

MULLATÖÖD. OSA 5: KVALITEEDIKONTROLL

Earthworks - Part 5: Quality control

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 16907-5:2018 sisaldab Euroopa standardi EN 16907-5:2018 ingliskeelset teksti.	This Estonian standard EVS-EN 16907-5:2018 consists of the English text of the European standard EN 16907-5:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 05.12.2018.	Date of Availability of the European standard is 05.12.2018.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 93.020

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis- ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autoriõiguse kaitse kohta, võtke palun ühendust Eesti Standardimis- ja Akrediteerimiskeskusega: Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about standards copyright protection, please contact the Estonian Centre for Standardisation and Accreditation: Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Earthworks - Part 5: Quality control

Terrassement - Partie 5: Contrôle qualité et
surveillance

Erdarbeiten - Teil 5: Qualitätskontrolle und
Überwachung

This European Standard was approved by CEN on 14 May 2018.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	3
1 Scope.....	4
2 Normative references.....	4
3 Terms and definitions	4
4 Quality Assurance Programme	5
5 Quality Control Plan.....	5
6 Material checking.....	6
7 Approaches to Compaction Control.....	6
7.1 General.....	6
7.2 Method Specification.....	6
7.3 End product Specification	7
8 Compliance testing	7
8.1 General.....	7
8.2 <i>In situ</i> density testing.....	8
8.3 Stiffness and bearing capacity testing	9
8.3.1 General.....	9
8.3.2 Plate loading tests.....	9
8.3.3 Deflectometer tests	10
8.3.4 Penetration tests	10
8.3.5 Methods to check the quality of compaction of coarse materials.....	10
8.4 Continuous Compaction Control (CCC) using vibrating rollers.....	10
8.5 Geometry/Tolerances	11
9 Frequency of testing.....	11
10 Evaluation of test results.....	11
11 Records to be kept during construction	12
11.1 Daily records.....	12
11.2 Presentation of test results	12
11.3 As-built records	12
12 Fill construction monitoring.....	13
Annex A (informative) Methods of evaluation of test results	14
A.1 Evaluation by the single result method.....	14
A.2 Evaluation by the attributes method	14
A.3 Evaluation by the variables method.....	14
Annex B (informative) Specification of compaction requirements using the <i>Q/S</i> method	16
B.1 Definition	16
B.2 Compaction specifications.....	16
B.3 Compaction control	17
Bibliography.....	19

European foreword

This document (EN 16907-5:2018) has been prepared by Technical Committee CEN/TC 396 “Earthworks”, the secretariat of which is held by AFNOR.

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 June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

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.

This document is one of the European Standards within the framework series of EN 16907 on *Earthworks*, as follows:

- *Part 1: Principles and general rules;*
- *Part 2: Classification of materials;*
- *Part 3: Construction procedures;*
- *Part 4: Soil treatment with lime and/or hydraulic binders;*
- *Part 5: Quality control (this document);*
- *Part 6: Land reclamation earthworks using dredged hydraulic fill;*
- *Part 7: Hydraulic placement of extractive waste.*

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard provides recommendations and guidance on the quality assurance and quality control of earthworks construction forming part of general civil engineering and building works. It provides guidance on the techniques to be used to give clients, contractors and designers confidence that the earthworks have been constructed in accordance with their requirements.

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.

EN 1997-1:2004, *Eurocode 7: Geotechnical design - Part 1: General rules*

EN 16907-1, *Earthworks - Part 1: Principles and general rules*

EN 16907-2, *Earthworks - Part 2: Classification of materials*

EN 16907-3, *Earthworks - Part 3: Construction procedures*

EN 16907-4, *Earthworks - Part 4: Soil treatment with lime and/or hydraulic binders*

EN 16907-6, *Earthworks - Part 6: Land reclamation earthworks using dredged hydraulic fill*

CEN/TS 17006, *Earthworks - Continuous Compaction Control (CCC)*

EN ISO 18674 (all parts), *Geotechnical investigation and testing – Geotechnical monitoring by field instrumentation*

EN ISO 22476-1, *Geotechnical investigation and testing - Field testing - Part 1: Electrical cone and piezocone penetration test (ISO 22476-1)*

EN ISO 22476-2, *Geotechnical investigation and testing - Field testing - Part 2: Dynamic probing (ISO 22476-2)*

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>

Note See also Clause 3 in EN 16907-1:2018 for general terms and definitions for use in earthworks.

3.1 quality assurance

all those planned and systematic actions necessary to provide confidence that the earth-structure will perform satisfactorily in service i.e. that it has been constructed to the specified requirements