TRANSPORT SCOTLAND (AGENCY OF THE SCOTTISH GOVERNMENT)
TRUNK ROADS & BUS OPERATIONS (TRBO)

TS INTERIM AMENDMENT No 39:
USE OF EUROCODES FOR THE DESIGN OF BRIDGES AND ROAD RELATED STRUCTURES

Summary

This Transport Scotland Interim Amendment (TS IA) provides guidance on the requirements for the implementation of Eurocodes for the design of bridges and road related structures.

Instructions for use

This Interim Amendment supersedes TS IA 31 and takes immediate effect.

Transport Scotland Interim Amendment No 39

Use of Eurocodes for the design of bridges and road related structures

1. Scope

This Interim Amendment provides guidance and requirements for the use of Eurocodes for the design of bridges and road related structures (including geotechnical works) on the Scottish Trunk Road network.

This TS IA does not apply to the assessment of existing structures.

2. Introduction

Eurocodes are the suite of European Standards covering structural design of all civil engineering works, including bridges. The UK, as a member of the European Union, is obliged to comply with the requirements of the Construction Products Directive (CPD) and Public Procurement Directive (PPD), which set out the status of European Standards in the member states.

Since the withdrawal of conflicting UK National Standards by the British Standards Institution (BSi), Eurocodes have become the published and maintained structural design standards in the UK. Transport Scotland expresses its requirements for the design of new and modification of existing bridges and road related structures (including geotechnical works) in terms of Eurocodes.

3. Implementation

Unless otherwise agreed with Transport Scotland Project Manager and the TAA. Eurocodes must be used for the design of new and modification of existing bridges and road related structures (including geotechnical works), for:

a. All works where tenders are invited following the withdrawal of conflicting UK National Standards;
b. Existing contracts where following the withdrawal of conflicting UK National Standards any form of instruction or permission is given by TS to proceed with works involving either:

    i. Preparatory design work, eg: preparation of Technical Approval Documents
    ii. design of bridges and road related structures (including geotechnical works) or
    iii. design and construction of bridges and road related structures (including geotechnical works).

If application of the above implementation rules in existing contracts may lead to abortive costs or programme delays specific to a project then the Transport Scotland Project Manager and the TAA must be informed.

Designers applying Eurocodes to any form of structural design must consider the guidance and satisfy the requirements given in this document until further notice.

In addition, if required by the TAA the design may be subject to a level of check higher than that required in BD2 Technical Approval of Highway Structures (DMRB 1.1.1).

4. Specification

Designs to Eurocodes must be constructed in accordance with the referenced execution standards which give specification requirements for the materials concerned.

The Specification for Highway Works (MCHW Volume 1) and the associated Notes for Guidance (MCHW Volume 2) are being reviewed and will be revised as necessary to align with the requirements given in the Execution Standards.

Pending the publication of revised sections incorporating the requirements of the execution standards, departures from standards must be sought for the use of project specific specifications incorporating these standards.

5. Interim requirements for the use of Eurocodes

The interim requirements for the use of Eurocodes for the design of trunk road structures are included in Annex A of this Interim Amendment.

6. Further Information

If you have any questions regarding the application of this document, please contact the relevant Transport Scotland Unit Bridge Manager.

Annex A

Interim requirements for the use of Eurocodes for the design of bridges and road related structures

INTERIM REQUIREMENTS FOR THE USE OF EUROCODES FOR THE DESIGN OF BRIDGES AND ROAD RELATED STRUCTURES

Contents

1. INTRODUCTION

Background

1.1. Eurocodes are the suite of European Standards covering structural design of civil engineering works, including bridges and road related structures. Eurocodes are the published and maintained structural design standards in the UK and UK National Standards that are in conflict with Eurocodes have been withdrawn.

Scope

1.2. This Standard gives guidance, advice and the requirements of the Overseeing Organisation on the use of Eurocodes for the design of bridges and road related structures (including geotechnical works) and aspects of execution relevant to the design.

1.3. Eurocodes must be used for the design of new bridges and road related structures (including geotechnical works) unless agreed otherwise with the Technical Approval Authority (TAA).

1.4. Eurocodes must not be used for the structural assessment of existing bridges and road related structures unless agreed with the TAA.

1.5. Eurocodes must be used as the basis for the design of modification works as follows unless otherwise agreed with the TAA:

- Strengthening or upgrading works design.
- Structural element replacement design.
- Component replacement design in conjunction with the relevant European Standard for the component.
- Other modification design.

1.5.1 Where strengthening or modification of the existing structure involves deriving the resistance, serviceability performance or durability of a section that comprises both new and existing materials acting together, the Designer must make a statement in the AIP to justify the use of Eurocodes in this situation, taking into account the properties of the existing materials and workmanship compared to those required by the relevant EuroNorms upon which the relevant Eurocodes depend.

1.5.2 Where modification works fall outside the scope of the relevant Eurocodes, the Designer must make a statement in the AIP to justify the use of Eurocodes.

1.5.3 Where it is not possible to demonstrate the adequacy of a structural element using Eurocodes, assessment standards may be used to re-examine particular elements/load effects for which failure is determined. See also Clause **1.9**.

1.6. Eurocodes must be used in conjunction with any relevant European Standards for the design of proprietary structures, temporary structures and temporary works unless otherwise agreed with the TAA.

1.7. The Application Rules given in the Eurocodes may not fully cover the design of special types of structures such as moveable bridges or bridges carrying both road and rail/light rail traffic. For such structures additional design rules including values of partial factors, combination factors and values and configurations of actions must be determined for the individual project, in accordance with the relevant Principles given in BS EN 1990.

1.8. Eurocodes may be applied to the design of structures where materials used and / or the actions applied are outside the scope of Eurocodes subject to agreement with the TAA. See also Clause **2.1**.

1.9. Eurocodes must not be used in combination with UK National Standards (Non-Eurocodes) unless otherwise agreed with the TAA.

Implementation

1.10. This Standard must be used forthwith on all projects where Eurocodes are used.

Mandatory Sections

1.11. Sections of this Standard containing mandatory requirements are identified by being contained in boxes. These requirements must be complied with or a prior agreement to a Departure from Standard must be obtained from the Overseeing Organisation. The text outside boxes contains advice and explanation, which is commended to users for consideration.

Definitions

1.12. The following definitions apply throughout this Standard:

Application Rules	As defined in BS EN 1990.
Approval in Principle (AIP)	As defined in BD2 (DMRB 1.1.1).
Category	As defined in BD2 (DMRB 1.1.1).
Departure	Criterion, which departs from, or is an aspect not covered by, the Standards contained in the Technical Approval Schedule, the DMRB or project specific requirements.
EN	EN documents may be Eurocodes or EuroNorms. Only ENs with the series designation “199X” are Eurocodes. Other ENs are EuroNorms.
Eurocodes	As defined in BS EN 1990.
execution	As defined in BS EN 1990.

National annex (NA)	As defined in BS EN 1990.
Nationally Determined Parameter (NDP)	As defined in BS EN 1990.
Principles .	As defined in BS EN 1990
Published Documents (PD)	For the purpose of this Standard, Published Documents contain non-contradictory complementary information (NCCI) to assist in the application of Eurocode Principles.
Technical Approval Authority (TAA)	As defined in BD2 (DMRB 1.1.1).
Third Party	Any person, organisation or other legal identity that is not employed directly or indirectly by the Overseeing Organisation.

Abbreviations

1.13. The following abbreviations are used in this Standard:

BSI	British Standards Institution
CEN	Comité Européen de Normalisation (European Committee for Standardization)
DBFO	Design, Build, Finance, Operate

2. USE OF EUROCODES

General

2.1. The Designer must ensure that the design is compliant with the Principles and Application Rules of Eurocodes, which have precedence over Design Manual for Road and Bridges (DMRB) documents and other supplementary guidance.

2.2. For the design of bridges and road related structures in materials other than concrete, steel and composite concrete and steel, such as masonry, timber and aluminium, no specific guidance is given in this Standard.

2.2.1 The Designer must propose a list of non-contradictory complementary information (NCCI), including relevant BSI Published Documents to be used where appropriate for the individual project for agreement with the TAA.

Eurocodes

2.3. The relevant Eurocodes for the design of bridges and road related structures are listed in **3.3**.

2.4. Specific requirements of the Overseeing Organisation for aspects not covered in Eurocodes and/or to set a NDP that differs from the recommendation in the UK National annex are given in Annex A.

2.5. The UK National annex may contain references to BSI Published Documents (listed in **3.5**) which should be used where available unless stated otherwise in this Standard.

2.5.1 For the purpose of this Standard, the clause numbers of BSI Published Documents listed in Annex B for aspects not covered by and/or outside the scope of Eurocodes must be considered as the default means of compliance with Eurocode clauses for the design of bridges and road related structures.

Status of Design Manual for Roads and Bridges (DMRB) Documents

2.6. The DMRB documents listed in Annex C1 and the additional guidance and requirements listed thereof must be used for the design of bridges and road related structures.

2.7. In cases where Eurocodes are used for the design, any identified aspects of the DMRB documents which are in conflict with the Eurocodes should be reported to the Transport Scotland Project Manager and the TAA.

Use of Supplementary Guidance

2.8. Supplementary guidance and advice from recognised sources and publications from professional institutions may be used. Where applicable the source should be specified in the AIP.

Departures from Standards

2.9. Departure from Eurocodes (BS EN) and UK National annexes (UKNA) are not permitted except as follows:

- There is adverse safety implication in the application of BS EN and/or UKNA in the design. (BSI should be notified without delay)
- Error in the BS EN and/or UKNA has been identified and it is being considered by BSI or CEN for an amendment or corrigendum.
- Aspects not covered by BS EN or UKNA.
- Application to assessment of existing structure.

2.10. In cases where Clauses **1.7**, **1.8** and / or **2.9** apply, approval for Departures must be obtained from the TAA.

2.11. Use of the clauses in the Published Documents listed in clause **3.5** may be deemed to constitute compliance with the Eurocode principles and application rules and will not require a Departure from Standard to be submitted. For exceptions see clauses **2.13** and **2.15**.

2.12. The PD clauses listed in Annex B address situations which the Eurocode provisions are not considered to fully cover. Alternative methods in compliance with the Eurocode clauses may be permitted subject to the agreement of the TAA.

2.12.1 If agreed, this information must be recorded on the AIP for Categories 2 and 3 structures.

2.12.2 For PD clauses not listed in Annex B; if the Designer adopts, subject to the agreement of the TAA, a design that is contrary to the recommendation given in the PD clauses, this information must be recorded in the AIP for Categories 2 and 3 structures.

2.13. PD 6687-1:2010: Background paper to the UK National annex to BS EN 1992-1 clause 2.5. Types of reinforcement other than those covered in BS EN 1992-1-1 must only be used with approval from the TAA.

2.14. For Categories 2 and 3 structures, the use of PD 6687-1:2010: Background paper to the UK National annex to BS EN 1992-1 clause 2.22, PD 6687-2:2008 Recommendations for the design of structures to BS EN 1992-2:2005 clauses 7.6.3 (limiting stress ranges in Tables 2A and 2B), 8.2.2, 8.2.3 (use of guidance provided in CIRIA Report C660), 9.1 and 10.1 must be recorded on the design and check certificates.

2.15. PD 6688-1-7:2009 Recommendations for the design of structures to BS EN 1991-1-7 clause 2.5.2 for lightweight road structures, the restraint on the deck of a foot/cycle track bridge is required to be designed to the action of the vehicle collision forces locally but need not be designed globally.

2.16. Annex D of BS EN 15050:2007, which relates to bridge deck continuity at supports for decks constructed using precast concrete elements, offers a simplified approach to dealing with redistribution effects due to creep and shrinkage at the connection. The guidance given within Annex D of BS EN 15050:2007 may be used without obtaining approval for a Departure from Standard.

2.17. Where Eurocodes are used, information listed in Annex D relating to the individual project, options and choice of method adopted must be recorded for Categories 2 and 3 structures.

Execution

2.18. Where Eurocodes are used for the design of bridges and road related structures, their execution must be in accordance with the relevant execution standards listed in **3.4** and relevant parts of the Specification for Highway Works (SHW). Pending the publication of revised sections of the SHW (Manual of Contract documents for Highway Works Volume 1) incorporating the requirements of the execution standards referred to above, departures from standards must be sought for the use of project specific specifications incorporating these standards.

2.19. For concrete and steelwork the Execution Class should be in accordance with BS EN 13670:2009 and PD 6705-2:2010 respectively. For steelwork the quantified service category should be in accordance with PD 6705-2:2010.

2.20. The Consequence Classes given in Table **A.2** must be used unless otherwise agreed with the TAA.

2.21. Where structural elements are designated a higher or lower consequence class than for the whole structure, this information must be recorded in an AIP.

3. REFERENCES

The following documents are referred to in the text of this Standard including the Annexes

3.1. Design Manual for Roads and Bridges

BA 26/94	Expansion Joints for Use in Highway Bridge Decks
BA 28/92	Evaluation of Maintenance Costs in Comparing Alternative Designs for Highway Structures
BA 41/98	The Design and Appearance of Bridges
BA 47/99	Waterproofing and Surfacing of Concrete Bridge Decks
BA 67/96	Enclosure of Bridges
BA 68/97	Crib Retaining Walls
BA 82/00	Formation of Continuity Joints in Bridge Decks
BA 85/04	Coatings for Concrete Highway Structures & Ancillary Structures
BA 92/07	The Use of Recycled Concrete Aggregates in Structural Concrete
BD 2/05	Technical Approval of Highway Structures
BD 7/01	Weathering Steel for Highway Structures
BD 10/97	Design of Highway Structures in Areas of Mining Subsidence
BD 12/01	Design of Corrugated Steel Buried Structures with Spans Greater than 0.9 Metres and up to 8.0 Metres
BD 29/04	Design Criteria for Footbridges
BD 33/94	Expansion Joints for Use in Highway Bridge Decks
BD 35/06	Quality Assurance Scheme for Paints and Similar Protective Coatings
BD 36/92	Evaluation of Maintenance Costs in Comparing Alternative Designs for Highway Structures
BD 43/03	The Impregnation of Reinforced and Prestressed concrete Highway Structures using Hydrophobic Pore-Lining Impregnants
BD 45/93	Identification Marking of Highway Structures
BD 47/99	Waterproofing and Surfacing of Concrete Bridge Decks
BD 51/98	Portal and Cantilever Signs/Signal Gantries
BD 62/07	As Built, Operational and Maintenance Records for Highway Structures
BD 65/97	Design Criteria for Collision Protection Beams
BD 67/96	Enclosure of Bridges
BD 68/97	Crib Retaining Walls
BD 70/03	Strengthened/Reinforced Soils and Other Fills for Retaining Walls and Bridge Abutments. Use of BS 8006: 1995
BD 78/99	Design of Road Tunnels
BD 82/00	Design of Buried Rigid Pipes
BD 90/05	Design of FRP Bridges and Highway Structures
BD 94/07	Design of Minor Structures
HA 66/95	Environmental Barriers
HD 45/09	Road Drainage and Water Environment
TD 19/06	Requirement for Road Restraint Systems
TD 27/05	Cross-Sections and Headrooms

3.2. Manual of Contract Documents for Highway Works

It is anticipated that further guidance will be provided in a separate Interim Amendment.

