BRITISH STANDARD

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Execution of special geotechnical work — Sheet pile walls

ICS 93.020

National foreword

This British Standard is the English language version of EN 12063:1999.

The UK participation in its preparation was entrusted to Technical Committee B/526, Geotechnics, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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English version

Execution of special geotechnical work — Sheet pile walls

Exécution de travaux géotechniques spéciaux — Rideaux de palplanches

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This European Standard was approved by CEN on 9 January 1999.

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CEN

European Committee for Standardization
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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by August 1999, and conflicting national standards shall be withdrawn at the latest by August 1999.

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

The present standard expands on design only when necessary, but provides full coverage of the execution and supervision requirements for sheet pile wall structures.

It has been drafted on the basis of existing Codes of Practice and general available expertise which can be found in specialized literature.

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1 Scope

This standard specifies requirements, recommendations and information concerning the execution of permanent or temporary sheet pile wall structures in accordance with **2.4** of ENV 1991-1:1994 and the handling of equipment and materials.

It does not give requirements and recommendations for the installation of specific parts of the structure such as ground anchorages and piles which are covered by other codes.

It applies only to steel sheet pile walls, combined walls and wooden sheet pile walls.

Composite structures such as Berliner walls and sheet pile walls in combination with shotcrete, are not the subject of this standard.

2 Normative references

This 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 standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 287-1:1992 + A1:1997, *Approval testing of welders — Fusion welding — Part 1: Steels.*

EN 288-2:1992 + A1:1997, *Specification and approval of welding procedures for metallic materials — Part 2: Welding procedures specification for arc welding.*

EN 288-3:1992 + A1:1997, *Specification and approval of welding procedures for metallic materials — Part 3: Welding procedure tests for the arc welding of steels.*

EN 499:1994, *Welding consumables — Covered electrodes for manual metal-arc welding of non-alloy and fine grain steels — Classification.*

EN 996:1995, *Piling equipment — Safety requirements.*

prEN 1537, *Execution of special geotechnical work — Ground anchors.*

ENV 1991-1:1994, *Eurocode 1: Basis of design and actions on structures — Part 1: Basis of design.*

ENV 1992-1-1:1994, *Eurocode 2: Design of concrete structures — Part 1-1: General rules and rules and rules for buildings.*

ENV 1993-1-1:1994, *Eurocode 3: Design of steel structures — Part 1-1: General rules and rules for buildings.*

ENV 1993-5:1998, *Eurocode 3: Design of steel structures — Part 5: Piling.*

ENV 1997-1:1994, *Eurocode 7: Geotechnical design — Part 1: General rules.*

EN 10020:1988, *Definitions and classification of grades of steel.*

EN 10079:1992, *Definition of steel products.*

EN 10219-1:1997, *Cold formed structural welded hollow sections of non-alloy and fine grain steels — Part 1: Technical delivery requirements.*

EN 10219-2:1997, *Cold formed welded structural hollow sections of non-alloy and fine grain steels — Part 2: Tolerances, dimensions and sectional properties.*

EN 10248-1:1995, *Hot rolled sheet piling of non-alloy steels — Part 1: Technical delivery conditions.*

EN 10248-2:1995, *Hot rolled sheet piling of non-alloy steels — Part 2: Tolerances on shape and dimensions.*

EN 10249-1:1995, *Cold formed sheet piling of non-alloy steels — Part 1: Technical delivery conditions.*

EN 10249-2:1995, *Cold formed sheet piling of non-alloy steels — Part 2: Tolerances on shape and dimensions.*

EN 24063:1992, *Welding, brazing, braze welding and soldering of metals — Nomenclature of processes and reference number for symbolic representation on drawings.*
(ISO 4063:1990)

EN 25817:1992, *Arc-welded joints in steel — Guidance on quality levels for imperfections.*
(ISO 5817:1992)

EN 29692:1994, *Metal-arc welding with covered electrode, gas-shielded metal-arc welding and gas welding — Joint preparations for steel.*
(ISO 9692:1992)

ISO 1106-1:1984, *Recommended practice for radiographic examination of fusion welded joints — Part 1: Fusion welded butt-joints in steel plates up to 50 mm thick.*

3 Definitions

For the purposes of this standard, the following definitions apply.

3.1
anchorage
anchoring system for the sheet pile wall, for example anchor plates or anchor walls including the connecting rods (tie rods), screw anchors, ground and rock anchors, driven ground anchors, anchoring piles and anchors with grouted or expanded bodies

3.2
auxiliary structures
all structures necessary for the proper and safe execution of the sheet piling works

3.3
bracing
a system of walings and struts to support the structure

3.4
combined wall
retaining wall composed of primary and secondary elements. The primary elements can be steel tubes, beams, or box piles. The secondary elements are normally U or Z-shaped steel sheet piles.
Figure 1 shows examples of combined walls

3.5

comparable experience

documented, or other clearly established information related to the ground and installation conditions, involving similar types of soil and rock and for which similar behaviour is expected. Information gained locally is considered to be particularly relevant

3.6

cushion

material, fitted into a recess in the driving cap, which smoothes the impact force of the falling hammer on the driving cap and on the head of the sheet pile (see Figure 2)

3.7

de-clutching

disconnection of the interlock during sheet pile driving

3.8

de-clutching detector

instrument for determining whether or not the interlocks of adjacent sheet piles are fully engaged during driving

3.9

driving cap

device, placed on the top of the sheet pile which transmits the blow of the hammer evenly, thereby preventing damage of the sheet pile head (see Figure 2)

3.10

driving

any method of installing the sheet piles to the required depth

3.11

driving method

method of driving such as panel driving, pitch and drive, staggered driving by means of impact, vibration pressing or by a combination of these

3.12

driving assistance

method to reduce the penetration resistance during driving, such as jetting or pre-augering

3.13

fish plate, splice plate

steel plate which joins two lengths of sheet pile together (see Figure B.2)

3.14

guide frame

frame consisting of one or more stiff guide beams, normally of steel or wood, to position and maintain the alignment of sheet piles during pitching and driving

3.15

hammer

part of piling equipment for driving sheet piles by percussion impact

3.16

leader

beam or similar, attached to the driving rig to lead the sheet pile and the hammer (or the vibrator) during driving (see Figures 2, 3 and 5)

3.17

leader slide

guiding device connecting the drive cap and/or the hammer to the leader (see Figures 2 and 3)

3.18

leading system

whole system to guide the sheet pile and the hammer (or the vibrator) during driving (see Figure 3)

3.19

rock dowel

rod protruding from the toe of the sheet pile, used for fixing sheet piles to the bed-rock (see Figure 13)

3.20

screw anchor

rod with a screw blade at the end, which is rotated into the natural ground behind the sheet piles to provide an anchorage

3.21

shackle

device for lifting sheet piles from the ground and placing them in the vertical position (see Figure A.7)

3.22

sheet pile

individual element of a sheet pile wall (single, double or multiple sheet pile)

3.23

sheet pile wall

screen of sheet piles which forms a continuous wall. For steel sheet piles continuity is provided by interlocking of the joints, fitting of longitudinal grooves or by means of special connectors and for timber sheet piles, by tongue and groove

3.24

sheet pile wall structure

structure, consisting of sheet piles, soil and rock, anchorages, bracings and walings, which retains ground and water. The elements are shown in Figure 4

3.25

site inspection

inspection of the construction site and its surroundings