

## **EN752, the European Standard for Planning, Design and Operation of Drain and Sewer Systems**

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### **BACKGROUND**

The first code of practice for sewerage was Civil Engineering Code of Practice No 5 which later became CP2005 in 1968 and then in the late 1980's BS8005.

As part of the process to create a single European Market in the late 1980's, there was an impetus to replace national standards by new harmonised European Standards. European Standards are produced by Comité Européen de Normalisation (CEN), which known in English as the European Committee for Standardization. Contrary to popular view CEN is not an EU organisation, but an independent non profit organisation established under Belgian Law. It was founded in 1961 by the national standards bodies in the European Economic Community and EFTA countries. Its membership is now 30, including the national standards bodies from the 27 EU member countries and the 3 European Economic Area countries. In addition it has 7 affiliates who from countries which border the national member countries.

CEN Standards on Wastewater products largely come under the Technical Committee TC165 Wastewater Engineering, which has a Secretariat provided by DIN, the German Standards Organisation. To produce standards for functional requirements and overall planning design, construction and operation of sewer systems TC165 created Working Group 22 (known as CEN TC165/WG22) which met for the first time in Berlin in October 1989.

It's first take was to produce a harmonised standard based on the existing standards in those countries participating in the project. This inevitably required some generalisations and basing the work on existing standards meant that it was not able to take account of new developments. Nevertheless a standard, EN752, was produced in 7 parts between 1995 and 1998. The residual national content was incorporated into a series of National annexes which were published in the UK edition as BS EN 752. This superseded BS8005 which was withdrawn in 2000.

Recognising that EN752 had largely ignored new developments and that it had a structure that was produced as a means of achieving consensus, WG22 commenced a review of EN752 and commenced work on a revision in 2004. This was published in January 2008.

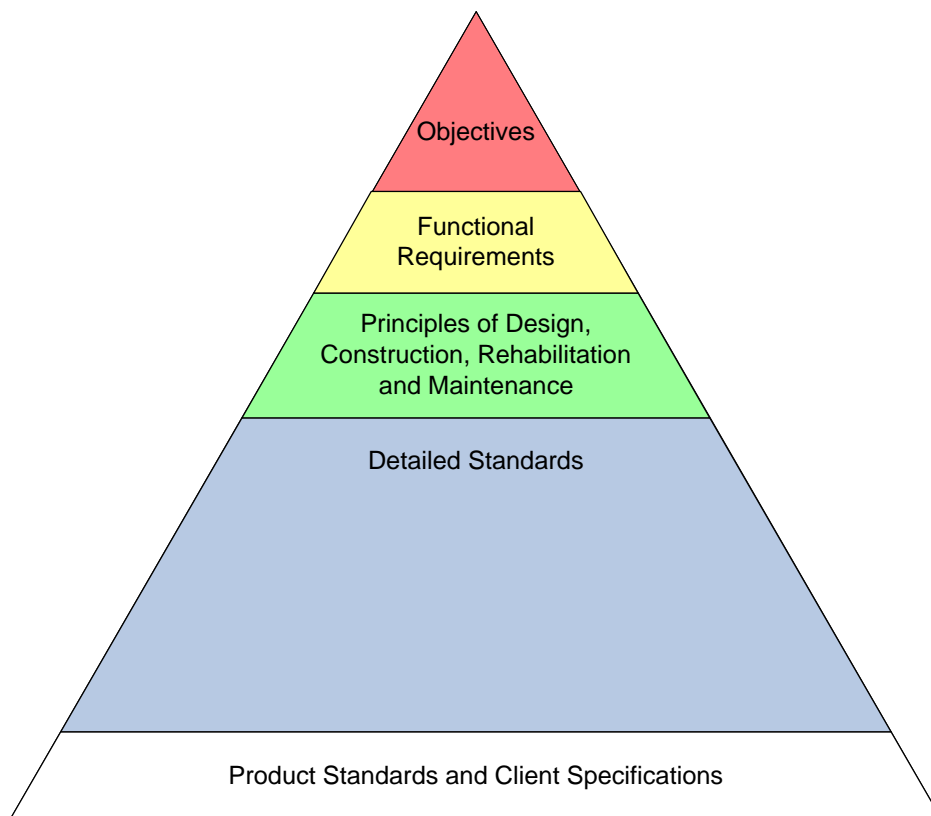
### **THE STRUCTURE OF EN 752:2008**

The structure of EN752 is illustrated by the diagram below which is taken from the standard.

