

This is a preview of "ISO 24516-3:2017". [Click here to purchase the full version from the ANSI store.](#)

First edition
2017-09

Guidelines for the management of assets of water supply and wastewater systems —

Part 3: Wastewater collection networks

*Lignes directrices pour la gestion d'actifs des systèmes d'eaux usées et
d'eau potable —*

Partie 3: Réseaux d'assainissement



Reference number
ISO 24516-3:2017(E)

© ISO 2017

This is a preview of "ISO 24516-3:2017". Click [here](#) to purchase the full version from the ANSI store.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

This is a preview of "ISO 24516-3:2017". Click here to purchase the full version from the ANSI store.

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principal aspects of the management of assets	5
4.1 Objectives and requirements.....	5
4.1.1 Objectives.....	5
4.1.2 Functional requirements.....	5
4.1.3 Performance requirements.....	6
4.2 General aspects.....	8
4.2.1 General.....	8
4.2.2 Principal aspects — Wastewater utilities.....	8
4.2.3 Principal aspects — Wastewater systems.....	9
4.2.4 Integrating the principal aspects.....	9
4.3 Specific aspects.....	9
4.3.1 Risk.....	9
4.3.2 Life cycle.....	11
4.4 Structuring the process for the management of assets.....	11
4.4.1 General.....	11
4.4.2 Strategies for the management of assets.....	12
4.4.3 Periods of planning.....	13
4.4.4 Strategic level activities.....	14
4.4.5 Tactical level activities.....	14
4.4.6 Operational level activities.....	14
5 Investigation	15
5.1 General.....	15
5.2 Purpose of investigation.....	15
5.3 Determine the scope of the investigation.....	15
5.4 Types of investigation.....	16
5.4.1 Hydraulic investigation.....	16
5.4.2 Environmental investigation.....	16
5.4.3 Structural investigation.....	16
5.4.4 Operational investigation.....	17
5.5 Data collection.....	17
5.5.1 General.....	17
5.5.2 Data requirements.....	17
5.5.3 Inventory data.....	17
5.5.4 Failure data.....	18
5.5.5 Further condition data.....	19
5.6 Data registering and data assignment.....	20
5.6.1 Data registering.....	20
5.6.2 Data assignment.....	21
5.6.3 Geo-referencing.....	21
5.7 Review existing information.....	21
5.8 Inventory update.....	21
5.9 Review of performance information.....	21
5.10 Planning of investigation.....	22
5.11 Performance testing.....	22
6 Assessment	23
6.1 Principles.....	23
6.2 Assessment of the hydraulic performance.....	23

This is a preview of "ISO 24516-3:2017". Click here to purchase the full version from the ANSI store.

6.3	Assessment of environmental impact.....	23
6.4	Assessment of structural condition	24
6.5	Assessment of operational performance.....	24
6.6	Comparison with performance requirements.....	24
6.7	Identification of unacceptable impacts.....	24
6.8	Identification of causes of performance deficiencies	24
7	Planning.....	24
7.1	General.....	24
7.2	Develop integrated solutions.....	25
7.3	Assess solutions.....	26
7.4	Prepare an action plan	26
8	Implementation.....	29
8.1	General.....	29
8.2	Create/update plan	29
8.3	Carry out work.....	29
8.4	Monitor performance.....	30
8.5	Review performance.....	30
9	Operation and maintenance.....	30
9.1	General.....	30
9.2	Operation.....	31
9.3	Maintenance.....	31
10	Rehabilitation.....	32
10.1	General.....	32
10.2	Strategic plan on rehabilitation	32
10.2.1	General.....	32
10.2.2	Strategic approaches.....	33
10.2.3	Budgeting.....	34
10.3	Tactical planning for rehabilitation of physical infrastructure (mid-term planning).....	35
10.3.1	Risk-based evaluation approach	35
10.3.2	Individual evaluation and prioritizing.....	35
10.3.3	Coordination with other construction activities.....	36
10.4	Operational plan — Implementation plan for rehabilitation measures.....	36
11	Documentation and performance review	36
Annex A (informative) Objectives and functional requirements		38
Bibliography.....		41

This is a preview of "ISO 24516-3:2017". [Click here to purchase the full version from the ANSI store.](#)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 224, *Service activities relating to drinking water supply systems and wastewater systems — Quality criteria of the service and performance indicators*.

