# DIN EN 1610:2015-12 (E)

## Construction and testing of drains and sewers

## Contents

Page


European foreword ..... 5

1 Scope ..... 6

2 Normative references ..... 6

3 Terms and definitions ..... 6

4 General ..... 8
4.1 Technical principles ..... 8
4.2 Safeguarding design decisions ..... 9
4.3 Short sections of trench ..... 9

5 Construction components and materials ..... 10
5.1 General ..... 10
5.2 Materials used for embedment ..... 10
5.2.1 General ..... 10
5.2.2 Native soil ..... 10
5.2.3 Imported materials ..... 10
5.3 Materials used for main backfill ..... 12

6 Construction of trench ..... 12
6.1 General ..... 12
6.1.1 Introduction ..... 12
6.1.2 Working space and soil compaction ..... 12
6.1.3 Transmission of load between trench support system and soil ..... 12
6.1.4 Installing and removing the trench support system ..... 13
6.2 Trenches ..... 13
6.3 Trench width ..... 13
6.3.1 Maximum trench width ..... 13
6.3.2 Minimum trench width ..... 13
6.3.3 Determination of trench width ..... 15
6.4 Trench stability ..... 15
6.5 Trench bottom ..... 15
6.6 Dewatering ..... 16

7 General principles of embedment and support ..... 16
7.1 General ..... 16
7.2 Bedding construction types ..... 17
7.2.1 Bedding construction type 1 ..... 17
7.2.2 Bedding construction type 2 ..... 17
7.2.3 Bedding construction type 3 ..... 17
7.3 Special methods of bedding or support ..... 18

8 Installation ..... 18
8.1 General ..... 18
8.2 Setting out ..... 18
8.3 Delivery, handling and transportation on site ..... 18
8.4 Storage ..... 18
8.5 Lifting of components ..... 19
8.6 Laying ..... 19
8.6.1 General ..... 19

8.6.2 Line and level ... 19
8.6.3 Jointing ... 19
8.6.4 Socket holes ... 19
8.6.5 Pipe cutting ... 20
8.6.6 Provisions for future connections ... 20
8.6.7 Other instructions ... 20
8.7 Special forms of constructions ... 20
8.7.1 Pipelines above ground ... 20
8.7.2 Pipelines within protective pipes ... 20
8.7.3 Brick and in situ concrete sewers ... 20
8.7.4 Pipelines through, under or close to structures ... 20
8.8 Supporting and anchoring ... 20
8.9 Manholes and inspection chambers ... 21

9 Connection to pipes and manholes ... 21
9.1 General ... 21
9.2 Connection by junctions ... 21
9.3 Connection by connecting fittings ... 21
9.4 Connection by saddle fittings ... 22
9.5 Connection by welding ... 22
9.6 Connection to manholes and inspection chambers ... 22

10 Testing during construction ... 22

11 Backfilling ... 22
11.1 General ... 22
11.2 Compaction ... 22
11.3 Embedment and initial backfill ... 23
11.4 Main backfill ... 23
11.5 Removal of trench support system ... 23
11.6 Surface reinstatement ... 24

12 Final inspection and/or testing of pipelines and manholes after backfilling ... 24
12.1 General ... 24
12.2 Visual inspection ... 24
12.3 Leaktightness ... 24
12.4 Embedment and main backfill ... 24
12.4.1 General ... 24
12.4.2 Compaction ... 24
12.4.3 Pipe deformation ... 24

13 Procedures and requirements for testing gravity pipelines ... 25
13.1 General ... 25
13.2 Testing with air (method "L") ... 25
13.3 Testing with water (method "W") ... 28
13.3.1 Test pressure ... 28
13.3.2 Conditioning time ... 29
13.3.3 Test requirements ... 29
13.3.4 Testing time ... 29
13.4 Testing individual joints ... 30

14 Testing of pressure pipelines ... 30

15 Qualifications ... 30

Annex A (informative) Dewatering ... 31

A.1 General ... 31
A.2 Sump pumping from trench bottom ... 31
A.3 Deep wells ... 31
A.4 Vertical well points ... 32
A.5 Horizontal pipe dewatering ... 32

**A.6 Eductor well pointing ..... 32**

**Annex B (informative) Abstract from DIRECTIVE 2014/25/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors and repealing Directive 2004/17/EC (Text with EEA relevance) ..... 33**

**Annex C (informative) Manufacturer's Instructions ..... 34**

**Annex D (informative) Additional national public documents ..... 35**

**D.1 France ..... 35**
**D.2 Germany ..... 35**
**D.3 The Netherlands ..... 35**
**D.4 Austria ..... 35**
**D.5 Switzerland: ..... 36**
**D.6 Sweden ..... 36**
**D.7 UK ..... 36**

**Bibliography ..... 38**