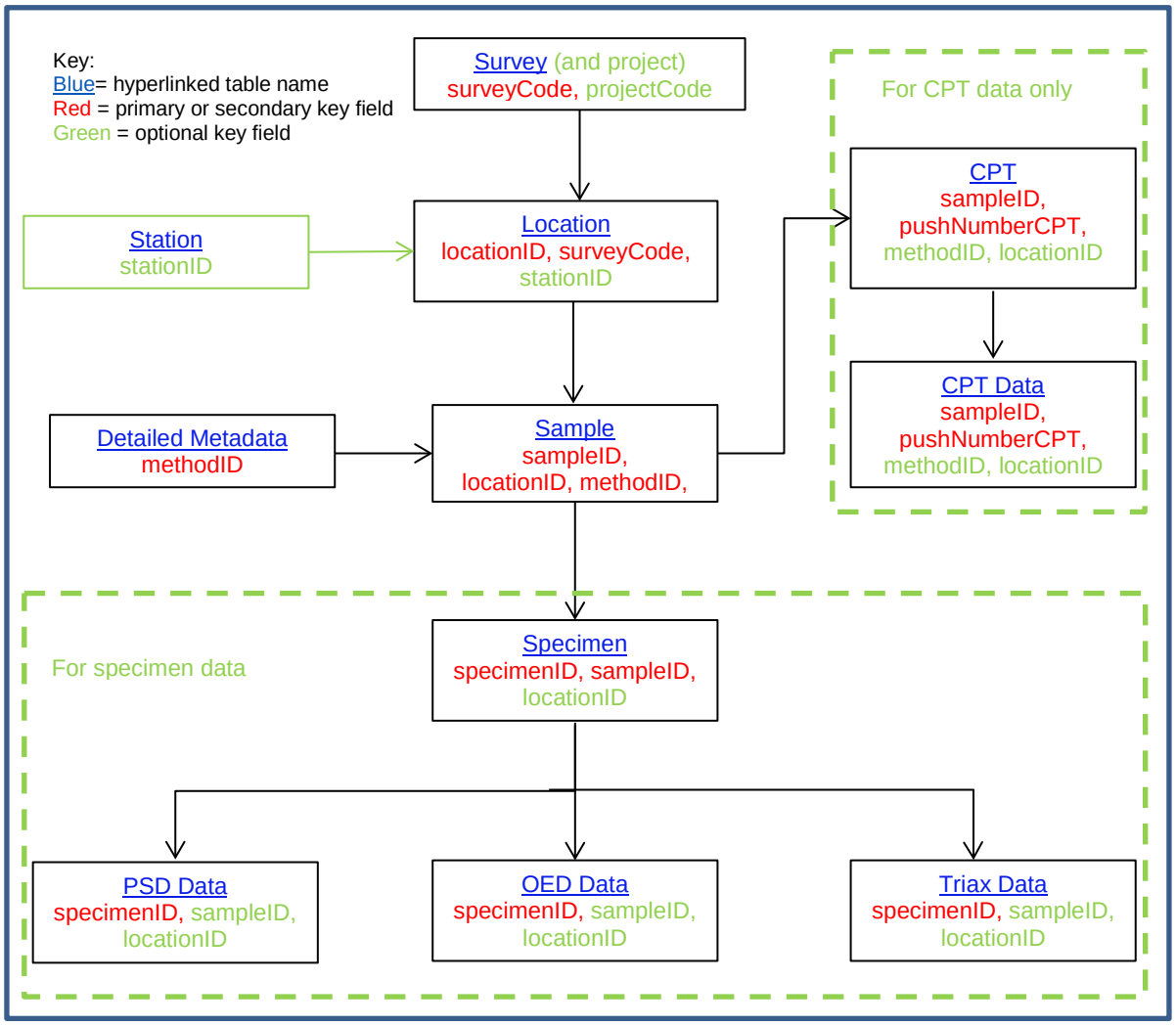
The British Geological Survey (BGS) is the MEDIN Data Archive Centre (DAC) responsible for archiving geotechnical site investigation data around the British Isles. Contact details are provided below.

British Geological Survey

Email: offshoredata@bgs.ac.uk
Telephone: +44(0)131 6500275

1.4 Summary of the information required

Due to the complex nature of geotechnical site investigations, the below figure is intended to demonstrate the interrelationships between the tables which follow. The table names have been linked to further sections in this document that offer more information on the content of each table.



A General Metadata:

This section lists the general metadata that should be provided with the data.

Users can populate the form here to record General Metadata and can find additional information in Appendix A

The General Metadata fields are common throughout all MEDIN data guidelines and only need to be given once and referenced if the data set is composed of many data types and therefore conforms to a number of MEDIN Data Guidelines. If the collection of data forms part of a wider project or time series then the **Project Information** must be recorded but if the work is a small survey then project details may not be required.

What is a Survey/Project?

A **survey** is a uniquely identifiable programme of data collection such as a research cruise, or site investigation job. This information is likely to be the same for all sample events and subsamples in a given dataset such as a multiple geotechnical locations across one site. Note that in the event that these are not common to all sample events then they should be specified for each one e.g. when infield and export corridor jobs have been awarded as separate lots with discrete job/project numbers.

A **project** is a collection of surveys that have been completed for a common purpose. For example: successive site investigations from initial investigation to aid feasibility studies to investigating specific locations for detailed design of foundations. A project is usually funded by the same organisations for its lifetime.

Survey Information:

This information is mandatory and **must** be supplied with the data to ensure they can be reused:

1. surveyName
2. surveyType
3. surveyAbstract
4. surveyCode
5. originator
6. owner
7. surveyStartDate
8. timeZone
9. spatialCRS
10. positionFix
11. horizontalAccuracy
12. depthCRS

Additional items:

Please provide as much of the following information as possible to help others assess the data:

Survey Information:

1. verticalAccuracy
2. surveyEndDate
3. originalCRS
4. transformation
5. platformName
6. platformType
7. cruiseReportReference
8. surveyReportReference
9. confidentiality

Project Information:

Please provide as much of the following information as possible if the survey forms part of a wider project, such as a windfarm or oil and gas consideration:

1. projectName
2. projectCode
3. projectStartDate
4. projectEndDate
5. projectWebsite

B Detailed Metadata:

This section lists the detailed metadata that should be collected with the data. Users can populate the form here to record Detailed Metadata and can find additional information in Appendix B. This information can be supplied in a cruise or survey report.

The Detailed Metadata fields are specific to each data guideline and should be completed for each type of data. The information requested here may be supplied as additional metadata or may be supplied in a cruise or survey report.

Acquisition Method:

The following information is mandatory and **must** be supplied with the data to ensure they can be reused:

1. methodID
2. samplingDevice
3. deviceReference
4. analyticalLaboratory
5. QCScheme
6. methodQCNotes

Additional Items:

Please provide as much of the following information as possible to help others assess the data:

1. protocolsUsed
2. storageMedium
3. analyticalPersonnel
4. methodNotes

C Data:

This section gives a summary of the required data content and format for offshore geotechnical site investigation data. It covers:

Station Information, Location Information, Sample Information, Specimen Data, CPT Information, CPT Data, PSD Data, OED Data, Triax Data

Users can populate the form here to record the data and can find additional information in Appendix C

Format

The format preferred by MEDIN for exchange of data relating to geotechnical site investigations is Association of Geotechnical and Geo-environmental Specialists (AGS) format (.AGS.) If users are submitting photos of samples and specimens, the preferred format is .JPG. Metadata as described in this document can be supplied in Excel spreadsheet (.XLS or .XLSX) format.

MEDIN do not require the submitted metadata to adhere to the field names in the guideline, provided the information matches the descriptions for each metadata element. This allows data and metadata in .AGS, and other file formats, to comply with the MEDIN guideline.

Users may, if they wish, include additional metadata beyond what is specified in this guideline, as long as the source format of this extra information is clearly referenced.

