Design Manual for Roads and Bridges

Highway Structures & Bridges
General information

CG 302
As-built, operational and maintenance records for highway structures

(formerly BD 62/07)

Revision 0

Summary
This document gives the Overseeing Organisations' minimum requirements for the records to be collected and maintained for highway structures.

Application by Overseeing Organisations
Any specific requirements for Overseeing Organisations alternative or supplementary to those given in this document are given in National Application Annexes to this document.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	CG 302 replaces BD 62/07. This full document has been re-written to make it compliant with the Highways England drafting rules.

Foreword

Publishing information

This document is published by Highways England.

This document supersedes BD 62/07, which is withdrawn.

Additional and specific requirements for the four Overseeing Organisations in England, Scotland, Wales, and Northern Ireland are given in National Application Annexes of this document.

Contractual and legal considerations

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

Introduction

Background

This document should be read in conjunction with the current health and safety legislation relevant to the highway construction industry.

The records described by this document may not be sufficient for effective management in all circumstances. Where this is the case, supplementary records can be compiled.

The document also identifies how the records should be held and those parties responsible for creating, maintaining, reviewing and updating records.

The records described in this document are specifically identified to support the business needs and processes for managing highway structures, important aspects of which include:

1) providing information the Overseeing Organisations are legally required to hold;
2) providing information that supports the management of highway structures, e.g. inspection scheduling, maintenance planning, structural reviews and assessments;
3) ensuring that records remain current and accurate by adopting appropriate reviewing and updating procedures;
4) ensuring that records are held in the required format, e.g. computerised asset management systems;
5) ensuring that records are created, maintained and managed by the relevant personnel/parties.

Details of the manner in which these records are to be held by respective Overseeing Organisations are provided within the National Application Annexes (NAA).

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 3.N] apply to this document.

Abbreviations

Abbreviations

Abbreviation	Definition
AIP	Approval in Principle
BBA	British Board of Agrément
BIM	Building information modelling
CDM 2015	Construction (Design and Management) Regulations 2015 SI 2015/51 [Ref 8.N]
COSHH	Control of Substances Hazardous to Health
DBFO	Design, Build, Finance and Operate
EIA	Environmental impact assessment
FRP	Fibre reinforced plastics
GGBS	Ground granulated blast-furnace slag
HAPAS	Highways Authorities Product Approval Scheme
MCHW	Manual of Contract Documents for Highway Works
M&E	Mechanical and electrical
N/A	Not applicable
NAA	National Application Annexes
PFA	Pulverised fuel ash
RA*	Assessment resistance
SA*	Assessment load effects
SAF	Structural adequacy factor
SHW	Specification for Highway Works
SSSI	Sites of special scientific interest
TAF	Technical appraisal forms

Terms and definitions

Terms

Term	Definition
Agent	A party appointed by the Overseeing Organisation to manage highway assets on their behalf, e.g. Maintaining Agent, Managing Agent, Managing Agent Contractor, Trunk Road Agent, Concessionaire, Service Provider or Operating Company. NOTE: Where the Overseeing Organisation manages the highway assets internally, the agent is the branch or section to which the duties have been delegated.
Contractor	The organisation contracted by the Overseeing Organisation or agent to undertake construction works on its behalf.
Designer	The organisation responsible for the overall design including proprietary components.
Hold	Retain records for the structure that are unlikely to require regular/periodic updating, but on occasion can require reviewing and updating. NOTE: Superseded records are to be retained in order to provide a full history for the structure but should be clearly marked as superseded.
Maintain	Keep, protect and update records that are retained for the structure and are likely to require regular/periodic reviewing and updating throughout the structure's life in order to reflect changes. Superseded records are retained in order to provide a full history for the structure but are clearly marked as superseded.
Principal Contractor	Contractors appointed by the client to coordinate the construction phase of a project where it involves more than one contractor.
Principal Designer	Designers appointed by the client in projects involving more than one contractor. NOTE: They can be an organisation or an individual with sufficient knowledge, experience and ability to carry out the role.
Provide	Supply and upload as necessary original records created.
Structural review	A review of an individual structure or group of structures to establish or confirm the validity of its latest assessment (or its original design, if there has been no subsequent assessment).

1. Scope

Aspects covered

1.1 This document shall apply to highway structures over, under or alongside motorways and all-purpose trunk roads.

NOTE *For any variations to the scope of structures covered see the NAAs.*

1.2 This document shall be read in conjunction with CS 450 [Ref 2.N], which provides details of the records associated with inspections of highway structures.

1.2.1 The records produced and held for each structure should be appropriate to its complexity and size.

NOTE *Normally, the detail and quantity of records increases as complexity and size increase.*

1.2.2 When uncertain about the records to be produced or held for a structure, the Overseeing Organisation should be consulted.

1.3 Quality assurance systems shall be amended to reflect the requirements of this document.

NOTE *The Overseeing Organisation reserves the right to audit agents against this document.*

1.4 The scope of highway structures to which this document shall apply is set out in Table 2.1 of CS 450 [Ref 2.N].

NOTE 1 *Highway structures which are marginally outside the parameters set out in CS 450 [Ref 2.N], especially those which are subject to hydraulic action, can be included within the scope of this document by agreement with the Overseeing Organisation.*

NOTE 2 *The highway structures which are within the scope of this document are provided in the NAA.*

1.4.1 The specific requirements of each Overseeing Organisation, which may replace or amplify certain aspects of this document are provided in the relevant NAA.

1.4.2 For signs/signal gantries and masts, the structural aspects should include foundations, columns, beams, arms and any structural connections between these.

1.4.3 Any significant attachments and their connections should be highlighted when preparing records.

1.4.4 Records for access gantries should comply with The Institution of Structural Engineers publication IStructE Gantries & Runways [Ref 9.N].

1.4.5 This document should be applied to temporary works which have a permanent effect on the structure or where a temporary works solution is to be repeated some time in the future.

Implementation

1.5 This document shall be implemented forthwith on all schemes involving the construction, inspection and maintenance of highway structures on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 3.N].

