



**SLOVENSKI STANDARD**  
**oSIST prEN 12063:2020**  
**01-september-2020**

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**Izvedba posebnih geotehničnih del - Zagatne stene, kombinirane zagatne stene, visoke modularne stene**

Execution of special geotechnical work - Sheet pile walls, combined pile walls, high modulus walls

Ausführung von Arbeiten im Spezialtiefbau - Spundwandkonstruktionen

Exécution des travaux géotechniques spéciaux - Rideaux de palplanches, rideaux mixtes, rideaux à forte inertie

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**ICS:**

93.020	Zemeljska dela. Izkopavanja.	Earthworks. Excavations.
	Gradnja temeljev. Dela pod zemljo	Foundation construction. Underground works

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 12063**

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ICS 93.020

Will supersede EN 12063:1999

English Version

## Execution of special geotechnical work - Sheet pile walls, combined pile walls, high modulus walls

Exécution des travaux géotechniques spéciaux -  
Rideaux de palplanches, rideaux mixtes, rideaux à forte  
inertie

Ausführung von Arbeiten im Spezialtiefbau -  
Spundwandkonstruktionen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 288.

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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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**prEN 12063:2020 (E)****European foreword**

This document (prEN 12063:2020) has been prepared by Technical Committee CEN/TC 288 “Execution of special geotechnical work”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12063:1999.

The general scope of TC 288 is the standardization of the execution procedures for geotechnical works (including testing and control methods) and of the required material properties. WG 19 has been charged to revise EN 12063:1999, with the subject area of sheet pile walls.

In comparison with the previous edition, the following technical modifications have been made:

- The document has been technically revised,
- Normative references have been updated,
- All figures have been revised,
- Combined pile walls, high modulus walls structures, synthetic sheet pile walls, precast and timber sheet pile walls have been added in the scope.

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## 1 Scope

This document specifies requirements, recommendations and information concerning the execution of permanent or temporary sheet pile wall, combined pile walls, high modulus walls structures 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 documents.

It applies only to steel sheet pile walls, combined walls, high modulus walls, synthetic sheet pile walls (composite), precast concrete and timber sheet pile walls. Tubular piles included in combined walls and high modulus walls can be filled with concrete.

Composite structures such as Berliner walls and sheet pile walls in combination with shotcrete, are not covered by this document.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1090-2:2018, *Execution of steel structures and aluminium structures - Part 2: Technical requirements for steel structures*

EN 1537, *Execution of special geotechnical works - Ground anchors*

EN 1997-1:2004, *Eurocode 7: Geotechnical design - Part 1: General rules*  
<https://standards.iteh.ai/catalog/standards/sist/0625c936-5df7-4914-bed1-584402229ecc/osist-pr-en-12063-2020>

EN 1997-2:2007, *Eurocode 7: Geotechnical design - Part 2: Ground investigation and testing*

EN 10020:2000, *Definition and classification of grades of steel*

EN 10079, *Definition of steel products*

EN 10219-1:2006, *Cold formed welded structural hollow sections of non-alloy and fine grain steels - Part 1: Technical delivery conditions*

EN 10219-2, *Cold formed welded steel structural hollow sections - 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, *Cold formed sheet piling of non alloy steels - Part 2: Tolerances on shape and dimensions*

EN 15804, *Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products*

EN 16228-1, *Drilling and foundation equipment - Safety - Part 1: Common requirements*

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EN 16228-2, *Drilling and foundation equipment - Safety - Part 2: Mobile drill rigs for civil and geotechnical engineering, quarrying and mining*

EN 16228-3, *Drilling and foundation equipment - Safety - Part 3: Horizontal directional drilling equipment (HDD)*

EN 16228-4, *Drilling and foundation equipment - Safety - Part 4: Foundation equipment*

EN 16228-5, *Drilling and foundation equipment - Safety - Part 5: Diaphragm walling equipment*

EN 16228-6, *Drilling and foundation equipment - Safety - Part 6: Jetting, grouting and injection equipment*

EN 16228-7, *Drilling and foundation equipment - Safety - Part 7: Interchangeable auxiliary equipment*