This starts with the fundamental objects of a sewer system from which are developed a number of functional requirements. From these are developed a number of principles of planning, design, construction, rehabilitation, operation and maintenance of drain and sewer systems. More detailed text supporting these principles is contained in the annexes to the document and in a number of supporting standards.

It is also from these principles, through product standards, that we ensure that these components will allow the systems to meet the functional requirements.

Client specifications such as Sewers for Adoption, Civil Engineering Specification for the Water Industry and Company Policy documents should also relate back to the fundamentals of this hierarchy.



## **OBJECTIVES**

It is important to remember that drain and sewer systems are fundamentally provided to protect public health and safety and environmental protection. Also in the provision or management of and drain and sewer system it is essential to consider the health and safety of operations staff and sustainability issues. The four fundamental objectives in EN752 are therefore:

1. Public health and safety
2. Occupational health and safety
3. Environmental protection
4. Sustainability

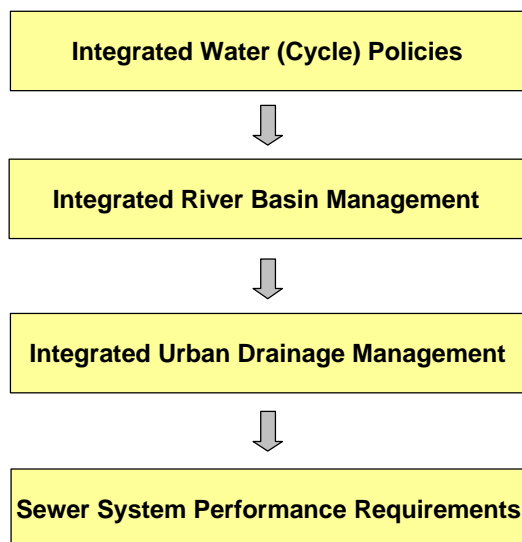
## **FUNCTIONAL REQUIREMENTS**

EN 752 defines thirteen functional requirements for the planning, design, construction and operation have been identified which follow from the objectives as follows:

- a) Protection from flooding;
- b) Maintainability (i.e. the system should be built in a way that allows necessary maintenance to be carried out);
- c) Protection of surface receiving waters (i.e. rivers, lakes, estuaries and coastal waters);
- d) Protection of groundwater;
- e) Prevention of odours and toxic, explosive and corrosive gases;

- f) Prevention of noise and vibration;
- g) Sustainable use of products and materials;
- h) Sustainable use of energy;
- i) Structural integrity and design life;
- j) Maintaining the flow (i.e. the system continues to carry the necessary flows);
- k) Leak tightness;
- l) Not endangering adjacent structures and utility services;
- m) Inputs quality (i.e. controlling discharges into the system that might otherwise damage the system or the environment through, for example, trade effluent control).

These functional requirements are descriptive and contain no numeric standards. Performance standards will often come from legislation and national regulators, however in many cases this needs to be interpreted into performance requirements for individual locations. These must take into account the context of national policies (e.g. Making Space for Water); river basin constraints e.g. from WFD river basin plans and from catchment flood management plans.



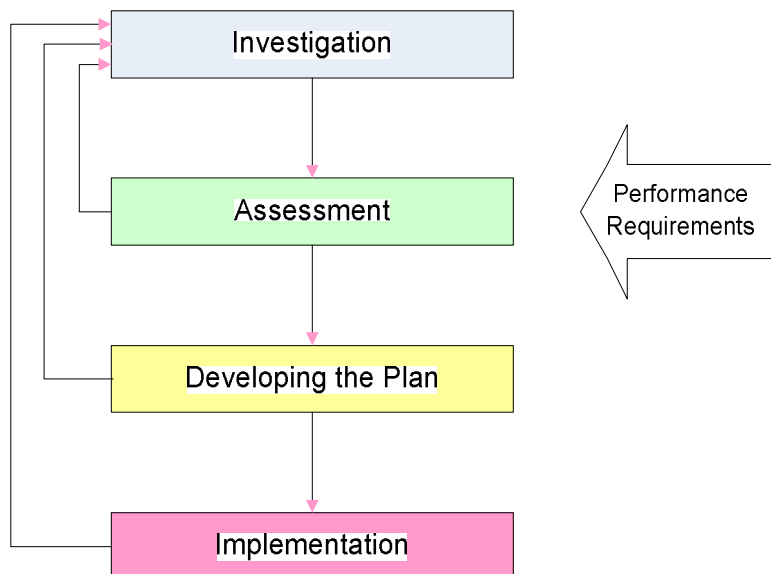
At a more local level EN752 recognises the need to consider the wider urban drainage environment through Integrated Urban Drainage Management. This should define what the performance the sewer system needs to achieve having regard criteria such as the capacity of receiving watercourses (both for pollution and volume of flow) and the impact of the failure (e.g. whether an escape of water would flood buildings or would over the ground to a receiving watercourse).