Content

What is a Station?
A station refers to a specific target location of sampling or in-situ testing, such as an offshore windfarm, fixed mooring or defined area of seabed being surveyed. It is useful to record the station position in addition to the Location Event information e.g. if data collectors are returning to a fixed target station as a basis for repeat replicate sample events and for repeat monitoring surveys. This is optional information.

What is a Location?
A location is the specific date, time, location/extent and local conditions for the data collection. This is mandatory.

What is a Sample?
A sample is the material recovered in a single sampling run e.g. one vibrocore, one core-run. Information pertaining to the recovery of each sample should be recorded in the Sample table. When the sample is to be split down, these subsamples should be entered in the Specimen table.

What is a Specimen?
A specimen is a subsample – a piece of material taken from the larger whole for a specific testing purpose or for the purpose of specific preservation. Information pertaining to a

subdivision of the sample or a specific point within the sample. Any tests with a simple output (e.g. a shear strength measurement from a pocket penetrometer) may be entered in this table. Laboratory tests with more complex result formats are given their own tables as they require a series of bespoke fields.

What are Test Data?

Test types that require the recording of a large number of parameters are given their own tables. These include the industry standard, regularly used tests: triaxials (triax), particle size distributions (PSD) and oedometers (OED). Beyond these, a diverse range of laboratory testing methods exist for specialist circumstances and it is not practicable to provide a table that would cater to all of them. In these cases the user must exercise their engineering judgement and discretion to ensure that all the specifics that would be needed to reproduce the test are recorded in the general style and ethos of the MEDIN standard.

What is a CPT?

A CPT – or Cone Penetration Test - is a method of measuring soil properties in-situ by pushing a cone shaped sensor into the soil. Seabed or downhole cone penetration testing data should be split between tables CPT Information and CPT Data, where CPT Information contains parameters about the test and CPT Data contains the data acquired in each test.

Station Information:

Please provide as much of the following information as possible if sampling takes place at defined stations:

1. stationID
2. geometry
3. primaryLatitude
4. primaryLongitude

Additional Station Information Items:

Please provide as much of the following information as possible to help others assess the data:

5. secondaryLatitude
6. secondaryLongitude
7. originalCoordinates
8. stationName
9. stationNotes

Location Information:

This information is mandatory and **must** be supplied with the data to ensure they can be reused:

1. surveyCode
2. locationID
3. startDate
4. startTime

5. endDate
6. locationType
7. locationLatitude
8. locationLongitude
9. locationEndDepth
10. locationBoreholeLog
11. locationWaterDepth
12. locationElevation

Additional Location Information Items:

Please provide as much of the following information as possible to help others assess the data:

1. locationInclination
2. locationOrientation
3. endTime
4. originalLatitude
5. originalLongitude
6. locationAlternateID
7. locationTargetLatitude
8. locationTargetLongitude
9. phreaticLevel
10. locationNotes
11. stationID

Sample Information:

This information is mandatory and **must** be supplied with the data to ensure they can be reused:

1. locationID
2. sampleID
3. methodID
4. typeSample
5. topSample
6. baseSample
7. dateTimeSample
8. loggedBySample

Additional Sample Information Items:

Please provide as much of the following information as possible to help others assess the data:

1. tcrSample
2. scrSample
3. rqdSample
4. operatorSample
5. photoFileSample
6. lengthSample
7. diameterSample
8. massSample

9. strokeTopSample
10. strokeBaseSample
11. strokeTimeSample
12. recoveryPercentSample
13. phreaticLevelSample
14. blowCountSample

Click here to move to **Specimen information**

CPT Information:

This information is mandatory if CPT measurements have been made and **must** be supplied with the data to ensure they can be reused:

1. locationID
2. pushNumberCPT
3. coneIDCPT
4. coneAreaCPT
5. coneAreaRatioCPT
6. pwpSensorPosCPT
7. frictionOffsetCPT

Additional CPT Information Items:

Please provide as much of the following information as possible to help others assess the data:

1. startDepthCPT
2. shearMethodCPT
3. densityMethodCPT
4. phreaticLevelCPT

CPT Data:

This information is mandatory if CPT measurements have been made and **must** be supplied with the data to ensure they can be reused:

1. locationID
2. pushNumberCPT
3. depthCPT
4. tipCPT
5. sleeveCPT

Additional CPT Data Items:

Please provide as much of the following information as possible to help others assess the data:

1. poreCPT
2. inclinationXCPT
3. inclinationYCPT
4. inclinationCombinedCPT
5. frictionRatioCPT
6. shearStrengthCPT
7. relativeDensityCPT

Specimen Information:

This information is mandatory if subsamples have been taken and **must** be supplied with the data to ensure they can be reused:

1. sampleID
2. specimenID
3. topSpecimen
4. techSpecimen
5. geoSpecimen
6. descSpecimen
7. containerType

Additional Specimen Information:

Please provide as much of the following information as possible to help others assess the data:

1. baseSpecimen
2. testTypeSpecimen
3. testEquipSpecimen
4. testTypeValueSpecimen
5. testTypeUnitSpecimen
6. testCustomName
7. testStdSpecimen
8. containerSize
9. containerWall
10. testOrienSpecimen
11. lengthSpecimen
12. diameterSpecimen
13. weightSpecimen
14. bulkDenSpecimen
15. dryDenSpecimen
16. satDenSpecimen
17. mCSpecimen
18. satRatioSpecimen
19. parDenSpecimen
20. thermalCondSpecimen
21. electricalResSpecimen
22. specificGSpecimen
23. voidsRatioSpecimen
24. porositySpecimen
25. plasticLimitSpecimen
26. liquidLimitSpecimen
27. liquidityIndexSpecimen
28. plasticityIndexSpecimen
29. plasDescSpecimen
30. activitySpecimen
31. shearSpecimen
32. youngsModSpecimen
33. youngsModStrainSpecimen
34. percStrainSpec

35. ucsSpecimen
36. pointLoadIndexSpecimen
37. photofileSpecimen
38. blowCountSPT

PSD Data:

This information is mandatory if particle size measurements have been made and **must** be supplied with the data to ensure they can be reused:

1. locationID
2. sampleID
3. specimenID
4. testIDPSD
5. typePSD
6. topPSD
7. basePSD
8. standardPSD
9. d90PSD
10. d50PSD
11. d10PSD
12. percentClayPSD
13. percentSiltPSD
14. percentSandPSD
15. percentGravelPSD
16. percentCobblesPSD
17. percentFinesPSD
18. analyticalLaboratory

Additional PSD Data Items:

Please provide as much of the following information as possible to help others assess the data:

1. analyticalPersonnel

OED Data:

This information is mandatory if oedometer data have been recorded and **must** be supplied with the data to ensure they can be reused:

1. locationID
2. sampleID
3. specimenID
4. testIDOED
5. standardOED
6. typeOED
7. topOED
8. baseOED
9. conditionOED
10. plasticLimitOED
11. plasticityIndexOED

12. initVoidsOED
13. p0VoidsOED
14. p0OED
15. consPOED
16. finalPOED
17. satRatioOED
18. ccOED
19. csOED
20. mvOED
21. analyticalLaboratory

Additional OED Data Items:

Please provide as much of the following information as possible to help others assess the data:

1. heightOED
2. diameterOED
3. bulkDenOED
4. dryDenOED
5. initMCOED
6. finalMCOED
7. consVoidsOED
8. verticalStrainP0OED
9. verticalStrainCOED
10. parDenOED
11. waterDenOED
12. timeMethodOED
13. analyticalPersonnel

Triax Data:

This information is mandatory if triaxial measurements have been made and **must** be supplied with the data to ensure they can be reused:

1. locationID
2. sampleID
3. specimenID
4. testIDTriax
5. standardTriax
6. typeTriax
7. topTriax
8. baseTriax
9. conditionTriax
10. satRatioTriax
11. analyticalLaboratory
12. failStrainTriax
13. maxDevStressTriax

Additional Triax Data Items:

Please provide as much of the following information as possible to help others assess the data:

1. initDryDenTriax
2. initMCTriax
3. finMCTriax
4. initVoidsTriax
5. finVoidsTriax
6. specificDensTriax
7. cellPressureTriax
8. membraneThTriax
9. shearSpeedTriax
10. strainRateTriax
11. failureModeTriax
12. speciOrienTriax
13. drainsTriax
14. pressureIncTriax
15. pressureDifTriax
16. finalPWPTriax
17. finalCellWP
18. bTriax
19. initStrTriax
20. finalStrTriax
21. analyticalPersonnel

Appendix A

General Metadata:

This section describes the general metadata that should be provided with the data.