3.3. British Standards: Eurocodes

(The listed documents were current at the time of preparation of this standard; it is the Designer's responsibility to ensure that the documents used are the most recent revision and to use the relevant published amendments and corrigenda.)

3.3.1. BS EN 1990:2002 + A1:2005 Eurocode 0: Basis of structural design

NA to BS EN 1990:2002 + A1:2005 UK National Annex to Eurocode 0 Basis of structural design

3.3.2. i) BS EN 1991-1-1:2002 Eurocode 1: Actions on structures. General Actions. Densities, self-weight, imposed load for buildings

NA to BS EN 1991-1-1:2002 UK National Annex to Eurocode 1: Actions on structures. General Actions. Densities, self-weight, imposed load for buildings

ii) BS EN 1991-1-3:2003 Eurocode 1: Actions on structures. General Actions. Snow loads

NA to BS EN 1991-1-3:2003 UK National Annex to Eurocode 1: Actions on structures. General Actions. Snow loads

iii) BS EN 1991-1-4:2005 Eurocode 1: Actions on structures. General Actions. Wind actions

NA to BS EN 1991-1-4:2005 UK National Annex to Eurocode 1: Actions on structures. General Actions. Wind actions

iv) BS EN 1991-1-5:2003 Eurocode 1: Actions on structures. General Actions. Thermal actions

NA to BS EN 1991-1-5:2003 UK National Annex to Eurocode 1: Actions on structures. General Actions. Thermal actions

v) BS EN 1991-1-6:2005 Eurocode 1: Actions on structures. General Actions. Actions during execution

NA to BS EN 1991-1-6:2005 UK National Annex to Eurocode 1: Actions on structures. General Actions. Actions during execution

vi) BS EN 1991-1-7:2006 Eurocode 1: Actions on structures. General Actions. Accidental actions

NA to BS EN 1991-1-7:2006 UK National Annex to Eurocode 1: Actions on structures. Part 1-7 : Accidental actions

vii) BS EN 1991-2:2003 Eurocode 1: Actions on structures. Traffic loads on bridges

NA to BS EN 1991-2:2003 UK National Annex to Eurocode 1: Actions on structures. Traffic loads on bridges

3.3.3. i) BS EN 1992-1-1:2004 Eurocode 2: Design of concrete structures– Part 1-1: General rules and rules for buildings

NA to BS EN 1992-1-1:2004 UK National Annex to Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings

ii) BS EN 1992-2:2005 Eurocode 2: Design of concrete structures – Part 2: Concrete bridges – Design and detailing rules

NA to BS EN 1992-2:2005 UK National Annex to Eurocode 2: Design of concrete structure – Part 2: Concrete bridges – Design and detailing rules

iii) BS EN 1992-3:2006 Eurocode 2: Design of concrete structures – Part 3: Liquid retaining and containment structures

NA to BS EN 1992-3:2006 UK National Annex to Eurocode 2: Design of concrete structure – Part 3: Liquid retaining and containment structures

3.3.4. i) BS EN 1993-1-1:2005 Eurocode 3: Design of steel structures – Part 1-1 General rules and rules for buildings

NA to BS EN 1993-1-1:2005 UK National Annex to Eurocode 3: Design of steel structures – Part 1-1 General rules and rules for buildings

ii) BS EN 1993-1-3:2006 Eurocode 3: Design of steel structures – Part 1-3 General rules – Supplementary rules for cold-formed members and sheeting

NA to BS EN 1993-1-3:2006 UK National Annex to Eurocode 3: Design of steel structures – Part 1-3 Supplementary rules for cold-formed members and sheeting

iii) BS EN 1993-1-4:2006 Eurocode 3: Design of steel structures – Part 1-4 General rules – Supplementary rules for stainless steels

NA to BS EN 1993-1-4:2006 UK National Annex to Eurocode 3: Design of steel structures – Part 1-4 Supplementary rules for stainless steels

iv) BS EN 1993-1-5:2006 Eurocode 3: Design of steel structures – Part 1-5 Plated structural elements

NA to BS EN 1993-1-5:2006 UK National Annex to Eurocode 3: Design of steel structures – Part 1-5 Plated structural elements

v) BS EN 1993-1-6:2007 Eurocode 3: Design of steel structures – Part 1-6 Strength and stability of shell structures

vi) BS EN 1993-1-7:2007 Eurocode 3: Design of steel structures – Part 1-7 Plated structures subject to out of plane loading

vii) BS EN 1993-1-8:2005 Eurocode 3: Design of steel structures – Part 1-8 Design of joints

NA to BS EN 1993-1-8:2005 UK National Annex to Eurocode 3: Design of steel structures – Part 1-8 Design of joints

viii) BS EN 1993-1-9:2005 Eurocode 3: Design of steel structures – Part 1-9 Fatigue

NA to BS EN 1993-1-9:2005 UK National Annex to Eurocode 3: Design of steel structures – Part 1-9 Fatigue

ix) BS EN 1993-1-10:2005 Eurocode 3: Design of steel structures – Part 1-10 Material toughness and through-thickness properties

NA to BS EN 1993-1-10:2005 UK National Annex to Eurocode 3: Design of steel structures – Part 1-10 Material toughness and through thickness properties

x) BS EN 1993-1-11:2006 Eurocode 3: Design of steel structures – Part 1-11 Design of structures with tension components

NA to BS EN 1993-1-11:2006 UK National Annex to Eurocode 3: Design of steel structures – Part 1-11 Design of structures with tension components

xi) BS EN 1993-1-12:2007 Eurocode 3: Design of steel structures – Part 1-12 Additional rules for the extension of EN 1993 up to steel grades S 700

NA to BS EN 1993-1-12:2007 UK National Annex to Eurocode 3: Design of steel structures – Part 1-12 Additional rules for the extension of EN 1993 up to steel grades S 700

xii) BS EN 1993-2:2006 Eurocode 3: Design of steel structures – Part 2 Steel bridges

NA to BS EN 1993-2:2006 UK National Annex to Eurocode 3: Design of steel structures – Part 2 Steel bridges

xiii) BS EN 1993-5:2007 Eurocode 3: Design of steel structures – Part 5 Piling

NA to BS EN 1993-5 National Annex to Eurocode 3: Design of steel structures – Part 5 Piling

3.3.5. i) BS EN 1994-1-1:2004 Eurocode 4: Design of composite steel and concrete structures – Part 1-1 General rules and rules for buildings

NA to BS EN 1994-1-1:2004 National Annex to Eurocode 4: Design of composite steel and concrete structures – Part 1-1 General rules and rules for buildings

ii) BS EN 1994-2:2005 Eurocode 4: Design of composite steel and concrete structures – Part 2 General rules and rules for bridges

NA to BS EN 1994-2:2005 National Annex to Eurocode 4: Design of composite steel and concrete structures – Part 2 General rules and rules for bridges

3.3.6. i) BS EN 1995-1-1:2004 Eurocode 5: Design of timber structures – Part 1-1 General – common rules and rules for buildings

NA to BS EN 1995-1-1:2004 National Annex to Eurocode 5: Design of timber structures – Part 1-1 General – common rules and rules for buildings

ii) BS EN 1995-2:2004 Eurocode 5: Design of timber structures – Part 2 Bridges

NA to BS EN 1995-2:2004 National Annex to Eurocode 5: Design of timber structures – Part 2 Bridges

3.3.7. i) BS EN 1996-1-1:2005 Eurocode 6: Design of masonry structures – Part 1-1 General rules for reinforced and unreinforced masonry structures

NA to BS EN 1996-1-1:2005 National Annex to Eurocode 6: Design of masonry structures – Part 1-1 General rules for reinforced and unreinforced masonry structures

ii) BS EN 1996-2:2006 Eurocode 6: Design of masonry structures – Part 2 Design considerations, selection of materials and execution of masonry

NA to BS EN 1996-2:2006 National Annex to Eurocode 6: Design of masonry structures – Part 2 Design considerations, selection of materials and execution of masonry

iii) BS EN 1996-3:2006 Eurocode 6: Design of masonry structures – Part 3 Simplified calculation methods for unreinforced masonry structures

NA to BS EN 1996-3:2006 National Annex to Eurocode 6: Design of masonry structures – Part 3 Simplified calculation methods for unreinforced masonry structures

3.3.8. i) BS EN 1997-1:2004 Eurocode 7: Geotechnical design – Part 1 General rules

NA to BS EN 1997-1:2004 National Annex to Eurocode 7: Geotechnical design – Part 1 General rules

ii) BS EN 1997-2:2007 Eurocode 7: Geotechnical design – Part 2 Ground investigation and testing

NA to BS EN 1997-2:2007 UK National Annex to Eurocode 7: Geotechnical design – Part 2 Ground investigation and testing

3.3.9. i) BS EN 1998-1:2005 Eurocode 8: Design of structures for earthquake resistance – Part 1 General rules, seismic actions and rules for buildings

NA to BS EN 1998-1:2005 Eurocode 8: Design of structures for earthquake resistance – Part 1 General rules, seismic actions and rules for buildings

ii) BS EN 1998-2:2005 Eurocode 8: Design of structures for earthquake resistance – Part 2 Bridges

NA to BS EN 1998-2:2005 National Annex to Eurocode 8: Design of structures for earthquake resistance – Part 2 Bridges

iii) BS EN 1998-5:2004 Eurocode 8: Design of structures for earthquake resistance - Part 5 Foundations, retaining structures and geotechnical aspects

NA to BS EN 1998-5:2004 Eurocode 8: Design of structures for earthquake resistance - Part 5 Foundations, retaining structures and geotechnical aspects

3.3.10. i) BS EN 1999-1-1:2007 Eurocode 9: Design of aluminium structures– Part 1-1 General structural rules

NA to BS EN 1999-1-1:2007 Eurocode 9: Design of aluminium structures - Part 1-1 General structural rules

ii) BS EN 1999-1-3:2007 Eurocode 9: Design of aluminium structures – Part 1-3 Structures susceptible to fatigue

NA to BS EN 1999-1-3:2007 Eurocode 9: Design of aluminium structures - Part 1-3 Structures susceptible to fatigue

iii) BS EN 1999-1-4:2007 Eurocode 9: Design of aluminium structures – Part 1-4 Cold formed structural sheeting

NA to BS EN 1999-1-4:2007 Eurocode 9: Design of aluminium structures - Part 1-4 Cold formed structural sheeting

3.4. Other British/European Standards

3.4.1. BS EN 1337 Structural bearings

3.4.2. BS EN 10025 Hot rolled products of structural steels – Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance

3.4.3. BS EN 15050 Precast concrete products – Bridge elements

3.4.4. BS EN 1090-1 Execution of steel structures and aluminium structures - Part 1: Requirements for conformity assessment of structural components

3.4.5. BS EN 1090-2 Execution of steel structures and aluminium structures – Part 2: Technical requirements for the execution of steel structures

3.4.6. BS EN 1090-3 Execution of steel structures and aluminium structures – Part 3: Technical requirements for aluminium structures

3.4.7. BS EN 13670 Execution of concrete structures

3.4.8. BS 8006-1 Code of practice for strengthened/reinforced soils and other fills

3.5. BSI Published Documents

3.5.1. PD 6688-1-4:2009 Background paper to the UK National Annex to BS EN 1991-1-4

3.5.2. PD 6688-1-7:2009 Recommendations for the design of structures to BS EN 1991-1-7

3.5.3. PD 6688-2:2011 Recommendations for the design of structures to BS EN 1991-2

3.5.4. PD 6687-1:2010 Background paper to the UK National Annexes to BS EN 1992-1 and BS EN 1992-3

3.5.5. PD 6687-2:2008 Recommendations for the design of structures to BS EN 1992-2:2005

3.5.6. PD 6694-1:2011 Recommendations for the design of structures subject to traffic loading to BS EN 1997-1:2004

3.5.7. PD 6695-1-9:2008 Recommendations for the design of structures to BS EN 1993-1-9

3.5.8. PD 6695-1-10:2009 Recommendations for the design of structures to BS EN 1993-1-10

3.5.9. PD 6695-2:2008 Recommendation for the design of bridges to BS EN 1993

3.5.10. PD 6696-2:2007 Background paper to BS EN 1994-2 and the UK National Annex to BS EN 1994-2

3.5.11. PD 6698:2009 Recommendations for the design of structures for earthquake resistance to BS EN 1998

3.5.12. PD 6703:2009 Structural bearings – Guidance on the use of structural bearings

3.5.13. PD 6705-2:2010 Recommendations for the execution of steel bridges to BS EN 1090-2

3.6. Other Publications

The following documents are referred to in the text of this Standard including the Annexes

3.6.1. CIRIA Document C543 Bridge detailing guide

3.6.2. CIRIA Document C660 Early-age thermal crack control in concrete

3.6.3. CIRIA Document C686 Safe access for maintenance and repair

3.6.4. Transport Scotland Interim Amendment No 22 Implementation Of New Reinforcement Standards (BS 4449:2005, BS 4482:2005, BS 4483:2005 and BS 8666:2005)

3.6.5. Interim Advice Note 85/07 Design Of Passively Safe Portal Signal Gantries [Not applicable for use in Scotland]

3.6.6. Interim Advice Note 86/07 Amendments To Design Requirements For Portal And Cantilever Sign/Signal Gantries [Not applicable for use in Scotland]

3.6.7. Transport Scotland Interim Amendment No 23 Revised guidance regarding the use of BS8500(2006) for the design and construction of structures using concrete

3.6.8. Transport Scotland Interim Amendment No 26 The Anchorage of Reinforcement & Fixings in Hardened Concrete

4. STANDARDS

General

4.1 Any reference in this specification to a “British Standard”, or to a “British Standard which is an adopted European Standard”, is to be taken to include reference also to the following standards:

(a) a standard or code of practice of a national standards body or equivalent body of any EEA state;

(b) any international standard recognised for use as a standard or code of practice by any EEA state;

(c) a technical specification recognised for use as a standard by a public authority of any EEA state; and

(d) a European Technical Approval (ETA) issued in accordance with the procedure set out in directive 89/106/EEC.

4.2 Where there is a requirement in this specification for compliance with any part of a British Standard or a British Standard which is an adopted European Standard, that requirement may be met by compliance with any of the standards given above, provided that the relevant standard imposes an equivalent level of performance and safety provided for by a British Standard or a British Standard which is an adopted European Standard.

4.3 “EEA State” means a state which is a contracting party to the EEA Agreement.

4.4 “EEA Agreement” means the agreement on a European Economic Area signed at Oporto on the 2nd of May 1992 as adjusted or amended.

5. NOTIFICATION

5.1 This document was notified in draft to the European Commission in accordance with Directive 98/34/EC, as amended by Directive 98/48/EC.