EN ISO 2560, *Welding consumables - Covered electrodes for manual metal arc welding of non-alloy and fine grain steels - Classification (ISO 2560)*

EN ISO 4063:2010, *Welding and allied processes - Nomenclature of processes and reference numbers (ISO 4063:2009, Corrected version 2010-03-01)*

EN ISO 5817:2014, *Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfections (ISO 5817:2014)*

EN ISO 9606-1, *Qualification of welders - Fusion welding - Part 1: Steels (ISO 9606-1)*

EN ISO 9692-1:2013, *Welding and allied processes - Types of joint preparation - Part 1: Manual metal arc welding, gas-shielded metal arc welding, gas welding, TIG welding and beam welding of steels (ISO 9692-1:2013)*

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<https://standards.iteh.ai/catalog/standards/sist/0625c936-5df7-4914-bed1-784f2372/iso-17636-1-2013>

EN ISO 17636-1, *Non-destructive testing of welds - Radiographic testing - Part 1: X- and gamma-ray techniques with film (ISO 17636-1)*

EN ISO 22477-5, *Geotechnical investigation and testing - Testing of geotechnical structures - Part 5: Testing of grouted anchors (ISO 22477-5)*

### 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### 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, and drilled anchors with grouted or expanded bodies

Note 1 to entry: Anchors can be pre-stressed (active) or not (passive).



### 3.2

#### **auxiliary structures**

all structures necessary for the proper and safe execution of the sheet piling works such as guiding system

### 3.3

#### **bracing**

system of waling and struts to support the structure

### 3.4

#### **combined wall**

retaining walls composed of primary and secondary elements

Note 1 to entry: The primary elements are normally steel tubular piles, I-sections or built up box types, spaced uniformly along the length of the wall. The secondary elements are generally steel sheet piles of various types installed in the spaces between the primary elements and connected to them by interlocks (see Figure 1 a)).

### 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

Note 1 to entry: 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

Note 1 to entry: See Figure 2.

### 3.7

#### **de-clutching**

disconnection of the interlock connection during pile driving

### 3.8

#### **de-clutching detector**

instrument for determining the integrity of the interlock connection, that is whether adjacent pile interlocks are fully engaged during and/or after installation

### 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

Note 1 to entry: See Figure 2.

### 3.10

#### **driving**

any method of installing the sheet piles to the required depth

**prEN 12063:2020 (E)****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, pre-drilling or blasting

**3.13****fish plate, splice plate**

steel plate which joins two lengths of sheet pile together

Note 1 to entry: See Annex B, 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****high modulus wall**

high strength retaining wall formed by interlocking steel elements that have the same geometry

Note 1 to entry: The elements may consist of fabricated profiles, see Figure 1 c), to obtain a high section modulus.

**3.17****interlock connection**

permanent longitudinal connection established by effective contact of coupled adjacent sheet pile interlocks

Note 1 to entry: Interlock connections may be described as:

- Free: Threaded interlocks that are neither crimped or welded;
- Crimped: Interlocks of threaded single piles that have been mechanically connected by crimped points;
- Welded: Interlocks of threaded single piles that have been mechanically connected by continuous or intermittent welding.

**3.18****leader**

beam or similar structure, attached to the driving rig to lead the sheet pile and the hammer (or the vibrator) during driving

Note 1 to entry: See Figures 2, 3 and 4 a).

**3.19****leader slide**

guiding device connecting the drive cap and/or the hammer to the leader

Note 1 to entry: See Figure 2 and Figure 3.

### 3.20 leading system

whole system to guide the sheet pile and the driving device during driving

Note 1 to entry: See Figure 3.

### 3.21 rock dowel

rod protruding from the toe of the sheet pile, used for fixing sheet piles to the bed-rock

Note 1 to entry: See Figure 14.

### 3.22 shackle (automatic release)

device for safely lifting sheet piles from the ground and placing them in the vertical position

Note 1 to entry: See Annex A, Figure A.7.

### 3.23 sheet pile

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

### 3.24 sheet pile wall

screen of sheet piles which forms a continuous wall

Note 1 to entry: For steel and synthetic sheet piles continuity is provided by connection of the interlocks, fitting of longitudinal grooves or by means of special connectors, and for timber sheet piles, by tongue and groove.

