

Code of practice for

Pipelines —

Part 2: Pipelines on land: design,
construction and installation —

Section 2.7 Precast concrete

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- Association of Consulting Engineers
- British Compressed Gases Association
- British Gas plc
- British Plastics Federation
- British Precast Concrete Federation Ltd.
- Concrete Pipe Association
- Country Landowners' Association
- County Surveyors' Society
- Department of Energy (Petroleum Engineering Division)
- Ductile Iron Producers' Association
- Electricity Supply Industry in England and Wales
- Engineering Equipment and Materials Users' Association
- Federation of Civil Engineering Contractors
- Health and Safety Executive
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- Institute of Petroleum
- Institution of Civil Engineers
- Institution of Gas Engineers
- Institution of Mechanical Engineers
- Institution of Water and Environmental Management (IWEM)
- Ministry of Agriculture, Fisheries and Food
- National Farmers' Union
- Pipeline Industries Guild
- Royal Institution of Chartered Surveyors
- Society of British Gas Industries
- Water Authorities Association
- Water Companies Association
- Water Research Centre

This British Standard, having been prepared under the direction of the Civil Engineering and Building Structures Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 31 July 1989

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Foreword

This Section of BS 8010 has been prepared under the direction of the Civil Engineering and Building Structures Standards Policy Committee. The standard is being published in four Parts to form a complete revision of all Parts of CP 2010 as follows:

- *Part 1: Pipelines on land: general;*
- *Part 2: Pipelines on land: design, construction and installation;*
- *Part 3: Pipelines subsea: design, construction and installation;*
- *Part 4: Pipelines on land and subsea: operation and maintenance.*

The new Part 1 (which superseded CP 2010-1:1966) contains general information which is relevant to a variety of pipeline construction materials and a variety of transported materials. It deals with those aspects of pipeline development that affect the owner and occupier of land through which the pipeline passes.

Part 2 will be divided into several Sections which will be published as separate documents as follows:

- *Section 2.1: Ductile iron;*
- *Section 2.2: Steel (for water, sewage and associated products)¹⁾;*
- *Section 2.3: Asbestos cement;*
- *Section 2.4: Prestressed concrete pressure pipelines;*
- *Section 2.5: Glass reinforced thermosetting plastics¹⁾;*
- *Section 2.6: Thermoplastics¹⁾;*
- *Section 2.7: Precast concrete;*
- *Section 2.8: Steel (for oil, gas and associated products)¹⁾.*

Each Section will contain information on the design, construction and installation of a pipeline in the particular material. These Sections will supersede the existing Parts 2, 3, 4 and 5 of CP 2010.

Part 3 will contain information relevant to the design, installation and commissioning of subsea pipelines in steel and other materials.

Part 4 will contain advice on the operation and maintenance of pipelines and will probably be in Sections related to conveyed material.

This Section of BS 8010 gives design considerations and construction and installation recommendations for pipelines constructed using precast concrete pipes and fittings, for the conveyance of fluids, normally under atmospheric pressure.

Pipelines of precast concrete were not included in CP 2010.

Appendix A gives a method determining the compaction fraction for bedding materials.

Appendix B is a bibliography.

It has been assumed in the drafting of this British Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

¹⁾ In preparation.

Attention is drawn to the following principal statutory legislation in the UK. This list is not intended to be complete and the relevant authorities should be consulted and reference made to BS 8010-1. These Acts are supplemented by Statutory Instruments.

- Acquisition of Land Act 1981
- Control of Pollution Act 1974
- Countryside Act 1968
- Countryside (Scotland) Acts 1967 and 1981
- Gas Acts 1965 and 1972
- Health and Safety at Work etc. Act 1974
- Land Powers (Defence) Act 1958
- Pipelines Act 1962
- Public Health Acts 1936 and 1961
- Public Utilities Street Works Act 1950
- Requisitioned Land and War Works Act 1948
- Sewerage Scotland Act 1968
- Water Acts 1945, 1948, 1973, 1975, 1981 and 1983
- Water (Scotland) Acts 1946, 1949, 1967 and 1980

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 16, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Subsection 1. General

1 Scope

This Section of BS 8010 gives design considerations and construction and installation recommendations for precast concrete pipelines using pipes complying with BS 5911-100 for the conveyance of fluids, normally under atmospheric pressure.

