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Geotechnical investigation and testing — Laboratory testing of soil —

Part 7: Unconfined compression test

Reconnaissance et essais géotechniques — Essais de laboratoire sur les sols —

Partie 7: Essai de compression uniaxiale

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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 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 the following URL: www.iso.org/iso/foreword.html.

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This first edition of ISO 17892-7 cancels and replaces ISO/TS 17892-7:2004, which has been technically revised. It also incorporates the Technical Corrigendum ISO/TS 17892-7:2004/Cor 1:2006.

A list of all the parts in the ISO 17892 series can be found on the ISO website.

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Introduction

This document covers areas in the international field of geotechnical engineering never previously standardized. It is intended that this document presents broad good practice throughout the world and significant differences with national documents are not anticipated. It is based on international practice (see Reference [4]).

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Geotechnical investigation and testing — Laboratory testing of soil —

Part 7: Unconfined compression test

1 Scope

This document specifies a method for the unconfined compression test.

This document is applicable to the determination of the unconfined compressive strength for a homogeneous specimen of undisturbed, re-compacted, remoulded or reconstituted soil under compression loading within the scope of geotechnical investigations.

This test method is useful to estimate the undrained shear strength of soil. It is noted that drainage is not prevented during this test. The estimated value for undrained shear strength is, therefore, only valid for soils of low permeability, which behave sufficiently undrained during the test.

NOTE This document fulfils the requirements of unconfined compression tests for geotechnical investigation and testing in accordance with EN 1997-1 and EN 1997-2.

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

ISO 17892-1, *Geotechnical investigation and testing — Laboratory testing of soil — Part 1: Determination of water content*

ISO 17892-2, *Geotechnical investigation and testing — Laboratory testing of soil — Part 2: Determination of bulk density*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
unconfined compressive strength
vertical stress at *failure* (3.3) in the test

3.2
undrained shear strength
shear strength in the unconfined compression test equal to one-half of the *unconfined compressive strength* (3.1)

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3.3
failure
stress or strain condition at which one of the following criteria are met:

— peak stress during the test;

— a specified deformation criterion if a peak stress has not been achieved, e.g. 15 % vertical strain.

4 Symbols

σ_v	vertical stress on the specimen
ε_v	vertical strain
q_u	unconfined compressive strength
c_u	undrained shear strength
H_i	initial height of the specimen
ΔH	change in height of the specimen during compression
A_i	initial cross-sectional area of specimen
P	vertical load on the specimen including the weight of the top platen if it is resting on the specimen

5 Apparatus

5.1 General

The apparatus shall undergo regular maintenance, checking and calibration as specified in Annex A.

A schematic diagram of a typical apparatus for unconfined compression testing is shown in Figure 1.

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