Users can populate the form here to record General Metadata

To return to the summary above, click here

The General Metadata fields are common throughout all MEDIN data guidelines and only need to be given once and referenced if the data set is composed of many data types and therefore conforms to a number of MEDIN Data Guidelines. If the collection of data forms part of a wider project or time series then the **Project Information** must be recorded but if the work is a small survey then project details may not be required.

A.1 Guidance:

Detailed descriptions and examples are given below to help users create General Metadata to accompany the data.

Survey Information

This information **must** be supplied with the data to ensure they can be reused:

Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
surveyName	**M**	Title of the survey	Free text	2011 South Coast Offshore Wind Farm Phase 1 Geotechnical Survey
surveyType	**M**	Category of survey for use in subsequent searching for certain types of surveys.	Controlled Vocabulary; **OGP SSDM WORK_CATEGORY Domain**	Geotechnical Investigation
surveyAbstract	**M**	Brief description of the purpose of the survey and other types of measurements that were made for the survey.	Free text	Preliminary geotechnical survey for the Phase 1 area of the wind farm under development.

	surveyCode	**M**	A unique code for the survey to allow links to be built between this and sample event data, (the cruise identifier code could be used). To ensure uniqueness, it is recommended that the website of the organisation responsible for the work is used, followed by a unique code designated by the responsible organisation.	Free text	http://sse.com/SSE0001123
	originator	**M**	The organisation who has created the data set. EDMO controlled vocabulary is recommended. If the organisation is not in EDMO please contact enquiries@oceannet.org to add it. If a person who is not associated with any organisation generated the data then please provide their name.	Controlled Vocabulary: **European Directory of Marine Organisations (EDMO)** at http://seadatanet.maris2.nl/v_edmo/welcome.asp	2657: GEMS Survey Ltd.; 2410: Gardline Geosurvey Ltd.; Joe Bloggs
	owner	**M**	Organisation that owns the data set. If the organisation is not in EDMO please contact enquiries@oceannet.org to add it.	Controlled Vocabulary: **European Directory of Marine Organisations (EDMO)** at http://seadatanet.maris2.nl/v_edmo/welcome.asp	3263: Navitus Bay Development Limited; 53: BP Exploration and Production
	surveyStartDate	**M**	The date and time that the survey started.	Date or DateTime; yyyy-mm-dd or yyyy-mm-dd hh:mm:ss	2011-01-24 12:33:00
	timeZone	**M**	Give the time zone in which the date and time of the data acquisition is made (preferably Coordinated Universal Time (UTC))	Free text	UTC

	spatialCRS	**M**	Spatial coordinate reference system. Describes the system of spatial referencing i.e. the datum used to supply the decimal latitudes and longitudes. There are additional fields to indicate the datum of the original data if the coordinates have been transformed.	Controlled vocabulary: **EPSG Geodetic Parameter Dataset** at http://www.epsg-registry.org/	**WGS84** code: EPSG::4326; **British National Grid** (projected) code: EPSG::27700; **ETRS89 / UTM zone 28N** code: EPSG::25828; **ETRS89 / UTM zone 29N** code: EPSG::25829; **ED50** code: EPSG::4230; **UTM31N** code: EPSG::23031
	positionFix	**M**	Position fix method and source. Give the method and source of the position fix instrument.	Free text	Differential GPS taken from the ships navigation equipment. 4 point satellite fix achieved
	horizontal Accuracy	**M**	How accurate the spatial positions are likely to be.	Decimal; units = metres	15.2
	depthCRS	**M**	Depth coordinate reference system. Give the reference to which the depth has been calculated e.g. Ordnance Datum Newlyn; Highest Astronomical Tide. Mandatory if seabed depths are given for each sample.	Controlled Vocabulary; **EPSG Geodetic Parameter Dataset** at http://www.epsg-registry.org	Ordnance Datum Newlyn code: EPSG::5701; Malin Head height code: EPSG::5731

Additional Items:

Please provide as much of the following information as possible to help others assess the data:

Survey Information:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	verticalAccuracy	**C**	Vertical positional accuracy. How accurate the vertical resolution is. Must be provided if seabed depths are given.	Decimal; units = metres	0.5

	surveyEndDate	**C**	The date and time that the survey ended. May be left null if the survey is still ongoing.	Date or DateTime; yyyy-mm-dd or yyyy-mm-dd hh:mm:ss	2009-02-16 16:33:00
	originalCRS	**C**	Datum of original coordinates if different from the one used to supply data	Controlled vocabulary: EPSG Geodetic Parameter Dataset at http://www.epsg-registry.org or other defined coordinate reference system register	WGS84: EPSG::4326; British National Grid (projected): EPSG::27700; ETRS89 / UTM zone 28N: EPSG::25828; ETRS89 / UTM zone 29N: EPSG::25829; ED50: EPSG::4230; UTM31N: EPSG::23031
	transformation	**C**	Transformation used to create decimal degrees if transformation undertaken.	Free Text.	Data was converted from OSGB to WGS84 in ArcGIS using the petroleum transformation.
	platformName	**C**	Mandatory if a vessel was used for the survey. The name of the ship from which the sampling device was deployed. If the survey ship is not on the list please contact accessions@ices.dk	Controlled vocabulary: ICES Reference Codes, **Table SHIPC** at http://vocab.ices.dk/	74LG: Lough Foyle; AA30: Unspecified Ship; 74E9: Cefas Endeavour; AA36: Unspecified Fishing Vessel;
	platformType	**O**	The platform type (e.g. Research Vessel) from which the sampling device was deployed.	Controlled vocabulary: NVS2 Platform Classes, **Table L06** at https://www.bodc.ac.uk/data/codes_and_formats/vocabulary_search/L06;	3Z: Surface Vessel; 3D: Drillship; 13: beach/intertidal zone structure

	cruiseReport Reference	**O**	Cruise report or boat log reference if applicable.	Free text; in reference format.	Litt, E.J. 2009. PHiXT 4. 30 July to 2 August 2009 RV Prince Madog POL Coastal Observatory Liverpool Bay Cruise Report. POL Coastal Observatory, Liverpool.
	surveyReport Reference	**O**	Survey report reference if applicable.	Free text; in reference format.	Geo (2015) South Coast Offshore Wind Farm July 2015 Detailed Geotechnical Survey Field Report 45810-2D
	confidentiality	**O**	Note if the survey is confidential. If not noted, the data will be assumed to be releasable to the public	Free text	Restricted access; Public

Project Information:

Please provide as much of the following information as possible if your survey forms part of a wider project

	Field Title	**M C O**	**Description**	**Recommended Controlled Vocabulary or Format**	**Examples**
	projectName	**M**	The nationally/internationally accepted version of the project name.	Free text	South Coast Offshore Wind Farm Ltd; Lomond Gasfield
	projectCode	**M**	Provide a code to uniquely identify the project and allow links to be made between the tables. To ensure uniqueness, it is recommended that the website of the organization responsible for the work is used, followed by a unique code which should reflect the code used by the funding organisation where possible e.g. contract code.	Free text	http://www.bg-group.com/BG178; http://sse.com/SSE0001123

	projectStartDate	**M**	The date that the project started which is from when the funding was in place to start. Use the 1st of the month if the exact date is not known.	Date; yyyy-mm-dd	2010-05-06
	projectEndDate	**C**	The date that the project finished or is due to finish. Use the 1st of the month if the exact date is not known.	Date; yyyy-mm-dd	2017-04-07
	projectWebsite	**C**	If a project website exists give the address. This should be the web address of the environmental survey and not, in the case of environmental impact assessments, the engineering development.	URL	http://sse.com/whatwedo/ourprojectsandassets/renewables/Beatrice/

Appendix B

Detailed Metadata:

This section describes the detailed metadata that should be collected with the data. It contains specific information about the methods used, the organisations that carried out the work and any calibrations that have been applied to the data.