From the performance requirements, design standards can then be derived which provide headroom to take into account additional allowances e.g. for future growth in the system. This ensures that new systems can continue to meet the performance requirements for a significant period of time without the need for upgrading.

### **INTEGRATED SEWER SYSTEM MANAGEMENT**

Having established how the sewer system interacts with the wider water system, the sewer system should then be managed in an integrated way. This should ensure that the rehabilitation, extension, operation and maintenance of the sewer system consider all

aspects of the performance and the interactions between them. This is achieved through an Integrated Sewer System Management Plan developed using a process very similar to the Sewerage Rehabilitation Manual planning procedures. The procedure is summarised in the diagram below.



The Integrated Sewer System Management Plan is a single plan that forms the basis for the operation of the system, all maintenance activities, any rehabilitation and the accommodation of new developments.

Another standard, EN13508 Condition of drain and sewer systems outside buildings, also developed by WG22 provides support to the investigation and assessment stages of this process. The last revision of the Manual of Sewer Condition Classification was carried out to make it compatible with EN13508.

From the rehabilitation plan further investigation and assessment will be required to define programmes of work and individual projects. Further supporting standards on management of control of sewer cleaning work (EN 14654-1) and rehabilitation (under development) support the development of the plan into projects.

## PRINCIPLES

EN 752 contains principles of health and safety, design, construction, operations and maintenance, performance testing, qualifications and training.

The health and safety principles recognise that many, but not all, of national health and safety laws in the CEN member countries are based European Directives common to nearly all CEN countries.

The design principles include provisions on hydraulic and environmental design, provision of access, and use of separators.

## DETAILED STANDARDS

Some more detailed provisions on design and operation of drain and sewer systems are contained in Clause 9 and a number annexes to EN752. Other standards are also relevant including EN1295 for design of buried pipelines, EN1610 for construction of buried pipelines,

EN1091 for vacuum sewer systems, EN858-2 for oil separators, EN1825-2 for grease separators. This area is one where there is likely to be further development of European Standards.

## **NATIONAL ANNEXES**

A significant amount of material previously contained in BS 8005 Sewerage, BS8301 Building Drainage, BS 6367 (the material related to drainage paved areas) not included in EN752 was abstracted into a series of national annexes in the first edition of BS EN 752. This includes guidance on manhole sizes and spacing, UK rainfall. These have now been consolidated and updated, introducing new material on SUDS and exceedance flood risk assessment. These form an important part of BS EN 752 for UK users.

## **OTHER UK DOCUMENTS**

Even after the development of more detailed standards, there will always be a role for detailed client specifications. These may be national documents or they may be company specific manuals of sewerage or practice documents.

Relevant national documents are referenced in the National Annex. These include Civil Engineering Specification for the Water Industry, Sewers for Adoption, Sewers for Scotland, Approved Document H to the Building Regulations, the Design Manual for Roads and Bridges.

These should be based on the principles set out in EN752. During the revision of EN752 a careful check has been made of Sewers for Adoption, Sewers for Scotland and Approved Document H to establish that these documents are not in conflict with any requirements of the new BS EN 752 and these documents have influenced the UK input to the drafting process.

## **CONCLUSIONS**

BS EN 752 is an important resource for all those involved in the planning, design, construction, rehabilitation, operations and maintenance of drain and sewer systems. Those producing contract specifications and company practice documents should ensure that these comply with the requirements of BS EN 752:2008.

## **ACKNOWLEDGEMENTS**

EN 752:2008 was drafted by a European working group with representatives from a number of countries including, Austria, Denmark, France, Germany, Italy, Netherlands, Portugal and the UK. The convenor of the working group was Mr Peter Forster. The work of the convenor and secretary was funded by Water UK through its standards support programme.

The UK input to this work including the national annexes was under the direction of a BSI project group with representatives with experience in sewerage, building drainage and highway drainage and included consultants, clients, suppliers and a representative from the Sustainable Buildings Division of the Department of Communities and Local Government.