6. BIBLIOGRAPHY

6.1. Design Manual for Roads and Bridges

BA 36/90 The Use of Permanent Formwork

BA 42/96 The Design of Integral Bridges

BA 57/01 Design for Durability

BA 59/94 Design of Highway Bridges for Hydraulic Actions

BA 84/02 Use of Stainless Steel Reinforcement in Highway Structures

BD 20/92 Bridge Bearings

BD 41/97 Reinforced clay brickwork retaining walls of pocket type and grouted cavity type construction – use of BS5628:Part 2:1995

BD 57/01 Design for Durability

BD 91/04 Unreinforced Masonry Arch Bridges

6.2. British Standards: Eurocodes

NA to BS EN 1993-1-6:2007 UK National Annex to Eurocode 3: Design of steel structures – Part 1-6 Strength and stability of shell structures *(publication of this document to be confirmed by BSi)*

NA to BS EN 1993-1-7:2007 Eurocode 3: Design of steel structures – Part 1-7 Plated structures subject to out of plane loading *(publication of this document to be confirmed by BSi)*

6.3. British Standards

6.3.1. BS 5400 Steel, concrete and composite bridges

6.3.2. BS 5628 Code of practice for the use of masonry

6.4. BSI Published Documents

6.4.1. PD 6688-1-1: 2011 Recommendations for the design of structures to BS EN 1991-1-1

6.4.2. PD 6688-1-2:2007 Background paper to the UK National Annex to BS EN 1991-1-2

6.5. Other Publications

6.5.1. Interim Advice Note 05/96 BD 24/92 The Design of Concrete Highway Bridges and Structures. Use of BS 5400: Part 4:1990

ANNEX A: CLARIFICATION OF SPECIFIC EUROCODE REQUIREMENTS

BS EN 1990:2002 BASIS OF STRUCTURAL DESIGN

Design working life

A.1 Design working life category classifications are given in Table **A.1**. The required design working life must be specified for the individual structure in accordance with the requirements for the technical approval of bridges and road related structures.

Table A.1 – Design working life

Design working life category 1 (temporary structures, up to 10 years design working life)	
Temporary structures (1)	
Design working life category 2 (replaceable structural parts, up to 50 years design working life)	
Expansion joints	Waterproofing systems
Safety barriers	Parapets
Design working life category 3 (Short term structures, up to 50 years design working life)	
Lighting columns	Environmental barriers
CCTV masts, High mast lighting	Sign and signal gantries
Columns for Traffic signs/Signals	Bridge gantries, access systems
M & E installations	
Design working life category 4 (50-120 years design working life)	
No example is given	
Design working life category 5 (≥120 years design working life)	
Bridges	Retaining walls
Tunnels	Buried structures
Bridge Bearings (2)	
(1) Structures or parts of structures that can be dismantled with a view to being re-used must not be considered as temporary. (2) The design working life of bridge bearings may be reduced to 50 years subject to agreement with the TAA.	

A.2 Unless specified in other Standards of the DMRB or project specific requirements, the design working life of a bridge or road related structure should be determined with due consideration given for, amongst other things, functional requirement, safety, consequence, traffic disruption, durability, sustainability, financial and practical feasibility if it were to be replaced in the future.

UK NATIONAL ANNEX TO BS EN 1990: 2002+A1:2005

A.3 With reference to the UK NA to BS EN 1990, requirements for the Reliability Classes, the corresponding Design Supervision Levels and Inspection Levels for bridges and road related structures must be as given in Table **A.2**. based on the corresponding structure category. The information should be recorded in the AIP.

Table A.2. - Categories and Structural Reliability Classes

				Comments
Whole structure Category as defined in BD2 Technical Approval of Highway Structures	0	1 and 2	3	
Consequence Class BS EN1990 Table B1 i) For the whole structure ii) For structural elements	CC1 project specific	CC2 project specific	CC3 project specific	Structural elements may be designated a higher or lower Consequence Class than for the whole structure.
Reliability Class BS EN1990 Table B2	RC1 Note A1	RC2	RC3 Note A1	For whole structure.
Design Supervision Level BS EN1990 Table B4	DSL1	DSL2	DSL3	For the whole structure. The DSL should be taken as the corresponding Check Categories in BD2 Technical Approval of Highway Structures
Inspection Level during execution BS EN1990 Table B5	IL1, IL2 or IL3 Note A2	IL1, IL2 or IL3 Note A2	IL2 or IL3 Note A2	For a whole structure or parts of structure.
Inspection Level during execution for individual projects	project specific	project specific	project specific	To be specified in the Contract Documents.

Note A1: K_{FI} must be taken as 1,0 and not modified as stated in B3.3 Table B3 of BS EN 1990:2002.

Note A2: Third party inspection: Inspection performed by an organisation different from that which has executed the works. (Note: Differs from Third Party as defined in **1.12**).

A.4 Higher or lower classes and/or levels than those given in Table **A.2** may be considered subject to agreement with the TAA.

TRAFFIC LOADS ON BRIDGES

Traffic loads on bridges and road related structures

A.5 Structures that carry traffic loads must be designed for BS EN 1991-2 load models LM1, LM2 and, if appropriate for pedestrians, LM4.

A.6 Structures that carry motorway and trunk road traffic must also be designed for all the SV models given in LM3 as defined in the UKNA to BS EN 1991-2.

A.7 For Principal Roads and other Public Roads the required SV models to be considered in the design must be agreed with the TAA for the individual structure. Recommendations are given in Table **A.3**.

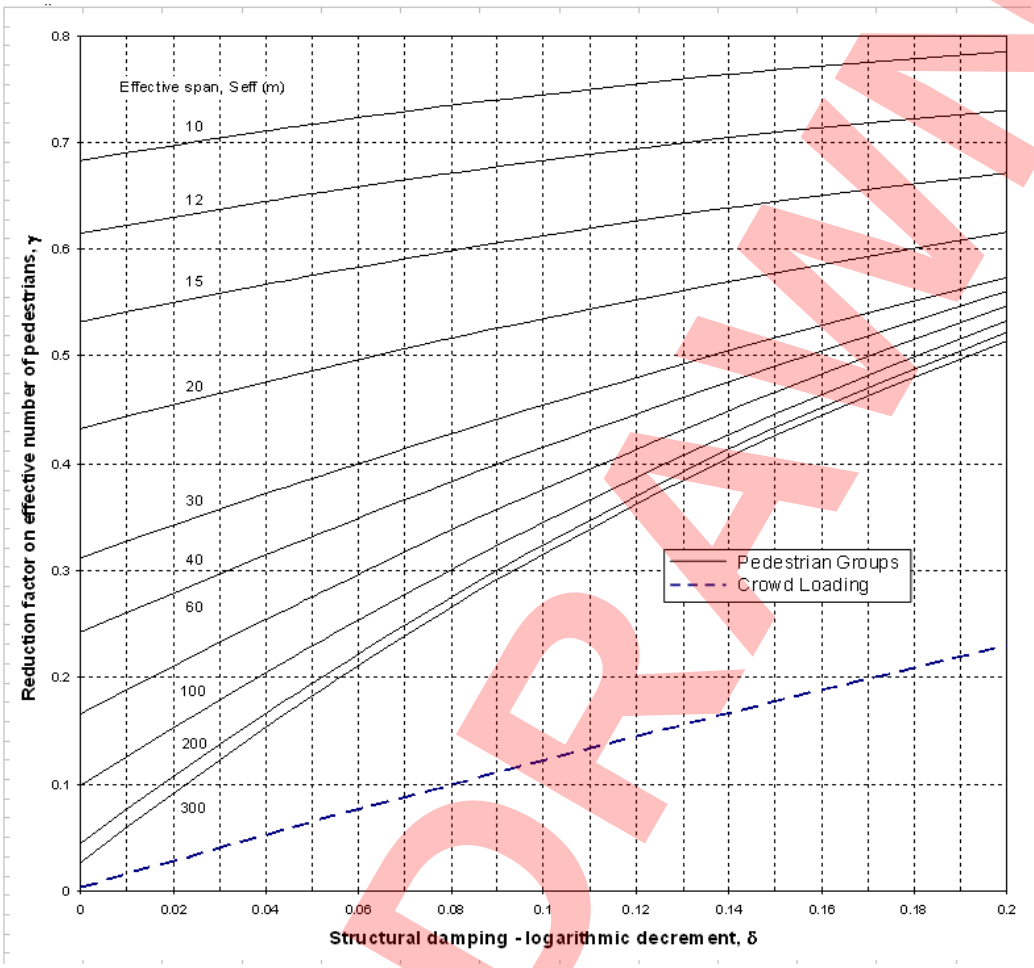
1.1 Table A.3 SV model vehicles for the design

Class of road carried by road structure	**SV models**
Motorway and Trunk Roads (or principal extensions of trunk roads)	SV80, SV 100, SV 196
Principal Roads as agreed with the TAA	SV80, SV100
Other Public Roads as agreed by TAA	SV 80

Pedestrian loads on bridges and road related structures

A.8 Figure NA.9 in the UK National Annex to BS EN 1991-2:2003 contains errors that are being addressed. Figure A.1 is the correct version and must be used instead.

Figure A.1. – New Figure NA.9 Reduction factor to allow for the unsynchronized combination of pedestrian actions within groups and crowds



Heavy Load Route

A.9 Where a bridge or road related structure carries traffic on a route that is designated by the Overseeing Organisation as a Heavy Load Route, the structure must be designed for the appropriate SOV models as defined in the UK NA to BS EN 1991-2 and/or specific individual vehicles as required. These loads must be agreed with the TAA.

Bridges which are subjected to an agreement with a Third Party

A.10 Accommodation bridges should be designed for BS EN 1991-2 load models LM1 and LM2 and, if appropriate for pedestrians, LM4.

A.11 Where the provision of a structure is the subject of an agreement with a Third Party, then the Third Party must be notified by the Overseeing Organisation of the traffic loading the structure will be able to carry. This must be done before any agreement is concluded between the Overseeing Organisation and the Third Party. As the Third Party will often not be familiar with trunk road design loading models, the loading must be translated into any agreement in terms of actual vehicles represented by the design loading.

ACCIDENTAL ACTIONS CAUSED BY ROAD VEHICLES: IMPACT ON SUPPORTING SUBSTRUCTRES

A.12 Table NA.1 in the UK National Annex to BS EN 1991-1-7:2005 and Table 1 in the UK Published Document PD 6688-1-7:2009 contain errors that are being addressed. Tables **A.4** and **A.5** are the correct versions and must be used.

Table A.4. – New Table NA.1 – Equivalent static design forces due to vehicular impact on members supporting bridges over or adjacent to roads

	Force F_{dx} in the direction of normal travel kN	**Force F_{dy} perpendicular to the direction of normal travel** kN	**Point of application on bridge support**
Bridges over Motorways, Trunk and Principal Roads			
Main component	1650	825	At the most severe point between 0.75 m and 1.5 m above carriageway level
Residual component	825	415	At the most severe point between 1m and 3m above carriageway level
Bridges over other roads where speed limit ≥ 45 mph (72 kph): e.g. Other Rural Roads			
Main component	1240	620	At the most severe point between 0.75 m and 1.5 m above carriageway level
Residual component	620	290	At the most severe point between 1m and 3m above carriageway level
Bridges over other roads where speed limit < 45 mph (72 kph): e.g. Other Urban Roads			
Main component	825	415	At the most severe point between 0.75 m and 1.5 m above carriageway level
Residual component	415	205	At the most severe point between 1m and 3m above carriageway level
Bridges over roads: minimum forces for robustness			
Main component	250	250	At the most severe point between 0.75 m and 1.5 m above carriageway level
Residual component	165	165	At the most severe point between 1m and 3m above carriageway level

Table A.5. – New Table 1 – Equivalent static design forces due to vehicular impact on members supporting foot and cycle track bridges over or adjacent to roads

	Force F_{dx} in the direction of normal travel kN	**Force F_{dy} perpendicular to the direction of normal travel** kN	**Point of application on bridge support**
Footbridges			
Main and Residual load components applied to plinth	As road bridge, depending on road class below bridge (see Table NA.1 of NA to BS EN 1991-1-7:2006)		
Residual load component	165	165	At the most severe point between 1m and 3m above carriageway level
Footbridges: minimum forces for robustness			
Main load component	165	165	At the most severe point between 0,75 m and 1,5 m above carriageway level
Residual load component	85	85	At the most severe point between 1 m and 3 m above carriageway level

DESIGN OF STRUCTURES FOR EARTHQUAKE RESISTANCE

A.13 As the whole of the UK is considered to be an area of very low seismicity, the provisions of EN1998 need not apply unless otherwise specified by the TAA. Any specific seismic requirements, where appropriate (see PD6698:2009 and Table **A.6** for further information), should be considered for the individual structure.

Table A.6. - Importance Classes of Bridges and Road Related Structures

				Comments
Structure Category	0 and 1	2	3	CC is assumed to correspond to Structure Categories as shown
Consequence Class EN1990 Table B1	CC1	CC2	CC3	For a whole structure
Importance Class EN1998-2 clause 2.1(4)P Note	IC I	IC II	IC II or IC III as agreed by TAA	Seismic design need not be considered for IC I and II

ANNEX B: CLAUSES OF PUBLISHED DOCUMENTS THAT CONSTITUTE THE DEFAULT MEANS OF COMPLIANCE WITH EUROCODE CLAUSES FOR THE DESIGN OF BRIDGES AND ROAD RELATED STRUCTURES

These clauses are applicable for the design of concrete, steel and composite steel and concrete bridges and road related structures.

For the design of bridges and road related structures in other materials such as masonry, timber and aluminium, no guidance is given. See clause **2.2**.

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
PD 6688-1-1:2011 Recommendations for the design of structures to BS EN 1991-1-1	None	
PD 6688-1-2:2007: Background paper to the UK National Annex to BS EN 1991-1-2	None.	
PD 6688-1-4:2009 Background paper to the UK National Annex to BS EN 1991-1-4	Annex A excluding clauses A.1.5.2 and A.1.5.3.	BS EN 1991-1-4:2005 Annex E
PD 6688-1-7:2009 Recommendations for the design of structures to BS EN 1991-1-7	cl. 2.1	BS EN 1991-1-7:2006 cl. 3.1 (2) Note 1
	cl. 2.3	BS EN 1991-1-7:2006 cl. 3.2 (1) Note 3
	cl. 2.4	BS EN 1991-1-7:2006 cl. 3.4 (2) Note
	cl. 2.5	BS EN 1991-1-7:2006 cl. 4.1 (1) Note 1
	cl. 2.6	BS EN 1991-1-7:2006 cl. 4.1 (1) Note 3
	cl. 2.7	BS EN 1991-1-7:2006 cl. 4.3.1 (1) Note 1
	cl. 2.8	BS EN 1991-1-7:2006 cl. 4.3.2
	cl. 2.9	BS EN 1991-1-7:2006 cl. 4.3.2 (1) Note 3
PD 6688-2 2011: Recommendations for the design of structures to BS EN 1991-2	***PD has been published.*** ***Clauses will be specified in a later amendment.***	
PD 6687-1:2010: Background paper to the UK National Annexes to BS EN 1992-1 and BS EN 1992-3	None.	

