BSI Standards Publication

Eurocode 1 — Actions on structures

Part 1-1: Specific weight of materials, self-weight of construction works and imposed loads for buildings

bsi.

National foreword

This British Standard is the UK implementation of EN 1991-1-1:2025. It supersedes BS EN 1991-1-1:2002, which will be withdrawn on 30 March 2028.

The UK participation in its preparation was entrusted to Technical Committee B/525/1, Actions (loadings) and basis of design.

A list of organizations represented on this committee can be obtained on request to its committee manager.

National choice is allowed in this standard where explicitly stated within notes. The National Annex to this standard contains the national choices to be used for buildings and civil engineering works constructed in the UK.

The first generation of EN Eurocodes was published between 2002 and 2007, with conflicting British Standards withdrawn in 2010. This document forms part of the second generation of EN Eurocodes.

The second generation of EN Eurocodes is expected to be published between 2023 and 2026. These documents are being published as soon as they are available. This is being done to enable users to prepare for the transition from the first generation to second generation of EN Eurocodes.

UK adoptions of the first generation of EN Eurocodes will be withdrawn by BSI on 30 March 2028. Until that date, the first generation documents should be considered as the applicable standards for buildings and civil engineering works constructed in the UK unless otherwise specified by the relevant authority or in the specification for a particular project.

This standard is intended to be used with its National Annex and other referenced documents, including other second generation Eurocodes, as an interdependent suite of documents.

While the use of provisions in this standard in conjunction with first generation Eurocodes is not precluded, it should be undertaken with care and should only be done when users are satisfied that it will not result in a lower level of reliability than the minimum level set in the first generation Eurocodes and associated UK National Annexes.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

Published by BSI Standards Limited 2025

ISBN 978 0 539 22272 2

ICS 91.010.30; 91.080.01

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 28 February 2025.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD **EN 1991-1-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM February 2025

ICS 91.010.30 Supersedes EN 1991-1-1:2002

English Version

Eurocode 1 - Actions on structures - Part 1-1: Specific weight of materials, self-weight of construction works and imposed loads for buildings

Eurocode 1 - Actions sur les structures - Partie 1-1 : Poids volumiques des matériaux, poids propre des ouvrages de construction et charges d'exploitation applicables aux bâtiments

Eurocode 1 - Einwirkungen auf Tragwerke - Teil 1-1: Wichte von Baustoffen und Lagergütern, Eigengewicht von Bauwerken und Nutzlasten im Hochbau

This European Standard was approved by CEN on 29 December 2024.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN 1991-1-1:2025 E

Contents

Page

European foreword

This document (EN 1991-1-1:2025) has been prepared by Technical Committee CEN/TC 250 “Structural Eurocodes”, the secretariat of which is held by BSI. CEN/TC 250 is responsible for all Structural Eurocodes and has been assigned responsibility for structural and geotechnical design matters by CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2027, and conflicting national standards shall be withdrawn at the latest by March 2028.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document will supersede EN 1991-1-1:2002.

The main changes compared to the previous edition are listed below:

— introduction of the notion of “tributary area”;

— provision of a single table of imposed loads on buildings for all categories of use and a single table for horizontal loads on partition walls and parapets;

— additional sub-category G2 of garages and subcategories S1, S2, S3 for stairs and landings;

— additional class of roofs HC3 for helicopter landing;

— updates on partitions treated as imposed loads;

— updates on reduction factors α_A and α_n;

— removal of former Annex B (Vehicle barriers and parapets for car parks).

The first generation of EN Eurocodes was published between 2002 and 2007. This document forms part of the second generation of the Eurocodes, which have been prepared under Mandate M/515 issued to CEN by the European Commission and the European Free Trade Association.

The Eurocodes have been drafted to be used in conjunction with relevant execution, material, product and test standards, and to identify requirements for execution, materials, products and testing that are relied upon by the Eurocodes.

The Eurocodes recognize the responsibility of each Member State and have safeguarded their right to determine values related to regulatory safety matters at national level through the use of National Annexes.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

0.1 Introduction to the Eurocodes

The Structural Eurocodes comprise the following standards generally consisting of a number of parts:

— EN 1990 Eurocode — Basis of structural and geotechnical design

— EN 1991 Eurocode 1 — Actions on structures

— EN 1992 Eurocode 2 — Design of concrete structures

— EN 1993 Eurocode 3 — Design of steel structures

— EN 1994 Eurocode 4 — Design of composite steel and concrete structures

— EN 1995 Eurocode 5 — Design of timber structures

— EN 1996 Eurocode 6 — Design of masonry structures

— EN 1997 Eurocode 7 — Geotechnical design

— EN 1998 Eurocode 8 — Design of structures for earthquake resistance

— EN 1999 Eurocode 9 — Design of aluminium structures

— New parts are under development, e.g. Eurocode for design of structural glass

The Eurocodes are intended for use by designers, clients, manufacturers, constructors, relevant authorities (in exercising their duties in accordance with national or international regulations), educators, software developers, and committees drafting standards for related product, testing and execution standards.

NOTE Some aspects of design are most appropriately specified by relevant authorities or, where not specified, can be agreed on a project-specific basis between relevant parties such as designers and clients. The Eurocodes identify such aspects making explicit reference to relevant authorities and relevant parties.

0.2 Introduction to EN 1991 (all parts)

EN 1991 (all parts) specifies actions for the structural and geotechnical design of buildings, bridges and other civil engineering works, or parts thereof, including temporary structures, in conjunction with EN 1990 and the other Eurocodes.

