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**VOLUME 1    HIGHWAY STRUCTURES:  
                  APPROVAL PROCEDURES  
                  AND GENERAL DESIGN**  
**SECTION 1    APPROVAL PROCEDURES**

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**PART 1**

**BD 2/05**

**TECHNICAL APPROVAL OF HIGHWAY  
STRUCTURES**

**SUMMARY**

This Standard specifies the procedures for Technical Approval for Highway Structures. It updates and supersedes BD 2/02.

**INSTRUCTIONS FOR USE**

This revised Standard is to be incorporated in the Manual.

1. This document supersedes BD 2/02, which is now withdrawn.
2. Remove existing contents pages for Volume 1, and insert new contents page for Volume 1, dated August 2005.
3. Remove BD 2/02, which is superseded by BD 2/05, and archive as appropriate.
4. Insert BD 2/05, in Volume 1, Section 1, Part 1.
5. Archive this sheet as appropriate.

Note: A quarterly index with a full set of Volume Contents Pages is available separately from The Stationery Office Ltd.



**THE HIGHWAYS AGENCY**



**SCOTTISH EXECUTIVE**



Llywodraeth Cynulliad Cymru  
Welsh Assembly Government

**WELSH ASSEMBLY GOVERNMENT  
LLYWODRAETH CYNULLIAD CYMRU**



**THE DEPARTMENT FOR REGIONAL DEVELOPMENT  
NORTHERN IRELAND**

# Technical Approval of Highway Structures

**Summary:** This Standard specifies the procedures for Technical Approval for Highway Structures. It updates and supersedes BD 2/02.

**REGISTRATION OF AMENDMENTS**

Amend No	Page No	Signature & Date of incorporation of amendments	Amend No	Page No	Signature & Date of incorporation of amendments

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**SECTION 1    APPROVAL PROCEDURES**

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**PART 1**

**BD 2/05**

**TECHNICAL APPROVAL OF HIGHWAY  
STRUCTURES**

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# 1. INTRODUCTION

## General

1.1 This Standard specifies the Technical Approval (TA) procedures for Highway Structures on motorways and other trunk roads or designated roads.

1.2.1 The following Standards and Advice Notes had been superseded and were withdrawn by the 2002 version of BD 2:

BD 2/79	Technical Approval of Highway Structures on Motorways and Other Trunk Roads Part IV Procedures for Lighting Columns	(DMRB 1.1)
BD 2/89	Technical Approval of Highway Structures on Motorways and Other Trunk Roads Part I General Procedures	(DMRB 1.1)
BD 2/89	Technical Approval of Highway Structures on Motorways and Other Trunk Roads Part III Procedures for Tunnels	(DMRB 1.1)
BA 32/89	Technical Approval of Highway Structures on Motorways and Other Trunk Roads Part I General Procedures	(DMRB 1.1)
NIRS 7/82	DOE (NI) Roads Service Technical Approval Scheme – 6th Revision	(DMRB 1.1)

BE 1/74	The Independent Checking of Erection Proposals and Temporary Works Details for Major Highway Structures on Trunk Roads and Motorways	(DMRB 1.2)
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1.2.2 Major changes in this version of BD 2:

- (i) Clause 1.16: gives definitions for Outline Approval in Principle, ‘Proprietary manufactured structure’ and ‘Third Party’.
- (ii) Clause 2.34: requires relevant data, information and documents to be recorded in the Overseeing Organisation’s management system for structures.
- (iii) Clauses 3.4.1 (d), (e) and (f): clarify Category 0 for lighting columns, CCTV masts and cantilevered masts for traffic signals and/or speed cameras.
- (iv) Clauses 3.4.2 (e), (f) and (g): clarify Category 1 for lighting columns, CCTV masts and cantilevered masts for traffic signals and/or speed cameras.
- (v) Clause 3.4.4 (k): includes earth retaining structures with an effective restrained height of 14m or greater.
- (vi) Clause 3.6: clarifies Annex C2 certificate for lighting column system.
- (vii) Clause 4.4: clarifies categories for Types A and B. Allow category 1 for Type B proposal where the risk is relatively minor and with TAA agreement.
- (viii) Clause 4.8: clarifies requirements for certificates and AIP of Type A proposals.
- (ix) Clauses 4.11-4.13: clarify requirements for Type B proposals.
- (x) Clause 4.15: includes model certificate C6 and clarifies requirements for certificate of construction compliance.

- (xi) Clauses 3.7, 5.5, 6.13 and 7.8: include model certificate C6.
- (xii) Annex C4: amendments made.
- (xiii) New Annex D on Proprietary Manufactured Structures.
- (xiv) New Annex E on Special Requirements for Records in Overseeing Organisations.
- (xv) New Annex F on Special Requirements for Overseeing Organisations concerning Third Party Proposals of Temporary Works or Temporary Structures.

1.3 In the early 1970s, four failures i.e. Yarra (Australia), Milford Haven (Pembrokeshire, Wales), Koblenz (Germany) and one over the Danube (Austria), had occurred during erection. Due to these failures and the subsequent Report of the Merrison Committee, the following important changes were made by the then Ministry of Transport:

- (i) The Department would continue to examine design criteria and methods but not computations.
- (ii) The requirements by the Department for a certificate of independent check of the design and computations.
- (iii) 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.

1.4 The TA procedures as described in this Standard generally require the proposer to submit an AIP 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.

1.5 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 are in place to minimise the possible risks to highway users and others who may be affected. The procedures may be applied to any other

circumstances where the highway authority considers the requirements to be appropriate.

1.6 The TA procedures differ from Integrated Management Systems and Environmental Management Systems, which provide systems for quality assurance, environmental and safety management of projects with audit and feedback processes for continuous improvement. TA provides the comprehensive technical requirements that are managed and audited within the Integrated Management Systems Plans for specific projects.

1.7 The TA procedures will also help the Overseeing Organisation to identify those features that are not adequately covered by existing codes and Standards. It provides the valuable feedback required to initiate action to improve existing codes and Standards.

### Objectives

1.8 The fundamental objectives of the TA procedures is to give increased assurance for the required construction, refurbishment or demolition so that the proposals are safe to implement, and 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 the highway user and any others who may be affected are protected from any adverse effects resulting from any work carried out to any Highway Structure and that there is adequate provision for safety under all circumstances.

1.9 TA provides procedures to demonstrate that the Overseeing Organisation, in its capacity of Highway Authority, has carried out its duty to safeguard the highway users and others who may be affected.

### Scope

1.10 TA shall apply to Proposals, including private development, i.e. to construct, assess, refurbish or demolish a structure within the highway boundary. It shall also apply to Proposals, which are outside the highway boundary, for adoption of Highway Structures by the Overseeing Organisation.

It is recommended that TA be applied to Third Party proposals outside the highway boundary resulting from planning applications that are referred to the Overseeing Organisation for direction, as they may affect the highway or Highway Structure. Special requirements as given in Annex F are recommended for Third Party proposals where the Overseeing Organisation would not be able to give an opinion on whether they are safe or not as the Overseeing Organisation do not have a specific knowledge or expertise.

TA does not apply to cases where there are no public safety issues such as temporary works in green field sites or only in place during full road closures with no other public access and where there is no significant risk to the highway or Highway Structure. However, TA applies to temporary works where the permanent works Proposal has identified the need for an independent check.

1.11 The scope of TA shall be as specified in Chapters 3 to 7.

### Contractual Responsibilities and Procedures

1.12 TA serves as a real-time proactive form of Integrated Management Systems for the Overseeing Organisation and does not in any way modify and reduce the contractual and statutory responsibilities of any party for the work carried out or the legal responsibilities of professional engineers.

1.13 This Standard has been written such that it is applicable in principle to all current and likely future forms of procurement. The procedures, format and terms used in this Standard, including the model AIP forms, Technical Approval Schedules (TAS) and certificates provided in Annexes A to C, are intended to be contract-neutral and should be taken as models. Any Departure from this Standard should ensure that the following objectives are achieved:

- (i) That the required design principles are formally agreed, prior to award of any contract, to a sufficient extent to avoid contractual repercussions.
- (ii) That construction is not allowed to proceed until there is formal agreement to a comprehensive submission of the design principles in accordance with the requirements of this Standard.

These shall be amended and agreed with the Overseeing Organisation, to suit specific contract requirements, such as design and construct contracts.

Timings and procedures should be identified in the scheme specific contract requirements.

1.14 The contract requirements may clarify whether the Proposals and the AIP are of an outline nature sufficient for the invitation or acceptance of tenders or whether they are comprehensive and sufficient for detailed design or assessment. The principles, detailed requirements and recommendations contained in this Standard should apply accordingly. The Outline AIP (O/AIP) may be based on the relevant sections of the model AIP Annex A1 or D.5.

1.15 For some forms of procurement, TA for the design would typically be completed in detail before tenders for carrying out the construction work required by the design are invited. For other forms of procurement, where the design has not yet been completed prior to inviting tenders, the TA process would typically only be partially completed during the tender period. Submission of a final detailed AIP would usually take place following award of contract.

### Definitions

1.16 The following definitions shall apply throughout this Standard (see 1.13):

<b>Approval in Principle (AIP)</b>	The document, which records the agreed basis and criteria for the detailed design or assessment of a Highway Structure.
<b>Assessment Team</b>	The group of engineers responsible for the assessment. It may comprise an appropriate mix of specialists under the direction of a Team Leader.
<b>Assessor</b>	The organisation responsible for the overall assessment, including proprietary components.
<b>Category</b>	The classification of the Proposals, which determines the need for AIP, the form of check to be applied and the certificates to be prepared.
<b>Checker</b>	The organisation responsible for the independent check of the design or assessment.
<b>Checking Team</b>	The group of engineers responsible for the check of the design or assessment. It may comprise an appropriate mix of specialists under the direction of a Team Leader.
<b>Contractor</b>	The organisation contracted by the Overseeing Organisation to undertake construction works on its behalf.
<b>Contractor's Representative</b>	A representative of the Contractor, with responsibility for overseeing the construction works.
<b>Departure</b>	Criterion, which departs from, or is an aspect not covered by, the Standards contained in the Technical Approval Schedule.
<b>Designer</b>	The organisation responsible for the overall design including proprietary components.
<b>Design Team</b>	The group of engineers responsible for the design. It may comprise an appropriate mix of specialists under the direction of a Team Leader.
<b>Geotechnical Report</b>	A report that contains geotechnical information relevant to the design or assessment (see HD 22 (DMRB 4.1.2)).
<b>Highway Structure</b>	Structure or installation coming within the scope of this Standard and situated under, over or adjacent to a motorway or other trunk road or designated road.
<b>Large Service Tunnel</b>	A tunnel installed by trench-less technology beneath a highway for any purpose, in an excavated bore of diameter or span greater than 2000mm.
<b>Lighting Column System</b>	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.
<b>Maintaining Agent (MA)</b>	The organisation responsible for the maintenance of a Highway Structure.
<b>Outline Approval in Principle (O/AIP)</b>	The outline performance specification for a structure.

<b>Overseeing Organisation</b>	The highway authority responsible for motorways and other trunk roads or designated roads in England, Scotland, Wales or Northern Ireland.
<b>Principal</b>	A senior representative of the Designer, Assessor or Checker having authority to sign certificates on its behalf.
<b>Project Manager of the Overseeing Organisation</b>	Representative of the Overseeing Organisation with responsibility for project management of tunnel or bridge gantry operating procedures.
<b>Proposals</b>	The proposals relating to the design or assessment of a Highway Structure including the mechanical and electrical (M & E) installations covered by this Standard.
<b>Proprietary Manufactured Structure</b>	A structure manufactured to a system covered by a patent and/or a registered design that conforms to a Technical Approval procedure and TAS.
<b>Road Tunnel</b>	A subsurface Highway Structure enclosed for a length of 150m or more.
<b>Service Tunnel Promoter</b>	Authority or Organisation other than the Overseeing Organisation, sponsoring a service tunnel.
<b>Small Service Tunnel</b>	A tunnel installed by trench less technology beneath a highway for any purpose, in an excavated bore of diameter or span greater than 900mm but less than 2000mm.
<b>Team Leader</b>	The person responsible for overseeing and co-ordinating the work of the design, assessment or checking team and having authority to sign on behalf of the team. The Team Leader shall be appropriately qualified and competent in relevant fields of engineering related to the work and is expected to be a Chartered Member of a relevant Institution or suitable equivalent.
<b>Technical Approval (TA)</b>	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.
<b>Technical Approval Authority (TAA)</b>	The organisation responsible for agreeing the Approval in Principle and subsequently accepting the relevant certificates.
<b>Technical Approval Schedule (TAS)</b>	The schedule of documents to be used for the design or assessment of a Highway Structure.
<b>Third Party</b>	Any person, organisation or other legal identity that is not employed directly or indirectly by the Overseeing Organisation.
<b>Works Examiner</b>	The organisation nominated in the Contract to undertake independent examination of the construction, commissioning (of M&E) or testing of works carried out by the Contractor.

## **Implementation**

1.17 This Standard shall be used forthwith on all projects for the construction, maintaining and improvement of motorways and other trunk roads (and roads designated by the Overseeing Organisation in Northern Ireland) except where the preparation of a contract has reached a stage at which, in the opinion of the Overseeing Organisation, its use would result in significant additional expense or delay progress. This Standard shall also be used to implement the procedures for private development within the highway boundary, other works that affect the structural integrity of existing Highway Structures and for proposals for adoption of Highway Structures by the Overseeing Organisation. Designers or Assessors shall confirm its application to particular projects with the Overseeing Organisation.

## **Mandatory requirements**

1.18 Sections of this Standard that are mandatory requirements of the Overseeing Organisations are highlighted by being contained within boxes. The remainder of the document contains advice and guidance.