This British Standard code of practice is not intended to replace or duplicate hydraulic, mechanical or structural design manuals.

NOTE 1 The numbers in square brackets in the text of this Section refer to the numbered references in Appendix B

NOTE 2 The titles of publications referred to in this Standard are listed on the inside back cover.

2 Definitions

For the purposes of this Section of BS 8010 the following definitions apply.

2.1

pipeline

a line of pipes of any length without frequent branches. It does not include piping systems such as process plant piping within refineries, factories or treatment plant

2.2

precast concrete pipe

flexibly jointed pipe of precast concrete, either reinforced or unreinforced (but not prestressed), complying with BS 5911-100

2.3

backfill

fill placed above bedding, over and around a buried pipeline

2.4

bedding material

material used to support a buried pipeline, introduced under and around the pipes so as to produce, in combination with the pipes themselves, a pipeline able to resist the external loads

2.5

flexible joint

a connection between individual pipes and/or fittings that permits both angular deflection and axial movement without impairing the efficiency of the joint

2.6

nominal size (DN)

a numerical designation of the size of a unit, which is a convenient round number approximately equal to a manufacturing dimension

NOTE For the purposes of this Section this number approximates to the internal diameter of the unit measured in millimetres.

2.7

unit

a precast concrete pipe, bend, junction or manhole component

3 Application

The pipelines covered by this Section of BS 8010 are suitable for conveying under gravity water, sewage, slurries and some trade wastes. The pipelines may be suitable for low pressure operation, not exceeding 1 bar²⁾, provided that the pipe manufacturer's recommendations are followed.

When used for the conveyance of sewage, reference should be made to BS 8005. The actual service and environmental conditions should be considered in determining whether precast concrete is suitable. Service conditions include operating pressure, maximum and minimum operating temperatures, the extent of chemical and physical reaction between either the material carried or the surrounding ground and the pipe and joint material and any toxicity of the material carried.

Environmental factors relate to the route of the pipeline and include the amount of open country or built-up areas along the route, the presence of areas liable to subsidence, and the existence of exposed aquifers.

4 Safety

4.1 Prevention of injury to personnel

Part 1 of BS 8010 should be consulted for outline recommendations for public safety under conditions normally encountered during installation of a buried pipeline. Because site operatives are particularly at risk in the lifting and handling of heavy pipes and through all stages of excavation and trench support (see 5.4) constant vigilance by the site supervisor and the safety officer is essential and is a legal requirement under the Health and Safety at Work etc. Act 1974.

4.2 Prevention of damage to the pipeline

During construction damage is possible from a variety of potential hazards. The major hazards and suggested means of prevention are shown in Table 1.

²⁾ 1 mbar = 100 N/m² 100 Pa.

5 Inspection

5.1 General

The performance of a pipeline is dependent on standards of workmanship and inspection at all stages. Inspection of the pipeline and its components should include at least the inspections in 5.2 to 5.8.

5.2 Manufacture

Inspection of units should be to the relevant Part of BS 5911.

NOTE Independent certification provides additional safeguards.

5.3 Delivery

Units should be inspected on arrival at site for compliance with the contract specification and for damage, especially of joint profiles. Any damaged unit should be assessed for possible repair. If rejected the unit should be removed from site. Other material should be similarly inspected on arrival and, if rejected, removed from site.

5.4 Trenching

5.4.1 Trench width. Where design is based on “narrow trench conditions”, the trench width should be inspected for compliance with the contract specification and site drawings.

5.4.2 Trench support. The excavation and trench support system should be inspected for compliance with the approved design and specification [10]. There should be detailed inspection of excavation and trench support systems at least daily.

Where removal or replacement of support is required during construction, inspection should ensure that the correct sequence of operations is followed.

5.5 Pipe bedding

Bedding materials should be checked for compliance with the specification and, when placed, for compliance with the drawings.

5.6 Laying and jointing

Units and joint rings should be inspected and checked for compatibility immediately before laying. The pipeline should be laid within the specified tolerances for line and level. Joints should be tested and/or inspected before being covered and backfilled.

5.7 Anchoring

Any anchoring should be installed and checked for compliance with the drawings before the pipeline is tested.

5.8 Pre-commissioning inspection

After testing in accordance with clause 31, the completed pipeline should be inspected by a competent person before commissioning.