

Eurocode 2: Design of concrete structures —

Part 4: Liquid retaining and containing structures

**(together with United Kingdom National
Application Document)**

ICS: 91.080.040

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee B/525/2, Sturctural use of concrete, upon which the following bodies were represented:

- Association of Consulting Engineers
- British Cement Association
- British Precast Concrete Federation Ltd.
- Concrete Society
- Institution of Civil Engineers
- Institution of Structural Engineers

This Draft for Development, having been prepared under the direction of the Building and Civil Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 August 2000

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Amendments issued since publication

Amd. No.	Date	Comments

The following BSI references relate to the work on this standard:
Committee reference B/525/2

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National foreword

This Draft for Development was prepared by Subcommittee B/525/2 and is the official English language version of ENV 1992-4:1998 *Eurocode 2: Design of concrete structures — Part 4: Liquid retaining and containment structures*, as published by the European Committee for Standardization (CEN). This Draft for Development also includes the United Kingdom (UK) National Application Document (NAD) to be used with the ENV in the design of structures to be constructed in the UK.

ENV 1992-4:1998 results from a programme of work sponsored by the European commission to make available a common set of rules for the structural and geotechnical design of building and civil engineering works.

This publication should not be regarded as a British Standard.

An ENV is made available for provisional application, but does not have the status of a European Standard. The aim is to use the experience gained to modify the ENV so that it can be adopted as a European Standard. The publication of this ENV and its National Application Document should be considered to supersede any reference to a British Standard in previous DD ENV Eurocodes concerning the subject covered by these documents.

The values for certain parameters in the ENV Eurocodes may be set by individual CEN Members so as to meet the requirements of national regulations. These parameters are designated by | _ | in the ENV.

During the ENV period of validity, reference should be made to supporting documents listed in the National Application Document (NAD).

The purpose of the NAD is to provide essential information, particularly in relation to safety, to enable the ENV to be used for structures constructed in the UK and the NAD takes precedence over the corresponding provisions in the ENV.

The Building Regulations 1991, Approved Document A 1992, draws attention to the potential use of ENV Eurocodes as an alternative approach to Building Regulation compliance. ENV 1992-4:1998 is considered to offer such an alternative approach, when used in conjunction with its NAD.

Users of this document are invited to comment on its technical content, ease of use and any ambiguities or anomalies. These comments will be taken into account when preparing the UK national response to CEN on the question of whether the ENV can be converted to an EN.

Comments should be sent in writing to the Secretary of Subcommittee B/525/2, BSI, 389 Chiswick High Road, London, W4 4AL, quoting the document reference, the relevant clause and, where possible, a proposed revision, by 1st March 2001.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to vi, the ENV title page, pages 2 to 18, an inside back cover and a back cover.

National Application Document

for use in the UK with ENV 1992-4:1998

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National Application Document**

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National Application Document

Introduction

This National Application Document (NAD) has been prepared under the direction of the Building and Civil Engineering Sector Committee. It has been developed from:

- a) a textual examination of ENV 1992-4:1998;
- b) a parametric calibration against BS 8110, BS 8007, supporting standards and test data.

1 Scope

This NAD provides information to enable ENV 1992-4:1998 (hereafter referred to as EC2: Part 4) to be used for the design of structures to be constructed in the UK. It will be used in conjunction with DD ENV 1992-1-1:1992, the NAD of which refers to BSI publication for values of actions.

2 Partial factors, combination factors and other values

- a) The values for combination coefficients (ψ) given in Table 1 of the NAD for EC2:Part 1.1 are not appropriate and a value of 1 for ψ_0 , ψ_1 and ψ_2 should be applied to the operating load as given in 2.2.2.3 (103) of EC2:Part 4.
- b) The values for partial factors for normal temperature design should be those given in 2.3.3.1 of EC2:Part 4.

3 Reference standards

Supporting standards including materials specification and standards for construction are listed in Table 1 of this NAD.

4 Additional recommendations

4.1 Clause 1 Introduction

- a) Sub-clause 1.1.2 (102)

Reference should also be made to BS 8007 or CIRIA Report 139 for details of water excluding structures.

4.2 Clause 4 Section and member design

- a) Sub-clause 4.4.2.4 (109)

This Sub-clause should be revised as follows:

“For members subject predominantly to intrinsic imposed deformations (e.g. thermal contraction or shrinkage) the minimum mean strain $\epsilon_{sm,min}$ should be taken as that given by equation (4.184). For strains less than $\epsilon_{sm,min}$ crack widths are constant at spacings generally greater than that given by equation (4.82).

$$\epsilon_{sm,min} = 0.6k_c k_{fct,ef} \left(\frac{A_{ct}}{E_s A_s} + \frac{1}{E_c} \right) \quad (4.184)$$

The definition of the symbols is as in 4.4.2.2 of part 1. There is no necessity to take any further measures to deal with the long term effects.”

4.3 Clause 5 Detailing provisions

- a) Sub-clause 5.4.7.6 (102)

Reference should be made to BS 8007 for semi-continuous types of construction.

- b) Sub-clause 5.4.7.6 (103)

Reference should be made to BS 8007 or CIRIA Report 139 for construction details.

Table 1 — Reference in EC2:Part 4 to other codes and standards

Reference in EC2:Part 4	Document referred to	Document title or subject area	Status	UK document
Various	ENV 1992-1-1	Design of concrete structures. General rules for buildings	Published 1991	DD ENV1992-1-1:1992
2.3.3.1 Table 2.102	ENV 1991-1	Basis of design and actions on structures	Published 1994	DD ENV 1991-1:1996
2.3.3.1(109)	Eurocode 7 (ENV 1997-1)	Geotechnical design: General rules	Published 1994	DD ENV 1997-1:1995

ICS 91.010.30; 91.080.40

Descriptors: civil engineering, buildings, concrete structures, design, building codes, compulation

English version

Eurocode 2: Design of concrete structures — Part 4: Liquid retaining and containment structures

Eurocode 2: Calcul des structures en béton —
Partie 4: Structures de soutènement et réservoirs

Eurocode 2: Planung von Stahlbeton- und
Spannbetontragwerken — Teil 4: Stütz- und
Behälterbauwerke aus Beton

This European Standard was approved by CEN on 27 May 1997 as a prospective standard for provisional application.

The period of validity of the ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
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Central Secretariat: rue de Stassart 36, B-1050 Brussels

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