

© Copyright SEK. Reproduction in any form without permission is prohibited.

Dimensionering av friledningar för starkström – Provning av fundament

*Overhead lines –
Testing of foundations for structures*

Som svensk standard gäller europastandarden EN 61773:1996. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61773:1996.

Nationellt förord

Europastandarden EN 61773:1996^{*)}

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61773, First edition, 1996^{**)} - Overhead lines - Testing of foundations for structures**

utarbetad inom International Electrotechnical Commission, IEC.

^{*)} EN 61773:1996 ikraftsattes 1997-11-28 som SS-EN 61773 utan återgivning av IEC-standardens.

^{**)} Corrigendum March 1997 till IEC 61773:1996 är inarbetat i standarden.

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

ICS 29.240.20

Descriptors: Overhead lines, foundations for structures, soil investigation, beam, pile

English version

**Overhead lines
Testing of foundations for structures
(IEC 1773:1996)**

Lignes aériennes - Essais
de fondations des supports
(CEI 1773:1996)

Freileitungen - Prüfung
von Gründungen für Bauwerke
(IEC 1773:1996)

This European Standard was approved by CENELEC on 1996-10-01. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 11/111/FDIS, future edition 1 of IEC 1773, prepared by IEC TC 11, Recommendations for overhead lines, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61773 on 1996-10-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 1997-08-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1997-08-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annexes A, B, C, D, E and F are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 1773:1996 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

**Normative references to international publications
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 50(466)	1990	International electrotechnical vocabulary (IEV) - Chapter 466: Overhead lines	-	-
IEC 826	1991	Loading and strength of overhead transmission lines	-	-

CONTENTS

	Page
Clause	
1 Scope and object.....	9
2 Normative references	9
3 Definitions	11
4 Categories of tests	11
4.1 Design tests	11
4.2 Proof tests.....	13
5 Geotechnical data.....	15
5.1 General	15
5.2 Soil investigation results	15
5.3 Geotechnical design parameters	15
5.4 Soil conditions during foundation installation	15
6 Foundation installation.....	17
6.1 General	17
6.2 Variations on foundations for design tests	17
6.3 Installation techniques for foundations subject to design testing.....	17
6.4 Installation records	19
6.5 Minimum period of time required between installation and testing	19
7 Test equipment.....	21
7.1 Load application	21
7.2 Test loading arrangements.....	23
7.3 Reference beam – Design tests	25
7.4 Displacement measurement devices – Design tests.....	25
7.5 Displacement measurement devices – Proof tests	27
7.6 Calibration of measuring instruments	27
8 Test procedure	41
8.1 Number of tests	41
8.2 Testing of pile groups	41
8.3 Loading procedure.....	43
8.4 Test recording	45
9 Test evaluation.....	47
9.1 General	47
9.2 Design tests	47
9.3 Proof tests.....	49

Clause	Page
10 Acceptance criteria	49
10.1 General	49
10.2 Design tests	49
10.3 Proof tests	51
11 Test report	51
Annexes	
A Bibliography	53
B Soil investigations	55
C Comments on clear horizontal distance between reaction supports and test foundation	61
D Formats for records of installation and testing	67
E Guidance notes for graphical determination of foundation uplift or compression capacity	77
F Glossary of terms and explanations	87

OVERHEAD LINES – TESTING OF FOUNDATIONS FOR STRUCTURES

1 Scope and object

This International Standard is applicable to the testing procedures for foundations of overhead line structures. This standard distinguishes between:

- a) foundations predominantly loaded by axial forces, either in uplift or compression, acting in the direction of the foundation central axis. This applies to foundations of rigid lattice towers with typical individual footings, that is concrete pad and chimney foundations, steel grillages, concrete piers, piles and grouted anchors. Guy (stay) foundations are included when they are tested in line with their true guy inclinations;
- b) foundations predominantly loaded by lateral forces, overturning moments, or a combination of both. This applies to single poles with typical compact foundations, for example monoblock foundations, concrete slabs, concrete piers, piles and poles directly embedded in the ground. It may also apply to H-frame structure foundations for which the predominant loads are lateral forces, overturning moments, or a combination of both;
- c) foundations loaded by a combination of forces mentioned under a) and b).

Tests on reduced scale or model foundations are not included. However, they may be useful for design purposes.

Dynamic foundation testing is excluded from the scope of this document.

The object of this standard is to provide procedures which apply to the investigation of the load-carrying capacity and/or the load response (deflection or rotation) of the total foundation as an interaction between the foundation and the surrounding soil and/or rock. The mechanical strength of the structural components is not within the object of this standard. However, in the case of grouted anchors, the failure of structural components, for example the bond between anchor rod and grout, may predominate.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50(466): 1990, *International Electrotechnical Vocabulary (IEV) – Chapter 466: Overhead lines*

IEC 826: 1991, *Loading and strength of overhead transmission lines*