



SLOVENSKI STANDARD
SIST EN ISO 18674-8:2024

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Geotehnično preiskovanje in preskušanje - Geotehnične meritve - 8. del: Merjenje sil: obremenilne celice (ISO 18674-8:2023)

Geotechnical investigation and testing - Geotechnical monitoring by field instrumentation - Part 8: Measurement of loads: Load cells (ISO 18674-8:2023)

Geotechnische Erkundung und Untersuchung - Geotechnische Messungen - Teil 8: Messung von Kräften: Kraftmessdosen (ISO 18674-8:2023)

Reconnaissance et essais géotechniques - Surveillance géotechnique par instrumentation in situ - Partie 8: Mesure de charges : cellules de charge (ISO 18674-8:2023)

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	Gradnja temeljev. Dela pod zemljo	Foundation construction. Underground works

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Geotechnical investigation and testing - Geotechnical monitoring by field instrumentation - Part 8: Measurement of loads: Load cells (ISO 18674-8:2023)

Reconnaissance et essais géotechniques - Surveillance géotechnique par instrumentation in situ - Partie 8: Mesure de charges : cellules de charge (ISO 18674-8:2023)

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European foreword

This document (EN ISO 18674-8:2023) has been prepared by Technical Committee ISO/TC 182 "Geotechnics" in collaboration with Technical Committee CEN/TC 341 "Geotechnical Investigation and Testing" the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2024, and conflicting national standards shall be withdrawn at the latest by March 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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INTERNATIONAL
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**Geotechnical investigation and
testing — Geotechnical monitoring by
field instrumentation —**

**Part 8:
Measurement of loads: Load cells**

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

Partie 8: Mesure de charges: Cellules de charge

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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 document 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).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 182, *Geotechnics*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 341, *Geotechnical Investigation and Testing*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 18674 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Geotechnical investigation and testing — Geotechnical monitoring by field instrumentation —

Part 8: Measurement of loads: Load cells

IMPORTANT — The electronic file of this document contains colours which are considered to be useful for the correct understanding of the document. Users should therefore consider printing this document using a colour printer.

1 Scope

This document specifies the measurement of forces by means of load cells carried out for geotechnical monitoring. General rules of performance monitoring of the ground, of structures interacting with the ground, of geotechnical fills and of geotechnical works are presented in ISO 18674-1.

This document is applicable to:

- performance monitoring of geotechnical structures such as anchors, tiebacks, piles, struts, props and steel linings;
- checking geotechnical designs and adjustment of construction in connection with the observational method;
- evaluating stability during or after construction.

This document is not applicable to devices where the load is purposely applied to geotechnical structures in the wake of geotechnical field tests such as calibrated hydraulic jacks for pull-out tests of anchors or load tests of piles.

NOTE 1 This document fulfils the requirements for the performance monitoring of the ground, of structures interacting with the ground and of geotechnical works by the means of load cells as part of the geotechnical investigation and testing in accordance with References [2] and [3].

NOTE 2 ISO 18674-7 is intended to define the measurement of forces by means of strain or displacement gauges.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

ISO 18674-1:2015, *Geotechnical investigation and testing — Geotechnical monitoring by field instrumentation — Part 1: General rules*

3 Terms and definitions

For the purposes of this document the terms and definitions given in ISO 18674-1 and the following apply.

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ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

load cell

field instrument for monitoring forces acting in geotechnical structures

Note 1 to entry: Load cells are commonly placed at an end of a structural member where forces are transmitted from one member to another.

EXAMPLE Load cell at the anchor head where the force acting in the anchor tendon is transmitted to a retaining wall.

Note 2 to entry: Common load cells are electric (see 3.2) and hydraulic (see 3.3) measuring principles.

Note 3 to entry: Indispensable components of load cells are a load bearing element and load distribution plates for transmitting forces between structural members.

Note 4 to entry: Load cells are not useful for fully grouted rock bolts.

3.2

electric load cell

instrument with an elastically-behaving body which deforms under the applied force, where the resulting deformation is measured by electric sensors

Note 1 to entry: An example of such body is a steel cylinder (see Figure 2).

Note 2 to entry: For typical electric sensors, see 5.2.4.

3.3

hydraulic load cell

instrument with a flat liquid-filled compartment where the force to be monitored acts normal to the flat distribution plates on the sides of the compartment and where the pressure in the liquid of the compartment is measured by a pressure measuring device

Note 1 to entry: See Figure 3.

Note 2 to entry: The compartment is formed by two steel plates, welded together around their peripheries, where the intervening cavity is filled with a liquid (de-gassed fluid).

3.4

anchor load cell

purpose-designed load cell with a centric passage to accommodate the anchor tendon

Note 1 to entry: See Figure 4.

Note 2 to entry: The tendon typically comprises a bar, strands or wires.

3.5

nominal range

range over which the load cell is calibrated

Note 1 to entry: Other terms which are used in practice are, for example, load range, nominal load, capacity, full-scale capacity or measuring range.

Note 2 to entry: Outside of the nominal range, the load cell is not calibrated and therefore the measurements are not reliable.