



SLOVENSKI STANDARD
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**Ugotavljanje stanja drenažnih in kanalizacijskih sistemov zunaj stavb – 2. del:
Sistem za vizualni nadzor in kodiranje**

Conditions of drain and sewer systems outside buildings - Part 2: Visual inspection coding system

Zustandserfassung von Entwässerungssystemen außerhalb von Gebäuden - Teil 2: Kodiersystem für die optische Inspektion

Condition des réseaux d'évacuation et d'assainissement à l'extérieur des bâtiments - Partie 2 : Systeme de codage de l'inspection visuelle

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English version

Conditions of drain and sewer systems outside buildings - Part 2: Visual inspection coding system

Condition des réseaux d'évacuation et d'assainissement à
l'extérieur des bâtiments - Partie 2: Système de codage de
l'inspection visuelle

Zustandserfassung von Entwässerungssystemen
außerhalb von Gebäuden - Teil 2: Kodiersystem für die
optische Inspektion

This European Standard was approved by CEN on 4 November 2002.

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 Management Centre or to any CEN 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 CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 13508-2:2003) 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of an identical text or by endorsement, at the latest by November 2003, and conflicting national standards shall be withdrawn at the latest by May 2006.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

The Standard series EN 13508 "Condition of drain and sewer systems outside buildings" contains the following parts

- Part 1: General requirements
- Part 2: Visual inspection coding system

Other parts, dealing with other methods of inspection, can be added later.

In drafting this part of this European Standard account has been taken of other available standards, in particular EN 752 "Drain and sewer systems outside buildings"

To allow for the alteration of existing data and coding system software in accordance with this standard and training of inspection personnel, a transition period is granted until (DAV + 36 month) for the withdrawal of conflicting national standards and the application of this standard.

Where there are existing inspection programmes to meet legal requirements commenced before the publication of this standard, it is permitted to complete such programmes using the original coding system.

Introduction

In producing this draft standard, existing national coding systems have been reviewed. To preserve the link with existing data, TC165/WG22 has tried to ensure that there is an equivalent code, or combination of codes, for every observation recorded in an existing national system. This should allow existing data to be transferred to the new coding system.

At present the amount of detail recorded varies between countries. The choice of features to be recorded and the extent of detail to be included is left to the employing authority.

Before the standard can be fully applied, extensive retraining of operators and modification of software will be necessary.

1 Scope

This European Standard is applicable to the establishment of the condition of drain and sewer systems by inspection, status codification and consideration of external factors and other information.

It 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 of the European Standard specifies a coding system for the description of the internal condition of drains, sewers, manholes and inspection chambers identified through visual inspection. Where appropriate, it can also be used for pressure and vacuum systems in accordance with the requirements of the employing authority.

This part of the European Standard does not generally specify requirements for carrying out inspections.

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 (including amendments).

EN 476:1997, *General requirements for components used in discharge pipes, drains and sewers for gravity systems.*

EN 752-1:1995, *Drain and sewer systems outside buildings – Part 1: Generalities and definitions.*

EN 752-5:1997, *Drain and sewer systems outside buildings – Part 5: Rehabilitation.*

ISO 8601, *Data elements and interchange formats — Information interchange — Representation of dates and times.*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

NOTE These definitions are general terms. Other specific terms are defined in the text.

3.1

adjusting construction

part of a manhole or inspection chamber between the cover and frame and the shaft. This is used to adjust the level of the cover and frame to accord with the required surface level

3.2

backdrop manhole

manhole with a connection, by means of a vertical pipe, at or just above invert, from a drain or sewer at a higher level

[EN 752-1:1995]

3.3

benching

near horizontal surface adjacent to the channel in a manhole or inspection chamber, or a large sewer

3.4

chamber

part of a manhole or inspection chamber providing working space above the channel

3.5

chamber unit

component part of a manhole or inspection chamber manufactured as a single entity and intended to be joined with other chamber units

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3.6

combined system

sewer system designed to carry both wastewater and surface water in the same pipeline(s)

[EN 752-1:1995]

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3.7

connection

general term used for the location at which one pipeline joins another pipeline or a manhole or inspection chamber

3.8

drain

pipeline, usually underground, designed to carry wastewater and/or surface water from a source to a sewer.

