Highway Structures & Bridges
General Information

CG 300
Technical approval of highway structures

(formerly BD 2/12)

Version 0.2.1

Summary
Former DMRB document BD 2/12 has been amended as follows to form this document: *Amended clauses and model AIP to include Principal Designer, which is stipulated in Construction (Design and Management) Regulations 2015 *Added provisions for structures options reports.*Clause 2.29.7 added 'Water management' as a specific aspect for assessment.*Clauses 3.5 - 3.12 have alterations to some height/span ranges for some structures following feedback.*Added Type N classification to temporary works section to reflect provisions within PAS 8811 (see references).*Amended procedure to require Designer to agree design or assessment criteria within AIP with checker prior to submission to TAA.* Requirements included to identify safety critical fixings.*Updates to model forms. 2022 Update – Added requirement to include carbon impact assessments in submissions to TAA. Required more explanatory text on maintenance of design proposals.

National Variation
This document has associated National Application Annexes providing alternative or supplementary content to that given in the core document, which is relevant to specific Overseeing Organisations. National Application Annexes are adjoined at the end of this document.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated National Highways team. The online feedback form for all enquiries and feedback can be accessed at: www.standardsforhighways.co.uk/feedback.

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Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CG 300	0.2.1	February 2025	Core document	Incremental change to notes and editorial updates

Editorial change to a note in Appendix J.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CG 300	0.2.0	January 2025	Core document	Incremental change to requirements
CG 300	0.1.0	April 2021	Core document, England NAA	Incremental change to requirements
CG 300	0	March 2020		

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Foreword

Publishing information

This document is published by National Highways

This document supersedes CG 300 version 0.1.0, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

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Introduction

Background

This document specifies the technical approval (TA) procedures for highway structures on motorways, trunk roads or any road designated by the Overseeing Organisation.

In the early 1970s, structure failures at Yarra (Australia), Milford Haven (Pembrokeshire, Wales), Koblenz (Germany) and over the Danube (Austria) occurred during erection. Resulting from these failures and the subsequent Merrison Report [Ref 3.I], the following important changes were made by the then Ministry of Transport:

1) the Department would continue to examine design criteria and methods but not computations;
2) the requirements by the Department for a certificate of independent check of the design and computations; and,
3) the application of approval in principle (AIP) stage to all but minor structures, which would cover the selection of bridge type, the materials for its construction and methods of analysis and design to be adopted.

The TA procedures as described in this document generally require the proposer to submit an AIP to the Checker for agreement prior to submission to the Overseeing Organisation and to receive endorsement of the AIP before proceeding with any design or assessment. The completed design or assessment cannot be implemented until the Overseeing Organisation is in receipt of certified confirmation that the implementation documents are accurate and fully in compliance with the requirements of the AIP. TA procedures for proprietary manufactured structures and products are also covered in this document.

The TA procedural requirements impose a discipline on the process that encourages good practice and should reduce the possibility of errors affecting structural fitness for purpose. Most importantly however, the procedures minimise the possible risks to highway users and others who are being affected. The procedures can be applied to any other circumstances where the highway authority considers the requirements to be appropriate.

The fundamental objectives of the TA procedures are to give increased assurance for the required execution, refurbishment or demolition of highway structures. This will help ensure that the proposals are safe to implement, that any new structures procured are serviceable in use, economic to build and maintain, comply with the objectives of sustainability, have due regard for the environment and that they satisfactorily perform their intended functions. The TA procedures also ensure, as far as reasonably practicable, that highway users, the public and any others who may be affected are protected from adverse effects resulting from any work carried out to any highway structure.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 10.N] apply to this document.

Mutual Recognition

Where there is a requirement in this document for compliance with any part of a "British Standard" or other technical specification, that requirement can be met by compliance with the mutual recognition clause in GG 101 [Ref 10.N].

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Abbreviations

Abbreviation	Definition
AIP	Approval in principle
CEng	Chartered engineer
CPR	Construction Products Regulations UKSI 2022/712 [Ref 13.N]
EOTA	European Organisation for Technical Approvals
ETA	European Technical Approval
GDR	Geotechnical Design Report
M&E	Mechanical and electrical
MICE	Member of the Institution of Civil Engineers
MIStructE	Member of the Institution of Structural Engineers
O/AIP	Outline approval in principle
TA	Technical approval
TAA	Technical approval authority
TAS	Technical approval schedule
TDA	Tunnel design authority
TDSCG	Tunnel design and safety consultation group

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Terms and definitions

Term	Definition
All lane running	England-only term for a smart motorway which includes the permanent conversion of a hard shoulder to a running lane
Approval in principle	the document, which records the agreed basis and criteria for the detailed design or assessment of a highway structure
Assessment team	the group of engineers responsible for the assessment. It may comprise an appropriate mix of specialists under the direction of a team leader.
Assessor	the organisation responsible for the overall assessment
Buildability	the extent to which the design facilitates ease and safety of construction, allowing the most efficient and economic use of resources, subject to the overall requirements for the completed project
Category	the classification of the proposals, which determines the need for AIP, the form of check to be applied and the certificates to be prepared
CE marking	the marking that the manufacturer applies to declare compliance of a product with relevant EU product regulations including the Construction Products Regulation (CPR) 2011/305/EU [Ref 4.N]
Checker	the organisation responsible for the independent check of the design or assessment
Check team	the group of engineers responsible for the independent check of the design or assessment. It may comprise an appropriate mix of specialists under the direction of a check team leader.
Construction compliance	confirmation that the execution works undertaken are in compliance with the agreed documents (such as AIP, design, specification, drawings, etc.)
Contractor	the organisation contracted by the Overseeing Organisation to undertake execution works on its behalf
Contractor's representative	a representative of the Contractor, with responsibility for overseeing the execution works
Departure	criterion, which departs from, or is an aspect not covered by, the standards contained in the technical approval schedule
Designer	the organisation responsible for the overall design

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Term	Definition
Design team	the group of engineers responsible for the design. It may comprise an appropriate mix of specialists under the direction of a design team leader
Eurocodes	as defined in BS EN 1990 [Ref 9.N]
Execution	as defined in BS EN 1990 [Ref 9.N]
Foundation	generally, in a highway structure, that part of the substructure in direct contact with, and transmitting load to, the ground. Note: Specific elements forming the foundation are to be given in the AIP
Ground investigation report	a report that contains geotechnical information relevant to the design or assessment. See CD 622 [Ref 11.N]
Highway boundary	limits of the highway that are the responsibility of the Overseeing Organisation. This includes the road, footpaths, verges, slopes, etc. within those limits
Highway structure	structure or installation coming within the scope of this document and situated under, over or adjacent to a motorway or other trunk road or road designated by the Overseeing Organisation
Lighting column system	range of combinations of column heights and lengths of brackets together with the weights and windage areas of lanterns and attachments for which the column has been designed
Maintaining agent	the organisation with delegated responsibility for the maintenance of a highway structure
Outline approval in principle	the document that records the agreed basis and outline criteria for the detailed design of a highway structure
Overseeing Organisation	this refers to the following organisations (or their successors): National Highways; Transport Scotland; Welsh Government (Llywodraeth Cymru) and The Department for Infrastructure (Northern Ireland). Additionally, it will refer to any other organisation or client that chooses to use this document for technical approval.
Principal	a senior representative of the designer, assessor, checker, contractor or works examiner having authority to sign certificates on its behalf
Principal Contractor	the organisation or individual appointed by the client to plan, manage, monitor and coordinate the construction phase of work required by the UKSI 2015/51 [Ref 12.N]
Principal Designer	the designer appointed by the client to perform specific duties required by the UKSI 2015/51 [Ref 12.N]

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Term	Definition
Project manager of the Overseeing Organisation	representative of the Overseeing Organisation with responsibility for project management of execution works to highway structures
Proposal	the proposal relating to the design or assessment of a highway structure including the mechanical and electrical (M&E) installations covered by this document
Proprietary manufactured structure or products	a structure with UKCA/CE marking or product with UKCA/CE marking, manufactured to a system covered by a patent and/or a registered design
Road tunnel	a subsurface highway structure enclosed for a length of 15 0 m or more
Safety critical fixing	application in which the failure of a post-installed reinforcement or anchor can: 1) result in the collapse or partial collapse of the structure; 2) cause risk to human life; and/or, 3) lead to significant economic loss
Service tunnel	a tunnel structure installed by trenchless technology beneath a highway for any purpose. This can be regarded as a service crossing if the internal diameter is 2 m or less
Structure resilience	the ability of structure to resist deliberate damage, which may arise from the actions of vandals, thieves or terrorists
Structure robustness	the ability of a structure not to be damaged disproportionately in the event of accident, misuse or deterioration
Substructure	generally in a highway structure, the wing walls, piers, columns, towers and abutments that support the superstructure Note: Specific elements forming the substructure are to be given in the AIP.
Superstructure	generally in a highway structure, that part of the structure that is supported by the piers, columns and abutments. Note: Specific elements forming the superstructure are to be given in the AIP
Team leader	the person responsible for overseeing and co-coordinating the work of the design, assessment or check team and having authority to sign on behalf of the team. The team leader is to be appropriately qualified and competent in relevant fields of engineering related to the work and is to be a chartered member of a relevant institution or suitable equivalent.

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Term	Definition
Technical approval	the submission of proposals for agreement by the technical approval authority and the subsequent provision and acceptance of certificates confirming that the design, assessment, specification or construction works complies with the agreed approval in principle, and design/assessment and specification certificates as appropriate
Technical approval authority	the organisation responsible for agreeing the approval in principle and subsequently accepting the relevant certificates
Technical approval schedule	the schedule of documents to be used for the design or assessment of a highway structure
Third party	any person, organisation or other legal identity that is not employed directly or indirectly by the Overseeing Organisation
Tunnel Design Authority (TDA)	A central high level governance group - as in the ENAA for CD 352 [Ref 2.I]
UKCA Marking	the marking that the manufacturer applies to declare compliance of a product with relevant UK product regulations including the Construction Products Regulation (CPR) UKSI 2022/712 [Ref 13.N]
UK national standards (Eurocodes)	The suite of Eurocodes to be implemented by BSI as UK national standards, covering structural design of all civil engineering works, including bridges.
UK national standards (non-Eurocodes)	British Standards that, prior to being replaced by UK national standards (Eurocodes), were used for the design of highway structures or British Standards that apply to aspects not covered by Eurocodes
Works Examiner	the organisation nominated in the contract to undertake independent examination of the execution, commissioning (of M&E) or testing of works carried out by the Contractor

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1. Scope

Aspects covered

1.1 Subject to any exclusions expressly stated in this document, technical approval (TA) procedures shall be applied to all proposals, including third party proposals and private developments, that are:

1) within the highway boundary;
2) outside the highway boundary, where the structures are to be adopted by the Overseeing Organisation;
3) outside the highway boundary where works can affect the highway or highway structure; and,
4) outside the highway boundary where works can affect the safety of the highway user.

NOTE *Proposals can relate to construction, widening, assessment, improvement, repair (where structural integrity is affected), and demolition.*

1.2 The scope of TA shall be in accordance with Sections 3 to 6 of this document.

1.2.1 In cases where the design and construction of a third party proposal for temporary works or temporary structures are outside the competence of the Overseeing Organisation, the special requirements given in respective National Annexes may be implemented.

1.3 TA procedures shall apply to temporary works where the permanent works proposal has identified the need for an independent check.

1.4 TA procedures shall not apply where there are no public safety issues.

NOTE *Temporary work in green field sites or works within the highway boundary where there will be no interface with the public are examples of works where there are no public safety issues.*

Contractual responsibilities and procedure

1.5 TA shall not in any way modify or reduce the contractual and statutory responsibilities of any party for the work carried out, nor the legal responsibilities of professional engineers.

NOTE *This document is written such that it is applicable in principle to all current and likely future forms of procurement (refer to respective National Annexes for exceptions).*

1.6 Where departing from the procedures, format or terms used in this document, the Designer/Assessor shall ensure that the following objectives are achieved:

1) the required design or assessment principles are formally agreed prior to award of any contract; and,
2) execution of the works is not allowed to proceed until there is formal agreement to a comprehensive submission of the design or assessment principles in accordance with the requirements of this document.

NOTE *Formal agreement of design or assessment principles can avoid contractual repercussions.*

1.7 The model forms and certificates provided in the appendices to this document shall be amended and agreed with the Overseeing Organisation, to suit specific contract requirements.

1.8 Timings and procedures for TA shall be identified in the scheme-specific contract requirements.

NOTE *It is recommended to consult the TAA in advance to agree timings and include these in the works programme.*

1.9 The contract requirements shall clarify whether the proposals and the AIP are of an outline nature or whether they are comprehensive and sufficient for detailed design or assessment.

NOTE 1 *Outline proposals are sufficient for the invitation or acceptance of tenders.*

NOTE 2 *For detailed design, the principles, detailed requirements and recommendations of this document apply .*

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1.9.1 The TAA should be consulted to agree the TA procedures where there are any uncertainties with regard to procurement.

NOTE *For example, TA for the design can typically be completed in detail before tender; in other forms of procurement where design and the TA process is incomplete prior to inviting tenders, submission of a final detailed AIP can take place following award of contract.*

Implementation

1.10 This document shall be implemented forthwith on all schemes involving the assessment, design, execution, operation and maintenance of highway structures on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 10.N].

1.11 This document shall be used to implement the procedures for private development within the highway boundary.

Use of GG 101

1.12 The requirements contained in GG 101 [Ref 10.N] shall be followed in respect of activities covered by this document.

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2. General requirements and principles

Overseeing Organisation's requirements

2.1 Technical requirements for the design, execution, operation and maintenance, decommissioning and demolition of highway structures shall be contained in the technical approval schedule (TAS).

2.1.1 In some forms of contract, such as design and construct, technical requirements may be contained in the contract requirements.

NOTE *The TAS includes the DMRB, the British Standards (including Eurocodes, National Annexes and Published Documents), MCHW and other supplementary standards for specific project's requirements.*

2.2 All submissions shall be in an agreed electronic format in accordance with the Overseeing Organisations' requirements, unless set out otherwise in contract documents.

2.3 The format selected shall allow the Designer, Checker and TAA to review all information and, when required, attach unique electronic signatures.

2.4 Third party proposals covered in Section 1 shall be dealt with as follows:

1) the principles given for the TA procedures in this document are adopted;
2) the TAA does not take on the responsibility that belongs to the third party;
3) the principles of special requirements given in the respective NAAs are applied where the Overseeing Organisation does not have a specific competence or expertise to give an opinion on whether the third party proposal or temporary works are safe or not; and,
4) for third party proposal of temporary work or temporary structure, Section 4 of this document is to be followed.

NOTE *Third party proposals include any from adjacent landowners, statutory undertakers, private developers, and government bodies.*

Proprietary manufactured structures and products

2.5 Proprietary manufactured structures and products shall be subject to the full TA procedures, with the exception of those that comply with the requirements of the Construction Products Regulations (CPR) 2011/305/EU [Ref 4.N] or UKSI 2022/712 [Ref 13.N].

2.6 Proprietary manufactured structures and products shall be used for their intended purpose.

NOTE 1 *An essential consideration for adoption of proprietary manufactured structures or products is the avoidance of discrimination against any structure or product that has the required declared performance either under a UKCA/CE mark applied in compliance with the CPR or a recognised product registration system and would satisfy the specified end use.*

NOTE 2 *Any discrimination that does create a "barrier to trade" is in contravention of legislation. The procedures are to avoid two forms of discrimination in particular: (a) discrimination between different forms of construction or product that will satisfy the same end use, and (b) discrimination between directly competing proprietary systems or products.*

2.7 Proprietary manufactured structures or products with UKCA/CE marking in accordance with CPR procedures shall be accepted for their correct intended use and satisfy the specified performance requirements.

2.8 The TA procedures shall not be applied to any aspect related to this acceptance except to confirm that the declared performance of the product meets that required.

2.9 Additional requirements must not be imposed on manufactured structures with UKCA/CE markings or products with UKCA/CE markings that are used for their intended use.

2.10 Where there are potential safety issues with the use of manufactured structures with UKCA/CE markings or products with UKCA/CE markings, TAA shall be consulted.

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2.11 TA procedures shall apply for installation of UKCA/CE marked structures or products, but not their manufacture.

2.12 TA procedures shall apply where unintended use is proposed for UKCA/CE marked structures or products.

NOTE *Further information is given in 3.12(6) and Appendix P.*

Use of UK National Standards

2.13 For the design of highway structures using UK National Standards (Eurocodes), reference shall be made to the Overseeing Organisations' current requirements for the use of Eurocodes for the design of highway structures.

2.14 For the design of highway structures using UK National Standards (Eurocodes), the model AIP form in Appendix A shall be used.

2.15 For the design or assessment of highway structures using UK National Standards (non-Eurocodes), the model AIP form in Appendix B shall be used.

NOTE *Model forms are intended to be generic and can be enhanced and edited to suit particular proposals as required.*

Options report

2.16 An options report shall be submitted for all works listed below, unless indicated otherwise by the Overseeing Organisation:

1) where there are a number of realistic cost effective alternatives for permanent structures expected to be category 2 or 3 (as described in Sections 3 to 6 of this document);
2) for structures to be category 0 or 1 with an estimated construction cost in excess of £0.5 million; and,
3) where directed.

2.17 The options report shall be prepared by the Designer.

2.18 The format, content and level of detail of the options report shall be as agreed with the Overseeing Organisation.

NOTE 1 *Guidance is provided in Appendix O.*

NOTE 2 *It is intended that the options are limited to the primary alternatives rather than numerous iterations of similar or unrealistic options. Typically, the option report sets out possible alternative structure solutions considering factors such as complexity, buildability, durability, risk, programme, cost, etc..*

2.19 An options report for assessment shall not be required, unless this has been included as an alternative to new work options above.

Category of proposals

2.20 The proposals shall be placed in one of four categories: 0, 1, 2 or 3, according to the criteria described in Sections 3 to 6.

2.21 The category from clause 2.20 shall be proposed by the Designer or Assessor and details of the proposal submitted to the TAA for agreement.

2.21.1 The Designer or Assessor may undertake an initial screening process with the TAA to obtain an early agreement on the category.

NOTE *The category boundaries are not rigid and the category of each proposal is decided on its merits, having regard to potential consequences of failure, design complexity and whole life costs.*

2.22 AIP's shall be required for categories 1, 2 and 3.

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NOTE *AIP's are not required for category 0.*

2.22.1 Where TAA agrees that the AIP does not add value, it may be omitted for category 1 and 2.

2.23 Where a structure has been placed in category 0 or 1 and a proposal arises subsequently requiring a departure, the TAA shall be contacted to request a review of the category.

2.23.1 Typically a change to category 2 will be required, but a change of category may not be necessary if the TAA judges that the Departure has little or no structural implications.

2.24 Where the TAA has reviewed the category and agreed to retain category 0, a new certificate shall be submitted making reference to the approved departure from standard.

2.25 Where the TAA has reviewed the category and agreed to retain category 1, an amendment or addendum to the AIP shall be submitted.