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
PD 6687-2:2008 Recommendations for the design of structures to BS EN 1992-2:2005	cl. 3.2	BS EN 1992-1-1:2004 cl. 2.4.2.4 (3) and Annex A
	cl. 4.3 (first paragraph)	BS EN 1992-1-1:2004 cl. 3.1.9
	cl. 5.1	BS EN 1992-1-1:2004 cl. 4.3
	cl. 6.4	BS EN 1992-1-1:2004 cl. 5.5
	cl. 6.6 (fourth and fifth paragraphs)	BS EN 1992-1-1:2004 cl. 5.6.3
	cl. 7.2.4.1	BS EN 1992-1-1:2004 cl. 6.2.3 (1)
	cl. 7.2.4.4	BS EN 1992-1-1:2004 cl. 6.2.3 (107)
	cl. 7.2.4.5	BS EN 1992-1-1:2004 cl. 6.2.3 (109)
	cl. 7.2.5 (first paragraph)	BS EN 1992-1-1:2004 cl. 6.2.4
	cl. 7.2.6	BS EN 1992-1-1:2004 cl. 6.2.5
	cl. 7.3.1 (excluding first paragraph)	BS EN 1992-1-1:2004 cl. 6.4
	cl. 8.1.1	BS EN 1992-2:2005 cl. 7.2 (102)
	cl. 8.1.2	BS EN 1992-1-1:2004 cl. 7.2 (5)
	cl. 9.2	BS EN 1992-1-1:2004 cl. 8.10.1.3
	cl. 9.4	BS EN 1992-1-1:2004 cl. 8.10.5
	cl. 10.2	BS EN 1992-1-1:2004 cls. 9.2.1.2 (3) and 9.5.3 (6)
	cl. 10.4	Pile caps
	cl. 10.5	Voided slabs
	cl. 12	Additional rules for external prestressing
PD 6695-1-9:2008 Recommendations for the design of structures to BS EN 1993-1-9	cl. 2.2	BS EN 1993-1-9:2005 cl. 1.1 (2)
	cl. 2.3	BS EN 1993-1-9:2005 cl. 1.1 (2)
	cl. 2.4 (third paragraph)	BS EN 1993-1-9:2005 cl. 1.1 (2)
	cl. 3	BS EN 1993-1-9:2005 cl. 2 (2)
	cl. 5.2(Note B1)	BS EN 1993-1-9:2005 cl. 3 (1)
	cl. 5.3(Note B1)	BS EN 1993-1-9:2005 cl. 3 (1)
	cl. 6.2	BS EN 1993-1-9:2005 cls. 5 & 6
	cl. 6.3.1	BS EN 1993-1-9:2005 cls. 5 & 6
	cl. 6.3.2.1	BS EN 1993-1-9:2005 cls. 5 & 6
	cl. 6.3.2.2	BS EN 1993-1-9:2005 cls. 5 & 6

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
	cl. 6.3.3.1 (Note B2)	BS EN 1993-1-9:2005 cls. 5 & 6
	cl. 6.3.3.2	BS EN 1993-1-9:2005 cls. 5 & 6
	cl. 6.3.3.3	BS EN 1993-1-9:2005 cls. 5 & 6
	cl. 6.3.4.1	BS EN 1993-1-9:2005 cls. 5 & 6
	cl. 6.3.4.2	BS EN 1993-1-9:2005 cls. 5 & 6
	cl. 8.2.1	BS EN 1993-1-9:2005 Annex A
	cl. 8.2.2	BS EN 1993-1-9:2005 Annex A
	cl. 8.2.3.1	BS EN 1993-1-9:2005 cl. A.1
	cl. 8.2.3.2	BS EN 1993-1-9:2005 cl. A.2
	cl. 8.2.3.3	BS EN 1993-1-9:2005 cl. A.3
	cl. 8.2.3.4	BS EN 1993-1-9:2005 cl. A.4
PD 6695-1-10:2009 Recommendations for the design of structures to BS EN 1993-1-10	cl.3.2	BS EN 1993-1-10:2005 cl.3
PD 6695-2:2008 Recommendation for the design of bridges to BS EN 1993	cl. 4.2	BS EN 1993-2:2006 cl. 5.1.2
	cl. 4.3	BS EN 1993-1-8:2005 cls. 2.7 & 5 BS EN 1993-2:2006 Annex D
	cl. 4.4	BS EN 1993-1-8:2005 cl. 3.4.1 BS EN 1993-2:2006 cl. 5.2
	cl. 4.5	BS EN 1993-1-8:2005 cl. 5 BS EN 1993-2:2006 cls. 5.3 & 6.3.4.2
	cl. 5.1	BS EN 1993-1-1:2005 cls. 6.3.2.2 & 6.3.2.3 BS EN 1993-2:2006 cls. 6.3.2.2 & 6.3.2.3
	cl. 5.2	BS EN 1993-2:2006 cls. 6.3.2.2, 6.3.2.3 & 6.3.4
	cl. 5.3	BS EN 1993-2:2006 cl. 6.3.4.2(6)
	cl. 6.2	BS EN 1993-2:2006 cls. 6.3.2.2, 6.3.2.3 & 6.3.4 (Note B3)
	cl. 6.3.1	BS EN 1993-2:2006 cls. 6.3.4.2 & Annex D
	cl. 6.3.2	BS EN 1993-2:2006 cls. 6.3.4.2 & Annex D
	cl. 7.2	BS EN 1993-2:2006 cls. 6.3.2.2, 6.3.2.3 & 6.3.4 (Note B3)
	cl. 7.3	BS EN 1993-2:2006 cls. 6.3.4.2 & Annex D
	cl. 8.2	BS EN 1993-2:2006 cls. 6.3.2.2, 6.3.2.3 & 6.3.4 (Note B3)

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
	cl. 8.3	(Note B4)
	cl. 8.4	BS EN 1993-2:2006 cls. 6.3.4 & Annex D
	cl. 8.5.1	(Note B4)
	cl. 8.5.2	(Note B4)
	cl. 9	BS EN 1993-2:2006 cl. 6.3.4.2
	cl. 10.1 (Note B5)	BS EN 1993-2:2006 cl. 5.3.3
	cl. 10.2.1 Note B5)	BS EN 1993-2:2006 cl. 5.3.3
	cl. 10.2.2 Note B5)	BS EN 1993-2:2006 cl. 5.3.3
	cl. 10.2.3 Note B5)	BS EN 1993-2:2006 cl. 5.3.3
	cl. 10.2.4 Note B5)	BS EN 1993-1-8:2005 cl. 5
	cl. 10.2.5 Note B5)	BS EN 1993-1-8:2005 cl. 5
	cl. 10.2.6 Note B5)	BS EN 1993-1-8:2005 cl. 5
	cl. 10.3 Note B5)	BS EN 1993-1-8:2005 cl. 5
	cl. 11	BS EN 1993-2:2006 cl. 6.3.4.2
	cl. 12.1	BS EN 1993-1-5:2006 cl. 4.1
	cl. 12.2	BS EN 1993-1-5:2006 cl. 4.6
	cl. 12.3	BS EN 1993-1-5:2006 cl. 10
	cl. 13.3.1 (Note B6)	BS EN 1993-1-5:2006 cl. 8
	cl. 13.3.2 (Note B6)	BS EN 1993-1-5:2006 cl. 7.2
	cl. 13.3.4 (Note B6)	BS EN 1993-1-1:2005 cl. 6.3.1.2 BS EN 1993-1-5:2006 cl. 4.5.3(5)
	cl. 14	BS EN 1993-1-5:2006 cls. 2.3 & 9.2.4
	cl. 15 paragraphs 2,3 and 4	BS EN 1993-1-5:2006 cl. 9
	cl. 16.1 paragraph 2	BS EN 1993-1-5:2006 cl. 9
	cl. 16.2 paragraph 2	BS EN 1993-1-5:2006 cl. 9
	cl. 16.3 (Note B7)	BS EN 1993-1-5:2006 cl. 9
	cl. 16.4	BS EN 1993-1-5:2006 cl. 9
	cl. 17.2	BS EN 1993-1-8:2005 cls. 2.7 & 3.12
	cl. 17.3.1	BS EN 1993-1-1:2005 cl. 5.3.3
	cl. 17.3.2	BS EN 1993-1-1:2005 cl. 6.2.4
	cl. 17.4.2	BS EN 1993-1-1:2005 cl. 6.2.3

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
	cl. 17.5.2	BS EN 1993-1-8:2005 cl. 3.12 BS EN 1993-1-1:2005 cl. 6.24
	cl. 17.5.4	BS EN 1993-1-8:2005 cl. 3.4
	cl. 18.2	(Note B4)
	cl. 18.3	(Note B4)
	cl. 19.2.1	BS EN 1993-1-8:2005 cl. 3
	cl. 20.2	BS EN 1993-1-8:2005 cl. 4
	cl. 20.3	BS EN 1993-1-8:2005 cl. 4
	cl. 20.3.1.1	BS EN 1993-1-8:2005 cl. 4
	cl. 21.1 paragraphs 2 and 3	BS EN 1993-1-5:2006 cl. 9
	cl. 21.2	BS EN 1993-1-5:2006 cl. 9
	cl. 22.2	BS EN 1993-1-5:2006 cl. 9
	cl. 23.2.2	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 23.2.3	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 23.2.4	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 23.3.2	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 23.3.3	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 23.3.4.2	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 23.3.4.3	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 23.4.2	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 23.5	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
	cl. 24.1	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.2.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.2.2 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.2.3 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.2.4 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.2.5 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.2.6 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.2.7 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.2.8.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.2.8.2 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.2.8.3 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.3.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.3.2 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.4.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.4.2.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
	cl. 24.4.2.2 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.4.2.3 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.4.2.4 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.4.2.5 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.4.3 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.4.4 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.4.5 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5.2 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5.2.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5.2.2 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5.2.3 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5.2.4 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5.2.4.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
	cl. 24.5.2.4.2(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5.3(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5.4(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.5.5(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.1(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.2(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.2.1(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.2.2(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.2.3(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.2.3.1(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.2.3.2(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.2.3.3(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.2.4(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.2.4.1(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
	cl. 24.6.2.4.2 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.2.4.3 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.3 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.3.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.3.2 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.3.3 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.3.4 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.3.4.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.3.4.2 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.3.4.3 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.3.4.4 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.3.4.5 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.4 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.5 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.5.1 (Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
	cl. 24.6.5.2(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.6(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.6.1(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.6.2(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.6.7(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.7.1(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.7.2(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.7.3(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.7.3.1(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.7.4(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.8.1(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.9(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.9.1(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.9.2(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 24.9.3(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
	cl. 24.9.4(Note B9)	BS EN 1993-2:2006 cl. 5.2 BS EN 1993-1-5:2006 cls. 2, 3, 4, 5, 6.7, 8, 9, 10 & Annex C (Note B8)
	cl. 25.2.1	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 25.2.2	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 25.2.3	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 25.2.4	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 25.3	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 25.4.1	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 25.4.2	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 25.5.1	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 25.5.2	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 25.5.3	BS EN 1993-2:2006 cls. 6.2.7 & 6.2.8 BS EN 1993-1-5:2006 Annex C (Note B8)
	cl. 26	BS EN 1993-2:2006 cl. 7.4
PD 6696-2:2007 Background paper to BS EN 1994-2 and the UK National Annex to BS EN 1994-2	All clauses where appropriate.	
PD 6694-1 2011 Recommendations for the design of structures subject to traffic loading to BS EN 1997-1:2004	All clauses where appropriate.	

Published Document	Clause numbers that must be treated as requirements	Referenced Eurocode and Clause
PD 6698:2009 Recommendations for the Design of Structures for Earthquake Resistance to BS EN 1998	None.	

Note B1. Either the Safe life method (cl. 5.2) or Damage tolerant method (cl. 5.3) must be used.
Note B2. The gross geometrical stress concentrating effects listed are not exhaustive and Designers should consider other cases as appropriate.
Note B3. The expressions for non dimensional slenderness as given in clauses 6.2, 7.2 and 8.2 should only apply to uniform I, channel, angle or T sections. They should not be used for rectangular or trapezoidal box sections or solid rectangular sections.
Note B4. The clauses are not covered by Eurocodes.
Note B5. Requirement if second order analysis is not undertaken.
Note B6. If computer analysis is used Designers must take these stresses into account.
Note B7. Other load effects including but not limited to differential settlement, soil pressures and wind may need to be considered.
Note B8. The specific requirements for the design of plated diaphragms, cross frames, the design for torsion and distortion, are not given in Eurocodes. However the reference clauses should provide the necessary guidance.
Note B9. Requirement if hand method of calculation is used.

ANNEX C: STATUS OF THE DMRB DOCUMENTS AND GUIDANCE OR REQUIREMENTS FOR USE WITH EUROCODES

DMRB standards and advice notes for structures that may be used with Eurocodes for the design of bridges and road related structures are listed in Annex C1, together with the conditions of use where applicable. DMRB standards and advice notes for structures where substitute guidance and/or requirements must be used with Eurocodes for the design of bridges and road related structures are also listed in Annex C1. All other DMRB documents in Volumes 1-3 not listed in Annex C1, including the technical memoranda, must not be used with Eurocodes for the design of bridges and road related structures.

DMRB standards and advice notes may contain requirements that are in conflict with the Principles and Application Rules for Eurocodes. In such cases the conflicting requirements must not be used. See clause **2.1**.

Requirements for the use of Transport Scotland Interim Amendments with Eurocodes for the design of bridges and road related structures are given in Annex C2

ANNEX C1: DMRB standards that may be used with Eurocodes and DMRB standards where substitute guidance and/or requirements must be used with Eurocodes for the design of bridges and road related structures

DMRB Standard	**Status of DMRB Standard for use with Eurocodes**	**Additional guidance and/or requirements to be applied for design in conjunction with Eurocodes (see clause 2.1)**
APPROVAL PROCEDURES AND GENERAL DESIGN (DMRB 1)		
Approval Procedures (DMRB 1.1)		
BD 2 Technical Approval of Highway Structures (DMRB 1.1.1)	BD2 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	Schedule of design documents makes reference to standards that conflict with Eurocodes. Prior to the publication of a revised version of BD2 the schedule should be amended to include documents relevant to design using Eurocodes.
Other Procedural Documents (DMRB 1.2)		
BD 36 Evaluation of maintenance costs in comparing alternative designs for highway structures (DMRB 1.2.1)	BD36 to be fully applied.	None.
BA 28 Evaluation of maintenance costs in comparing alternative designs for highway structures (DMRB 1.2.2)	BA28 to be fully applied.	None.
General Design (DMRB 1.3)		
BA 59 Design of highway bridges for hydraulic actions. (DMRB 1.3.6)	Existing Advice Note must not be used. However, substitute guidance and/or requirements given in this annex must be used.	Bridges crossing rivers, estuaries and flood plains may be vulnerable to damage or loss due to hydraulic action, and to scour in particular. Designers must consider protection or otherwise minimise these risks by taking account of the effects the bridge and approaches have on the existing hydraulic regime and the various forms of hydraulic action including but not confined to: foundation failure due to scour and bank erosion, hydraulic forces on piers and bridge decks, the effects of debris, ice forces and ship collision. At the concept stage the relevant river and navigation authorities must be consulted to agree the criteria for flow capacity and navigation requirements. The design must take into account effects both upstream and downstream of the

