BSI Standards Publication

Guide to the structural design of buried pipes

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Published by BSI Standards Limited 2026

ISBN 978 0 539 41531 5

ICS 23.040.01; 93.030

The following BSI references relate to the work on this document:
Committee reference B/505
Drafts for comment 19/30359667 DC; 23/30453511 DC

Amendments/corrigenda issued since publication

Date	Text affected
July 2026	C.1 See Foreword for details. Missing equation added in **7.3.8.4.2,** Table 10, Table 13 and Table 17 corrected and Figure 11 corrected

Contents

Summary of pages
This document comprises a front cover, an inside front cover, pages I to VI, pages 1 to 144, and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 29 February 2020. It was prepared by Technical Committee B/505, *Wastewater engineering*. A list of organizations represented on this committee can be obtained on request to the committee manager.

Supersession

BS 9295:2020 superseded BS 9295:2010, which has been withdrawn.

BS 9295:2020+A1:2025 supersedes BS 9295:2020, which is withdrawn.

Relationship with other publications

This British Standard is complementary to BS EN 1295-1:2019 and PD CEN/TR 1295-2:2005.

BS EN 1295-1:2019 specifies general requirements for the structural design of buried pipes under various conditions of loading. Guidance is also given on the application of the nationally established methods of design declared by, and used in, CEN member countries at the time it was prepared. The established United Kingdom method is described as BS 9295.

PD CEN/TR 1295-2:2005 summarizes the nationally established methods of design made available to CEN. The United Kingdom method is described in **A.9**, which is consistent with BS EN 1295-1:1997.

This British Standard gives further information to facilitate in full the structural design of buried pipes under various conditions of loading using the established United Kingdom method; it does not alter any of the provisions of BS EN 1295-1:2019.

Information about this document

BS 9295:2020 was a full revision of the document, and introduced the following principal changes:

- incorporation of the content of National Annex A to BS EN 1295:1997; and
- inclusion of the Gumbel method for the design of buried pipes.

Text introduced or altered by Amendment No. 1 is indicated in the text by tags 〖A1〉 〈A1〗. Minor editorial changes are not tagged.

Amendment No. 1 introduces changes to provide consistency of units between those commonly used and those necessary for direct numerical input to formulae. Where values are derived from graphs, this distinction of units is particularly important. For historic reasons, various figures and tables have contained source information in particular units. Different pipe standards also use different units for the same named variable.

Text introduced or altered by Corrigendum No. 1 is indicated in the text by tags 〖C1〉 〈C1〗. Minor editorial corrections are not tagged.

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As a guide, this British Standard takes the form of guidance and advisory recommendations. It is not to be quoted as if it were a specification or a code of practice.

Presentational conventions

The guidance in this document is presented in roman (i.e. upright) type. Any recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Additional commentary, explanation and general informative material is presented in smaller italic type.

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. "organization" rather than "organisation").

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Introduction

This revision of BS 9295 has been prepared to maintain alignment with BS EN 1295-1:2019, which now cites BS 9295 as the primary source of the methods accepted for the structural design of buried pipes in the UK. The opportunity has been taken to review various shortcomings in the earlier UK design methods, many of which have arisen due to changes in the nature of pipes over the period since those methods were originally published.

Changes from the methods previously published as BS EN 1295-1:2019 and BS 9295 include the introduction of a new conceptual model for the design of buried flexible pipes focused on large-diameter structured-wall thermoplastics pipes, explicit consideration of the quality of workmanship envisaged during installation, non-circular shaped concrete pipes, and a wider range of bedding materials. Non-circular shaped pipes in materials other than concrete are not in common use in the UK so their design is not covered by this edition.

1 Scope

This British Standard gives the UK established method for the structural design of buried pipes under various conditions of loading. The procedures are explained, with tables listing the recommended design values for the appropriate variables in the design formulae, figures providing graphical information on vehicle surcharge loadings, and tables of rigid pipe bedding factors.

NOTE The scope of BS EN 1295-1:2019 is restricted to the structural design of water supply pipelines, drains and sewers, and other water industry pipelines, whether operating at atmospheric, greater or lesser pressure.

Some aspects of longitudinal effects are discussed (see Annex A), but this topic is not fully covered.

The initial selection of options for the pipe material involves consideration of matters beyond structural design and is outside the scope of this standard.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions, or limits the application, of this document[1)]. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BS EN 545, *Ductile iron pipes, fittings, accessories and their joints for water pipelines – Requirements and test methods*

BS EN 598, *Ductile iron pipes, fittings, accessories and their joints for sewerage applications – Requirements and test methods*

BS EN 622-4, *Fibreboards – Specifications – Part 4: Requirements for softboards*

BS EN 1295-1:2019, *Structural design of buried pipelines under various conditions of loading – Part 1: General requirements*

BS EN 1610:2015, *Construction and testing of drains and sewers*

BS EN 1992-1-1:2004+A1:2014, *Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings*

BS EN 13242:2002+A1:2007, *Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction*

1) Documents that are referred to solely in an informative manner are listed in the Bibliography.