2.26 The agreement of the TAA shall be required before any proposal that includes a departure can be incorporated in the design or assessment.

Proposals for categories 1, 2 and 3

2.27 Proposals for categories 1, 2 and 3 shall:

1) provide sufficient information and evidence to demonstrate compliance with the Overseeing Organisation's requirements and to justify their viability;
2) identify, assess and take into account, through appropriate methods of risk management, potential risks and hazards during the whole life of the structure such as execution, operation, maintenance and demolition, with a view to eliminating or minimising these risks;
3) list in the AIP only risks and hazards that would not be apparent to an experienced and competent contractor or are likely to require special attention to manage them effectively;
4) provide evidence that appropriate consultation has taken place with all relevant stakeholders, and that full and proper consideration has been given to their respective interests;
5) identify, assess and consider risks and hazards that can affect the structure as a result of other stakeholders' requirements (such as leakage of gas or water mains);
6) identify, assess and take into account risks and hazards posed by the structure to other infrastructure belonging to a third party;
7) include documentation relating to consultation and special requirements of those consulted within the AIP;
8) describe the information that is available concerning existing records and assumptions made regarding the interpretation of available data that will be relevant to the design or assessment; and,
9) list in the TAS all relevant documents that are being proposed for use in the design or assessment.

2.28 Documentation relating to consultation and special requirements of those consulted shall be included as part of the AIP submission.

Proposals for designs

2.29 In addition to proposals for categories, proposals for designs shall address the following:

1) sustainability;
2) environment (both the natural and built environment) and the requirements of any cultural heritage, environmental management plans and walking, cycling and horse riding assessments, carbon impact (recalculate/confirm estimates and new upper/lower range limits, where not done in options phase) to be calculated unless agreed otherwise with TAA;
3) aesthetics;
4) buildability;

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5) structure robustness;

6) structure resilience;

7) water management (describe how water will be managed within the design of the structure. This includes internally (transport of water on and through the structure and sealing of elements to prevent water ingress) and externally (global management considering interface with other assets, such as watercourses, drainage, pavement, geotechnical features, etc.) Confirm allowances for climate change that will be included within the design;

8) maintenance and operational commitments in terms of whole-life costs in design options and choices of materials. Identify required maintenance regimes split into bands (<6 years, 6-12 years, 12-24 years, > 24 years), which should include items like cleaning, checking bolts, replacing seals, etc. ;

9) provision of safe access for periodic inspection;

10) avoidance of a 'barrier to trade' and the requirements for using proprietary manufactured structures or products; and,

11) deliberate damage and security.

2.30 Proposals for designs shall include for the likelihood of future heavier loads, all lane running and/or widening and describe how the structure may be upgraded.

2.30.1 In the case of road tunnels, proposals for designs should consider future development above or adjacent to the tunnel.

NOTE *It is not intended that additional provision be included within the design unless agreed with the Overseeing Organisation.*

2.31 For major structures, and those sited in environmentally sensitive locations, the TAA shall be consulted at an early stage to determine whether submission is required to relevant environmental or architectural bodies or a design panel.

NOTE 1 *Major structures can include tunnel portals, tunnel service buildings and landscaping.*

NOTE 2 *Environmentally sensitive locations can include National Parks, areas of outstanding natural beauty, green-belts, sites of special scientific interest and urban areas.*

2.32 Proposals for designs shall ensure that the relevant environmental and planning legislation have been taken account of during the development of the design.

NOTE *Legislation includes, but is not limited to, environmental assessments, environmental statements and habitat surveys.*

2.33 Affected stakeholders shall be consulted to ascertain environmental requirements during the development of the design and post construction.

NOTE *Environmental requirements can include translocation of endangered species, acceptable environmental mitigation and other measures where existing habitats are disrupted.*

2.34 Where proposals are located close to or cross watercourses, the relevant national environmental body shall be consulted.

2.35 Proposals for designs shall state any assumptions that have been made with regard to construction processes or temporary works aspects that are significant factors in the design.

NOTE *For example the design of an integral bridge could assume a phi value or stiffness for abutment backfill.*

2.36 Where construction processes or temporary works during the course of construction have structural implications different from those assumed by the Designer, the TA shall be consulted and agreement obtained before the commencement of construction of that part of the works.

2.37 Proposals by the Designer for an independent checker shall be submitted to the TAA for consideration/agreement.

NOTE *Agreement to Checkers for category 3 structures depends on relevant experience and competence.*

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Proposals for assessments

2.38 In addition to proposals for designs, proposals for assessments shall describe proposed arrangements for access, traffic management and intrusive investigation where required.

NOTE *An inspection of the structure is required by CS 454 [Ref 2.N].*

Departures from standards

2.39 All applications for departures shall be subject to the approval procedures of the Overseeing Organisation.

NOTE *Designers or Assessors can seek to introduce innovative techniques, research findings or developments in the state of the art and best practice by the adoption of departures.*

2.40 Applications for departures shall include reasons and justification, including benefits and disbenefits to the Overseeing Organisation.

2.41 Applications for departures shall allow sufficient time for consideration by the Overseeing Organisation prior to inclusion in the AIP or an addendum to the AIP.

NOTE *In some cases the Checker's comments on the proposed departure can be required to assist the TAA in the deliberation.*

2.42 Where UK national standards are used, the limitations for the use of departures shall be given in the Overseeing Organisation's requirements.

2.43 Where a structure is in the ownership of the Overseeing Organisation but accommodates other infrastructure that is the responsibility of another party, the party concerned shall be consulted by the Designer or Assessor.

NOTE *Factors that affect the design, construction phasing, and obtaining any required agreements together with timescales need to be taken account of.*

2.43.1 A record of consultation and any agreements in place or to be put in place with the party should be recorded in the AIP.

NOTE *Areas of specific concern can include vehicle restraint systems especially in transition areas, drainage, slopes, and maintenance. It is recommended that where possible individual responsibilities are agreed and set out during design and operational phases of the work.*

Submission for AIP

2.44 Submissions for AIP to the TAA shall be in accordance with the Overseeing Organisation's requirements.

NOTE *Generally submissions comprise a completed AIP, a location plan, a general arrangement drawing, relevant parts of the geotechnical investigation report, documents relating to consultation and any other relevant information or reports.*

2.44.1 A single AIP for the whole structure, should be submitted by the Designer.

2.44.2 Where the designs of the superstructure, substructure and/or foundation are carried out by different teams, the designer of the superstructure and/or substructure should give the conditions and loads to be taken into account by the designer of the substructure and/or foundations respectively.

NOTE *The Designer is responsible for ensuring that any separately designed elements are compatible.*

2.44.3 Relevant information and reports submitted to the TAA should be referenced in the AIP and written with regard to a clear proposal or objective.

2.45 Calculations and detailed drawings shall not form part of the submission.

NOTE *Any submitted calculations and detailed drawings will not be reviewed by the TAA.*

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2.46 The AIP (or O/AIP) shall be based on the relevant sections of the model AIPs provided in Appendix A, Appendix B or Appendix O.

2.47 The AIP shall record all the agreed criteria on which the design or assessment is to be based.

2.48 Deviations from an agreed AIP to account for subsequent variations during design, assessment or execution shall render the AIP invalid.

2.49 Revisions to the AIP shall be submitted to the TAA for agreement.

2.50 Agreement shall be confirmed either in the form of an amended version of the agreed AIP or as a separate addendum to the agreed AIP.

2.51 Revised AIP submissions to the TAA for agreement shall:

1) clearly indicate deletions or additions that have been made to the agreed AIP;
2) take account of any comments or conditions of approval imposed by the TAA on the original submission;
3) be signed by the Designer/Assessor and Checker and forwarded with supporting information to the TAA; and,
4) ensure addenda refer to the original AIP by the date of agreement by the TAA.

NOTE *Retaining the same clause numbering as the original AIP, showing mark-ups, etc. help all reviewers to understand the changes and to minimise duplication of work.*

2.51.1 TA should start at an early stage of development of proposals.

NOTE 1 *This is particularly important for structures where early submission of AIP to the TAA allows timely consideration of other fundamental aspects, such as crossing requirements and carriageway alignment.*

NOTE 2 *The period over which TA extends can vary according to the size and complexity of the structure and number of departures. To avoid any unnecessary delay, AIP can be given in stages in the form of interim AIP as principles are evolved. However, the use of interim AIP does not prejudice the agreement of an AIP for the full structure.*

Technical approval

2.52 Sufficient information shall be provided, by the Designer, to enable the TAA to carry out the following tasks, where applicable:

1) appraise the proposed design or assessment criteria, principles and methods;
2) agree the required working life for the structure and its main components;
3) agree the category of the proposals;
4) ensure consideration has been given to any special studies concerning safety risk assessment and management that have a bearing on the final design or assessment or the construction process;
5) be satisfied that the following have been considered:
    a) safety;
    b) sustainability;
    c) buildability;
    d) traffic management;
    e) environmental impact;
    f) aesthetics;
    g) structure robustness;
    h) water management;
    i) durability;
    j) maintenance, access and inspection;

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k) upgradeability;
l) whole life costs;
m) demolition; and,
n) compliance with the Overseeing Organisation's requirements;

6) agree the list of documents included in the TAS and departures;
7) appraise the geotechnical conditions and other relevant investigations;
8) appraise the adequacy of existing records and investigation data and the need for further investigations; or studies that have a significant bearing on the preliminary or final design, assessment, execution, operation, maintenance or demolition processes;
9) review the adequacy of consultation with other stakeholders and the incorporation of agreed requirements;
10) agree proposed category 3 Checker based on their relevant experience and competence;
11) resolve any point(s) of difference between the Designer or Assessor and the Checker;
12) confirm agreement of Designer and Checker by signature on AIP; and,
13) for tunnels, confirm that the tunnel design authority output report has been signed off.

2.53 When satisfied with the proposals, the TAA shall confirm its agreement by signature of the AIP.

2.54 On completion of the detailed design, check or assessment, the certificates shall be submitted to the TAA.

2.55 The agreement of the AIP or acceptance of the certificates by the TAA shall not relieve the Designer, Assessor nor Checker of any of their responsibilities.

NOTE *Responsibilities include the accuracy of information of all information submitted in TA submissions, the validity and arithmetical correctness of the calculations, methods and techniques and their translations into design details and drawings, specification clauses or assessed capacities.*

2.56 The AIP shall be valid for three years after the date of agreement by the TAA.

2.57 Where the construction has not yet commenced, or an assessment has not been certified, within this 3-year period, the AIP shall be resubmitted to the TAA.

2.58 Prior to re-submission of an AIP it shall be reviewed by the Designer or Assessor.

2.59 Whether any updating or amendment to the design is required shall be determined by the review and the outcome recorded in an amendment or addendum to the AIP.

2.60 The agreement of the TAA to the re-submitted AIP shall be required before the execution can proceed, or the assessment certified.

2.61 The works examiner shall inform the TAA of any amendments to the design, during execution, which have structural implications.

2.61.1 The proposed works examiner should be notified to the TAA prior to construction (unless already defined in the contract).

2.62 Any amendments which have structural implications shall be included in an addendum to the AIP.

2.63 Certificates shall be revised to take account of the amendments.

2.63.1 Where the proposed erection procedure induces different stresses in the completed structure from those anticipated in the design, any changes to agreed details in the AIPs or certificates should be covered by an AIP addendum and/or additional certificates.

2.64 Any AIP addendum and/or additional certificates shall require acceptance by the TAA before erection commences.

Design and assessment procedure

2.65 The design/assessment shall comply with the AIP.

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2.66 The applicability and accuracy of all computer programs used, and the validity of the programs for each application, shall be ensured by the Designer or Assessor.

Checking procedure

2.67 Assessments, designs, drawings, bar bending schedules and other relevant documentation, shall be checked as follows:

1) categories 0 and 1 are checked independently by another engineer who may be from the design/assessment team;
2) category 2 are checked by a check team, which may be from the same organisation but independent of the design/assessment team; and,
3) category 3 are checked by a check team from a separate organisation proposed by the Designer or Assessor and agreed by the TAA.

2.68 The Checker shall carry out the check, with due professional skill and care, in accordance with the agreed AIP.

2.69 The Checker shall carry out a comprehensive examination of all aspects of the design or assessment in accordance with the Overseeing Organisation's requirements.

NOTE *A comprehensive examination can include any proposed departures and specification clauses that could affect structural integrity, (such as new materials).*

2.70 The check shall include that the calculations are translated accurately into design details and drawings, specification clauses or assessed capacities.

2.71 During the course of the check a report shall be submitted to the Designer or Assessor and TAA for any aspect of the agreed AIP, design or assessment where changes are considered necessary.

2.72 The agreement of the TAA to variations in the AIP shall be confirmed in accordance with clauses 2.47 to 2.51.

2.73 Any disagreement arising between Designer or Assessor and Checker that they cannot resolve shall be notified immediately to the TAA.

2.74 The Checker's analytical models and analytical work shall be independent of that of the Designer or Assessor and carried out without exchange of calculation sheets, or similar analytical work, between the Designer or Assessor and the Checker.

2.74.1 The Designer or Assessor and the Checker may consult with each other during the course of their work to ensure that the results they are obtaining are comparable.

NOTE *The method of analysis employed by the respective teams need not be the same.*

2.75 The Checker shall take responsibility for the applicability and accuracy of all computer programs used in the check and the validity of the programs for each application.

2.75.1 Both activities of design/assessment and check may proceed in parallel.

Certification

2.76 The certificates shall be signed to declare the satisfactory completion of the work involved and that the organisations concerned have exercised due professional skill and care.

NOTE *For some structures the TAA can call a pre-certification meeting with the Designer/Assessor and the Checker, to discuss their findings prior to accepting certificates.*

2.77 Where structures have an assessed capacity of less than current operational needs or there are aspects with the potential to lead to other safety or operational risks in the near future, the Assessor shall notify the TAA and agree any necessary actions before submitting the certificates.

NOTE *In agreement with the TAA this can be included within the assessment report and include recommendations for risk mitigation measures/options with, where possible, timescales.*

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2.78 For all proposals, a single organisation shall assume responsibility for the whole of each activity; the design, assessment, check or construction compliance for the entire structure.

NOTE *Clause 2.78 does not preclude the design of elements of the structure being done by others. However, the responsibility for the overall structure remains with the Designer. This ensures that elements are not designed in isolation and the interfaces between any element and the global performance is included in the design. In relation to the detailed design of elements designed by others, the Designer could obtain assurance through certification received from another designer, rely on separate certification (accepted by the TAA) or by producing performance requirements where elements are supplied that meet those, (such as identifying loading, dimensional limits, and movement ranges).*

2.79 Each certificate shall be endorsed, as required, by the Designer, Assessor, Checker, Contractor's representative and Works Examiner.

2.80 Each certificate shall be submitted where required for acceptance by the TAA.

2.81 Signatories shall be required from the team leader and another from the principal of the organisation concerned.

2.81.1 The team leader may be the Designer, Assessor or Checker.

2.82 All signatories to certificates shall:

1) be authorised to sign on behalf of their organisation;
2) be competent in the field of work undertaken; and,
3) have relevant experience and appropriate engineering qualifications.

2.83 Signatories' qualifications shall be clearly indicated on the certificate along with their name and position in their organisation.

2.84 Signatories for the construction compliance certificate shall comprise a representative of the Contractor and principals of both the Contractor and of the Works Examiner.

2.85 The signatory for the TAA shall be a person delegated to undertake this task on its behalf.

2.86 Where the TAA agrees that the design of the superstructure, substructure and/or foundations of highway structures are carried out by different teams, the conditions and loads imposed by the superstructure and/or substructure for the design of the substructure and/or foundation respectively shall be given in the AIP and/or certificate as applicable.

NOTE *Clause 2.86 above does not negate the requirement for a single organisation to take overall responsibility for the design of the entire structure.*

2.87 Where a proprietary structure or product is supplied in accordance with an O/AIP, and the item has been UKCA/CE marked in accordance with the CPR, the Designer shall confirm to the TAA in a certificate that they have inspected the declared performance under the UKCA/CE mark and that declared performance of the item meets the requirements of the O/AIP (refer to Appendix P).

2.88 For category 1, 2 and 3 structures the design, assessment and check certificates shall refer to the relevant AIP and any addenda by their respective dates of agreement by the TAA, and any Departures.

2.89 Where additional and substitute specification clauses have been prepared by the Designer, they shall be endorsed by the Checker, if in agreement, and submitted as a Departure from standards for acceptance by the TAA.

NOTE *Many specifications require the designer to prepare a schedules of performance requirements or set out requirements within an appendix. A departure is not required for these provided they are prepared in compliance with that specification.*

2.89.1 Additional and substitute specification clauses may be submitted either individually or collectively on a specification certificate.

2.90 Where additional and substitute specification clauses can affect structural integrity, for example clauses concerning new materials, they shall be checked in accordance with the AIP.

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2.91 For category 0 structures, the design, assessment and check certificates shall refer to the relevant standards and departures and be submitted for acceptance by the TAA, unless otherwise stated in Sections 3 to 6.

2.92 A copy of the general arrangement drawing and any relevant supporting information shall accompany certificates for category 0 structures.

2.92.1 Where several similar category 0 or 1 structures occur in a project, with the agreement of the TAA a single certificate may be used to cover them.

Construction of the structure

2.93 Construction of the structure shall not proceed until the design or assessment certificates have been formally accepted by the TAA.

2.94 The construction compliance certificate shall be submitted to the TAA for acceptance by the Overseeing Organisation.

2.95 The public shall not be permitted to use a structure or have access to places where their safety would depend on the integrity of that structure until the TAA has accepted the Construction Compliance Certificate.

2.95.1 The TAA may agree an interim certificate to allow highways to be opened while the information for the final certificate is being prepared.

NOTE 1 *Typically, as-constructed drawings, bar bending schedules and material schedules are completed after construction.*

NOTE 2 *The Interim Construction Compliance Certificate can be based on the model in Appendix N, but clearly marked as "Interim" and omitting any reference to "as-constructed drawings and bar bending schedules".*

2.96 Unless otherwise stated in Sections 3 to 6, the construction compliance certificate shall refer to, if available, the relevant AIP, design and check certificates, specification and as-constructed drawings.

2.97 The format of certificates shall be agreed with the Overseeing Organisation.

NOTE 1 *The wording on certificates can vary depending on the Overseeing Organisation's particular requirements/type of contract.*

NOTE 2 *Model certificates are provided in Appendices I to N.*

2.97.1 Where the completed certificate consists of more than one page, each page should be identifiable by the name of the project and by the name and reference number of the structure and the date of preparation.

2.98 The forms of certificate defined in the contract requirements shall be used.

2.99 All certification, after acceptance by the TAA, shall be uploaded onto the Overseeing Organisation's structures management system.

Records to be submitted

2.100 Relevant data, information and documents, which have an effect on safety, access, structural or traffic management, such as assessed load carrying capacity of structure, shall be recorded as required by the Overseeing Organisation's management system for structures.

2.101 For categories 2 or 3 checks, when Eurocodes are used, the Designer's record for the choices and options adopted shall not be submitted to the TAA.