		structure and future likely changes to the river regime and navigation requirements. Additional guidance is given in 'HD 45 Road drainage and water environment (DMRB 11.3.10)'.
BD 57 and BA 57 Design for durability (DMRB 1.3.7 and 1.3.8)	Existing Standard and Advice Note must not be used. However, substitute guidance and/or requirements given in this annex must be used.	Additional information is given in CIRIA Document C686 – Safe access for maintenance and repair. In designing all bridges and road related structures, Designers should consider the need to minimise future maintenance activities to avoid traffic disruption. Durability is a key issue throughout the design, detailing and construction phases, and the principles of whole life costing must be adopted. **Structural continuity:** All bridges should be designed as continuous over intermediate supports unless special circumstances exist. Such continuity may be either full continuity of the whole deck structure or partial continuity of usually the deck slab alone. (See also CIRIA Document C543 - Bridge Detailing Guide). **Deck hinges and half joints:** Deck hinges must not be used in bridges. Unless there are facilities for inspection and maintenance, half joints must not be used in bridge decks. **Post tensioning:** Segmental post-tensioned concrete bridges with an internally grouted system must not be used. Segmental bridges incorporating continuous external post-tensioned duct systems, and non-segmental construction with either external or internal continuous duct systems may be constructed providing that post-tensioned structures using external systems or unbonded tendons are detailed such that inspection of all individual tendons and their eventual replacement is possible without restricting traffic. **Replacement Cables:** The design must provide for the capacity and practical considerations of cable replacement. **Alternative to steel reinforcing bars:** Consideration should be given to options for eliminating or reducing the use of corrodible ferrous reinforcement. See the requirements for 'BA 84 Use of stainless steel reinforcement in highway structures (DMRB 1.3.15)'. **Access:** Designers should make provision for access for the following purposes: i) Cleaning and painting ii) Routine maintenance, jacking, removal/replacement of bearings iii) Inspection of closed cell and box members iv) All other inspection requirements v) All other maintenance activities In providing such access, all the requirements of the Health and Safety legislation and other relevant requirements must be fully observed; provision for access in excess of the minimum requirements must be adopted wherever possible. Access should be provided from below deck level, to avoid access through deck surfaces which should be avoided. Public use of any of the access facilities provided for bridge

		inspection and maintenance should be prevented by the provision of suitable secure and lockable barriers, doors, covers etc. Access openings on bridges should be provided with sealed and drained hatches or covers where necessary. Ventilation and drainage holes should be provided to all closed cell or box sections. In closed sections where access for inspection is provided, provision for safe artificial lighting should be made, preferably with some minimum provision for illumination by natural light. Where provision for inspection and maintenance is not available, abutment galleries should be provided below all bridge deck expansion and rotational joints. **Drainage:** Surface water should be removed from bridge decks by the provision of falls and suitable drainage outlets. Sub-surface drains should be provided where required and service bays should have provision for drainage. Systems for the drainage of surface water from bridges should be so detailed that water is not allowed to fall freely from bridge decks. Closed drainage systems with easily accessible facilities for rodding and other necessary maintenance should be used. Drainage systems should be sufficiently robust to withstand damage during cleaning, and should be resistant to all commonly occurring chemical spillage. Drainage details which are integral with the structure should be avoided where possible. Down-pipes cast into piers should not be used. Drainage water from bridge decks should never be discharged into the drainage layers behind abutments. Water should be prevented from entering bridges from the approaches.
BA 41 The design and appearance of bridges (DMRB 1.3.11)	BA41 to be fully applied.	None.
BA 42 The design of integral bridges (DMRB 1.3.12)	Existing Advice Note must not be used. However, substitute guidance and/or requirements given in this annex must be used.	To be reviewed after PD6694-1 Recommendations for the design of structures subject to traffic loading to BS EN 1997-1:2004 is issued. See guidance and/or requirements for design for durability. Bridges with overall lengths not exceeding 60m and skews not exceeding 30˚ should be designed as integral bridges, with abutments connected directly to the bridge deck without movement joints and bearings for expansion or contraction of the deck. Additional information is given in CIRIA Document C543 - Bridge Detailing Guide and SCI Publication 340.
BD 10 Design of highway structures in areas of mining subsidence (DMRB 1.3.14)	BD10 to be fully applied except references to BS5400. The additional guidance and/or requirements in this annex must also be applied.	Sections 3.14, 3.20 and 3.33 make reference to a standard that conflict with Eurocodes (BS5400). Prior to the publication of a revised version of BD10, the relevant Eurocodes should be used in lieu of BS5400.
BA 84 Use of stainless steel reinforcement in highway structures (DMRB 1.3.15)	Existing Advice Note must not be used. However, substitute guidance and/or requirements given in this annex must be used.	When designing for durability consideration should be given to options for eliminating or reducing the use of corrodible ferrous reinforcement.

BD 90 Design of FRP bridges and highway structures (DMRB 1.3.17)	BD90 to be fully applied.	None.
DESIGN (SUBSTRUCTURES AND SPECIAL STRUCTURES) MATERIALS (DMRB 2)		
Substructures (DMRB 2.1)		
BD 41 Reinforced clay brickwork retaining walls of pocket type and grouted cavity type construction – use of BS5628:Part 2:1995 (DMRB2.1.1)	See clause **2.2**.	
BD 68 Crib retaining walls (DMRB 2.1.3)	BD68 to be fully applied.	None.
BA 68 Crib retaining walls (DMRB 2.1.4)	BA68 to be fully applied.	None.
BD 70 Strengthened/reinforced soils and other fills for retaining walls and bridge abutments. Use of BS 8006: 1995, incorporating amendment no. 1 (issue 2 March 1999) (DMRB 2.1.5)	Existing Standard must not be used. However, substitute guidance and/or requirements given in this annex must be used.	Design must be in accordance with BS 8006-1.
Special Structures (DMRB 2.2)		
BD 94 Design of minor structures (DMRB 2.2.1)	BD94 to be fully applied.	None.
BD 51 Portal and cantilever signs/signal gantries (DMRB 2.2.4)	BD51 to be fully applied except Chapters 3 and 4. The additional guidance and/or requirements in this annex must also be applied.	Gantries should be designed to withstand static, dynamic, environmental and impact loading; safe for use by maintenance personnel; easily replaceable and may be constructed from materials other than conventional steel and concrete e.g. fibre reinforced plastic. Appropriate risk assessment should be undertaken for protection against vehicle impact. Passive safety consideration should be addressed. Mechanical and electrical engineers should be consulted with regard to electrical safety on impact. Chapters 3 and 4 of BD51 on loadings for and design of portal and cantilever sign/signal gantries respectively contain design rules based on standards such as BS5400 that conflict with Eurocodes. Prior to the publication of a revised version of BD51, guidance should be sought from the TAA on a project specific basis on whether Eurocodes should be used for the design of portal and cantilever sign/signal gantries.
BD 65 Design criteria for collision protection beams (DMRB 2.2.5)	BD65 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	BD65 makes references to a number of standards that are in conflict with Eurocodes. Prior to the publication of a revised version of BD65, the relevant Eurocodes should be used in lieu of the referenced standards. Annex A will be amended in due course, so that the vertical sag requirement will be the same as that given in 'TD27 Cross-sections and headrooms (DMRB 6.1.2)'.
BD 12 Design of corrugated steel buried structures with spans greater than 0.9 metres and up to 8.0 metres (DMRB 2.2.6)	BD12 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	BD12 makes references to a number of standards that are in conflict with Eurocodes. Prior to the publication of a revised version of BD12, the relevant Eurocodes should be used in lieu of the referenced standards.
BD 67 Enclosure of bridges (DMRB 2.2.7)	BD67 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	BD67 makes references to a number of standards that are in conflict with Eurocodes. Prior to the publication of a revised version of BD67, the relevant Eurocodes should be used in lieu of the referenced standards.

BA 67 Enclosure of bridges (DMRB 2.2.8)	BA67 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	See guidance and/or requirements for 'BD 67 Enclosure of bridges (DMRB 2.2.7)'.
BD 29 Design criteria for footbridges (DMRB 2.2.8)	BD 29 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	Footbridges should be designed to ease walking and cycling taking account of likely pedestrian and cyclist flows. Account should also be taken of the requirements of mobility-impaired persons including the elderly, people with prams or with walking difficulties and heavily laden shoppers. Footbridges can be prone to various forms of damage, misuse and vandalism by users. Consideration should be given to likely vandalism at the location and whether enclosures are required. Protection measures including security should be provided. Materials vulnerable to fire damage, graffiti and of high scrap value should be avoided at high risk locations All references made to British Standards that conflict with Eurocodes and/or DMRB documents not to be used with Eurocodes for the design of bridges and road related structures, must not be followed. Prior to the publication of a revised version of BD29, Eurocodes must be used in lieu of the referenced standards.
TD 19 Requirement for road restraint systems (DMRB 2.2.8)	TD19 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	TD19 makes references to a number of standards that are in conflict with Eurocodes. Prior to the publication of a revised version of TD19, the relevant Eurocodes should be used in lieu of the referenced standards.
BD 78 Design of road tunnels (DMRB 2.2.9)	BD78 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	The design requirements, including loading, must comply with the Eurocodes. Road tunnels must be provided with mechanical and electrical systems to enable the tunnels to be safe for use by motorists and by those who need to enter the tunnel, during normal operation, maintenance and emergencies. The design, supply, installation and testing of individual M&E systems must take due account of the requirements in the relevant DMRB documents covering the design, inspection and maintenance of road tunnels.
BD 82 Design of buried rigid pipes (DMRB 2.2.10)	BD82 to be fully applied.	None.
BD 91 Unreinforced masonry arch bridges (DMRB 2.2.14)	See clause **2.2**.	
Materials and Components (DMRB 2.3)		
BD 20 Bridge bearings (DMRB 2.3.1)	Existing Standard must not be used. However, substitute guidance and/or requirements given in this annex must be used.	Design of bearings must be in accordance with BS EN 1337 and PD6703:2009. Bridges and road related structures must be provided, where appropriate, with structural bearings providing the means of transferring loads between the superstructure and substructure while accommodating and/or controlling the articulation. The bearings must, amongst other things, cater for the forces of gravity, traffic, wind and friction to which the bridge is subjected, together with the translational and rotational movements arising, amongst other things, from

		temperature changes, creep, shrinkage and prestress, and from permanent and traffic loading.
BD 47 Waterproofing and surfacing of concrete bridge decks (DMRB 2.3.4)	BD47 to be fully applied.	***To be confirmed***
BA 47 Waterproofing and surfacing of concrete bridge decks (DMRB 2.3.5)	BA47 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	See guidance and/or requirements for 'BD 47 Waterproofing and surfacing of concrete bridge decks (DMRB 2.3.4)'.
BD 33 Expansion joints for use in highway bridge decks (DMRB 2.3.6)	BD33 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	See also EN1993-2 Expansion joints, which are provided to accommodate movement, must have good riding quality and skid resistance, and must not cause a hazard to any road user, including motorcyclists, cyclists, pedestrians and animals where they have access. Expansion joints must be capable of sustaining traffic loading, including traction and skidding loading, and movements due to traffic, temperature, creep, shrinkage, lateral movement and settlement.
		Expansion Choice of joint must consider the range of movement to be accommodated, the whole life cost of providing the joint (including traffic delay costs of installation, maintenance and replacement), system environmental issues, sustainability and the noise generated. The same joint must continue across the full width of the deck including footway, verge, hardshoulder and central reserve.
BA 26 Expansion joints for use in highway bridge decks (DMRB 2.3.7)	BA26 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	See guidance and/or requirements for 'BD 33 Expansion joints for use in highway bridge decks (DMRB 2.3.6)'.
BA 36 The use of permanent formwork (DMRB 2.3.7)	Existing Advice Note must not be used. However, substitute guidance and/or requirements given in this annex must be used.	Permanent formwork must be safe for use and capable of resisting all load effects arising during construction, operation or maintenance, without detrimental deflection or risk of uncontrolled displacement. Where provided, temporary seals must be suitable for the proposed use. The adequacy of proposals for permanent formwork should be demonstrated through the use of certified manufacturer's data or though site testing.
BA 82 Formation of continuity joints in bridge decks (DMRB 2.3.7)	BA82 to be fully applied.	***To be confirmed***
BD 7 Weathering steel for highway structures (DMRB 2.3.8)	BD7 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	The requirements of BD7 are to be adopted for the design of weathering steel structures, subject to the following amendments. In BD7, where reference is made to BS EN 10155, this standard has been superseded by BS EN 10025-5, which should be adopted. In BD7 Clause 4.2, delete ', in accordance with clause 7.2 of BS 5400: Part 3,' In BD7 Clause 4.3, delete ', in accordance with BS 5400: Part 3,'

BA 92 Use of recycled concrete aggregates in structural concrete (DMRB 2.3.9)	BA92 to be fully applied.	None.
Paints and other Protective Coatings (DMRB 2.4)		
BD 35 Quality assurance scheme for paints and similar protective coatings (DMRB 2.4.1)	BD35 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	Steelwork in bridges and road related structures must be protected against corrosion by a protection system as specified in the project specification.
BD 43 The impregnation of reinforced and prestressed concrete highway structures using hydrophobic pore-lining impregnants (DMRB 2.4.2)	BD43 to be fully applied.	***To be confirmed***
BA 85 Coatings for concrete highway structures & ancillary structures (DMRB 2.4.3)	BA85 to be fully applied.	***To be confirmed***
INSPECTION AND MAINTENANCE (DMRB 3)		
Inspection (DMRB 3.1)		
BD 45 Identification markings of highway structures (DMRB 3.1.1)	BD45 to be fully applied.	None.
Maintenance (DMRB 3.2)		
BD 62 As built, operational and maintenance records for highway structures (DMRB 3.2.1)	BD62 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	Where appropriate see also standards for inspection and records for road tunnels and inspection of bridges and road related structures.
ROAD GEOMETRY (DMRB 6)		
Links (DMRB 6.1)		
TD 27 Cross-sections and headrooms (DMRB 6.1.2)	TD27 to be fully applied. The additional guidance and/or requirements in this annex must also be applied.	High Load Routes: Particular routes are nominated as High Load Routes by the Overseeing Organisation. If the structures are identified to be along these routes, headroom must be provided as required for the route.
ENVIRONMENTAL DESIGN AND MANAGEMENT (DMRB 10)		
Environmental Barriers (DMRB 10.5)		
HA 66 environmental barriers (DMRB 10.5.2)	HA66 to be fully applied except Chapters 6 and 7 and Appendices A, B and C. The additional guidance and/or requirements in this annex must also be applied.	Environmental barriers, providing visual screening and noise reduction, should be designed to resist all load effects arising during operation, or maintenance, without rupture or instability, detrimental deflection or vibration. Consideration should be given to the environmental impact of the barrier itself. Chapters 6 and 7 and Appendices A, B and C of HA 66 contain design rules based on standards such as BS5400 that conflict with Eurocodes. Prior to the publication of a revised version of HA66, the relevant Eurocodes should be used for the design of environmental barriers.

ANNEX C2: Use of Interim Amendments with Eurocodes for the design of bridges and road related structures

Transport Scotland interim amendments may contain requirements that are in conflict with the Principles and Application Rules for Eurocodes. In such cases the conflicting requirements must not be used. See clause **2.1**.