Use of GG 101

1.6 The requirements contained in GG 101 [Ref 3.N] shall be followed in respect of activities covered by this document.

2. Managing records

General

2.1 Records shall be collected for highway structures and the appropriate parties responsible for providing, maintaining, reviewing and updating these records are described.

NOTE 1 The details of some records are described in other documentation, e.g. DMRB documents and respective user manuals/guides for computerised asset management systems. Where this is the case, the descriptions of the records are not duplicated in this document, instead the appropriate cross reference is provided. Where descriptions of records are not provided elsewhere then a description is provided in this document.

NOTE 2 Records can be held in different formats, but are typically held as electronic or hard copy (electronic records can be held in different formats). Formats are defined in the NAA, and in some cases supporting documents are referenced which define the format.

2.1.1 The records defined in this document should be consistent with CDM Regulation requirements in SI 2015/51 [Ref 8.N] and good asset management practice.

2.1.2 Additional records may be useful to support design and maintenance activities.

NOTE Exclusion of additional records from this document does not preclude parties from holding them, but the Overseeing Organisations do not accept any financial or other responsibilities for these records unless formally agreed.

Computerised asset management systems

2.2 The asset management systems defined by Overseeing Organisations, with associated user manuals and help files, shall be used.

NOTE 1 Details of asset management systems are provided in the NAA.

NOTE 2 The Overseeing Organisations have computerised asset management systems for highway structures. These systems hold records, assist the creation and maintenance of records, and support management processes, e.g. inspection and maintenance planning.

NOTE 3 Computerised management systems have associated user manuals and help files, which are periodically updated to provide additional guidance to users and/or to reflect changes and improvements to the system. This document does not replicate the guidance provided in user manuals/help files; instead this document refers to these documents where necessary.

2.3 Where this document refers to user manuals/help files these shall be taken to be the latest versions.

NOTE The latest versions of user manuals/help files can be obtained from the Overseeing Organisations. Contact details are available from the relevant organisations.

Roles and responsibilities

2.4 The roles and responsibilities required for the creation and ongoing maintenance, review and updating of records are described in detail in the NAA and shall be followed.

2.4.1 The responsibilities should be undertaken by those that are in the best position to be able to provide and manage the records.

3. Records for highway structures

General

3.1 The records described under the following headings shall be provided for the whole life management of highway structures:

1) inventory;
2) drawings;
3) design;
4) construction and demolition;
5) materials, components and treatments;
6) certification and tests;
7) operation;
8) inspection;
9) maintenance;
10) structural assessment and load management;
11) other appraisals and assessments;
12) legal;
13) environmental; and,
14) supplementary records.

3.2 Records shall be provided to the Overseeing Organisation, in accordance with this document, for all new structures, as well as the information required to update these records for reconstructions, modifications and major maintenance.

3.3 Structural records shall be stored as required by the Overseeing Organisation, as such they can be stored electronically, in hard copy, or some combination of the two, and can be stored in one location, or a number of different locations.

3.3.1 Where BIM has been used in the design, the relevant details should be extracted to fulfil the requirements of this document.

3.3.2 The provision and maintenance of the models of the completed works should be agreed with the Overseeing Organisation.

NOTE *Overseeing Organisation specific requirements are provided in the NAAs.*

3.3.3 In whatever format or location the records are stored they should be easily accessible and be clearly marked as belonging to a particular structure.

3.4 Records, in accordance with this document, shall be maintained and updated for existing structures.

3.4.1 Records described in this document should be held for all existing structures, including available records for third party owned structures which are on, over or adjacent to the highway network.

NOTE *Existing structures can have gaps between the records described in this document and those currently held.*

3.4.2 Missing data should be identified and closed in a cost effective and efficient manner by combining record reviews, data collection and record creation with ongoing management activities.

NOTE *For example general inspections, principal inspections and routine maintenance activities can be used to gather missing information.*

3.4.3 In all instances superseded records should be retained in order to provide a full history for the structure as this can be beneficial to future management.

3.4.4 Any superseded files should be clearly marked as such, including any reference to the file.

NOTE *During the life of a structure some records can be superseded, for example, following maintenance or assessment.*

3.5 For any additional or specific requirements and for details of how records are to be provided to the Overseeing Organisation the relevant NAA shall be complied with.

Inventory

3.6 Inventory records provide general information on each structure and the inventory information shall be reviewed, amended or updated:

1) as part of a principal inspection;
2) as soon as aware of any errors in the current information; and,
3) as soon as aware of any changes to the structure.

3.6.1 General inventory details may include structure name, structure reference, location, construction year, designer, agent, dimensions, headroom, restrictions, high/heavy load route, road carried/obstacle crossed or obstacle carried/road crossed, and historic listing.

3.6.2 Inventory details should consist of a hierarchical structured and interconnected list and details of all elements and components in the structure, and in the case of multi-span bridges be split by span.

NOTE *Different structure types are presented in CG 300 [Ref 7.N].*

3.6.3 The structure summary may include key features of the structure, plus section drawings and location plan.

Drawings

3.7 Drawings shall include the following:

1) location plan – showing the location of the structure on the network;
2) general arrangement drawings – showing plan, elevation and cross–sectional details of the structure with the actual headroom clearances clearly shown; and,
3) as-built drawings – including details of any:
   a) built-in features;
   b) hidden critical elements and hidden fixings;
   c) any propriety components and protection systems;
   d) service ducts and drainage systems;
   e) reinforcement, post-tensioning, etc. and bar bending schedules; and,
   f) demountable structures (e.g. gantries) including designated lifting positions, safe working loads, etc.

3.7.1 Drawings should provide additional information that is necessary for the safe and effective management and maintenance of a structure.