### 3.25 sheet pile wall structure

structure, consisting of sheet piles, soil and rock, anchorages, bracings and/or walings, which retains ground and/or water

Note 1 to entry: The elements are shown in Figure 5.

### 3.26 site inspection

inspection of the construction site and its surroundings

### 3.27 site investigation

geotechnical investigations on and near the construction site

### 3.28 slippage

relative longitudinal displacement between the interlocks of adjacent sheet piles

### 3.29 strut

long compression member, usually of steel, wood or reinforced concrete, for the support of the sheet pile walls and normally connected to the walings

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Note 1 to entry: It can be pre-stressed.

**3.30  
template**

specific type of guide frame, used for positioning curved or angled sheet pile walls

Note 1 to entry: They often incorporate a working platform or access staging for piling operators.

**3.31  
threader**

device fixed to the toe of a sheet pile to guide the sheet pile into the interlock of a sheet pile already placed in the guide frame

Note 1 to entry: See Annex A, Figure A.8.

**3.32  
vibrator**

vibrating unit for the driving and extraction of the sheet piles and the primary and secondary elements of a combined wall

**3.33  
waling**

horizontal beam, usually of steel or reinforced concrete, fixed to the sheet pile wall and connected to the anchorage or struts, in order to distribute the applied anchor- or strut forces equally over the sheet pile wall

**3.34  
refusal**

lack of ability to reach required depth due to limit of driving method, elastic limit of material, or ground conditions

Note 1 to entry: Refusal criteria have to be agreed between parties and must relate time, energy and penetration.

**3.35  
sheet pile press**

leader guided or self-walking device pushing statically the sheet piles into the ground

Note 1 to entry: See Figures 4 b) and 4 c).

**3.36  
straight web sheet pile**

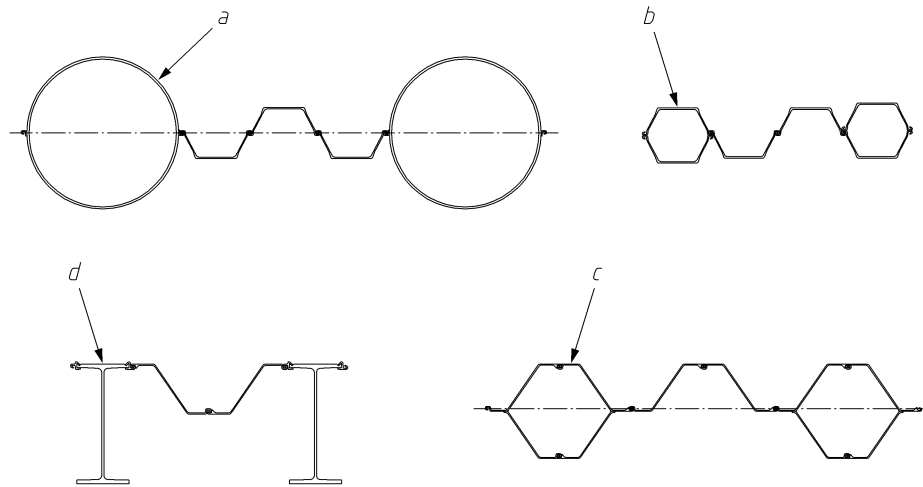
flat of slightly bent section with interlocks working in tension only

Note 1 to entry: See Figure 1 b).

**3.37  
crimping**

preventing differential movement of adjacent sheet piles by locally deforming the interlock connection

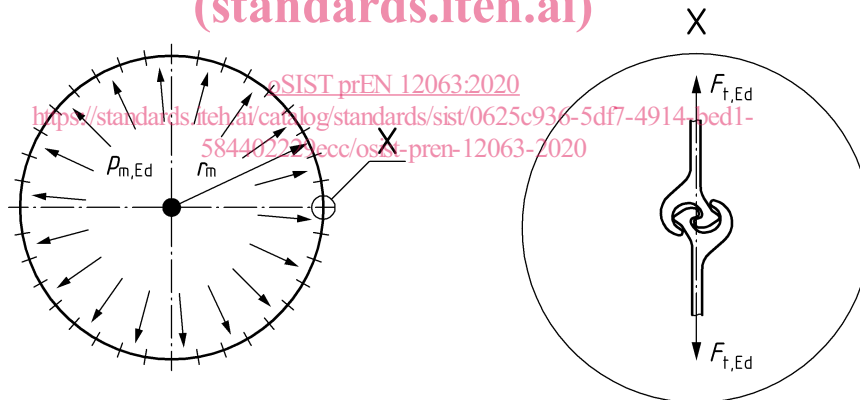
Note 1 to entry: Used for shear transmission in U-shaped sheet piles and for safe handling of all double piles.



