

**Technical Approval of Structures
on
Motorways and Other National Roads**

June 2001

Summary :

This Standard sets out the requirements for technical and other approvals for structures associated with national roads and other roads.

**VOLUME 1 APPROVAL PROCEDURES
AND GENERAL DESIGN
SECTION 1 APPROVAL PROCEDURES**

Part 1A

NRA BD 2/01

**TECHNICAL APPROVAL
OF STRUCTURES ON MOTORWAYS
AND OTHER NATIONAL ROADS**

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1. INTRODUCTION

General

1.1 This Standard specifies the procedures for Technical Approval of structures in motorway and other national road schemes. It applies also to structures on non-national roads, which are improved, diverted or in any way affected by national roads works.

1.2 The Standard supersedes NRA BD 2/00 dated December 2000.

Scope

1.3 The National Roads Authority (NRA) requires the procedures described in this Standard to be applied to the designs of all structures of:

- (a) Clear span or internal diameter greater than 2.0m;
- (b) Retaining walls with over 1.5m design retained height;
- (c) All alternative designs and temporary structures under or over or adjacent to a motorway or other national road carrying public traffic;
- (d) Other structure types designated by the NRA.

1.4 The procedures contained in this Standard also apply to the assessment of load-carrying capacity of existing structures and to partial renewals, strengthening and repairs affecting the integrity or load-carrying capacity of existing structures. These procedures also apply to abnormal indivisible load assessments beyond the loading for which the structure has been designed or assessed previously.

Implementation

1.5 These Technical Approval procedures apply to the design, assessment, alteration, strengthening and repair of all road structures. These include bridges, tunnels, subways, culverts, retaining walls, reinforced earth structures and temporary structures under or over motorways or other national roads carrying public traffic.

1.6 On all road schemes the Technical Approval procedures should also be considered for the following structures: -

sign/signal gantries, catenary lighting systems, high masts for lighting and television cameras, pipe bridges, sign/signal mast arm structures, inspection gantries, buried corrugated steel structures and noise barriers.

The application of the procedures for these structures should be agreed with the NRA at the earliest opportunity in a project.

1.7 For any other structures, the NRA should be consulted to ascertain whether they fall within the scope of these procedures.

1.8 If this Standard is to be used for the design of local and regional road schemes, the Designer should agree with the relevant Road Authority the extent to which the document is appropriate in any particular situation.

Definitions

1.9 For the definitions of the general road terms used in this Standard such as components of the road (central reserve, verge, hard shoulder, and hard strip, etc.) see BS 6100: Subsection 2.4.1.

1.10 Particular terms used in this Standard are defined as follows:

Road Authority (RA): - For the purposes of this Standard only, Road Authority shall mean both the National Roads Authority and the Local Authority responsible for the roads and bridges.

Technical Approval: – Preliminary Approval, and the subsequent provision and acceptance of the appropriate Certificates.

Preliminary Approval: – approval given by the Road Authority (RA) of design or assessment proposals and their associated costs at preliminary design stage.

Contractor's Proposals for Structures: – proposals for structures where the Contractor is responsible for both the design and construction.

Preliminary Design: – all design and subsequent modifications, which affects Preliminary

Approval, Contractor's Proposals for Structures and Preliminary Reports.

Structure Category: – the classification of a structure, dependent on structural complexity and/or cost, which determine the form of check to be applied and the Certificate to be presented.

Designer: - the organisation or firm responsible for the design and also the organisation or firm responsible for the assessment, where appropriate. The scope of the responsibility exists until the structure is passed to the Bridge Management Organisation.

Checker: – the organisation or firm responsible for the check.

Design Team: – the group of engineers responsible for the design or assessment.

Checking Team: – the group of engineers responsible for the check.

Certificate: – a document titled 'Design Certificate for Structures' with undertakings and conditions confirming that the design or assessment complies with the agreed standards and cost limitations and that the design including relevant drawings have been checked. It is signed by the design engineer, the checking engineer and others as appropriate.

Contractor: – the organisation or firm responsible for the construction of a structure. In the case of schemes procured by Design and Build (D&B) or Public Private Partnership (PPP), the contractor is also the Designer. Contractor also refers to the firm who may be tendering for the construction work.

Project Supervisor Design: - Project supervisor for the design stage as required in the Safety, Health And Welfare At Work (Construction) Regulations, 1995.

Project Consultant: - the organisation or firm engaged by and reporting to the RA, to procure high quality infrastructures and services contract utilising the PPP initiative.

National Roads Project Management Guidelines

1.11 This standard should be read in conjunction with the NRA publication 'National Roads Project Management Guidelines' (NRPMG).

1.12 The National Roads Project Management Guidelines require approvals at various stages. These approvals are both technical and project management. One of the most important approvals impacting on structures is approval to go to tender. Tender approval concerns design, drawings, specifications, conditions of contract and the bill of quantities and it is given in phase 5. This phase of the NRPMG corresponds to the completion of detailed design of structures and submission of Certificates. For efficiency in both processes (i.e. technical and project management) it is therefore recommended that, where possible, the submission required in Paragraph 2.17 of this Standard should include all the relevant tender documents in addition to the technical information. Table 1/1 illustrates the relationships between the NRPMG and the Technical Approval process.

Mandatory Sections

1.13 Sections of this document which form part of the standards the National Roads Authority expects in design are highlighted by being contained in boxes. These are the sections with which the Design Organisation must comply or must have agreed a suitable Departure from Standard with the National Roads Authority. The remainder of the document contains advice and enlargement which is commended to designers for their consideration.

Relaxations within Standard

1.14 In difficult circumstances, the Designer may relax a requirement set out in this standard. The Designer shall record the fact that a Relaxation has been used in the design and the corresponding reasons for its use. The record shall be contained in the Preliminary Approval and the Certificate. The Design Organisation shall report all Relaxations incorporated into the design as part of the project report at the end of each project management phase (refer to the National Roads Project Management Guidelines).

Departures from Standards

1.15 In exceptional situations, the National Roads Authority may be prepared to agree to a Departure from Standard where the standard, including permitted Relaxations, is not realistically achievable. Design Organisations faced by such situations and wishing to consider pursuing this course shall discuss any such option at an early stage in design with the National Roads Authority. Proposals to adopt Departures from Standard must be submitted by the Design Organisation to the National Roads Authority and formal approval received BEFORE incorporation into a design layout. The Designer shall record the fact that a Departure has been used in the design and the corresponding reasons for its use. The record shall be contained in the Preliminary Approval and the Certificate.