## 2. GENERAL REQUIREMENTS AND PRINCIPLES

### Overseeing Organisation's Requirements

2.1 Technical requirements for the design, construction, maintenance and operation of Highway Structures are contained in the TAS (in some forms of contract, such as design and construct, these may be contained in the contract requirements). The TAS normally includes the Design Manual for Roads and Bridges (DMRB), the Manual of Contract Documents for Highway Works (MCHW) and other supplementary Standards for specific project requirements. TAA should be consulted at the earliest appropriate opportunity in order to avoid the risk of abortive work and allow timely consideration to be given to the Proposals.

In Scotland two sets of documents (AIP and Certificates) with original signatures shall be submitted.

2.2 Consideration shall be given to Third Party proposals as follows:

- (i) Inside highway boundary: the principles given for the TA procedures in this Standard should be adopted to meet the objective stated in 1.9. However the TAA should not take on the responsibility that belongs to the Third Party. The principles of special requirements given in Annex F should be applied where the Overseeing Organisation would not be able to give an opinion on whether the Third Party proposal is safe or not as the Overseeing Organisation do not have a specific knowledge or expertise. For Third Party proposal of temporary work or temporary structure, refer to Chapter 4.
- (ii) Outside highway boundary: refer to 1.10.

### Category of Proposals

2.3 The Proposals shall be placed in one of four Categories: 0, 1, 2 or 3, according to the criteria described in Chapters 3 to 7. The Category shall be proposed by the Designer or Assessor and agreed by the TAA. The category boundaries are not rigid. In case of doubt each case shall be decided in

consultation with the TAA on its merits, having regard to potential consequences of failure, design complexity and whole life costs.

2.4 AIPs are required for Categories 1, 2 and 3, but not Category 0. The Designer or Assessor shall submit brief details of proposed Category 0 to the TAA for agreement of Category.

2.5 Where a structure has been placed in Category 0 or 1, and a proposal arises subsequently requiring a Departure, the category shall be changed to 2. However if the TAA considers that the Departure has little or no structural implication, then a change of Category may not be required. In such circumstances for Category 1, an amendment or addendum to the AIP shall be submitted. The agreement of the TAA will be required before the proposals can be incorporated in the design or assessment.

### Proposals

2.6 Proposals for Categories 1, 2 and 3 shall:

2.6.1 Provide sufficient information and evidence to demonstrate compliance with the Overseeing Organisation's requirements and to justify their viability. Potential risks and hazards during the whole life of the structure such as construction, operation, maintenance and demolition, shall be identified, assessed and considered. Where available, references, special investigations and studies that have been carried out shall be included. The overall project should consider appropriate methods of risk management such as those given in the Value for Money Manual.

2.6.2 Provide evidence that appropriate consultation has taken place with all relevant parties having a direct interest in the Proposals, and that full and proper consideration has been given to their respective interests. Risks and hazards which may affect the structure as a result of other parties' requirements (eg leakage of gas or water mains) shall also be identified, assessed and considered. Likewise, risks and hazards posed by

the structure to other infrastructure belonging to a Third Party shall be identified, assessed and considered. Documentation relating to consultation and special requirements of those consulted shall be included as part of the AIP submission.

2.6.3 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.

2.6.4 List in the TAS all relevant documents that are being proposed for use in the design or assessment.

2.7 Proposals for Designs shall, in addition to 2.6:

2.7.1 Consider aspects relating to:

- Sustainability (sustainable development which meets the needs of the present without compromising the ability of future generations to meet their own needs e.g. prudent use of natural resources)
- Environment (give regard for both the natural and built environment)
- Aesthetics
- Buildability (the extent to which the design facilitates ease of construction, allowing the most efficient and economic use of resources, subject to the overall requirements for the completed project)
- Structure robustness (the ability of a structure not to be damaged disproportionately in the event of accident, misuse or deterioration)
- Durability
- Maintenance and operational commitments in terms of whole life costs in design options and choices of materials
- Provision of access for periodic inspection
- Avoidance of 'barrier to trade' (for Proprietary Manufactured Structure, see Annex D).

2.7.2 Where specified, consider and make provisions for future heavier loads or future widening and describe how the structure may be upgraded. In the case of road tunnels, it may also be necessary to make provision for future development above or adjacent to the tunnel.

2.7.3 Consult the TAA at an early stage to determine whether submission is required to the Commission for Architecture and the Built Environment (CABE) in England or to equivalent bodies in Scotland, Wales and Northern Ireland. This applies to major structures, including tunnel portals, tunnel service buildings and landscaping, and those structures in environmentally sensitive locations, such as National Parks, areas of outstanding natural beauty, green-belts, urban areas, etc.

2.7.4 Ensure that the required environmental and planning legislation is complied with during the development of the design. This includes, but is not limited to Environmental Assessments, Environmental Statements and Habitat Surveys. Affected parties such as English Nature and Wildlife Trusts shall be consulted to ascertain environmental requirements during and post construction, including translocation of endangered species (e.g. greater crested newts, rare plants/soils), acceptable environmental mitigation (e.g. sustainable urban drainage systems) and other measures such as otter ledges along banks on river bridges and wildlife tunnels where existing habitats are disrupted.

2.7.5 State any assumptions that have been made with regard to construction processes or temporary works aspects that are significant factors in the design. If construction processes or temporary works during the course of construction have structural implications different from those assumed by the Designer, a further TA shall be completed before the commencement of construction of that part of the works.

2.8 Proposals for Assessments shall, in addition to 2.6, describe proposed arrangements for access, traffic management and intrusive investigation.

## Departures from Standards

2.9 Designers or Assessors may seek to introduce cost savings, innovative techniques, research findings or developments in the state of the art by the adoption of Departures.

In cases where mixing Standards with different design principles such as limit states, load factors and working stress are used, they may need to be considered as Departures unless it can be demonstrated that there is consistency and compatibility between the different design principles.

In cases where a structure is in the ownership of the Overseeing Organisation but accommodates a highway, railway, waterway or similar resource that is the responsibility of another owner, authority or a Third Party, it shall be brought to their attention for their comment. This should be recorded e.g. in item 4.1.8 of the model Annex A1.

2.10 All applications for Departures shall be subject to the approval procedures of the Overseeing Organisation and details of the proposed Departures together with reasons and justification, including benefits to the Overseeing Organisation, shall be submitted to the TAA for consideration. Applications for Departures shall allow adequate time for consideration by the TAA prior to inclusion in the AIP or an addendum to the AIP.

In some cases the Checker's comments on the proposed Departure may be required to assist the TAA in the deliberation.

## Submissions for AIP

2.11 Submissions for AIP to the TAA shall be in accordance with the Overseeing Organisation's particular requirements. Generally submissions comprise a completed AIP, a location plan, a general arrangement drawing, relevant parts of the Geotechnical Report, documents relating to consultation and any other relevant information or reports. The reports should be referenced in the AIP and written with a clear proposal or objective. Calculations and detailed drawings are not required as part of the submission.

The O/AIP may be based on the relevant sections of the model AIP Annex A1 or D.5 for some generic AIPs e.g. MS4 gantries, Model AIPs for Temporary Works Systems, modular arch systems etc.

2.12 The AIP shall record all the agreed criteria on which the design or assessment is to be based. Changes to an agreed AIP to account for subsequent variations during design, assessment or construction shall render the AIP subject to re-approval and agreement by the TAA. This shall be confirmed either in the form of an amended version of the agreed AIP or as a separate addendum to the agreed AIP. Submissions clearly indicating deletions or additions that have been made to the agreed AIP shall be signed by the Designer or Assessor and forwarded with supporting information to the TAA. Addenda shall refer to the original AIP by the date of agreement by the TAA.

2.13 AIP is a continuing exercise that should start at an early stage of development of proposals. This is particularly important for structures where early submission to the TAA allows timely consideration of other fundamental aspects, such as crossing requirements, carriageway alignment etc.

The period over which TA extends will vary according to the size and complexity of the structure and number of Departures. To avoid any unnecessary delay, AIP may be given in stages in the form of interim AIP as principles are evolved and agreed. However the use of the interim AIP should not be allowed to prejudice the agreement of an AIP for the full structure.

## Technical Approval

2.14 In order to achieve the required objectives, the TAA shall carry out the following aspects, where applicable:

- (i) Appraise the proposed design or assessment criteria, principles and methods.
- (ii) Agree the Category of the Proposals.
- (iii) Ensure that the endorsed AIP requires any special studies concerning safety and risk assessment and management that have a bearing on the final design or assessment or the construction process.

- (iv) Ensure that adequate consideration has been given to safety, sustainability, buildability, traffic management, environmental impact, aesthetics, structure robustness, durability, maintainability, access and inspection, upgradeability, whole life costs and compliance with the Overseeing Organisation's requirements.
- (v) Agree the list of documents selected from the TAS and proposals for additional documents and Departures.
- (vi) Appraise the geotechnical conditions and other relevant investigations.
- (vii) 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, operation, construction, maintenance or demolition processes.
- (viii) Review the adequacy of consultation with other parties and the incorporation of agreed requirements.
- (ix) Agree proposed Category 3 Checker and their relevant experience/competence.
- (x) Be available to the Designer, Assessor or Checker for consultation and advice on the interpretation of codes and Standards.
- (xi) Resolve any point(s) of difference between the Designer or Assessor and the Checker.

2.15 When satisfied with the Proposals, the TAA shall confirm its agreement by signature of the AIP. On completion of the detailed design or assessment, the TAA shall accept the appropriate certificates.

2.16 The agreement of the AIP or acceptance of the certificates by the TAA does not relieve the Designer, Assessor or Checker of any of the responsibility including the validity and arithmetical correctness of the calculations and their translations into design details and drawings, specification clauses or assessed capacities.

2.17 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

shall be re-submitted to the TAA. The TAA shall review the AIP and determine whether any updating or amendment to the design is required. In such circumstances the outcome shall be recorded in an amendment or addendum to the AIP and the agreement of the TAA will be required before the construction can proceed.

#### Design and Assessment Procedure

2.18 The design/assessment shall comply with the AIP.

Model AIP forms are given in Annex A but the Overseeing Organisation may adopt other formal means of recording approval depending upon particular requirements.

2.19 The Designer or Assessor shall be responsible for the applicability and accuracy of all computer programs used and shall also ensure the validity of the programs for each application.

#### Checking Procedure

2.20 Assessments, designs and drawings, together with bar bending schedules, shall be checked as follows:

- (a) Categories 0 and 1 require an independent check by another engineer who may be from the Design/Assessment Team.
- (b) Category 2 requires a check by a Checking Team, which may be from the same organisation but shall be independent of the Design/Assessment Team.
- (c) Category 3 requires a check to be carried out by a Checking Team from a separate organisation proposed by the Designer Assessor and agreed by the Overseeing Organisation.

2.21 The Checker shall carry out a comprehensive examination of all aspects of the design or assessment and any proposed Departure where required by the TAA, including Specification clauses that affect structural integrity eg new materials, and shall ensure that it complies with the Overseeing Organisation's requirements. The Checker shall ensure that the calculations are

translated accurately into design details and drawings, specification clauses or assessed capacities.

2.22 The Checker shall be responsible for checking, with due professional skill and care, in accordance with the agreed AIP. In the course of checking the Checker shall draw the attention of the Designer or Assessor and TAA to any aspect of the agreed AIP where changes are considered necessary. The agreement of the TAA to variations in the AIP shall be confirmed in accordance with 2.12.

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

2.24 The Checker shall be responsible for the applicability and accuracy of all computer programs used in the check and shall ensure the validity of the programs for each application.

2.25 The method of analysis employed by the respective teams need not be the same but the Designer or Assessor and the Checker should consult with each other during the course of their work to ensure that the results they are obtaining are comparable.

2.26 It is not necessary to await the completion of the design/assessment before commencing checking. Both activities of design/assessment and checking may proceed in parallel as far as is practicable.

### Certification

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

2.28 For all proposals, a single organisation shall assume responsibility for the whole of each activity; the Design, Assessment, Checking or Construction Compliance. The Designer, Assessor, Checker, Contractor's Representative or Works Examiner shall sign each certificate as appropriate, which shall be countersigned where required upon acceptance by the TAA. All signatories to certificates shall be competent in the field of work

undertaken and have relevant experience and appropriate Engineering qualifications, which shall be clearly indicated on the certificate along with their name and position in their organisation. One signatory from the Designer, Assessor or Checker shall be the Team Leader and the other shall be a Principal of the organisation concerned. Signatories for the Construction Certificate shall comprise a representative of the Contractor and Principals of both the Contractor and of the Works Examiner. The signatory for the TAA shall be a person delegated to undertake this task on its behalf.

2.29 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 or, in the case of Category 0 structures, relevant Standards and Departures, if any, and be submitted for acceptance by the TAA, unless otherwise stated in Chapters 3 to 7.

2.30 A copy of the general arrangement drawing shall accompany Certificates for Category 0 structures.

2.31 Where additional and substitute Specification clauses have been prepared, they shall be submitted for acceptance by the TAA. They may be submitted either individually or collectively on a Specification Certificate. Where clauses affect structural integrity e.g. new materials, they shall be checked in accordance with the AIP.

2.32 Unless otherwise stated in Chapters 3 to 7, the Construction Compliance Certificate shall refer to, if available, the relevant AIP, Design and Check Certificates, Specification and As-Constructed drawings and shall be submitted to the TAA for acceptance.

2.33 Model certificates are contained in Annex C. However, the wording may vary depending on the Overseeing Organisation's particular requirements/type of contract. If 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.

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

### **Records**

2.34 Relevant data, information and documents, which have an effect on safety, structural or traffic management e.g. assessed load carrying capacity of structure, shall be recorded as required by the Overseeing Organisation's management system for structures. The specific requirements for Overseeing Organisations are given in Annex E.

### 3. BRIDGES AND OTHER HIGHWAY STRUCTURES

#### Introduction

3.1 This Chapter describes specific TA requirements for bridges and other Highway Structures and shall be read in conjunction with Chapters 1 and 2.

