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Execution of special geotechnical works - Reinforced fill

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EESTI STANDARDIKESKUS

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 14475:2006 sisaldab Euroopa standardi EN 14475:2006+AC:2006 ingliskeelset teksti. Käesolev dokument on jõustatud 27.02.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 14475:2006 consists of the English text of the European standard EN 14475:2006+AC:2006. This document is endorsed on 27.02.2006 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 construction of reinforced fill. This European Standard covers engineered fills that are reinforced by the inclusion of horizontal or subhorizontal reinforcement placed between layers of fill during construction.	**Scope:** This European Standard establishes general principles for the construction of reinforced fill. This European Standard covers engineered fills that are reinforced by the inclusion of horizontal or subhorizontal reinforcement placed between layers of fill during construction.

ICS 93.020

Võtmesõnad: common areas, conformity tests, exhaust manifolds, flues, liquefied petroleum gases, measurement, sampling, specification (, specifications, systems, temperature, testing, thermal resistance, tightness, tolerances, tolerances (measurement), types, water absorption

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Eesti Standardikeskusele kuulub standardite reprodutseerimis- ja levitamisõigus

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14475

January 2006

ICS 93.020

English Version

Execution of special geotechnical works - Reinforced fill

Exécution de travaux géotechniques spéciaux - Remblais renforcés

Ausführung von besonderen technischen Arbeiten (Spezialtiefbau) - Bewehrte Schüttkörper

This European Standard was approved by CEN on 10 November 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, 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.

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

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Ref. No. EN 14475:2006: E

Contents

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Foreword

This document (EN 14475:2006) 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 July 2006, and conflicting national standards shall be withdrawn at the latest by July 2006.

The design of reinforced fill structures is currently carried out using national standards such as BS 8006 (1995) and NF P 94-220 (1998) and other standards. As a matter of fact EN 1997-1, Eurocode 7 (Geotechnical design) does not currently cover the detailed design of reinforced fill structures. The values of partial factors and load factors given in EN 1997-1 have not been calibrated for reinforced fill structures.

Whilst many common features exist between the design methods that have been developed and established in the various member countries of CEN, there are also differences reflecting different working practices, as well as such matters as geological and climatic variations.

In view of these differences, and of the time required to develop a common design method that would fully reflect the various considerations identified in particular national methods, a two stage approach has been adopted for the development of standards for reinforced fill.

In accordance with this two stage approach Working Group 9 was mandated by TC 288 for first producing an EN giving guidance on the Execution of reinforced fill, before working towards a common method of design. This standard represents the implementation of the first part of that mandate.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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

1.1 This European Standard establishes general principles for the construction of reinforced fill.

1.2 This European Standard covers engineered fills that are reinforced by the inclusion of horizontal or sub-horizontal reinforcement placed between layers of fill during construction.

1.3 The scope of reinforced fill applications considered in this European Standard includes (Figure 1):

— earth retaining structures, (vertical, battered or inclined walls, bridge abutments, bulk storage facilities), with a facing to retain fill placed between the reinforcing layers;

— reinforced steep slopes with a facing, either built-in or added or wrap-around, reinforced shallow slopes without a facing, but covered by some form of erosion protection without a facing, reinstatement of failed slopes;

— embankments with basal reinforcement and embankments with reinforcement against frost heave in the upper part.

Principles for the execution of other special geotechnical works using soil nails, bored piles, displacement piles, micro piles, sheet pile walls, diaphragm walls, grouting or jet grouting are established in other European Standards.

Reinforcement of road pavements is not covered by this Standard.

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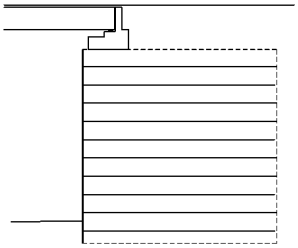
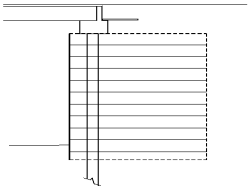
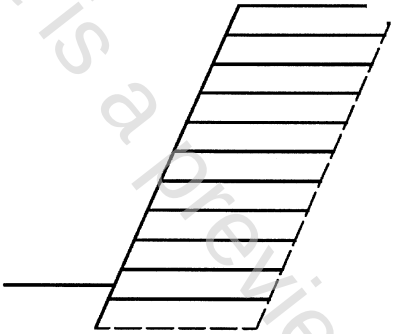
a) Walls



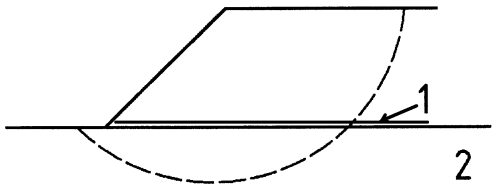
b) Abutments



c) Mixed abutments



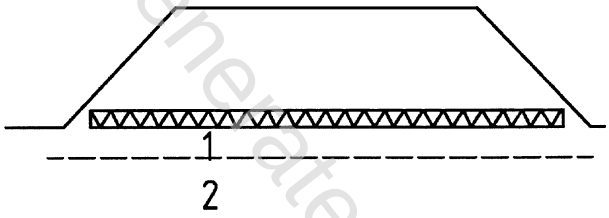
d) Reinforced slopes



e) Basal reinforcement

Key

1 Reinforcement
2 Soft deposit



f) Basal mattress

Key

1 Thin soft layer
2 Firm layer

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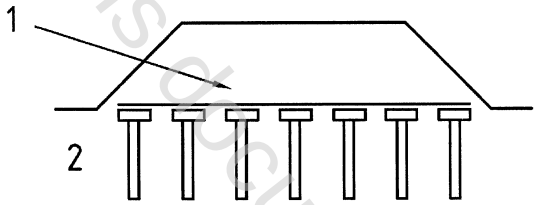
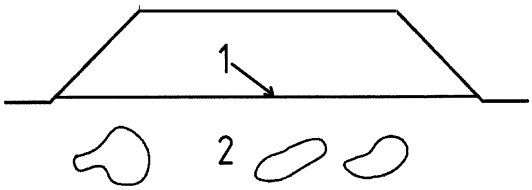


