



SLOVENSKI STANDARD
SIST EN 752-2:1996

01-december-1996

Sistemi za odvod odpadne vode in kanalizacijo zunaj zgradb - 2. del: Zahteve

Drain and sewer systems outside buildings - Part 2: Performance requirements

Entwässerungssysteme außerhalb von Gebäuden - Teil 2: Anforderungen

Réseaux d'évacuation et d'assainissement à l'extérieur des bâtiments - Partie 2:
Prescriptions de performances

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Ta slovenski standard je istoveten z: EN 752-2:1996

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ICS:

93.030 Zunanji sistemi za odpadno External sewage systems
vodo

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EUROPEAN STANDARD

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Drain and sewer systems outside buildings - Part 2: Performance requirements

Réseaux d'évacuation et d'assainissement à
l'extérieur des bâtiments - Partie 2:
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This European Standard was approved by CEN on 1996-06-17. CEN 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 CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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

CEN

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 165 "Waste water engineering", the secretariat of which is held by DIN.

This part is the second in a series relating to the functional requirements of drain and sewer systems outside buildings that operate essentially under gravity. There will be seven parts, as follows: Drain and sewer systems outside buildings -

- Part 1: General and definitions
- Part 2: Performance requirements
- Part 3: Planning
- Part 4: Hydraulic design and environmental considerations
- Part 5: Rehabilitation
- Part 6: Pumping installations
- Part 7: Maintenance and operations.

In drafting this part of this European Standard account has been taken of other available draft standards, in particular prEN 476 "General requirements for components used in discharge pipes, drains and sewers for gravity systems".

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 1997, and conflicting national standards shall be withdrawn at the latest by January 1997.

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

1 Scope

This European Standard is applicable to drain and sewer systems, which operate essentially under gravity, from the point where the sewage leaves a building or roof drainage system, or enters a road gully, to the point where it is discharged into a treatment works or receiving water.

Drains and sewers below buildings are included provided that they do not form part of the drainage system of the building.

This part sets out the performance requirements to be taken into account when planning, designing, installing and operating drain and sewer systems that operate essentially under gravity.

2 Normative references

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.

EN 752-1 Drain and sewer systems outside buildings - Part 1: Generalities and definitions.

3 Definitions

For the purposes of this standard, the definitions given in EN 752-1 apply.

4 Sources of additional information

This standard sets out the essential requirements for good practice in various engineering activities relating to the planning, design and operation of drain and sewer systems. For supplementary detail and guidance reference should be made to national documents until such time as fully comprehensive European Standards are available.

The documents listed in annex A contain details which may be used in the framework of this part, given approval by the relevant authority.

5 General

Performance requirements cover the drain and sewer systems, together with combined sewer overflows, pumping installations and the receiving sewage treatment works, including the effects of their discharges on receiving waters. Performance requirements shall be considered in respect of the whole system to ensure that additions or modifications to the system do not result in failure to meet the target standards.

Performance requirements shall be established which, whilst taking into account total costs and indirect costs, ensure that drain and sewer systems convey and discharge their contents without causing unacceptable environmental nuisance, risk to public health, or risk to personnel working therein.

6 Basic performance requirements

The basic performance requirements to which drain and sewer systems shall operate are that:

- a) the pipework operates without blocking;

- b) the flooding frequencies shall be limited to prescribed values;
- c) public health and life shall be safeguarded;
- d) the sewer surcharge frequencies should be limited to prescribed values;
- e) the health and safety of operator personnel shall be safeguarded;
- f) receiving waters shall be protected from pollution within prescribed limits;
- g) drains and sewers shall not endanger existing adjacent structures and utility services;
- h) the required design life and structural integrity shall be achieved;
- i) drains and sewers shall be watertight accordance with testing requirements;
- j) odour nuisance and toxicity do not arise;
- k) appropriate access shall be provided for maintenance purposes.

The impact of drain and sewer systems on the receiving waters shall meet the requirements of the relevant authority. Other environmental requirements specified by the relevant authority shall also be met.

In setting hydraulic design performance criteria for surface water and combined sewers, allowance shall be made for the design methods that are likely to be used. In all cases the scale of the consequences of flooding should be taken into account.

For smaller schemes a relatively simple, but safe, approach is recommended, though use of simulation models is not excluded. Sewers are usually designed to run full, without surcharge, for relatively frequent storms in the knowledge that this provides protection against flooding from much larger storms. For these schemes the "design storm frequency" criteria in table 1 should be used in the absence of any specified by the relevant authority. The designer shall use rainfall intensity and duration figures applicable to that particular area.

Table 1: Recommended design frequencies

Design storm frequency ¹⁾ (1 in "n" years)	Location	Design flooding frequency (1 in "n" years)
1 in 1	Rural areas.	1 in 10
1 in 2	Residential areas.	1 in 20
1 in 2 1 in 5	City centres/industrial/commercial areas: - with flooding check; - without flooding check.	1 in 30
1 in 10	Underground railway/underpasses.	1 in 50

¹⁾ For those design storms no surcharge shall occur

For smaller schemes to be designed using a simulation model and for larger schemes, particularly where damage or public health risks are significant, it is recommended that the level of flooding protection be directly assessed. The sewer system may be initially designed, as above, to give no surcharge with an appropriate "design storm frequency". A sewer flow simulation model should then be used to check the level of flood protection against the "design flooding frequency" and the design adjusted where the required flooding protection is not achieved. There will be cases, however, where adjustments are appropriate to avoid unnecessary over-design. Any requirements from the relevant authority shall be followed, but in their absence the design flooding frequency values given in table 1 should be used.

These approaches should be applied when an existing system is being considered for upgrading.

7 Performance testing

It is necessary to test and assess the performance of the drain and sewer systems during construction, at the completion of the construction stage and also during the operational life of the system.

Examples of tests and assessments are:

- a) water test;
- b) air test;
- c) infiltration test;
- d) visual inspection;
- e) CCTV (closed circuit television) inspection;
- f) dry weather flow assessment;
- g) monitoring of inputs to the system;
- h) monitoring effluent quality, quantity and frequency at point of discharge to receiving water;
- i) monitoring within the system for toxic and/or explosive gas mixtures;
- j) monitoring of discharge from system to treatment works.

The tests to be undertaken to determine the performance being achieved by the drain or sewer system will depend on whether it is a new system or an existing system being tested.

8 Performance assessment and documentation

In order to assess the performance of a drain and sewer system, it is necessary to review all available relevant data. Examples are records of:

- a) flooding incidents;

- b) pipe blockage incidents;
- c) sewer collapse incidents;
- d) disease, injury or fatal incidents to operators;
- e) disease, injury or fatal incidents to members of the public;
- f) sewer damage incidents;
- g) compliance with discharge consents into and out of the system;
- h) CCTV survey and visual inspection data;
- i) sewage-related odour complaint incidents;
- j) hydraulic performance analysis;
- k) performance of mechanical/electrical equipment;
- l) results of testing and monitoring;
- m) performance and condition of flow control structures;
- n) sewer surcharge incidents.

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If the desired performance is not being achieved, remedial action is required according to the priority allocated.

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To be able to undertake performance assessment it is necessary to have available as-constructed drawings to provide essential basic information.

The relevant authorities will be the source of many of the records listed above. All appropriate records are to be retained.