[EN 752-1:1995]

3.9

drain system

network of pipelines and ancillary works that conveys wastewater and/or surface water to a cesspool, sewer system or other place of disposal

[EN 752-1:1995]

3.10

employing authority

organisation which owns or is responsible for the inspection of a drain or sewer system

3.11

exfiltration

escape of flow from a drain or sewer system into surrounding ground

[EN 752-1:1995]

3.12**gradient**

ratio between the vertical and the horizontal projections of a pipe length
[EN 752-1:1995]

3.13**gravity system**

drain or sewer system where flow is caused by the force of gravity and where the pipeline is designed normally to operate partially full
[EN 752-1:1995]

3.14**groundwater**

water present in the sub-surface strata
[EN 752-1:1995]

3.15**infiltration**

ingress of groundwater into a drain or sewer system
[EN 752-1:1995]

3.16**inspection chamber**

chamber with a removable cover constructed on a drain or sewer that provides access from surface level only, but does not permit entry of a person
[EN 752-1:1995]

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3.17**invert**

lowest point of the internal surface of the barrel of a pipe or channel at any cross section
[EN 476:1997]

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3.18**joint**

location at which the ends of two adjacent pipe units are joined together longitudinally

3.19**junction**

connection made using a prefabricated junction pipe unit

3.20**landing**

intermediate rest platform used to limit the height of a run of steps in a manhole

3.21**manhole**

chamber with a removable cover constructed on a drain or sewer to permit entry by personnel
[EN 752-1:1995]

3.22**node**

manhole, inspection chamber, outfall, rodding eye or other significant intermediate point

3.23**outfall**

final length of pipeline from which sewage is discharged to a treatment works or receiving water
[EN 752-1:1995]

3.24**pipe unit**

component part of a drain or sewer manufactured as a single entity and intended to be joined with other pipe units

- 3.25
pipeline**
assembly of pipes, fittings, masonry and insitu concrete units and joints between manholes or other structures.
- 3.26
pipeline length**
continuous section of drain or sewer between two adjacent nodes
- 3.27
pipe unit length**
length of a manufactured pipe unit used in the construction of a pipeline
- 3.28
ramp manhole**
manhole with a steeply inclined pipe or channel from a drain or sewer at a higher level
[EN 752-1:1995]
- 3.29
receiving water**
any body of water such as the sea, a river, stream or lake as well as an aquifer into which drain or sewer systems discharge
[EN 752-1:1995]
- 3.30
rehabilitation**
all measures for restoring or upgrading the performance of existing drain and sewer systems
[EN 752-1:1995]
- 3.31
repair**
rectification of local damage
[EN 752-5:1997]
- 3.32
rising main**
pipe through which sewage is pumped
[EN 752-1:1995]
- 3.33
sewage**
wastewater and/or surface water conveyed by a drain or sewer
[EN 752-1:1995]
- 3.34
sewer**
pipeline or other construction, usually underground, designed to carry wastewater and/or surface water from more than one source
[EN 752-1:1995]
- 3.35
sewer system**
network of pipelines and ancillary works which conveys wastewater and/or surface water from drains to a treatment works or other place of disposal
[EN 752-1:1995]
- 3.36
shaft**
upper part of a manhole or inspection chamber between the adjusting construction and the chamber

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3.37

surface water

water from precipitation, which has not seeped into the ground and which is discharged to the drain or sewer system directly from the ground or from exterior building surfaces

[EN 752-1:1995]

3.38

taper

part of manhole or inspection chamber where the cross sectional area changes gradually

