

GENERAL SPECIFICATION

SURVEYS

GS EP GEO 101

Offshore Geotechnical Soil Survey

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1. Scope

The document, giving the minimum requirements applicable to the equipment and procedures for offshore geotechnical soil surveys, defines standards and references for obtaining satisfactory and consistent quality in offshore soil investigations. It applies to:

- The geotechnical survey vessel and onboard drilling equipment
- The equipment and procedures for soil sampling and in-situ soil testing
- The procedures for laboratory tests on soil samples, both onboard the vessel and onshore
- The evaluation and processing of the geotechnical data to determine the soil characteristics and parameters required for the design of the foundations for the intended structure(s)
- The safety of offshore site operations and the Contractor's responsibility.

In addition, Particular Technical Specifications shall apply when more detailed references are required, and the geotechnical survey works shall be performed in accordance with the Agreement signed between Company and Contractor.

2. Reference documents

The reference documents listed below form an integral part of this General Specification.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of this document.

Reference	Title
API RP 2A	Recommended Practice for Planning, Designing and Constructing Fixed Offshore Platforms - Working Stress Design & Load and Resistance Factor Design
API RP 2GEO	Geotechnical and Foundation Design Considerations
API RP 2N	Recommended Practice for Planning, Designing and Constructing Pipelines for Arctic Conditions
API RP 2SK	Recommended Practice for Design and Analysis of Stationkeeping Systems for Floating Structures
API RP 2T	Recommended Practice for Planning, Designing and Constructing Tension Leg Platforms
ASTM Standards Volume 04.08	Construction, Soil and Rock; Building Stones
BS 1377 Parts 1 to 9	Methods of Tests for Soils for Civil Engineering Purposes
BS 5930	Code of Practice for Site Investigations

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Reference	Title
BS 6349	Code of Practice for Maritime Structures - Part 2: Design of Quay Walls, Jetties and Dolphins
BS 8004	Code of Practice for Foundations
CEN EN 1997 (Parts 1; 2)	Eurocode 7 – Geotechnical design – Parts 1;2
CEN EN 1998-5	Eurocode 8: Design of structures for earthquake resistance – Part 5: Foundations, retaining structures and geotechnical aspects
ISO 13623	Petroleum and Natural Gas Industries - Pipeline Transportation Systems
ISO 14688-1	Geotechnical Investigation and Testing - Identification and Classification of Soil
ISO 14689-1	Geotechnical Investigation and Testing - Identification and Classification of Rock
ISO 19901-4	International Standard for Offshore Structures - General Requirements - Geotechnical and Foundation Design Considerations
ISO 19901-7	International Standard for Offshore Structures - Station keeping Systems for Floating Offshore Structures and Mobile Offshore Units
ISO 19902	Petroleum and Natural Gas Industries - Fixed Steel Offshore Structures
ISO 19904-1	Petroleum and Natural Gas Industries - Floating Offshore Structures - Part 1: Monohulls, Semi-submersibles and Spars.
ISO 22476-1	Geotechnical Investigation and Testing - Field Testing - Part 1: Electrical Cone and Piezocone Penetration Tests
ISO 80000-1	Quantities and units – Part 1: General
ISRM	International Society for Rock Mechanics. Rock Characterisation Testing and Monitoring - ISRM Suggested Methods (1981)
NF P94	Soils: Surveys and Tests
NS 3481	Soil Investigation and Geotechnical Design of Marine Structures
NS 8000	Geotechnical Testing - Laboratory Methods
SN NORSOK G001	Marine Soil Investigations
SOLAS 74/78/81/83	International Maritime Organization. International Conventions for the Safety of Life at Sea
USCS	Unified Soil Classification System. Waterways Exp. Station Corps of Engineers, US Army. Technical Memorandum No. 3-357, Vols. 1 to 3 (1953)

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Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published in the applicable yearly collection.

Reference	Title
GS EP GEO 110	Requirements for Offshore Survey Vessels
GS EP GEO 201	Offshore geophysical surveys
GS EP GEO 202	Geophysical Survey for the Installation and/or the Inspection of Offshore Structures and Pipelines
GS EP GEO 401	GIS requirements for engineering site surveys and studies
GS EP GEO 701	Geotechnical data and foundation design considerations for subsea production systems and pipelines
GS EP GEO 702	Requirements for design and installation of skirted foundations and suction anchors
GS EP GEO 703	Requirements for design and installation of drag anchors and anchor piles for offshore floating structures
GS EP POS 001	Offshore surface positioning works
GS EP STR 431	Installation of piles for offshore steel structures. Driven piles
GS EP STR 432	Installation of piles for offshore steel structures. Drilled and grouted piles

3. Units

Only the ISO international system of units (ISO 80000-1) shall be used. However, the standard diameter and wall thickness of steel tubular pipes can also be expressed in inches (1 inch = 25.4 mm). When this is the case, the symbol used for the inch unit (" or in.) shall be clearly indicated.

4. Geotechnical survey vessel

4.1 General documentation

The Contractor shall supply the following general documentation about the geotechnical survey vessel (to be in agreement with GS EP GEO 110):

- Copy of vessel certificates (original documents to be provided at Company's request)
- Dimensions, main characteristics, accommodations, etc.
- Bunker capacity (fuel, potable water, food, consumables, etc.), for allowing to perform the complete geotechnical survey without port call
- Methods of communication (VHF and BLU radio, SATCOM facilities, etc.)
- Helideck (if any)

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- Equipment and procedures for mooring and/or dynamic positioning
- Drilling equipment (derrick, power swivel, equipment for heave motion compensation, seabed frame, mud pumps, drill string and bits) and sampling equipment
- Equipment and procedures for measuring the environmental conditions, including water depth, surface and sea bottom current, and wind speed
- Equipment and procedures for surveying the sea bottom, in the event that there are subsea wellheads or other obstacles to be identified on the work site
- Onboard test laboratory
- List of references of previous jobs using the proposed survey vessel, and marine crew experience.

A survey vessel without dynamic positioning shall have at least four mooring points and shall be able to anchor alone. In the event that assistance from an anchor handling ship is required, this shall be mentioned by the Contractor, as well as the characteristics this vessel requires (refer to [GS EP GEO 110](#)).

4.2 Positioning

Unless otherwise indicated in the Particular Technical Specifications, positioning of the survey vessel at the geotechnical boring locations shall be the responsibility of the Contractor, including supply of the equipment and personnel needed to work 24 hours a day throughout the period of offshore works.

The positioning equipment and procedures shall be in accordance with General Specification [GS EP POS 001](#) regarding offshore surface positioning works.

Positioning shall be carried out with a satellite-based positioning system with onshore or offshore reference stations (DGPS system), providing accurate real time positioning information. A complete description of the positioning system shall be included in the Contractor's technical documentation.

The positioning system shall be checked before commencement of the offshore works, by means of:

- A check along quayside relative to a fixed point with known co-ordinates, and/or
- A check at sea, by transit fixes around a fixed platform with known geographical and grid co-ordinates.

In the event that any doubt remains about the accuracy of the positioning system, this check shall be repeated at Company's request on completion of the survey works, before the vessel is demobilized.

If there are wellheads or any other obstructions present on the seabed near the survey points, a location map will be provided by the Company. These wellheads or other obstructions shall be clearly identified prior to commencement of the geotechnical survey works.