Design

3.8 The following design records shall be provided for new structures, modifications, major maintenance, upgrades and reconstructions in accordance with the Overseeing Organisation's requirements:

1) copies of the signed Approval in Principle (AIP) document and any further addenda in accordance with CG 300 [Ref 7.N], or other structure review process documents specific to the contract requirements, e.g. technical appraisal forms (TAF) for Design, Build, Finance and Operate (DBFO) companies;
2) copies of the signed design and check certificates;
3) copies of the signed construction compliance certificates;
4) key correspondence and/or reports relating to the design;

5) any relevant design drawings not already covered by clause 3.7 for drawings;
6) key design option choice as permitted in the design standard; and,
7) the life-cycle management plan for the design.

NOTE *CG 300 [Ref 7.N] provides more details on items 1), 2) and 3) above.*

3.9 All records shall contain the structure reference, file references, date and version control number.

Construction and demolition

3.10 For all new structures, modifications, major maintenance, upgrades and reconstructions, the following details shall be provided:

1) the programme and methods of construction where special techniques were necessary, e.g. dewatering or ground freezing, sequential post-tensioning and bearing fixings;
2) any construction methods/features that can necessitate special techniques or precautions if a structure has to be demolished or extensively modified, e.g. method of demolition, sequence of demolition to avoid progressive collapse, jacking of the structure, or when extensive modifications are envisaged. Where appropriate, details of the special technique or precautions to be taken are required;
3) any significant problems not anticipated that arose during construction (or reconstruction), the solutions adopted and the repercussions on future inspection, maintenance (e.g. materials out of specification) and/or demolition. Where appropriate these are to be supplemented with instrument readings, sketches, photographs and/or reports;
4) any temporary works left in the structure or associated earthworks; and,
5) any monitoring carried out during construction or required after completion of the works, (e.g. measurements of weathering steel).

3.11 Precise details of any major hazards with health and safety implications known at the time of construction, e.g. external stressing, strutting, hinging, arching etc., which can be important in planning maintenance and demolition methods shall be provided.

Materials, components and treatments

3.12 In all instances, where a product or material is covered by the Control of Substances Hazardous to Health Regulations SI 2002/2677 [Ref 1.N] full details of the product or material specification shall be given.

3.12.1 Records should be held for all materials, treatments and components, only some examples are included within this document.

3.12.2 The Manual of Contract Documents for Highway Works (MCHW) Volume 1 Specification for Highway Works MCHW SHW [Ref 4.N] and MCHW NG [Ref 5.N] should be consulted when determining the records to be held.

3.12.3 Appendix A provides examples of information sheets that may be used to hold details of materials, treatments and components.

Materials

3.13 Records shall be provided for all materials used in the construction and maintenance of highway structures that are relevant to future inspection, maintenance, assessment, demolition and disposal.

3.13.1 Records should include details of the material, name and address of the supplier, name and address of any sub-contractors, and where appropriate, the material source and its location within the structure.

3.13.2 Examples of the materials for which records should be provided include:

1) concrete materials:

a) cement;
b) ground granulated blast-furnace slag (GGBS);
c) pulverised fuel ash (PFA);
d) aggregates;
e) ready mixed concrete;
f) admixtures;
g) mix proportions;
h) reinforcing bars;
i) prestressing wire;
j) reinforcing fibres;
k) strand or bar;

2) steel materials:
   a) plate;
   b) rolled sections;
   c) prefabricated steelwork, etc. weathering steel, type of fixings and torque settings for bolts;
3) other materials:
   a) aluminium;
   b) timber;
   c) fibre reinforced plastics (FRP);
   d) imported fill.

3.14 Where a number of concrete mixes are supplied, their destinations shall be recorded within each element.

3.15 Histograms of concrete cube test results for different concrete mixes and their locations within the structure shall be provided.

Components

3.16 Components records shall be created for the following, but not be restricted to:

1) expansion joints;
2) drainage systems;
3) bearings;
4) parapets;
5) waterproofing systems;
6) precast units;
7) reinforced earth components; brick, precast or masonry facings;
8) lighting systems; and
9) moving bridge equipment.

3.17 The records shall provide the details of the component (product data sheet), name and address of the manufacturer/supplier/subcontractor, date of installation and, where appropriate, any test results, the part number and manufacturer's drawings.

3.18 The manufacturer's recommendations for inspection and maintenance shall be included along with relevant product literature.

Surface and protective treatments

3.19 Surface and protective treatment records shall include details of the product (product data sheet), name and address of the manufacturer/supplier and applicator, the date of application, number of coats and life expectancy before re-coating.

3.20 The area of the structure and/or components treated shall be shown on the general arrangement drawings.

3.21 Records shall be provided for:

1) paint – including a copy of the contract specification and details of any site trials, for example, paint system sheets and paint data sheets;
2) concrete impregnation;
3) concrete surface coatings; and,
4) corrosion prevention system, e.g. inhibitors, sacrificial anodes, embedded parts, control boxes etc.

Certification and tests

3.22 Certificates and test records shall be provided for materials, components and treatments and these include, where appropriate, but are not restricted to:

1) compliance certificates, e.g. BS EN 1317 [Ref 3.I] for parapets. Compliance test certificates for mechanical, electrical and hydraulic equipment;
2) load test results, e.g. on precast beams, piles, bearings etc;
3) mill certificates;
4) location of monitoring points for weathering steel and as-built measurements;
5) cement analyses;
6) cube test results related to position on the general arrangement drawings;
7) sulphate content in the mix;
8) chloride content in the mix;
9) alkali-aggregate reactivity/sodium oxide equivalent content in mix;
10) analysis of fresh concrete, e.g. slump test and concrete fresh analysis;
11) air entrainment;
12) concrete impregnation and coatings tests;
13) test results on fill adjacent to structure;
14) ground investigation – geotechnical design report structure summary information; and,
15) other relevant certificates, including, British Board of Agrément (BBA) and Highways Authorities Product Approval Scheme (HAPAS).

3.22.1 The list of certication and tests should be extended to cover all tests and certificates required by the design/construction specification and deemed worthy of capture under SI 2015/51 [Ref 8.N].

Operation

3.23 An operating manual and log book shall be provided where appropriate for mechanical or electrical plant and equipment, for example, movable bridges.

