



SLOVENSKI STANDARD
SIST EN 16933-1:2022

01-maj-2022

**Sistemi za odvod odpadne vode in kanalizacijo zunaj stavb - Načrtovanje - 1. del:
Načela načrtovanja**

Drain and sewer systems outside buildings - Design - Part 1: Layout principles

Entwässerungssysteme außerhalb von Gebäuden - Planung - Teil 1:
Planungsgrundsätze

Réseaux d'évacuation et d'assainissement à l'extérieur des bâtiments - Conception -
Partie 1 : Principes d'implantation

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Ta slovenski standard je istoveten z: EN 16933-1:2022

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ICS:

91.140.80	Drenažni sistemi	Drainage systems
93.030	Zunanji sistemi za odpadno vodo	External sewage systems

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EUROPEAN STANDARD

EN 16933-1

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ICS 93.030

English Version

Drain and sewer systems outside buildings - Design - Part 1: Layout principles

Réseaux d'évacuation et d'assainissement à l'extérieur
des bâtiments - Conception - Partie 1 : Principes
d'implantation

Entwässerungssysteme außerhalb von Gebäuden -
Planung - Teil 1: Planungsgrundsätze

This European Standard was approved by CEN on 17 January 2022.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 16933-1:2022) has been prepared by Technical Committee CEN/TC 165 “Wastewater engineering”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by September 2022, and conflicting national standards shall be withdrawn at the latest by September 2022.

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EN 16933-1:2022 (E)**Introduction**

Drain and sewer systems are part of the overall wastewater system that provides a service to the community. This can be briefly described as:

- removal of wastewater from premises for public health and hygienic reasons;
- prevention of flooding in urbanised areas;
- protection of the environment.

The overall wastewater system has four successive functions:

- collection;
- transport;
- treatment;
- discharge.

Drain and sewer systems provide for the collection and transport of wastewater.

EN 752:2017 provides a framework for the design, construction, rehabilitation, maintenance and operation of drain and sewer systems outside buildings. This is illustrated in the upper part of the diagram in Figure 1. EN 752:2017 is supported by more detailed standards for the investigation, design, construction, management and control of drain and sewer systems.

Investigation and assessment standards include:

- EN 13508 (all parts), *Investigation and assessment of drain and sewer systems outside buildings*

Design and construction standards include:

- EN 16932 (all parts), *Drain and sewer systems outside buildings - Pumping systems*
- EN 16933, *Drain, sewer systems outside buildings - Design*
- EN 1295, *Structural design of buried pipelines under various conditions of loading*
- EN 1610, *Construction and testing of drains and sewers*
- EN 12889, *Trenchless construction and testing of drains and sewers*
- EN 15885, *Classification and characteristics of techniques for renovation, repair and replacement of drains and sewers*

Management and control standards include:

- EN 14654 (all parts), *Drain and sewer systems outside buildings - Management and control of activities*