EN 1991 does not cover the specific requirements of actions for seismic design. Provisions related to such requirements are given in EN 1998 (all parts), which complement and are consistent with EN 1991.

EN 1991 is also applicable to existing structures for:

— structural assessment;

— strengthening or repair;

— change of use.

NOTE 1 In these cases additional or amended provisions can be necessary.

EN 1991 is also applicable for the design of structures where materials or actions outside the scope of the other Eurocodes are involved.

NOTE 2 In this case additional or amended provisions can be necessary.

EN 1991 is subdivided in various parts:

EN 1991-1-1 Eurocode 1 — Actions on structures — Part 1-1: Specific weight of materials, self-weight of construction works and imposed loads for buildings

EN 1991-1-2 Eurocode 1 — Actions on structures — Part 1-2: Actions on structures exposed to fire

EN 1991-1-3 Eurocode 1 — Actions on structures — Part 1-3: Snow Loads

EN 1991-1-4 Eurocode 1 — Actions on structures — Part 1-4: Wind Actions

EN 1991-1-5 Eurocode 1 — Actions on structures — Part 1-5: Thermal Actions

EN 1991-1-6 Eurocode 1 — Actions on structures — Part 1-6: Actions during execution

EN 1991-1-7 Eurocode 1 — Actions on structures — Part 1-7: Accidental actions

EN 1991-1-8 Eurocode 1 — Actions on structures — Part 1-8: Actions from waves and currents on coastal structures

EN 1991-1-9 Eurocode 1 — Actions on structures — Part 1-9: Atmospheric icing

EN 1991-2 Eurocode 1 — Actions on structures — Part 2: Traffic loads on bridges and other civil engineering works

EN 1991-3 Eurocode 1 — Actions on structures — Part 3: Actions induced by cranes and machines

EN 1991-4 Eurocode 1 — Actions on structures — Part 4: Silos and tanks

0.3 Introduction to EN 1991-1-1

EN 1991-1-1 gives rules on the following aspects related to actions, which are relevant to the structural design of buildings and civil engineering works including some geotechnical aspects:

— specific weight of construction materials and stored materials;

— self-weight of construction works; and

— imposed loads for buildings.

0.4 Verbal forms used in the Eurocodes

The verb “shall” expresses a requirement strictly to be followed and from which no deviation is permitted in order to comply with the Eurocodes.

The verb “should” expresses a highly recommended choice or course of action. Subject to national regulation and/or any relevant contractual provisions, alternative approaches could be used/adopted where technically justified.

The verb “may” expresses a course of action permissible within the limits of the Eurocodes.

The verb “can” expresses possibility and capability; it is used for statements of fact and clarification of concepts.

0.5 National Annex for EN 1991-1-1

National choice is allowed in this standard where explicitly stated within notes. National choice includes the selection of values for Nationally Determined Parameters (NDPs).

The national standard implementing EN 1991-1-1 can have a National Annex containing all national choices to be used for the design of buildings and civil engineering works to be constructed in the relevant country.

When no national choice is given, the default choice given in this standard is to be used.

When no national choice is made and no default is given in this standard, the choice can be specified by a relevant authority or, where not specified, agreed for a specific project by appropriate parties.

National choice is allowed in EN 1991-1-1 through notes to the following clauses:

5.4.3(1)	5.4.3(2) – 2 choices	5.4.3(3)	5.4.3(4)
5.4.3(5)	6.2.2(1)	6.5.2(1)	6.5.2(2)
6.5.3.1(3)	6.5.3.1(4)	6.5.3.2(2)	6.5.3.2(4)
6.5.3.2(5)	6.5.3.2(6)	6.5.3.4(3) – 3 choices	6.5.6.1(1)
6.5.6.2(1) – 2 choices	6.5.6.3(1)	6.6.2(1) – 2 choices	6.6.2(2)
6.6.3(1)			

National choice is allowed in EN 1991-1-1 on the application of the following informative annex:

Annex A.

The National Annex can contain, directly or by reference, non-contradictory complementary information for ease of implementation, provided it does not alter any provisions of the Eurocodes.

1 Scope

1.1 Scope of EN 1991-1-1

(1) EN 1991-1-1 gives rules on the following aspects related to actions, which are relevant to the structural design of buildings and civil engineering works including some geotechnical aspects:

— specific weight of construction materials and stored materials;

— self-weight of construction works;

— imposed loads for buildings.

(2) Mean values for specific weight of specific construction materials, additional materials for bridges, stored materials and products are given. In addition, for specific materials and products the angle of repose is provided.

(3) Methods for the assessment of the characteristic values of self-weight of construction works are given.

(4) Characteristic values of imposed loads are given for the following areas in buildings according to the category of use:

— residential, social, commercial and administration areas;

— areas for archive, storage and industrial activities;

— garage and vehicle traffic areas (excluding bridges);

— roofs;

— stairs and landings;

— terraces and balconies.

NOTE The loads on traffic areas given in this standard refer to vehicles up to a gross vehicle weight of 160 kN. Further information can be obtained from EN 1991-2.

(5) Characteristic values of horizontal imposed loads on parapets and partition walls acting as barriers are provided.

NOTE Forces due to vehicle impact are specified in EN 1991-1-7 and EN 1991-2.

1.2 Assumptions

(1) The general assumptions of EN 1990 apply.

(2) EN 1991-1-1 is intended to be used with EN 1990, the other parts of EN 1991 and the other Eurocode parts for the design of structures.