3.24 The manual shall provide details of the day-to-day running of the equipment including where appropriate, but not be restricted to, operating procedures (user instructions), energy management and routine maintenance schedule.

3.25 The log book shall record activities including where appropriate, but not restricted to, times and dates of operation and name/ID of staff, time and dates of routine maintenance and name/ID of staff.

Access

3.26 Records shall provide details of any particular access arrangement which includes, but is not restricted to, details/drawings of access to the site (including walkways, ladders and manholes), details of key holders or permits, and details of security to prevent unauthorised access.

3.27 Details of procedures to obtain approval to enter including notice to landowners/ interested parties shall be provided.

Headrooms and constraints

3.28 The profiles of the headrooms beneath a structure shall be recorded on a drawing as constructed and checked periodically and updated if required.

3.29 Details of constraints and restrictions that affect the inspection, ongoing maintenance, or demolition of a structure shall be recorded and maintained.

Inspection

New structures, reconstructions and modifications

3.30 Acceptance inspections shall be carried out in accordance with CS 450 [Ref 2.N] and the corresponding records provided, including details of any special inspection and/or monitoring requirements.

3.30.1 The acceptance inspection should be used to check that all required records have been provided.

NOTE *Section 4 provides a checklist of the records required for new structures, reconstructions and modifications.*

3.30.2 Details of how inspection of hidden elements and hidden fixings has been facilitated should be included in the records.

Existing structures

3.31 Inspection schedules and records shall be provided in accordance with CS 450 [Ref 2.N].

3.31.1 Condition information from previous inspections should be retained as the change of condition over time gives an indication of the rate of deterioration and, in some cases, remaining service life.

NOTE *Condition information can be used to inform life-cycle maintenance planning.*

3.31.2 The records should be reviewed periodically in accordance with CS 450 [Ref 2.N].

Maintenance

3.32 The records described in clauses 3.6 to 3.31 (from Inventory to Inspection) shall be reviewed and updated following maintenance work.

Routine maintenance schedule

3.33 Routine maintenance comprises tasks, which shall be undertaken as frequently as dictated by a risk assessment process agreed with the Overseeing Organisations, using a baseline value of every 12 months, such as:

1) removing graffiti;
2) removing undesirable vegetation, e.g. that blocks drainage, can cause structural damage or restricts access;
3) removing debris, bird droppings and other detritus that blocks drainage, promotes corrosion or other deterioration, or presents a health risk to inspectors or others;
4) clearing and ensuring correct operation of drain holes, drainage channels and drainage systems;
5) repairing gap sealant to movement joints;
6) checking operation of flap valves and greasing where required;
7) checking and tightening where necessary any loose nuts and bolts to expansion joints, parapet supports and gantry holding down assemblies, replacing nuts and bolts where appropriate;
8) replacing expansion joint gaskets where this is a specific requirement defined for the structure/ component;

9) removing general dirt and debris from bearings, where appropriate, cleaning sliding and roller surfaces if accessible and re-greasing, following any additional advice contained in the bearing manufacturer's instructions;
10) ensuring free flow of water through culverts;
11) ensuring correct operation of ancillary equipment (e.g. drainage pumps and associated sumps and pipework) and maintaining certification of lifting devices;
12) checking (and rectifying where necessary) seating of drainage gratings or covers, replacing any missing or defective items;
13) checking, cleaning and replacing pedestrian security measures (e.g. mirrors, handrails, nonslip surfaces);
14) checking for scour damage around training works;
15) checking holding down assemblies;
16) repairing superficial defects in surface protection systems; or,
17) ensuring special finishes are clean and perform to the appropriate standards.

NOTE 1 *Whilst many of the routine maintenance tasks are fairly minor in themselves, failure to carry them out can lead to deterioration of the structure and the need for more costly repair operations in the future.*

NOTE 2 *The Overseeing Organisations regard routine maintenance to be cost effective in whole life terms.*

3.34 All structures, or groups of similar minor structures, shall have a routine maintenance schedule consisting of cyclical maintenance activities.

3.35 For new structures, reconstructions and modifications, details of those items of routine maintenance which are appropriate for new structures, reconstructions and modifications shall be identified and provided.

3.35.1 Details of routine maintenance for new structures should be used to prepare a schedule of routine maintenance activities, prior to or immediately following handover, which are appropriate for the structure.

3.35.2 In the case of modifications, a review and update of the routine maintenance schedule for the whole structure should be undertaken.

3.36 For existing structures where a routine maintenance schedule does not exist for a structure, then an appropriate list of items of routine maintenance and schedule of activities shall be identified and prepared for the structure.

3.36.1 The routine maintenance schedule should be reviewed during the next inspection.

3.36.2 The routine maintenance schedule should be agreed with the Overseeing Organisation.

3.37 Routine maintenance schedules shall be maintained and updated in the light of new information and/or experience gained from maintaining the structure.

Design features affecting maintenance

3.38 During design, construction, re-construction and modification details of features which have possible implications for future maintenance shall be provided.

3.38.1 Details should be provided of any hidden elements and structural fixings forming part of the structure and be identifiable in the structural records held.

3.39 Any special maintenance requirements which have been assumed in the conception, design and construction shall be recorded.

3.39.1 Full information on the maintenance actions required and the frequency of these maintenance actions should be provided, e.g. a method statement for maintenance work on structural significant details with difficult access, life expectancy of components such as joints and bearings.

3.40 Details shall be provided on any design/construction issues and/or structure characteristics which influence future structural assessment.

NOTE Details include design live loading, construction sequence and construction joint positions.