Following the implementation of Eurocodes, the use of Transport Scotland Interim Amendments for the design of bridges and road related structures is set out below:

Transport Scotland Interim Amendment (TS IA)	**Additional guidance and/or requirements to be applied**
Not to be used with Eurocodes	
HA[1] Interim Advice Note 05/96	None.
May be used with Eurocodes provided the additional guidance and/or requirements are applied	
Transport Scotland Interim Amendment No 22 Implementation Of New Reinforcement Standards (BS 4449:2005, BS 4482:2005, BS 4483:2005 and BS 8666:2005)	Amendment to BS 5400-4 as given in TS IA 22 is not applicable to Eurocode design, as BS 5400-4 will be withdrawn. However, the use of BS 4449, BS 4482, BS 4483 and BS 8666 are unaffected.
HA Interim Advice Note 85/07 [Not applicable for use in Scotland] Design Of Passively Safe Portal Signal Gantries	Loadings, Dynamic Analysis, Design and Foundation criteria for passively safe portal signal gantries given in Chapters 7, 8, 9 and 11 respectively must not be used. Designers must use Eurocodes when undertaking structural design of such gantries and any part of them.
HA Interim Advice Note 86/07 [Not applicable for use in Scotland] Amendments To Design Requirements For Portal And Cantilever Sign/Signal Gantries	Loadings and Design criteria of portal and cantilever sign/signal gantries given in Chapters 3 and 4 respectively of BD 51/98 must not be used. See BD 51/98 in Annex C1.
Transport Scotland Interim Amendment No 23 Revised guidance regarding the use of BS8500(2006) for the design and construction of structures using concrete	The section “Interaction with BS5400” must not be used when designing to Eurocodes, as BS 5400 will be withdrawn.
Transport Scotland Interim Amendment No 26 The Anchorage of Reinforcement & Fixings in Hardened Concrete	• Where the maximum and minimum concrete temperatures are to be evaluated, the relevant Eurocodes must be used. • Design – Design Process for Anchorages Subject to Axial Tension – Step 7: the design resistance of the metal component must be determined using the relevant Eurocodes.
May be used without any restriction	
Any other relevant Transport Scotland Interim Amendments not withdrawn or listed above.	

[1] HA – Highways Agency

ANNEX D: PROJECT SPECIFIC INFORMATION TO BE RECORDED

A list of choices and options are compiled in this Annex. (See **2.17**)

It is the responsibility of the compiler of the AIP and designer record to ensure that the Standards, references and clauses listed are relevant and up-to-date.

Information is to be recorded only if applicable and/or where recommended values/methods are not used.

Where the information to be recorded in the AIP is not available at the time of its submission, this should be noted. The information should be added when available to the AIP or addendum AIP.

The designer record is where the Designer should record the choices and options selected. It should not be submitted to the TAA.

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
BS EN 1990:2002 + A1:2005 Eurocode 0: Basis of structural design			
2.1 Basic Requirements (4)P NOTE 1	Define design events to be taken into account.	AIP 4.1.7	
3.4 Serviceability limit states (1)P NOTE 2	Define the serviceability requirements.	AIP 5.1 or 4.7	
4.1.2 Characteristic values of actions (8)	For accidental actions define the design value A_d.	Designer record	
4.1.2 Characteristic values of actions (9)	For seismic actions define the design value A_{Ed}.	Designer record	
A2.1.1 General (1) NOTE 4	Define the combination rules if clauses A2.2.2 to A2.2.5 are changed.	Designer record	
A2.2.1 General (10) NOTE	Define the requirements for snow loads and wind actions to be taken into account simultaneously with other construction loads (e.g. actions due to heavy equipment or cranes) during some transient design situations.	AIP 4.1.8	
A2.2.1 General (13) NOTE	Specify limits on total settlement and differential settlement.	AIP 6.3	
A2.2.1 General (15) NOTE 1	Define variable actions to be taken into account for settlements.	Designer record	
A2.2.2 Combination rules for road bridges (3) NOTE	Define the combination rules for special vehicles with normal traffic and other variable actions.	AIP 4.1.2 or 4.6	Information to be recorded only if combination rules defined in NA.2.3.3.2 are not used.

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
A2.2.5 Combinations of actions for accidental (non seismic) design situations (2) NOTE 2	Define additional combinations of actions for other accidental design situations.	AIP 4.1.7 or 4.7	
A2.2.5 Combinations of actions for accidental (non seismic) design situations (4) NOTE	For ship impact define additional requirements.	AIP 4.1.7 or 4.7	
A2.2.6 Values of ψ factors(1) NOTE 3	Define representative values of water forces (F_{wa}).	Designer record	
A2.2.6 Values of ψ factors (1) NOTE 5	For specific design situations (e.g. calculation of bridge camber for aesthetics and drainage consideration, calculation of clearance, etc.) define the requirements for the combinations of actions to be used.	Designer record	
Table A2.4(B) - Design values of actions (STR/GEO) (Set B) NOTE 5	Where actions due to water are not covered by EN 1997 (e.g. flowing water), define the combinations of actions to be used.	AIP 4.1.9 or 4.7	Advice is given in Table NA.A2.4(B) NOTE 2.
Table A2.5 - Design values of actions for use in accidental and seismic combinations of actions (***)	Specify particular seismic design situations.	AIP 4.6	Information to be recorded only if the advice given in NA.2.3.8 is not adopted.
A2.3.2 Design values of actions in the accidental and seismic design situations (2) NOTE	As an example, in the case of bridges built by the cantilevered method, some construction loads may be considered as simultaneous with the action corresponding to the accidental fall of a prefabricated unit. Define the relevant representative values.	Designer record	Information needs to be passed to the Contractor.
A2.4.3.1 Design situations and associated traffic assumptions (1) NOTE	Define the design situations.	AIP 4.1.3	
A2.4.3.1 Design situations and associated traffic assumptions (3) NOTE 1	Define traffic categories and the relevant design situations.	AIP 4.1.5	
NA to BS EN 1990:2002+A1:2005 – UK National Annex for Eurocode - Basis of structural design			
NA.2.1.1 NOTE	The values of design working life in Table NA.2.1 are indicative. Alternative values of design working life may be determined for the individual project.	AIP 3.1	See Table **A1** of this document.
NA.2.3.2 BS EN 1990(A1):2005, A.2.2.1(2), Note 1 General	Determine combinations involving actions that are outside the scope of EN 1991.	AIP 4.1.9 or 4.7	
NA.2.3.3.3 A.2.2.2(4), Note	Determine the combination of snow loads and group loads gr1a and gr1b.	AIP 4.1.2	Information to be recorded only if recommended values or methods are not used.
NA.2.3.3.4 A.2.2.2(6), Note	Depending upon the local climatic conditions determine a different simultaneity rule for wind and thermal actions.	AIP 4.1.2	Information to be recorded only if recommended values or methods are not used.

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
NA.2.3.4.1 A.2.2.3(2), Note	Depending upon the local climatic conditions define a different simultaneity rule for wind and thermal actions.	AIP 4.1.2	Information to be recorded only if recommended values or methods are not used.
NA.2.3.4.2 A.2.2.3(3), Note	Determine the combination of snow loads and group loads gr1a and gr1b.	AIP 4.1.2	Information to be recorded only if recommended values or methods are not used.
NA.2.3.4.3 A.2.2.3(4), Note	For footbridges on which pedestrian and cycle traffic is fully protected from all types of bad weather, determine combinations of actions.	AIP 4.1.9 or 4.7	
NA.2.3.6.3 A.2.2.6(1), Note 3	Determine representative values of water actions F_{wa}.	Designer record	
NA.2.3.7.3 A.2.3.1(7)	Record general and local scour depths if assessed. Define requirements for taking account of forces due to ice pressure on bridge piers, etc.	AIP 4.1.9 or 4.7	
NA.2.3.7.4 A.2.3.1(8)	In the case where γ_P values for prestressing actions are not provided in the relevant design Eurocodes, these values should be determined for the individual project.	AIP 4.1.9 or 4.7	
Table NA.A.2.4(A) – Design values of actions (EQU) (Set A)	Prestressing γ_P as defined in the relevant design Eurocode or for the individual project. NOTE 2 For self-weight of water, ground-water pressure and other actions dependent on the level of water, no partial factor is specified in this National Annex. The design value of such actions may be directly assessed in accordance with 2.4.6.1 (2)P and 2.4.6.1(6)P of BS EN 1997-1:2004. Alternatively a safety margin may be applied to the characteristic water levels set out in 2.4.6.1(8) of BS EN 1997-1:2004. Partial factors for such actions may be determined for the individual project (see 2.4.7.3.2(2) of BS EN 1997-1:2004). NOTE 4 For all other actions, not covered in NOTES 1 to 3, the partial factors should be determined for the individual project. NOTE 7 Partial factors for actions involving aerodynamic effects of wind on bridges should be determined for the individual project. Guidance on the factors to be considered may be found in PD 6688-1-4:2009. NOTE 9 For verification of uplift of bearings of continuous bridges in cases where the verification of static equilibrium also involves the resistance of structural elements or the ground γ values may be determined for the individual project as an alternative to separate verifications based on Tables NA.A2.4(A)-(C), see also BS EN 1990:2002+A1:2005, 6.4.3.1(4).	AIP 4.1.9 or 4.7 Designer record Designer record Designer record Designer record	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
Table NA.A.2.4(B) – Design values of actions (STR/GEO) (Set B)	Prestressing γ_P as defined in the relevant design Eurocode or for the individual project. NOTE 2 For self-weight of water, ground-water pressure and other actions dependent on the level of water, no partial factor is specified in this National Annex. The design value of such actions may be directly assessed in accordance with 2.4.6.1 (2)P and 2.4.6.1(6)P of BS EN 1997-1:2004. Alternatively a safety margin may be applied to the characteristic water level (see 2.4.6.1(8) of BS EN 1997-1:2004). Partial factors for such actions may be determined for the individual project (see 2.4.7.3.2(2) of BS EN 1997-1:2004). NOTE 4 For all other actions, not covered in NOTES 1 to 3, the partial factors should be determined for the individual project. NOTE 7 Partial factors for actions involving aerodynamic effects of wind on bridges should be determined for the individual project. Guidance on the factors to be considered may be found in PD 6688-1-4:2009. NOTE 9 For particular verifications, the values of γ_G and γ_Q may be sub-divided into γ_g and γ_q and the model uncertainty factor γ_{Sd}. A value of γ_{Sd} = 1,15 can be used except where otherwise determined for the individual project.	AIP 4.1.9 or 4.7 Designer record Designer record Designer record Designer record	
Table NA.A.2.4(C) – Design values of actions (STR/GEO) (Set C)	Prestressing γ_P as defined in the relevant design Eurocode or for the individual project. NOTE 2 For self-weight of water, ground-water pressure and other actions dependent on the level of water, no partial factor is specified in this National Annex. The design value of such actions may be directly assessed in accordance with 2.4.6.1 (2)P and 2.4.6.1(6)P of BS EN 1997-1:2004. Alternatively a safety margin may be applied to the characteristic water level (see 2.4.6.1(8) of BS EN 1997-1:2004). Partial factors for such actions may be determined for the individual project and agreed with the relevant authority, but see 2.4.7.3.2(2) of BS EN 1997-1:2004. NOTE 4 For all other actions, not covered in NOTES 1 to 3, the partial factors should be determined for the individual project.	AIP 4.1.9 or 4.7 Designer record Designer record	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
Table NA.A.2.4(C) – Design values of actions (STR/GEO) (Set C)	NOTE 7 Partial factors for actions involving aerodynamic effects of wind on bridges should be determined for the individual project. Guidance on the factors to be considered may be found in PD 6688-1-4:2009. NOTE 9 For particular verifications, the values of γ_Q may be sub-divided into γ_q and the model uncertainty factor γ_{Sd}. A value of γ_{Sd} between 1,05 and 1,15, should be determined for the individual project.	Designer record Designer record	
Table NA.A2.5 – Design values of actions for use in accidental and seismic combinations of actions B)	The seismic design situation should be used only when specified for the individual project (see BS EN 1998).	AIP 4.1.9	
NA 2.3.9.3 A.2.4.1(2) Note	Determine serviceability requirements and criteria.	AIP 5.1	
NA.3.2.1 Annex B	Record if a design for a lower or higher consequence class is considered.	AIP 3.6.1	
NA.3.2.2 Annex C	Record if a design based on probabilistic methods is considered.	AIP 5.1	
BS EN 1991-1-1:2002 Eurocode 1: Actions on structures. General Actions. Densities, self-weight, imposed load for buildings			
4.1 General (1) NOTE	Define selected values of densities when a range is given in the table in Annex A.	AIP 4.1.1	
4.1 General 2)	For materials (e.g. new and innovative materials) which are not covered by the Tables in Annex A, define the characteristic value of the density.	AIP 4.1.1	
NA to BS EN 1991-1-1:2002 UK National Annex to Eurocode 1: Actions on structures. General Actions. Densities, self-weight, imposed load for buildings			
Table NA.1 Characteristic values of self-weight — UK guidance on additional provisions for bridges – 5.2.3(1)	Define self-weight of fill.	AIP 4.1.1	
BS EN 1991-1-3:2003 Eurocode 1: Actions on structures. General Actions. Snow loads			
1.5 Design assisted by testing	Tests and proven and/or properly validated numerical methods to obtain snow loads on the construction works.	AIP 4.1.2	Information to be recorded only if recommended values or methods are not used.
4.1 Characteristic values (1) NOTE 1	When there are unusual local conditions that need to be taken into account in the characteristic value of snow load on the ground (see NA to BS EN 1991-1-3 clause NA.2.8).	AIP 4.1.2	Information to be recorded only if recommended values or methods are not used.
NA to BS EN 1991-1-5:2003 UK National Annex to Eurocode 1: Actions on structures. General Actions. Thermal actions			
NA.2.2.1 General (2nd paragraph)	The uniform temperature component and temperature difference component for other types of bridges not covered in BS EN 1991-1-5.	AIP 4.1.2 or 4.7	Information to be recorded only if recommended values or methods are not used.
NA.2.3 Consideration of thermal actions [BS EN 1991-1-5:2003, 6.1.2(2)]	Use of Approach 1.	AIP 4.1.2	Information to be recorded only if recommended values or methods are not used.