2.102 For categories 2 or 3 checks, when Eurocodes are used, the Designer record shall be recorded as required in the Overseeing Organisation's management system for structures.

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3. Bridges and other highway structures

3.1 This section covers specific TA requirements for bridges and other highway structures and shall be read in conjunction with Sections 1 and 2.

3.2 The TA requirements shall be applied without limitation to:

1) design and execution of new structures;
2) assessment and related construction work, whether refurbishment, maintenance or strengthening, that affects structural integrity;
3) assessment relating to loading beyond that for which a structure has been designed or previously assessed; and,
4) assessment relating to loading for which a structure has been designed or previously assessed but the condition of the critical structural elements has subsequently deteriorated to the extent that a reassessment is required.

3.3 In addition to clause 1.1, the procedures described in this Section shall be applied to the following highway structures:

1) bridge, buried structure, subway, underpass, culvert and any other structure over the highway or supporting the highway with a clear span or internal diameter greater than 0.9 m;
2) overhead crossing carrying conveyor or utility service;
3) movable inspection access gantry, gantry rail and gantry support system;
4) earth-retaining structure where the effective retained height, i.e. the level of fill at the back of the structure above ground level in front of the structure is greater than 1.5 m;
5) reinforced/strengthened soil/fill structure, with hard facings where the effective retained height is greater than 1.5 m;
6) reinforced/strengthened soil/fill which is an integral part of another highway structure;
7) portal and cantilever sign and/or signal gantry;
8) minor structures listed below:
    a) cantilever mast for traffic signal and/or speed camera;
    b) lighting column;
    c) high mast of more than 20 m in height, i.e. the vertical distance from top of post to bottom of flange plate, for lighting;
    d) mast for monitoring equipment. i.e. camera, radio and telecommunication transmission equipment;
    e) catenary lighting support system;
    f) noise barrier;
    g) traffic sign/signal posts of more than 7 m in height, i.e. the vertical distance from top of post to bottom of flange plate or top of foundation, whichever is the lesser;
    h) other 'mast type' structures identified by the TAA as requiring technical approval.
    i) 'fence type' structures, including environmental barriers, visual screens and fencing, identified by the TAA as requiring technical approval
9) proprietary manufactured structure or product;
10) reinforced/strengthened soil/fill structure where hard facings are not provided and the face inclination exceeds 45 degrees, unless agreed with the Overseeing Organisation that structural TA in accordance with this document is not required;
11) fitting of M&E apparatus and fixtures to existing structures, including tunnels, either permanent or temporary;
12) design, selection and installation of cathodic protection systems for reinforced concrete structures; and,
13) safety critical fixings (as defined in CD 372 [Ref 6.N])

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Determination of category of structure

3.4 In addition to clauses 2.20 to 2.26, the following criteria shall be taken into account when determining category.

3.4.1 The TAA may require a higher or lower category where deemed appropriate.

Category 0

3.5 Category 0 structures shall:

1) conform in all aspects of design, assessment and execution to DMRB and MCHW standards;
2) contain no departures; and,
3) be a structure covered by clause 3.6.

3.6 Unless otherwise indicated by the TAA the following structures shall be category 0:

1) single-span structures with span of less than 5 m;
2) buried concrete boxes, buried rigid pipes and corrugated steel buried structures of less than 3 m clear span/diameter and having more than 1 m cover;
3) multi-cell buried structures, where the cumulative span is less than 5 m, and having more than 1 m cover;
4) earth retaining structures with an effective retained height of greater than 1.5 m but less than 2.5 m;
5) minor structures listed within clause 3.3 (8) and not situated at a very exposed site as defined in CD 354 [Ref 5.N];
6) high masts 25 m or less in height and not situated at a very exposed site as defined in CD 354 [Ref 5.N].
7) noise barriers less than 7 m high and without overhangs;
8) masonry arches with span of less than 6.5 m (for assessment only); and,
9) portal and cantilever sign and/or signal gantries compliant with a generic AIP.

Category 1

3.7 Category 1 structures shall:

1) conform in all aspects of design, assessment and execution to DMRB and MCHW standards;
2) contain no departures; and,
3) be a structure covered by clause 3.8.

3.8 Unless otherwise indicated by the TAA the following structures shall be category 1:

1) structures with a single simply supported or integral span of 5 m or greater, but less than 20 m and having less than 25° skew;
2) buried concrete boxes, buried rigid pipes and corrugated-steel buried structures with a clear span/diameter of 8 m or less;
3) earth retaining structures with an effective retained height of 2.5 m or greater but less than 7 m;
4) minor structures outside the limits of those listed within clause 3.3 item (8) or situated at a very exposed site as defined in CD 354 [Ref 5.N];
5) high masts greater than 25 m in height or situated at a very exposed site as defined in CD 354 [Ref 5.N];
6) noise barriers 7 m or more in height or with overhangs; and,
7) portal and cantilever sign and/or signal gantries with a span of less than 20 m.

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Category 2

3.9 Structures not included within the parameters of categories 0, 1 or 3 shall be category 2.

Category 3

3.10 Complex structures that require sophisticated analysis or have any one of the following features shall be category 3:

1) high structural redundancy;
2) unconventional, novel or esoteric design aspects;
3) any span exceeding 50 m;
4) skew exceeding 45 degrees;
5) difficult foundation problems;
6) movable bridges;
7) movable inspection access gantries, gantry rail and gantry support systems;
8) bridges with suspension systems;
9) steel orthotropic decks;
10) post-tensioned concrete structures;
11) earth retaining structures with an effective retained height of 14 m or greater;
12) rock anchorages and anchorages forming part of a structure.
13) portal sign and/or signal gantries with a span greater than 50 m;
14) structures with hidden or difficult to inspect critical elements; or,
15) structures with cathodic protection systems installed in accordance with clause 6.5 of CD 370 [Ref 3.N].

Assessment and related construction work

3.11 The assessment of load carrying capacity of existing structures and related construction work, such as demolition, repair, renewal, refurbishment and strengthening work that affects structural integrity, shall be categorised on the same basis that the original structure would have warranted.

3.11.1 The TAA may require a higher or lower category where deemed appropriate.

Technical approval

3.12 Sufficient information to enable the TAA to consider the following aspects, where applicable, shall be provided by the Designer or Assessor in addition to clause 2.52:

1) cross-section and headroom clearances;
2) the loading and design or assessment criteria;
3) any provision to be made additional to items (1) and (2) for abnormally high and/or heavy loads;
4) the structural adequacy at all stages of construction work, such as repairs, strengthening, monitoring, partial renewals or demolitions;
5) proposals for the independent checking of temporary works; and,
6) that proper consideration has been given to the adoption of proprietary manufactured structures or products with UKCA/CE markings by the Overseeing Organisation (see Appendix P).

NOTE *The list in clause 3.12 above is not necessarily exhaustive.*

Certification

3.13 For category 0 minor structures as defined in clause 3.6(5) a certificate in the form given in Appendix J and a UKCA, EC certificate or declaration of conformity (where applicable) shall be submitted to the TAA for retention.

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NOTE *Some minor structures like CCTV masts, cantilever masts and telecom masts are not manufactured to a harmonised standard.*

Documentation

3.14 The AIP for highway structures within the scope of this section shall be based on the relevant model AIP forms given in Appendices A and B.

3.15 TASs shall be prepared in accordance with the notes given in Appendix H.

3.16 Certificates shall be based on the relevant model certificates given in Appendices I, J and N.

NOTE *The form of certificates can vary depending on the Overseeing Organisation's particular requirements.*

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4. Temporary works

4.1 This section describes the TA requirements for temporary works, including temporary structures, and shall be read in conjunction with Sections 1 to 3.

4.2 All temporary works proposals shall be reviewed and allocated into one of the following categories:

1) type N proposals: temporary works having no potential for impact on client or third party assets or on any person other than those under the direct control of the Principal Contractor;
2) type S (structure) proposals: erection proposals or temporary works which require both:
   a) an independent check of the effects of temporary works on permanent works (refer to the AIP for permanent works), and,
   b) where the works would not affect or potentially affect any highway or other way or area used by or accessible to the public; and,
3) type P (public) proposals: erection proposals, temporary works including those over, under, alongside or otherwise affecting or potentially affecting any highway or other way or area used by, or accessible, to the public.

4.3 A summary of the categorised list of temporary works shall be provided to the TAA when requested.

4.4 The TA requirements shall be applied to type S and type P proposals.

4.4.1 Where necessary and depending on the degree of risk, the TAA may change the proposal from type N to type S or from type S to type P.

4.4.2 Where the temporary works are permanently left in place (sheet piling for example), they may be considered instead, if appropriate, in the AIP of the permanent highway structure.

Scope of TA requirements for temporary works

4.5 In addition to 1.1, the procedures described in this section shall be applied without limitation to the following temporary structures:

1) temporary works and falsework for major and complex structures;
2) proposals where erection procedure, method of construction or the procedure for the demolition or removal of an existing structure is of critical importance;
3) purpose built or prefabricated forms of temporary works that are alongside or temporarily support or span live carriageways or railway lines or other areas with public access, including facilities or construction procedures that maintain the structural integrity or safe operation of an existing structure; and,
4) temporary works details, erection proposals or construction procedures involving work that affects or potentially affects the structural integrity or operating procedures of a structure during its reconstruction, demolition and removal, maintenance, monitoring, alteration or repair.

Category of temporary works

4.6 The category adopted shall reflect the adverse consequences of any potential failure, and comply with clauses 2.20 to 2.26.

4.7 For type N proposals, the Contractor's own procedures shall determine the relevant category.

4.8 For type S proposals, the category shall be the same as the category of the permanent structure.

4.9 For type P proposals, the category shall be 2 or 3.

4.9.1 Where agreed with the TAA that the risk is relatively minor and the reasoning is recorded in the AIP (or certificate in the case of category 0), proposals may be lowered to category 1 or 0.

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Design criteria relating to permanent works

4.10 Design criteria for temporary works shall include all relevant design data concerning the design and construction of the permanent works.

4.11 The design data shall include, where applicable:

1) protection and/or safe operation of the permanent work or live carriageway during the use of a temporary highway structure; and,
2) temporary conditions of construction of new designs or the alteration of existing structures.

NOTE *Relevant design data can include allowable deflections, settlements, rotations, loading, jacking forces, propping requirements, clearances, impact protection, erection or demolition procedures, traffic control, carriageway possessions, etc.*

Proposals for temporary works

4.12 The limits of application of a submission and related certification shall be clearly described and, where applicable, related to constraints of staged construction.

4.13 Proposals shall state the criteria that have been adopted to encompass the technical, operational and safety requirements of the authorities consulted.

4.14 Proposals shall demonstrate to the satisfaction of the TAA that safeguards and contingency measures have been introduced and will be maintained throughout the duration of the work.

Type N proposals

4.15 No certification shall be submitted to the Overseeing Organisation.

NOTE *The Contractor is responsible for all aspects of this work.*

Type S proposals

4.16 For type S temporary works proposals the classification shall be agreed with the TAA.

4.17 Check certificate shall be required to confirm checking is carried out.

4.18 Design certificate and AIP of temporary works shall not be required.

NOTE *They are not required as there is no risk to the public and the Contractor is responsible for the safety and adequacy of erection or temporary works proposals.*

4.19 Prior to the commencement of the relevant parts of the works, check certificate(s) based on those given in Appendix K related to type S proposals shall be submitted to the TAA.

4.20 The check certificate shall be recorded and kept in the Overseeing Organisation's management system for the permanent structure.

NOTE *The purpose of requiring a certified independent check is to ensure that not only are the erection proposals and/or temporary works details properly prepared but also that an independent engineer examines and certifies for their adequacy.*

Type P proposals

4.21 Unless otherwise stated in clauses 4.24 and 4.25, or agreed with the TAA as category 0, proposals for temporary works shall be described in an AIP in accordance with the requirements and form of submission described in Section 2.

4.22 Unless otherwise stated in clauses 4.24 and 4.25, all design, checking and certification of temporary works for type P proposals shall comply with the TA procedures of Sections 1 and 2.

4.23 Consent to proceed with the works shall not be given until the type P design and check certificates have been accepted by the TAA.

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4.24 Special requirements given in the respective NAAs shall be complied with for third party proposals of temporary works or temporary structures that are not described in Sections 3 to 6.

4.25 Special requirements given in the respective NAAs shall be complied with where the Overseeing Organisation has no specific competence or expertise to enable it to review the safety aspects of the proposal.

Technical approval

4.26 Sufficient information to enable the TAA to consider the following aspects, where applicable and in addition to clause 2.52, shall be provided by the Designer:

1) structural adequacy and stability at all stages;
2) precautions during erection/dismantling operations;
3) protection of the temporary works (including protection against vehicle or other impact);
4) general provisions in terms of permanent works execution;
5) loading and design criteria, including factors of safety where limit states design codes for bridges are not used;
6) effects on any existing structures or earthworks assessed by the permanent works designer during design;
7) working spaces for installation and removal;
8) clearances and access for construction plant and machinery; and,
9) provision for periodic inspection and checking.

NOTE *The list in clause 4.26 above is not necessarily exhaustive.*

Documentation for temporary works

4.27 The AIP for temporary works within the scope of this section shall be based on the model forms given in Appendices A or B, as relevant.

4.28 TASs shall be prepared in accordance with the notes given in Appendix H.

4.29 The certificates shall be based on the model certificates given in Appendices K, L and N.

NOTE *The form of certificates can vary depending on the Overseeing Organisation's particular requirements.*

4.30 A certificate of construction compliance shall be provided for temporary bridges and any structures and installations identified by the TAA .

NOTE *Generally a certificate of construction compliance is not required for temporary works.*

Special requirements concerning third party proposals

4.31 For third party proposals of temporary works or temporary structures that are not described in Sections 3 to 6, or where the Overseeing Organisation does not have a specific knowledge or expertise, the Overseeing Organisation shall not be able to give an opinion on whether they are acceptable or not.

4.32 The third party shall have the required experience and competence to carry out the proposed works and be responsible for them.

4.33 The steps set out in clauses 4.34 and 4.35 shall be taken to ensure that the proposal is safe and the works are safely carried out.

4.34 The third party shall seek an agreement for its proposal and draw up a legal agreement with the Overseeing Organisation.

4.35 The legal agreement shall contain, amongst other things, the following:

1) outline procedures in dealing with the proposal which can include:

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a) certification to confirm that the principles of design and/or execution have been appropriately transformed into an appropriate design using due reasonable professional skill and care;
b) required information to be submitted to the Overseeing Organisation. Where appropriate this could be a general arrangement drawing, reason for structure, type of highway, traffic speed, description of structure, span arrangements, headrooms, foundation types, arrangement for inspection and maintenance, highway and other live loadings, ground conditions, risks and hazards, period of service, etc.;
c) seeking and taking into consideration of Overseeing Organisation considered comments on the proposal. If the Overseeing Organisation consider there is any safety issue and that safety issue is not resolved to the satisfaction of the Overseeing Organisation, the works cannot be carried out; and,
d) administrative processes e.g. establish contact points; agree relevant periods of notices; third party to give notifications; Overseeing Organisation to give comments and requirements; Overseeing Organisation to grant agreement; third party to start work; Overseeing Organisation to serve notice to stop work etc;

2) for temporary works or temporary structures, the following are to be addressed:
a) the Overseeing Organisation is not required to approve or disapprove the temporary works or temporary structures or any of their isolated aspects;
b) a statement to confirm that the proposal is in compliance with normal industry standards and practices;
c) clearances e.g. headroom;
d) effect of temporary works or temporary structures on roads such as sight line or other highway structures (load on bridges);
e) where appropriate, requirement of geotechnical certification to CD 622 [Ref 11.N];
f) where there is little or no proven track record of the proposal or the proposal is an innovative solution, it is recommended that the proposal first be tried on a test site or a minor road; and,
g) certification to confirm that the proposal has been checked by an appropriately qualified and competent organisation which is independent from the third party. The relevant experience/competence of the Checker is to be agreed with the Overseeing Organisation before employing them;

3) for aspects other than temporary works or temporary structures, the following are to be considered:
a) for road traffic operations and/or management such as signage, parking and access of support vehicles, coning, lighting etc that are described in Sections 3 to 6 or where the Overseeing Organisation has the necessary expertise, the normal Overseeing Organisation practices required for appropriate Overseeing Organisation technical approval processes or operational requirements are to be applied; and,
b) the relevant parts of the Design Manual for Roads and Bridges are to be applied and Departures sought where appropriate;

4) agreement on an amount of public liability insurance and provision of a copy of the insurance certificate to the Overseeing Organisation;
5) provide confirmation to the Overseeing Organisation that the third party has taken appropriate safety advice identifying what advice has been taken and from whom;
6) agree to making good of any damages due to the work by the third party and obtain a certificate from the Overseeing Organisation area maintaining agent that the condition of the road network is almost the same before and after the work by the third party; and,
7) confirmation that all costs associated with the proposal will be borne by the third party.

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5. Road tunnel and service tunnel structures

5.1 Technical approval (TA) requirements in this section shall be followed for the following:

1) road tunnel structures;
2) service tunnels where the internal diameter is greater than 2 m; and,
3) major tunnelling or building operations within the zone of influence of an existing road tunnel.

5.2 This section shall be read in conjunction with Sections 1, 2 and 6, and in the case of cut-and-over construction and for tunnel portals and road decks, the relevant parts of Section 3.

5.3 The requirements of the Tunnel Design and Safety Consultation Group shall be complied with.

5.4 The TA requirements within this document shall not apply to service tunnels where the internal diameter is 2 m or less.

5.5 For service tunnels where the internal diameter is 2 m or less requirements of CD 622 [Ref 11.N] shall apply.

Scope of TA requirements for tunnels

5.6 In addition to clause 1.1, the procedures described in this Section shall be applied to:

1) the design and execution of new road tunnels, tunnel services buildings and service tunnels;
2) the assessment of existing tunnels that are subject to the effects of new temporary or permanent construction above or adjacent to the tunnel structure; and,
3) the refurbishment and strengthening of existing road tunnels.

Category

5.7 In addition to clauses 2.20 to 2.26, proposals for the design or assessment of road tunnel structures and service tunnels shall be in category 3.

Technical approval

5.8 Sufficient information to enable the TAA to consider the following aspects, where applicable and in addition to clause 2.52, shall be provided by the Designer:

1) structure and form:
   a) methods of excavation and construction including proposed ground categorisation for tunnelling;
   b) tunnel profile;
   c) bore spacing;
   d) portal design;
   e) waterproofing;
   f) maintenance access;
   g) ventilation shafts;
   h) proposed tunnel wall finish;
   i) fire resistance;
   j) stability of ground above portals;
   k) primary support design;
   l) groundwater control;
   m) effect on overlying or adjacent structures or tunnels;
   n) secondary lining and cladding;
   o) ground movements;
   p) loading history of the site and effect of proposed new loading sequences;

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q) the adequacy of the assessment of the loading conditions involved;
r) water management; and,
s) safety critical fixings.