Ongoing management of existing structures

3.41 Maintenance records shall be held that provide a full view of the maintenance cycle, including:

1) list of maintenance needs – records to include details of the maintenance needs that have been identified, e.g. action required, quantity of work, estimated cost of works, date identified and recommended action date. Records to indicate how the need was identified e.g. inspection, assessment, life-cycle management plan;
2) needs assessment – records to include the priority/importance of doing the work. Records to describe how the needs are assessed, e.g. risk and value management assessments and/or workshops;
3) scheme/project development – records to provide details of the schemes/projects that have been developed around the maintenance needs, e.g. combining maintenance needs to make better use of resources. Where relevant, this includes an AIP or equivalent documentation. The records provide a clear link between the maintenance needs and the subsequent scheme/project;
4) work tracking and completion – records to include details of progress (against agreed milestones) and completion details, e.g. completion date, work acceptance and any problems encountered. Where appropriate, records to be updated; and,
5) life-cycle management plan – where required by the Overseeing Organisation an optimised life-cycle management plan, based on the expected future (60 years) maintenance needs, to be provided for each structure. The plan take accounts of how the structure behaves and deteriorates, the life expectancy of materials, treatments and components, the required condition/performance, and optimised whole life costs. The assumptions and procedures used to develop the plan to be recorded.

3.42 Maintenance records shall be retained as the details on maintenance needs, intervention frequencies and service lives can be used to inform future maintenance planning.

Structural assessment and load management

3.43 CS 454 [Ref 1.I], CS 453 [Ref 4.I], CS 470 [Ref 2.I], CS 451 [Ref 6.N] and CS 458 [Ref 5.I] and other relevant guidance shall be referred to for information and records relating to structural assessment and load management.

3.43.1 In general, information and records relating to structural assessment and load management should include the following information, where appropriate, for each structure:

1) date of last structural review and reason for review;
2) outcome of structural review;
3) date of next scheduled structural review;
4) date of last structural assessment and reason for assessment;
5) AIP for original structure (if the record exists) or equivalent, modifications/major maintenance and assessments;
6) code/standard/procedure used for assessment (or reason for exclusion from the assessment programme);
7) assessor and checker;
8) the vehicle (loading) requirements for the structure, derived from the route requirements, e.g. 40 tonne, abnormal loading;
9) critical assessment component;
10) assessed capacity and/or live load capacity rating;

11) structural adequacy factor (SAF) can be calculated using Equation 3.43.1;
12) vehicle ratings and reserve factors (see CS 458 [Ref 5.I]);
13) assessment inspection report;
14) assessment report including details of the assessment assumptions and methodology;
15) current loading restriction and interim measures;
16) details of any interim measures currently in place, e.g. physical restrictions, signs, propping, etc; and,
17) information to support the recommended regime for managing abnormal loads.

Equation 3.43.1 Structural adequacy factor

$$SAF = \frac{RA^*}{SA^*}$$

where:

SAF	= structural adequacy factor
RA*	= assessment resistance
SA*	= load effects

Other appraisals and assessments

3.44 The results of other appraisals that are relevant to the ongoing management of a structure and its eventual demolition shall be held which are typically:

1) parapet assessments;
2) pier assessments;
3) scour assessments;
4) asbestos appraisals and action plans.

Legal

3.45 Records shall be held of any contracts, performance guarantees, licences, legal agreements etc. that influence management of a structure.

NOTE 1 *Agreements or easements with landowners, railway authorities, local authorities and statutory undertakers are examples of such records.*

NOTE 2 *Warranties for proprietary elements such as joints, bearings, parapets or waterproofing are examples of performance guarantees.*

Environmental

3.46 Relevant environmental information shall be held or cross referenced in the structure records.

NOTE *For example environmental statement, environmental impact assessment (EIA) and sites of special scientific interest (SSSI) are relevant.*

Supplementary records

3.47 Where supplementary records are required they shall be compiled and agreed with the Overseeing Organisation.

3.47.1 The records described by this document may not be sufficient for effective management in all circumstances.

4. Summary of records

4.1 Table 4.1 summarises the records that shall be provided for highway structures, and distinguishes between those required for new and existing structures.

Table 4.1 Summary of Records

1. Record	2.Includes	3.Ref	4.New structure	5.Existing structure
Inventory	General inventory details	3.6	Provide	Maintain
	Structure type details	3.6	Provide	Maintain
	Structure summary	3.6	Provide	Maintain
Drawings	Location plan (and/or strip map)	3.7	Provide	Hold
	General arrangement drawings	3.7	Provide	Hold
	As-built drawings	3.7	Provide	Hold
Design	Approval in principle or equivalent	3.8	Provide	Hold
	Design and check certificates	3.8	Provide	Hold
	Construction compliance certificates	3.8	Provide	Hold
	Key correspondence	3.8	Provide	Hold
	Design drawings	3.8	Provide	Hold
	Design option choice and life-cycle plan	3.8	Provide	Hold
Construction and demolition	Special construction techniques	3.10	Provide	Hold
	Special demolition techniques	3.10	Provide	Hold
	Construction problems and repercussions	3.10	Provide	Hold
Materials, components and treatments	Materials	3.13	Provide	Maintain
	Components	3.16	Provide	Maintain
	Surface and protective treatments	3.19	Provide	Maintain
Certification and tests		3.22	Provide	Hold
Operation	Operation manual	3.23	Provide	Maintain
	Log book	3.25	Provide	Maintain
	Access Headroom and constraints	3.26 3.28	Provide Provide	Maintain Maintain
Inspection	Acceptance inspection (see NOTE)	3.30	Provide	Hold
	Inspection schedule	3.31	N/A	Provide / maintain
	Inspection records	3.31	N/A	Provide / maintain

Table 4.1 Summary of Records (continued)

1. Record	2.Includes	3.Ref	4.New structure	5.Existing structure
Maintenance	Routine maintenance schedule	3.33	Provide	Maintain
	Design features affecting maintenance	3.38	Provide	Maintain
	Maintenance cycle	3.41	N/A	Provide / maintain
	Life-cycle management plans	3.41	Provide	Provide / maintain
Assessments, reviews and load management	Load management	3.43	N/A	Provide / maintain
	Assessments and reviews	3.44	N/A	Provide / maintain
Legal		3.45	Provide	Maintain
Environmental		3.46	Provide	Maintain
Supplementary records		3.47	Provide	Maintain

NOTE CS 450 [Ref 2.N] provides details of when an existing structure requires an acceptance inspection.