Users can populate the form here to record Detailed Metadata or it may be supplied in a cruise or survey report.

To return to the summary above, click here

The Detailed Metadata fields are specific to each data guideline and should be completed for each type of data. The information requested here may be supplied as additional metadata or may be supplied in a cruise or survey report.

B.1 Guidance:

Detailed descriptions and examples are given below to help users create Detailed Metadata to accompany the data.

Acquisition Method:

This information **must** be supplied with the data to ensure it can be reused:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	methodID	**M**	Method Identifier. A unique code for the methods to allow links to be built between this and sample event data.	Free text	WISON CPT
	samplingDevice	**M**	The category of sampling device, whether for collection or for in-situ testing, used.	Controlled Vocabulary:NVS2 Device Categories, **Table L05** at https://www.bodc.ac.uk/data/codes_and_formats/vocabulary_search/L05/	361: penetrometers; 50: sediment grabs

	deviceReference	**M**	Name and serial number of sampling device.	Free Text.	Neptune 5000 CPT S/N A0001
	analytical Laboratory	**M**	The laboratory/organisation(s) (with EDMO record ID) that analysed the samples if different from the originator identified in the general metadata. Contact MEDIN to add an organisation to this list	Controlled Vocabulary: **European Directory of Marine Organisations (EDMO)** at http://seadatanet.maris2.nl/v_edmo/welcome.asp	2410: Gardline Geosurvey Limited
	QCScheme	**M**	Description of any quality control scheme that samples were audited under during the analysis.	Free text	Samples audited according to BS EN ISO 19901-8 2015.
	methodQCNotes	**M**	Any further notes on sample analysis that may be of relevance.	Free text	10% of samples were checked by Brian Begger for QC purposes.

Additional Items:

Please provide as much of the following information as possible to help others assess the data:

	Field Title	**MCO**	**Description**	**Recommended Controlled Vocabulary or Format**	**Examples**
	protocolsUsed	**C**	Standard or protocols followed by the equipment operators during sample acquisition. Any written methodology used should be referenced and linked. If the methodology is not referenced then provide a full description here.	Free text	BS EN ISO 19901-8 2015
	storageMedium	**C**	The storage medium and file type used for digital data.	Free text	.ags file on 500gb external hard drive

	analytical Personnel	**O**	Names of the personnel who were involved in analysing the samples and their role in the analysis.	Free text; personnel name(s) separated by semi-colon if more than one personnel involved; indicate organisation name in brackets if more than one organisation involved.	Joe Bloggs collected and analysed all samples. John Doe; Henry Rice (ME Consulting) collection and sorting; Harriet Smith (Marine Consult) identification and biomass; Jamie Creed (Marine Consult) Checking
	methodNotes	**O**	Sampling analysis notes. Any further notes on sample analysis that may be of relevance.	Free text	Core samples were stored in lock-boxes

Appendix C

Data

This section describes the required data content and format for offshore geotechnical site investigation data. It covers:

Station Information, Location Information, Sample Information, Specimen Data, CPT Information, CPT Data, PSD Data, OED Data, Triax data

Users can populate the form here as guidance for what the dataset should contain.

To return to the summary above, click here

The data content and format are specific to each data guideline and the relevant data guideline should be consulted for each type of data.

C.1 Well Organised Data

Where geophysical survey data are supplied to a Data Archive Centre (DAC), it is recommended that the data are incorporated within a standard documented folder structure as this reduces data archiving costs. For an example folder structure refer to the BGS Offshore Acquisition Folder Structure at http://www.bgs.ac.uk/downloads/start.cfm?id=2256.

An inventory of files and their respective sizes, and supply formats and media should be provided to the DAC. It is very important that a link can be made between the bathymetry data files and the bathymetry metadata information.

C.2 Format

The format preferred by MEDIN for exchange of data relating to geotechnical site investigations is Association of Geotechnical and Geo-environmental Specialists (AGS) format (.AGS.) If users are submitting photos of samples and specimens, the preferred format is .JPG. Metadata as described in this document can be supplied in Excel spreadsheet (.XLS or .XLSX) format.

MEDIN do not require the submitted metadata to adhere to the field names in the guideline, provided the information matches the descriptions for each metadata element. This allows data and metadata in .AGS, and other file formats, to comply with the MEDIN guideline.

Users may, if they wish, include additional metadata beyond what is specified in this guideline, as long as the source format of this extra information is clearly referenced.
The Station (if relevant) and Location Event information can be supplied in a cruise or survey report.

C.3 Guidance

Station Information:

If data collection took place at target stations, this information **must** be supplied with the data to ensure they can be re-used.

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	stationID	**M**	Station identifier. A unique identifier for the station.	Free text.	Stanton_Bank_station_4 (point); EastChan_Innerdover_se04; Lagan_Estuary (area)
	geometry	**M**	Description of station spatial form. Describe if the fixed station is a point, transect (curve) or an area (surface).	Controlled Vocabulary: NVS2 Geospatial Feature Type, **Table L02** at https://www.bodc.ac.uk/data/codes_and_formats/vocabulary_search/L02/	004: Point; 003: Curve; 005: Surface;
	primaryLatitude	**M**	The primary latitude of the station must be given in decimal degrees. For a point this field is set to the point latitude; for a transect it is set to the latitude of the start of the transect; for an area it is set to the southern edge of the box. Units are positive North.	Decimal degrees; minimum of four decimal places.	54.5837

	Primary Longitude	**M**	The primary longitude of the station must be given in decimal degrees. For a point this field is set to the point longitude; for a transect it is set to the longitude of the start of the transect; for an area it is set to the western edge of the box. Units are positive east (West is negative, East is positive).	Decimal degrees; minimum of four decimal places.	-5.5837

Station Information Additional items:

Please provide as much of the following information as possible to help others assess the data:

	Field Title	**MCO**	**Description**	**Recommended Controlled Vocabulary or Format**	**Examples**
	secondary Latitude	**C**	The secondary latitude of the station must be given in decimal degrees. For a point this field is not required; for a transect it is set to the latitude of the end of the transect; for an area it is set to the northern edge of the box. Units are positive North.	Decimal degrees; minimum of four decimal places.	55.7393
	secondary Longitude	**C**	The secondary longitude of the station must be given in decimal degrees. For a point this field is not required; for a transect it is set to the longitude of the end of the transect; for an area it is set to the eastern edge of the box. Units are positive east (West is negative, East is positive).	Decimal degrees; minimum of four decimal places.	-3.7394

	original Coordinates	**C**	Original coordinates and coordinate transformation technique. If coordinates were transformed from a different reference system into decimal degrees then the original coordinate and original coordinate reference system should be given, the method used to transform stated and any differences in the relative (significant figures) of the original transformation explained.	Free text;	SX498476, Coordinates were transformed from British National Grid using in house software 'BODC_transform '. The number of significant figures was reduced to 4 decimal degrees in line with the accuracy of the coordinate and transformation technique.
	stationName	**O**	The name by which a particular station is known	Free text.	L4 Stannock Head
	stationNotes	**O**	Any further notes on the station that may be of relevance can be added here.	Free text;	Rocky reef, west of West Maiden; Also known as Hell's Mouth

Location Information

This table is structured to record the properties of each investigation location. Any "retests" that require the movement of subsea equipment to unsampled ground should be logged as a new location on a new line. They should be identified with alphabetical suffixes e.g. CPT1, CPT1a.