3.2 The TA requirements shall apply without limitation to:

3.2.1 Design of new structures.

3.2.2 Assessment and related construction work that affects structural integrity.

3.2.3 Assessment relating to loading beyond that for which a structure has been designed or previously assessed.

3.2.4 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 an assessment is required.

#### Scope

3.3 In addition to 1.10, the procedures described in this Chapter shall without limitation apply to the following Highway Structures:

- (a) Bridge, buried structure, subway underpass, culvert and any other structure supporting the highway with clear span or internal diameter greater than 0.9m, (0.9m or greater in Scotland).
- (b) Overhead crossing carrying conveyor or utility service.
- (c) Access gantry.
- (d) Earth retaining structure 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 greater than 1.5m (1.0m or greater in Northern Ireland).

- (e) Reinforced/strengthened soil/fill structure, with hard facings, where the effective retained height is greater than 1.5m (1.0m or greater in Northern Ireland).
- (f) Reinforced/strengthened soil/fill which is an integral part of another highway structure.
- (g) Portal and cantilever sign and/or signal gantry.
- (h) Cantilever mast for traffic signal and/or speed camera.
- (i) Lighting column.
- (j) High mast of more than 20m in height i.e. the vertical distance from top of post to bottom of flange plate, for lighting.
- (k) Mast for camera, radio and telecommunication transmission equipment.
- (l) Catenary lighting support system.
- (m) Environmental barrier.
- (n) Proprietary manufactured structure.
- (o) Highway signs on posts of more than 7m in height, i.e. the vertical distance from top of post to bottom of flange plate or top of foundation whichever is the lesser.
- (p) Multi-level public car parks proposed for adoption by Roads Service (in Northern Ireland only).
- (q) Mass gabion steep slope/retaining structure, face slope not greater than 70° to the horizontal where the effective height is 1.0m or greater (in Northern Ireland only).
- (r) Reinforced/strengthened soil/fill structure where hard facings are not provided and the face inclination exceeds 45 degrees, the Overseeing Organisation may decide to require structural TA in accordance with this Standard (in Wales only).

### Category

3.4 In addition to 2.3 to 2.5, the following criteria shall be considered when determining Category:

#### 3.4.1 Category 0:

Structures, which conform in all aspects of design, assessment and construction to DMRB and MCHW Standards and contain no Departures, provided they also conform to one of the following:

- (a) Buried structures of less than 3m clear span/diameter and having more than 1m cover.
- (b) Multi-cell buried structures, where the cumulative span is less than 5m, and having more than 1m cover.
- (c) Environmental barriers less than 3m high and without overhangs.
- (d) Lighting columns within the scope of BD 26 (DMRB 2.2.1) and not situated at a very exposed site as defined in BD 26.
- (e) CCTV masts within the scope of BD 83 (DMRB 2.2.11).
- (f) Cantilever masts for traffic signals and/or speed cameras within the scope of BD 88 (DMRB 2.2.13).
- (g) Other mast structures that are less than 10m in height and where the horizontal arm projection is less than 3m.
- (h) Highway signs on posts that are more than 7m in height but less than 12m in height.
- (i) Single span simply supported structures with span of less than 5m.
- (j) Masonry arches with span of less than 6.5m (for assessment only).
- (k) Earth retaining structures with an effective retained height of less than 2m.

#### 3.4.2 Category 1:

Structures, other than those in Category 0, which conform in all aspects of design/assessment and construction to DMRB and MCHW Standards and contain no Departures, provided they also conform to one of the following:

- (a) Structures with a single simply supported span of less than 20m and having less than 25° skew.
- (b) Buried concrete box and corrugated steel buried structures with less than 8m clear span.
- (c) Earth retaining structures with an effective retained height of less than 7m.
- (d) Environmental barriers 3m or more in height or with overhangs.
- (e) Lighting columns outside the scope of BD 26 (DMRB 2.2.1) or situated at a very exposed site as defined in BD 26.
- (f) CCTV masts outside the scope of BD 83 (DMRB 2.2.11).
- (g) Cantilever masts for traffic signals and/or speed cameras outside the scope of BD 88 (DMRB 2.2.13).
- (h) Fixing arrangements to structures for M&E apparatus (in Wales only).
- (i) Other mast structures that are more than 10m in height but less than 25m in height, or where the horizontal arm projection is more than 3m.

#### 3.4.3 Category 2

Structures, not within the parameters of Categories 0, 1 or 3.

#### 3.4.4 Category 3

Complex structures, which require sophisticated analysis or with any one of the following features:

- (a) High structural redundancy.
- (b) Unconventional, novel or esoteric design aspects.

- (c) Any span exceeding 50 m.
- (d) Skew exceeding 45°.
- (e) Difficult foundation problems.
- (f) Moveable bridges.
- (g) Access gantries.
- (h) Bridges with suspension systems.
- (i) Steel orthotropic decks.
- (j) Internal grouted duct form of post tensioned concrete structures.
- (k) Earth retaining structures with an effective retained height of 14m or greater.

#### 3.4.5 Assessment and related construction work

3.4.5.1 In general 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 should be categorised on the same basis that the original structure would have warranted. However, the TAA may decide to require a higher category where they are deemed appropriate.

3.4.5.2 (In Northern Ireland only) A check of the assessment is generally required for Category 3 structures only. In cases of doubt guidance shall be sought from the TAA.

- (iv) In the case of construction work, such as repairs, strengthening, monitoring, partial renewals or demolitions, that the structural adequacy at all stages of the work has been fully considered.
- (v) Proposals for the independent checking of temporary works.
- (vi) In the case of proprietary manufactured structures where circumstances are appropriate, that proper consideration has been given to facilitate their adoption by the Overseeing Organisation (see Annex D).

#### Certification

3.6 For Category 0 lighting column systems, CCTV masts where the nominal height as defined in BD83 (DMRB 2.2.13) is less than 6m, and other mast structures where nominal height is less than 4m, approval by the TAA is not required.

A certificate in the form given in Annex C2 shall be submitted to the TAA for retention.

#### Documentation

3.7 The relevant model AIP form for Highway Structures within the scope of this Chapter is A1 from Annex A. Relevant model certificates are C1, C2 and C6 from Annex C. The form of certificates may vary depending on the Overseeing Organisation's particular requirements.

#### Technical Approval

3.5 In addition to 2.14, the TAA shall consider where applicable the following aspects (this list is not necessarily exhaustive):

- (i) Cross-section and headroom clearances.
- (ii) The loading and design or assessment criteria.
- (iii) Any provision to be made additional to items (i) and (ii) for abnormally high and/or heavy loads.

## 4. TEMPORARY WORKS

### Introduction

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

4.2 The TA requirements shall apply to the following types of proposals:

(a) **Type A proposals:**

Erection proposals or temporary works which require:

- (i) An independent check in accordance with the AIP for permanent works, **and**
- (ii) Where the works would not affect or potentially affect any highway or other way or area used by or accessible to the public.

Where necessary and depending on the degree of risk, the TAA may change the proposal from Type A to type B in order to require a submission of an AIP.

(b) **Type B 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.

### Scope

4.3 In addition to 1.10, the procedures described in this Chapter shall apply without limitation to the following temporary structures:

- (a) Temporary works and falsework for major and complex structures.

- (b) Proposals where erection procedure, method of construction or the procedure for the demolition or removal of an existing structure is of critical importance.
- (c) 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.
- (d) 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

4.4 The Category adopted shall reflect the adverse consequences of any potential failure and comply with 2.3 and 2.4.

- (a) For Type A proposals, the Category shall generally be the same Category as the permanent structure.
- (b) For Type B proposals, the Category shall generally be 2 or 3. Where it has been agreed with the TAA that the risk is relatively minor and the reasoning recorded in the AIP, the proposal may be lowered to Category 1.

### Design Criteria Relating to Permanent Works

4.5 Design criteria for temporary works shall include all relevant design data concerning the design and construction of the permanent works. This includes the protection and/or safe operation of the permanent work or live carriageway during the use of a temporary highway structure, or temporary conditions of construction of new designs or the alteration of existing structures (eg allowable deflections, settlements, rotations, loading, jacking forces, propping requirements, clearances, impact protection, erection or demolition procedures, traffic control, carriageway possessions etc).

### Proposals

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

4.7 Proposals shall state the criteria that have been adopted to encompass the technical, operational and safety requirements of the authorities consulted and shall demonstrate to the satisfaction of the TAA that adequate safeguards and contingency measures have been introduced and will be maintained throughout the duration of the work.

### Type A proposals

- 4.8 (a) Check certificate shall be required to ensure that checkings is carried out.
- (b) Design certificate and AIP of temporary works 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.

4.9 Prior to the commencement of the relevant parts of the Works, check certificate(s) in the form given in Annex C related to Type A proposals shall be submitted to the TAA. The certificate shall be recorded and kept in the file for the permanent structure.

4.10 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 B proposals

4.11 Unless otherwise stated in 4.13, proposals for temporary works shall be described in an AIP in accordance with the requirements and form of submission described in Chapter 2.

4.12 Unless otherwise stated in 4.13, all design, checking and certification of temporary works for Type B proposals shall comply with the TA procedures of Chapters 1 and 2. The Type B certificate shall be accepted by the TAA before consent to proceed with the works can be given.

4.13 Special requirements shall be in accordance with Annex F for Third Party proposals of temporary works or temporary structures that are not described in chapters 3 to 7 or where the Overseeing Organisation would not be able to give an opinion on whether they are safe or not as the Overseeing Organisation do not have a specific knowledge or expertise.

### Technical Approval

4.14 In addition to 2.14, the TAA shall consider where applicable the following aspects (this list is not necessarily exhaustive):

- (i) Structural adequacy and stability at all stages.
- (ii) Precautions during erection/dismantling operations.
- (iii) Protection of the temporary works (including protection against vehicle or other impact).
- (iv) General provisions in terms of permanent works construction.
- (v) Loading and design criteria.
- (vi) Effects on any existing structures or earthworks.

- (vii) Working spaces for installation and removal.
- (viii) Clearances and access for construction plant and machinery,
- (ix) Provision for periodic inspection and checking.

#### **Documentation**

4.15 The relevant model AIP for temporary works within the scope of this Chapter is A1 from Annex A. Relevant model certificates are C3, C4 and C6 from Annex C. Generally a certificate of construction compliance is not required for temporary works except temporary bridges and those structures and installations required by the TAA. The form of certificates may vary depending on the Overseeing Organisation's particular requirements.

## 5. ROAD TUNNEL AND LARGE SERVICE TUNNEL STRUCTURES

### Introduction

5.1 This Chapter describes specific TA requirements for road tunnel structures including Large Service Tunnels and major tunnelling or building operations within the zone of influence of an existing Road Tunnel. It shall be read in conjunction with Chapters 1, 2, 6, and 7, and in the case of cut and cover construction and for tunnel portals and road decks, the relevant sections of Chapter 3. The requirements of the Tunnel Design and Safety Consultation Group referred to in BD 78 (DMRB 2.2.9) shall be complied with.

### Scope

5.2 In addition to 1.10, the procedures described in this Chapter shall apply to:

- (i) The design and construction of new Road Tunnels, tunnel services buildings and Large Service Tunnels,
- (ii) The assessment of existing tunnels that are subject to the effects of new temporary or permanent construction above or adjacent to the tunnel structure,
- (iii) The refurbishment and strengthening of existing road tunnels.

### Category

5.3 In addition to 2.3 and 2.4, Proposals for the design or assessment of Road Tunnel structures and Large Service Tunnels shall be in Category 3.

### Technical Approval

5.4 In addition to 2.14, the TAA will consider the following aspects (this list is not necessarily exhaustive):

#### 5.4.1 Structure and Form

- (i) Methods of excavation and construction including proposed ground categorisation for tunnelling,
- (ii) Tunnel profile,
- (iii) Bore spacing,
- (iv) Portal design,
- (v) Waterproofing,
- (vi) Maintenance access,
- (vii) Ventilation shafts,
- (viii) Proposed tunnel wall finish,
- (ix) Fire resistance,
- (x) Stability of ground above portals,
- (xi) Primary support design,
- (xii) Ground water control,
- (xiii) Effect on overlying or adjacent structures or tunnels,
- (xiv) Secondary lining and cladding,
- (xv) Ground movements,
- (xvi) Loading history of the site and effect of proposed new loading sequences,
- (xvii) The adequacy of the assessment of the loading conditions involved.

#### 5.4.2 Alignment and Clearances

- (i) Site constraints,
- (ii) Highway and tunnel alignment,
- (iii) Stopping sight distances,
- (iv) Carriageway and verge widths,

- (v) Duct provision for services,
- (vi) Horizontal and vertical clearances,
- (vii) Effect of super-elevation,
- (viii) Space requirements for equipment beyond the traffic space,
- (ix) Cross-connections between traffic bores and escape passages,
- (x) Emergency point spacing,
- (xi) Tunnel signing,
- (xii) Parking for emergency vehicles,
- (xiii) Area for casualty attendance,
- (xiv) Emergency crossovers and portal space.

#### **5.4.3 General**

- (i) Provision made for inspection and maintenance,
- (ii) Proposals for the checking of temporary works,
- (iii) The safeguards adopted to ensure that construction effects are kept within tolerable limits,
- (iv) 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,
- (v) The arrangements to sustain all necessary liaison between interested parties.

#### **Documentation**

5.5 The relevant model AIP for Road Tunnel and Large Service Tunnel structures within the scope of this Chapter is A2 from Annex A. The relevant model certificates are C1 and C6 from Annex C. The form of certificates may vary depending on the Overseeing Organisation's particular requirements.

## 6. SMALL SERVICE TUNNELS

### Introduction

6.1 This Chapter describes specific TA requirements for Small Service Tunnels and shall be read in conjunction with Chapters 1, 2 and 5.

### Scope

6.2 In addition to 1.10, the procedures described in this Chapter shall apply to small (900mm - 2000mm) diameter Service Tunnels. Proposals for Small Service Tunnels shall only be assessed in terms of the safety and serviceability of the existing highway.