2) alignment and clearances:

a) site constraints;
b) highway and tunnel alignment;
c) stopping sight distances;
d) carriageway and verge widths;
e) duct provision for services;
f) horizontal and vertical clearances;
g) effect of super-elevation;
h) space requirements for equipment beyond the traffic space;
i) cross-connections between traffic bores and escape passages;
j) emergency point spacing;
k) tunnel signing;
l) parking for emergency vehicles;
m) area for casualty attendance; and,
n) emergency crossovers and portal space.

3) general:

a) provision made for inspection and maintenance;
b) proposals for the checking of temporary works;
c) the safeguards adopted to ensure that construction effects are kept within tolerable limits;
d) an intervention facility being in place to regulate progress or halt work in the event of unforeseen situations which might adversely affect or compromise the structural integrity or operational regime of the tunnel; and,
e) the arrangements to sustain all necessary liaison between interested stakeholders.

NOTE *This list in clause 5.8 above is not necessarily exhaustive.*

Documentation

5.9 The AIP for road tunnel and service tunnel structures within the scope of this section shall be based on the model AIP form given in Appendix C.

5.10 TASs shall be prepared in accordance with the notes given in Appendix H.

5.11 Certificates shall be based on the relevant model certificates given in Appendices I and N.

NOTE *The form of certificates can vary depending on the Overseeing Organisation's particular requirements.*

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6. Mechanical and electrical installations

6.1 This section describes specific TA requirements for mechanical and electrical (M&E) installations in highway structures and shall be read in conjunction with Sections 1, 2 and 3 or 5 as required.

Scope of TA requirements for M&E installations

6.2 In addition to 1.1, the procedures described in this Section shall be applied without limitation to the following:

1) movable bridges and bridge access gantries;
2) road tunnels and tunnel services buildings; and,
3) pumped drainage installations for underpasses.

Category

6.3 In addition to 2.20 and 2.26, proposals for work covered by this section shall be in category 3.

Proposals for technical approval of M&E installations

6.4 In addition to clauses 2.27 to 2.29, proposals shall:

1) be presented in terms of preliminary and/or final design proposals as required with due consideration to whole-life costs;
2) fully describe the provision to be made for component replacement;
3) fully describe the provision for keeping the facility operational in the event of component failure; and,
4) include a draft report on maintenance and operating procedures (safety consultation document) based on the relevant model document in Appendix F and G.

Technical approval of M&E installations

6.5 Sufficient information to enable the TAA to consider the following aspects, where applicable and in addition to clause 2.52, shall be provided by the Designer:

1) the adequacy of the consultation and proposals forming the basis of the draft operating procedures (safety consultation document);
2) for movable bridges:
   a) the provision of integrated methods of incorporating safety of road users and bridge operatives (e.g. road barriers and traffic lights, linked to the bridge moving mechanism, to safeguard bridge users);
   b) the static and dynamic loading and design criteria under normal and adverse operating conditions including 'locked-in' stresses and over-turning;
   c) that all loads for the M&E design are consistent with those for the design of the bridge structure;
   d) the adequacy of system redundancy to guard against single component failure; and,
   e) the provision for manual operation (such as in the event of power failure or equipment failure).

NOTE *This list in clause 6.5 above is not necessarily exhaustive.*

Mechanical and electrical installation certification

6.6 The design and check certificates shall take account of 2.82 to 2.96 and be carried out in two stages.

6.7 Stage 1 certification shall:

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1) confirm that the principles in the AIP are valid and that they have been translated into appropriate levels of equipping, design and specification;

2) confirm that sufficient information has been provided to enable the detailed design of the installation to be developed and completed in accordance with the Overseeing Organisation's requirements; and,

3) require that details of work tests for equipment/systems tested at the manufacturer's work site and commissioning trials have been specified for the purpose of performance verification and formal handover.

6.8 Stage 2 certification shall confirm that the following meet the Overseeing Organisation's requirements:

1) the completed design proposals;

2) the testing of components; and,

3) the commissioning of the complete installation.

6.9 The format and wording of stage 1 and stage 2 certificates shall be agreed with the TAA.

6.10 A copy of the relevant safety consultation document with original signatures shall accompany the design and check certificates.

Documentation

6.11 The AIPs for highway structures within the scope of this section shall be based on Appendices D and E.

6.12 The relevant safety consultation documents that shall be used are given in Appendices F and G.

6.13 TASs shall be prepared in accordance with the notes given in Appendix H.

6.14 The certificates shall be based on the relevant model certificates provided in Appendices I and N.

NOTE *The form of certificates can vary depending on the Overseeing Organisation's particular requirements.*

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7. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref.	Document
Ref 1.N	National Highways. CG 302, 'As-built, operational and maintenance records for highway structures'
Ref 2.N	National Highways. CS 454, 'Assessment of highway bridges and structures'
Ref 3.N	National Highways. CD 370, 'Cathodic protection for use in reinforced concrete structures.'
Ref 4.N	Europa.eu. 2011/305/EU, 'Construction Products Regulation'
Ref 5.N	National Highways. CD 354, 'Design of minor structures'
Ref 6.N	National Highways. CD 372, 'Design of post-installed anchors and reinforcing bar connections in concrete'
Ref 7.N	National Highways. GD 304, 'Designing health and safety into maintenance'
Ref 8.N	BSI. BS EN 1991-2, 'Eurocode 1. Actions on structures. Traffic loads on bridges'
Ref 9.N	BSI. BS EN 1990, 'Eurocode: Basis of structural design'
Ref 10.N	National Highways. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 11.N	National Highways. CD 622, 'Managing geotechnical risk'
Ref 12.N	National Archives. UKSI 2015/51, 'The Construction (Design and Management) Regulations'
Ref 13.N	National Archives. UKSI 2022/712, 'The Construction Products (Amendment) Regulations'

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8. Informative references

The following documents are informative references for this document and provide supporting information.

Ref.	Document
Ref 1.I	BSI. Construction Leadership Council. PAS 2080, 'Carbon Management in Infrastructure'
Ref 2.I	National Highways. CD 352, 'Design of road tunnels'
Ref 3.I	HMSO. Merrison Report, 'Inquiry into the Basis of Design and Method of Erection of Steel Box Girder Bridges'
Ref 4.I	National Highways. GG 103, 'Introduction and general requirements for sustainable development and design'
Ref 5.I	National Highways. www.standardsforhighways.co.uk. Standards for Highways (website), 'Standards for Highways'
Ref 6.I	National Highways. CD 351, 'The design and appearance of highway structures'

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Appendix A. Model form of Approval in Principle for the design of bridges and other highway structures where UK National Standards (Eurocodes) are used

Project details:

Name of project

Name of bridge or structure

Structure reference no.

Summary: set out a brief summary of what this AIP covers, why it is necessary and anticipated construction dates.

1. HIGHWAY DETAILS

1.1 Type of highway

1.2 Design traffic speed [1]

1.3 Existing restrictions [2]

2. SITE DETAILS

2.1 Obstacles crossed

3. PROPOSED STRUCTURE

3.1 Description of structure and design working life [3]

3.2 Structural type

3.3 Foundation type

3.4 Span arrangements

3.5 Articulation arrangements[4]

3.6 Classes and levels[5]

1) consequence class;
2) reliability class;
3) inspection level.

3.7 Road restraint systems requirements

3.8 Proposals for water management[6]

3.9 Proposed arrangements for future maintenance and inspection

1) traffic management;
2) arrangements for future maintenance and inspection of structure. Access arrangements to structure.

3.10 Environment and sustainability[7]

3.11 Durability - materials and finishes [8]

3.12 Risks and hazards considered for design, execution, maintenance and demolition. Consultation with and/or agreement from Overseeing Organisation [9, 23]

3.13 Acceptance of recommendations of the structures Options Report (reference date) to be used in the design and reasons for any proposed changes (including estimated cost of proposed structure). If an Options Report has not been prepared, state the reasons for the selected solution and reasons for rejecting alternatives (including comparative whole life costs with dates of estimates).

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3.14 Proposed arrangements for construction

1) construction of structure;
2) traffic management;
3) service diversions;
4) interface with existing structures or other features.

3.15 Deliberate damage and security.[24]

4. DESIGN CRITERIA

4.1 Actions

1) permanent actions;
2) snow, wind and thermal actions;
3) actions relating to normal traffic under AW regulations and C&U regulations[10];
4) actions relating to General Order traffic under STGO regulations [11];
5) footway or footbridge variable actions;
6) actions relating to Special Order traffic, provision for exceptional abnormal indivisible; loads including location of vehicle track on deck cross-section [12, 13];
7) accidental actions;
8) actions during construction;
9) any special action not covered above [14].

4.2 Heavy or high load route requirements and arrangements being made to preserve the route, including any provision for future heavier loads or future widening

4.3 Proposed minimum headroom to be provided

4.4 Set out measures that will be incorporated into design to minimise maintenance.[15]

4.5 Authorities consulted and any special conditions required

4.6 Standards and documents listed in the technical approval schedule (TAS)

4.7 Proposed departures from standards listed in 4.6

4.8 Proposed departures from standards concerning methods for dealing with aspects not covered by standards listed in 4.6

4.9 Proposed safety critical fixings

5. STRUCTURAL ANALYSIS

5.1 Methods of analysis proposed for superstructure, substructure and foundations [16]

5.2 Description and diagram of idealised structure to be used for analysis

5.3 Assumptions intended for calculation of structural element stiffness

5.4 Proposed range of soil parameters to be used in the design of earth retaining elements

6. GEOTECHNICAL CONDITIONS

6.1 Acceptance of recommendations of the ground investigation report (reference/dates) to be used in the design and reasons for any proposed changes

6.2 Summary of design for highway structure in the ground investigation report

6.3 Differential settlement to be allowed for in the design of the structure

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6.4 If the ground investigation report is not yet available, state when the results are expected and list the sources of information used to justify the preliminary choice of foundations [17]

7. CHECK

7.1 Proposed category and design supervision level

7.2 If category 3, name of proposed independent checker

7.3 Erection proposals or temporary works for which types S and P proposals will be required, listing structural parts of the permanent structure affected with reasons

8. DRAWINGS AND DOCUMENTS

8.1 List of drawings (including numbers) and documents accompanying the submission [18]

9. THE ABOVE IS SUBMITTED FOR AGREEMENT[25]

We confirm that details of the temporary works design will be/have been[19] passed to the permanent works designer for review.[20]

Signed _____

Name _____ Design Team Leader

Engineering Qualifications _____ [21]

Name of Organisation _____

Date _____

Signed _____

Name _____ Check Team Leader

Engineering Qualifications _____ [21]

Name of Organisation _____

Date _____

10. THE ABOVE IS REJECTED/AGREED[19] SUBJECT TO THE AMENDMENTS AND CONDITIONS SHOWN BELOW[20]

Signed _____

Name _____

Position held _____

Engineering Qualifications _____ [21]

TAA _____

Date _____

Notes

1) For a bridge, give over and/or under. Where relevant give the design traffic speed, and posted speed if different.

2) Include weight, height, width and any environmental restrictions at or adjacent to the bridge.

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3) The design working life of the structure including temporary structure, and replaceable structural parts are to be given. They are to be expressed as a number of years rather than a range of years. A design working life is to be based on the DMRB if stated, otherwise it may be based on the guidance given in the Overseeing Organisation's current requirements for the use of Eurocodes for the design of highway structures.

4) Bearings and joints are components that will require maintenance and are vulnerable to water ingress. Where it is proposed not to have a structure with integral construction provide justification for that.

5) State the classes and levels for the whole structure, as well as those for the individual structural elements if higher or lower. See the Overseeing Organisation's current requirements for the use of Eurocodes for the design of highway structures. Identify elements of the structure that require elevated inspection levels and/or areas where specific inspections are recommended at certain stages of construction.

6) Describe how water will be managed within the design of the structure. This includes internally (transport of water through the structure and sealing of elements to prevent water ingress) and externally (global management considering interface with other assets, (watercourses, drainage, pavement, geotechnical features, etc.) Identify allowances that have been made for climate change.

7) Designer to set out the measures they will put in place to ensure that the design will follow industry guidance and best practice on environmental and sustainability aspects in accordance with GG 103 [Ref 4.I]. Confirm carbon impact of design (including uncertainty range) and confirm if that is in line with previous estimates. Confirm Aesthetic Category (CD 351 [Ref 6.I])

8) For concrete structures, give applicable exposure classes for particular structural elements. For all material strengths given, list the relevant codes/standards.

9) Designer to confirm that they have reviewed the risks and hazards identified in the AIP, have consulted with the Principal Designer and are satisfied that these are acceptable. Also see clause 2.27.

10) e.g. Load Models 1 and 2, BS EN 1991-2 [Ref 8.N]

11) e.g. SV model vehicle in Load Model 3, BS EN 1991-2 [Ref 8.N]

12) e.g. SOV model vehicle in Load Model 3, BS EN 1991-2 [Ref 8.N] and/or individual vehicle which includes the following information as applicable:

    a) gross weight of the vehicle in tonnes and vehicle type and number;
    b) axle load and spacing (longitudinally and transversely);
    c) air cushion in tonnes over area applied (in metres, longitudinally and transversely);
    d) single or twin tyres and wheel contact areas.

13) The heavy or high load route requirements should be confirmed by the relevant administration e.g. Abnormal Indivisible Load team in National Highways.

14) e.g. seismic action, atmospheric icing, floating debris, etc.

15) Designs that have minimal maintenance provide significant benefits in reducing the safety risk to the workforce and reducing disruption to the network. Designs that include elements with relatively high maintenance interventions need to be justified through the maintenance and repair statement in accordance with GD 304 [Ref 7.N]. Identify required maintenance regimes (split into bands <6 years, 6-12 years, 12-24 years, over 24 years) which should include items like cleaning, checking bolts, replacing seals, painting, etc. Where the design includes components that have different design life to the main structure these should be separately listed.

16) List the main structural elements for superstructure, substructure and foundation. Identify analysis methods (Note: 'hand calculations, 'spreadsheets or 'software' are not analysis methods.) If the designs of the superstructure, substructure and/or foundation are carried out by different teams, refer to clause 2.84.

17) When the ground investigation report becomes available, an addendum to the AIP, covering section 6, is to be submitted to the TAA. The addendum is to have its own sections 8, 9 and 10 to provide a list of drawings, documents and signatures.

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18) Include:
    a) technical approval schedule (TAS);
    b) general arrangement drawing;
    c) relevant extracts from the ground investigation report;
    d) departures;
    e) relevant correspondence and documents from consultations.
19) Delete as appropriate.
20) This statement is applicable to temporary works design AIP only.
21) CEng MICE, CEng MIStructE or equivalent.
22) AIP is valid for three years after the date of agreement by the TAA. If the construction has not yet commenced within this period, the AIP is to be resubmitted to the TAA for review.
23) Confirm that the risk of harm to vulnerable users (e.g. risk of suicide attempts) has been assessed and where necessary mitigation measures identified.
24) Consider the risk of deliberate damage or unauthorised access to all parts of the structure (e.g. climbable parts) and where necessary outline measures to reduce risk.
25) Submissions are to be made without caveats, disclaimers, limitation and copyright markings or statements.

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Appendix B. Model form of Approval in Principle for the design/assessment of bridges and other highway structures where UK National Standards (Non-Eurocodes) are used

Model form of Approval in Principle (AIP) for the design/assessment[1] of bridges and other highway structures where UK national standards (non-Eurocodes) are used.

Project details:

Name of project:

Name of bridge or structure:

Structure reference no.

Summary: Set out a brief summary of what this AIP covers, why it is necessary and anticipated construction dates.

1. HIGHWAY DETAILS

1.1 Type of highway

1.2 Design traffic speed [2]

1.3 Existing restrictions [3]

2. SITE DETAILS

2.1 Obstacles crossed

3. PROPOSED STRUCTURE

3.1 Description of structure and design working life

3.2 Structural type

3.3 Foundation type

3.4 Span arrangements

3.5 Articulation arrangements

3.6 Road restraint systems requirements

3.7 Proposals for water management [21]

3.8 Proposed arrangements for future maintenance and inspection/inspection for assessment:[1]

1) traffic management
2) arrangements for future maintenance and inspection of structure. Access arrangements to structure
3) intrusive or further investigations proposed[A]

3.9 Environment and sustainability [22]

3.10 Durability - materials and finishes/materials strengths assumed and basis of assumptions[1,4]

3.11 Risks and hazards considered for design, execution, maintenance and demolition. Consultation with and/or agreement from the Overseeing Organisation [5, 23]

3.12[D] Estimated cost of proposed structure, together with other structural forms considered (including where appropriate proprietary manufactured structure), and the reasons for their rejection (including comparative whole life costs with dates of estimates). Reference should be made to any options reports done.

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3.13[D] Proposed arrangements for construction:

1) construction of structure
2) traffic management
3) service diversions
4) interface with existing structures

3.14 Resilience and security [24]

3.15[A] Year of construction.

3.16[A] Reason for assessment.

3.17[A] Part of structure to be assessed.