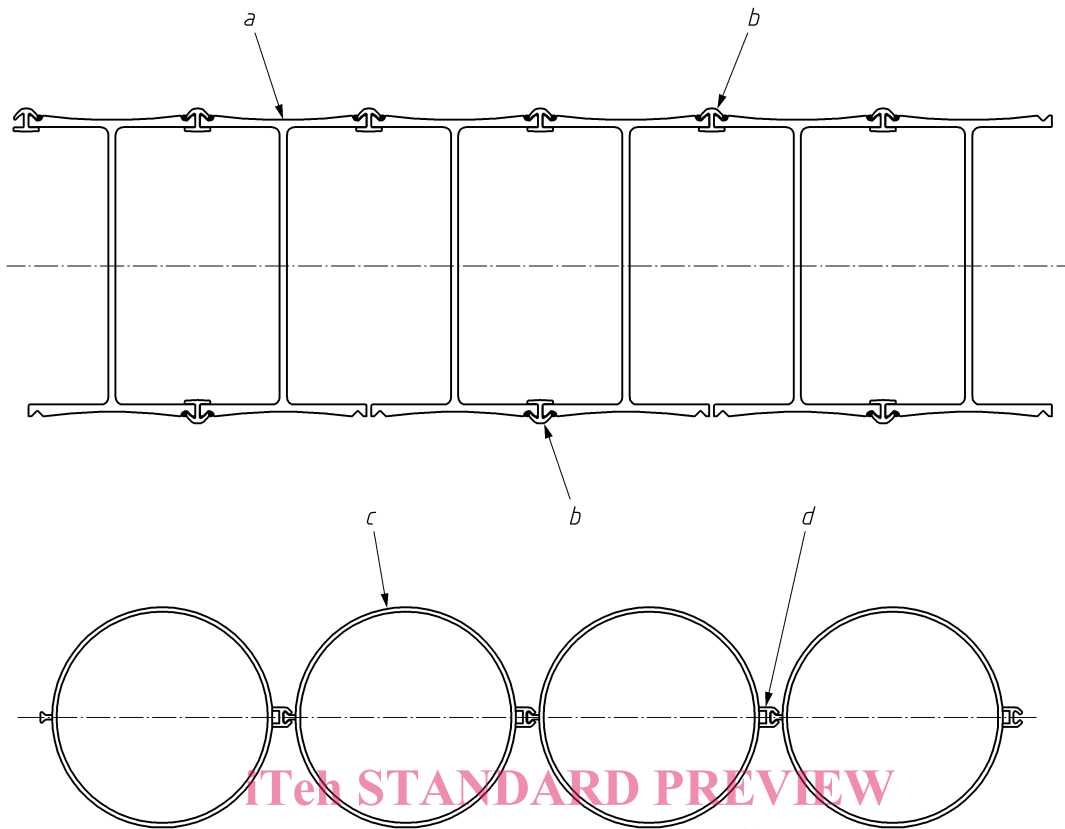
**Key**

- a Tubes + sheet piles
- b U Box piles + U sheet piles
- c Z Box piles + Z sheet piles
- d H beams + Z sheet piles

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**a) Examples of combined walls**  
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**b) Example of straight web sheet pile**