6.3 TA of Large Service Tunnels shall be in accordance the appropriate requirements of Chapter 5 together with the relevant supplementary requirements contained in this Chapter.

### Category

6.4 In addition to 2.3 and 2.4 Proposals for the design or assessment of a small service tunnel shall be in Category 2.

### Submissions for AIP

6.5 In addition to 2.11 and 2.14 the following shall be included:

- (i) A site plan showing road chainages and other references, locations of Service Tunnel crossings, all potentially affected structures, manholes, boreholes, Statutory Undertakers' equipment and similar cables and pipelines owned by others.
- (ii) A longitudinal section showing ground profile along the tunnel, borehole logs including ground water levels, existing road construction, existing ground levels, tunnel inverts, minimum cover to crown, all potentially affected structures, Statutory Undertakers' equipment and similar cables and pipelines owned by others.

(iii) Cross section(s) at minimum or critical cover showing all potentially affected structures, Statutory Undertakers' equipment and similar cables and pipelines owned by others.

(iv) All necessary information relating to existing Highway Structures, carriageways, Statutory Undertakers' equipment and similar cables and pipelines owned by others, that has been provided by the relevant authorities and its effect on the design and construction of the Service Tunnel.

6.6 Submissions by Service Tunnel Promoters shall be made through the appropriate Regional Office of the Overseeing Organisation, for forwarding to the TAA and to the Maintaining Agent (MA). The MA shall review the submission, with particular reference to their local knowledge of the site, liaise as necessary with the Designer and confirm to the TAA when they are satisfied with the AIP submission.

6.7 The TAA will not consider Contractor's method statements as part of the AIP unless they are fully approved and endorsed by the Service Tunnel Promoter or the Service Tunnel Designer.

6.8 Methods of construction chosen by the Contractor or tunnelling difficulties encountered during the Contract, which give rise to changes in the construction procedures described in the AIP shall be brought to the attention of the TAA for a ruling on the need for an amendment or addendum to AIP in accordance with 2.12.

6.9 A comprehensive condition survey of the structures and carriageway within the zone of influence of the tunnelling work shall be carried out with the agreement of the MA prior to commencement of the works.

6.10 The highway must be continuously monitored during the installation of the service tunnel to ensure surface movements are kept within prior agreed limits to protect ride quality and drainage gradients.

6.11 Installation of the service tunnel under the highway shall be executed on a 24-hour continuous basis.

### **Technical Approval**

6.12 In addition to 2.14, the TAA shall consider where applicable the following aspects (this list is not necessarily exhaustive):

- (i) Temporary supports to construction processes that may affect the stability or integrity of the existing highway, Highway Structures, Statutory Undertakers' equipment and similar cables and pipelines owned by others, and public safety;
- (ii) Safeguards to ensure that tunnelling effects are kept within limits that protect pavement riding quality and drainage gradients at carriageway level;
- (iii) Arrangements for a condition survey prior to installation and carriageway monitoring during and after the tunnel drive and installation;
- (iv) Impact on traffic management, delays during construction and future maintenance proposals.

### **Documentation**

6.13 The relevant model AIP for Small Service Tunnels within the scope of this Chapter is A5 from Annex A. The relevant model certificates are C1 and C6 from Annex C. The form of certificates may vary depending on the Overseeing Organisation's particular requirements.

## 7. MECHANICAL AND ELECTRICAL INSTALLATIONS

### Introduction

7.1 This Chapter describes specific TA requirements for mechanical and electrical (M&E) installations in Highway Structures and shall be read in conjunction with Chapters 1, 2 and 3 or 5 as appropriate.

### Scope

7.2 In addition to 1.10, the procedures described in this Chapter shall apply without limitation to the following:

- (a) Moveable bridges and bridge access gantries.
- (b) Road Tunnels and tunnel services buildings.
- (c) Pumped drainage installations for underpasses.

### Category

7.3 In addition to 2.3 and 2.4, Proposals for work covered by this Chapter shall be in Category 3.

### Proposals

7.4 In addition to 2.6 to 2.8, Proposals shall:

- (i) Be presented in terms of preliminary and/or final design proposals as appropriate with due consideration to whole life costs.
- (ii) Fully describe the provision to be made for component replacement and provision for keeping the facility operational in the event of component failure.
- (iii) Include a draft report on maintenance and operating procedures (Safety Consultation Document) based on the relevant model document in Annex A.

### Technical Approval

7.5 In addition to 2.14, the TAA shall consider where applicable the following aspects (this list is not necessarily exhaustive):

- (i) The adequacy of the consultation and proposals forming the basis of the draft Operating Procedures (Safety Consultation Document).
- (ii) For moveable bridges:
  1. 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.
  2. The static and dynamic loading and design criteria under normal and adverse operating conditions including 'locked-in' stresses and over-turning.
  3. That all loads for the M&E design are consistent with those for the design of the bridge structure.
  4. The adequacy of system redundancy to guard against single component failure.
  5. The provision for manual operation in the event of power failure or equipment failure.

### Mechanical and Electrical Installations Certification

7.6. The design and check certificates shall take account of 2.27 to 2.33 and be carried out in two stages.

- (i) Stage 1 certificates shall confirm that the principles in the AIP are valid and that they have been translated into appropriate levels of equipping, design and specification. It shall also 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 that details of work tests and commissioning trials have been specified for the purpose of performance verification and formal handover.
- (ii) Stage 2 certificates shall confirm that the completed design Proposals, the testing of components and the commissioning of the complete installation meet the Overseeing Organisation's requirements.
- (iii) The format and wording of Stage 1 and Stage 2 certificates shall be agreed with the TAA.

7.7 A copy of the relevant Safety Consultation Document with original signatures shall accompany the design and check certificates.

### Documentation

7.8 The relevant model AIPs for Highway Structures within the scope of this Chapter are A3 and A4 from Annex A. The relevant Safety Consultation Documents are A6 and A7 from Annex A. Relevant model certificates are C1 and C6 from Annex C. The form of certificates may vary depending on the Overseeing Organisation's particular requirements.

## **8. REFERENCES**

### **8.1 Design Manual for Roads and Bridges**

BD 26 – Design of Lighting Columns  
(DMRB 2.2.1)

BD 78 – Design of Road Tunnels (DMRB 2.2.9)

BD 83 – Design of CCTV Masts (DMRB 2.2.11)

BD 88 – Design of Cantilever Masts for Traffic  
Signals and/or Speed Cameras (DMRB 2.2.13)

### **8.2 Manual of Contract Documents for Highway Works**

Volume 1: Specification for Highway Works  
(MCHW 1)

### **8.3 Value for Money Manual**

Value for Money Manual (TSO 1999)

## 9. ENQUIRIES

All technical enquiries or comments on this Standard should be sent in writing as appropriate to:

Chief Highway Engineer  
The Highways Agency  
123 Buckingham Palace Road  
London  
SW1W 9HA

G CLARKE  
Chief Highway Engineer

Chief Road Engineer  
Scottish Executive  
Victoria Quay  
Edinburgh  
EH6 6QQ

J HOWISON  
Chief Road Engineer

Chief Highway Engineer  
Transport Wales  
Welsh Assembly Government  
Cathays Parks  
Cardiff  
CF10 3NQ

M J A PARKER  
Chief Highway Engineer  
Transport Wales

Director of Engineering  
The Department for Regional Development  
Roads Service  
Clarence Court  
10-18 Adelaide Street  
Belfast BT2 8GB

G W ALLISTER  
Director of Engineering

## ANNEX A

### Model AIPs

- A1 For the design or assessment of bridges and other Highway Structures
- A2 For the design or assessment of Road Tunnel structures and Large Service Tunnels
- A3 For M&E installations in moveable bridges and access gantries
- A4 For M&E installations in Road Tunnels and services buildings
- A5 For the design or assessment of Small Service Tunnels
- A6 Safety Consultation Document  
Operation, Control and Maintenance of Moveable Bridges and Bridge Access Gantries
- A7 Safety Consultation Document  
Tunnel Operation, Control and Maintenance

## Annex A1

**Model form of Approval in Principle for the design/assessment<sup>1</sup> of bridges and other highway structures**

**Name of Project** \_\_\_\_\_

**Name of Bridge or Structure** \_\_\_\_\_

**Structure Ref No** \_\_\_\_\_

- 1. HIGHWAY DETAILS**
  - 1.1 Type of highway
  - 1.2 Permitted traffic speed 2
  - 1.3 Existing restrictions 3
- 2. SITE DETAILS**
  - 2.1 Obstacles crossed
- 3. PROPOSED STRUCTURE**
  - 3.1 Description of structure
  - 3.2 Structural type
  - 3.3 Foundation type
  - 3.4 Span arrangements
  - 3.5 Articulation arrangements
  - 3.6 Types of road restraint systems
  - 3.7 Proposed arrangements for maintenance and inspection/Inspection for Assessment<sup>1</sup>
    - 3.7.1 Traffic management
    - 3.7.2 Access
    - 3.7.3<sup>A</sup> Intrusive or further investigations proposed
  - 3.8 Sustainability issues considered. Materials and finishes/Materials strengths assumed and basis of assumptions<sup>1</sup> 4
  - 3.9 Risks and hazards considered 5
  - 3.10<sup>D</sup> 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
  - 3.11<sup>D</sup> Proposed arrangements for construction
    - 3.11.1 Traffic management
    - 3.11.2 Service diversions
    - 3.11.3 Interface with existing structures
  - 3.10<sup>A</sup> Year of construction
  - 3.11<sup>A</sup> Reason for assessment
  - 3.12<sup>A</sup> Part of structure to be assessed
- 4. DESIGN/ASSESSMENT<sup>1</sup> CRITERIA**
  - 4.1 Live loading, Headroom
    - 4.1.1 Loading relating to normal traffic under AW regulations and C&U regulations 6
    - 4.1.2 Loading relating to General Order traffic under STGO regulations 7
    - 4.1.3 Footway or footbridge live loading
    - 4.1.4 Loading relating to Special Order Traffic, provision for exceptional abnormal loads indivisible loads including location of vehicle track on deck cross-section 8
    - 4.1.5 Any special loading not covered above
    - 4.1.6 Heavy or high load route requirements and arrangements being made to preserve the route, including any provision for future heavier loads or future widening
    - 4.1.7 Minimum headroom provided \_\_\_\_\_ m
    - 4.1.8 Authorities consulted and any special conditions required
  - 4.2 List of relevant documents from the TAS
    - 4.2.1 Additional relevant standards
  - 4.3 Proposed departures from Standards given in 4.2 and 4.2.1
  - 4.4 Proposed methods for dealing with aspects not covered by Standards in 4.2 and 4.2.1

**5. STRUCTURAL ANALYSIS**

- 5.1 Methods of analysis proposed for superstructure, substructure and foundations
- 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 earth pressure coefficients ( $k_a$ ,  $k_0$ , or  $k_p$ ) to be used in the design/assessment<sup>1</sup> of earth retaining elements

**6. GEOTECHNICAL CONDITIONS**

- 6.1 Acceptance of recommendations of the Section 8 of the Geotechnical Report to be used in the design/assessment<sup>1</sup> and reasons for any proposed changes
- 6.2 Geotechnical Report Highway Structure Summary Information (Form C)<sup>9</sup>
- 6.3 Differential settlement to be allowed for in the design/assessment<sup>1</sup> of the structure
- 6.4<sup>D</sup> If the Geotechnical 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

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**7. CHECKING**

- 7.1 Proposed Category
- 7.2 If Category 3, name of proposed Independent Checker
- 7.3<sup>D</sup> Erection proposals or temporary works for which an independent check will be required, listing parts of the structure affected with reasons for recommending an independent check

**8. DRAWINGS AND DOCUMENTS**

- 8.1 List of drawings (including numbers) and documents accompanying the submission
- 8.2<sup>A</sup> List of construction and record drawings (including numbers) to be used in the assessment
- 8.3<sup>A</sup> List of pile driving or other construction records
- 8.4<sup>A</sup> List of previous inspection and assessment reports

11

12

**9. THE ABOVE IS SUBMITTED FOR ACCEPTANCE**

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Design/Assessment<sup>1</sup> Team Leader

Engineering Qualifications \_\_\_\_\_ 13  
Name of organisation \_\_\_\_\_

Date \_\_\_\_\_

**10. THE ABOVE IS REJECTED/AGREED SUBJECT TO THE AMENDMENTS AND CONDITIONS SHOWN BELOW<sup>1, 14</sup>**

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held \_\_\_\_\_

Engineering Qualifications \_\_\_\_\_ 13

TAA \_\_\_\_\_

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, width and any environmental restrictions at or adjacent to the bridge*
- 4. *From record drawings or intrusive investigation*
- 5. *eg Risks and Hazards required to be considered under CDM such as construction methods, future demolition, jacking for bearing replacement*
- 6. *eg HA Loading*
- 7. *eg HB or SV Loading*
- 8. *Include the following as applicable:*
  - a) *Gross weight of the vehicle in tonnes and vehicle No*
  - b) *Axle load and spacing (longitudinally and transversely)*
  - c) *Air cushion in tonnes over area applied in m x m*
  - d) *Single or twin tyres and wheel contact areas*
- 9. *Include the Geotechnical Report Highway Structure Summary Information Form C listing relevant design/assessment parameters*
- 10. *When the results of the ground investigation become available, an addendum to the AIP, covering section 6, shall be submitted to the TAA. The addendum shall have its own sections 8, 9 and 10 to provide a list of drawings, documents and signatures*
- 11. *Include, without limitation:*
  - a) *Technical Approval Schedule (TAS)*
  - b) *General Arrangement Drawing*
  - c) *Relevant extracts from the Geotechnical Report (Section 8), Inspection Report, Intrusive Investigation Report, Previous Assessment Report (or reference for Report)*
  - d) *Departures from Standards*
  - e) *Methods of dealing with aspects not covered by Standards*
  - f) *Relevant correspondence and documents from consultations*
- 12. *Include details of previous structural maintenance and/or strengthening works*
- 13. *CEng, MICE, MIStructE or equivalent*
- 14. *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 shall be re-submitted to the TAA for review*

