SLOVENSKI STANDARD
SIST EN 14654-2:2013

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Upravljanje in nadzor nad čiščenjem odvodnih in odpadnih kanalov - 2. del: Sanacija

Management and control of cleaning operations in drains and sewers - Part 2: Rehabilitation

Management und Überwachung von betrieblichen Maßnahmen in Abwasserleitungen und -kanälen - Teil 2: Sanierung

Gestion et contrôle des opérations de nettoyage des canalisations d'évacuation et d'assainissement - Partie 2: Réhabilitation

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ICS:

93.030	Zunanji sistemi za odpadno vodo	External sewage systems

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Management and control of operational activities in drain and sewer systems outside buildings - Part 2: Rehabilitation

Gestion et contrôle des opérations de nettoyage des canalisations d'évacuation et d'assainissement - Partie 2: Réhabilitation

Management und Überwachung von betrieblichen Maßnahmen in Abwasserleitungen und -kanälen - Teil 2: Sanierung

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Foreword

This document (EN 14654-2:2013) has been prepared by Technical Committee CEN/TC 165 “Waste water 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of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

The standard series EN 14654 contains the following parts:

— EN 14654-1, *Management and control of operational activities in drain and sewer systems outside buildings — Part 1: Sewer cleaning*;

— EN 14654-2, *Management and control of operational activities in drain and sewer systems outside buildings — Part 2: Rehabilitation* (the present document).

Other parts dealing with other activities may 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*, and EN 13508, *Investigation and assessment of drain and sewer systems outside buildings*.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard establishes the general principles for the management and control of operational activities in drain and sewer systems outside buildings and specifies requirements for development and implementation of work programmes, and the selection of techniques.

This part covers the management and control of rehabilitation activities.

It is applicable to drain and sewer systems, which operate essentially under gravity, from the point where wastewater leaves a building, roof drainage system, or paved area, 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.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 752:2008, *Drain and sewer systems outside buildings*

EN 13508-1:2012, *Investigation and assessment of drain and sewer systems outside buildings — Part 1: General requirements*

3 Terms and definitions

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

3.1
extraneous water
unwanted flow in a drain or sewer system

[SOURCE: EN 752:2008, definition 3.25]

3.2
inspection chamber
chamber with a removable cover constructed on a drain or sewer that permits the introduction of cleaning and inspection equipment from surface level, but does not provide access for personnel

[SOURCE: EN 752:2008, definition 3.34]

3.3
maintenance
routine work undertaken to ensure the continuing performance of drain and sewer systems

[SOURCE: EN 752:2008, definition 3.40]

3.4
manhole
chamber with a removable cover constructed on a drain or sewer to permit entry by personnel

[SOURCE: EN 752:2008, definition 3.41]

3.5
pipeline length
continuous section of drain or sewer between two adjacent nodes

[SOURCE: EN 13508-2:2003, definition 3.26]

3.6
rehabilitation
all measures for restoring or upgrading the performance of existing drain and sewer systems

[SOURCE: EN 752:2008, definition 3.50]

3.7
renovation
work incorporating all or part of the original fabric of the drain or sewer by means of which its current performance is improved

[SOURCE: EN 752:2008, definition 3.52]

3.8
repair
rectification of local damage

[SOURCE: EN 752:2008, definition 3.53]

3.9
replacement
construction of a new drain or sewer, on or off the line of an existing drain or sewer, the function of the new drain or sewer incorporating that of the old

[SOURCE: EN 752:2008, definition 3.54]

4 General

Rehabilitation includes a wide range of activities to restore or upgrade the performance of a drain or sewer system including those examples shown in Table 1.

Table 1 — Scope of rehabilitation

	Examples of system related measures	Examples of component related measures
Restore original Performance	• Remove extraneous flows • …	• Cleaning • Repair • Renovation • Replacement (like for like).
Upgrade original Performance	• Maximise use of existing flow capacity • Reduce hydraulic input to the drain or sewer system • Attenuate peak flows • …	• Replacement (increased capacity).

EN 752:2008, Clause 6, outlines the process for preparation and implementation of an integrated drain and sewer system management plan which includes, at a strategic level, a plan for rehabilitation of the drain and sewer system. The amount of detail in the rehabilitation plan in the integrated drain and sewer system plan can vary.