‘National Roads Project Management Guidelines’ for the Overall Project	Deliverable	Technical Approval of Structures - Deliverables
1. Pre-planning	Identification of need.	Reports and studies necessary to feed into the overall planning aspects of the project, including where appropriate reports on structures, aesthetics, geotechnical, etc.
2. Constraints Study	Identification of all constraints affecting all aspects of the project	
3. Route Selection	Identification of the most favourable route.	
4. Preliminary Design/Land Acquisition. Procedures	Development of alignment and land required.	
5. Construction Documents Prep/Tender/Award	Detailed design.	
6. Scheme Construction	Construction.	Preliminary Report and Preliminary Approval (STA-1, STA-2, STA-3, STA-4, STA-5)
		Revisions to Preliminary Report Contractor’s Proposals for Structures (STA-2D&B) Design Certificates (STA-3, STA-6)
6. Scheme Construction	Construction.	Design Certificates (STA-3, STA-6)
		Construction related revisions to Preliminary Report, and to Design Certificates
7. Final Account and Completion Report.	Completion Report and as-constructed drawings	First Principal Inspection

Table 1/1

2. TECHNICAL APPROVAL

General

2.1 Preliminary Approval is required for all structures (including temporary structures, which carry any type of public traffic); apart from minor structures referred to in Paragraph 2.5 below. The purpose of the Preliminary Approval stage is to enable the RA to be satisfied as to: -

- (a) Compliance with the NRPMG.
- (b) The economy of the type and form of structure proposed within the overall scheme concept.
- (c) Its suitability for the environment and sub-soil conditions.
- (d) Its appearance, including the standards of finish to be adopted.
- (e) The adequacy of proposals for geotechnical and other investigations.
- (f) The loading and other design, durability or assessment criteria proposed.
- (g) The suitability of the design or assessment method(s) proposed for use in the final design.
- (h) The application of selected documents and Standards, and the suitability of any methods or criteria outside existing Codes or Standards proposed for adoption in a particular structure.
- (i) The need for consultation with interested authorities and compliance with statutory requirements.
- (j) Constructability issues in the context of the environment, traffic management, services, utilities and timing issues of related work.
- (k) The provision made for the inspection and maintenance of the structure both in the context of the structure itself and the environment in which it will function.
- (l) In the case of repair, strengthening or partial renewal works, the adequacy of the whole and all parts of the structure at all stages of the works to carry the required loading arrangement.

The Preliminary Approval shall not be given until after the Designer and RA are satisfied that all foreseeable aspects have been covered and any differences resolved.

2.2 Preliminary Approval is a continuing process and the period required for consideration will vary according to the size and complexity of the structure and the items falling outside current design standards. The RA may agree certain aspects of the Preliminary Approval submission in outline as the consideration of the proposals proceed prior to formal submission for Preliminary Approval. One or two presentations using visual aids, together with discussions, have been found to be a useful method of progressing expeditiously to formal submission for Preliminary Approval. Such presentations may deal with some or all of the structures.

Assessments

2.3 Preliminary Approval is required for assessments of the load-carrying capacity of existing structures categorised in accordance with Paragraph 2.5 below.

Design Development

2.4 Designers shall liaise as early as possible with the RA prior to making a formal submission. In the course of design development the Designer shall prepare reports covering:-

- (a) Constraints;
- (b) Route Selection;
- (c) Structural options;
- (d) Aesthetics review.

During this liaison the Designer shall propose the category of the structure.

Classification of Structures

2.5 All highway structures shall be classified into one of the following broad categories:

Category 0 - Minor structures, which conform in all respects to current NRA standards.

Individual structures for which all aspects of design and construction are covered by NRA

Standards may be classified as Category 0 provided they are: -

- (a) single span of under 10m and statically determinate for all load cases;
- (b) buried structures less than 3m clear span/diameter, or
- (c) multicell buried structures where the cumulative span is less than 5m, having more than 1m cover.

Assessments for single span simply supported structures under 10m and masonry arches under 6.5m span may be classified as Category 0, provided the assessment is being carried out fully in accordance with the current standards.

Category 1 - Simple structures which can be analysed by statical methods and where all aspects of design are in accordance with current NRA standards.

Category 1 structures include simple structures, which contain no departures from, or aspects not covered by, current NRA Standards and which are: -

- (a) single simply supported spans less than 20m with less than 30° skew;
- (b) buried concrete box type structures with less than 7.5m span,
- (c) corrugated steel buried structures, or
- (d) retaining walls with a retained height of less than 7m.

Category 2 -Intermediate structures which have redundant features and may contain departures from, or aspects not covered by, current NRA standards.

Category 2 structures include intermediate Structures: i.e. all those not within the parameters of categories 0, 1 & 3

Category 3 -Complex structures, which require sophisticated analysis of highly redundant features, and consequences of failure would be severe.

Category 3 structures include complex structures with any one of the following features: - high redundancy, unconventional design aspects, any span exceeding 50m, skew exceeding 45°, difficult foundation problems.

Registration of Minor Structures (Category 0)

2.6 Structures classified as Category 0 do not require Preliminary Approval. They must, however, be identified through a registration process: 'Registration of Minor Structures' (Appendix A). The Registration shall include:-

- (a) The form 'Registration of Minor Structures', (STA-1) One form is sufficient for all 'minor' structures on a scheme;
- (b) One copy of a 'Minor Structures Report' briefly describing each structure;
- (c) The form 'Structures Information Database' (STA-3) completed for each structure.

The forms STA1 and STA3 (Appendix C) must accompany the report and be bound into the report after the cover.

2.7 Registration is required for assessment of existing 'minor' structures if they were never previously registered.

Minor Structures Report

2.8 The 'Minor Structures Report' will give a brief description of each structure, where possible in a single paragraph.

Application for Preliminary Approval (Category 1,2 & 3)

2.9 Applications for formal Preliminary Approval shall include: -

- (a) The form 'Application for Preliminary Approval for Structures', (STA-2) completed and ready for signature by the RA, for each structure;
- (b) One copy of a Preliminary Report;
- (c) The form 'Structures Information Database' (STA-3).

The forms STA2 and STA3 must accompany the report and be bound into the report after the cover.

Preliminary Report.

2.10 The information required for Preliminary Approval will vary and is unique for each structure; however, a model for a Preliminary Report, which should be suitable for the majority of new structures is given in Appendix A. This is a comprehensive document drawn up to cover the design of new bridges; some of the information requested may not be applicable to other types of structures or other purposes, e.g. assessment, design-construct contracts, etc. The RA needs only information pertinent to the particular Preliminary Approval. Irrelevant information should not be included. On the other hand the RA may ask for additional information before Preliminary Approval can be granted. The scope of the Preliminary Report may be influenced by the nature of the procurement process.

2.11 The initial Preliminary Approval for assessments will cover the standards to be used, material properties, any known special criteria and methods of analysis, etc. It is unlikely to cover Departures from Standards and shortfalls because in most cases they will not be identified before the structural analysis has been carried out. The Certificates can cover these.

Preliminary Approval

2.12 The RA will issue the Preliminary Approval (STA5) when it is satisfied in accordance with Paragraph 2.1 above. Together with the Preliminary Approval the RA will issue a blank Certificate (STA6) which must be completed and returned when the design or assessment has been completed and checked.

2.13 Preliminary Approval is valid for four years after the acceptance date. If a structure has not commenced construction within this period, the RA shall review it and decide whether or not updating or any other amendment in the design is required. The RA's decision on a resubmission will be recorded as a revision to the original Preliminary Approval and will then be sent to the Designer.