This information **must** be supplied with the data to ensure they can be re-used:

	Field Title	**M C O**	**Description**	**Recommended Controlled Vocabulary or Format**	**Examples**
	surveyCode	**M**	Survey identifier. A unique identifier for the location.	Free text. Populate with entry from Survey table	http://sse.com/SSE0001123

	locationID	**M**	Location identifier. A unique identifier for the location. Repeat tests should use alphabetical suffixes e.g.: CPT1, CPT1a; CPT1b	Free text. Recommended to be less than 10 characters	BH1; CPT99; VC20
	startDate	**M**	Date at start of drilling or CPT testing	Date: yyyy-mm-dd	2015-05-15
	startTime	**M**	Time at start of drilling or CPT testing	Time: hh:mm:ss in 24-hour clock.	22:15:37
	endDate	**M**	Date at end of drilling or CPT testing	Date: yyyy-mm-dd	2015-06-15
	locationType	**M**	Type of investigation carried out at this site.	Controlled Vocabulary: NVS2 Site Investigation Type, **Table M16** at https://www.bodc.ac.uk/data/codes_and_formats/vocabulary_search/M16/	INVEST_BOX: Box core investigation; INVEST_SAMPBORE: Sample borehole;
	locationLatitude	**M**	The latitude of the sampling location must be given in decimal degrees. Units are positive North.	Decimal degrees; minimum of four decimal places.	54.5837
	location Longitude	**M**	The longitude of the sampling location must be given in decimal degrees. Units are positive east (West is negative, East is positive).	Decimal degrees; minimum of four decimal places.	-5.5837
	locationEnd Depth	**M**	Depth from below seabed (mudline) to base of borehole.	Decimal; units=metres; minimum of two decimal places	65.10
	location BoreholeLog	**M**	File name of PDF investigation log must be entered. Can be a reference to a report if all logs are amalgamated.	Free text	BH1.pdf

	locationWater Depth	**M**	Height of water column above test location.	Decimal; units=metres; minimum of one decimal place	30.2
	location Elevation	**M**	Seabed elevation in survey datum.	Decimal; units=metres; minimum of one decimal place	-33.1

Location Information

Additional items:

Please provide as much of the following information as possible to help others assess the data:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	location Inclination	**C**	Inclination of borehole.	Decimal degrees; minimum of two decimal places.	45.00
	location Orientation	**C**	Orientation of borehole referenced to survey datum.	Decimal degrees; minimum of two decimal places.	286.01
	endTime	**C**	Time at end of drilling or CPT testing	Time: hh:mm:ss in 24-hour clock.	03:15:24
	originalLatitude	**C**	The latitude of the sample given in whichever format was used to record at the time of sampling if not recording decimal degrees.	Free text	5988416
	original Longitude	**C**	The longitude of the sample given in whichever format was used to record at the time of sampling if not recording decimal degrees.	Free text	690944
	location AlternateID	**O**	Any alternate name by which a particular location is known	Free text	L4 Stannock Head

	locationTarget Latitude	**O**	The original planned target location	Decimal degrees; minimum of four decimal places.	54.5837
	locationTarget Longitude	**O**	The original planned target location	Decimal degrees; minimum of four decimal places.	-5.5837
	phreaticLevel	**O**	Depth of phreatic surface (generally for onshore boreholes, may be relevant in certain circumstances).	Decimal; Units=metres; at least two decimal places; may not exceed value of locationEndDepth	1.55
	locationNotes	**O**	Any further notes on the location that may be of relevance can be added here.	Free text;	Rocky reef, west of West Maiden; Also known as Hell's Mouth
	stationID	**O**	Station identifier. A unique identifier for the station.	Must be selected from stationID in Station table	Stanton_Bank_ station_4 (point); EastChan_Inner dover_se04; Lagan_Estuary (area)

Sample Information

This table is designed to record information regarding each sample run. While the general purpose of each location is already entered in the Location table, it is common for sampling methods to vary downhole as each stratum encountered will require different techniques to achieve optimum recovery. The sample table, therefore, contains fields for describing the technique used for each individual sampling run e.g. coring, push sampler, hammer sampler etc. which may all be used in one borehole.

Standard Penetration testing (SPT) test data can be entered by treating each SPT as a sample, with each increment treated as a subsample and entered into in the specimen table

The following information **must** be supplied with the data to ensure they can be re-used:

	Field Title	**M C O**	**Description**	**Recommended Controlled Vocabulary or Format**	**Examples**
	locationID	**M**	Location identifier. A unique identifier for the location.	Must be selected from locationID in Location table	BH1, CPT17, VC76

	sampleID	**M**	Unique identification number for this sample	Free text	CR01; P01; H04
	methodID	**M**	Unique identification number for the method used for this sample.	Must be selected from the methodID field in Detailed Metadata form.	01; 02
	typeSample	**M**	Type of sample	Controlled Vocabulary: NVS2 Type of Sample Collected during a Geotechnical Investigation, **Table M17** at https://www.bodc.ac.uk/data/codes_and_formats/vocabulary_search/M17/	SAMP_CORE: Core run; SAMP_HAM: Hammer sample;
	topSample	**M**	Depth of top of sample (from seabed)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.00
	baseSample	**M**	Depth of base of sample (from seabed)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.25
	dateTimeSample	**M**	Date and time of sample recovery	Date or DateTime; yyyy-mm-dd or yyyy-mm-dd hh:mm:ss	2009-02-16 16:33:00
	loggedBy Sample	**M**	Name or initials of geologist/engineer/ logger	Free text	JS; Jane Smith

Sample Information

Additional items:

Please provide as much of the following information as possible to help others assess the data:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	tcrSample	**C**	Total Core Recovery as defined by BS5930, based on ratio of solid and non-intact core recovered to length of core run. Must be entered for rock core.	Percentage	75
	scrSample	**C**	Solid Core Recovery as defined by BS5930, based on ratio of solid core recovered to length of core run. Must be entered for rock core.	Percentage	50
	rqdSample	**C**	Rock Quality Designation as defined by BS5930, based on ratio of solid core pieces longer than 100mm to length of core run. Must be entered for rock core.	Percentage	35
	operatorSample	**C**	Name of equipment operator(s).	Free text	John Smith
	photoFileSample	**C**	File name of sample photograph must be entered if photographs are taken e.g. for core photography. This should contain the Location, and Sample numbers.	Free text	BH1__P01.jpg
	lengthSample	**O**	Length of recovered sample	Decimal; Units=metres; at least two decimal places	0.25
	diameterSample	**O**	Diameter of recovered sample	Decimal; units=millimetres, at least one decimal place	74.2

	massSample	**O**	Mass of recovered sample	Decimal; units=kilograms; at least three decimal places	2.123
	strokeTop Sample	**O**	Enter the depth of start of push, core run, vibrocore etc. such that stroke/penetration length may be compared with recovery.	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.00
	strokeBase Sample	**O**	Enter the depth of base of push, core run, vibrocore etc. such that stroke/penetration length may be compared with recovery.	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.50
	strokeTime Sample	**O**	Where the time taken to acquire sample is relevant, enter here e.g. vibration time of vibrocore.	mm:ss	03:30
	recoveryPercent Sample	**O**	Percentage recovery. i.e. 100 x [(strokeBaseSample - strokeTopSample) / (baseSample - topSample)]	Percentage	50
	phreaticLevel Sample	**O**	Depth of phreatic surface at time of sampling (generally for onshore boreholes, may be relevant in certain circumstances)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.55
	blowCount Sample	**O**	Number of total blows for percussive sampling methods, such as SPT or hammer sampling.	Integer	7