A list of all parts in the ISO 24516 series can be found on the ISO website.

Introduction

This document is written within the overall concept of management of assets which is an activity all organizations undertake in some manner and to some degree. It focuses on the details of managing the physical assets at the operational level rather than the organizational (corporate management, structural or process) level.

Wastewater utilities are reliant on their assets to deliver their services to the resident populations in their jurisdictions. The assets (underground pipes, retention and detention tanks, treatment plants, etc.) collectively form the physical infrastructure of the wastewater utilities and are the consequence of the accumulated capital investments and operational expenditures on maintenance and rehabilitation over many years. In many of these utilities, the replacement value of these past investments will amount to many millions (even billions) of US dollars depending on the size of the community served. The infrastructure represents therefore a major societal investment in essential services contributing to public health and the protection of the environment.

In many countries, these assets have been identified as critical infrastructure, and programmes are in place to ensure their protection or their sustainability. Like many other organizations having assets, wastewater utilities undertake programmes of activities to manage the assets to ensure they continue to meet the needs of the community. These management activities can be at the strategic, tactical or operational level. The activities can be part of a formal management system, the result of specific legislative requirements, or simply the result of due diligence by the service operators and managers.

This document can serve as a supporting document for utilities operating an asset management system regardless of whether the utilities make use of any management system standard (e.g. ISO 55001).

In many countries, there is a recognized sustainability problem, sometimes referred to as the infrastructure gap, which recognizes that for various reasons, the infrastructure has not been maintained over the years on a truly sustainable basis, i.e. funding of rehabilitation programmes has been postponed, with a focus instead on short-term repairs or an allowed decrease in the level of service provided.

The condition of wastewater infrastructure greatly influences the adequacy of the wastewater service from aspects of quantity, quality, safety, reliability, environmental impact, degree of treatment and economic efficiency. System condition-based rehabilitation approaches serve to meet these requirements with a focus on a holistic approach of condition-based, risk-oriented maintenance.

As the installation and development of wastewater assets mature, the optimization of networks will become necessary in many places in order to respond to changing societal and economic conditions. Consequently, networks are subject not only to ageing as well as wear and tear but also to adaptation processes resulting from growth, new legislative requirements, or changing user service level expectations. This requires wastewater utilities not only to focus on maintenance and rehabilitation but also to keep future requirements and developments in mind. Rehabilitation will thus become essential in management of assets, with ever more stringent requirements on the design and execution of rehabilitation (partial replacement of specific sections of the entire network is also considered as rehabilitation).

In recent years, much effort has been applied to the whole issue of management of assets on two levels:

- What are the principles and structure of an asset management system?
- What are the good practices that can be implemented on a technical level to assess the condition of the assets and help decide when asset interventions (repair, renovation or replacement) take place?

This document describes the information required and how to collect and process reliable inventory, condition, operational and environment data about wastewater systems. Data on wastewater infrastructure notably include data on failure. These data serve mainly as a basis for systematic maintenance and can also contribute data needed for benchmarking.

This is a preview of "ISO 24516-3:2017". [Click here to purchase the full version from the ANSI store.](#)

Reliable failure statistics and the database description of the condition are of particular significance for establishing investigation, maintenance and rehabilitation priorities.

This document also provides guidance on how to define a strategy on management of assets with regard to the overall performance expected by the owner and other stakeholders. It includes several aspects of the operation and maintenance, including asset condition assessment and investment strategies (new assets and rehabilitation).

Guidance in [Clauses 4, 5, 6, 7](#) and [9](#) is taken from EN 752. This document provides a framework for the design, construction, rehabilitation, maintenance and operation of drain and sewer systems outside buildings and also focuses on "integrated sewer system management" in which management of assets is a part.

The approaches offered in this document are intended to be universally applicable, regardless of the structure of a given wastewater system. Any empirical numeric values given are mere support values; concrete plans always need to rely on utility and/or object-specific values.

The usual and expected goal of the effective management of assets is to provide maximum life and value in a cost-effective manner. However, in some circumstances where the assets are being operated to satisfy a short-term goal, this will not be to maximize the life of the assets, but could, for example, be to minimize costs while meeting other objectives within the planned timeframe.

This document is intended to provide guidance on the assets typically owned or operated by wastewater utilities that are expected to meet users' needs and expectations over longer (multi-generational) periods.

Additional information on objectives and functional requirements of management of assets is provided in [Annex A](#).