4. DESIGN/ASSESSMENT[1] CRITERIA

4.1 Actions:

1) permanent actions
2) snow, wind and thermal actions
3) actions relating to normal traffic under AW regulations and C&U regulations [6]
4) actions relating to General Order traffic under STGO regulations [7]
5) footway or footbridge variable actions
6) actions relating to Special Order traffic, provision for exceptional abnormal indivisible loads including location of vehicle track on deck cross-section [8]
7) accidental actions
8) actions during construction
9) any special action not covered above [9]

4.2 Heavy or high load route requirements and arrangements being made to preserve the route, including any provision for future heavier loads or future widening [10]

4.3 Minimum headroom provided

4.4 Authorities consulted and any special conditions required

4.5 Standards and documents listed in the Technical Approval Schedule (TAS)

4.6 Proposed departures from standards listed in 4.5

4.7 Proposed departures from standards concerning methods for dealing with aspects not covered by standards in 4.5

4.8 Proposals for design/assessment[1] of safety critical fixings.

5. STRUCTURAL ANALYSIS

5.1 Methods of analysis proposed for superstructure, substructure and foundations [11], [12]

5.2 Description and diagram of idealised structure to be used for analysis

5.3 Assumptions intended for calculation of structural element stiffness

5.4 Proposed range of soil parameters to be used in the design/assessment of earth retaining elements [13]

6. GEOTECHNICAL CONDITIONS

6.1 Acceptance of recommendations of the ground investigation report to be used in the design/assessment[1] and reasons for any proposed changes

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6.2 Summary of design for highway structure in ground investigation report

6.3 Differential settlement to be allowed for in the design/assessment[1] of the structure

6.4[D] If the ground investigation report is not yet available, state when the results are expected and list the sources of information used to justify the preliminary choice of foundations. [14]

7. CHECK

7.1 Proposed category

7.2 If category 3, name of proposed independent Checker

7.3[D] Erection proposals or temporary works for which types S and P proposals will be required, listing structural parts of the permanent structure affected with reasons

8. DRAWINGS AND DOCUMENTS

8.1 List of drawings (including numbers) and documents accompanying the submission [15]

8.2[A] List of construction and record drawings (including numbers) to be used in the assessment

8.3[A] List of pile driving or other construction records [19]

8.4[A] List of previous inspection and assessment reports

9. THE ABOVE IS SUBMITTED FOR AGREEMENT

We confirm that details of the temporary works design will be/have been[1] passed to the permanent works designer for review.[16]

Signed _____

Name _____ Design/Assessment[1] Team Leader

Engineering Qualifications _____ [17]

Name of Organisation _____

Date _____

Signed _____

Name _____ Check Team Leader

Engineering Qualifications _____ [17]

Name of Organisation _____

Date _____

10. THE ABOVE IS REJECTED/AGREED[1] SUBJECT TO THE AMENDMENTS AND CONDITIONS SHOWN BELOW[18]

Signed _____

Name _____

Position held _____

Engineering Qualifications _____ [17]

TAA _____

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Date _____

Notes

D. Indicates clauses to be used in design AIP only

A. Indicates clauses to be used in assessment AIP only

1) Delete as appropriate.
2) For a bridge, give over and/or under.
3) Include weight, height, width and any environmental restrictions at or adjacent to the bridge.
4) In cases of design, give applicable exposure classes for particular concrete structural elements. In cases of assessment, give material strengths from record drawings or intrusive investigation. For all material strengths given, list the relevant codes/standards.
5) Designers to confirm that they have reviewed the risks and hazards identified in the AIP, have consulted with the Principal Designer and are satisfied that these are acceptable. Also see clause 2.27.
6) e.g. HA Loading
7) e.g. HB or SV Loading
8) e.g. individual vehicle which includes the following information as applicable:
   a) gross weight of the vehicle in tonnes and vehicle type and number;
   b) axle load and spacing (longitudinally and transversely);
   c) air cushion in tonnes over area applied (in metres, longitudinally and transversely);
   d) single or twin tyres and wheel contact areas.
9) e.g. seismic loading, atmospheric icing, floating debris etc
10) If in doubt, the heavy or high load route requirements are to be confirmed by the relevant administration.
11) List the main structural elements for superstructure, substructure and foundation. If the designs of the superstructure, substructure and/or foundation are carried out by different teams, refer to cl. 2.84.
12) Factors of Safety are required where limit state design codes for bridges are not used. See 4.24(5).
13) Where no such geotechnical information is available, suggested earth pressure coefficient values given in relevant DMRB parts should be used instead.
14) When the results of the ground investigation become available, an addendum to the AIP, covering section 6, is to be submitted to the TAA. The addendum is to have its own sections 8, 9 and 10 to provide a list of drawings, documents and signatures.
15) Include, without limitation:
   a) technical approval schedule (TAS);
   b) general arrangement drawing;
   c) relevant extracts from the ground investigation report, inspection report, intrusive investigation report, previous assessment report (or reference for report);
   d) departures;
   e) relevant correspondence and documents from consultations.
16) This statement is applicable to temporary works design AIP only.
17) CEng MICE, CEng MIStructE or equivalent.
18) AIP is valid for three years after the date of agreement by the TAA. If the construction has not yet commenced or the assessment has not been certified within this period, the AIP is to be re-submitted to the TAA for review.

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19) Include details of previous structural maintenance and/or strengthening works.

20) identify required maintenance regimes (split into bands <6 years, 6-12 years, 12-24 years, over 24 years) which should include items like cleaning, checking bolts, replacing seals, etc. Where the design includes components that have different design life to the main structure these should be separately listed.

21) Confirm/identify any allowances that have been included for climate change within the design

22) Confirm carbon impact of design (including uncertainty range) and confirm if that is in line with previous estimates. For assessment, carbon impact only to be calculated if agreed with TAA.

23) Confirm that the risk of harm to vulnerable users (e.g. risk of suicide attempts) has been assessed and where necessary mitigation measures identified.

24) Consider the risk of deliberate damage or unauthorised access to all parts of the structure (e.g. climbable parts) and where necessary outline measures to reduce risk.

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Appendix C. Model form of Approval in Principle for the design/assessment of road tunnel structures and service tunnels

Model form of approval in principle for the design/ assessment[1] of road tunnel structures and service tunnels.

Project details:

Name of project

Name of road/service[1] tunnel

Road/Service[1] tunnel reference no.

1. HIGHWAY DETAILS

1.1 Type of highway

1.2 Design traffic speed

2. TUNNEL DETAILS

2.1 Basic layout [2]

2.2 Restrictions to traffic

3. BRIEF DESCRIPTION OF TUNNEL, TRAFFIC AND TUNNEL GEOMETRY

3.1 Structural form of tunnel and design working life

3.2 Structural form of portal structures

3.3 Traffic and geometry:

1) horizontal and vertical alignment of tunnel and tunnel approaches ;
2) cross-section [3];
3) highway standards [4];
4) accommodation of M&E services in tunnel [5];
5) minimum headroom (traffic gauge), horizontal clearances;
6) structure gauge.

3.4 Classes and levels: [6]

1) Consequence class;
2) Reliability class;
3) Inspection level.

3.5 Proposed arrangements for future inspection and maintenance

3.6 Provision to be made in the tunnel layout for emergency communication and escape facilities, fire points, fixed fire fighting systems, cross passages etc

3.7 Landscaping above tunnel and protection of tunnel roof

3.8 Sustainability issues considered. Materials and finishes for structural walls, ceiling and secondary cladding including fire protection

3.9 Estimate cost of proposed structure together with other structural forms considered and the reasons for their rejection - give comparative whole-life costs (with date of estimate). Reference to be made to any options reports done.

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3.10 Compliance with EU road tunnel safety directive requirements or alternatives with accompanying risk analysis

3.11 Risks and hazards considered for design, execution, maintenance and demolition. Consultation with and/or agreement from Overseeing Organisation [7]

3.12 Resilience and security.

4. DESIGN/ASSESSMENT[1] CRITERIA

4.1 Actions

1) permanent actions;
2) actions relating to normal traffic under AW regulations and C&U regulations [8];
3) actions relating to General Order traffic under STGO regulations [9];
4) actions relating to Special Order traffic, provision for exceptional abnormal indivisible loads; including location of vehicle track on deck cross-section [10];
5) side verge actions;
6) accidental actions;
7) any special action not covered above.

4.2 Authorities consulted and any special conditions required

4.3 Is the tunnel on a heavy and/or high load route, and any provision for future heavier loads or future widening?

4.4 Any loading from planned development over or adjacent to tunnel

4.5 Technical Approval Schedule (TAS)

4.6 Proposed departures from standards given in 4.5

4.7 Proposed departures relating to methods for dealing with aspects not covered by standards in 4.5

4.8 Proposals for design/assessment of safety critical fixings

4.9 Equality impact assessments

5. DESCRIPTION AND DIAGRAM OF IDEALISED STRUCTURE TO BE USED FOR ANALYSIS. METHODS OF ANALYSIS AND DESIGN PROPOSED FOR TUNNEL SUPPORT SYSTEM(S) AND PORTAL STRUCTURES

5.1 Methods of analysis proposed

5.2 Assumptions intended for calculation of structural element stiffness

5.3 Proposed range of angle of shearing resistance (ϕ) representative of the soil type(s) concerned

5.4 Proposed fire design including protection of structure and cables

6. GEOTECHNICAL CONDITIONS

6.1 Acceptance of recommendations of the ground investigation report to be used in the design/assessment[1] and reasons for any proposed changes. (A copy of the ground investigation report is to be supplied to the TAA in advance of the AIP submission whenever possible.)

6.2 Summary of design for highway structure in ground investigation report highway structure summary Information. Give details of any further ground investigation required to validate basis of design/assessment

6.3 Is there any evidence of past mining or is any current or future mineral extraction likely to affect the tunnel?

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6.4 If the ground investigation report is not yet available, state when the results are expected and list the sources of information used to justify the preliminary choice of foundations.[11]

7. WATER MANAGEMENT

7.1 Details of proposed drainage:

1) ground water seepage, sump/pumping arrangements, run off through the portal;
2) accidental spillage, water carried in by vehicles;
3) fire main burst;
4) tunnel washing.

7.2 Details of proposed waterproofing

7.3 Articulation arrangement (immersed tube)

7.4 List special requirements of local drainage authority.

8. TUNNEL SUPPORT SYSTEM AND METHOD OF CONSTRUCTION

8.1 Give the basis of the design of the tunnel support system for temporary and permanent conditions and any proposals for ground treatment.

8.2 Show how the proposed method of construction, i.e. excavation and application of ground support, will ensure the continued safe use of the highway and prevent structural failure of the carriageway.

8.3 Give details of predicted tunnelling effects on adjoining structures and the carriageway; including maximum vertical settlement and trough width.

8.4 Indicate any proposals to use explosives. State any vibration limits adopted or imposed. Have specific site rules relating to charge weight, distance, peak particle velocity and frequency been determined ?

8.5 State method(s) to be adopted to monitor and control the effects of tunnel construction to ensure compliance with any criteria imposed to limit surface movements or vibrations

9. CHECK

9.1 Structure to be category 3 and design supervision level 3 [12]

9.2 Name of proposed independent Checker

10. DRAWINGS AND DOCUMENTS

10.1 List of drawings (including numbers) and documents accompanying the submission [13]

11. THE ABOVE IS SUBMITTED FOR AGREEMENT

Signed _____

Name _____ Design/Assessment[1] team leader

Engineering qualifications _____ [14]

Name of organisation _____

Date _____

Signed _____

Name _____ Check team leader

Engineering qualifications _____ [14]

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Name of organisation _____

Date _____

12. THE ABOVE IS REJECTED/AGREED SUBJECT TO THE AMENDMENTS AND CONDITIONS SHOWN BELOW[1]

Signed _____

Name _____

Position held _____

Engineering qualifications _____[14]

TAA _____

Date _____

Notes

1) Delete as appropriate.
2) Number of tubes, lanes, length between portals.
3) Include widths of lanes, verges, emergency stopping lanes, space outside traffic gauge provided for M&E equipment.
4) Include design flows and speeds and any proposed Departures.
5) A separate submission is required for M&E functions and tunnel services buildings.
6) State the classes and levels for the whole structure, as well as those for the individual structural elements if higher or lower. See the Overseeing Organisation's current requirements for the use of Eurocodes for the design of highway structures.
7) Designers to confirm that they have reviewed the risks and hazards identified in the AIP, have consulted the Principal Designer and are satisfied that these are acceptable. Also, see clause 2.27.
8) e.g. Load Models 1 and 2 of BS EN 1991-2 [Ref 8.N]
9) e.g. SV model vehicle in Load Model 3 in BS EN 1991-2 [Ref 8.N].
10) e.g. SOV model vehicle in Load Model 3 in BS EN 1991-2 [Ref 8.N] and/or Individual vehicle which includes the following information as applicable:
    a) gross weight of the vehicle in tonnes and vehicle type and number;
    b) axle load and spacing (longitudinally and transversely);
    c) air cushion in tonnes over area applied (in metres, longitudinally and transversely);
    d) single or twin tyres and wheel contact areas.
11) When the ground investigation report becomes available, an addendum to the AIP, covering section 6, is to be submitted to the TAA. The addendum is to have its own sections 10, 11 and 12 to provide a list of drawings, documents and signatures.
12) Category 3 for road tunnel and service tunnel structures
13) Include, without limitation:
    a) technical approval schedule (TAS);
    b) general arrangement drawing;
    c) relevant extracts from the ground investigation report;
    d) Departures;
    e) relevant correspondence and documents from consultations;
    f) Tunnel Design Authority output report.
14) CEng MICE, CEng MIStructE or equivalent.

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Appendix D. Model form of Approval in Principle for M&E installations in movable bridges and access gantries

Project details:

Name of project

Name of bridge or structure

Structure reference no.

Summary: set out a brief summary of what this AIP covers, why it is necessary and anticipated construction dates.

1. HIGHWAY DETAILS

1.1 Type of highway

1.2 Design traffic speed [1]

2. STRUCTURE DETAILS

2.1 Brief description of structure

2.2 Date of AIP for structure

3. GENERAL DESCRIPTION OF MECHANICAL AND ELECTRICAL INSTALLATION (M&E)

3.1 Proposed mode of operation of structure

3.2 Location of operating and control mechanism

3.3 Electrical power supply and distribution

3.4 Stand-by-power facilities (UPS etc.)

3.5 Design working life, whole life cost and sustainability considerations

3.6 Resilience and security.

4. OPERATIONAL DESIGN CRITERIA (as relevant)

4.1 Variable actions

4.2 Traffic actions

4.3 Snow actions

4.4 Wind actions

4.5 Thermal actions including temperature range

4.6 Any special actions not listed above (e.g. ship impact)

4.7 List of relevant safety consultation documents:

1) additional relevant standards and publications

4.8 Proposed Departures relating to Departures from standards given in 4.7 and 4.7(1)

4.9 Proposed Departures relating to methods of dealing with aspects not covered by standards in 4.7 and 4.7(1)

4.10 Proposed safety critical fixings

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5. BASIS OF OPERATION AND CONTROL

5.1 Normal operation conditions

5.2 Authorities consulted [2]

5.3 State any special requirements imposed during liaison with such authorities.

5.4 Describe communications system involved.

5.5 Design requirements for emergency works testing and site operating conditions

5.6 Fail-safe operation safety systems, failure and mode effect (FME) analysis

5.7 Arrangements for commissioning and handover to maintaining authority including relevant documentation, operators' manuals

6. PLANT ROOM

6.1 General layout

6.2 Drainage and associated pumping requirements

6.3 Plant room environment; heating, lighting, humidity, ventilation.

6.4 Mechanical and electrical equipping

6.5 Security; intruder and fire alarm systems

6.6 Proposed fire fighting measures

7. DESCRIPTION OF INSPECTION AND MAINTENANCE ARRANGEMENTS

7.1 Proposals for inspection and maintenance of the movable bridge structure or gantry are given in the AIP for the structure

7.2 Proposals for inspection and maintenance of M&E installation

7.3 Proposed documentation [3]

7.4 Proposals for plant monitoring, data collection and management

8. CHECK

8.1 M&E installation to be category 3 [4]

8.2 Name of proposed independent checker

9. DRAWINGS AND DOCUMENTS

9.1 List of drawings and documents (including numbers) accompanying the submission [5]

9.2 List of documents relating to inspection, maintenance and safe operation

10. THE ABOVE IS SUBMITTED FOR AGREEMENT

Signed _____

Name _____ Design Team leader

Engineering qualifications _____ [6]

Name of organisation _____

Date _____

Signed _____

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Name _____ Check team leader

Engineering qualifications _____ [6]

Name of organisation _____

Date _____

11. THE ABOVE IS REJECTED/AGREED SUBJECT TO THE AMENDMENTS AND CONDITIONS SHOWN BELOW[7]

Signed _____

Name _____

Position held _____

Engineering qualifications _____ [6]

TAA _____

Date _____

Notes

1) For a bridge, give over and/or under.
2) For example; traffic, police, highway, maintenance, local, harbour, river, emergency services.
3) Maintenance manual and operator's manual including safe operating procedures.
4) Category 3 for all M&E Installations.
5) Include, without limitation:
   a) AIP for structure;
   b) general arrangement drawing;
   c) departures;
   d) relevant correspondence and documents from consultations;
   e) relevant loading data from the structural design.
6) CEng from an appropriate chartered engineering institution.
7) Delete as appropriate.

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Appendix E. Model form of Approval in Principle for M&E installations in road tunnels and services buildings

Project details:

Name of project

Name of bridge or structure

Structure reference no.

Summary: set out a brief summary of what this AIP covers, why it is necessary and anticipated construction dates.

1. HIGHWAY DETAILS

1.1 Type of highway

1.2 Design traffic speed [1]

1.3 General description [2]

1.4 Any restriction to traffic including maintenance

2. BRIEF DESCRIPTION OF STRUCTURE OPERATION AND MAINTENANCE FRAMEWORK

2.1 Type of structure

2.2 Accommodation of M&E services in the tunnel

2.3 Location of tunnel monitoring centre and maintenance building(s)

2.4 Proposed arrangements for inspection and maintenance

2.5 Location of tunnel services building

2.6 Design working life and estimated costs of M&E services including all running, maintenance and replacement costs and sustainability considerations

3. AUTHORITIES CONSULTED

3.1 List authorities consulted and any special requirements [3]

4. LAYOUT AND BASIC DESIGN CRITERIA

4.1 Basic tunnel geometry [4]

4.2 Environmental conditions within the tunnel plant rooms and buildings [5]

4.3 Technical Approval Schedule (TAS)

4.4 Proposed Departures relating to Departure from standards given in 4.3

4.5 Proposed Departures relating to methods for dealing with aspects not covered by standards in 4.3

4.6 Proposed safety critical fixings

4.7 Equality impact assessments

4.8 Resilience and security.

5. VENTILATION

5.1 General description including justification

5.2 Design criteria [6]

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10.5 Plant inspection and maintenance

11. ELECTRICAL POWER SUPPLY AND DISTRIBUTION

11.1 General description and design criteria including an analysis of power requirements, supply costs and tunnel operating conditions in relation to security of supply

11.2 Supply distribution [23]

11.3 Emergency arrangements [24]

11.4 Cabling [25]

12. TUNNEL SERVICES BUILDINGS AND PLANT ROOMS

12.1 General description [26]

12.2 Design criteria and layout [27]

12.3 Building security and protection [28]

13. CHECK

13.1 Give proposals for checking M&E installations including the design of tunnel services buildings.

13.2 Name of proposed Checker

14. DRAWINGS AND DOCUMENTS

14.1 List of drawings (including numbers) and documents accompanying the submission [29]

15. THE ABOVE IS SUBMITTED FOR AGREEMENT

Signed _____

Name _____ Design team leader

Engineering qualifications _____ [30]

Name of organisation _____

Date _____

Signed _____

Name _____ Check team leader

Engineering qualifications _____ [30]

Name of organisation _____

Date _____

16. THE ABOVE IS REJECTED/AGREED SUBJECT TO THE AMENDMENTS AND CONDITIONS SHOWN BELOW[31]

Signed _____

Name _____

Position held _____

Engineering qualifications _____ [30]

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TAA _____

Date _____

Notes

1) Design speed and during maintenance.
2) Number of tubes, lanes, length between portals
3) For examples: traffic, Police, highway, maintenance, local, harbour, river, emergency services
4) Widths, heights, horizontal and vertical alignments
5) Ambient temperature variations, relative humidity, effects of tunnel washing, road salts etc.
6) Traffic composition and system, tunnel site aspects, environmental effects, air velocities, response to fire
7) Pollution thresholds and emission criteria
8) Basis of determination of fresh air requirements, provision for smoke control details of computer modelling
9) Management of carbon monoxide, visibility, wind speed and direction, tunnel air velocity
10) Road and wall surface maintenance factor
11) Including any limitations imposed by the drainage authority.
12) Ground water, precipitation, wall washing, fire fighting supplies
13) Ventilation, gas detectors, fire prevention and control including automatic systems
14) Fire scenarios and fire modelling, fire loading
15) Fire points and equipment communications, escape means, smoke control, fixed firefighting systems, operating procedures
16) Protection of structure, cabling, role of secondary cladding, cross connection doors
17) Fire detection and control including automatic systems
18) Emergency public, service, fire phones
19) Communication between Police, Fire and Rescue Service, ambulance, maintaining authority, including system of underground communication
20) Including advance warning and diversions, vehicle overheight detection
21) Automatic traffic surveillance, closed circuit television
22) Provision for various operating conditions and resources entailed
23) Details of high voltage distribution on the road tunnel side of electricity supply authority's boundary.
24) Uninterrupted power supply, justification for standby generator
25) Type, location and protection
26) Including a drawing of all plant floors showing equipment layout
27) Plant room and access way loading indicating any loading restrictions in the provision made for transfer and temporary positioning of heavy plant during installation maintenance or replacement
28) Include fire alarm systems.
29) Include, without limitation:
    a) technical approval schedule (TAS);
    b) general arrangement drawing;
    c) departures;
    d) relevant correspondence and documents from consultations;
    e) Tunnel Design Authority output report.
30) CEng from an appropriate chartered engineering institution

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Appendix F. Operation, control and maintenance of movable bridges, and bridge access gantries - Safety Consultation Document

Model form of background discussion document for appending to AIP.