2.14 Preliminary Approval will require a review after statutory approvals have been received. The Designer will review the Preliminary Report and the Approval and make modifications if appropriate. All modifications will require approval by the RA and if approved will be recorded as a revision to the original Preliminary Approval and will then be sent to the Designer.

Contractor's Proposals for Structures

2.15 Contractor's Proposals for Structures is an extension to the Preliminary Approval process and is relevant only for D&B/PPP methods of procurement and for Contractor's alternatives in conventional contracts. Refer to Paragraph 3.9 for further details.

Design / Assessment

2.16 The design or assessment must comply with the Preliminary Approval or the Contractor's Proposals for Structures. Should any variations or additions prove necessary during the design, assessment or check, the RA must agree to them before they are implemented. Such variations must be recorded on an addendum/revision to the Preliminary Approval or the Contractor's Proposals for Structures. The Designer shall be responsible for the applicability and accuracy of all computer programs used and shall also ensure the validity of the program for each application.

Certification

2.17 When the design/assessment and check of each structure have been completed, the Designer must send to the RA the following:-

- (a) The appropriate Certificates (STA6) (see Appendix D) filled in and signed by the Designer and Checker where appropriate. They shall be sent by the Designer, with original signatures, for acceptance and, if appropriate, endorsement;
- (b) One complete set of drawings (maximum A3 size) and specification. In the case of Category 0 structures, one general arrangement drawing is sufficient;
- (c) The form 'Structures Information Database' (STA-3).

All Departures and aspects not covered by Standards must be recorded on the Certificates for endorsement by the RA. Assessments for the load-carrying capacity of existing or strengthened structures will also require certification in the same way.

2.18 Where a structure has been placed in Category 0 or 1, and a need arises subsequently to depart from current standards, the Category will be changed to 2, unless the RA considers, when agreeing the departure, that a change of category is unnecessary. The appropriate Certificate shall be used and any previous Certificate endorsed as superseded.

2.19 The signatories submitting the Certificate must clearly indicate their name and office. Signatures are required from the team leader responsible for the design and independent check and the Principal in charge of the organisation or firm which is responsible for the design and independent check, either of whom may delegate this responsibility for Category 0 and 1 structures. The Certificate must be signed by the 'Project Supervisor Design' to demonstrate that the structure has been taken into account in accordance with the requirements of the Safety, Health and Welfare at Work (Construction) Regulations, 1995.

2.20 Any proposed substitute, additional or cancelled bridge works specification clauses, which require endorsement by the RA, must be sent to the RA prior to submission of the Certificates together with notes fully explaining the reasons for Specification variations. Endorsement will be recorded on the Certificates.

2.21 The persons who sign as Team Leader for design and check on Certificates must be Chartered Civil or Structural Engineers (or equivalent) with appropriate experience.

2.22 The RA will acknowledge the Certificate(s) (STA6) and return a copy to the Designer. Acknowledgement of the Certificates by the RA shall conclude the Technical Approval procedure.

2.23 The form STA-4 provides a record of the registration of minor structures. It is for internal use only in the NRA.

3. CONTRACTUAL ENVIRONMENTS

General

3.1 Technical Approval of Structures is required regardless of the nature of the contractual arrangements between the various parties. The Designer is required to prepare and submit reports and certify designs. The design must also be checked and the checker must be included in the Certificate. The effect of the contractual environment is to change the circumstances in which the Designer operates and to change the relationships between the various parties. There may be several designers involved in a project prior to hand over to the RA. The text in this chapter will refer to the RA's Designer and the Contractor's Designer. All these designers are regarded as the 'Designer'.

3.2 The following sections describe the variations to the procedures set out in Chapter 2 required as a result of different contractual environments. It should be noted that the terms 'Contractor Designed Structures' and 'Contractor's Alternatives' have different meanings. The former is in accordance with Series 2500 in the Specification for Road Works while the latter means an alternative to a structure, which has been fully designed and detailed by the RA's Designer.

Conventional Contracts - General

3.3 In a conventional contract, the RA employs the Designer to prepare designs for structures and to prepare construction drawings and contract documents. In addition it is normal that the same Designer will supervise the construction until hand-over to the RA. The basis of the procedures in Chapter 2 is a conventional contract arrangement with well-established relationships between RA, Designer and Contractor.

Contractor Designed Structures in Conventional Contracts

3.4 In conventional contracts it is common to designate certain minor structures as contractor's designs. The purpose of this arrangement is to take advantage of the cost savings resulting from competition among manufacturers of proprietary and standard structures. The Contractor may also

opt to provide these structures using conventional construction techniques rather than using proprietary or standard structures.

3.5 Contractor designed structures in conventional contracts are limited to the following types:

- (a) Category 0 structures
- (b) Category 1 structures where:
 - Spans are 10m or less.
 - The Contractor provides the whole structure.
 - Soil structure interaction requires no special structural or geotechnical expertise.

3.6 The Designer shall comply with the Technical Approval Procedures set out in Chapter 2 for both Category 0 and Category 1 structures.

3.7 Prior to tender the RA's Designer should take account of the Contractor's future inputs in the preparation of the Preliminary Report for Category 1 structures. The report required for submission in accordance with Paragraph 2.9(b) may be in the format shown in Appendix B together with a General Arrangement drawing.

3.8 For Category 1 structures it is the intention that the Contractor supplements the Preliminary Report prepared by the RA's Designer so that it becomes a comprehensive document as outlined in Paragraph 2.10. The RA's Designer therefore should set out clearly the requirements for the Contractor with respect to the nature of any supplementary information.

3.9 The RA's Designer may act as the Checker in the Certificates.

3.10 The Contractor's Designer shall supplement and seek approval for any modifications to the Preliminary Report and will provide the required Certificates when the design is complete. The RA's Designer shall ensure that the Technical Approval Procedures are implemented.

Contractor's Alternatives in Conventional Contracts

3.11 In a conventional contract the Contractor may be permitted to provide an alternative design for a structure as part of the tender. The Contractor's alternative submission for consideration by the Employer should follow the procedures set out in Paragraphs 3.15 to 3.24. These procedures and the contract responsibilities of the Designer may be amended by the Instructions to Tender in order to suit the actual contract. Where an alternative is permitted after tender then a similar procedure may be followed.

3.12 The Contractor's Designer shall supplement and seek approval for any modifications to the Preliminary Report and will provide the required Certificates when the design is complete. The RA's Designer shall ensure that the Technical Approval Procedures are implemented.

Design and Build Contracts. (D&B/PPP)

3.13 For schemes procured by means of a Design & Build (D&B) or Design, Build, Finance & Operate (DBFO) / Private Public Partnership (PPP) strategy, the procedures described in the sections 3.15 to 3.24 shall apply.

3.14 In D&B schemes, the Contractor is the organisation responsible for the design, construction and in certain cases maintenance of the scheme. In DBFO/PPP, the Concession Company has these responsibilities. The term 'Contractor' covers both circumstances.

Contractor's Proposals for Structures

3.15 Prior to tender, the Technical Approval procedures as set out in Chapter 2 must be followed. The Project Consultant will act as the RA's Designer in D&B/PPP contracts.