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
NA.2.7 Temperature difference components [BS EN 1991-1-5:2003, 6.1.4(3)]	The initial temperature difference at the closure of cantilever construction.	Designer record	
BS EN 1991-1-6:2005 Eurocode 1: Actions on structures. General Actions. Actions during execution			
1.1Scope (1) NOTE 2	Define rules concerning the safety of people in and around the construction site. (Out of the scope of this BS EN 1991-1-6.)	AIP 3.1	
2.2 Construction loads (3) NOTE	Where construction loads are classified as fixed, define tolerances for possible deviations from theoretical position.	Designer record	
3.1 General – identification of design situations (12) NOTE	For long construction phases, define the scour levels.	Designer record	
3.3 Serviceability limit states (5) NOTE	Define the frequent values of particular actions which need to be considered.	Designer record	
4.1 General (5) NOTE	Define the friction coefficients.	Designer record	
4.4 Actions due to prestressing (1) NOTE	Define specific requirements of prestressing forces during execution.	Designer record	
4.7 Wind actions (1) NOTE	Define the dynamic response design criteria and procedures for wind actions for the execution stages.	Designer record	
4.7 Wind actions (3) NOTE	Define the maximum wind speed for lifting and moving operations or other construction phases that are of short duration.	Designer record	
4.9 Actions caused by water (2) NOTE	Define the classification of actions caused by water as permanent or variable.	Designer record	
4.9 (4) NOTE 1	A more refined formulation is used to determine F_{wa}.	Designer record	Information to be recorded only if recommended values or methods are not used.
4.9 (5) NOTE 1	If expression (4.2) is adjusted.	Designer record	Information to be recorded only if recommended values or methods are not used.
Table 4.1 Representation of construction loads (Q_c) NOTE 4	If the recommended characteristic value $q_{cc,k}$ is not used.	Designer record	Information to be recorded only if recommended values or methods are not used.
4.11.1 General (1) NOTE 2	Define the groupings of loads to be taken into account.	Designer record	
NA to BS EN 1991-1-6:2005 UK National Annex to Eurocode 1: Actions on structures. General Actions. Actions during execution			
NA.2.1 Design rules for auxiliary construction works	Define design rules for auxiliary construction works.	Designer record	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
NA.2.2 Positioning of construction loads classified as “free”	Define the limits of movement for construction loads classified as “free”.	Designer record	
NA.2.4 Return periods for the determination of the characteristic values of variable actions during execution	Define the return periods for the determination of the characteristic values of variable actions during execution.	Designer record	
NA.2.5 Minimum wind speed during execution	Define the minimum wind velocity during execution.	Designer record	
NA.2.6 Rules for the combination of snow loads and wind actions with construction loads	Define rules for combination of snow loads and wind actions with construction loads.	Designer record	
NA.2.7 Rules concerning imperfections in the geometry of the structure	Define the imperfections in the geometry of the structure and of structural members.	Designer record	
NA.2.8 Criteria associated with serviceability limit states during execution	Define the criteria associated with serviceability limit states during execution.	Designer record	
NA.2.9 Serviceability requirements for auxiliary construction works	Define serviceability requirements for auxiliary construction works.	Designer record	
NA.2.10 Actions due to ice, including floating ice	Define the loads and water levels associated with actions due to ice, including floating ice.	Designer record	
NA.2.11 Actions due to atmospheric icing	Define the representative values of the actions due to atmospheric icing.	Designer record	
NA.2.12 Recommended characteristic values of construction load Q_{cb}	Only record if the recommended minimum values Q_{ca} and Q_{cb} are not to be used.	Designer record	Information to be recorded only if recommended values or methods are not used.
NA.2.13 Construction loads during the casting of concrete	Only record if the recommended minimum values Q_{ca} and Q_{cc} are not to be used.	Designer record	Information to be recorded only if recommended values or methods are not used.
NA.2.14 Dynamic effects due to accidental actions	Define dynamic effects due to accidental actions.	Designer record	
NA.2.15 Dynamic effects due to falls of equipment	Define dynamic effects due to falls of equipment.	Designer record	
NA.2.17 Seismic actions	Define the design values for ground acceleration and the importance factor □I for seismic actions.	Designer record	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
NA.2.19 Characteristic values of equivalent horizontal forces	Define the characteristic values of equivalent horizontal forces.	Designer record	
NA.2.20 Design values of vertical deflections for the incremental launching of bridges	Define the design values of vertical deflections for the incremental launching of bridges	Designer record	
NA.2.21 Reduction of the characteristic value of snow loads	Define the reduction of the characteristic value of snow loads.	Designer record	
NA.2.23 Design values of horizontal friction forces	Define the design values of horizontal friction forces.	Designer record	
NA.2.24 Determination of friction coefficients μ_{min} and μ_{max}	Define the friction coefficients μ_{min} and μ_{max}.	Designer record	
NA.3.1 Actions on structures during alteration, reconstruction or demolition	If Annex B is to be used for trunk road or railway structures.	AIP 4.1.8	Information to be recorded only if Annex B is used.
BS EN 1991-1-7:2006 Eurocode 1: Actions on structures. General Actions. Accidental actions			
B.5 Risk acceptance and mitigating measures (4) 2nd paragraph	Define risk acceptance levels	AIP 4.1.7	Information to be recorded only if recommended values or methods are not used.
NA to BS EN 1991-1-7:2006 UK National Annex to Eurocode 1: Actions on structures. Part 1-7 : Accidental actions			
NA.2.1 Classification of accidental actions [BS EN 1991-1-7:2006, 2 (2)]	Define accidental actions which are not free actions.	Designer record	
NA.2.8 Design approaches [BS EN 1991-1-7:2006, 3.4 (2) Note]	For the design of structures for higher and lower consequence classes define the requirements.	AIP 4.1.7	Information to be recorded only if recommended values or methods are not used.
NA.2.11.2.4.1	Define the values for T_a and T_b.	AIP 4.1.7	
NA.2.33 Classification system for ships on sea waterways [BS EN 1991-1-7:2006, 4.6.1 (3) Note 1]	Define the characteristics of ships on sea waterways to be taken into account in the case of ship impact on structures.	AIP 4.1.7	
NA.2.34 Values of frontal and lateral dynamic forces from river and canal traffic [BS EN 1991-1-7:2006, 4.6.2 (1) Note]	Define the values of frontal and lateral dynamic forces due to impact from river and canal traffic.	AIP 4.1.7	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
NA.2.36 Application area of impact [BS EN 1991-1-7:2006, 4.6.2 (3) Note 1]	Define the height of application of the impact force and the impact area *b x h*.	AIP 4.1.7	
NA.2.37 Impact forces on bridge decks from ships [BS EN 1991-1-7:2006, 4.6.2 (4) Note]	Define the equivalent static impact forces on bridge decks from ships.	AIP 4.1.7	
NA.2.38 Dynamic impact forces from seagoing ships [BS EN 1991-1-7:2006, 4.6.3 (1) Note]	Define the values of frontal and lateral dynamic impact forces from seagoing ships.	AIP 4.1.7	
NA.2.40 Area and position of impact areas [BS EN 1991-1-7:2006, 4.6.3 (4)P Note]	Define the area and position of impact areas.	Designer record	
NA.2.41 Forces on superstructure [BS EN 1991-1-7:2006, 4.6.3 (5) Note 1]	Define the forces on superstructure.	AIP 4.1.7	
NA.2.42 Procedures to be used for types of internal explosions [BS EN 1991-1-7:2006, 5.3 (1)P Note] (3rd para)	Define the design requirements for dealing with internal explosions in road tunnels.	AIP 4.1.7	
PD 6688-1-7:2009 Recommendations for the design of structures to BS EN 1991-1-7			
2.5.1 d) 1) Impact on supporting substructures – For foot and cycle track bridges	Define the value for T_c.	AIP 4.1.7	See Annex B of this document.
BS EN 1991-2:2003 Eurocode 1: Actions on structures. Traffic loads on bridges			
4.2.1 Models of road traffic loads (1) NOTE 3	If additional dynamic amplification is to be taken into account.	Designer record	
4.2.3 Divisions of the carriageway into notional lanes (4) NOTE	If the rules given in 4.2.3(4) are to be adjusted.	Designer record	
4.3.5 Load Model 4 (crowd loading) (1) NOTE	Define the application of LM4.	AIP 4.1.5	Information to be recorded only if applicable.
4.6.1 General (2) NOTE 1	If horizontal forces are to be taken into account simultaneously with vertical forces.	AIP 4.1.9	Information to be recorded only if applicable.
4.6.1 General (2) NOTE 4	If the values of Fatigue Load Models 1 and 2 are to be modified.	AIP 4.1.9	Information to be recorded only if recommended values or methods are not used.

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
4.6.2 Fatigue Load Model 1 (similar to LM1) (1) NOTE	If q_{fk} is to be neglected.	AIP 4.1.9	Information to be recorded only if recommended values or methods are not used.
4.7.3.4 Collision forces on structural members (2) NOTE	For some intermediate members where damage to one of which would not cause collapse (e.g. hangers or stays), define smaller forces.	AIP 4.1.7	
4.8 Actions on pedestrian parapets (2) NOTE	Define whether pedestrian parapets can be considered as adequately protected.	AIP 3.7	
5.1 Field of application (2) NOTE 2	For large footbridges define complementary load models, with associated combination rules.	AIP 4.1.5	
5.2.1 Models of the loads (1) NOTE 1	Define loads due to horses or cattle.	AIP 4.1.9 or 4.7	
5.6.1 General (1) NOTE	Define other collision forces.	AIP 4.1.9 or 4.7	Information to be recorded only if recommended values or methods are not used.
5.9 Load model for abutments and walls adjacent to bridges (1) NOTE 2	If the characteristic value is to be adjusted.	AIP 4.1.9	Information to be recorded only if recommended values or methods are not used.
NA to BS EN 1991-2:2003 UK National Annex to Eurocode 1: Actions on structures. Traffic loads on bridges			
NA.2.3 Appropriate protection against collision	Define the requirements for protection against collision from road and rail traffic.	AIP 4.1.7	
NA.2.5 Bridges carrying both road and rail traffic	Define the rules for bridges intended for both road and rail traffic.	AIP 4.7	
NA.2.7 Weight restricted bridges	For road bridges where effective means are provided to strictly limit the weight of any vehicle, define specific load models.	AIP 4.1.3	Information to be recorded only if recommended values or methods are not used.
NA.2.8 Complementary load models	Define complementary load models and rules for their application.	AIP 4.1.9 or 4.7	Information to be recorded only if recommended values or methods are not used.
NA.2.9 Models for special vehicles	Define complementary load models for special vehicles and rules for their application.	AIP 4.1.9 or 4.7	Information to be recorded only if recommended values or methods are not used.
NA.2.16 Load Model 3 (Special Vehicles) (2nd para)	Define the choice of the particular STGO or SO model vehicle.	AIP 4.1.4 and 4.1.6	Advice is given clause **A.7** of this document.
NA.2.25 Fatigue Load Model 3	Define the conditions of application for two vehicles in the same lane.	AIP 4.1.9 or 4.7	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
Table NA.5 Set of equivalent lorries for Fatigue Load Model 4	Define specific vehicle axle arrangements.	AIP 4.1.9	
NA.2.31 Collision forces on structural members	Define nominal vehicle collision forces on structural members.	AIP 4.1.7	
NA.2.32 Actions on pedestrian parapets	Define the required class of pedestrian parapet.	AIP 3.7	
NA.2.43 Accidental presence of a heavy vehicle	Define alternative load model characteristics.	AIP 4.1.7	
NA.2.44.1 General (3rd para)	Define any associated requirements such as: • mass gathering (for example marathons, demonstrations); • deliberate pedestrian synchronization; • vandal loading.	AIP 4.1.5	
NA.2.44.2 Dynamic actions to be considered (2)	Define crowd loading densities.	AIP 4.1.5	
NA.2.44.2 Dynamic actions to be considered (3)	Define whether jogging cases can be neglected.	AIP 4.1.5	
NA.2.44.5 Steady state modelling of pedestrians in crowded Conditions (3)	Define alternative appropriate dynamic models.	AIP 4.1.5	
NA.2.44.6 Recommended serviceability limits for use in design (1)	Define exposure factor k4.	AIP 5.1	
NA.2.44.6 Recommended serviceability limits for use in design (2)	Define exposure factor k4.	AIP 5.1	
NA.2.44.6 Recommended serviceability limits for use in design (3)	Define relaxation of the design limits.	AIP 5.1	
Tables NA.9 to NA.11 Recommended values for the structure height factor k3	Define values of k1, k2 and k3.	AIP 5.1	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
NA to BS EN 1992-1-1:2004 UK National Annex to Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings			
Table NA.1 – UK decisions for Nationally Determined Parameters described in BS EN 1992-1-1:2004 Sub clause 9.8.3 (2)	Minimum downward load for tie beams – To be determined for each individual project.	Designer record	
BS EN 1992-2:2005 Eurocode 2: Design of concrete structures – Part 2: Concrete bridges – Design and detailing rules			
5.7 (105) Non-linear analysis	Details of method for non-linear analysis and safety format.	Designer record	
5.8.5 Second order effects with axial load (including slender column design)	• Non-linear analysis to 5.8.6 • Method based on moment magnification factor to 5.8.7 Method based on nominal curvature 5.8.8	Designer record	
5.10.6 Time dependent losses	• Use of 5.10.6 Use of Annex D	Designer record	
6 ULS checks	• Member rules in 6.1 to 6.3 • Rules in Annex LL • Strut and tie rules in 6.5	Designer record	
6.1	6.1/(109)a) 6.1/(109)b) 6.1/(109)c)	Designer record	
6.2.4 Longitudinal shear with transverse bending – check of concrete crushing	Method of 6.2.4/(105) Method of Annex MM	Designer record	
6.8.7 Concrete Fatigue	• Equivalent damage (6.8.7(1)) • Static verification (6.8.7(2))	Designer record	
Annex KK	General method (KK.3) Incremental (KK.4) Linear viscoelasticity methods (KK.5) Ageing coefficient (KK.6)	Designer record	
PD6687-2:2008 Recommendations for the design of structures to BS EN 1992-2:2005			
6.5 Plastic Analysis BS EN 1992-1-1:2004 Clause 5.6	BS EN 1992-2:2005, 5.6.1 (101)P allows the use of plastic analysis when permitted by National Authorities. Permission for the use of plastic analysis should therefore be sought from the relevant body on a project-specific basis, see 2.1 of this Standard. Typically this will be part of the technical approval process.	Designer record	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
12 Additional rules for external prestressing	The following additional rules are recommended for the design of structures with external prestressing. The need for their application should be determined on a project-specific basis.	Designer record	See Annex B of this document.
BS EN 1993-1-1:2005 Eurocode 3: Design of steel structures – Part 1-1 General rules and rules for buildings			
5.2.2(3) Treatment of second order effects and imperfections	a) – both totally by global analysis b) – partially by global analysis and partially through individual stability checks of members according to 6.3 c) – for basic cases by individual stability checks of equivalent members according to 6.3 using appropriate buckling lengths according to the global buckling mode of the structure.	Designer record	
5.3.2 Imperfections for analysis	5.3.2(3) – combination of local bow and global sway imperfections 5.3.2(11) – unique imperfection from shape of critical buckling mode	Designer record	
7.1 (3) Serviceability limit states, General	Any serviceability limit state and the associated loading and analysis model should be specified for a project.	Designer record	
BS EN 1993-1-5:2006 Eurocode 3: Design of steel structures – Part 1-5: Plated structural elements			
2.3 or 2.4 Stress calculation	Use effective width models (2.3) Use reduced stress method (2.4)	Designer record	
3.3(1) Calculation of shear lag effective widths at ULS	• a) elastic calculation • b) combined shear lag and plate buckling • c) elastic-plastic calculation	Designer record	
4.4(2) Effective cross-section for outstand compression elements	• Use k_σ from Table 4.1 or Table 4.2 • Determine k_σ from more accurate calculation	Designer record	
4.4(4), (5) Class 4 section design buckling resistance	• Use plate slenderness λ_p • Use second order analysis as appropriate and slenderness $\lambda_{p,red}$	Designer record	
9.2.1(8) Torsional buckling of stiffeners	Criterion given by equation (9.3) More advanced method	Designer record	Information to be recorded only if recommended values or methods are not used.
9.2.1(9) Torsional buckling of stiffeners	Criterion given by equation (9.4) More advanced method	Designer record	Information to be recorded only if recommended values or methods are not used.
10(5) Reduction factor ρ	• Use of equation (10.4) • Use of equation (10.5)	Designer record	
A.1(2) Buckling coefficient kσ,p	Use of application rules supplied Use of first principles	Designer record	
C.2(1) Use of FE analysis	Project Specification to give conditions for use of FEM	AIP	