3.39

wastewater

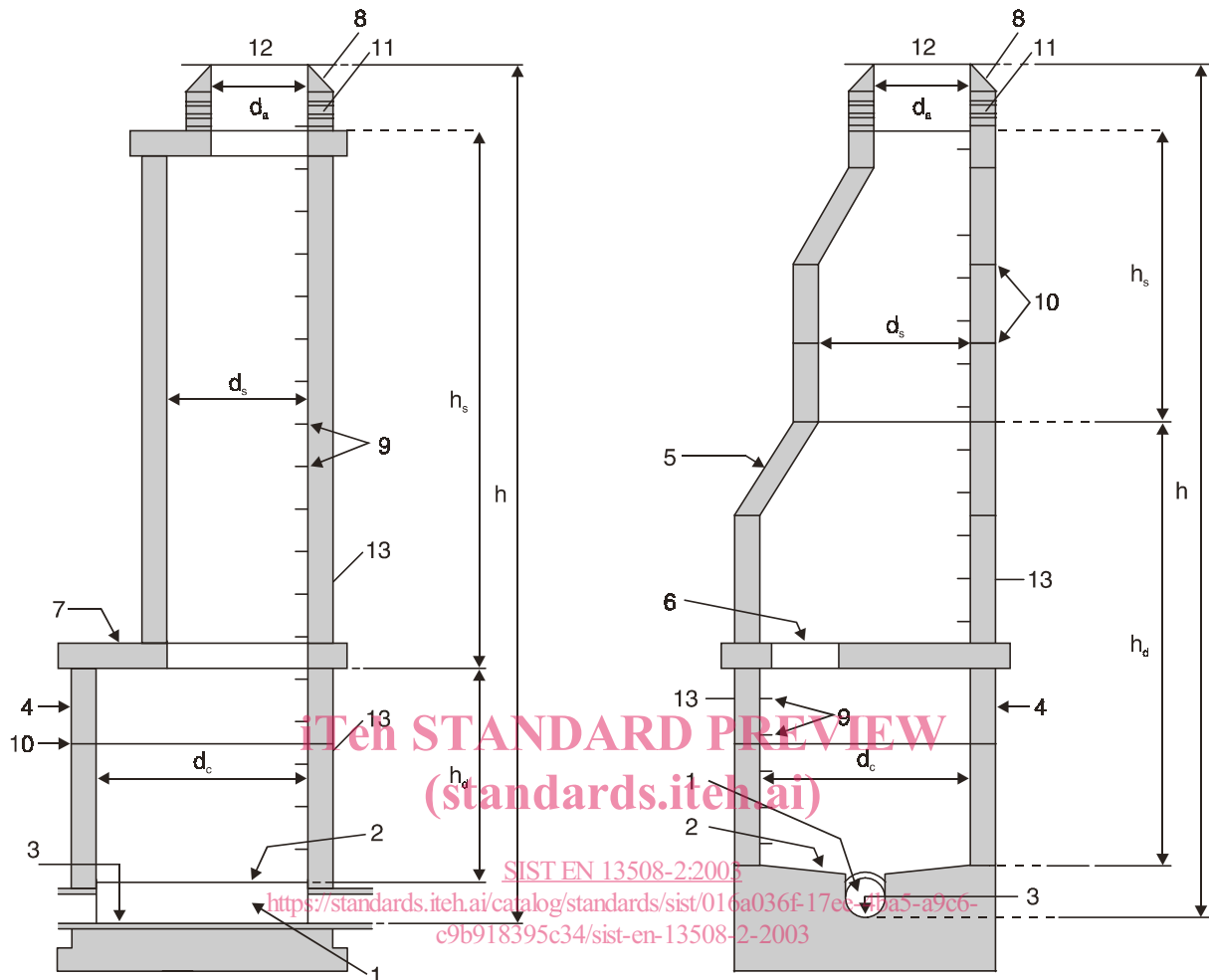
water changed by use and discharged to a drain or sewer system

[EN 752-1:1995]

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Key

- | | | |
|-----------------|---------------------------------|-----------------------------|
| 1 Channel | 8 Manhole top (cover and frame) | h Depth to invert |
| 2 Benching | 9 Step | h_s Depth of shaft |
| 3 Invert | 10 Sealing material | h_d Depth of chamber |
| 4 Chamber unit | 11 Adjusting construction | d_a Access diameter/size |
| 5 Taper | 12 Cover level | d_s Shaft diameter/size |
| 6 Landing | 13 Manhole wall | d_c Chamber diameter/size |
| 7 Reducing slab | | |

Figure 1 — Illustration of terms relating to manholes

4 Sources of additional information

This standard specifies a coding system for visual inspection of drain and sewer systems. For further guidance on the execution of visual inspection in various countries reference should be made to national documents until such time as fully comprehensive European Standards are available.

The documents listed in annex H contain details, which can be used in the framework of this part.

5 General

5.1 Purpose

EN 752-5 recommends the use of a uniform standard coding system to ensure that results from visual inspections can be compared. This part of this standard specifies a system, which can be used to objectively record the visual information from the inspection. It does not include methods for assessing the condition of the drain or sewer as this requires subjective judgements and the use of additional information.

The coded information can be used for one or more of the following purposes:

- to assess the performance deficiencies as part of the development of a rehabilitation plan (see EN 752-5:1997, clause 7);
- to provide information for use in the planning of maintenance activities, e.g. sewer cleaning programmes (see EN 752-7:1998, clause 6);
- to investigate specific maintenance or operational problems (see EN 752-7:1998, clause 8);
- the recording of inventory data (see EN 752-5:1997, clause 7)

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5.2 Methods

The visual inspection can be carried out in one of the following ways:

- inspection of the pipeline from within the pipeline;
- inspection of the pipeline from within the manhole or inspection chamber;
- inspection of the manhole or inspection chamber from within the manhole or inspection chamber;
- inspection of the manhole or inspection chamber from the surface.