CPT Information

This table structure is to record parameters that apply to the entire CPT test. The following information **must** be supplied with the data to ensure they can be reused:

	Field Title	**M C O**	**Description**	**Recommended Controlled Vocabulary or Format**	**Examples**

	locationID	**M**	Location identifier. A unique identifier for the location.	Must be selected from locationID list in Location table	CPT17; CPT17a; CPT17b; CPT18; CPT99
	pushNumber CPT	**M**	Push number at this location. Note: if CPT is moved, new locationID should be generated with new positioning data.	Integer	001; 002; 003;
	coneIDCPT	**M**	Unique identifier for cone sensor used	Free text	2084
	coneAreaCPT	**M**	Tip area of cone sensor	Decimal; units=square centimetres	10
	coneAreaRatio CPT	**M**	Cone Area Ratio - also known as Alpha Factor	Decimal; at least two decimal places	0.75
	pwpSensorPos CPT	**M**	The position of the pore water pressure sensor on CPT cone.	Select from uninstrumented, U_1, U_2 or U_3. Select 'uninstrumented' if CPT does not record water pressure	U_2;
	frictionOffset CPT	**M**	Offset from tip sensor to friction sleeve	Decimal; units=metres; at least two decimal places	0.06

CPT Information

Additional items:

Please provide as much of the following information as possible to help others assess the data:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	startDepthCPT	**C**	If depth below mudline at start of CPT is not zero (e.g. downhole CPT), it must be specified	Decimal; units=metres; at least two decimal places	11.30

	shearMethod CPT	**C**	Name and reference of method of shear strength derivation and any parameters assumed. Must be completed if shearStrengthCPT is used.	Free text	Robertson, P. (2009). "CPT-DMT Correlations." J. Geotech. Geoenviron. Eng., 10.1061/(ASCE) GT.1943-5606.0000119, 1762-1771.
	densityMethod CPT	**C**	Name and reference of method of relative density derivation and any parameters assumed. Must be completed if relativeDensityCPT is used.	Free text	Jamiolkowski, M., Lo Presti, D.C.F., Manassero, M., 2001. Evaluation of relative density and shear strength of sands from CPT and DMT. CC Ladd Symposium.
	phreaticLevel CPT	**O**	Depth of phreatic surface at time of sampling (generally for onshore boreholes, may be relevant in certain circumstances)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.55

CPT Data

This table records CPT parameters that vary continuously during the test. The following information **must** be supplied with the data to ensure they can be reused:

	Field Title	**M C O**	**Description**	**Recommended Controlled Vocabulary or Format**	**Example**
	locationID	**M**	Location identifier. A unique identifier for the location.	Must be selected from locationID list in Location table	BH1, CPT17
	pushNumber CPT	**M**	Push number at this location	Must be selected from pushnumberCPT list in CPT table	001
	depthCPT	**M**	Depth at current data point	Decimal; units=metres; at least two decimal places	0.01

	tipCPT	**M**	Cone tip resistance (qc), This value should be as measured and not have any corrections applied.	Decimal; units=mega-pascals; at least three decimal places	20.317
	sleeveCPT	**M**	Cone sleeve resistance at current data point. This value should be as measured and not have any corrections applied.	Decimal; units=mega-pascals; at least four decimal places	0.1925

Additional items:

Please provide as much of the following information as possible to help others assess the data:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Example
	poreCPT	**C**	If using PCPT/CPTU cone with pore pressure sensor, reading at current data point must be entered here. This value should be as measured and not have any corrections applied.	Decimal; units=mega-pascals; at least four decimal places	0.0023
	inclinationXCPT	**C**	If CPT is instrumented for cone inclination with x and y components, enter x-axis value	Decimal degrees; at least two decimal places	2.37
	inclinationYCPT	**C**	If CPT is instrumented for cone inclination with x and y components, enter y-axis value	Decimal degrees; at least two decimal places	2.37
	inclination CombinedCPT	**C**	If CPT is instrumented for cone inclination where x and y axis inclinations are combined, enter values here	Decimal degrees; at least two decimal places	4.13
	frictionRatioCPT	**O**	If derived parameters are calculated, enter friction ratio values here	Percentage; at least two decimal places	1.02

	shearStrength CPT	**O**	If derived parameters are calculated, enter shear strength values here	Decimal; units=kilopascals; at least one decimal place	50.5
	relativeDensity CPT	**O**	If derived parameters are calculated, enter relative density values here	Percentage; at least one decimal place	83.1

Specimen Information

This table is to record soil description and laboratory test results. Results for a variety of tests can be entered (one per row) along with the test type and the standard or methodology followed.

This table can be used for entering SPT increments. Increments are normally 150 mm if testing is carried out as defined by BS EN ISO 22476-3-2005, but can be varied. Other increment lengths can be recorded using the topSpecimen and baseSpecimen fields if needed. The blowcount for each increment may be entered in the blowCountSPT field. Test particulars such as the standard followed, type and dimensions of equipment used etc. shall be entered in the Detailed Metadata table and linked to each test by a methodID contained in the Sample table above.

The following information **must** be supplied with the data to ensure they can be re-used:

	Field Title	**M C O**	**Description**	**Recommended Controlled Vocabulary or Format**	**Examples**
	sampleID	**M**	Unique identification number for this sample	Must be selected from sampleID list in sample table	BH1_P_01
	specimenID	**M**	Unique identification number for this specimen (subsample)	Free Text	001; U2; Q4; WAXA
	topSpecimen	**M**	Depth of top of specimen (subsample) (from seabed)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.00
	techSpecimen	**M**	Name of laboratory technician	Free text	John Smith
	geoSpecimen	**M**	Name of geologist/engineer/ logger	Free text	Jane Smith

	descSpecimen	**M**	Geological description of specimen	Free text. Inputs must be as defined by the most recent iteration of ISO 14688-1/14688-2 for soil, ISO 14689 for rock and ISO 22475 for sampling.	Very low strength slightly silty CLAY
	containerType	**M**	If a physical sample was recovered, what was the type of container	Controlled Vocabulary: NVS2 Type of Container Used to Hold Physical Sample, **Table M18** at https://www.bodc.ac.uk/data/codes_and_formats/vocabulary_search/M18/	CONT_WAX: Wax; CONT_SHELBY: Shelby tube;

Specimen Information

Additional items:

Please provide as much of the following information as possible to help others assess the data:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	baseSpecimen	**C**	Depth of base of specimen (subsample) (from seabed). Use if test is performed over a depth range rather than just a point.	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.25
	testType Specimen	**C**	Where any geotechnical parameter is recorded, the method of measurement must be entered here	Free text	Pocket Penetrometer, Torvane,
	testEquip Specimen	**C**	Instrument used for test.	Free text	Pocket penetrometer serial no: 150515

	testTypeValue Specimen	**C**	Where any geotechnical parameter is recorded for which a field has not been provided, the result value must be entered here.	Decimal	.25
	testTypeUnit Specimen	**C**	Units of the measurement in **testTypeValue Specimen** must be entered here	Free text	Gigapascals
	testCustom Name	**C**	Where any geotechnical parameter is recorded for which a field has not been provided, the name of the parameter/test must be entered here. **testTypeValue Specimen**, **testTypeUnit Specimen** and **testStdSpecimen** must be completed also. **testOrienSpecimen** must be completed if relevant.	Free text	Young's Modulus
	testStd Specimen	**C**	Where **testTypeSpecimen** is recorded, the testing standard followed must be entered here	Free text	BS 1377: Part 7: 1990; DIN 18137-2
	containerSize	**C**	If a physical sample was recovered, what was the width of the container e.g. core diameter.	Number; units = millimetres	75
	containerWall	**C**	If a physical sample was recovered, what was the wall thickness of the container	Number; units = micrometres	2
	testOrien Specimen	**C**	Where relevant e.g. point load test, enter the orientation of the test	Free text	Axial; Diametral; Indeterminate