## **Annex A2**

**Model form of Approval in Principle for the design of assessment of road tunnel structures and large service tunnels**

**Name of Project** \_\_\_\_\_

**Name of Road/Large Service Tunnel** \_\_\_\_\_

**Road/Large Service Tunnel Ref No** \_\_\_\_\_

### **1. HIGHWAY DETAILS**

- 1.1 Type of highway
- 1.2 Permitted traffic speed

### **2. TUNNEL DETAILS**

- 2.1 Basic layout 1
- 2.2 Restrictions to traffic

### **3. BRIEF DESCRIPTION OF TUNNEL, TRAFFIC AND TUNNEL GEOMETRY**

- 3.1 Structural form of tunnel
- 3.2 Structural form of portal structures
- 3.3 Traffic and Geometry
  - 3.3.1 Horizontal and vertical alignment of tunnel and tunnel approaches
  - 3.3.2 Cross-section 2
  - 3.3.3 Highway Standards 3
  - 3.3.4 Accommodation of M&E services in Tunnel 4
  - 3.3.5 Minimum headroom (traffic gauge), horizontal clearances
  - 3.3.6 Structure gauge
- 3.4 Proposed arrangements for inspection and maintenance
- 3.5 Provision to be made in the tunnel layout for emergency communication and escape facilities, fire points, cross passages etc
- 3.6 Landscaping above tunnel and protection of tunnel roof
- 3.7 Sustainability issues considered. Materials and finishes for structural walls, ceiling and secondary cladding including fire protection
- 3.8 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)
- 3.9 Compliance with EU Road Tunnel Safety Directive requirements or alternatives with accompanying risk analysis

### **4. DESIGN CRITERIA**

- 4.1 Live loading , Headroom
  - 4.1.1 Loading relating to normal traffic under AW regulations and C&U regulations 5
  - 4.1.2 Loading relating to General Order Traffic under STGO regulations 6
  - 4.1.3 Loading relating to Special Order Traffic, provision for exceptional abnormal indivisible loads including location of vehicle track on deck cross-section 7
  - 4.1.4 Side verge loading
  - 4.1.5 Authorities consulted and any special conditions required
  - 4.1.6 Is the tunnel on a heavy and/or high load route, and any provision for future heavier loads or future widening
  - 4.1.7 Any loading from planned development over or adjacent to tunnel
- 4.2 List of relevant documents from the TAS
  - 4.2.1 Additional relevant standards
- 4.3 Proposed departures from Standards given in 4.2 and 4.2.1
- 4.4 Proposed methods for dealing with aspects not covered by Standards in 4.2 and 4.2.1

**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 earth pressure coefficients ( $k_a$ ,  $k_0$ , or  $k_p$ )
- 5.4 Proposed fire design including protection of structure and cables

**6. GEOTECHNICAL CONDITIONS**

- 6.1 Geotechnical Report Highway Structure Summary Information (Form C)<sup>8</sup>. Give details of any further geotechnical investigation required to validate basis of design/assessment
- 6.2 Acceptance of recommendations of Section 8 of the Geotechnical Report to be used in the design/assessment<sup>1</sup> and reasons for any proposed changes. (A copy of the Geotechnical Report should be supplied to the TAA in advance of the AIP submission whenever possible)
- 6.3 Is there any evidence of past mining or is any current or future mineral extraction likely to affect the tunnel?
- 6.4 If the Geotechnical 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

9

**7. DRAINAGE AND WATERPROOFING**

- 7.1 Details of proposed drainage
  - 7.1.1 Ground water seepage, run off through the portals
  - 7.1.2 Accidental spillage, water carried in by vehicles
  - 7.1.3 Fire main burst
  - 7.1.4 Tunnel washing
- 7.2 Details of proposed waterproofing
- 7.3 Articulation arrangement (immersed tube)
- 7.4 List special requirements of load 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, ie 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. CHECKING**

- 9.1 Structure to be Category 3
- 9.2 Name of proposed independent Checkers

10

**10. DRAWINGS AND DOCUMENTS**

- 10.1 List of drawings (including numbers) and documents accompanying the submission

11

**11. THE ABOVE IS SUBMITTED FOR ACCEPTANCE**

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Design Team Leader

Engineering Qualifications \_\_\_\_\_ 12  
Name of organisation \_\_\_\_\_

Date \_\_\_\_\_

**12. THE ABOVE IS REJECTED/AGREED SUBJECT TO THE AMENDMENTS AND  
CONDITIONS SHOWN BELOW<sup>13</sup>**

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held \_\_\_\_\_

Engineering Qualifications \_\_\_\_\_ 12

TAA \_\_\_\_\_

Date \_\_\_\_\_

**Notes**

1. Number of tubes, lanes, length between portals
2. Include widths of lanes, verges, emergency stopping lanes, space outside traffic gauge provided for M&E equipment
3. Include design flows and speeds and any proposed Departures from highway Standards
4. A separate submission is required for M&E functions and tunnel services buildings
5. eg HA Loading
6. eg HB or SV Loading
7. Include the following as applicable:
  - a) Gross weight of the vehicle in tonnes and vehicle No
  - b) Axle load and spacing (longitudinally and transversely)
  - c) Air cushion in tonnes over area applied in m x m
  - d) Single or twin tyres and wheel contact areas
8. Include the Geotechnical Report Highway Structure Summary Information Form C listing relevant design/assessment parameters
9. When the results of the geotechnical investigation become available, an addendum to the AIP, covering section 6, should be submitted to the TAA. The addendum should have its own sections 8, 9 and 10 to provide a list of drawings, documents and signatures
10. Category 3 for Road Tunnel and Large Service Tunnel Structures
11. Include, without limitation:
  - a) Technical Approval Schedule (TAS)
  - b) General Arrangement Drawing
  - c) Relevant extracts from the Geotechnical Report (Section 8)
  - d) Departures from Standards
  - e) Methods of dealing with aspects not covered by Standards
  - f) Relevant correspondence and documents from consultations
12. CEng, MICE, MIStructE or equivalent
13. Delete as appropriate

## Annex A3

Model form of Approval in  
Principle for M&E  
installations in moveable  
bridges and access gantries

Name of Project \_\_\_\_\_

Name of Structure \_\_\_\_\_

Structure Ref No \_\_\_\_\_

1. **HIGHWAY DETAILS**
  - 1.1 Type of highway
  - 1.2 Permitted traffic speed
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 Whole lift cost and sustainability considerations
4. **OPERATIONAL DESIGN CRITERIA (As relevant)**
  - 4.1 Live Loading
  - 4.2 Traffic Loading
  - 4.3 Snow Loading
  - 4.4 Wind Loading
  - 4.5 Temperature Range
  - 4.6 Any Special Loading not listed above (eg ship impact)
  - 4.7 List relevant Safety Consultation document
    - 4.7.1 Additional relevant Standards
  - 4.8 Proposed departures from Standards given in 4.7 and 4.7.1
  - 4.9 Proposed methods of dealing with aspects not covered by Standards in 4.7 and 4.7.1
5. **BASIS OF OPERATION AND CONTROL**
  - 5.1 Normal operation conditions
  - 5.2 Authorities consulted
  - 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 moveable 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
  - 7.4 Proposals for plant monitoring, data collection and management

**8. CHECKING**

- 8.1 M&E installation to be Category 3 4  
8.2 If Category 3, name of proposed Independent checkers

**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 ACCEPTANCE**

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Design Team Leader

Engineering Qualifications \_\_\_\_\_ 6  
Name of organisation \_\_\_\_\_

Date \_\_\_\_\_

**12. THE ABOVE IS REJECTED/AGREED SUBJECT TO THE AMENDMENTS AND  
CONDITIONS SHOWN BELOW<sup>7</sup>**

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 from Standards
  - d) Aspects not covered by Standards
  - e) Relevant correspondence and documents from consultations
  - f) Relevant loading data from the structural design
6. CEng from an appropriate Chartered Engineering Institution
7. Delete as appropriate

## **Annex A4**

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

**Name of Project** \_\_\_\_\_

**Name of Structure** \_\_\_\_\_

**Structure Ref No** \_\_\_\_\_

- 1. HIGHWAY DETAILS**
  - 1.1 Type of highway
  - 1.2 Permitted 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 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 List of relevant documents from the TAS
    - 4.3.1 Additional relevant standards
  - 4.4 Proposed departures from standards given in 4.3 and 4.3.1
  - 4.5 Proposed methods for dealing with aspects not covered by standards in 4.3 and 4.3.1
  
- 5. VENTILATION**
  - 5.1 General description including justification
  - 5.2 Design criteria 6
  - 5.3 Pollution and vehicle emissions 7
  - 5.4 Fresh air requirements 8
  - 5.5 Proposed ventilation system
  - 5.6 Ventilation fans
  - 5.7 Monitoring and control 9
  
- 6. LIGHTING**
  - 6.1 General description
  - 6.2 Design criteria
  - 6.3 Surface reflectivity 10
  - 6.4 Special operating conditions
  - 6.5 Monitoring and control

<b>7. DRAINAGE</b>		
7.1	General description, design criteria	
7.2	Effluent standards	11
7.3	Amounts to be handled	
7.4	Pumping equipment	12
7.5	Safety precautions	13
7.6	Siting of sumps	
7.7	Sizing of sumps	
<b>8. FIRE SAFETY</b>		
8.1	Design criteria	14
8.2	Active protection	15
8.3	Passive protection	16
8.4	Services building and plant rooms	17
<b>9. COMMUNICATIONS AND TRAFFIC CONTROL</b>		
9.1	General description, design criteria. Traffic management authority	
9.2	Telephone system	18
9.3	Emergency liaison	19
9.4	Traffic signs	20
9.5	Traffic monitoring	21
<b>10. TUNNEL OPERATION AND PLANT CONTROL</b>		
10.1	Basis of tunnel operation. Operating and maintaining authority	22
10.2	Plant monitoring and control	
10.3	Data logging and transfer	
10.4	Plant inspection and maintenance	
<b>11. ELECTRICAL POWER SUPPLY AND DISTRIBUTION</b>		
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
<b>12. ELECTRICAL POWER SUPPLY AND DISTRIBUTION</b>		
12.1	General description	26
12.2	Design criteria and layout	27
12.3	Building security and protection	28
<b>13. CHECKING</b>		
13.1	Give proposals for checking M&E installations including the design of tunnel services buildings	
13.2	Name of proposed Checker	
<b>14. TUNNEL SERVICES BUILDINGS AND PLANT ROOMS</b>		
14.1	List of drawings (including numbers) and documents accompanying the submission	29

**15. THE ABOVE IS SUBMITTED FOR ACCEPTANCE**

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Design Team Leader

Engineering Qualifications \_\_\_\_\_ 30  
Name of organisation \_\_\_\_\_

Date \_\_\_\_\_

**16. THE ABOVE IS REJECTED/AGREED SUBJECT TO THE AMENDMENTS AND  
CONDITIONS SHOWN BELOW<sup>31</sup>**

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held \_\_\_\_\_

Engineering Qualifications \_\_\_\_\_ 30

TAA \_\_\_\_\_

Date \_\_\_\_\_

**Notes**

1. *Design speed and during maintenance*
2. *Number of tubes, lanes, length between portals*
3. *For example; 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, 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 Brigade, Ambulance, Maintaining Authority including system of underground communication*
20. *Including advance warning and diversions, vehicle over height 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 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. *Including fire alarm systems*
29. *Include, without limitation:*
  - a) *Technical Approval Schedule (TAS)*
  - b) *General Arrangement Drawing*
  - c) *Departures from Standards*
  - d) *Aspects not covered by Standards*
  - e) *Relevant correspondence and documents from consultations*
30. *CEng from an appropriate Chartered Engineering Institution*
31. *Delete as appropriate*

## **Annex A5**

**Model form of Approval in Principle for the design or assessment of small service tunnels**

**Name of Project** \_\_\_\_\_

**Name of Small Service Tunnel** \_\_\_\_\_

**Small Service Tunnel Ref No** \_\_\_\_\_

### **1. PROJECT DESCRIPTION**

- 1.1 State purpose for which tunnel is required and give details of alternative routes that have been considered and reasons why they will not serve

### **2. NAME OF TUNNEL AND ROAD NUMBER**

- 2.1 Location of tunnel 1
- 2.2 Description of carriageway construction 2

### **3. TUNNEL GEOMETRY AND STRUCTURE**

- 3.1 Length 3
- 3.2 Cross-section 4
- 3.3 State structure and form of tunnel and give geometric requirements 5
- 3.4 Proposed arrangements for inspections and maintenance 6
- 3.5 Sustainability issues considered. Materials and finishes 7
- 3.6 List risks and hazards considered and give reasons for special safety measures deemed necessary (eg fire) for both construction and operating periods 8

### **4. DESIGN LOADS AND DOCUMENTS**

- 4.1 Live Loading
- 4.1.1 Loading relating to normal traffic under AW regulations and C&U regulations 9
- 4.1.2 Loading relating to General Order Traffic under STGO regulations 10
- 4.1.3 Loading relating to Special Order Traffic, provision for exceptional abnormal indivisible loads including location of vehicle track on deck cross-section 11
- 4.1.4 Any loading imposed by other structures/Statutory Authorities' equipment 12
- 4.1.5 Authorities consulted and any special conditions required 13
- 4.2 List relevant documents from the TAS
- 4.2.1 Additional relevant Standards
- 4.3 Proposed departures from Standards given in 4.2 and 4.2.1
- 4.4 Proposed methods for dealing with aspects not covered by Standards 4.2 and 4.2.1

### **5. TUNNEL DESIGN, METHOD OF CONSTRUCTION, SITE SUPERVISION**

- 5.1 Give the basis of the design of the tunnel support system for temporary and permanent conditions and any proposals for ground treatment
- 5.2 Show how the proposed method of construction, ie excavation and application of ground support, will ensure the continued safe use of the highway and prevent structural failure of the carriageway. Include proposals for dealing with over-breaking, annular space and emergency stoppage of work
- 5.3 Give details of predicted long and short term tunnelling effects on the carriageway; including maximum vertical settlement and trough width and consequential effects on structures or Statutory Undertakers' equipment within the zone of influence of the tunnelling work
- 5.4 Indicate any proposal to use explosives. State any vibration limits adopted or imposed. State specific site rules relating to charge weight, distance, peak particle velocity and frequency that have been determined
- 5.5 State method to be adopted to monitor the effects of tunnel construction to ensure compliance with any criteria imposed to limit surface movements or vibrations.