This European Standard sets out a process for implementing the rehabilitation proposals in the integrated drain and sewer system management plan. The process is based on a staged application of the process outlined in Figure 1.

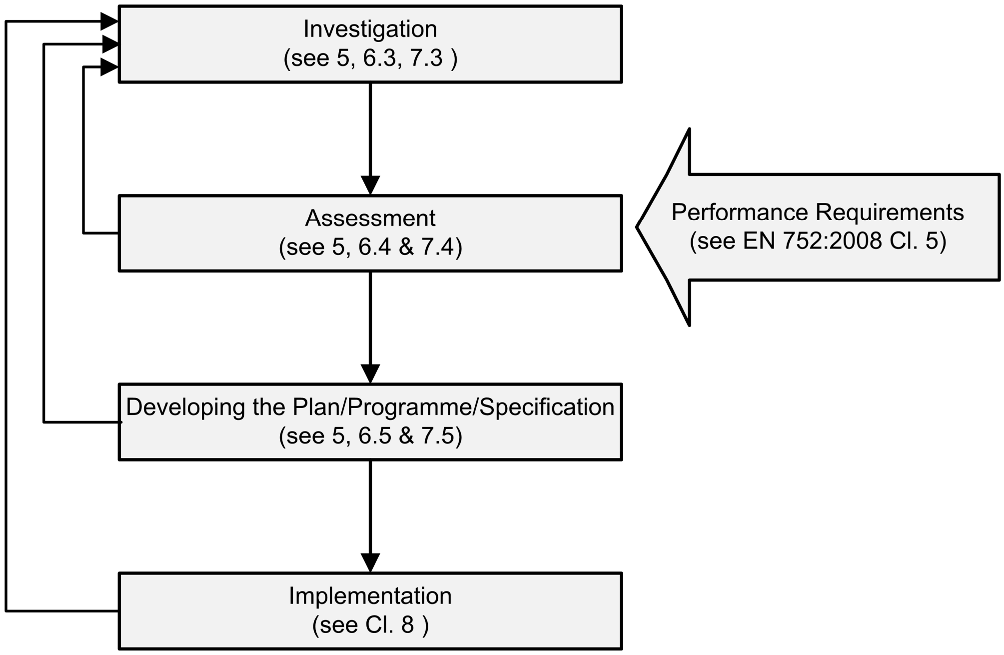

Figure 1 — The integrated sewer system management process (based on EN 752:2008, Figure 5)

The integrated sewer system management process is applied successively to develop a rehabilitation programme based on the integrated sewer system management plan. The programme outlines a series of discrete rehabilitation projects to implement the rehabilitation proposals in the plan. Following this, the integrated sewer system management process is then used to produce a detailed specification for each of these projects in the programme. Finally, following the implementation of each project, the rehabilitation programme and the integrated sewer system management plan are reviewed and updated where necessary. The performance requirements for the rehabilitated systems should be in accordance with EN 752:2008, 5.2. At each stage further investigation and assessment is carried out in accordance with EN 13508-1.

This staged process is summarised in Figure 2.