Project details:

Name of project

Name of bridge or structure

Structure reference no.

1. INTRODUCTION

1.1 Purpose of movable bridge/bridge access gantry, Design and Safety Consultation Group [1]

1.2 Terms of reference

1.3 Systems overview (see appendices)

1.4 Safety considerations in the use of movable bridges/access gantries

1.5 Plant

1.6 Communications

1.7 Power supply:

1) emergency supply arrangements

1.8 Emergency breakdown arrangements

1.9 Organisational responsibilities, such as maintaining authority

2. MAINTAINING AUTHORITY

2.1 General

2.2 Lines of communication and cover

2.3 Documentation:

1) operator's manuals ;
2) maintenance & Inspection manuals;
3) permit to work;
4) condition monitoring .

2.4 Day-to-day operations

2.5 Planned maintenance activities

2.6 Emergencies

2.7 Plant failures

3. TRAINING

4. MAINTENANCE COSTS

4.1 General

5. PROCEDURAL TRIALS AND HANDOVER

5.1 Normal use

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5.2 Emergency drill

6. The provisions and procedures described in this document, draft No (number) dated (date) were accepted by the working party on (date)

Signed _____ Project Manager of the Overseeing Organisation

Name _____

Engineering qualifications _____ [2]

Date _____

APPENDICES

A General layout

B General details of system

C Communications

1) general provision
2) location of contacts

Notes

1) The Movable Bridge/Bridge Access Gantry Design and Safety Consultation Group carries out similar functions to the Tunnel Design and Safety Consultation Group (TDSCG).
2) CEng from an appropriate chartered engineering institution.

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Appendix G. Tunnel operation, control and maintenance - Safety consultation document

Model form of background discussion document for appending to AIP.

Project details:

Name of project

Name of bridge or structure

Structure reference no.

1. INTRODUCTION

1.1 Purpose of Tunnel Design and Safety Consultation Group (TDSCG)

1.2 Terms of reference

1.3 Organisational responsibilities [1]

1.4 Overview (see appendices)

1.5 Safety considerations for road tunnels

1.6 Traffic management & signing

1.7 Tunnel plant:

1) ventilation;
2) lighting;
3) drainage;
4) role in emergencies.

1.8 Communications:

1) tunnel;
2) regional;
3) emergency.

1.9 Power supply:

1) normal distribution;
2) emergency arrangements.

1.10 Emergency equipment:

1) fire points;
2) telephones;
3) CCTV;
4) cross connections between tunnel bores.

1.11 Tunnel services building and plant room:

1) functions;
2) maintenance access;
3) security protection;
4) fire protection.

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2. POLICE AND/OR NH TRAFFIC OFFICERS

2.1 Functions

2.2 Police HQ facilities

2.3 Traffic control

2.4 Emergency closures

2.5 Radio communication

2.6 Police computer terminal operations manual

2.7 Special requirements

3. FIRE AND RESCUE SERVICE

3.1 Fire fighting facilities - tunnel

3.2 Fire fighting facilities - services building

3.3 Accidental spillages

3.4 Radio communications

4. AMBULANCE SERVICE

4.1 General

4.2 Radio communications

5. ENVIRONMENT AGENCY

5.1 General

5.2 Specific requirements

6. MAINTAINING AUTHORITY

6.1 General

6.2 Lines of communication and emergency cover

6.3 Documentation:

1) maintenance and Inspection manuals;
2) permit to work;
3) condition monitoring.

6.4 Use of tunnel data

6.5 Day-to-day operations

6.6 Planned maintenance activities

6.7 Emergencies

6.8 Plant failure recording

6.9 Tunnel maintenance equipment:

1) wall washing requirements;
2) maintenance access.

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7. TRAINING

8. MAINTENANCE CONTRACTS

8.1 General

9. TUNNEL EMERGENCIES

9.1 General

9.2 Fire plan

9.3 Major incident response:

1) use of emergency cross passages (doors);
2) emergency drill exercise.

10. The provisions and procedures described in this document draft No. (number) dated (date), were accepted by the working party on (date).

Signed _____ Project Manager of the Overseeing Organisation

Name _____

Engineering qualifications _____ [2]

Date _____

APPENDICES

A. Plan of route

B. Cross section of tunnel

C. Plan of tunnel identifying:

1) emergency/distribution panels, fire points by number;
2) bores;
3) cross passages;
4) fan positions, overrides and controls.

D. Communications:

1) general layout;
2) location of CCTV.

E. Tunnel drainage

F. Traffic management plan

Notes

1. Police, Fire and Rescue Service, ambulance service, Environment Agency, maintaining authority.
2. CEng from an appropriate Chartered Engineering Institution.

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Appendix H. Notes for compiling technical approval schedules (TASs)

Only relevant standards are to be listed. The TAA is to be consulted to confirm whether any specific documents need to be added to the Technical Approval Schedule (TAS).

The Technical Approval Schedule (TAS) is to include the current, relevant publications of the following groups of standards and guidance documents:

1) British Standards;
2) Eurocodes and associated UK national annexes;
3) BSI published documents;
4) Execution Standards referenced in British Standards or Eurocodes;
5) Product Standards referenced in British Standards or Eurocodes;
6) The Manual of Contract Documents for Highway Works (MCHW);
7) The Design Manual for Roads and Bridges (DMRB);
8) Interim Advice Notes (IAN);
9) Specific documents required by the Overseeing Organisation.

The date of the publications (and any amendment) included in the TAS should be given, in the following forms:

1) the year of publication for British Standards, Eurocodes and associated UK national annexes, BSI Published Documents, Execution Standards and Product Standards;
2) the month and year of publication for MCHW documents; and,
3) the last two digits of the year of publication for DMRB documents, or version number

The latest information on DMRB standards documents can be obtained from the Standards for Highways (website) [Ref 5.I]

Insert other relevant supplementary references in the TAS. These can include statutory acts and regulations, Department for Transport or National Highways publications, industry-approved codes of practice or guidance literature on best practice, technical papers/journals, and relevant information from recognised sources.

For new designs, the use of British Standards conflicting with Eurocodes will require approval from the TAA.

An example of a TAS can be obtained from the Standards for Highways (website) [Ref 5.I] and entering TAS in the DMRB search bar.

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Appendix I. Model form of certificate for the design/assessment and/or check of highway structures, including road and service tunnels

Model form of certificate for the design/assessment[1] and/or check[1] of highway structures, including road and service tunnels.

Project details:

Name of project

Name of bridge or structure

Structure reference no.

Section 1

We certify that reasonable professional skill and care has been used in the preparation of the design/ assessment[1] and/or check[1] of (name of structure) with a view to securing that: [2]

1) it has been designed/assessed[1] and/or checked[1] in accordance with
   a) the following standards; or [3]
   b) the Approval in Principle dated (date) including the following: [4, 5, 6]
2) It has been checked for compliance with:
   a) the relevant standards in 1); or, [7, 17]
   b) the assessed capacity of the structure, or elements of the structure, is as follows: [8]

3) It has been accurately translated into construction drawings and bar bending schedules (all of which have been checked)[9]. The unique numbers of these drawings and schedules are:

4) Carbon impact has been assessed, is in the range of the previous estimates[15]

5) Information about the design, construction and maintenance of the structure has been provided to the Client.[16]

Signed _____

Name _____ Design/Assessment[10] team Leader

Engineering qualifications _____ [11]

Signed _____

Name _____

Position held _____ [12]

Name of Organisation _____

Date _____

Signed _____ [7]

Name _____ Check team leader[7]

Engineering qualifications _____ [11, 7]

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Signed _____

Name _____

Position held _____ [12]

Name of Organisation _____

Date _____

Section 2

The Departures and additional criteria given in paragraph 1 are agreed [13]

The certificate is agreed by the TAA

Signed _____

Name _____

Position held _____

Engineering qualifications _____ [14]

TAA _____

Date _____

Notes

1) Delete as appropriate.
2) Where several similar category 0 or 1 structures occur in a project, they may be listed on one certificate.
3) Used for category 0 only. Insert relevant current standards including amendments to date. This certificate should be accompanied by a general arrangement drawing.
4) Not required for category 0. Insert date of agreement of the AIP by the TAA including the dates of any addenda. Note the AIP is valid for three years after the date of agreement by the TAA. If the construction has not yet commenced within this period, the AIP should be resubmitted to the TAA for review.
5) List any departures and additional methods, criteria, GDR or specification clauses.
6) For the certification of M&E functions for highway structures, include here the reference number and date of the relevant safety consultation document.
7) Delete for categories 2 and 3, which require a separate check certificate.
8) Used for assessments only. Assessed capacity is to be recorded in the Overseeing Organisation's management system for structures.
9) The statement "(all of which have been checked)" is not applicable to categories 2 and 3 design certificates.
10) Delete as appropriate or repeat two columns if they are signed by both design/assessment and check teams.
11) CEng MICE, CEng MIStructE or equivalent, but this qualification can be relaxed for Categories 0 and 1 with the agreement of TAA. For Category 3 designs or assessments, the TAA can request a CV for the Design Team Leader (or Assessment Team Leader) demonstrating experience relevant to the design (or assessment).

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12) A principal of the organisation responsible for the design, assessment or check.

13) Delete as appropriate. Note: not permitted for categories 0 or 1 unless the TAA considers that the departure has little or no structural implication.

14) An engineer with appropriate qualification and experience for categories 0 and 1, and with CEng MICE, CEng MIStruct or equivalent for categories 2 and 3.

15) Quote calculated carbon impact and uncertainty range of design in a table with the previous estimates at AIP and Options phases.

16) Designers confirming they have taken reasonable steps to provide, with the design, sufficient information about the design, construction or maintenance of the structure and, where relevant, information on any residual risks, to the Principal Designer/Client.

17) Where it is proposed to use proprietary manufactured structures or products, then signature confirms that the properties have been checked and meet the design requirements.

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Appendix J. Model form of certificate for minor structures and telecom masts on motorways and trunk roads

Model form of certificate for minor structures and telecom masts on motorways and trunk roads

Project details:

Name of project

Column/mast[1] reference no.

Section 1

We certify that the lighting column system/CCTV masts/cantilever masts for traffic signs/signals, speed cameras, telecom masts and/or noise barriers[1] accurately shown on drawing(s) numbers (list drawing numbers) has/have[1] been designed/checked[1] for the following range of parameters (or reference data sheet)[2] and fully complies with:

1) The Specification for Highway Works (edition, date),
2) CD 354 [Ref 5.N], or,
3) the following standards (for the design of telecom masts):

Signed _____

Name _____ Design/Check Team Leaders [3]

Engineering Qualifications _____ [4]

Signed _____

Name _____

Position held _____ [5]

Name of Organisation _____ [6]

Date _____

Section 2

This certificate is agreed by the TAA[7]

Signed _____

Name _____

Position held _____

Engineering qualifications _____ [4]

TAA _____

Date _____

Notes

1) Delete as appropriate.

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2) For lighting column system, specify the range of combinations of column heights and lengths of brackets together with the weights and windage areas of the attachments such as lanterns, design wind speed and assumed ground conditions for which the column has been designed. For CCTV mast, cantilever mast and telecom mast, specify the design wind speed and assumed ground conditions for which the column has been designed. (Note: model data sheets are contained in Series NG1300 of MCHW).
3) Delete as appropriate or repeat if signed by both Designer and Checker.
4) Engineer with appropriate position, qualifications and experience for categories 0 and 1, and with CEng MICE, CEng MIStructE or equivalent for categories 2 and 3.
5) A principal of the organisation responsible for the design or check.
6) Manufacturer or organisation responsible for the design or check.
7) For category 0 minor structures, section 2 is not required.

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Appendix K. Model form of certificate for type 'S' temporary works

Model form of certificate for type 'S' temporary works[1]

Project details:

Name of project

Name of structure

Structure reference no.

Section 1

We certify that reasonable professional skill and care has been used in the checking of the design for the temporary works comprising (description of temporary works)[2] listed in the attached schedule.

We also certify, but without undertaking any responsibility other than towards (name of organisation procuring the temporary works), that in our opinion the erection proposals and proposed temporary works details specified in the attached schedule for the execution of (project title) are satisfactory for the proper discharge of their responsibilities, for the safety of the said part of the works and for their safe execution in accordance with the drawings and specification and without detriment to the related permanent works[3, 4].

Signed _____

Name _____ Temporary Works Check team leader

Engineering qualifications _____ [5]

Name of Organisation _____

Date _____

Signed _____

Name _____

Position held _____

Name of Organisation procuring the temporary works _____

Date _____

Section 2

The permanent works Designer is satisfied that the temporary works have no detrimental effects on the permanent works[6]

Signed _____

Name _____ Permanent Works Design team leader

Engineering qualifications _____ [5]

Name of Organisation _____

Date _____

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Notes

1) A copy of this certificate should be forwarded to the TAA for retention with the AIP, except for category 0, for the permanent structure to which it relates.
2) The description to be inserted is to define unambiguously the extent of the structure to which the check is to be applied. Where necessary the extent of the works is be shown on the drawings and the relevant drawing numbers stated.
3) Delete 'and without detriment to the related permanent works' if the check is carried out by permanent works designer.
4) If there is a detrimental effect on the permanent works, an addendum to the permanent works AIP is to be submitted to the TAA for review.
5) Engineer with appropriate qualification and experience for categories 0 and 1, and with CEng MICE, CEng MIStructE or equivalent for categories 2 and 3.
6) This clause is not required if the check is carried out by permanent works designer.

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Appendix L. Model form of certificate for type 'P' temporary works

Model form of certificate for type 'P' temporary works.

Project details:

Name of project

Name of structure

Structure reference no.

Section 1

We certify that reasonable professional skill and care has been used in the preparation of the design/check[1] of the temporary works comprising (description of temporary works) with a view to securing that:

1) it has been designed/checked[1] in accordance with:
   a) the Approval in Principle dated (date) including the following; [2 3]
   b) The TAA directives for the items listed in Section 3 2) below:[1]
2) the design proposals reflect the requirements of the relevant highway authorities for all affected highways;
3) the design of the temporary works has been accurately translated into temporary works drawings. The unique numbers of these drawings and schedules are:

Signed _____

Name _____ Design/Check[1] team leader

Engineering qualifications _____ [4]

Signed _____

Name _____

Position held _____ [5]

Name of organisation _____

Date _____

Section 2

This certificate is received [6]

Signed _____

Name _____

Position held _____

Name of organisation _____

Date _____

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Section 3

1) The Departures and additional criteria given in paragraph 1 are agreed.[1]
2) It has been directed that the following items are to be dealt with as described. [1,7]

Section 4

1) The Permanent Works Designer is satisfied that the temporary works have no detrimental effects on the permanent works[8]

Signed _____

Name _____ Permanent Works Design team leader[8]

Engineering qualifications _____ [4]

Name of organisation _____

Date _____

Section 5

We have considered and recommend the TAA to accept this certificate [9]

Signed _____

Name _____

Position held _____

Name of organisation _____

Engineering qualifications _____ [4]

Date _____

Section 6

The certificate is accepted by the TAA [10]

Signed _____

Name _____

Position held _____

Engineering qualifications _____ [4]

TAA _____

Date _____

Notes

1) Delete as appropriate.
2) Insert date of acceptance of the AIP by the TAA including the dates of any addenda.
3) List any departures and additional methods or criteria.
4) CEng MICE, CEng MIStructE or equivalent.

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5) A principal of the organisation responsible for the design/check.

6) This is to be completed by the organisation that procures the temporary works. This certificate is to be accepted by the TAA before consent to proceed can be given.

7) Describe the point at issue and the directed course of action.

8) Not applicable to design certificate. Not necessary for existing structures if agreed by the TAA.

9) This is to be completed by the employer's representative on site when applicable.

10) The TAA should inform of its acceptance of this certificate to the organisation that procures the temporary works so that work may then proceed.

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Appendix M. Model form of certificate for specification variation

Project details:

Name of project

Name of structure

Structure reference no.

Summary: Set out a brief summary of what this certificate covers, why it is necessary, and anticipated construction dates.

Section 1

We certify that reasonable professional skill and care has been used in the preparation/check[1] of the following additional and substitute clauses; list clause numbers[2] to the bridgework series clauses of the Specification for Highway Works for (name of project or structures).

The text of these clauses is appended to this certificate.

Signed _____

Name _____ Design[1]/team leader

Engineering qualifications _____ [3]

Signed _____

Name _____

Position held _____ [4]

Name of organisation _____

Date _____

Signed _____

Name _____ Check[1]team leader

Engineering qualifications _____ [3]

Signed _____

Name _____

Position held _____ [4]

Name of organisation _____

Date _____

Section 2

The additional and substitute clauses listed in Section 1 above and appended to this certificate are agreed as Departures.

Section 3

The certificate is agreed by the TAA

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Signed _____

Name _____

Position held _____

Engineering qualifications _____ [3]

TAA _____

Date _____

Notes

1) Delete as appropriate.

2) Only clauses that affect structural integrity, such as new materials, are required to be checked. The category of check should be the same as in the AIP.

3) Engineer with appropriate qualification and experience for categories 0 and 1, and with CEng MICE, CEng MIStructE or equivalent for categories 2 and 3.

4) A principal of the organisation responsible for the design or check.

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Appendix N. Model form of certificate of construction compliance

Project details:

Name of project

Name of structure

Structure reference no.