nt and Clause for Choices and Options		Where recorded if applicable to the project	Comment
C.5(2) Use of imperfections	Equivalent geometric imperfections More refined analysis	Designer record	Information to be recorded only if recommended values or methods are not used.
C.6(2) Non-linear analysis of plates to EC3-1-5 Annex C – stress-strain curve	• Use of 3-1-5/C.6(2) curve a) • Use of 3-1-5/C.6(2) curve b) • Use of 3-1-5/C.6(2) curve c) • Use of 3-1-5/C.6(2) curve d)	Designer record	
C.8 Limit state criteria	Criteria given in C.8(1) Other criteria: e.g. attainment of the yielding criterion	Designer record	
E.1(1) Effective areas for the ultimate limit state	Method in 4.4(2) and 4.4(4) Method in E.1	Designer record	
NA to BS EN 1993-1-5:2006 UK National Annex to Eurocode 3: Design of steel structures – Part 1-5 Plated structural elements			
NA.2.11 - BS EN 1993-1-5:2006, C.2(1)	Conditions for the use of FEM analysis in design should be specified for the particular project.	Designer record	
BS EN 1993-1-8:2005 Eurocode 3: Design of steel structures – Part 1-8: Design of joints			
2.4(2) Calculation of resistance of joints	• Use of linear elastic calculation • Use of elastic-plastic calculation	Designer record	
Table 6.2 Calculation of prying forces	• Method 1 • Method 2	Designer record	
BS EN 1993-1-9:2005 Eurocode 3: Design of steel structures – Part 1-9: Fatigue			
6.4(1) Design value of modified nominal stress range	Determine according to equation (6.3) More accurate calculation	Designer record	
A.3 Cycle counting: Stress histories evaluation	Rainflow method Reservoir method Stress ranges & number of cycles Mean stresses	Designer record	
NA to BS EN 1993-1-9:2005 UK National Annex to Eurocode 3: Design of steel structures – Part 1-9 Fatigue			
NA.2.10 Fatigue strength categories not covered by Tables 8.1 to 8.10 or Annex B BS EN 1993-1-9:2005, Clause 7.1 (5)	Fatigue strength categories for details not covered by BS EN 1993-1-9 should be given for individual projects.	Designer record	
PD6695-1-9:2008 Recommendations for the design of structures to BS EN 1993-1-9			
4.2 Test specimens – Determining fatigue strengths from tests BS EN 1993-1-9:2005, 2(4)[2)]	Any other agreed alternative methods should be specified for the individual projects.	Designer record	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
BS EN 1993-1-10:2005 Eurocode 3: Design of steel structures – Part 1-10: Material toughness and through-thickness properties			
2.1(2) Elements not subject to tension, welding or fatigue	Conservative rules in 2 Evaluation using fracture mechanism (2.4)	Designer record	
2.2(3) Methods to determine the toughness requirement	Fracture mechanics method Numerical evaluation	Designer record	
BS EN 1993-1-11:2006 Eurocode 3: Design of steel structures – Part 1-11 Design of structures with tension components			
2.2(2) Note Load factors for permanent loads (G) and prestress (P) (see also cl. 5.3)	• Same load factor applied to entity “G + P” • Separate factors applied to G and P	Designer record	
2.3.6(1) Design for cable replacement	During replacement of tension components, all elements of the structure should satisfy the relevant serviceability and ultimate limit state requirements without any restrictions to traffic or other imposed loads.	Designer record	
2.3.6(2) Design for cable accidental loss	Structures should be designed to accommodate the loss of any one hanger at ULS, stay or main cable without any restrictions to traffic or other imposed loads.	Designer record	
5.4 Global analysis to allow for non-linearities	• Cable sag catered for in non-linear analysis • Cable sag accounted for by Ernst equation	Designer record	
B(6) Monitoring cables after installation	Project Specification to specify: • Monitoring regime and duration • Replacement procedure	AIP 3.8.1	
NA to BS EN 1993-1-11:2006 UK National Annex to Eurocode 3: Design of steel structures – Part 1-11 Design of structures with tension components			
NA.2.1 (1) NOTE Replacement and loss of tension components BS EN 1993-1-11:2006, 2.3.6	If restrictions to traffic and other imposed loads are considered, the restrictions measures should be detailed in the Project Specification.	Record restriction measures in the AIP 3.8.2 if restriction to traffic and other imposed loads are considered.	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
NA.2.1 (2) NOTE Replacement and loss of tension components BS EN 1993-1-11:2006, 2.3.6	Unless specified otherwise for specific projects, structures should be designed to accommodate the loss of any one hanger, stay without any restrictions to traffic or other imposed loads. The structure should be designed to satisfy all ultimate limit state requirements in the accidental combination, including the dynamic effect of cable removal in NOTE 2 of **2.3.6**(2). Where a structure cannot be designed to accommodate the loss of a particular tension component, the Project Specification should specify the protection measures to be adopted to prevent sudden removal of that tension component	Give details in AIP 3.8.1 if structure is not designed to accommodate the loss of any one hanger, stay without any restrictions to traffic or other imposed loads. Specify in the AIP 3.8.1 the protection measures for the prevention of sudden removal of tension components.	
NA.2.3 (1) Note 6 Strengths of steels and wires [BS EN 1993-1-11:2006, 3.1]	At present there is no limit to the maximum value for fu. However the current ongoing research might find that extra high strength wire is more susceptible to premature failure. Wires of tensile strengths greater than the recommended maximum value should be agreed and specified in the Project Specification.	Specify in the AIP 3.9 the tensile strength of wires if it is greater than the recommended maximum in the Project Specification.	
NA.2.4 Corrosion protection of the exterior of Group B tension components BS EN 1993-1-11:2006, 4.4 – (2) NOTE 1	The corrosion resistance class for the stainless steel should be specified for the individual projects.	Specify in the AIP 3.9 the corrosion resistance class for the stainless steel for the individual project.	
NA.2.7 Persistent design situation during service EN 1993-1-11:2006, 5.3 – (2) NOTE	The aforementioned structures are therefore not within the scope of BS EN 1993-1-11:2006, 5.3. If the rules of BS EN 1993-1-11 are applied to such structure types it is suggested that the actions P and G should have partial factors applied to them separately as required in 5.2 (3). In such cases the project specification should give the values of γ_G and γ_P that are to be used.	Specify in the AIP 5.1 the values of γ_G and γ_P for the individual project.	
NA.2.13 (1) Note Waterproofing [BS EN 1993-1-11:2006, A.4.5.1]	The tension components should be tested for water-tightness in accordance with article 11.3 of *SETRA Cable Stays* [1] unless an alternative test is specified in the Project Specification.	Specify details of any alternative test used in the Project Specification	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
NA.2.15 (6) Note Annex B – Transport, storage, handling	Monitoring might be required to confirm that the design assumptions, such as final forces in tension components and vibration of tension components due to wind, rain and traffic, have been met in the completed structure. The Project Specification should specify the required monitoring regime and its duration. Details of maintenance procedures should be provided which should include at least: - Procedures for minor and major maintenance operations expected during the design lifetime of the tension components; The replacement procedure for a tension component in accordance with the design assumptions made in the Project Specification.	Specify the required monitoring regime and its duration for tension components in the Project Specification and in the AIP 4.1.8 Specify the replacement procedure for a tension component in the design assumptions in the Project Specification and in the AIP 3.8.1	
NA to BS EN 1993-1-12:2007 UK National Annex to Eurocode 3: Design of steel structures – Part 1-12 Additional rules for the extension of EN 1993 up to steel grades S 700			
NA.2.2.1 BS EN 1993-1-12:2007, 2.8 (4.2 (2) NOTE)	The required strength class of electrodes should be specified for the individual projects.	Record the required strength class of electrodes in the Project Specification	
BS EN 1993-2:2006 Eurocode 3: Design of steel structures – Part 2: Steel bridges			
2.1.3.4(1) Components which need to be designed for accidental design situations	Project Specification to specify components which need to be designed for accidental design situations	AIP 4.1.7	Information to be recorded if special components have been identified.
3.4(1) Types of cable which are deemed to satisfy the requirements for durability	Project Specification to specify the types of cable which are deemed to satisfy the requirements for durability	AIP 3.9	
5.2.1(4) Global analysis ($\alpha_{crit} \geq 10$)	First order theory Second order theory	Designer record	
5.4.1 Non-linear analysis of plates to EC3-1-5 Annex C – stress-strain curve	Plastic global analysis BS EN 1993-1-5 clause C.6(2) curve a) BS EN 1993-1-5 clause C.6(2) curve b) BS EN 1993-1-5 clause C.6(2) curve c) BS EN 1993-1-5 clause C.6(2) curve d)	Designer record	
6.2.8(1) Bending, axial load, shear and transverse loads	Interaction methods (6.2.8 to 6.2.10) Interaction of stresses (6.2.1)	Designer record	

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
6.3.1.5(1) Use of class 3 sect. prop. With stress limits	Use class 4 sec. prop. Use class 3 sec. prop. with stress limit.	Designer record	
6.3.3 Members in bending and axial compression	Use of BS EN 1993-2 clause 6.3.3(1) Use of BS EN 1993-1-1 clause 6.3.3(4) with interaction factors calculated in accordance with Annex A [(5) Note 1 alternative method 1] Use of BS EN 1993-1-1 clause 6.3.3(4) with interaction factors calculated in accordance with Annex B [(5) Note 1 alternative method 2] Use of BS EN 1993-1-1 clause 6.3.4 Use of BS EN 1993-2 clause 6.3.4.2(2)	Designer record	
7.11(2) Design of joint details if access is not provided	All parts effectively sealed against corrosion (with corrosion allowance) Use of weathering steel	Designer record	
9.4.1 Fatigue stress range	Use method of EN 1993-2/9 Use stress histories	Designer record	
BS EN 1993-5:2007 Eurocode 3: Design of steel structures – Part 5 Piling			
2.3 (2) Serviceability limit state criteria	Values for the limits given in (1), in relation to the combination of actions to be taken into account according to EN 1990, should be defined for each project.	Record the values for the limits in relation to the combination of actions to be taken into account in the AIP 5.1	
2.3 (3) Serviceability limit state criteria	Where relevant, values for limits imposed by adjacent structures should be defined for the project.	Only record in the AIP 5.1 if values for limits are to be imposed by adjacent structures.	
4.1 (6) Durability, General	The required design working life for sheet piling and bearing piles should be given for each project.	Record the design working life in the AIP 3.1	
4.1 (8) Durability, General	Corrosion protection systems should be defined for each project.	Record the corrosion protection systems in the AIP 3.9	
5.5.1 (4)P Combined walls, General	It should be stated for each project and agreed with the client whether driving imperfections need to be considered in the design of the combined wall. The design values of any driving imperfections shall be given as percentages of the length of the primary element, assuming a linear distribution.	Agree and record in the AIP 5.1 whether driving imperfections need to be considered in the design of the combined wall.	
6.1 (1) Serviceability limit states, Basis	The significance of settlements and vibrations, and their limiting values in each case, should be given for the project taking into account local conditions.	Record the significance of settlements and vibrations, and their limiting values in each case in the AIP 5.1	
BS EN 1994-2:2005 Eurocode 4: Design of composite steel and concrete structures – Part 2: General rules and rules for bridges			

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
5.3.2(1) Imperfection for bridges	Equivalent geometric imperfections should be used with values that reflect the possible effects of system imperfections and also member imperfections unless these effects are included in the resistance formulae.	Designer record	
5.4.2.8(4) Determination of internal forces in tension members	Simplified method in (5) Method in (6) and (7) A more accurate method according to (2) and (3).	Designer record	
NA to BS EN 1997-1:2004 National Annex to Eurocode 7: Geotechnical design – Part 1 General rules			
NA.3.4 BS EN 1997-1:2004 Annex H	The limiting values of structural deformation and foundation movement relate primarily to building. Limiting values of structural deformation and foundation movement for other civil engineering works should be determined for the project and agreed, where appropriate, with the client and other relevant authorities.	Agree and record the limiting values of structural deformation and foundation movement in the AIP 6.3	
A.2.1 Partial factors on actions	Actions listed in BS EN 1997-1:2004, 2.4.2 for which no values are set in BS EN 1991 may be specified for a particular project. The values of these actions and their partial factors and combination factors should be agreed with the client and relevant authorities.	Agree and record in the AIP 4.1.9 or 4.7 values of actions, partial factors and combination factors for actions for which no values are set.	
A3.1 Partial factors on actions or the effect of actions	Actions listed in BS EN 1997-1:2004, 2.4.2 for which no values are set in BS EN 1991 may be specified for a particular project. The values of these actions and their partial factors and combination factors might need to be agreed with the client and relevant authorities.	Agree and record in the AIP 4.1.9 or 4.7 values of actions, partial factors and combination factors for actions for which no values are set.	
NA to BS EN 1998-2:2005 National Annex to Eurocode 8: Design of structures for earthquake resistance – Part 2 Bridges			
Table NA.1 Ref. 2.1(3)P of BS EN 1998-2 Design seismic action	Reference return period T_{NCR} of seismic action for the no-collapse requirement may be specified for an individual project. See also 8.2 of PD 6698:2009.	Record in the AIP 4.1.9 reference return period determined from the site-specific hazard analysis.	Information to be recorded only if recommended values or methods are not used.
Table NA.1 Ref. 2.1(4)P of BS EN 1998-2 Design seismic action	The importance classes should be established for an individual project. For class 3 structures, the need for the design to consider earthquake resistance may be specified for an individual project.	Record in the AIP 4.1.9 the consequence class and the importance class of the structure. For bridges in consequence class 3, record whether earthquake resistance will be considered in the design.	Advice is given in Table **A.6** of this document.

Document and Clause for Choices and Options	Choices and Options	Where recorded if applicable to the project	Comment
Table NA.1 Ref. 2.1(6) of BS EN 1998-2 Design seismic action	Where T_{NCR} has been assessed on a project-specific basis, γ_I should also be chosen on a project-specific basis.	Record in the AIP 4.1.9 the value of γI used.	Information to be recorded only if recommended values or methods are not used.
Table NA.1 Ref. 4.1.2(4)P of BS EN 1998-2 Analysis – Modelling - Masses	The value of $\Psi_{2,1}$ for traffic loads assumed concurrent with the design seismic action may be specified for an individual project.	Record in AIP 4.1.9 values of Ψ2,1 used.	Information to be recorded only if recommended values or methods are not used.
Table NA.1 Ref. 6.6.2.3(3) of BS EN 1998-2 Bearings – Elastomeric bearings	Extent of damage to elastomeric bearings may be specified for an individual project, but see 8.8 of PD 6698:2009.	Record in the AIP 4.1.9 extent of damage to elastomeric bearings allowed.	Information to be recorded only if recommended values or methods are not used.
Table NA.1 Ref. 6.7.3(7) of BS EN 1998-2 Abutments rigidly connected to the deck	Value of d_{lim} may be specified for an individual project.	Record in the AIP 4.1.9 value of d_{lim} used.	Information to be recorded only if recommended values or methods are not used.
Table NA.1 Ref. 7.4.1(1)P of BS EN 1998-2 Seismic action – Design spectra	Value of control period T_D for the design spectrum of bridges with seismic isolation may be specified for an individual project, if a site-specific hazard analysis is carried out. See 8.10 of PD 6698:2009.	Record in the Designer record value of T_D used.	
Table NA.1 Ref. 7.7.1(2) of BS EN 1998-2 Lateral restoring capability	Values of δw and δd may be specified for an individual project.	Record in the Design Certificate values of δw and δd used.	
Table NA.1 Ref. J.1(2) of BS EN 1998-2 Factors causing variation of design properties	Value of annual probability used in the calculation of T_{min} and T_{max} may be specified for an individual project. See 8.13 of PD 6698:2009.	Record in the Designer record value of annual probability specified.	