5.6 State arrangements to halt work in the event of unforeseen circumstances and arrangements for repair and maintenance

**6. GEOTECHNICAL CONDITIONS**

6.1 Acceptance of recommendations of Section 8 of the Geotechnical Report and reasons for any proposed changes

6.2 Geotechnical Report Highway Structure Summary Information (Form C)<sup>14</sup>. Give details of any further geotechnical investigation required to validate basis of design/assessment

6.3 Indicate any evidence of past mining or any current or future mineral extraction likely to affect the tunnel

6.4 If the Geotechnical Report is not yet available, state when the results are expected and list the sources of information used to justify the preliminary choice

15

**7. DESIGN AND CHECK CERTIFICATION**

7.1 Nominated Designer responsible for design

7.2 Proposed category of structure

7.3 If Category 3, nominated Checker

16

**8. DRAWINGS AND DOCUMENTS**

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

17

**9. THE ABOVE IS SUBMITTED FOR ACCEPTANCE**

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Design Team Leader

Engineering Qualifications \_\_\_\_\_ 18  
Name of organisation \_\_\_\_\_

Date \_\_\_\_\_

**10. THE ABOVE IS REJECTED/AGREED<sup>19</sup> SUBJECT TO THE AMENDMENTS AND CONDITIONS SHOWN BELOW**

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held \_\_\_\_\_

Engineering Qualifications \_\_\_\_\_ 18

TAA \_\_\_\_\_

Date \_\_\_\_\_

**Notes**

1. *Relate to highway chainage marker post and map reference*
2. *Type of construction, materials, depth of construction etc*
3. *State length within limits of trunk road land*
4. *Internal and external diameters or principal dimensions if non-circular*
5. *Invert level and cover. Include drawings showing tunnel location, horizontal and vertical alignments, cross-sections, depth below ground, minimum cover to crown and/or carriageway, other structures and Statutory Undertakers' equipment that is affected*
6. *Method of entry and system of work*
7. *Temporary and permanent support materials*
8. *eg Risks and Hazards required to be considered under CDM such as construction methods*
9. *eg HA Loading*
10. *eg HB or SV Loading*
11. *Include the following as applicable:*
  - a) *Gross weight of the vehicle in tonnes and vehicle No*
  - b) *Axle load and spacing (longitudinally and transversely)*
  - c) *Air cushion in tonnes over area applied in m x m*
  - d) *Single or twin tyres and wheel contact areas*
12. *For example; retaining walls, foundations*
13. *Overseeing Organisation, Highway Authorities and Statutory Undertakers, including water, gas, electric companies, telecommunications operator*
14. *Include the Geotechnical Report Highway Structure Summary Information Form C listing relevant design parameters*
15. *When the results of the ground investigation become available, an addendum to the AIP, covering section 6, should be submitted to the TAA. The addendum should have its own sections 8, 9, and 10 to provide a list of drawings, documents and signatures*
16. *Category 2 or 3 only*
17. *Include, without limitation:*
  - a) *Technical Approval Schedule (TAS)*
  - b) *General Arrangement Drawing*
  - c) *Relevant extracts from the Geotechnical Report (Section 8)*
  - d) *Departures from Standards*
  - e) *Methods of dealing with aspects not covered by Standards*
  - f) *Relevant correspondence and documents from consultations*
18. *CEng, MICE, MStructE or equivalent*
19. *Delete as appropriate*

## **Annex A6**

**Model form of background  
discussion document for  
appending to AIP**

**Name of Project** \_\_\_\_\_

**Name of Structure** \_\_\_\_\_

**Structure Ref No** \_\_\_\_\_

### **THE OPERATION, CONTROL AND MAINTENANCE OF MOVEABLE BRIDGES AND BRIDGE ACCESS GANTRIES - SAFETY CONSULTATION DOCUMENT**

#### **1. INTRODUCTION**

- 1.1 Purpose of Moveable 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 moveable bridges/access gantries
- 1.5 Plant
- 1.6 Communications
- 1.7 Power Supply
  - 1.7.1 Emergency supply arrangements
- 1.8 Emergency breakdown arrangements
- 1.9 Organisational responsibilities, e.g. Maintaining Authority

#### **2. MAINTAINING AUTHORITY**

- 2.1 General
- 2.2 Lines of communication and cover
- 2.3 Documentation
  - 2.3.1 Operator's Manuals
  - 2.3.2 Maintenance & Inspection manuals
  - 2.3.3 Permit to work
  - 2.3.4 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
- 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
  - (i) General provision
  - (ii) Location of contacts

### **Notes**

1. *The Moveable Bridge/Bridge Access Gantry Design and Safety Consultation Group should carry out similar functions to the Tunnel Design and Safety Consultation Group (TDSCG) (see BD 78 DMRB 2.2.9)*
2. *CEng from an appropriate Chartered Engineering Institution*

## **Annex A7**

**Model form of background  
discussion document for  
appending to AIP**

**Name of Project** \_\_\_\_\_

**Name of Structure** \_\_\_\_\_

**Structure Ref No** \_\_\_\_\_

### **TUNNEL OPERATION, CONTROL AND MAINTENANCE - SAFETY CONSULTATION DOCUMENT**

#### **1. INTRODUCTION**

- 1.1 Purpose of Tunnel Design and Safety Consultation Group (TDSCG) (see BD 78 DMRB 2.2.9)
- 1.2 Terms of reference
- 1.3 Organisational responsibilities
- 1.4 Overview (see Appendices)
- 1.5 Safety considerations for road tunnels
- 1.6 Traffic Management & Signing
- 1.7 Tunnel Plant
  - 1.7.1 Ventilation
  - 1.7.2 Lighting
  - 1.7.3 Drainage
  - 1.7.4 Role in emergencies
- 1.8 Communications
  - 1.8.1 Tunnel
  - 1.8.2 Regional
  - 1.8.3 Emergency
- 1.9 Power Supply
  - 1.9.1 Normal distribution
  - 1.9.2 Emergency arrangements
- 1.10 Emergency Equipment
  - 1.10.1 Fire points
  - 1.10.2 Telephones
  - 1.10.3 CCTV
  - 1.10.4 Cross Connections between tunnel bores
- 1.11 Tunnel Services Building and Plant Room
  - 1.11.1 Functions
  - 1.11.2 Maintenance Access
  - 1.11.3 Security Protection
  - 1.11.4 Fire Protection

#### **2. POLICE AND/OR HA 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 BRIGADE**

- 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
  - 6.3.1 Maintenance and Inspection manuals
  - 6.3.2 Permit to work
  - 6.3.3 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
  - 6.9.1 Wall washing requirements
  - 6.9.2 Maintenance access

**7. TRAINING**

**8. MAINTENANCE CONTRACTS**

- 8.1 General

**9. TUNNEL EMERGENCIES**

- 9.1 General
- 9.2 Fire plan
- 9.3 Major incident response
  - 9.3.1 Use of emergency cross passages (doors)
  - 9.3.2 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:
  - (i) EPD's Fire points by number
  - (ii) Bores
  - (iii) Cross passages
  - (iv) Fan positions, overrides and controls
- D. Communications
  - (i) General layout
  - (ii) Location of CCTV
- E. Tunnel drainage
- F. Traffic management plan

**Notes**

1. *Police, Fire Brigade, Ambulance Service, Environment Agency, Maintaining Authority*
2. *CEng from an appropriate Chartered Engineering Institution*

## ANNEX B

### Model TA Schedule

B1	Schedule of Documents Relating to Design or Assessment of Highway Bridges and Structures
B2	Schedule of Documents Relating to Design of Temporary Works
B3	Schedule of Documents Relating to Design or Assessment of Road Tunnels, Large Service Tunnels and M&E Installations
B4	Schedule of Documents Relating to Design and Construction of Large and Small Service Tunnels

Notes for the compiler of the TAS:

- (i) \* - Insert the current date of publication of the asterisked British Standards, MCHW, DMRB Standards and Advice Notes. This should be in the form of the year of publication for British Standards, the month and year of publication for MCHW, and the last two digits of the year of publication for DMRB Standards and Advice Notes. The dates of any Amendments should also be included. (The latest information on Highways Agency Standards can be obtained from the Highways Agency website <http://www.official-documents.co.uk/document/deps/ha/dmrb/index.htm>)
- (ii) A line should be struck through any document that is listed in the TAS but is not applicable to the AIP submitted.
- (iii) Ensure the Standards and references given in the model TAS are up-to-date.
- (iv) Ensure other relevant supplementary Standards and references to the model TAS are included.

# ANNEX B1

## Schedule of Design Documents Relating to Highway Bridges and Structures

### *British Standards*

BS 5268; Part 2; (Date)*	Structural Use of Timber
BS 5400	Steel concrete and composite bridges
Part 1; (Date)*	General Statement (see BD 15 (DMRB 1.3.2))
Part 2; (Date)*	Specification for loads (as implemented by BD 37 (DMRB 1.3))
Part 3; (Date)*	CP for design of steel bridges (see BD 13 (DMRB 1.3))
Part 4; (Date)*	CP for design of concrete bridges (see BD 24 (DMRB 1.3.1))
Part 5; (Date)*	CP for design of composite bridges (see BD 16 (DMRB 1.3))
Part 9; (Date)*	Bridge bearings (see BD 20 (DMRB 2.3.1))
Part 10; (Date)*	CP for fatigue (see BD 9 (DMRB 1.3))
BS 5628; Part 1; (Date)*	Unreinforced Masonry
BS 5930; (Date)*	Site Investigations
BS 6031; (Date)*	Earthworks
BS 8002; (Date)*	Earth retaining structures
BS 8004; (Date)*	Foundations
BS 8118; (Date)*	The structural use of aluminium
BS EN 1317-1; (Date)* Road Restraints Systems - Part 1	Terminology and general criteria for test methods
BS EN 1317-2; (Date)* Road Restraint Systems - Part 2	Performance classes, impact test acceptance criteria and test methods for safety barriers
BS EN 1317-3; (Date)* Road Restraint Systems - Part 3	Performance classes, impact test acceptance criteria and test methods for crash cushions
DD ENV 1317-4; (Date)* Road Restraint Systems - Part 4	Performance classes, impact test acceptance criteria and test methods for terminals and transitions of safety barriers.
BS EN 14388 (Date)*	Road traffic noise reducing devices - Specification

*Miscellaneous*

Circular Roads No 61/72 - Routes for heavy and high abnormal loads

Railway Approved Code of Practice GC/RC5510: Recommendations for the Design of Bridges (2000) (for full list of other Network Rail Standards, refer to RSSB, Railway Safety and Standards Board)

Simplified Tables of External Loads on Buried Pipelines (1986) (published by TSO)

Traffic Management Act 2004

***The Manual of Contract Documents for Highway Works (MCDHW)***

Volume 1: Specification for Highway Works (Date)\*

Volume 2: Notes for Guidance on the Specification for Highway Works (Date)\*

Volume 3: Highway Construction Details (Date)\*

***The Design Manual for Roads and Bridges (DMRB)***

**Bridges and Structures, Advice Notes (BA Series)**

The current alpha-numeric index in the DMRB, Volume 1, Section 0, Part 2 should be reproduced.

**Bridges and Structures, Standards (BD Series)**

The current alpha-numeric index in the DMRB, Volume 1, Section 0, Part 2 should be reproduced.

**Bridges and Structures, Technical Memoranda (BE Series)**

The current alpha-numeric index in the DMRB, Volume 1, Section 0, Part 2 should be reproduced.