5. Normative references

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

Ref 1.N	The National Archives. Legislation.co.uk. SI 2002/2677, 'Health and Safety. The Control of Substances Hazardous to Health Regulations 2002'
Ref 2.N	Highways England. CS 450, 'Inspection of highway structures'
Ref 3.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 4.N	Highways England. MCHW SHW, 'Manual of Contract Documents for Highway Works Volume 1: Specification for Highway Works'
Ref 5.N	Highways England. MCHW NG, 'Manual of Contract Documents for Highway Works Volume 2: Notes for Guidance on the Specification for Highway Works'
Ref 6.N	Highways England. CS 451, 'Structural review and assessment of highway structures'
Ref 7.N	Highways England. CG 300, 'Technical approval of highway structures'
Ref 8.N	The National Archives. legislation.gov.uk. SI 2015/51, 'The Construction (Design and Management) Regulations 2015'
Ref 9.N	IStructE. IStructE Task Group. IStructE Gantries & Runways, 'The operation and maintenance of bridge access gantries and runways'

6. Informative references

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

Ref 1.I	Highways England. CS 454, 'Assessment of highway bridges and structures'
Ref 2.I	Highways England. CS 470, 'Management of sub-standard highway structures'
Ref 3.I	BSI. BS EN 1317, 'Road restraint systems.'
Ref 4.I	Highways England. CS 453, 'The assessment of highway bridge supports'
Ref 5.I	Highways England. CS 458, 'The assessment of highway bridges and structures for the effects of special type general order (STGO) and special order (SO) vehicles '

Appendix A. Example tables

This Appendix provides examples of forms that may be used to record information that assists the ongoing management of a structure. The examples provided are:

1) Table A.1: Materials information sheet - may be used for materials such as concrete (in-situ or precast), cement for concrete, coarse and fine aggregates for concrete, reinforcement, granular backfill, etc;
2) Table A.2: Components and products: Joints information sheet - where each row on the sheet may relate to a joint in a specific position on the bridge, for example, deck/north abutment joint, deck joint over pier, etc;
3) Table A.3: Components and products: Parapets information sheet - may be used to provide details of each parapet type;
4) Table A.4: Components and products: Bridge bearings information sheet - where each row on the sheet may relate to a specific bearing type;
5) Table A.5: Components and products: Waterproofing information sheet;
6) Table A.6: Components and products: Miscellaneous information sheet - may be used to record information about components such as prestressed concrete beams, gratings and frames, etc;
7) Table A.7: Protection of steelwork: Contract specification 1900 - may be used to provide details of:
   a) environment - the exposure conditions, e.g. road salts and grit;
   b) required durability of system - the expected timing and type of maintenance, e.g. minor and major after x_1 and x_2 years respectively;
   c) paint system - the specification for preparation, coating, thickness etc;
   d) special considerations - any special consideration for this paint system, area of application etc;
   e) variations and minimum requirements - any permitted variations and minimum requirements or tolerances;
   f) fixings - treatment of any fixings, e.g. bolts and nuts;
   g) other - other information relevant to this paint system;
8) Table A.8: Notes for inspection and maintenance - example text is provided.

These examples are provided as guidance and can be tailored to reflect specific management needs.

Table A.1 Materials information sheet

Scheme name			
Structure name(s)			
Structure ref no.(s)			
Main contractor			
Material (enter all materials used)	Supplier's name and address	Source name and address	Element and/or location on structure

Table A.2 Joints information sheet

Scheme name			
Structure name(s)			
Structure ref no.(s)			
Joint location	1. Relevant drawing no.s 2. Contract reference no.	Joint type	Manufacturer's name and address
	1.		
	2.		
	1.		
	2.		
	1.		
	2.		
	1.		
	2.		
	1.		
	2.		
	1.		
	2.		

Table A.3 Parapets information sheet

Scheme name			
Structure name(s)			
Structure ref no(s)			
Parapet type	Fabricator and erector's name and address	1. Relevant drawing no.s 2. Contract reference no.	Manufacturer's name and address
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	

Table A.4 Bearings information sheet

Scheme name			
Structure name(s)			
Structure ref no(s)			
Bearing types	1. Relevant drawing no.s 2. Contract reference no.	Manufacturer's reference number	Manufacturer's name and address
	1. 2.		
	1. 2.		
	1. 2.		
	1. 2.		
	1. 2.		
	1. 2.		

Table A.5 Waterproofing information sheet

Scheme name		
Structure name(s)		
Structure ref no.(s)		
Component/Product/Material (enter all components/products/materials used)	Installer name and address	Manufacturer/Supplier/Source name and address

Table A.6 Miscellaneous information sheet

Scheme name			
Structure name(s)			
Structure ref no.(s)			
Component/Product/Material (enter all components/products/materials used)	Manufacturer/Supplier/Source name and address	Relevant drawing no.s	Location on structure

Table A.7 Information sheet: Protection of steelwork against corrision

Scheme name	
Structure name(s)	
Structure ref no.(s)	
Standard ref	
1. Environment	
2. Required durability of systems	
3. Paint system	
4. Special considerations	
5. Variations and minimum requirements	
6. Fixings	
7.	
8.	