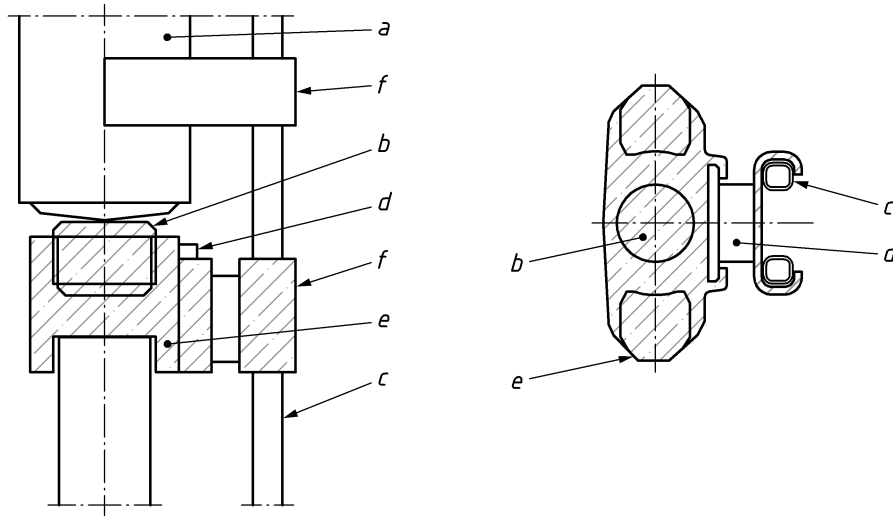


**Key**

- a H beam
- b Connector welded to H beam
- c Tubular pile
- d Connectors welded to tubular piles

**c) Examples of high modulus walls**

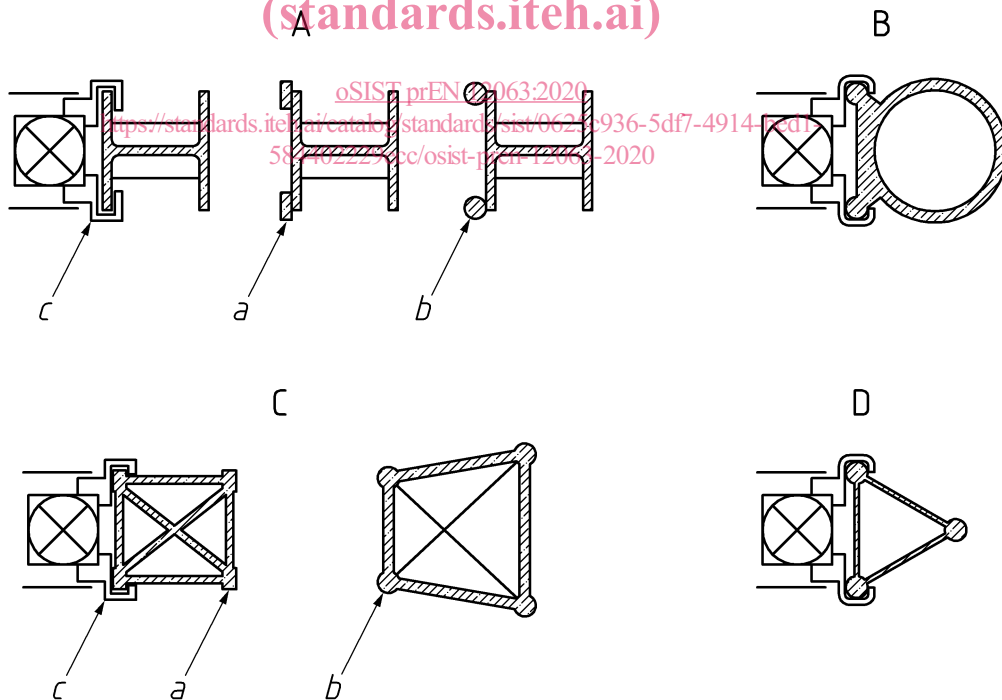
**Figure 1**



**Key**

- |   |               |   |               |
|---|---------------|---|---------------|
| a | Impact hammer | d | Sliding guide |
| b | Cushion       | e | Driving cap   |
| c | Leader        | f | Leader slide  |

**Figure 2 — Example of a driving cap**  
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**Key**

- |   |                   |   |                |
|---|-------------------|---|----------------|
| A | H beam leader     | a | Square profile |
| B | Tubular leader    | b | Round profile  |
| C | Truss leader      | c | Leader slide   |
| D | Triangular leader |   |                |

**Figure 3 — Examples of leading systems**