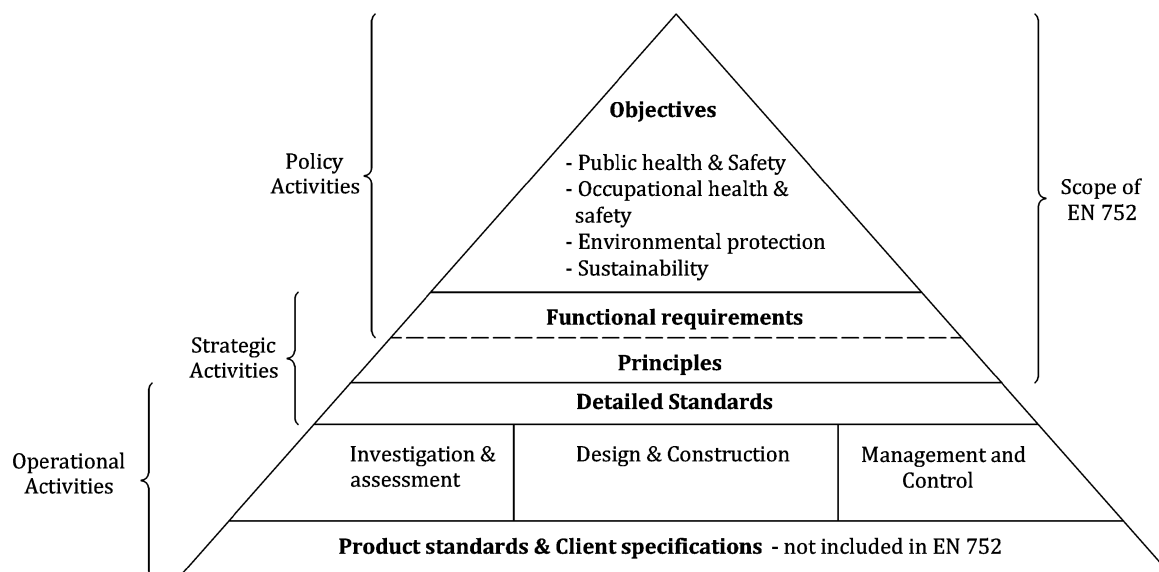


Figure 1 — Relationship to EN 752:2017 and other drain and sewer standards¹

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¹ Source: EN 752:2017.

EN 16933-1:2022 (E)**1 Scope**

This document specifies requirements for the design of drain and sewer systems outside buildings.

It is applicable to drain and sewer systems from the point where the wastewater leaves a building, roof drainage system, or paved area, to a point where it is discharged into a wastewater treatment plant or receiving water body.

This document specifies requirements for the layout of drain and sewer systems.

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 752:2017, *Drain and sewer systems outside buildings - Sewer system management*

EN 14654 (all parts), *Drain and sewer systems outside buildings - Management and control of activities*

EN 16323:2014, *Glossary of wastewater engineering terms*

EN 16932 (all parts), *Drain and sewer systems outside buildings - Pumping systems*

EN 16933-2:2017, *Drain and sewer systems outside buildings - Design - Part 2: Hydraulic design*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16323 and the following apply.

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

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

NOTE Certain key definitions from EN 16323:2014 have been repeated below for clarity. The following additional terms used in this document are defined in EN 16323:2014:

combined sewer overflow,	jetting,	runoff,
combined system,	maintenance,	separate system,
detention tank,	manhole,	sewer,
drain,	outfall,	sewer system,
dry weather flow,	pumping station,	surcharge,
foul wastewater,	receiving water body,	surface receiving water body,
gradient,	rehabilitation,	surface water,
gravity system,	relevant authority,	wastewater,
infiltration,	repair,	wastewater treatment plant.
inspection chamber,	rising main,	
inverted syphon,	rodding,	

3.1**pumping installation**

pumping station together with any associated rising main(s)

[SOURCE: EN 752:2017, 3.8]

3.2**layout**

configuration of the principal components of a drain and sewer system in both the horizontal and vertical planes

3.3**detention pond**

permanently wet depression designed to temporarily store surface water runoff above the permanent pool and permit settlement of suspended solids and biological removal of pollutants

3.4**principal component**

functional unit that forms part of a wastewater system

EXAMPLES pipeline section, pumping station, combined sewer overflow, gully

3.5**rodding point**

small diameter connection to a drain or sewer that facilitates cleaning or inspection

3.6**sewer flooding**

condition where wastewater and/or surface water escapes from or cannot enter a drain or sewer system and either lies on the surface or enters buildings

[SOURCE: EN 752:2017, 3.13]
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3.8**drainage**

group of technologies techniques and actions to achieve satisfactory hygiene and public health relating to wastewater, including both foul wastewater and surface water

[SOURCE: EN 752:2017, 3.18]

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EN 16933-1:2022 (E)**4 General****4.1 Introduction**

This document covers the design of the layout of drain and sewer systems that are intended to be constructed to implement a sewer system management plan in accordance with EN 752:2017, 6.4.4. Implementation of these plans shall be in accordance with EN 752:2017, 6.5, and EN 14654 (all parts).

EN 752:2017 specifies objectives, functional requirements and the principles for design of drain and sewer systems outside buildings.

The design of the layout is affected by the functional requirements, in particular the following:

- Maintainability (see EN 752:2017, 5.1.3);
- Protection of groundwater (see EN 752:2017, 5.1.5);
- Prevention of odours and toxic, explosive and corrosive gases (see EN 752:2017, 5.1.6);
- Prevention of noise and vibration (see EN 752:2017, 5.1.7);
- Structural integrity and design working life (see EN 752:2017, 5.1.8);
- Maintaining the flow (see EN 752:2017, 5.1.12);
- Not endangering adjacent structures and utility services (see EN 752:2017, 5.1.13).

Except where they are specified by national or local regulations or the relevant authority, design criteria shall be determined in accordance with EN 752:2017, 5.3.

4.2 The design process

The design of the layout shall be carried out in accordance with the design principles in EN 752:2017, 8.3.

It is essential because it allows the designer to collect and evaluate all the data needed to make the best technical choices in terms of design, construction, rehabilitation, maintenance and operation.