3.16 During the tender period a number of consultation meetings, as advised in the Instructions for Tendering, shall take place between the Contractor and the RA.

3.17 During these consultation meetings, the Contractor shall provide details of his conceptual design proposals at each structure location for discussion. The details to be discussed shall include:-

- (a) general description of proposed structure;
- (b) span arrangement;
- (c) proposed foundation details;
- (d) details of articulation;
- (e) proposed materials and finishes;
- (f) parapet type;
- (g) arrangements for inspection and maintenance
- (h) design Standards to be adopted or proposed Departures from Standard;
- (i) any other relevant matters.

3.18 The Contractor's conceptual design proposals shall be capable of development to a detailed design that satisfies all of the requirements set out by the RA.

3.19 Prior to tender submission and at a date to be advised in the Instructions for Tendering, the Contractor shall submit to the RA:-

- (a) The form 'Contractor's Proposals for Structures' (STA-2D&B);
- (b) One copy of a Preliminary Report including a general arrangement drawing (see Appendix B);
- (c) The form 'Structures Information Database' (STA-3) with physical and administrative information about the structure. Financial and quantity data are not required for D&B/PPP schemes.

For minor structures (Category 0) the submission shall be as described in Paragraph 2.6.

3.20 Following receipt of the items in Paragraph 3.17, the RA shall provide the Contractor with any further comments on the Contractor's Conceptual Design proposals, which the Contractor shall require to incorporate in the tender submission.

3.21 The RA shall acknowledge receipt of the Contractor's conceptual design proposals.

3.22 Following award of the Contract, the Contractor shall prepare the preliminary and detailed design in accordance with the tender including the general arrangement drawings of structures and the 'Contractor's Proposals for Structures'. Should the Contractor at this stage modify or amend his proposed design, he shall re-submit to the RA in accordance with any Change Procedure contained within the Contract the items in Paragraphs 3.17 and 3.19 above. This submission shall show details of his new proposals together with reasons and justification for the proposed changes. The RA shall not be bound to accept any new proposals, modifications or amendments.

3.23 Prior to commencing detailed design the Contractor should supplement the Preliminary Report (see Paragraph 3.19(b) above) so that it becomes a comprehensive document as outlined in Paragraph 2.10. This should then be resubmitted to the RA together with the forms described in Paragraphs 3.19(a) and 3.19(c).

3.24 On completion of detailed design and checking of each structure, the Contractor shall provide the RA with copies of the appropriate Certificates (STA6) as required in Paragraph 2.17. Where the Contractor wishes to commence construction on site prior to completion of design and checking of the whole structure, the Contractor shall provide the RA with copies of the appropriate interim Certificates as required by the Contract.

3.25 Acknowledgement of the Certificates by the RA shall conclude the Technical Approval Procedure.

Compliance with Procedures and 'Release for Construction'

3.26 Where the Contractor carries out the design of structures under any of the contract arrangements described above or in any other contract arrangement, the RA must put in place an auditing system to ensure that the Technical Approval Procedures are implemented.

3.27 The RA may delegate the auditing system to the RA's Designer, the Engineer, the Project Consultant, Technical Advisor or any other competent body.

3.28 Where a Contractor (or a Contractor's Designer) is required to prepare designs and drawings prior to construction, the Approval Procedures require that his designs are checked and that certificates are furnished to the RA. These procedures ensure that a structure is in compliance with current codes and standards. However they may not ensure that the structures are detailed and constructed to best meet the maintenance and durability requirements of the RA. It may not be feasible to describe these requirements in specifications or employer's requirements. It is thus necessary to put in place a method of review of reports, drawings and specifications prepared by the Contractor prior to construction. This can be achieved by means of a 'Release for Construction' procedure. The RA may delegate this function to the RA's Designer, the Engineer, the Project Consultant, Technical Adviser or any other competent body.

3.29 Where reports, designs, drawings and specifications are prepared by a Contractor for construction, the RA shall ensure that all documents used for construction have been reviewed and have been signed and stamped 'Released for Construction' by the RA.

4. OTHER MATTERS

The Role of the Road Authority

4.1 To examine proposals contained in a Preliminary Report at the preliminary design or preliminary assessment stage and, when satisfied, to give Preliminary Approval.

4.2 To examine proposals for structures by Contractors contained in a Preliminary Report at the tender stage or during construction and, when satisfied, to acknowledge such proposals in order that they can be developed into designs for construction.

4.3 To agree the application of selected documents and Standards to particular structures and record any directives on principles to be followed in the Preliminary Approval.

4.4 To determine and agree the Category of structure.

4.5 To be available for consultation by the Design Team or Checking Team and to give advice on interpretations of Codes and Standards during the design or assessment stages.

4.6 To consider at any stage proposals for additional criteria or for departures from relevant documents and Standards subsequently issued.

4.7 To resolve any points of differences between the Design Team and Checking Team.

4.8 To receive from the Designer Certificates of compliance with the Preliminary Approval or Contractor's Proposals for Structures, signed by the Designer, Checker and others as appropriate, which will also record:-

- (a) Departures from and aspects not covered by Codes and Standards;
- (b) Directives issued by the NRA.

4.9 The RA will not check the calculations nor their translation into design other than to such limited extent as may be required for the purposes of Paragraphs 4.6 and 4.7 above.

Checking

4.10 Assessments, designs, construction drawings together with schedules and specifications shall be checked as follows: -

- (a) Categories 0 and 1 will require a check by another Engineer within the Design Team;
- (b) Category 2 will require a check by a Checking Team, which may be from the same office or firm but must be independent of the Design Team;
- (c) Category 3 will require a check to be carried out by a Checking Team from a separate organisation, proposed by the Designer and agreed by the RA, having knowledge and experience relating to the type of structure it is to examine.

4.11 Although the form and detail of the check is for the Checker to decide, his analytical work shall be independent of that of the Designer and carried out without reference to the Designer's calculations. The Designer must make the Checker aware of the design assumptions and details of any approved deviations to the design. The Designer shall not give calculation sheets to the Checker. The Checker shall be responsible for the applicability and accuracy of all computer programs used and also for ensuring the validity of the program for each application.

4.12 Independence between the Design Team and the Checking Team must be maintained, and although the methods of analysis they employ need not be the same, they should consult each other to ensure that the results they are obtaining are directly comparable. Where the Checking Team uses a different method of analysis, then the agreement of the RA shall be obtained.

4.13 The essence of the approval is technical and will apply irrespective of the nature of the contract.

Relevant Documents and Standards

4.14 The Preliminary Report shall contain a list of relevant documents and Standards. The list must set out the name of the actual document to be used together with the relevant date or version number. It is not sufficient to quote standards by general references, e.g. to the NRA DMRB or equivalent. The list may be compiled from the following sources: -

- (a) Relevant Irish Standards where there is a substitute for a European or British Standard;
- (b) NRA Standards;
- (c) The latest editions of the NRA Design Manual for Roads and Bridges (NRA DMRB);
- (d) The latest relevant European and British Standards.