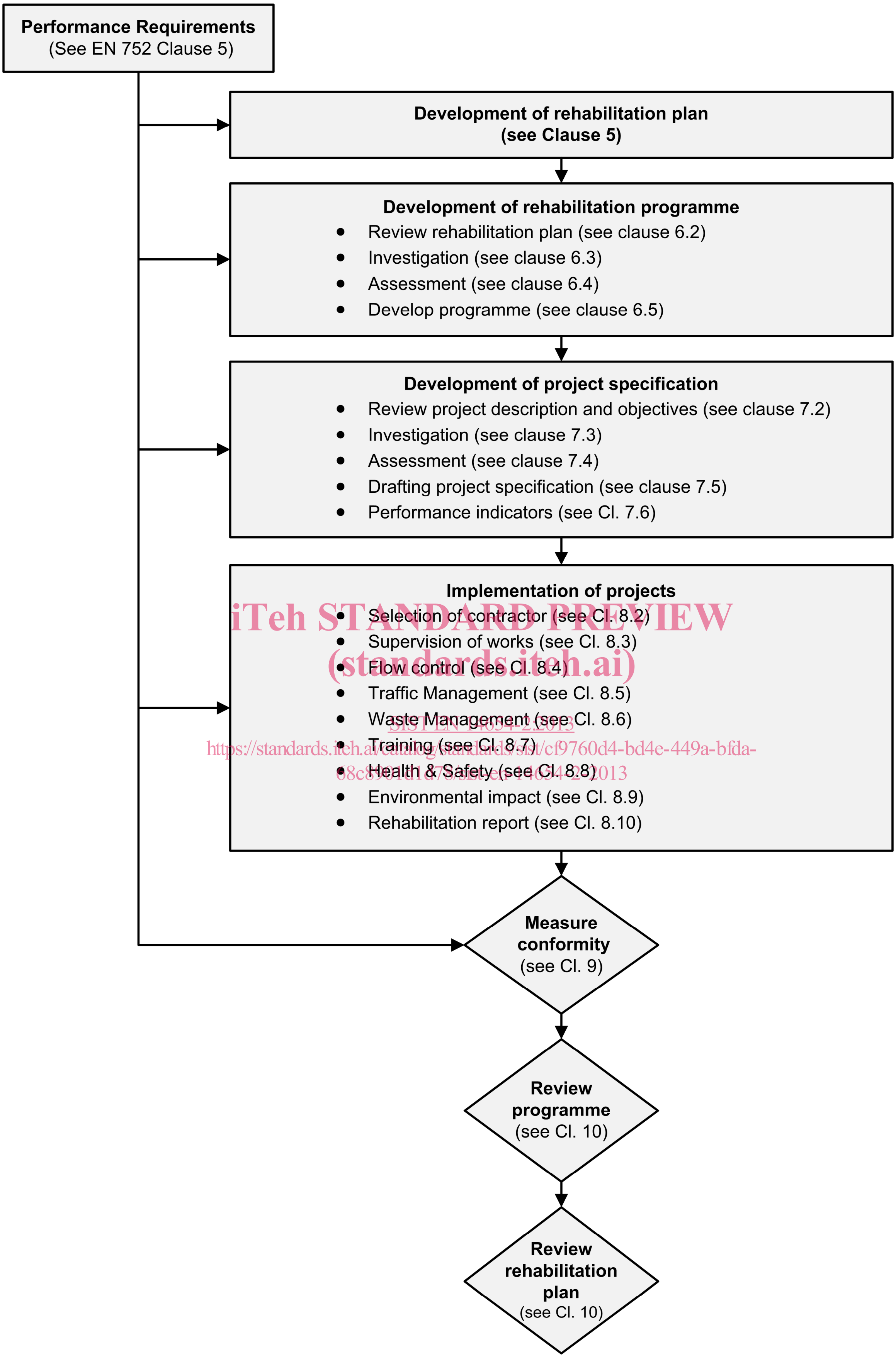
Performance Requirements
(See EN 752 Clause 5)
Development of rehabilitation plan
(see Clause 5)
Development of rehabilitation programme
• Review rehabilitation plan (see clause 6.2)
• Investigation (see clause 6.3)
• Assessment (see clause 6.4)
• Develop programme (see clause 6.5)
Development of project specification
• Review project description and objectives (see clause 7.2)
• Investigation (see clause 7.3)
• Assessment (see clause 7.4)
• Drafting project specification (see clause 7.5)
• Performance indicators (see Cl. 7.6)
Implementation of projects
• Selection of contractor (see Cl. 8.2)
• Supervision of works (see Cl. 8.3)
• Flow control (see Cl. 8.4)
• Traffic Management (see Cl. 8.5)
• Waste Management (see Cl. 8.6)
• Training (see Cl. 8.7)
• Health & Safety (see Cl. 8.8)
• Environmental impact (see Cl. 8.9)
• Rehabilitation report (see Cl. 8.10)
Measure conformity
(see Cl. 9)
Review programme
(see Cl. 10)
Review rehabilitation plan
(see Cl. 10)

Figure 2 — Summary of the rehabilitation management and control process

5 Rehabilitation plan

An Integrated Sewer System Management Plan prepared in accordance with EN 752:2008, Clause 6, includes:

— new development plan;

— rehabilitation plan;

— operational plan;

— maintenance plan.

