GEOTEHNILISTE ERITÖÖDE TEGEMINE. PINNASEANKRUD

Execution of special geotechnical work - Ground anchors

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 1537:2013 sisaldab Euroopa standardi EN 1537:2013 ingliskeelset teksti.	This Estonian standard EVS-EN 1537:2013 consists of the English text of the European standard EN 1537:2013.
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.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 10.07.2013.	Date of Availability of the European standard is 10.07.2013.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1537

July 2013

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Supersedes EN 1537:1999

English Version

Execution of special geotechnical works - Ground anchors

Exécution des travaux géotechniques spéciaux - Tirants d'ancrage

Ausführung von Arbeiten im Spezialtiefbau - Verpressanker

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

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Foreword

This document (EN 1537:2013) 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of an identical text or by endorsement, at the latest by January 2014, and conflicting national standards shall be withdrawn at the latest by January 2014.

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

This document supersedes EN 1537:1999.

The remit of CEN/TC 288 is the standardisation of the execution procedures for geotechnical works (including testing and control methods) and of the required material properties. CEN/TC 288/WG 14 has been charged with the revision of EN 1537:1999 in the subject area of ground anchors, which includes all anchors that are bonded to the ground by grout and are stressed and tested.

This standard has been prepared to stand alongside EN 1997-1, *Eurocode 7: Geotechnical design — Part 1: General rules*, and prEN ISO 22477-5, *Geotechnical investigation and testing — Testing of geotechnical structures — Part 5*. Design, safety aspects and testing, which were included as the informative Annexes D and E in the previous issue of this standard (EN 1537:1999), were consequently taken out of this present issue. Clause 7, “Considerations related to design” of this standard deals only with those design matters that should be taken into account during the execution stage of ground anchors so that the design of the anchor system may be fulfilled. In addition, this standard provides full coverage of the construction and supervision requirements.

The revision of this standard was effected by a working group comprising of delegates from ten countries and the comments of these countries have been taken into account. The main amendments are:

— definitions and terminology brought into accordance with the definitions and terminology of EN 1997-1:2004, *Eurocode 7*, in particular with Section 8;

— alignment of this European Standard with prEN ISO 22477-5;

— structural revisions to match the structure of this standard with that of other standards for special geotechnical works, e.g. EN 1536, *Execution of special geotechnical work — Bored piles* and EN 1538, *Execution of special geotechnical work — Diaphragm walls*;

— general revision in accordance with comments received during the CEN Enquiry, 2010;

— update of references.

As long as EN ISO 22477-5 is not available, national solutions should be implemented for the testing of anchors.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

1.1 This European Standard covers ground anchors grouted into the ground which are stressed and tested. They can be used for permanent or temporary applications.

NOTE For the purpose of this standard the term ‘anchor(s)’ refers to ‘ground anchor(s)’.

1.2 The anchors are designed in accordance with EN 1997-1 and are tested in accordance with prEN ISO 22477-5.

1.3 Typical bond and compression type anchors are shown in Figure 1 and Figure 2.

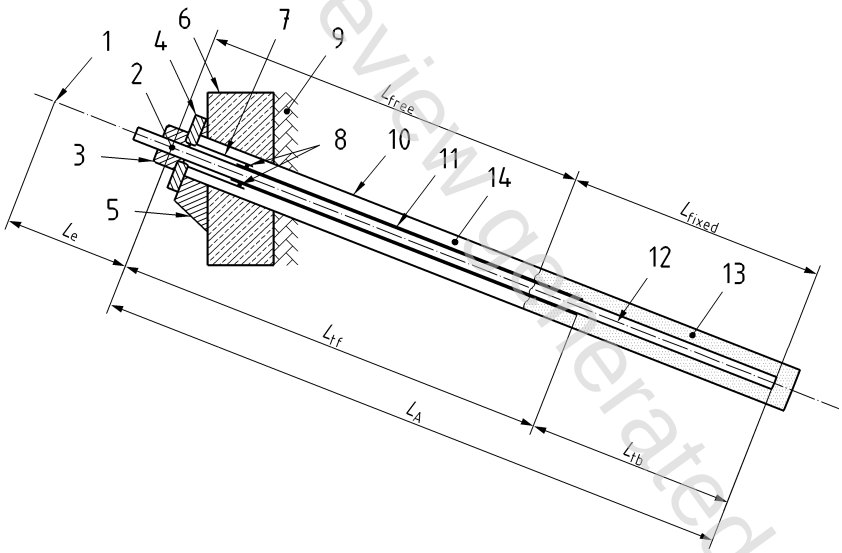
1.4 The term "ground" is taken to encompass soil, rock and fill already in place or existing prior to the execution of the construction work.