4.15 The latest revision of a document shall be that at the date of the granting of the Preliminary Approval or acceptance of the Contractor's Proposals for Structures, or its subsequent amendment or endorsement. Where it is feasible in terms of cost and programme, a later revision should be used for detailed design. Where it is considered necessary to use a later revision and there are cost or programme implications, then approval should be sought from the NRA by using an addendum to the Preliminary Approval or Contractor's Proposals for Structures.

Health and Safety Requirements

4.16 The Designer shall inform the RA of any alterations to design or construction arising from Health and Safety requirements, Safety Audits or any other cause. The RA will decide on the appropriate procedure for dealing with such changes by amending the Preliminary Approval or the Certificates.

Amendments during Construction

4.17 It is the responsibility of the Designer to inform the RA of any amendments to the design during construction, which have structural or durability implications and such amendments shall normally be included in an addendum to the Preliminary Approval or the Contractor's Proposals for Structures. Certificates revised to take account of such amendments shall have been accepted prior to construction, unless otherwise agreed by the RA.

4.18 Additionally, where the proposed erection procedure induces different stresses in the completed structure from those anticipated in the design, the changes will need to be covered by additional Certificates and accepted by the RA before erection commences.

Completion of Construction

4.19 On completion of the maintenance period and correction of all defects, the Designer shall inform the RA's bridge management organisation that the structure is complete. A Principal Inspection shall then be carried out and details of the structure shall be entered in the Bridge Management System database. The Designer shall arrange for as-constructed drawings and all other pertinent information to be supplied to the RA.

Other Approvals

4.20 Bridges and structures constructed on National Roads must comply with other NRA approval requirements set out in the National Roads Project Management Guidelines. The approvals are associated with the commercial aspects of the projects and apply to conventional contracts only. While not part of the Technical Approval Procedures it is worth noting them here for consistency.

NRA Approval of Contract Documents

4.21 Approval is required of the Contract Documents. The submission to the NRA shall include:-

- (a) Instructions to Tenderers;
- (b) Conditions of Contract;
- (c) Designs, Drawings, and Specifications;
- (d) Bills of Quantities
- (e) Preliminary Health and Safety Statement;
- (f) The form 'Structures Information Database' (STA-3), updated with the pre-tender estimate and quantities summary.

The information supplied for this approval has considerable overlap with that required for acceptance of Certificates. In order to avoid duplication it may be considered appropriate to combine the submission for approval of contract documents and the submission for acceptance of Certificates.

NRA Approval of the Tender Report

4.22 Following submissions of tenders the RA will prepare a report on the tenders received. This will normally include a recommendation to appoint a particular Contractor. NRA Approval is required before the tender can be placed. The submission should include:-

- (a) The Tender Report;
- (b) The form 'Structures Information Database' (STA-3), updated with the tender price.

NRA Approval of the Final Account.

4.23 Following construction the RA will prepare a Final Account Report for approval by the NRA. The submission for approval should include:

- (a) The Final Account Report;
- (b) The form 'Structures Information Database' (STA-3), updated with the final account breakdown and total as well as a summary of final quantities.

5. REFERENCES

5.1 The following documents are referred to in this Standard:

BS 6100 : Subsection 2.4.1, Glossary of Building and Civil Engineering Terms: Highway Engineering. British Standards Institution.

National Roads Project Management Guidelines. National Roads Authority,

Safety, Health and Welfare at Work (Construction) Regulations 1995, S.I. No. 138/1995.

6. ENQUIRIES

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

Head of Project Management and Engineering
National Roads Authority
St Martin's House
Waterloo Road
Dublin 4



.....
E O'CONNOR
Head of Project Management and
Engineering

APPENDIX A – PRELIMINARY APPROVAL FOR CONVENTIONAL CONTRACTS

Instructions for Category 0 Structures

A.1 Category 0 structures do not require Preliminary Approval. However, they are required to have Certificates. In order that they can be entered in a database for certification, they must be identified. This is achieved through registration. This appendix illustrates a simple form to be used for 'Registration of Minor Structures'. A single form (STA-1) may be used for all structures. The form will accompany a report entitled 'Minor Structures Report'. This report will give a brief description of each structure, where possible, in a single paragraph. The form should be bound into the report inside the front cover.

Instructions for Category 1,2 & 3 Structures

A.2 This appendix illustrates the layout of the form (STA-2) 'Application for Preliminary Approval for Structures' and the accompanying Preliminary Report. The application form should be bound into the report inside the front cover.

A.3 The accompanying model for a Preliminary Report should not be regarded as prescriptive nor should its contents be regarded as exhaustive. However, Designers are expected to have considered all the topics in the model and should demonstrate such consideration by developing the topic or stating that it is not relevant. New topics should be introduced at the end of each section.

A.4 Text should be concise and to the point.

A.5 Appendices may be used to include photographs, drawings, third party reports, and lists of standards to be used. The appendices should include references to other reports, studies and working papers, which were used to develop the project to the Preliminary Approval stage.

Reports

A.6 The reports should be in A4 format and portrait page layout. Where possible, drawings should be A4 size bound into the document. The maximum size for drawings is A3, folded to A4 size and bound into the document.

A.7 The executive summaries should be not more than one A4 page. The body of the Preliminary Report between 1.0 and 11.0 should be contained in approximately ten A4 pages. The reports should be in 12-point font.

Database and Forms

A.8 The information provided in the application for Preliminary Approval and the Registration of Minor Structures, as well as the Certificates, are held in a database by the NRA. The database is used for the Approval process and to collect statistical information about structures. Appendix C illustrates the form (STA-3) which must be completed and returned to the NRA as information becomes available, at the following stages:-

- (a) Preliminary Approval, Registration of Minor Structures
- (b) Certificates
- (c) Approval of Contract Documents.
- (d) Tender Report
- (e) Final Account

REGISTRATION OF MINOR STRUCTURES*

STA-1

Category 0

Structures

Title of Report. _____

Reference _____

Revision _____

Date ___ / ___ / ___

Submitted by

Signed _____

Name _____

Position _____ (Team Leader)

Organisation _____

Date ___ / ___ / ___

Other Information (signatures are not required)

Name of the Principal responsible
for the Design Organisation: - _____

Name of the checking organisation: - _____

Name of the Principal responsible
for the checking organisation: - _____

Name of the Team Leader responsible
for the check:- _____

Name of the Project Supervisor Design: - _____
(Safety, Health and Welfare at Work (Construction) Regulations, 1995)

* This form should appear as the first page after the cover of the Minor Structures Report.

**APPLICATION FOR PRELIMINARY
APPROVAL FOR STRUCTURES***

STA-2

Categories 1,2 & 3

Structure

Name and nature of the Structure. _____

Preliminary Report

Reference _____

Revision _____

Date ___ / ___ / ___

Submitted by

Signed _____

Name _____

Position _____ (Team Leader)

Organisation _____

Date ___ / ___ / ___

Other Information (signatures are not required)

Name of the Principal responsible
for the Design Organisation: - _____

Name of the checking organisation: - _____

Name of the Principal responsible
for the checking organisation: - _____

Name of the Team Leader responsible
for the check:- _____

Name of the Project Supervisor Design: - _____

(Safety, Health and Welfare at Work (Construction) Regulations, 1995)

* This application should appear as the first page after the cover of the Preliminary Report.