**Traffic Engineering and Control, Standards (TD Series)**

TD 9/(Date)*	Road layout and geometry. Highway link design
TD 89/(Date)*	Use of passively safe supports to BS EN 12767:2000
TD 27/(Date)*	Cross Sections and headroom
TD 36/(Date)*	Subways for pedestrians and cyclists, layout and dimensions
IRRRS/(Date)*	Interim Requirements for Road Restraint Systems

**Highways, Advice Notes (HA Series)**

HA 66/(Date)*	Environmental Barriers - Technical Requirements
HA 84/(Date)*	Nature Conservation and Biodiversity
HA 59/(Date)*	Mitigating Against Effects on Basgers
HA 80/(Date)*	Nature Conservation Advice in Relation to Bats
HA 81/(Date)*	Nature Conservation Advice in Relation to Otters
HA 97/(Date)*	Nature Conservation Management Advice in Relation to Dormice
HA 98/(Date)*	Nature Conservation Management Advice in Relation to Amphibians

**Highways, Standards (HD Series)**

HD 22/(Date)*	Managing Geotechnical Risks
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## ANNEX B2

### Schedule of Documents Relating to Design of Temporary Works

#### *British Standards*

BS 449	Part 2	1969	- Specification for the use of structural steel in building
BS 1139, EN 39		(Date)*	- Metal Scaffolding. Tubes. Specification for Steel Tube
BS 1139, EN 39	Part 1: Section 1.2	(Date)*	- Metal Scaffolding. Tubes. Specification for Aluminium Tube
BS 1139, EN 39 BS EN 74	Part 2: Section 2.1	(Date)*	- Metal Scaffolding. Couplers. Specification for Steel Couplers, Loose Spigots and Baseplates for use in Working Scaffolds and Falsework Made of Steel Tubes
BS 1139 EN 39	Part 2: Section 2.2	(Date)*	- Metal Scaffolding. Couplers. Specification for Steel and Aluminium Couplers, Fittings and Accessories for use in Tubular Scaffolding
BS 1139, EN 39	Part 3	(Date)*	- Metal Scaffolding. Specification for Prefabricated Mobile Access and Working Towers
BS 1139, EN 39	Part 4	(Date)*	- Metal Scaffolding. Specification for Prefabricated Steel Splitheads and Trestles
BS 4074		(Date)*	- Specification for Steel Trench Struts
BS 5950	Part 1	(Date)*	- Structural use of Steelwork in Building. Code of Practice for Design of Rolled and Welded Sections
BS 5950	Part 2	(Date)*	- Structural use of Steelwork in Building. Specification for Materials, Fabrication and Erection. Rolled and Welded Sections
BS 5950	Part 5	(Date)*	- Structural use of Steelwork in Building. Code of Practice for Design of Cold Formed Thin Gauge Sections
BS EN 12811-1		(Date)*	- Temporary Works Equipment, Scaffolds, Performance Requirements and General Design
BS 5974		(Date)*	- Code of Practice for Temporarily Installed Suspended Scaffolds and Access Equipment
BS 5975		(Date)*	- Code of Practice for Falsework
BS EN 12812		(Date)*	- Falsework, Performance Requirements and General Design
BS 6187		(Date)*	- Code of Practice for Demolition
BS 6399	Part 1	(Date)*	- Loading for buildings. Code of Practice for Dead and Imposed Loads

BS 6399	Part 2	(Date)* - Loading for buildings. Code of practice for wind loads.
BS 7121	Part 1	(Date)* - Code of Practice for the Safe use of Cranes
BS 8081		(Date)* - Code of Practice for Ground Anchors
BS EN 1537		(Date)* - Execution of Special Geotechnical Work, Ground Anchors
BS 8110	Part 1	(Date)* - Structural use of Concrete. Code of Practice for Design and Construction

***Miscellaneous***

Traffic Management Act 2004

Formwork - A Guide to Good Practice, 2nd edition, 1995. Concrete Society

Design and Construction of Sheet Pile Cofferdams. CIRIA Report No. 95

Trenching Practice CIRIA Report No. 97

Concrete Pressure on Formwork. CIRIA Report No. 108

Control of Ground Water for Temporary Works. CIRIA Report No. 113

Concreting of Deep Lifts Large Volume Pours CIRIA Report No. 135

Formwork Striking Times. CIRIA Report No. 136

BSC Piling Handbook (Edition, Date)

Code of Practice for the Safe Use of Lifting Equipment. Lifting Equipment Engineers Association

## ANNEX B3

### Schedule of Documents Relating to Design or Assessment of Road Tunnels, Large Service Tunnels and M&E Installations

#### *Documents relating to Structures*

The documents listed in Annex B1 make no specific reference to the design and construction of tunnel structures, but both Parts apply where they are appropriate to the type of construction and materials used, eg design of cut and cover construction and/or the design of discrete structural elements in other forms of tunnel construction. BD 78 (DMRB 2.2.9) gives general requirements for the performance of a tunnel structure.

#### *Documents relating to M&E Installations*

The procedural, contractual and technical performance requirements for the M&E Installations for road tunnels, movable bridges and bridge access gantries are contained in the Manual of Contract Documents for Highway Works (MCHW) Volume 5 Section 7. BD 78 (DMRB 2.2.9) describes the design and operational requirements for road tunnels and is compatible with MCHW Volume 5 Section 7.

#### *Documents relating to Planning, Design, Operation and major Refurbishment*

Guidance and requirements for decision making relevant to the planning, design, operation and major refurbishment of road tunnels is contained in BD 78 (DMRB 2.2.9). The requirements for the inspection and records required for road tunnels are given in BD 53 (DMRB 3.1.6). BA 72 (DMRB 3.2.3) provides advice on the maintenance of road tunnels.

#### *Acts and Statutory Instruments*

In the planning, design, installation and operation of road tunnels and tunnel services buildings, it is the Designer's responsibility to identify and to ensure compliance with all relevant Acts and Statutory Instruments.

#### *British Standards*

BS 727		(Date)* - Specification for Radio-interference Measuring Apparatus
BS 4683		(Date)* - Specification for Electrical Apparatus for Explosive Atmospheres
BS 4683	Part 1	(Date)* - Classification of Maximum Surface Temperatures
BS 4683	Part 2	(Date)* - The Construction and Testing of Flameproof Enclosures of Electrical Apparatus
BS 5045		(Date)* - Transportable Gas Containers
BS 5045	Part 2	(Date)* - Specification for Steel Containers of 0.5 L up to 450 L Water Capacity With Welded Seams
BS 5045	Part 6	(Date)* - Specification for Seamless Containers of Less than 0.5 Litre Water Capacity
BS 5045	Part 7	(Date)* - Specification for Seamless Steel Gas Containers of Water Capacity 0.5 L up to 15 L for Special Portable Applications.

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BS 5045	Part 8	(Date)* - Specification for Seamless Aluminium Alloy Gas Containers of Water Capacity 0.5 L up to 15 L and up to 300 bar Charged Pressure at 15° C for Special Portable Application
BS 5445		(Date)* - Components of Automatic Fire Detection Systems
BS 5445	Part 5	(Date)* - Heat Sensitive Detectors – Point Detectors Containing a Static Element
BS 5445	Part 7	(Date)* - Specification for Point-Type Smoke Detectors using Scattered Light, Transmitted Light or Ionization
BS 5445	Part 8	(Date)* - Specification for High Temperature Heat Detectors
BS 5445	Part 9	(Date)* - Methods of Test of Sensitivity to Fire
BS 5499		(Date)* - Fire Safety Signs, Notices and Graphic Symbols
BS 5499	Part 1	(Date)* - Specification for Fire Safety Signs
BS 5499	Part 2	(Date)* - Specification for Self-Luminous Fire Safety Signs
BS 5499	Part 3	(Date)* - Specification for Internally-Illuminated Fire Safety Signs
BS 5499	Part 4	(Date)* - Code of Practice for Escape Route Signing
BS 5501		(Date)* - Electrical Apparatus for Potentially Explosive Atmospheres
BS 5501	Part 1	(Date)* - General Requirements
BS 5501	Part 2	(Date)* - Oil Immersion ‘o’
BS 5501	Part 4	(Date)* - Powder Filling ‘q’
BS 5501	Part 5	(Date)* - Flameproof Enclosure ‘d’
BS 5501	Part 6	(Date)* - Increased Safety ‘e’
BS 5501	Part 7	(Date)* - Intrinsic Safety ‘i’
BS 5501	Part 8	(Date)* - Electrical Apparatus for Potentially Explosive Atmospheres. Encapsulation ‘m’
BS 5501	Part 9	(Date)* - Specification for Intrinsically Safe Electrical Systems ‘i’
BS 6535		(Date)* - Fire Extinguishing Media
BS 6535 (BS EN 25923)	Part 1	(Date)* - Carbon Dioxide
BS 6941		(Date)* - Specification for Electrical Apparatus for Explosive Atmospheres with Type of Protection N
BS 7430		(Date)* - Code of Practice for Earthing
BS 7863		(Date)* - Recommendations for Colour Coding to Indicate the Extinguishing Media Contained in Portable Fire Extinguishers.

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BS EN 2	(Date)* - Classification of fires
BS EN 3	(Date)* - Portable Fire Extinguishers
BS EN 3-3	(Date)* - Construction, Resistance to pressure, Mechanical Tests
BS EN 3-6	(Date)* - Provisions for the Attestation of Conformity of Portable Fire Extinguishers in Accordance with EN 3 Part 1 to Part 5
BS EN 3-7	(Date)* - Characteristics, performance requirements and test methods
BS EN 124	(Date)* - Gully Tops and Manhole Tops for Vehicular and Pedestrian Areas. Design Requirements, Type Testing, Marking, Quality Control
BS EN 25923 BS 6535-1, ISO 5923	(Date)* - Carbon Dioxide
BS EN 50014	(Date)* - Electrical Apparatus For Potentially Explosive Atmospheres. General Requirements
BS EN 50015	(Date)* - Electrical apparatus For Potentially Explosive Atmospheres. Oil Immersion 'o'

***Miscellaneous***

Traffic Management Act 2004

The Traffic Signs Regulations and General Directions 2002 (S.I. 2002 No. 3113)

The Traffic Signs Regulations (Northern Ireland) 1997 (SR No. 386)

Reports of the PIARC (Permanent International Association of Road Congresses) Technical Committee on Road Tunnels

Proceedings of BHRA (British Hydromechanics Research Association) Symposiums

***Department for Transport (DfT) or Highways Agency (TSS Division) Publications***

List of Drawings, Specifications and Instruction: Traffic Systems and Lighting, MCS 206 (refer to the website <http://www.tssplansregistry.org/>)

## ANNEX B4

### Schedule of Documents Relating to Design and Construction of Large and Small Service Tunnels

Guide to best practice for the installation of pipe jacks and micro-tunnels. (Pipe Jacking Association)

New Roads and Street Works Act – Specification for the Reinstatement of Openings in Highways. A Code of Practice. (Highways Authorities Utilities Committee) TSO.

The guide to Pipelines Safety Regulations HSE 1996

BS 6164 (Date)*	Code of Practice for Safety in Tunnelling in the Construction Industry.
BS 5911	Concrete Pipes and Ancillary Products
BS 5911-1	Part 1: Specification for Unreinforced and Reinforced Concrete Pipes (Including Jacking Pipes) and Fittings with Flexible Joints (Complementary to BS EN 1916:2002)
BS EN 1916	Concrete Pipes and Fittings, Unreinforced, Steel Fibre and Steel Fibre and Reinforced

## ANNEX C

### Model Certificates

- C1 Highway Structures, including Road and Service Tunnels,  
in Categories 0, 1, 2 or 3  
  
(May also be used as basis for Stage 1 and Stage 2 certification  
of M&E Installations)
- C2 Lighting Columns; CCTV Masts and Cantilever Masts for Traffic Signals and/or  
Speed Cameras and Telecom Masts on Motorways and Trunk Roads
- C3 Type 'A' temporary works
- C4 Type 'B' temporary works
- C5 Specification variation
- C6 Construction Compliance

## Annex C1

**Model form of certificate  
for the design/assessment<sup>1</sup>  
and/or check<sup>1</sup> of Highway  
Structures, including Road  
and Service Tunnels**

**Name of Project** \_\_\_\_\_  
**Name of Structure** \_\_\_\_\_  
**Structure Ref No** \_\_\_\_\_

1. We certify that reasonable professional skill and care has been used in the preparation of the design/assessment<sup>1</sup> and/or check<sup>1</sup> of Name of Structure with a view to securing that: 2
- i. It has been designed/assessed<sup>1</sup> and/or checked<sup>1</sup> in accordance with
- The following Standards; **or** 3
- The Approval in Principle dated (date) including the following: 4
- 5  
6
- ii. It has been checked for compliance with the relevant Standards in i; **or** 8
- The assessed capacity of the structure is as follows: 9
- iii. It has been accurately translated into construction drawings and bar bending schedules (all of which have been checked)<sup>10</sup>. The unique numbers of these drawings and schedules are:

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Design/Assessment/Checking<sup>1</sup>  
Team Leader

Engineering Qualifications \_\_\_\_\_ 11

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held 12

\_\_\_\_\_  
Name of organisation

Date \_\_\_\_\_

2. The Departures from Standards and additional criteria given in paragraph 1 are agreed

7

3. The certificate is accepted by the TAA

Signed \_\_\_\_\_

Name \_\_\_\_\_

Position held

Engineering Qualifications \_\_\_\_\_ 13

TAA \_\_\_\_\_

Date \_\_\_\_\_

## Notes

1. *Delete if not required*
2. *Where several 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 will 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 re-submitted to the TAA for review*
5. *List any Departures and additional methods or criteria*
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 if not required. Note: not permitted for Categories 0 or 1 unless the TAA considers that the Departure has little or no structural implication*
8. *Delete for Categories 2 and 3, which require a separate check certificate*
9. *Used for assessments only. Assessed capacity is to be recorded in the Overseeing Organisation's management system for structures*
10. *Applicable for Categories 0 and 1 design certificate only*
11. *CEng, MICE, MIStructE or equivalent, but this qualification can be relaxed for Categories 0 and 1 with the agreement of TAA*
12. *A Principal of the organisation responsible for the design or assessment*
13. *Engineer with appropriate qualification and experience for Categories 0 and 1, and with CEng, MICE, MIStructE or equivalent for Categories 2 and 3*

## Annex C2

**Model form of certificate for  
 Lighting Column Systems/  
 CCTV Masts/Cantilever Masts  
 for Traffic Signals and/or Speed  
 Cameras<sup>1</sup> and Telecom Masts  
 on motorways and trunk roads**

**Name of Project** \_\_\_\_\_

**Column/Mast Ref No** \_\_\_\_\_

1. We certify that the Lighting Column System/CCTV Masts/Cantilever Masts for Traffic Signals and/or Speed Cameras<sup>1</sup> and Telecom Masts accurately shown on drawing(s) numbers (list drawing numbers) has/have<sup>1</sup> been designed/checked<sup>1</sup> for the following range of parameters<sup>2</sup> and fully complies with:

- i. The Specification for Highway Works (**edition, date**)
- ii. BD 26 (date) (DMRB 2.2.1)/BD 83 (date) (DMRB 2.2.11)/BD 88 (date) (DMRB 2.2.13)<sup>1</sup> or
- iii. the following Standards (for the design of Telecom masts)

Signed \_\_\_\_\_

Name \_\_\_\_\_  
 Designer/Checker 1

Engineering Qualifications \_\_\_\_\_ 3

Signed \_\_\_\_\_

Name \_\_\_\_\_  
 Position held 4

\_\_\_\_\_ 5  
 Name of organisation

Date \_\_\_\_\_

2. This certificate is accepted by the TAA \_\_\_\_\_ 6

Signed \_\_\_\_\_  
 Position held

Name \_\_\_\_\_

Engineering Qualifications \_\_\_\_\_ 3

TAA \_\_\_\_\_

Date \_\_\_\_\_

**Notes**

- 1. Delete as required
- 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
- 3. Engineer with appropriate qualification and experience for Categories 0 and 1, and with CEng, MICE, MIStructE or equivalent for Categories 2 and 3
- 4. A Principal of the organisation responsible for the design or check
- 5. Manufacturer or organisation responsible for the design or check

<sup>6</sup> C/4 For Category 0 lighting column systems and CCTV masts, Section 2 may be omitted

## Annex C3

Model form of certificate for  
type 'A' temporary works<sup>1</sup>

**Name of Project** \_\_\_\_\_  
**Name of Structure** \_\_\_\_\_  
**Structure Ref No** \_\_\_\_\_

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)<sup>2</sup> 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 construction of (project title) are satisfactory for the proper discharge of his 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.