Approval in Principle[1] dated (date) and addenda[1] (date):

Construction drawings (permanent and temporary works[1,2]) and bar bending schedules listed within the design and check certificate/certificates[1] (date) [3]:

'As constructed' drawings[3] and bar bending schedules[3]; the unique numbers of these drawings and schedules are:

Schedule of drawings/bending schedules

Document Number	Title	Revision	Date

'As built' information has been uploaded onto the client asset management system.[11]

The carbon impact has been assessed and is within the agreed range. [12, 13]

The Specification for Highway Works (date), including additional and substituted clauses recorded in certificates for specification variations[1,3] (date):

Section 1

We certify[14] that (name of structure) and its equipment[4]:

1) have been constructed, commissioned and tested[1] in accordance with:
   a) the construction drawings and bar bending schedules listed within the above design and check certificate/certificates[1], with any modifications in accordance with the technical approval procedures given in DMRB CG 300, [1]except (list exception(s) and give appropriate information and reason for non-compliance [5]).
   b) the above Specification for Highway Works and specification variations, [1]except (list exception(s) and give appropriate information and reason for non-compliance [5]).
2) The execution of the works has been accurately translated into 'as constructed' drawings and bar bending schedules as listed above.[10]

Signed _____

Name _____ Contractor's representative

Engineering qualifications _____ [6]

Signed _____

Name _____

Position held _____ [7]

Name of organisation _____

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Date _____

Section 2

We certify[14] reasonable professional skill and care has been used, relating to the execution of (name of structure), in the task described below (choose[8] either 1), 2) or 3):

1) [1]examining the execution and that it has been constructed, commissioned and tested in accordance with:
   a) the above Approval in Principle, Design and Check certificate/certificates[1], with any modifications in accordance with the technical approval procedures given in DMRB CG 300,[1]except (list exception(s) and give appropriate information and reason for non-compliance[5]); and,
   b) the construction drawings and bar bending schedules listed within the Design and Check certificate/certificates[1] (date)[3], as modified by authorised variations accepted by the Overseeing Organisation,[1]except (list exception(s) and give appropriate information and reason for non-compliance[5]).
2) [1,9]'hands off' audit role assessment to ensure that the correct quality control procedures have been followed; or,
3) [1](state task/role required under the contract's work specification or if different, the actual task/role performed and give appropriate information and reason for non-compliance[8]).

Signed _____

Name _____

Work Examiner's Representative

Engineering qualifications _____ [6]

Position held

Name of organisation

Date _____

3. This certificate is agreed by the TAA

Signed _____

Name _____

Position held

Engineering qualifications _____ [6]

TAA _____

Date _____

Notes

1) Delete as appropriate.
2) Temporary works are required where they may have significant effect on the permanent works.
3) A full list to be given including any addenda.

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4) Certification for mechanical and electrical installations are not required as they are covered in Section 6 of CG 300. However all the maintenance and operation manuals, including guarantees, should be provided to the Overseeing Organisation.

5) Consider appropriate measure if required and advise the TAA if it needs to be recorded in the Overseeing Organisation's management system for structures.

6) Competent engineer with appropriate qualification and experience e.g. for Categories 0 and 1, and with CEng MICE, CEng MIStructE or equivalent for Categories 2 and 3. The acceptance of competency criteria can be varied, subject to TAA agreement.

7) A principal of the Contractor or organisation responsible for the execution

8) Options 2 & 3 allow for certification by independent parties to provide assurance on work elements. However Option 1 is a requirement for all projects.

9) A hands off audit role provides additional assurance for complex projects or procedures. Where required, this will be in addition to the works examiner.

10) Where 'as constructed' drawings and bar bending schedules have not been completed then this clause is to be omitted and the certificate marked as 'Interim' – reference CG 300 clause 2.95.1.

11) This includes 'as-built' drawings, requirements for maintenance, manufacturer's instructions, product data sheets and other information that would assist the client in managing that structure. - Reference DMRB CG 302 [Ref 1.N].

12) The range of carbon estimates to be included listing the estimate, uncertainty range and method of calculation for each stage (Options phase, AIP, Design and 'as-built')

13) Where agreed with the TAA this information may be omitted for some structures.

14) Certification to be made without caveats, disclaimers, limitations or statements.

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Appendix O. Structure options report

O.1 Introduction

The TAA is to be consulted prior to preparing the report to assist in determining the most appropriate options to be included in the report.

The format is provided in O.2 of a structure options reports for new works, maintenance, modification, refurbishment, strengthening and demolition where there are a number of realistic cost-effective alternatives to be evaluated. This applies to permanent structures expected to be category 2 or 3 and to permanent structures expected to be category 0 or 1 with an estimated cost of more than £0.5million. The report should contain only necessary relevant information and state 'Not Applicable' in sections not relevant. Additional sections are to be added where necessary.

The structure options report should briefly summarise the development process for each of the structure proposals, identifying all significant influences on the form of structure proposed and reasons for rejecting other structural forms.

Where a proposal has previously been considered in procedures such as value management, it is important that this is referenced in section 1.1 of the options report. This is to ensure relevant continuity is maintained between these procedures and the conclusions of the options report. For consistency, an option brought forward from previous considerations is to be detailed as option 1 in the options report.

For maintenance work, where options during value management processes have been considered in sufficient detail to meet the above criteria then, with agreement of the TAA, a separate options report may not be necessary.

O.2 Report structure and content

Project details:

Name of project

Name of structure

Structure reference no.[1]

Report structure and content

Report section	Notes for guidance
1.1 Introduction	Brief scheme overview. State if the structure has previously been considered in other procedures such as value management. For an existing structure give a description of the structure, current condition and state what certification exists with the current assessment rating. List the options considered at pre-options stage, state which options will be considered in detail within this report, which have been discounted and state the reasons. Append location plan and schedule of structures.

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Report structure and content (continued)

1.2 Consultations and requirements	List all parties consulted, e.g. project managers, maintaining agent, other authorities, specialist suppliers, Principal Designer, etc. State their requirements and what agreements have been made. Describe the current and proposed utilities.
1.3 Geology	Where relevant, summarise the geology of the site and any key risks.
1.4 Loading	State high and heavy load route requirements. State any current restrictions and or constraints.
1.5 Environment	Summarise environmental requirements and any constraints. Identify if any option has a significant beneficial/detrimental impact in comparison with the other options. Proposals for each option are to are to provide estimates of carbon impact, identify the method used to prepare estimates (for examples GG 103 [Ref 4.I], PAS 2080 [Ref 1.I], GD 304 [Ref 7.N] etc) and the upper and lower bounds of that estimate (uncertainty range). Also set out the basis for the design and materials used and any assumptions made (i.e. that all materials are locally sourced) Provide justification where it is proposed that the application of sustainable development goals are deemed a low priority or not relevant.
1.6 Land and property	Summarise land and property requirements and any constraints.
2.1 Description of proposed structure options	State if option is brought forward from consideration in other procedures (as described in section 1.1). Attach an outline general arrangement drawing to illustrate each option. Include cross sections showing any construction constraints associated with carrying out the work.
2.2 Capital cost and whole life cost	List major assumptions in determining whole life costs. Forecast maintenance regimes (including carbon impact) should be estimated and costed for each option over the life of the structure. List separately any user delay costs during construction as well as during future maintenance.
2.3 Appearance	Describe the aesthetic form and the setting, and if consultation required with Design Panel. State aesthetic category in accordance with CD 351 [Ref 6.I] Describe proposed finishes (for preferred option only).

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Report structure and content (continued)

2.4 Sustainability and use of natural resources	Give anticipated requirements for use of natural resources and potential for use of recycled materials.
2.5 Durability/design life	State durability assumptions and design life. State how water will be managed, including surface/subsurface drainage and mitigation measures for controlling leakages from service ducts. Identify provision for climate change.
2.6 Health and safety, and potential risks and constraints to the project	List any unusual hazards and risks.Confirm that the Principal Designer has been consulted and is content that the risks are acceptable. Assess the risk of harm to vulnerable users (such as the risk of suicide attempts), or unauthorised access (such as climbable parts) and, where appropriate, outline potential mitigation.
2.7 Proposed analysis method	Describe the proposed analysis method. e.g. linear elastic grillage.
2.8 Departures from standards	Include a brief summary of all Departures from standard proposals necessary for each option, and indicate any yet to be agreed or likely to be critical to option.
2.9 Construction	Describe any construction constraints, including interfaces with existing highway or other infrastructure. State temporary traffic management measures agreed with the Overseeing Organisation project manager.
2.10 Operation and maintenance	Identify if any option has a significant beneficial/detrimental impact in comparison with the other options. Describe any unusual methods and facilities required to carry out inspections and maintenance.
2.11 Preferred option	A brief conclusion identifying the preferred option and reason for selection.
2.12 Proposed category of check	State reason for proposed category of check when not in accordance with guidance in this document.
2.13 Role of the works examiner supervising the works	Role of the works examiner to be agreed by the Overseeing Organisation (i.e. options 1, 2, or 3 listed in section 2 of the construction compliance certificate in Appendix N). (Note – Options 2 or 3 are in addition to 1, and are used when the designer considers additional inspections are necessary for an element of work)

THE ABOVE IS SUBMITTED FOR ACCEPTANCE

Signed _____

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Name _____

Position held _____

Engineering qualifications _____ [2]

Name of organisation _____

Date _____

PREFERRED OPTION AGREED

Signed _____

Name _____

Position held _____

Engineering qualifications _____ [2]

TAA _____

Date _____

Notes

1. Ideally this should be a structure key from the Overseeing Organisation's asset management database if available.

2. CEng MICE, CEng MIStructE or equivalent

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Appendix P. Proprietary manufactured structures

1. Scope of Appendix P

The range of proprietary manufactured structures may include various types of culverts; small span underbridges (up to eight metres span) in precast concrete; various systems for earth-retaining structures such as reinforced/anchored earth systems; crib and gabion walls, lighting columns, large sign supports (greater than 7 m high) and environmental barriers.

These structures may be supplied with their performance declared in accordance with the requirements of the UKSI 2022/712 [Ref 13.N] (under a UKCA/CE mark) either through compliance with a European harmonised standard or a European Technical Approval (ETA) issued by the European Organisation for Technical Approvals (EOTA).

Requirements for avoiding "barriers to trade" when specifying proprietary manufactured structures and products, and for application of the TA procedure to proprietary products that have their performance declared in accordance with the CPR are given in CG 300 clause 2.5.

2. Different forms of construction

Generally the form of structure appropriate for a particular application will fall into one of the following groups:

1) those where a uniquely designed structure is most suitable for the site conditions and end requirements. Such a design will be based substantially on non-proprietary materials such as reinforced concrete or structural steel, although some of the individual components may be proprietary products;
2) those where a proprietary manufactured structure is the most suitable, e.g. a corrugated-steel buried structure, a precast concrete culvert selected from a manufacturer's range of products, or a proprietary reinforced earth wall system; or,
3) those where either form of construction would be more or less equally suitable.

To avoid the risk of discrimination, the Designer is to demonstrate to the TAA at the AIP stage that all three groups as described in 2, as above, have been considered. However, there is no obligation on the Designer to adopt a design in a particular form, if there are sound engineering or aesthetic reasons for believing it to be inappropriate, or another option has clearly identified advantages that justify limiting the choice. The reasons for the final selection should be clearly recorded on the AIP form agreed by the TAA.

Where the use of a proprietary manufactured structure is not assessed as appropriate for aesthetic or other reasons, the status and authority of the person(s) making that judgement should be clearly established and recorded on the AIP form. Where others, such as planning or water authorities, with a legitimate interest or statutory duty to consider the form of structure to be provided, will not permit a particular form, that authority should be asked to provide a written justification of its position and confirmation that it is aware of the legal implications.

In assessing the suitability of a particular form of construction, the Designer will assess whether maintenance costs can affect the choice. In order to ensure fair competition between different structures, the foreseeable special maintenance costs need to be added to the contract construction costs. Where this is believed necessary, it should be made clear in the O/AIP (see Appendix P 4. below).

3. Proprietary designs

Where the Designer decides that a proprietary manufactured structure is the most suitable, an outline AIP (O/AIP) should be provided for all the relevant design parameters and end-use requirements for the structure. This should include appropriate statements regarding appearance, environment and maintenance considerations. A check list of requirements for the O/AIP is given in Appendix P.4. The O/AIP should be submitted to the TAA for agreement.

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4. Outline AIP

The O/AIP for proprietary manufactured structures may be based on the relevant sections of the model AIP Appendix A and include any other additional requirements. A check list of requirements for the O/AIP is given as follows:

CHECK LIST OF ESSENTIAL REQUIREMENTS FOR AN OUTLINE AIP (O/AIP)

1. location;
2. operational dimensions/levels;
3. requirements for traffic loads;
4. requirements for other actions;
5. relevant Overseeing Organisation standards, UK national standards (Eurocodes and non-Eurocodes), BSI Published Documents, Codes of Practice, etc.; and,
6. general arrangement drawing including the designated outline.

CHECK LIST OF OTHER REQUIREMENTS FOR AN OUTLINE AIP (O/AIP)

7. ground investigation data;
8. appearance of structure;
9. environmental factors;
10. constraints/external control during execution;
11. operational or user requirements;
12. special maintenance; and,
13. any other essential requirements.

5. Confirmation of compliance

Where a proprietary structure or product is supplied in accordance with an O/AIP and the item has been UKCA/CE marked in accordance with the CPR, the Designer is to confirm to the TAA in a certificate that they have inspected the declared performance under the UKCA/CE mark and that declared performance of the item meets the requirements of the O/AIP.

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Highway Structures & Bridges
General Information

CG 300 - ENAA
England National Application Annex for Technical approval of highway structures

(formerly BD 2/12)

Version 0.1.1

Summary
This National Application Annex sets out the Highways England-specific requirements on technical approval (TA) of highway structures.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated National Highways team. The online feedback form for all enquiries and feedback can be accessed at: www.standardsforhighways.co.uk/feedback.

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Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CG 300 - ENAA	0.1.1	January 2025	England NAA	Incremental change to notes and editorial updates

RELEASE NOTES: Version 0.1.1: Minor editorial changes only. Publishing January 2025.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CG 300	0.1.0	April 2021	England NAA	Incremental change to requirements
CG 300	0	March 2020		

WITHDRAWN

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Foreword

Publishing information

This document is published by National Highways.

This document supersedes part of BD 2/12, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

WITHDRAWN

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Introduction

Background

This National Application Annex gives the National Highways-specific requirements and advice for the application of technical approval (TA) procedures in England.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 1.N] apply to this document.

Mutual Recognition

Where there is a requirement in this document for compliance with any part of a "British Standard" or other technical specification, that requirement may be met by compliance with the Mutual Recognition (See GG 101 [Ref 1.N]).

WITHDRAWN

Downloaded from https://www.standardsforhighways.co.uk on 31-Oct-2025, CG 300 Version 0.2.1, published: 07-Feb-2025

Abbreviations

Abbreviation	Meaning
DBFO	Design, build, finance, operate (contract scheme)
TA	Technical approval

WITHDRAWN

Downloaded from https://www.standardsforhighways.co.uk on 31-Oct-2025, CG 300 Version 0.2.1, published: 07-Feb-2025

E/1. Particular requirements for DBFO schemes (CG 300, whole document & 3.4-3.10)

Use of interim requirements for technical approval of highway structures in English DBFO schemes

E/1.1 When used on the A69 Carlisle to Newcastle DBFO Contract, this document shall be amended as follows:

Table E/1.1 A69 Carlisle to Newcastle DBFO Contract

Paragraph no.	Description
Whole document	Delete whole document except the paragraphs identified below.
Clauses 3.4 to 3.10 Criteria for Categories 0, 1, 2 and 3.	These criteria replace the criteria in Paragraph 34 of Section A of Part 3 of Schedule 4.

E/1.2 When used on the A1(M) Alconbury to Peterborough DBFO Contract, the A417/A419 Swindon to Gloucester DBFO Contract, the M1A1 Link Road (Lofthouse to Bramham) DBFO Contract, the A50/A564 Stoke-Derby Link DBFO Contract, the A30/A35 Exeter to Bere Regis DBFO Contract, the M40 Junctions 1 to 15 DBFO Contract, the A19 Dishforth to Tyne Tunnel DBFO Contract, the A1 Darrington to Dishforth DBFO Contract and the A249 Stockbury (M2) to Sheerness DBFO Contract, this document shall be amended as described in Table E/1.2:

Table E/1.2 CG 300 amendments for specific DBFO contracts

Paragraph no.	Description
Whole document	Delete whole document except the paragraphs identified below.
Clauses 3.4 to 3.10 Criteria for Categories 0, 1, 2 and 3.	These criteria replace the criteria in Paragraph 35 of Section A of Part 3 of Schedule 4.

E/1.3 When used on the M25 DBFO Contract, this document shall be amended as described in Table E/1.3:

Table E/1.3 Document amendments for M25 DBFO Contract

Paragraph no.	Description
Whole document	Delete whole document except the paragraphs identified below
Clauses 3.4 to 3.10 Criteria for Categories 0, 1, 2 and 3.	These criteria replace the criteria in Paragraph 12.2 of Section A of Part 1 of Schedule 8

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E/2. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref.	Document
Ref 1.N	National Highways. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

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Department for Infrastructure
An Roinn Bonneagair
Depairtment fur Infrastructure
www.infrastructure-ni.gov.uk

Highway Structures & Bridges
General Information

CG 300 - NINAA
Northern Ireland National Application Annex for Technical approval of highway structures

(formerly BD 2/12)

Version 0.0.1

Summary
This National Application Annex sets out the Department for Infrastructure, Northern Ireland-specific requirements on technical approval of highway structures.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated team in the Department for Infrastructure, Northern Ireland. The email address for all enquiries and feedback is: dcu@infrastructure-ni.gov.uk

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Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CG 300 - NINAA	0.0.1	January 2025	Northern Ireland NAA	Incremental change to notes and editorial updates

Version 0.0.1.0.: [Publication date January 2025]: Minor editorial changes only. Revision 1: No changes are required to the NI NAA as a result of the changes proposed to CG300. Revision 0 (March 2020) Department for Infrastructure Northern Ireland National Application Annex to CG 300.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CG 300	0	March 2020		

WITHDRAWN

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Foreword

Publishing information

This document is published by National Highways on behalf of the Department for Infrastructure Northern Ireland.

This document supersedes BD 2/12, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

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Introduction

Background

This National Application Annex gives the Department for Infrastructure, Northern Ireland-specific requirements and advice for the application of technical approval procedures on all roads in Northern Ireland.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 1.N] apply to this document.

Mutual Recognition

Where there is a requirement in this document for compliance with any part of a "British Standard" or other technical specification, that requirement may be met by compliance with the Mutual Recognition clause in GG 101 [Ref 1.N].

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Abbreviations

Abbreviation	Meaning
AiP	Approval in Principle
TAA	Technical approval authority

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Downloaded from https://www.standardsforhighways.co.uk on 31-Oct-2025, CG 300 Version 0.2.1, published: 07-Feb-2025

Terms and Definitions

Term	Definition
Principal Contractor	The organisation or individual appointed by the client to plan, manage and monitor and coordinate the construction phase of work required by the NISR 2016/146 [Ref 2.N]
Principal Designer	The designer appointed by the client to perform specific duties required by the NISR 2016/146 [Ref 2.N]

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NI/1. General requirements and principles (CG 300, 2)

Overseeing Organisation requirements (CG 300, 2.2 & 2.3)

NI/1.1 The initial submission of Approval in Principle (AiP) and certificates shall be in hard copy and electronic format.

NI/1.1.1 Subsequent resubmissions of AiP and certificates may be in electronic format only, where agreed by the TAA.

NI/1.2 Original manuscript signatures shall be submitted on all documents.