g) Piled embankments with basal reinforcement

Key

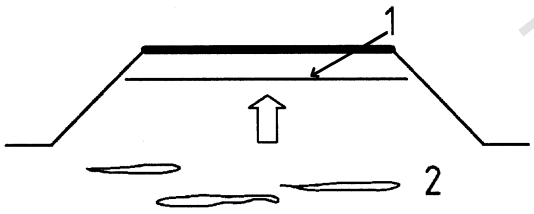
1 Reinforcement
2 Piles



h) Reinforcement over areas prone to subsidence

Key

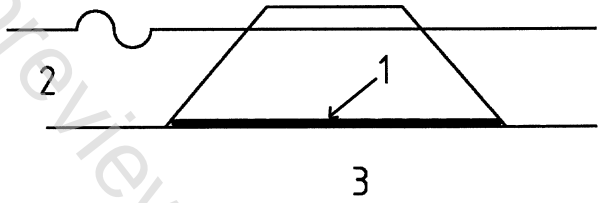
1 Reinforcement
2 Potential weak zones or voids



i) Reinforcement in areas prone to frost heave

Key

1 Reinforcement
2 Ice lenses



j) Offshore Basal Reinforcement

Key

1 Reinforcement
2 Lake or sea
3 Soft seabed

Figure 1 — Some reinforced fill applications

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 206-1, *Concrete – Part 1: Specification, performance, production and conformity.*

EN 1990, *Eurocode – Basis of structural design.*

EN 1991, *Eurocode 1 : Actions on structures.*

EN 1992-1-1, *Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings*

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

EN 10025-2, *Hot rolled products of structural steels – Part 2: Technical delivery conditions for non-alloy structural steels*.

EN 10025-4, *Hot rolled products of structural steels – Part 4: Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels.*

EN 10079, *Definition of steel products.*

EN 10080, *Steel for the reinforcement of concrete - Weldable reinforcing steel - General*

EN 10218-1, *Steel wire and wire products – General - Part 1 : Test methods*.

EN 10218-2, *Steel wire and wire products - General - Part 2 : Wire dimensions and tolerances*.

EN 10223-3, *Steel wire and wire products for fences - Part 3 : Hexagonal steel wire netting for engineering purposes.*

EN 10223-4, *Steel wire and wire products for fences - Part 4 : Steel wire welded mesh facing.*

EN 10244-1, *Steel wire and wire products - Non-ferrous metallic coatings on steel wire - Part 1: General principles.*

EN 10244-2*, Steel wire and wire products - Non-ferrous metallic coatings on steel wire - Part 2: Zinc or zinc alloy coatings.*

EN 10245-1, *Steel wire and wire products - Organic coatings on steel wire – Part 1: General rules.*

EN 10245-2, *Steel wire and wire products - Organic coatings on steel wire – Part 2: PVC finished wire.*

EN 10245-3, *Steel wire and wire products - Organic coatings on steel wire – Part 3: PE coated wire.*

EN 10326, *Continuously hot-dip coated strip and sheet of structural steels – Technical delivery conditions.*

EN 12224, *Geotextiles and geotextile-related products – Determination of the resistance to weathering.*

EN 12225, *Geotextiles and geotextile-related products – Method for determining the microbiological resistance by a soil burial test.*

EN 13251, *Geotextiles and geotextile-related products - Characteristics required for use in earthworks, foundations and retaining structures*.

EN ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel - Part 1: Bolts, screws and studs (ISO 898-1:1999)*

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods (ISO 1461:1999)*

EN ISO 2063, *Thermal spraying - Metallic and other inorganic coatings - Zinc, aluminium and their alloys (ISO 2063:2005)*

EN ISO 10320, *Geotextiles and geotextile-related products – identification on site (ISO 10320:1999).*

ENV ISO 10722-1, *Geotextiles and geotextile-related products - Procedure for simulating damage during installation - Part 1: Installation in granular materials (ISO 10722-1:1998)*

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EN ISO 12957-1, *Geosynthetics - Determination of friction characteristics - Part 1: Direct shear test (ISO 12957-1:2005)*

EN ISO 13431, *Geotextiles and geotextile-related products - Determination of tensile creep and creep rupture behaviour (ISO 13431:1999)*

3 Terms and definitions

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

3.1
fill
natural or man made material formed of solid particles, including certain rocks, used to construct engineered fill

3.2
reinforcement
generic term for reinforcing inclusions placed within fill

3.3
engineered fill
fill which is placed and compacted under controlled conditions

3.4
reinforced fill
engineered fill incorporating discrete layers of soil reinforcement, generally placed horizontally, which are arranged between successive layers of fill during construction

3.5
fill reinforcement
reinforcement which enhances stability of the reinforced fill mass by mobilising the axial tensile strength of the fill reinforcement by soil interaction over its total length

NOTE It is typically in the form of a strip, sheet, rod, grid or mesh and is usually placed in discrete layers.

3.6
geosynthetics
for the purpose of this European standard “geosynthetics” stands for “geotextiles and geotextile related products”

3.7
facing
covering to the exposed face of a reinforced fill structure which retains the fill between layers of reinforcement and protects the fill against erosion

3.8
foundation
foundation of a reinforced fill structure is the total area of the surface upon which the lowest layer of reinforcement is installed

3.9
discrete facing unit
partial height facing unit used to construct incrementally a reinforced fill structure

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