Several inspection techniques can be used such as:

- remotely controlled CCTV camera;
- man entry;
- mirrors;
- photographic camera.

The personnel involved in inspection work shall be adequately trained in the inspection methods and in the coding system.

The inspection shall be carried out sufficiently slowly to enable all features to be observed. Where a closed circuit television camera is used, the camera should only be moved along the pipe when the lens is pointing forward in the direction of the axis of the sewer.

The relevant authority can prescribe requirements regarding the health, safety and welfare of the public and/or personnel. The work should be carried out in accordance with EN 752-7:1998, clause 11.

5.3 The use of the coding system

The coding system specified in this European Standard for drains and sewers is described in clauses 6, 7 and 8. The coding system specified in this European Standard for manholes and inspection chambers is described in clauses 9, 10 and 11. Colour photographs showing examples of some observations are included to illustrate the use of the coding systems (see annex F and annex G).

Each observation is described by a main code comprising three letters and additional information. The first letter of the main code describes the application of the code (i.e. to a pipeline see clause 6 or to a manhole or inspection chamber see clause 10). The second letter indicates the type of code (see 8.1.2 and 11.1.2). The third letter determines the specific observation (see 8.1.3 and 11.1.3).

Where different observation types occur at the same point then each defect or feature shall be coded separately.

The defects, features and the general condition shall be coded in accordance with this standard and should be supported either with photographs or by a video recording.

5.4 National equivalent coding systems

The codes used in this standard are independent of any language. In order to make the codes more memorable or more compatible with existing systems, a list of national equivalent codes may be produced. Where these are produced, a table of equivalence should be included in a national annex to this standard. Only the language independent codes specified in this standard can be used with the electronic data transfer format described in annex B.

Rules for national equivalent coding systems are given in annex A.

5.5 Data transfer

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The coded information is frequently transferred between databases. A recommended format for data transfer, using this coding system, is included in annex B.

5.6 Information to be supplied by the employing authority

The coding systems are intended to provide a comprehensive choice of codes to allow the inspector to describe the drains, sewers, manholes or inspection chambers as required by the employing authority. The codes are only to be used as directed by the employing authority who may decide which features are to be recorded.

The employing authority should specify the following from the options available in this standard:

- a) Header information
 - i) The coding system to be used for recording header information (e.g. national equivalent system or annex C or D)
 - ii) Which of the optional header information items is to be recorded (see 7.2 and 10.2)
 - iii) The reference points to be used for the longitudinal location in inspections of drains and sewers (see 8.1.7) and the vertical and circumferential location in manholes and inspection chambers (see 11.1.5 and 11.1.8).
- b) The information about the individual observations.
 - i) Whether the coding system to be used is the system described in clause 8 or clause 11 of this standard or a specified national equivalent system in accordance with 5.4.

- ii) The types of observations to be recorded. (These observations shall be recorded in accordance with the coding systems described in clause 8 and clause 11, or a national equivalent system in accordance with 5.4).
- iii) The level of detail required in accordance with clause 8 and clause 11 - by specifying for each code:
 - whether quantification information, longitudinal, vertical, circumferential location information, or whether the fact that the observation is associated with a joint, is to be recorded;
 - whether quantification information is to be recorded as a single value or as a band;
 - if bands are to be used, the ranges of values be included in each band;
 - the tolerances to be used for estimation and/or measurement of values.

6 Drains and sewers - Coding system

The coding system for drains and sewers comprises a series of codes which shall be used to describe the defects and features found in the drain or sewer. A separate report shall be prepared for each pipeline length. The information recorded is of two main types.

- Header information - relating to the pipeline as a whole. This is described in clause 7 and annex C. All codes for these start with the letter A.
- Information about individual observations within the drain or sewer. This is described in clause 8. All codes for these start with the letter B.

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7 Drains and sewers - Header information

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7.1 Requirements

Header information is entered at the start of the inspection. The following information shall be recorded.

- a) The pipeline length identification, by pipeline reference and/or the two node references. Alternatively, where the pipeline length is a lateral connected to another pipeline without a chamber, the node at the junction with the main pipeline may be defined using the reference of the main pipeline and the distance from the start.
- b) The direction of the inspection.
- c) A textual description of the location.
- d) The coding system.
- e) The longitudinal reference point (if recording longitudinal location).
- f) The method of inspection.
- g) The date of inspection.
- h) Whether the drain or sewer was pre-cleaned.
- i) Any other information required by the employing authority.

7.2 Other header information

Other information may include:

- type of location;