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Temporary Works Checker

Engineering Qualifications \_\_\_\_\_ 3

\_\_\_\_\_  
Name of organisation

Date \_\_\_\_\_

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held

\_\_\_\_\_  
Name of organisation procuring  
the temporary works

Date \_\_\_\_\_

### 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 shall define unambiguously the extent of the structure to which the check is to be applied. Where necessary the extent of the Works shall be shown on the drawings and the relevant Drawing numbers stated.*
3. *Engineer with appropriate qualification and experience for Categories 0 and 1, and with CEng, MICE, MIStructE or equivalent for Categories 2 and 3*

**Annex C4**  
**Model form of certificate for**  
**type 'B' temporary**  
**works**

**Name of Project** \_\_\_\_\_  
**Name of Structure** \_\_\_\_\_  
**Structure Ref No** \_\_\_\_\_

1. We certify that reasonable professional skill and care has been used in the preparation of the design/ check<sup>3</sup> of the temporary works comprising (description of temporary works) with a view to securing that:

i. It has been designed/checked<sup>3</sup> in accordance with:

a. The Approval in Principle dated (date) including the following: 1

2

b. The TAA directives for the items listed in 3.ii below.

3

ii. The design proposals reflect the requirements of the relevant highway authorities for all affected highways.

iii. 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/Checking<sup>3</sup> Team Leader

Engineering Qualifications \_\_\_\_\_ 4

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held 5

\_\_\_\_\_  
Name of organisation

Date \_\_\_\_\_

2. This certificate is received \_\_\_\_\_ 6

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held

\_\_\_\_\_  
Name of organisation

Date \_\_\_\_\_

**DESIGN/CHECK<sup>3</sup> CERTIFICATE**  
**(Type 'B' temporary works)**

**Name of Project**  
**Name of Structure**  
**Structure Ref No**  
**Date**

3. i. The departures from standards and additional criteria given in paragraph 1 are agreed. 3  
ii. It has been directed that the following items shall be dealt with as described. 3

4. We have considered and recommend the TAA to accept this certificate 9

Signed \_\_\_\_\_

Name \_\_\_\_\_

Position held \_\_\_\_\_

Name of organisation \_\_\_\_\_

Engineering Qualifications \_\_\_\_\_ 4

Date \_\_\_\_\_

5. The certificate is accepted by the TAA 8

Signed \_\_\_\_\_

Name \_\_\_\_\_

Position held \_\_\_\_\_

Engineering Qualifications \_\_\_\_\_ 4

TAA \_\_\_\_\_

Date \_\_\_\_\_

**Notes**

1. *Insert date of acceptance of the AIP by the TAA including the dates of any addenda*
2. *List any Departures and additional methods or criteria*
3. *Delete if not required*
4. *CEng, MICE, MIStructE or equivalent*
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. *The TAA should inform of its acceptance of this certificate to the organisation that procures the temporary works so that work may then proceed*
9. *This is to be completed by the Employer's representative on site when applicable*

**Annex C5**  
**Model form of certificate**  
**for specification variation**

**Name of Project** \_\_\_\_\_  
**Name of Structure** \_\_\_\_\_  
**Structure Ref No** \_\_\_\_\_

1. We certify that reasonable professional skill and care has been used in the preparation/check<sup>1</sup> of the following additional and substitute clauses; list clause numbers<sup>2</sup> 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/Check<sup>1</sup> Team Leader

Engineering Qualifications \_\_\_\_\_ 3

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held 4

\_\_\_\_\_  
Name of organisation

Date \_\_\_\_\_

2. The additional and substitute clauses listed in paragraph 1 above and appended to this certificate are agreed.
3. The certificate is accepted by the TAA

Signed \_\_\_\_\_

Name \_\_\_\_\_  
\_\_\_\_\_  
Position held

Engineering Qualifications \_\_\_\_\_ 3

TAA \_\_\_\_\_

Date \_\_\_\_\_

**Notes**

1. Delete as appropriate
2. Only clauses that affect structural integrity eg 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, MIStructE or equivalent for Categories 2 and 3
4. A Principal of the organisation responsible for the design

**Annex C6**  
**Model form of certificate of  
construction compliance**

Name of Structure \_\_\_\_\_

Structure Ref No \_\_\_\_\_

1. We certify that Name of Structure:
- i. Has been constructed, commissioned and tested<sup>1</sup> in accordance with:
    - a. The following Standards<sup>1</sup>; **or** Approval in Principle dated (date)
    - b. The Design/Check Certificates dated (date) or  
The construction drawings and bar bending schedules listed within the Design and Check Certificates (dated)<sup>2</sup>
    - c. The Specification for Highway Works (edition, date)
  - ii. The construction of the works has been accurately translated into As Constructed drawings. The unique numbers of these drawings and schedules are:

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Contractor's Representative

Engineering Qualifications \_\_\_\_\_ 3

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held 4

\_\_\_\_\_  
Name of organisation

Date \_\_\_\_\_

2. We certify reasonable professional skill and care has been used in examining the construction of Name of Structure and that:
- i. It has been constructed, commissioned and tested<sup>1</sup> in accordance with:
    - a. The Approval in Principle dated (date)
    - b. The Design/Check Certificates dated (date) 2
    - c. The Specification for Highway Works (version, date)
  - ii. The construction of the works has been accurately translated into As Constructed drawings scheduled in 1.ii.

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held 5

\_\_\_\_\_  
Name of organisation

Date \_\_\_\_\_

3. This certificate is accepted by the TAA

Signed \_\_\_\_\_

Name \_\_\_\_\_  
Position held

Engineering Qualifications \_\_\_\_\_ 3

TAA \_\_\_\_\_

Date \_\_\_\_\_

**Notes**

- 1. *Used for Category 0 only*
- 2. *Applies where the contractor is not part of the design organisation*
- 3. *CEng, MICE, MStructE or equivalent*
- 4. *A Principal of the Contractor or organisation responsible for the construction*
- 5. *A Principal of the Works Examiner*

## ANNEX D

# Proprietary Manufactured Structures

### D.1 Avoidance of ‘barrier to trade’

D.1.1 An essential consideration for adoption of proprietary manufactured structures is the avoidance of discrimination against any structure that would satisfy a specified end use, and thereby create a “barrier to trade” in contravention of European Community legislation.

D.1.2 The procedures should avoid two forms of discrimination in particular. Firstly, discrimination between different forms of construction that will satisfy the same end use and secondly, discrimination between directly competing proprietary systems.

### D.2 Proprietary manufactured structures

D.2.1 The range of proprietary manufactured structures may include various types of culverts; small span underbridges (up to 8 metres span) in precast concrete; various systems for earth retaining structures such as reinforced/anchored earth systems; crib and gabion walls and environmental barriers.

### D.3 Different forms of construction

D.3.1 Generally the form of structure appropriate for a particular application will fall into one of the following groups:

- (a) 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.
- (b) Those where a proprietary manufactured structure is the most suitable, eg a corrugated steel buried structure, a precast concrete culvert selected from a manufacturer’s range of products, or a proprietary reinforced earth wall system.
- (c) Those where either form of construction would be more or less equally suitable.

D.3.2 To avoid the risk of discrimination, the Designer should demonstrate at the AIP stage to the TAA that all three groups as described in D.3.1 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 approved by the TAA.

D.3.3 Where the use of a proprietary manufactured structure is not considered appropriate for aesthetic or other reasons, the status and authority of the person(s) making that judgment 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.

D.3.4 In assessing the suitability of a particular form of particular application will fall into one of the construction, the Designer will consider whether maintenance costs may affect the choice. Departmental Standards for most structures within the scope of this Standard (eg corrugated steel or reinforced earth structures) include requirements for their continued performance throughout their design life with only routine minor maintenance, the cost of which should be ignored. However where a particular form of construction will require regular maintenance to preserve the structural integrity (eg. painting a steel footbridge), the foreseeable special maintenance costs may need to be added to the contract construction costs in order to ensure fair competition between different structures. Where this is considered necessary, it should be made clear in the O/AIP (see D.5).

#### D.4 Proprietary Designs

D.4.1 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 D.5. The O/AIP should be submitted to the TAA for approval.

#### D.5 Outline AIP

D.5.1 The O/AIP for proprietary manufactured structures may be based on the relevant sections of the model AIP Annex A1 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. Highway loading requirements
4. Other loading requirements
5. Relevant Departmental Standards, British Standards, Codes of Practice etc.
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 construction
11. Operational or user requirements
12. Special maintenance
13. Any other essential requirements

## ANNEX E

# Special Requirements for Records in Overseeing Organisations

### E.1 Highways Agency structures in England

Organisations and individuals responsible for signing certificates and other submissions as TAA shall ensure such certificates and submissions are recorded in the Highways Agency's Structures Management Information System (SMIS).

### E.2 Trunk Road Structures in Scotland

Records shall be submitted in accordance with the requirements of BD 62/94 (DMRB 3.1.2) Appendix B. As-built drawings shall be submitted in pdf format, or in a suitable format agreed with the Scottish Executive, in lieu of the Silver Halide Microfilm as-built drawings specified in Section 5.2 of Appendix B.

### E.3 Roads Service Structures in Northern Ireland

Records shall be submitted in accordance with the requirements of BD 62/94 (DMRB 3.1.2) Appendix D.

### E.4 Motorway and Trunk Road Structures in Wales

Records shall be submitted in accordance with the requirements of BD 62/94 (DMRB 3.1.2) Appendix D.

## ANNEX F

# Special Requirements for Overseeing Organisations Concerning Third Party Proposals of Temporary Works or Temporary Structures

### F.1 Motorways and Trunk Roads in England

F.1.1 For Third Party proposals of temporary works or temporary structures that are not described in Chapters 3 to 7 or where the Highways Agency (HA) does not have a specific knowledge or expertise, HA would not be able to give an opinion on whether they are safe or not. The Third Party is considered to have the required experience and competence to carry out the proposed works and be responsible for them. The following steps as described below shall be taken to ensure that the proposal is safe and the works are safely carried out.

F.1.2 The Third Party shall seek an Agreement for its proposal and draw up a legal agreement with the HA.

F.1.3 The legal agreement shall contain, amongst other things, the following:

- (i) Outline procedures in dealing with proposal which may include:
  - (a) Certification to confirm that the principles of design and/or construction have been appropriately transformed into an appropriate design using due reasonable professional skill and care.
  - (b) Required information to be submitted to HA. 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 HA considered comments on the proposal. If HA consider there is any safety issue and that safety issue is not resolved to the satisfaction of the HA, the works must not be carried out.
  - (d) Administrative processes e.g. establish contact points; agree relevant periods of notices; Third Party to give notifications; HA to give comments and requirements; HA to grant Agreement; Third Party to start work; HA to serve notice to stop work etc.
- (ii) For Temporary Works or Temporary Structures, consider the following:
  - (a) HA should not 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 e.g. sight line or other highway structures e.g. load on bridges.

- (e) Where appropriate, requirement of Geotechnical certification to HD22.
  - (f) Where there is little or no proven track record of the proposal or the proposal is an innovative solution, the proposal should first be tried on a test site or a minor road.
  - (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 should be agreed with the HA before employing them.
- (iii) For aspects other than Temporary Works or Temporary Structures, consider the following:
- (a) For road traffic operations and/or management such as signage, parking and access of support vehicles, coning, lighting etc that are described in Chapters 3 to 7 or where HA have the necessary expertise, the normal HA practices required for appropriate HA technical approval processes or operational requirements shall apply.
  - (b) The relevant parts of the Design Manual for Roads and Bridges shall be applied and Departures from Standard sought where appropriate.
- (iv) Agree an amount of public liability insurance by the Third Party and provide a copy of certificate to HAs.
- (v) Providing confirmation to the HA that the Third Party has taken appropriate safety advice identifying what advice has been taken and from whom.
- (vi) Making good of any damages due to the work by the Third Party. Obtain a certificate from the HA Area Maintaining Agent that the condition of the road network is almost the same before and after the work by the Third Party.
- (vii) All costs associated with the Third Party proposal will be borne by the Third Party.

## **F.2 Motorways and Trunk Roads in Scotland**

The requirements shall be the same as for England in F.1, except that Highways Agency is to be replaced by Scottish Executive.

## **F.3 Roads Designated by Roads Service in Northern Ireland**

F.3.1 For Third Party proposals for structures that are not described in Chapters 3 to 7 or where the Roads Service does not have a specific knowledge or expertise, Roads Service would not be able to give an opinion on whether they are safe or not. The Third Party is considered to have the required experience and competence to carry out the proposed works and be responsible for them.

F.3.2 The proposal/developer shall ensure that structures not covered by Chapters 3 to 7 are safe and the works are safely carried out. The proposer/developer shall contact the appropriate Roads Service Divisional Headquarters regarding the necessary certification procedures.

## **F.4 Motorway and Trunk Road Structures in Wales**

The requirements shall be the same as for England in F.1, except that Highways Agency is to be replaced by the Welsh Assembly Government.