PRELIMINARY REPORT

FOR

{NAME AND NATURE OF STRUCTURE}

Application for Preliminary Approval

Include STA-2

Document Information

Designation or number.

Revision* number and date. Nature of revision and page reference.

Author name and initials.

Reviewer/Checker's name and initials.

Executive Summary (1 A4 page)

Structure

Name:

Primary function:

Check Category:

Loading: Normal Abnormal

Passages

Primary

Number:

Name:

Other (multiple if necessary)

Number:

Name:

Recommendation

Unambiguous recommendations with a clear reference to an option or to a particular drawing.

Cost

The estimated initial capital cost and the discounted whole life cost. Costs should be given both without and with VAT.

Constraints

Unresolved constraints, conditions or reservations.

* Revision numbers are to be numeric and identified in the text with a reference in the right hand margin

1.0 Introduction

- 1.1 Instructions or brief given to the authors, including dates.
- 1.2 Background information covering the origins for the need for the structure.
- 1.3 Previous studies and their recommendations.
- 1.4 As required.

2.0 Site and Function

- 2.1 Site location. Described generally with reference to existing towns and roads. Location map at 1:50,000 and photographs (4 max).
- 2.2 Function of the structure and obstacles crossed.
- 2.3 Choice of location.
- 2.4 Site description and topography.
- 2.5 Vertical and horizontal alignments.
- 2.6 Cross sectional dimensions on the alignments.
- 2.7 Existing underground and overground services.
- 2.8 Geotechnical summary.
- 2.9 Hydrology and hydraulic summary.
- 2.10 Archaeological summary
- 2.11 Environmental summary.
- 2.12 As required.

3.0 Structure and Aesthetics

- 3.1 General description of recommended structure.
- 3.2 Aesthetic considerations.
- 3.3 Proposals for the recommended structure:
 - 3.3.1 Span arrangements.
 - 3.3.2 Approaches including run-on arrangements.
 - 3.3.3 Substructure.
 - 3.3.4 Foundation type.
 - 3.3.5 Superstructure.
 - 3.3.6 Articulation arrangements, joints and bearings.
 - 3.3.7 Parapet – type, corrosion protection, termination proposals, etc.
 - 3.3.8 Waterproofing – type, extent, etc.
 - 3.3.9 Drainage – deck, joints, bearing shelf, below ground, pipework, outfall, temporary, etc.
 - 3.3.10 Construction and buildability aspects.
 - 3.3.11 Inspection and maintenance – provisions made, effects on traffic management during future maintenance.

3.3.12 Materials and finishes.

3.3.14 As required.

4.0 Safety

4.1 Traffic management during construction – agreed in principal with all interested parties.

4.2 Safety during construction – Health and Safety regulations, etc.

4.3 Safety in use – impact, vandalism, etc.

4.4 Lighting – under, over, supply, fittings and fixtures.

4.5 Deck surface considerations – water disposal, freezing, different users, etc.

4.6 Damage – accidental, age deterioration, etc.

4.7 As required

5.0 Cost

5.1 Estimated cost. State the estimated cost of proposed structure together with other structural forms considered and the reasons for their rejection, including comparative costs with date of estimates. The emphasis should be on whole life costs and should include the effects of traffic management and diversions required during future maintenance. For comparison purposes, the discounted cost for 50 years should be used using a discount rate of 5%. Costs should be exclusive of VAT, however summaries of Costs should show, the VAT exclusive cost, VAT and total cost.

5.2 Base Year - state the base year and the source of rates and unit costs used in the estimate.

5.3 As required.

6.0 Design Assessment Criteria

6.1 Normal Loading (HA or Eurocode Load Model 1*).

6.2 Abnormal Loading. (No of units of HB or Eurocode Special Vehicle*).

6.3 Footway or footbridge live loading.

6.4 Provision for exceptional abnormal loads:

Gross weight tonnes on vehicle No.

Axle load and spacing

Air cushion tonnes over ...m x ...m

Location of vehicle track on deck cross section.

6.5 Any special loading not covered above.

6.6 Heavy or high load route requirements and arrangements being made to preserve route.

6.7 Minimum headroom provided m over m under. Clearance envelope diagrams to be provided.

6.8 Authorities consulted and any special conditions required (Utilities, Govt. Depts, OPW, Duchas, Fisheries, etc.).

* The application of Eurocodes to bridge loading in Ireland is not yet effective.

- 6.9 List of relevant documents and Standards (list here or refer to Appendix).
- 6.10 Proposed Departures from Standards.
- 6.11 Proposed methods of dealing with aspects not covered in Standards.
- 6.12 As required.

7.0 Structural Analysis

- 7.1 Methods of analysis proposed for superstructure, substructure and foundations.
- 7.2 Methods of analysis and design proposed for earth retaining systems..
- 7.3 As required.

8.0 Ground Conditions

- 8.1 Acceptance of the interpretative recommendations of the soils report to be used in the design and reasons for any proposed departures.
- 8.2 Acceptance of the topographical survey.
- 8.3 Describe the proposals for the foundations and demonstrate the merits (technical and cost) for the adoption of a particular solution.
- 8.4 Differential settlement to be allowed for in the design of the structure.
- 8.5 Anticipated vertical or lateral ground movements or settlements due to embankment loading, mineral extraction, flowing water, etc. Measures proposed to deal with these effects as far as they apply to the structure.
- 8.6 Results of tests on ground water and any counteracting measures proposed.
- 8.7 As required.

9.0 Checking

- 9.1 Proposed Category of structure.
- 9.2 Erection proposals or temporary works for which the Contractor will be required to arrange an independent check listing the parts of the structure affected with reasons for recommending the independent check.
- 9.3 As required.

10.0 Road Design

- 10.1 Interface with the Road Designer. Demonstrate (using recorded agreements) that there is full agreement between the road and bridge designers about alignments, traffic management, services, utilities, temporary works and the programming of works.
- 10.2 Separate construction of structures. Consider the construction, contractual and cost implications of the bridge works progressing as a separate contract before, after or contemporaneously with the road works. This may only be relevant if advantages have been identified in a procurement strategy previously agreed with the RA.
- 10.3 As required.

11.0 Drawings and Documents

- 11.1 List of all documents accompanying the submission. All documents are to be bound into sets. Each set is to contain a revision history together with signatures from the author, Checker, etc. Where drawings (A3 size maximum) are included, then a list of drawing titles, numbers and revision designations together with author and Checker signatures must be included.

Appendices to Accompany the Preliminary Report.

- | | |
|------------|---|
| Appendix 1 | Relevant documents and Standards used for this Structure. |
| Appendix 2 | Photographs and photomontages. |
| Appendix 3 | Drawings (A3 size maximum and bound into the document). |
| Appendix 4 | Relevant parts of the Geotechnical Investigation Report. |
| Appendix 5 | Other Reports. |

APPENDIX B – CONTRACTOR’S PROPOSALS FOR D&B/PPP CONTRACTS

Introduction

B.1 In Paragraph 3.11 it was noted that, prior to tender, the procedures as set out in Chapter 2 must be followed. The following is applicable to structures procured by D&B/PPP types of contract and applies from the tender period onwards.