Table A.8 Information sheet: Notes for inspection and maintenance (worked example)

Structure name(s)	
Structure ref no.(s)	

Table A.8 Information sheet: Notes for inspection and maintenance (worked example) (continued)

Central pier base	Excavation to founding level revealed some small fissures in the underlying sandstone. These were cleaned out, inspected and grouted up prior to construction of the base slab. Further details are given in the report, sketch and correspondence following these notes.
Drainage	Bearing shelf drainage at abutments and centre pier should be inspected and cleared as necessary. The outlet pipes should be inspected and rodded. Gullies at base of abutments should be inspected and cleared as necessary. The rear face drainage layer outfalls by underground pipe to manholes. These outlets should be inspected to ensure they are functioning correctly. Any significant accumulations of silt and debris on the bearing shelf or in the drainage system should be noted and investigated.
Waterproofing	The bridge deck east service bay has a waterproof membrane of mastic asphalt. The west service bay invert is waterproofed with Conidec. Any defects in the deck surfacing should be investigated to assess possible damage to the waterproofing. The service bay cover slabs are covered by Bituthene and Bitushield. Deck waterproofing is to remain intact for the reinforcement in the deck slab to be protected as required.
Joints	Sealants to expansion and movement joints should be checked for deterioration. The epoxy mortar transition strips should be checked for debonding or cracking. Holding down bolts to cover plates should be checked for tightness.
Bearings	Guides and dowels and rubber pot bearings should be inspected to ensure they are functioning correctly and to note any failure or excessive wear of moving elements. Metal sections of bearings, guides and dowels should be checked for corrosion and painted as necessary. Rubber bearings should be inspected to ensure that the rubber protection to the steel laminations has not cracked or debonded. The condition of the bearing seating material should also be checked. Holding-down bolts should be checked for tightness and any welds checked for cracking.
Alkali-aggregate reactivity	During the construction contract period the Overseeing Organisation issued additional substitute specification clauses to cover potential alkali-aggregate problems. The Test House (give name) carried out an assessment of the aggregates and concrete with particular reference to concrete mix details and cement contents. Calculations using the figures given in the Test House (give name) report with information from cement provided (give name) gave total alkali contents for the class 45/20 concrete marginally above the 3.0 kg/m^3 maximum recommended. Cement with a lower alkali content was used for the parapet edge beams. For the other mixes calculations gave total alkali contents less than 3.0 kg/m^3. Further details are included in the appendix on alkali aggregate reactivity.
Services and service bays	The services carried on the deck are indicated on the drawings. Particular attention should be paid to the pipe bays to ensure they are properly drained and that services are not leaking. It should be noted that the pipe bays are not designed to carry backfill. Vent pipes with flame traps lead from each service bay, to prevent pressure build up in the event of a mains failure.
Etc.	

Highway Structures & Bridges
General information

CG 302
England National Application Annex to CG 302 As-built, operational and maintenance records for highway structures

(formerly BD 62/07)

Revision 0

Summary
This National Application Annex sets out the Highways England specific requirements on as-built, operational and maintenance records for highway structures.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	Highways England National Application Annex to CG 302.

Foreword

Publishing information

This document is published by Highways England.

This document supersedes BD 62/07, which is withdrawn.

Contractual and legal considerations

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

Introduction

Background

This National Application Annex gives the Highways England specific requirements for as-built, operational and maintenance records for highway structures

This document describes certain records required for highway structures on motorways and all purpose trunk roads, but should be read in conjunction with CS 452 [Ref 2.N] when dealing with highway tunnels.

This document should be read in conjunction with the latest health and safety legislation relevant to the highways construction industry.

Compliance with this National Application Annex is deemed by Highways England to represent compliance with the requirements of CG 302.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 4.N] apply to this document.

Abbreviations

Abbreviation	Definition
ADMM	Asset Data Management Manual
AIP	Approval In Principle
BIM	Building information modelling
CDM	Construction (Design and Management) Regulations SI 2015/51 [Ref 6.N]
H&S	Health & safety
NMM	Network Management Manual
POI	Pre-opening inspection

Terms and definitions

Term	Definition
Agent	A party appointed by the Overseeing Organisation to manage highway assets on their behalf, e.g. Maintaining Agent, Managing Agent, Managing Agent Contractor, Trunk Road Agent, Concessionaire, Service Provider or Operating Company. Where the Overseeing Organisation manages the highway assets internally, the Agent will be the branch or section to which the duties have been delegated.
Designer	The organisation responsible for the overall design including proprietary components
Contractor	The organisation contracted by the Overseeing Organisation or Agent to undertake construction works on its behalf
Hold	Retain records for the structure that are unlikely to require regular/periodic updating, but on occasion require reviewing and updating. Superseded records are to be retained in order to provide a full history for the structure but be clearly marked as superseded.
Maintain	Keep, protect and update records that are to be retained for the structure and are likely to require regular/periodic reviewing and updating throughout the structure's life in order to reflect changes. Superseded records are to be retained in order to provide a full history for the structure but be clearly marked as superseded
Provide	Supply and upload as necessary original records created

E/1. General (additional to CG 302)

E/1.1 The provision of records and inspections shall adhere to the additional requirements as set out in Highways England's network management manual part 2 NMM [Ref 5.N], or asset data management manual ADMM [Ref 1.N] as relevant.

E/1.2 Records for new build, modifications and renewals works to trunk road highway structures in England shall be in accordance with the requirements of this annex and guidance on the use of Highways England's asset information and management system.

E/1.3 Records for new build, modifications and renewals works to trunk road highway structures in England shall be supplied by the organisations responsible for the design and construction of the works,.

E/1.4 Information supplied in accordance with this document is regarded as part of the Health & Safety (H&S) file required by Construction (Design and Management) Regulations SI 2015/51 [Ref 6.N] and shall be cross referenced to the asset information and management system, as the prime source of such information.

E/1.5 Record entries for new build, modification and renewal works shall be reviewed and accepted, by the organisation directly responsible for the ongoing inspection and maintenance of the asset.

E/1.6 The organisation directly responsible for the ongoing inspection and maintenance of the asset shall be responsible for the upkeep of the asset information and management system's structure files and ensuring that the data is populated correctly.

E/1.7 All appropriate asset information shall be provided within the relevant timescales set out in this annex.

E/2. Scope

E/2.1 The scope of highway structures for which records shall be supplied are in alignment with the definition of highway structures contained within CS 450 [Ref 3.N].

NOTE 1 For requirements for involvement in third party owned highways structures see E/4.1.

NOTE 2 Bridges between 1.8m and 3.0m span can be classed as either "Bridge and Large Culvert" or "Small Span Structure", depending on information need. Guidance on the use of the asset information and management system provides further information .

