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Geotechnical investigation and testing — Geotechnical monitoring by field instrumentation —

Part 1: General rules

Reconnaissance et essais géotechniques — Surveillance géotechnique par instrumentation in situ —

Partie 1: Règles générales

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

ISO 18674-1 was prepared by European Committee for Standardization (CEN) in collaboration with ISO/TC 182, *Geotechnics*, Subcommittee SC 01, *Geotechnical investigation and testing*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 18674 consists of the following parts, under the general title *Geotechnical investigation and testing — Geotechnical monitoring by field instrumentation:*

— *Part 1: General rules*

The following parts are under preparation:

— *Part 2: Displacement measurements along a line: Extensometers*

The following parts are planned:

— *Part 3: Displacement measurements across a line: Inclinometers*

— *Part 4: Piezometers*

— *Part 5: Total pressure cells*

— *Part 6: Hydraulic settlement gauges*

— *Part 7: Strain gauges*

— *Part 8: Load cells*

— *Part 9: Geodetic monitoring instruments*

— *Part 10: Vibration monitoring instruments*

NOTE For further information on geotechnical monitoring by field instrumentation, see References [1] to [7].

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Geotechnical investigation and testing — Geotechnical monitoring by field instrumentation —

Part 1: General rules

1 Scope

This part of ISO 18674 lays out the general rules for the performance monitoring of the ground, of structures interacting with the ground, of geotechnical fills, and of geotechnical works.

NOTE ISO 18674 fulfils the requirements for general rules for the performance monitoring of the ground, of structures interacting with the ground, of geotechnical fills, and of geotechnical works as part of the geotechnical investigation and testing according to EN 1997-1[8] and EN 1997-2[9].

Specifically, this part of ISO 18674 applies to field instrumentation and measurements carried out

— in connection with site investigations of soils and rocks,

— in connection with Observational Design procedures,

— in connection with the performance of geotechnical structures before, during, and after construction,

— for ground behaviour evaluation, e.g. unstable slopes, consolidation etc.,

— for the proof or follow-up of a new equilibrium within the ground, after disturbance of its natural state by construction measures (e.g. foundation loads, excavation of soil, tunnelling),

— for the proof or follow-up of the stability, serviceability, and safety of structures and operations which might be influenced by geotechnical construction,

— for perpetuation of evidence, and

— for the evaluation and control of geotechnical works.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14688-1, *Geotechnical investigation and testing — Identification and classification of soil — Part 1: Identification and description*

ISO 14689-1, *Geotechnical investigation and testing — Identification and classification of rock — Part 1: Identification and description*

ISO 22475-1, *Geotechnical investigation and testing — Sampling methods and groundwater measurements — Part 1: Technical principles for execution*

ISO/IEC Guide 99:2007, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

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3 Terms and symbols

3.1 Terms

For the purposes of this document, the terms and definitions given in ISO/IEC Guide 99:2007 and the following apply.

3.1.1
geotechnical monitoring
observation of the ground behaviour and/or performance of geotechnical structures before, during, and/or after construction

Note 1 to entry: Geotechnical monitoring is an integral part of the Observational Design procedure (see EN 1997–1: 2004).

Note 2 to entry: Geotechnical monitoring is based on field observation, including construction site inspection.

3.1.2
field instrument
measuring tool to assist geotechnical monitoring

Note 1 to entry: Monitoring by field instruments comprises the measurement of physical parameters, in particular, the change of the parameter values.

3.1.3
geotechnical key parameter
physical parameter indicative of the geotechnical issue under consideration and subject to geotechnical monitoring

EXAMPLE Displacement (absolute or relative), strain, inclination, stress, pore pressure, earth pressure, force, velocity, acceleration, temperature.

3.1.4
geotechnical monitoring project
entirety of aspects and processes which, in a specific project, are relevant for geotechnical monitoring

Note 1 to entry: Includes planning, risk assessment, specifying, procurement, delivery, and installation of a project-specific monitoring system and collecting, processing, evaluating, and reporting of the monitoring data.

3.1.5
geotechnical monitoring concept
preliminary plan for the measurement of geotechnical key parameters developed within the conceptual design phase, identifying specific objectives such as risk mitigation to be addressed by monitoring, thereby considering type of measurement, measuring locations, and schedule(s) for carrying out the measurement

3.1.6
geotechnical monitoring plan
advancement of the monitoring concept within the specification design phase

3.1.7
geotechnical monitoring system
hardware and software to provide field data

Note 1 to entry: Includes instruments signal, transmission (e.g. electric cables), data acquisition, and auxiliary units.

Note 2 to entry: The performance (e.g. the accuracy, stability, precision) of the geotechnical monitoring system will not necessarily be identical to the performances of the system components.

3.1.8
geotechnical monitoring programme
entirety of those components of a monitoring project which can be systematically planned, consisting of a monitoring plan and monitoring system

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