	lengthSpecimen	**C**	Length of specimen	Decimal; Units=metres; at least two decimal places	0.25
	diameter Specimen	**C**	Diameter of specimen	Decimal; units=millimetres, at least one decimal place	74.2
	weightSpecimen	**C**	Weight of specimen	Decimal; units=kilograms; at least three decimal places	2.124
	bulkDen Specimen	**C**	Bulk Density of specimen	Decimal; Units=Mg m^{-3}; at least two decimal places	2.44
	dryDen Specimen	**C**	Dry Density of specimen	Decimal; Units=Mg m^{-3}; at least two decimal places	1.86
	satDen Specimen	**C**	Saturated Density of specimen	Decimal; Units=Mg m^{-3}; at least two decimal places	2.81
	mCSpecimen	**C**	Moisture Content of specimen	Percentage; at least one decimal place	50.1
	satRatio Specimen	**C**	Percentage Saturation of specimen	Percentage; at least one decimal place	30.8
	parDen Specimen	**C**	Particle Density of specimen	Decimal; Units=Mg m^{-3}; at least two decimal places	2.70
	thermalCond Specimen	**C**	Thermal Conductivity of specimen	Decimal; watts per metre kelvin	3.00
	electricalRes Specimen	**C**	Electrical Resistivity of specimen	Decimal; ohm-metre	11.00

	specificG Specimen	**C**	Specific Gravity of specimen	Decimal; at least two decimal places	2.61
	voidsRatio Specimen	**C**	Voids ratio of specimen	Decimal; at least two decimal places	0.71
	porosity Specimen	**C**	Porosity of specimen	Percentage	15
	plasticLimit Specimen	**C**	Plastic limit of specimen	Percentage	25.0
	liquidLimit Specimen	**C**	Liquid limit of specimen	Percentage	24.0
	liquidityIndex Specimen	**C**	Liquidity index of specimen	Percentage	10.1
	plasticityIndex Specimen	**C**	Plasticity index of specimen	Percentage	47
	plasDesc Specimen	**C**	Plasticity description of specimen	Free text. Inputs must be as defined by the most recent iteration of BS 5930.	CL - Clay of low plasticity
	activity Specimen	**C**	Activity of the specimen	Percentage	12
	shearSpecimen	**C**	Shear Strength of specimen	Decimal; Units=kilopascal; at least one decimal place	217.0
	youngsMod Specimen	**C**	Young's Modulus of specimen	Decimal; Units=mega-pascal; at least to nearest whole number	541
	youngsMod StrainSpecimen	**C**	Strain at which Young's Modulus value applies	Percentage	0.01
	percStrainSpec	**C**	Percentage strain for the specimen.	Percentage	6
	ucsSpecimen	**C**	Unconfined Compressive Strength of specimen	Decimal; Units=mega-pascal; at least one decimal place	3.4

	pointLoadIndex Specimen	**C**	Point Load Strength Index of specimen	Decimal; Units=mega-pascal; at least one decimal place	4.2
	photofile Specimen	**C**	File name of specimen photograph. This should contain the Location, Sample and Specimen numbers.	Free text	BH1__P01_WAX A.jpg
	blowCountSPT	**O**	Number of blows in SPT increment to which this subsample corresponds	Integer	7

Test Data:

The following tables record the necessary information to re-use data from PSD tests, OED tests, and triax tests.

PSD Data

This table structure allows the recording of particle size distribution results as mandatory with some additional optional fields for grain size percentiles sometimes used in design. The following information **must** be supplied with the data to ensure they can be reused:

	Field Title	**M C O**	**Description**	**Recommended Controlled Vocabulary or Format**	**Example**
	locationID	**M**	Location identifier. A unique identifier for the location.	Must be selected from locationID list in Location table	BH1, CPT17
	sampleID	**M**	Unique identification number for this sample	Must be selected from sampleID list in Sample table	BH1_P_01
	specimenID	**M**	Unique identification number for this specimen (subsample)	Must be selected from specimenID list in Specimen table	001; 002; 003
	testIDPSD	**M**	Unique identification number for an individual test.	Free text	PSD_001

	typePSD	**M**	Type of PSD test	Free text	Wet sieve; dry sieve; pipette sedimentation; hydrometer sedimentation
	topPSD	**M**	Depth of top of test (from seabed)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.00
	basePSD	**M**	Depth of base of test (from seabed)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.25
	standardPSD	**M**	PSD standard followed	Free text	BS 1377: Part 2: 1990
	d90PSD	**M**	Particle size for which 90 percent of particles are smaller	Decimal; units=millimetres; at least three decimal places	1.000
	d50PSD	**M**	Particle size for which 50 percent of particles are smaller	Decimal; units=millimetres; at least three decimal places	0.100
	d10PSD	**M**	Particle size for which 10 percent of particles are smaller	Decimal; units=millimetres; at least three decimal places	0.050
	percentClayPSD	**M**	Percentage of clay in sample, clay as defined by ISO 14688.	Percentage; at least one decimal place	5.0
	percentSiltPSD	**M**	Percentage of silt in sample, silt as defined by ISO 14688.	Percentage; at least one decimal place	10.0
	percentSand PSD	**M**	Percentage of sand in sample, sand as defined by ISO 14688.	Percentage; at least one decimal place	65.0
	percentGravel PSD	**M**	Percentage of gravel in sample, gravel as defined by ISO 14688.	Percentage; at least one decimal place	17.0
	percentCobbles PSD	**M**	Percentage of cobbles in sample, cobbles as defined by ISO 14688.	Percentage; at least one decimal place	3.0

	percentFines PSD	**M**	Total of percentage of fines in sample, fines as defined by ISO 14688.	Percentage; at least one decimal place	15.0
	analytical Laboratory	**M**	The laboratory/organisation(s) (with EDMO record ID) that analysed the samples if different from the originator identified in the general metadata. Contact MEDIN to add an organisation to this list	Controlled Vocabulary: **European Directory of Marine Organisations (EDMO)** at http://seadatanet.maris2.nl/v_edmo/welcome.asp	2410: Gardline Geosurvey Limited

Additional items:

Please provide as much of the following information as possible to help others assess the data:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Example
	analytical Personnel	**O**	Names of the personnel who were involved in analysing the samples and their role in the analysis.	Free text; personnel name(s) separated by semi-colon if more than one personnel involved; indicate organisation name in brackets if more than one organisation involved.	Joe Bloggs collected and analysed all samples. John Doe; Henry Rice (ME Consulting) collection and sorting; Harriet Smith (Marine Consult) identification and biomass; Jamie Creed (Marine Consult) Checking

OED Data

This table is structured to record the parameters for the most common types of consolidation tests as mandatory with further optional fields for more specialised tests. The following information **must** be supplied with the data to ensure they can be reused:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Example

	locationID	**M**	Location identifier. A unique identifier for the location.	Must be selected from locationID list in Location table	BH1, CPT17
	sampleID	**M**	Unique identification number for this sample	Must be selected from sampleID list in Sample table	BH1_P_01
	specimenID	**M**	Unique identification number for this specimen (subsample)	Must be selected from specimenID list in Specimen table	001; 002; 003
	testIDOED	**M**	Unique identification number for an individual test.	Free text	OED_001
	standardOED	**M**	Oedometer test standard followed	Free text	BS1377: Part 5: 1990
	typeOED	**M**	Type of oedometer test	Free text	Incremental; Constant rate of strain; reconstituted incremental
	topOED	**M**	Depth of top of test (from seabed)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.00
	baseOED	**M**	Depth of base of test (from seabed)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.25
	conditionOED	**M**	Oedometer specimen condition	Free text	Undisturbed; reconstituted
	plasticLimitOED	**M**	Plastic limit	Percentage	24
	plasticityIndex OED	**M**	Plasticity index	Percentage	47
	initVoidsOED	**M**	Initial voids ratio	Decimal; at least two decimal places	0.71