The dimensions and gradients of the pipes are determined by the hydraulic design (see EN 16933-2:2017) or operational requirements and topographical constraints.

Establishing the layout is the first stage of the design of new drain and sewer systems. The process is summarized in Figure 2. In large projects this can be carried out in a number of stages with an outline of the layout first produced for the whole catchment. This can form part of the sewer system management plan (see EN 752:2017, Clause 6). This can then be followed by the more detailed layout of the main sewers in each of a number of sub-catchments. Finally, the layout of the smaller drains and sewers around the buildings can be established.

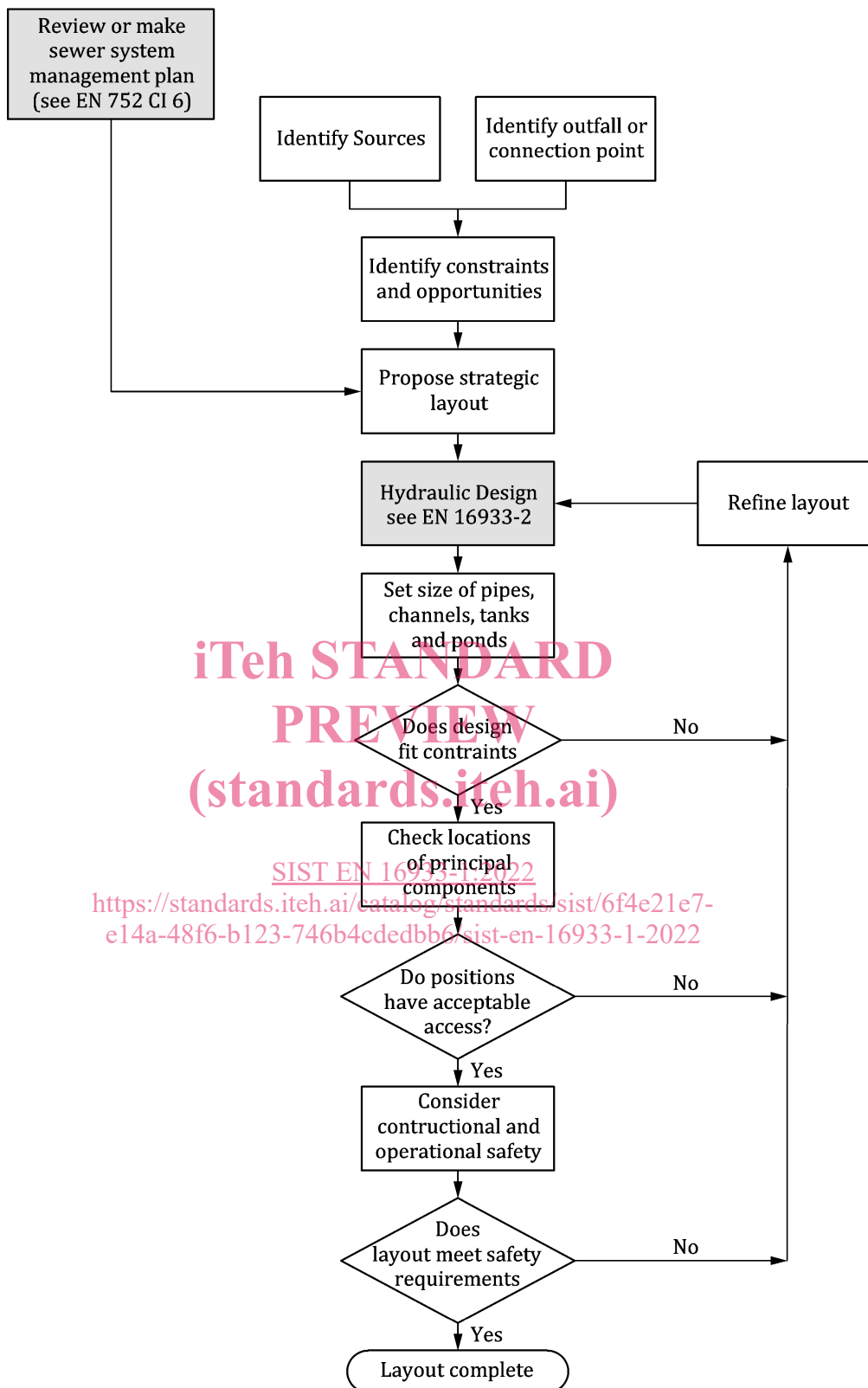


Figure 2 — Summary of the design process