EESTI STANDARD EVS-EN 15237:2007

Execution of special geotechnical works - Vertical drainage

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EESTI STANDARDIKESKUS

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 15237:2007 sisaldab Euroopa standardi EN 15237:2007 ingliskeelset teksti. Käesolev dokument on jõustatud 30.03.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 15237:2007 consists of the English text of the European standard EN 15237:2007. This document is endorsed on 30.03.2007 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This European Standard establishes general principles for the execution, testing, supervision and monitoring of vertical drain projects. This European Standard includes the application of prefabricated vertical drains and sand drains and deals with requirements to be placed on design, drain material and installation methods. This European Standard applies to the improvement of low-permeability, highly compressible soils by vertical drainage and preloading. Information regarding loading (embankment, vacuum or ground water lowering) and preloading is given in informative Annexes A and B.	**Scope:** This European Standard establishes general principles for the execution, testing, supervision and monitoring of vertical drain projects. This European Standard includes the application of prefabricated vertical drains and sand drains and deals with requirements to be placed on design, drain material and installation methods. This European Standard applies to the improvement of low-permeability, highly compressible soils by vertical drainage and preloading. Information regarding loading (embankment, vacuum or ground water lowering) and preloading is given in informative Annexes A and B.

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English Version

Execution of special geotechnical works - Vertical drainage

Exécution des travaux géotechniques spéciaux - Drains verticaux

Ausführung von besonderen geotechnischen Arbeiten (Spezialtiefbau) - Vertikaldräns

This European Standard was approved by CEN on 7 January 2007.

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 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 Management Centre has the same status as the official versions.

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

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 15237:2007) has been prepared by Technical Committee CEN/TC 288 “Execution of special geotechnical works”, 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 August 2007, and conflicting national standards shall be withdrawn at the latest by August 2007.

The document has been prepared to stand alongside EN 1997–1, *Eurocode 7: Geotechnical design — Part 1: General rules*, and EN 1997–2 *Eurocode 7: Geotechnical design — Part 2: Ground investigation and testing*. This standard expands on design only where necessary, but provides full coverage of the construction and supervision requirements.

This document was drafted by a working group comprising delegates from 10 European countries. Experts from Japan have taken part in the meetings of the working group and contributed to the formulation of the final draft. The working group commenced work in March 2002.

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

1 Scope

This European Standard establishes general principles for the execution, testing, supervision and monitoring of vertical drain projects.

This European Standard includes the application of prefabricated vertical drains and sand drains and deals with requirements to be placed on design, drain material and installation methods. This European Standard applies to the improvement of low-permeability, highly compressible soils by vertical drainage and preloading. Information regarding loading (embankment, vacuum or ground water lowering) and preloading is given in informative Annexes A and B.

Vertical drainage is used both in on land and in marine constructions for the following purposes:

— (pre-)consolidation and reduction of post-construction settlements;

— speeding up the consolidation process by decreasing the path lengths for pore water dissipation;

— increase of stability (by increasing effective stresses in the soil);

— groundwater lowering;

— mitigation of liquefaction effects.

In each case there is an overall treatment of the soil (the volume of the drains is small in relation to the soil volume treated).

This European Standard does not include soil improvement by means of wells, gravel and stone columns, large-diameter geotextile enclosed columns or reinforcing elements.

Vertical drainage can also be combined with other foundation or ground improvement methods, e.g. electro-osmosis, piles and compacted sand piles, dynamic compaction and deep mixing.

Guidance on practical aspects of vertical drainage, such as investigation of drain properties, execution procedures and equipment, is given in Annex A. Investigation of soil characteristics and assessment of design parameters, which are affected by drain properties and execution, are presented in Annex B.

2 Normative references

The following referenced documents are indispensable for the application 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, *Eurocode 7: Geotechnical design — Part 1: General rules*

EN 1997–2, *Eurocode 7: Geotechnical design — Part 2: Ground investigation and testing*

EN 13252:2000, *Geotextiles and geotextile-related products — Characteristics required for use in drainage systems*

EN ISO 9862, *Geosynthetics — Sampling and preparation of test specimens (ISO 9862:2005)*

EN ISO 10319, *Geotextiles — Wide-width tensile test (ISO 10319:1993)*

EN ISO 10320, *Geotextiles and geotextile-related products — Identification on site (ISO 10320:1999)*

EN ISO 10321, *Geotextiles — Tensile test for joints/seams by wide-width method (ISO 10321:1992)*

EN ISO 11058, *Geotextiles and geotextile-related products — Determination of water permeability characteristics normal to the plane, without load (ISO 11058:1999)*

EN ISO 12956, *Geotextiles and geotextile-related products — Determination of the characteristic opening size (ISO 12956:1999)*

EN ISO 12958:1999, *Geotextiles and geotextile-related products — Determination of water flow capacity in their plane (ISO 12958:1999)*

EN ISO 14688 (all parts), *Geotechnical investigation and testing*

3 Terms and definitions

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

3.1
auger installation method
fr: installation à la tarière
de: Schneckeneinbauverfahren
installation method of sand drains by means of screw type auger or continuous flight hollow stem auger

3.2
band drain[1)]
fr: drain plat
de: Streifendrän
prefabricated drain with a rectangular cross-section, usually consisting of a central core with a channel system surrounded by a filter sleeve

3.3
cylindrical prefabricated drain
fr: drain tubulaire
de: zylindrischer Drän
drain consisting of an annular-corrugated and perforated open core, surrounded by a filter sock

3.4
discharge capacity q_w
fr: capacité de décharge
de: Durchflusskapazität
discharge capacity of a drain well is equal to the cross-sectional area of the drain multiplied by its overall permeability in longitudinal direction (the volume of water which flows out of the drain per time unit under a hydraulic gradient equal to unity)

3.5
displacement installation method
fr: installation par fonçage refoulant
de: Verdrängungseinbauverfahren
installation method of drains by means of a closed-end steel tube/mandrel

1) The terms “wick drains” and “prefabricated vertical drains” (PVD) are also used.