A rehabilitation plan, as part of an Integrated Sewer System Management Plan should be prepared for the drain and sewer system prior to design or construction of any rehabilitation works. However, this is not always possible if works are required urgently (e.g. in response to a drain or sewer failure).

It is not necessary for the rehabilitation plan to include detailed descriptions of the solutions. It may include only general descriptions of the approaches to be taken.

A number of different approaches to rehabilitation options which may be used in preparing a rehabilitation plan are described in Annex A (normative).

6 Preparation of rehabilitation programme

6.1 Introduction

The starting point for the preparation of the rehabilitation programme is the rehabilitation plan produced in accordance with EN 752:2008, Clause 6, and the performance requirements produced in accordance with EN 752:2008, Clause 5.

The rehabilitation plan does not generally contain the necessary detail to proceed directly to the production of the project specification. The rehabilitation programme defines a series of projects, in line with the rehabilitation plan, to ensure that the drain and sewer system meets the performance requirements. The rehabilitation programme should define the objectives for each project in sufficient detail so that a project specification can then be produced in accordance with Clause 7.

The preparation of the rehabilitation programme involves:

a) review of the rehabilitation plan (see 6.2) to ensure it is still current and to establish what further investigation is required to develop the programme;

b) further investigation (see 6.3) to provide the information necessary for the more detailed assessment;

c) more detailed assessment (see 6.4) to identify further detail of the performance deficiencies that the programme needs to address;

d) preparation of the programme (see 6.5) setting the scope and objectives for each of the projects.

All stages of the preparation of the rehabilitation programme shall take account of the health and safety principles set out in EN 752:2008, Clause 7.

6.2 Review of the rehabilitation plan

A review should be undertaken of the rehabilitation aspects of the integrated sewer system management plan.

This should include:

a) ensuring the performance requirements used in the preparation of the integrated sewer system management plan are still current;

b) checking that any assumptions regarding projected timescales included in the plan for new developments or other changes to the sewer system are still valid;

c) identifying where further investigation and assessment is required in order to develop the programme of works.

If there have been any changes then the plan should be updated.

6.3 Investigation

The investigation of the drain and sewer system shall be carried out in accordance with EN 752:2008, Clause 6, and EN 13508-1:2012, Clause 5.

The scope of the investigations necessary to produce the rehabilitation programme will depend on the extent of the investigations carried out during the preparation of the integrated sewer system management plan. Investigations shall be carried out where further information is required in order to produce the rehabilitation programme. Examples can include:

— further inspection in parts of the system where the original assessment was based only on sample inspections;

— the production of more detailed sewer flow simulation models, where the original assessment was based on a simplified model;

— more detailed studies of the impact of any discharges on receiving waters.

The types of investigation can include:

— investigations of the existing drain and sewer system (e.g. visual inspections, radar, sonar, flow measurements, sewer flow simulation modelling, wastewater quality simulation modelling);

— more detailed investigations of the impact of proposed new developments in the area (e.g. hydraulic modelling etc.);

— other investigations to determine feasibility of options (e.g. preliminary topographical, geotechnical and other investigations (see EN 752:2008, 8.1, item 2 in list, and EN 752:2008, 9.3)).

Details of investigation techniques for existing drains and sewers are described in EN 13508-1.

6.4 Assessment

The performance of the drain or sewer systems shall be assessed in accordance with EN 13508-1:2012, Clause 6, using the results of the investigation (see 6.3). The assessments carried out during the preparation of the rehabilitation plan should be reviewed and updated in the light of any new information identified during the investigations. The performance at each planning horizon shall be compared to the performance requirements to identify the needs for rehabilitation.

The assessment should identify the location of those components of the drains and sewer system where proactive or reactive rehabilitation are to be carried out. This shall be based on:

— a knowledge of the characteristics and structural condition of the drain and sewer system;

— an understanding of existing and past failures and their association with performance deficiencies including their impact on operations and maintenance of parts of the drain and sewer system concerned;