Use of UK national Standards (CG 300, 2.14 & 2.15)

NI/1.3 Model forms specific to Department for Infrastructure, available on the Department for Infrastructure website, shall be used.

Options report (CG 300, 2.16)

NI/1.4 An options report shall not be required unless specifically requested by the TAA.

Submission for AiP (CG 300, 2.46)

NI/1.5 Model forms specific to Department for Infrastructure shall be used and are available on the Department for Infrastructure website.

Certification (CG 300, 2.94)

NI/1.6 Construction compliance certificate shall be submitted to the Department for Infrastructure Roads divisional office for acceptance.

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NI/2. Bridges and other highway structures

NI/2.1 Where the document mentions Interim Advice Notes (IAN) confirmation shall be sought from the Overseeing Organisation as to the applicability of the information within that note to any particular proposal or if alternative documents are referenced.

Bridges and other highway structures (CG 300, 3.3 parts 4), 5) & 6))

NI/2.2 In addition to to the requirements of clause 3.3, the procedures described in Section 3 shall be applied to

1) earth retaining structures where the effective retained height, i.e. the level of the fill at the back of the structure above the finished ground level in front of the structure, is 1.0 m or greater;
2) reinforced/strengthened soil/fill structure, with hard facings, where the effective retained height is 1.0 m or greater;
3) reinforced/strengthened soil/fill structure where hard facings are not provided and the face inclination exceeds 70 degrees.

Certification (CG 300, 3.13)

NI/2.3 Model forms specific to the Department for Infrastructure shall be used and are available on the Department for Infrastructure website.

Documentation (CG 300, 3.14 & 3.16)

NI/2.4 Model forms specific to the Department for Infrastructure shall be used and are available on the Department for Infrastructure website.

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NI/3. Temporary works (CG 300, 4.0)

Temporary works (CG 300, 4.2 & 4.4.1)

NI/3.1 Type N temporary works proposals shall be dealt with under the Principal Contractor's own procedures and do not require involvement of the Overseeing Organisation, nor any submission to be made to the Technical Approval Authority.

Type S proposals (CG 300, 4.19)

NI/3.2 Model forms specific to the Department for Infrastructure shall be used and are available on the Department for Infrastructure website.

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NI/4. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref.	Document
Ref 1.N	National Highways. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 2.N	National Archives. NISR 2016/146, 'The Construction (Design and Management) Regulations (Northern Ireland) 2016'

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Highway Structures & Bridges
General Information

CG 300 - SNAA
Scotland National Application Annex for Technical approval of highway structures

(formerly BD 2/12)

Version 0.0.1

Summary
This National Application Annex sets out Transport Scotland's specific requirements on the technical approvals of highway structures.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Transport Scotland team. The email address for all enquiries and feedback is: TSStandardsBranch@transport.gov.scot

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Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CG 300 - SNAA	0.0.1	January 2025	Scotland NAA	Incremental change to notes and editorial updates

Version: 0.0.1: Editorial changes only, including change of HE branding to NH; [Publication date December 2024.] Revision 1 (DATE TBC) No additional changes. Revision 0 (March 2020) Transport Scotland National Application Annex to CG 300.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CG 300	0	March 2020		

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Foreword

Publishing information

This document is published by National Highways on behalf of Transport Scotland.

This document supersedes BD 2/12, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

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Introduction

Background

This National Application Annex gives the Transport Scotland-specific requirements for technical approval procedures of highway structures.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 1.N] apply to this document.

Mutual Recognition

Where there is a requirement in this document for compliance with any part of a "British Standard" or other technical specification, that requirement may be met by compliance with the Mutual Recognition clause in GG 101 [Ref 1.N].

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S/1. Bridges and other highway structures (CG 300, 1)

Scope

S/1.1 Where the document mentions interim advice notes (IANs) confirmation shall be sought from the Overseeing Organisations as to the applicability of the information within that note to any particular proposal or if alternative documents are referenced.

S/1.2 CG 300 clause 3.3 list item 1) shall not apply and be amended to the following:

1) highway structures with clear span or internal diameters of 2.0 m or greater;
2) corrugated buried structures 0.9 m span or greater.

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S/2. Model form of Approval in Principle for the design of bridges and other highway structures where UK National Standards (Eurocodes) are used (GC 300, Appendix A)

S/2.1 In note 23, assessments of the risk of harm to vulnerable users (e.g. risk of suicide attempts), if applicable, shall consider consultations with relevant parties such as local suicide prevention groups, Samaritans and local mental health professionals, a review of local facilities such as hospitals, drug or alcohol addiction centres and the frequency of incidents at nearby structures.

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S/3. Model form of Approval in Principle for the design/assessment of bridges and other highway structures where UK National Standards (Non-Eurocodes) are used (CG 300, Appendix B)

S/3.1 In note 23, assessments of the risk of harm to vulnerable users (e.g. risk of suicide attempts), if applicable, shall consider consultations with relevant parties such as local suicide prevention groups, Samaritans and local mental health professionals, a review of local facilities such as hospitals, drug or alcohol addiction centres and the frequency of incidents at nearby structures.

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S/4. Structure options report (CG 300, Appendix O)

S/4.1 In 2.2 of 'Report structure and content' table, capital cost and whole life cost, assumptions included in the calculation of carbon impact, e.g. inclusion of carbon from maintenance vehicles and traffic diversion carbon to carry out major maintenance, shall be agreed with the TAA.

S/4.2 In 2.6 of 'Report structure and content' table, health and safety, and potential risks and constraints to the project, when assessing the risk of harm to vulnerable users (such as the risk of suicide attempts), if applicable, the options report shall include summary conclusions of consultations with relevant parties such as local Suicide Prevention Groups, Samaritans and local mental health professionals, the impact of any local medical facilities such as hospitals, drug or alcohol addiction centres and the frequency of incidents at nearby structures.

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S/5. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref.	Document
Ref 1.N	National Highways. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

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Llywodraeth Cymru
Welsh Government

Highway Structures & Bridges
General Information

CG 300 - WNAA
Wales National Application Annex for Technical approval of highway structures

(formerly BD 2/12)

Version 0.1.1

Summary
This National Application Annex gives the Welsh Government-specific requirements for the technical approval procedures of highway structures in Wales.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Welsh Government team. The email address for all enquiries and feedback is: Standards_Feedback_and_Enquiries@gov.wales

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Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CG 300 - WNAA	0.1.1	January 2025	Wales NAA	Incremental change to notes and editorial updates

Version 0.1.1: Change Highways England branding to National Highways only. [Publication in January 2025.]

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CG 300	0.1.0	April 2021	Wales NAA	Incremental change to requirements
CG 300	0	March 2020		

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Foreword

Publishing information

This document is published by National Highways on behalf of the Welsh Government.

This document supersedes BD 2/12, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

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Introduction

Background

This National Application Annex gives the Welsh Government-specific requirements for the technical approval procedures of highway structures in Wales.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 1.I] apply to this document.

Mutual Recognition

Where there is a requirement in this document for compliance with any part of a "British Standard" or other technical specification, that requirement may be met by compliance with the Mutual Recognition clause in GG 101 [Ref 1.I].

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Abbreviations

Abbreviation	Definition
CO_2e	Carbon dioxide equivalent
IRIS	Integrated road information system
ITS	Intelligent transport system
SAVI	Structures asset valuation and investment tool
VRS	Vehicle restraint system

WITHDRAWN

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W/1. Bridges and other highway structures (CG 300, 1)

Scope

W/1.1 Clause 2.21 shall be amended to utilise screening forms.

NOTE *The model screening form in Appendix W/A. of this document can be used.*

W/1.2 Clause 3.6 7) shall be amended to apply to noise barriers less than 3 m high and without overhangs.

W/1.3 Clause 3.8 6) shall be amended to apply to noise barriers 3 m high or more or with overhangs.

W/1.4 The risk of deliberate damage and security shall be considered within the design/assessment stage.

NOTE 1 *The TAA expects to see in the resilience and security/deliberate damage clause of the AIP either how the resistance of the structure to the below sub-clauses has been considered or a summary of the existing measures in place to provide resilience and security. The "Deliberate damage / Resilience and security" clause number varies depending on which Model form of Approval in Principle is used as follows, clause 3.15 in Appendix A, clause 3.14 in Appendix B, clause 3.12 in Appendix C, clause 3.6 in Appendix D and clause 4.8 in Appendix E.*

NOTE 2 *The TAA expects to see special consideration towards higher-risk areas. Examples include but are not limited to bridge inspection/access chambers within box-beams, abutment galleries, confined spaces, culverts, elevated platforms with access ladders and any area where a fall from height could occur.*

NOTE 3 *Actions prevented could include, but are not limited to, physical harm/injury to others, suicide and self-harm, political propaganda, hate crime, or distractions to drivers. Examples include, but are not limited to, motorway gantries, access to the railway environment, ITS structures, and services bridges.*

NOTE 4 *The design of security installations need to factor in access for maintenance of the structure.*

W/1.5 Where applicable, the model form clause requirements given in Section W/2. of this document shall be applied to all model forms of AIPs.

NOTE *Other model forms of AIPs are included within Appendices B, C, D and E.*

WITHDRAWN

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W/2. Additional requirements on Approval in Principle for the design of bridges and other highway structures where UK National Standards (Eurocodes) (additional to CG 300, Appendix A)

W/2.1 All new highway structures shall have a unique Welsh Government structure number.

NOTE *Guidance for creating new structure numbers is provided in CG 305 [Ref 3.N].*

W/2.2 The structure number shall be agreed with the TAA and included within the AIP.

W/2.3 A proposed construction programme containing dates shall be included in the project details section of the AIP.

NOTE *The TAA expects to see best estimates for construction dates if a formal programme is not available.*

W/2.4 For repair / refurbishment / strengthening schemes, AIP clause 3.1 'Description of structure and design working life' shall include a table of all the replaceable elements with the condition and design working life, and remaining life in years.

NOTE 1 *The estimated remaining life of each element from the Structures Asset Valuation and Investment Toolkit (SAVI) can be provided by Welsh Government.*

NOTE 2 *The Designer can identify further opportunities within the scheme if properly justified.*

W/2.4.1 The Designer should base their estimates on their engineering experience and on the condition of the element, such as with guidance provided by the SAVI data.

W/2.5 AIP clause 3.5 shall be reflected in the idealised structure diagram used for analysis.

W/2.5.1 The idealised structure diagram should clearly show the structural members, support conditions, articulation, and principal dimensions.

W/2.5.2 A separate diagram for the temporary construction stages should be provided where applicable.

W/2.5.3 The applied actions should also be indicated where relevant.

NOTE *Numerical values of applied actions and reactions are not required in the AIP stage.*

W/2.6 AIP clause 3.7 shall be sufficiently detailed.

W/2.6.1 The details should include information on the design code, type of risk assessment, containment level, parapet working width, consideration of land availability to accommodate the approach/departure VRS, connection between bridge parapet and approach/departure VRS.

W/2.6.2 Proposals for pedestrian protection on or under the structure e.g., at top of wing walls,head walls and retaining walls, should be included in the AIP.

W/2.7 AIP clause 3.9 shall consider if systems to monitor the health and/or performance of the structure are appropriate.

W/2.7.1 Estimated costs and benefits should be provided for any proposed structural health monitoring systems.

W/2.8 AIP clause 3.9 shall be thoroughly considered.

W/2.8.1 The forecast maintenance regime required for the remaining life of the asset should be included.

NOTE 1 *The TRMM (Trunk Road Maintenance Manual) sets out the routine and cyclic maintenance policy to be applied on the SRN in Wales. The document is available upon request.*

NOTE 2 *The asset management policy and strategy set out approach and vision for managing our assets. These documents are available upon request.*

W/2.9 AIP clause 3.9 shall propose a methodology for future maintenance and inspection that includes consideration of carbon, cost and road user impacts.

W/2.9.1 The methodology may be provided in an Appendix in the AIP.

WITHDRAWN

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W/2.9.2 The methodology should consider access for a conventional inspection and quantification of required closure times.

W/2.9.3 The section should include an estimation of the CO_2e impact of closures using available calculators, for example the Welsh Government CO_2e Traffic Calculator tool.

NOTE *The Welsh Government CO_2e Traffic Calculator tool is available upon request.*

W/2.10 AIP clause 3.10 shall describe the design approach taken to minimise the carbon impact of the design proposal.

NOTE *For some proposals, use of high carbon materials or processes can be justified by wider carbon benefits e.g., at a scheme level, or considering whole-life impacts.*

W/2.10.1 The taken approach should be structure-specific and quantify the whole-life carbon reduction as a result of the decisions.

NOTE *Generic responses are to be avoided.*

W/2.10.2 The Designer should complete the Designer's Carbon Elimination Decision Register and provide it as an Appendix in the AIP.

NOTE *The Designer's Carbon Elimination Decision Register template and examples are available on request from Welsh Government.*

W/2.11 All artificial habitats shall be supported by an independent ancillary provision.

NOTE *Provision of wildlife habitats on WG structures assets has created issues with accessing the structure in a timely manner to carry out inspection and maintenance.*

W/2.12 Analysis of possible alternative routes for services shall be undertaken prior to incorporating services within structures.

NOTE *Services can add disproportionately to the cost of renewals schemes.*

W/2.13 AIP clause 3.11 shall specify areas, if applicable, to be impregnated as required by CD 373 [Ref 4.N].

W/2.14 AIP clause 3.13 shall be sufficiently detailed.

W/2.14.1 The Designer should use a whole-life cost calculator and provide the output as an Appendix in the AIP.

NOTE *The Designer can use SAVI to develop whole-life costs for design proposals.*

W/2.15 The estimated cost in AIP clause 3.13 shall be updated when the AIP needs to be resubmitted following AIP note 22.

W/2.16 AIP clause 3.13 shall include the whole-life carbon associated with each option.

W/2.16.1 The Designer should use a whole-life carbon calculator and provide the output as an Appendix in the AIP.

NOTE 1 *The Designer can use their own or third party tools to create whole-life carbon estimate calculations.*

NOTE 2 *The Designer can request SAVI carbon data from Welsh Government to develop whole-life carbon costs for design proposals.*

W/2.17 AIP clause 3.14, 1) and 2) shall include evidence of the construction sequence analysis that has been undertaken to understand the CO_2e impact of different construction approaches with an aim to reduce the total quantifiable CO_2e of the proposal.

NOTE 1 *Analysis has shown that site-worker travel e.g., commuting to site, plant movements, materials transport and construction-related traffic impacts and diversions can have a significant impact on the overall embodied carbon of a project.*

NOTE 2 *The Designer's calculations can include a comparison between scheme options of estimated time on site, construction plant requirements and emissions, impact of traffic diversion routes and delay, and any other significant construction-related carbon emissions.*

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W/2.18 AIP clause 3.14, 4) shall include details for managing any interfaces with either existing or proposed structures as applicable.

W/2.19 AIP clause 4.4 shall demonstrate design decisions to optimise whole life CO_2e from the combination of initial construction and future maintenance.

W/2.19.1 AIP clause 4.4 should include material choices, durability and expected deterioration of the materials, estimation of whole life carbon, understanding of the maintenance impact on operational use of the structure, and diversion routes.

W/2.20 For ITS infrastructure submissions, a single AIP for the whole structure shall be submitted.

W/2.20.1 The AIP for ITS infrastructure submissions should include all components of the overall structure, this includes, but is not limited to, piling, substructure elements, superstructure elements, mountings, and enclosures for the sign.

W/2.21 For ITS infrastructure submissions, the AIP and certificates for all elements shall be endorsed by the TAA prior to construction.

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W/3. Additional requirements on Approval in Principle for the design/assessment of bridges and other highway structures where UK National Standards (Non-Eurocodes) (additional to CG 300, Appendix B)

W/3.1 The assessor shall confirm the previous historic inspection and assessment documents reviewed during the development of the AIP.

W/3.1.1 The documents reviewed should be referred to in the AIP.

W/3.2 For assessment AIPs, Section 3 shall be titled "Structure details".

NOTE *For assessment AIPs, "Not applicable for assessment" can be entered for sections not deemed applicable to assessment.*

W/3.3 AIP clause 3.5 shall be reflected in the idealised structure diagram used for analysis.

W/3.3.1 A separate diagram for any assumed temporary construction stages should be provided where applicable.

W/3.3.2 The applied actions should also be indicated where relevant.

NOTE *Numerical values of applied actions and reactions are not required in the AIP stage.*

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W/4. Additional requirements on Model form of certificate for minor structures and telecom masts on motorways and trunk roads (additional to CG 300, Appendix J)

W/4.1 The model form of certificate in Appendix J shall only be used for Category 0 structures.

NOTE *The model form in Appendix I can be used for structures designed in accordance with CD 354 [Ref 1.N] that are not Category 0.*

W/4.2 A Minor Structures Report shall be included as an Appendix to the model form of certificate in Appendix J.

W/4.2.1 The Minor Structures Report should include details of the proposed structure, structural form, design approach, construction arrangements and future maintenance requirements.

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W/5. Environment and sustainability requirements

W/5.1 The design shall follow industry guidance and best practice on environmental and sustainability aspects in accordance with GG 103 [Ref 5.N].

W/5.2 It must be demonstrated that the design is in accordance with the sustainable development principle set by the Well-being of Future Generations (Wales) Act 2015 ANAW 2015/2 [Ref 6.N].

W/5.3 It must be demonstrated that the maintenance and enhancement of the natural environment and biodiversity has been considered at the design stage in line with duties set out in Section 6 of the Environment (Wales) Act 2016 ANAW 2016/3 [Ref 2.N].

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W/6. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref.	Document
Ref 1.N	National Highways. CD 354, 'Design of minor structures'
Ref 2.N	National Archive. Welsh Government. ANAW 2016/3, 'Environment (Wales) Act 2016'
Ref 3.N	National Highways. CG 305, 'Identification marking of highway structures'
Ref 4.N	National Highways. CD 373, 'Impregnation of reinforced and prestressed concrete highway structures using hydrophobic impregnants'
Ref 5.N	National Highways. GG 103, 'Introduction and general requirements for sustainable development and design'
Ref 6.N	National Archive. Welsh Government. ANAW 2015/2, 'Well-being of Future Generations (Wales) Act 2015'

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W/7. Informative references

The following documents are informative references for this document and provide supporting information.

Ref.	Document
Ref 1.I	National Highways. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

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Appendix W/A. Model form of screening proforma

The purpose of this proforma is to record at project inception the outline details and proposed Category of each structure in accordance with the criteria described in Sections 2 to 3 of CG 300. These Categories are subject to the agreement of the Technical Approval Authority and subject to review as the design or assessment is developed.

Table W/A.1 Screening proforma

Scheme Name						
IRIS Scheme Ref / Project No. [1]						
Location of Works			Description of Works		Proposed Category	
Revision	Date	Status	Author	Checked	Approved	
Agreement of the Technical Approval Authority / Overseeing Organisation to the proposed category						
Signed _____ Name _____ Position held _____ Engineering Qualifications _____ [2] TAA _____ Date _____						

1) Delete as applicable.

2) CEng from an appropriate Chartered Engineering Institution.

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