	p0VoidsOED	**M**	Voids ratio at p'0	Decimal; at least two decimal places	0.69
	p0OED	**M**	Initial effective vertical stress (p'0)	Decimal; units=kilopascals; at least to nearest whole number	251
	consPOED	**M**	Effective vertical stress at consolidation (p'c)	Decimal; units=kilopascals; at least to nearest whole number	253.2
	finalPOED	**M**	Final effective vertical stress (p')	Decimal; units=kilopascals; at least one decimal places	253.3
	satRatioOED	**M**	Initial saturation ratio	Percentage	90
	ccOED	**M**	Compression index, Cc	Decimal; at least two decimal places	0.25
	csOED	**M**	Swelling (or recompression) index, Cs	Decimal; at least two decimal places	0.01
	mvOED	**M**	Coefficient of volume compressibility, mv	Decimal; units=square metres per meganewton at least two decimal places	0.08
	analyticalLaboratory	**M**	The laboratory/organisation(s) (with EDMO record ID) that analysed the samples if different from the originator identified in the general metadata. Contact MEDIN to add an organisation to this list	Controlled Vocabulary: **European Directory of Marine Organisations (EDMO)** at http://seadatanet.maris2.nl/v_edmo/welcome.asp	2410: Gardline Geosurvey Limited

Additional items:

Please provide as much of the following information as possible to help others assess the data:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Example
	heightOED	**O**	Oedometer specimen height	Decimal; units=millimetres; at least one decimal place	20.1
	diameterOED	**O**	Oedometer specimen diameter	Decimal; units=millimetres; at least one decimal place	50.0
	bulkDenOED	**O**	Bulk density of oedometer sample	Decimal; units=Mg m^{-3}; at least one decimal places	2.10
	dryDenOED	**O**	Dry density of oedometer sample	Decimal; units= Mg m^{-3}; at least two decimal places	1.54
	initMCOED	**O**	Initial moisture content	Percentage	21
	finalMCOED	**O**	Final moisture content	Percentage	13
	consVoidsOED	**O**	Effective vertical stress at consolidation (p'c)	Decimal; at least two decimal places	0.50
	verticalStrainP0OED	**O**	Initial effective vertical strain at p'0	Percentage; at least two decimal places	0.48
	verticalStrainCOED	**O**	Effective vertical strain at consolidation (p'c)	Percentage	9.03
	parDenOED	**O**	Particle density	Decimal; units= Mg m^{-3}; at least two decimal places	2.70
	waterDenOED	**O**	Assumed density of water	Decimal; units= Mg m^{-3};at least two decimal places	1.00
	timeMethodOED	**O**	Method of time fitting	Free text	Root time method

	analytical Personnel	**O**	Names of the personnel who were involved in analysing the samples and their role in the analysis.	Free text; personnel name(s) separated by semi-colon if more than one personnel involved; indicate organisation name in brackets if more than one organisation involved.	Joe Bloggs collected and analysed all samples. John Doe; Henry Rice (ME Consulting) collection and sorting; Harriet Smith (Marine Consult) identification and biomass; Jamie Creed (Marine Consult) Checking

Triax Data

This table structure is to record the parameters for the most common types of triaxial compression tests as mandatory with further optional fields for more specialised tests. The following information **must** be supplied with the data to ensure they can be reused:

	Field Title	**M C O**	**Description**	**Recommended Controlled Vocabulary or Format**	**Example**
	locationID	**M**	Location identifier. A unique identifier for the location.	Must be selected from locationID list in Location table	BH1, CPT17
	sampleID	**M**	Unique identification number for this sample	Must be selected from sampleID list in Sample table	BH1_P01
	specimenID	**M**	Unique identification number for this specimen (subsample)	Must be selected from specimenID list in Specimen table	001; 002; 003; WAXA; U3
	testIDTriax	**M**	Unique identification number for an individual test.	Free text	Triax_001
	standardTriax	**M**	Triaxial test standard followed	Free text	BS 1377: Part 7: 1990

	typeTriax	**M**	Type of triaxial test	Free text	UUT; CIU; CAU; CTXL;
	topTriax	**M**	Depth of top of test (from seabed)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.00
	baseTriax	**M**	Depth of base of test (from seabed)	Decimal; Units=metres; at least two decimal places; may not exceed depth of base of borehole.	1.25
	conditionTriax	**M**	Triaxial specimen condition	Free text	Undisturbed; remoulded; reconstituted
	satRatioTriax	**M**	Saturation ratio	Percentage	25
	analytical Laboratory	**M**	The laboratory/organisation(s) (with EDMO record ID) that analysed the samples if different from the originator identified in the general metadata. Contact MEDIN to add an organisation to this list	Controlled Vocabulary: **European Directory of Marine Organisations (EDMO)** at http://seadatanet.maris2.nl/v_edmo/welcome.asp	The laboratory/organisation(s) (with EDMO record ID) that analysed the samples if different from the originator identified in the general metadata. Contact MEDIN to add an organisation to this list
	failStrainTriax	**M**	Strain at failure	Percentage; at least one decimal place	10.2
	maxDevStress Triax	**M**	Maximum deviator stress	Decimal; units=kilopascals; at least nearest whole number	28

Additional items:

Please provide as much of the following information as possible to help others assess the data:

Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Example
initDryDenTriax	**O**	Initial dry density of triaxial specimen	Decimal; Units=Mg m^{-3}; at least two decimal places	1.65
initMCTriax	**O**	Initial moisture content of triaxial specimen	Percentage	20
finMCTriax	**O**	Final moisture content of triaxial specimen	Percentage	20
initVoidsTriax	**O**	Initial voids ratio of triaxial specimen	Decimal; at least two decimal places	0.71
finVoidsTriax	**O**	Final voids ratio of triaxial specimen	Decimal; at least two decimal places	0.68
specificDens Triax	**O**	Estimated specific density	Decimal; at least two decimal places	2.65
cellPressure Triax	**O**	Confining pressure	Decimal; units=kilopascals; at least one decimal place	200.0
membraneTh Triax	**O**	Membrane thickness	Decimal; units=millimetres; at least two decimal places	0.45
shearSpeedTriax	**O**	Speed of shearing	Decimal; units=millimetres per minute; at least to nearest whole number	2
strainRateTriax	**O**	Strain rate	Decimal; units=percent per minute; at least two decimal places	2.05
failureModeTriax	**O**	Mode of failure of sample	Restricted vocabulary from barrel failure, shear failure	barrel failure

speciOrienTriax	**O**	Specimen Orientation	Restricted vocabulary from horizontal, vertical	vertical
drainsTriax	**O**	Type of drains fitted	Restricted vocabulary from none, one end, both ends, side	side
pressureIncTriax	**O**	Pressure increments applied	Decimal; units=kilopascals; at least nearest whole number	50
pressureDifTriax	**O**	Pressure differential used	Decimal; units=kilopascals; at least nearest whole number	10
finalPWPTriax	**O**	Pore water pressure at completion	Decimal; units=kilopascals; at least nearest whole number	319
finalCellWP	**O**	Cell water pressure at completion	Decimal; units=kilopascals; at least nearest whole number	330
bTriax	**O**	B value	Decimal; at least two decimal places	0.97
initStrTriax	**O**	Initial effective stress	Decimal; units=kilopascals; at least nearest whole number	50
finalStrTriax	**O**	Final effective stress	Decimal; units=kilopascals; at least nearest whole number	50

Table continues on next page

	analytical Personnel	**O**	Names of the personnel who were involved in analysing the samples and their role in the analysis.	Free text; personnel name(s) separated by semi-colon if more than one personnel involved; indicate organisation name in brackets if more than one organisation involved.	Joe Bloggs collected and analysed all samples. John Doe; Henry Rice (ME Consulting) collection and sorting; Harriet Smith (Marine Consult) identification and biomass; Jamie Creed (Marine Consult) Checking