Instructions for Category 0 Structures

B.2 The Contractor should review and amend the Minor Structures Report submitted by the Project Consultant. The Registration form (STA-1) and the report should be amended as required and submitted to the RA.

Instructions for Category 1,2 & 3 Structures

B.3 This appendix illustrates the layout of the form ‘Contractor’s Proposals for Structures’ (STA-2D&B) and the accompanying Preliminary Report. The form should be bound into the report inside the front cover.

B.4 The accompanying model for a Preliminary Report should not be regarded as prescriptive nor should its contents be regarded as exhaustive.

B.5 Text should be concise and to the point.

B.6 Appendices may be used to include photographs, drawings, third party reports and lists of standards to be used. The appendices should include references to other reports, studies and working papers which were used to develop the project to this stage.

Reports

B.7 The reports should be in A4 format and portrait page layout. Where possible, drawings should be A4 size bound into the document. The maximum size for drawings is A3, folded to A4 size and bound into the document.

Database and Forms

B.8 The information provided in the application for Contractor’s Proposals for Structures and the Registration of Minor Structures, as well as the Certificates, are held in a database by the NRA. The database is used for the acceptance process and to collect statistical information about structures. Appendix C illustrates the form (STA-3) which must be completed and returned to the NRA as information becomes available, at the following stages:-

- (a) Contractor’s Proposals for Structures, Registration of Minor Structures;
- (b) Certificates.

**CONTRACTORS PROPOSALS FOR
STRUCTURES ***

STA-2D&B

{SCHEME NAME}

Certificate No. XXXX

TENDERER'S OUTLINE CONCEPTUAL DESIGN PROPOSALS

Tenderer's outline conceptual design proposals as presented and developed through the tender consultations with the Employer:-

Conceptual Design Element Reference No : _____

Description of Conceptual Design Element: _____

Location: _____

Technical Details: Refer to Preliminary Report attached.

These outline proposals are shown on the following preliminary drawings:

_____ (See Appendix B)

The Conceptual Design will not differ substantially in appearance or in principles of construction from these outline proposals:

Signed _____ Name _____
(Director, Designer)

Date ___ / ___ / ____

Signed _____ in the capacity of _____
(Tenderer)

Name _____

Address _____

Date ___ / ___ / ____

Receipt of the above proposals is acknowledged

Signed _____ Name _____
(Employer)

PRELIMINARY REPORT

FOR

{NAME AND NATURE OF STRUCTURE}

1.0 Name of Scheme

- 1.1 Type of Road
- 1.2 Permitted Traffic Speed (over / under)

2.0 Name of Structure

- 2.1 Obstacle Crossed.

3.0 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 Parapet Type
- 3.7 Proposed Arrangements for Inspection and Maintenance
- 3.8 Materials and Finishes
- 3.9 Construction Proposals
- 3.10 Proposed Category of Structure

4.0 Design Criteria

- 4.1 Normal Loading (HA or Eurocode Load Model 1*)
- 4.2 Abnormal Loading. (No of units of HB or Eurocode Special Vehicle*)
- 4.3 Footway or Footbridge Live Loading
- 4.4 Provision for exceptional abnormal loads:
 - Gross weight tonnes on vehicle No.
 - Axle load and spacing
 - Air cushion tonnes over ...m xm
 - Location of vehicle track on deck cross section.

- 4.5 Any special loading not covered above.
- 4.6 Heavy or high load route requirements and arrangements being made to preserve route.
- 4.7 Minimum headroom provided m over m under. Clearance envelope diagrams to be provided.
- 4.8 List of relevant documents and standards (list here or refer to Appendix).
- 4.9 Proposed Departures from Standards
- 4.10 Proposed methods of dealing with aspects not covered in standards.

APPENDIX C – STRUCTURES INFORMATION DATABASE – STA-3

STRUCTURES INFORMATION DATABASE

STA-3

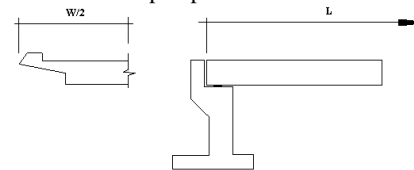
Local Authority		Scheme	
Name of Structure		Designers reference:	

General Information	
NRA ref.	
Design office/firm	
Principal	
Designer (team leader)	
Proj. Superv'r. design	
Check office/firm	
Principal	
Checker (team leader)	
Preliminary Approval or Registration	
Submitted	Date: / /
Approved/registered	Date: / /
Design approval	
Submitted	Date: / /
Accepted	Date: / /
Other Approvals	
Appr. of Contract Docs	Date: / /
Appr. of Tender Report	Date: / /
Appr. of Final Account	Date: / /
Category (0, 1, 2 or 3)	
Over bridge	Design load

Cost information		
Costs (excl VAT)	Date	Amount Ir£
Preliminary estimate		
Pre-tender estimate		
Tendered cost		
Final cost		
Final cost breakdown by Series		
Prelims		
100-1500		
1600		
1700		
1800		
1900		
2000		
2100		
2200		
2300		
2400		
Other		

Notes:

- Costs are in IR£.
- Costs exclude VAT.
- Costs exclude discounted whole life cost.
- Where bridges are part of a road scheme then the costs include a relevant proportion of the overall preliminaries.
- Bridge costs should include their relevant proportion of final account settlements, as preliminaries.
- Bridge area is based on the length to the centrelines of the abutment bearings and the overall width to the outside of the parapet fascia.



- For buried structures such as culverts, the deck should be described from the list (e.g. Solid slab, reinforced). The area should be the width x horizontal span.
- Financial and Quantity information is not required for D&B/PPP projects

Structure Information (see list next page)	
No.	Type
Cross Section	
Elevation	
Superstructure Material	
Pier Type	
Pier Material	
Pier Foundation Type	
Abutment Type	
Abutment Material	
Abutment Foundation Type	
Bridge Type	
Integral pier	
Integral abutment	
Deck Area	Sq m
No. Spans	
Maximum Span	m

Quantities information			
Quantities	F'work	Rebar	Conc.
<i>Pre-tender</i>	Sq m	Tonne	Cu m
End supports			
Intermediate supports			
Superstructure			
<i>Final Account</i>			
End supports			
Intermediate supports			
Superstructure			