1.5 The planning and design of ground anchors calls for experience and knowledge in this specialised field.

1.6 The installation and testing phases require skilled, qualified labour and supervision.

1.7 This standard cannot replace the knowledge of specialist personnel and the expertise of experienced contractors required to apply this standard.

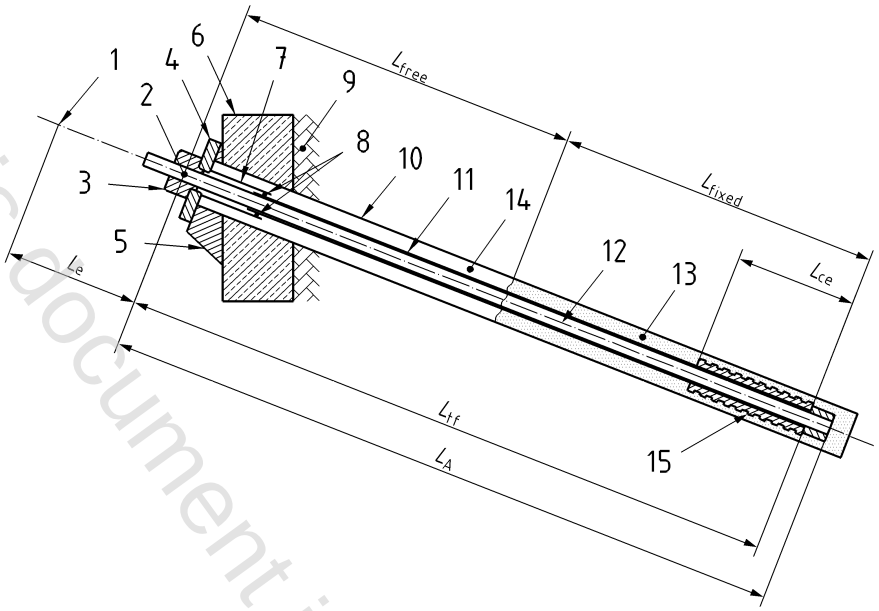
1.8 This standard does not address systems such as tension piles, screw anchors, mechanical anchors, soil nails, dead-man anchors or expander anchors as these do not fulfil the requirements of this standard.



Key

1	anchorage point at jack during stressing	8	O-Ring
2	anchorage point at anchor head in service	9	soil/rock
3	tensioning element at anchor head	10	borehole
4	bearing plate	11	debonding sleeve
5	load transfer block	12	tendon
6	structural element	13	fixed length grout body
7	trumpet or anchor head tube	14	free length filling where appropriate

Figure 1 — Sketch of a bond type ground anchor — Details of anchor head and head protection omitted



Key

1 anchorage point at jack during stressing
2 anchorage point at anchor head in service
3 tensioning element at anchor head
4 bearing plate
5 load transfer block
6 structural element
7 trumpet or anchor head tube
8 O - Ring
9 soil/rock
10 borehole
11 debonding sleeve
12 tendon
13 fixed length grout body
14 free length filling where appropriate
15 compression element

Figure 2 — Sketch of a compression type ground anchor — Details of anchor head and head protection omitted

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 447, *Grout for prestressing tendons — Basic requirements*

EN 934-2, *Admixtures for concrete, mortar and grout — Part 2: Concrete admixtures — Definitions, requirements, conformity, marking and labelling*

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

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

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

EN 10025 (all parts), *Hot-rolled products of structural steels*

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

prEN 10138-1, *Prestressing steel — Part 1: General requirements*

EN 10210-1, *Hot finished structural hollow sections of non-alloy and fine grain steels — Part 1: Technical delivery conditions*

EN 10219-1, *Cold formed welded structural hollow sections of non-alloy and fine grain steels — Part 1: Technical delivery conditions*

EN 10219-2, *Cold formed welded structural hollow sections of non-alloy and fine grain steels — Part 2: Tolerances, dimensions and sectional properties*

EN ISO 12944-5, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 5: Protective paint systems (ISO 12944-5)*

prEN ISO 22477-5, *Geotechnical investigation and testing — Testing of geotechnical structures — Part 5: Testing of anchorages (ISO/DIS 22477-5)*[1)]

ETAG 013, *Post-tensioning kits for prestressing of structures*

3 Terms, definitions and symbols

3.1 Terms and definitions

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

3.1.1
anchor head
fr: tête d'ancrage
de: Ankerkopf
element of a ground anchor which transmits the tensile load from the tendon to the bearing plate or the structure

1) In preparation.