STRUCTURES INFORMATION DATABASE
Bridge Information

STA-3

Cross Section Types	
10	Slab
11	Slab/girder, 1 girder
12	Slab/girder, 2 girders
13	Slab/girder, 3 girders
14	Slab/girder, 4 or more girders
30	Box beam, single box
31	Box beam, 2 or more boxes
40	Truss, interior passage
41	Truss below the deck
42	Truss beside the deck
43	Plate girders
50	Arch above the deck
51	Arch (not masonry) below, open
52	Arch (not mas.) below, closed
60	Masonry arch
70	Retaining wall
90	Other
91	Not applicable
Elevation Types	
10	Simple span, cons. cross sect.
11	Simple span, var. cross sect.
20	Continuous, const. cross sect.
21	Continuous, var. cross sect.
30	Cantilever, const. cross sect.
31	Cantilever, var. cross sect.
40	Frame, constant cross section
41	Frame, varying cross section
42	Box culvert
50	Arch, one or more spans
60	Cable stayed bridge
70	Suspension bridge
80	Bascular bridge
90	Other
91	Not applicable
Superstructure Materials	
10	Mass concrete
20	Reinforced conc., cast in situ
21	Reinforced concrete, precast
30	Stressed conc., cast in situ
31	Stressed concrete, precast
40	Concrete, in situ and precast
41	Conc., in situ & prec. prestr.
42	Composite, concrete and steel
50	Steel
60	Stone masonry
61	Brick masonry
90	Other
91	Not applicable
Pier Types	
10	Solid wall
20	Single column
30	2 or more separate columns
31	2 or more col., sep. cap beams
32	2 or more col., comm. cap beam
33	Columns w. bracing & cap beam
40	Piles with common cap beam
41	Piles w. bracing & cap beam
90	Other
91	Not applicable

Abutment Types	
10	Abutm. wall, integ. wing walls
11	Abutm. wall, indep. wing walls
20	Buried, solid
21	Buried, col./pile w. cap beam
29	Buried, unknown type
90	Other
91	Not applicable
Abutment and Pier Materials	
10	Masonry
11	Masonry & concrete
20	Mass concrete
21	Reinforced concrete
30	Steel
40	Steel and concrete
50	Reinforced earth
90	Other
91	Not applicable
Foundation Types	
10	Direct
20	Concrete piles
21	Steel piles
22	Wooden piles
30	Cylinders
40	Concrete caisson
90	Other
91	Not applicable
Bridge Type	
10.	Crossing a Road
20.	Crossing a River
30.	Crossing a Railway
40.	Footbridge
50.	Buried structure

APPENDIX D – FORMS

Introduction

D.1 The various forms STA-4, STA-5 and STA-6 have a similar appearance. They include the following information:-

- (a) Header with the RA name and the form name;
- (b) Administrative information and dates of events such as submissions and acceptances;
- (c) History of Conditions, Revisions, etc.;
- (d) Approval or Acceptance text and signatures.

An example of a typical form is shown in Figure D1.

D.2 Other forms – STA-7, STA-8 and STA-9 – are similar to each other and are illustrated in Figure D2.

**NATIONAL ROADS AUTHORITY
CLARE COUNTY COUNCIL**

NRA STA-4

Design Certificate for Structures

Scheme: N18 Droimoid to Crishesen
 NRA reference: 36 Designers reference: ST04
 Structure name: Killow Junction Overbridge

**Category
2**

Eliminary Approval
 Submitted: 2/11/2000 Preliminary Report reference: CU99/12 - 36 - PA
 Approved: 2/11/2000 Valentinetti 01/12/04

Design/Assessment Approval
 Submitted: Certificate reference: CU99/12 - 36 - DS
 Accepted: **Design**

Conditions/Amendments/Addenda

No.	Date	Affects Preliminary Approval
1	2/11/2000	Details
		Origin of Subsequence

Approval/Acceptance
text is not shown.

DD01/01 14.10.01 36-DS/1 Page1

Figure D1

**NATIONAL ROADS AUTHORITY
CLARE COUNTY COUNCIL**

NRA STA-7

Approval of Contract Documents

Road Authority: 3
 Scheme: 1 (N18/N19 Ballycree to Droichead - Contract 2)
 Element: 1 Bridges
 Structure: 67 Seabroome Junction - Structure 2

Approval date: 1/10/00
 Approval subject to: 1. From contract to be in accordance with the latest version of Public Procurement published by the Secretary Office.

 Tomás O'Connell
 Senior Project Manager - Structures
 Ref. CU99/12 - 67 - CA

Approval/Acceptance
text is not shown.

Figure D2

Text Used in Various Forms

D.3 The following text is used on the Certificate forms, STA-6. The text varies in accordance with the Category of the structure and the nature of the contract under which it is procured.

Text Used for Category 0 Structures

1.0 Undertaking

1.1 We certify that reasonable professional skill and care has been used in the preparation of the design of this structure and that:-

1.1.1 It has been designed in accordance with the Standards listed in the enclosed Annex 1 and the conditions and amendments listed above;

1.1.2 It has been checked for compliance with the relevant Standards in 1.1.1;

1.1.3 The design has been accurately translated into contract drawings, specifications and bar schedules. The unique numbers of these drawings and schedules are listed in the enclosed Annex 2.

Signed _____
Position Team Leader

Signed _____
Position Principal Officer or Director
Date ___ / ___ / ____

2.0 Acceptance of Certificate

The National Roads Authority accepts this certificate.

Signed _____
Position Senior Project Manager - Structures, National Roads Authority
Date ___ / ___ / ____

Text Used for Category 1 Structures

1.0 Undertaking

1.1 We certify that reasonable professional skill and care has been used in the preparation of the design of this structure and that:-

1.1.1 It has been designed in accordance with the *Preliminary Approval** referenced above and the conditions and amendments listed above;

1.1.2 It has been checked for compliance with the relevant Standards in 1.1.1;

1.1.3 The design has been accurately translated into contract drawings, specifications and bar schedules. The unique numbers of these drawings and schedules are listed in the enclosed Annex 2.

Signed _____
Position Team Leader

Signed _____
Position Principal Officer or Director
Date ___ / ___ / ____

2.0 Acceptance of Certificate

The National Roads Authority accepts this certificate.

Signed _____
Position Senior Project Manager - Structures, National Roads Authority
Date ___ / ___ / ____

* For D&B/PPP projects use the words 'Contractors Proposals for Structures' instead of 'Preliminary Approval'

Text Used for Category 2 & 3 Structures

1.0 Undertaking

1.1 We certify that reasonable professional skill and care has been used in the preparation of the design of this structure and that:-

1.1.1 It has been designed in accordance with the *Preliminary Approval** referenced above and the conditions and amendments listed above;

1.1.2 It has been checked for compliance with the relevant Standards in 1.1.1;

1.1.3 The design has been accurately translated into contract drawings, specifications and bar schedules. The unique numbers of these drawings and schedules are listed in the enclosed Annex 1.

Signed _____
Position Team Leader - Design

Signed _____
Position Principal Officer or Director - Design office or firm
Date ___ / ___ / ____

Signed _____
Position Team Leader - Design check

Signed _____
Position Principal Officer or Director - Check office or firm
Date ___ / ___ / ____

2.0 Acceptance of Certificate

The National Roads Authority accepts this certificate.

Signed _____
Position Senior Project Manager - Structures, National Roads Authority
Date ___ / ___ / ____

* For D&B/PPP projects use the words 'Contractors Proposals for Structures' instead of 'Preliminary Approval'

APPENDIX E – FLOW CHART

FLOW CHART FOR TECHNICAL APPROVAL OF STRUCTURES