E/3. Records to be supplied (additional to CG 302,3)

E/3.1 Records shall be provided, in accordance with the asset information and management system's (the system) user guidance, in electronic record format, and where available also in native format.

E/3.2 Supply in native format only shall not be acceptable.

NOTE 1 The system's administrator can be contacted for advice.

NOTE 2 The types of structure information to be supplied are described in Section 3, and are maintained within the relevant branch of the system's hierarchy, as detailed in user guidance.

NOTE 3 Information is initially supplied as a combination of uploaded document files, and data keyed into relevant on-screen data fields.

E/3.3 All required keyed-in data for the structure shall be provided directly into the system by applying to the system's administrator for online access.

E/3.3.1 Training on the use of the system may be required before access is permitted.

E/3.4 The agent responsible for the maintenance of the structure shall be consulted to establish a referencing protocol for the structure for inventory purposes.

E/3.5 Where bridge and culvert structures are modified to cater for road widening, the new construction shall be supplied and input as part of the existing structure.

Procedure for records of new build structures

E/3.6 The procedures for the creation and maintenance of records for a new build structure are described below and shall be followed unless alternative arrangements have been specifically agreed with all parties:

1) early notification to be provided to the system's administrator;
2) a record is created on the system to which further records, data and documents are to be added;
3) records as described in CG 302 Section 3 are uploaded directly onto the system;
4) initial records are reviewed and updated throughout the life of the structure.

E/3.6.1 The early notification should be provided by the Designer.

E/3.6.2 The initial record on the system should be created by the system's administrator.

E/3.6.3 The detailed records should be input onto the system by the Designer or Contractor.

E/3.6.4 The review of the records and their updating should be undertaken by the agent.

Procedure for records of existing structures

E/3.7 The procedures for the creation and ongoing maintenance, review and updating of records are described below and shall be followed unless alternative arrangements have been specifically agreed with all parties:

1) for a new structure to the system, early notification to be provided to the system's administrator;
2) a record is created on the system to which further records, data and documents are to be added;
3) for a new structure to the system records as described in CG 302 Section 3 are uploaded directly onto the system;
4) for works on or modifications to existing structures the existing records are modified to take account of all of the changes;
5) the records are reviewed and periodically updated throughout the life of the structure.

E/3.7.1 The early notification should be provided by the agent.

E/3.7.2 The initial record on the system should be created by the system's administrator.

E/3.7.3 For a new structure to the system the detailed records should be input onto the system by the Agent.

E/3.7.4 For works or modifications the detailed records should be input onto the system by the Designer, Contractor or agent.

E/3.7.5 The review and updating of the records should be undertaken by the agent.

E/4. Timescales for records input

E/4.1 For new build, modification and renewals, the required inventory details and structure file records shall be submitted to the relevant party within the timescales stated below:

1) an early notification for each new structure at the time of submission of the Approval In Principle (AIP) form for the structure to the relevant Highways England technical approval contact;
2) the structure inventory data at least one month before the planned pre-opening Inspection (POI) (refer to CS 450 [Ref 3.N]), directly onto the system;
3) structure file documents for the completed works no later than three months from the opening (or re-opening) of the structure to traffic, directly onto the system or to the system's administrator.

NOTE *For a POI, and indeed any inspections, to be properly undertaken it is imperative that the inventory is complete and accurate.*

E/5. Supply of structure records for structures not to be maintained by the agent

E/5.1 Where a new structure has been constructed under a Highways England contract, but ownership is to be transferred to a third party, data and documentation shall be supplied as if the structure is to be maintained by the agent.

E/5.2 The records shall subsequently be transferred to the owner of the asset so that they can undertake their duties as required by SI 2015/51 [Ref 6.N].

E/5.2.1 Responsibility for the transfer of the records should be established and agreed prior to construction.

NOTE *Where the information supplied is adequate and has been input onto the system, then, on request, the administrator of the system can supply a structure report as a summary record of the inventory for the structure to assist in the transfer.*

E/5.3 The asset information and management system's administrator shall be notified of the date of the change of ownership of the structure not later than one week after the transfer.

NOTE *The records of ownership need to be amended to preserve the integrity of the asset information and management system.*

E/6. Normative references

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

Ref 1.N	Highways England. ADMM, 'Asset Data Management Manual'
Ref 2.N	Highways England. CS 452, 'Inspection and records for road tunnel systems'
Ref 3.N	Highways England. CS 450, 'Inspection of highway structures'
Ref 4.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 5.N	Highways England. NMM, 'Network Management Manual'
Ref 6.N	The National Archives. legislation.gov.uk. SI 2015/51, 'The Construction (Design and Management) Regulations 2015'

Department for Infrastructure
An Roinn Bonneagair

Highway Structures & Bridges
General information

CG 302
Northern Ireland National Application Annex to CG 302 As-built, operational and maintenance records for highway structures

(formerly BD 62/07)

Revision 0

Summary
This National Application Annex sets out the Department for Infrastructure, Northern Ireland specific requirements on as-built, operational and maintenance records for highway structures.

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

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	Department for Infrastructure Northern Ireland National Application Annex to CG 302.

Foreword

Publishing information

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

This document supersedes BD 62/07, which is withdrawn.

Contractual and legal considerations

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

Introduction

Background

This National Application Annex gives the Department for Infrastructure, Northern Ireland specific requirements for as-built, operational and maintenance records for highway structures.

This document describes certain records required for highway structures on all roads in Northern Ireland, but should be read in conjunction with CS 452 [Ref 1.N] when dealing with highway tunnels.

This document should be read in conjunction with the latest health and safety legislation in relation to the highway construction industry.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 2.N] apply to this document.

Abbreviations

Abbreviations

Abbreviation	Definition
ACoP	Approved Code of Practice
CDM	Construction (Design and Management) Regulations CDM (NI) 2016 [Ref 5.N]
H&S	Health & safety
SMS-R	Structures Management System - Roads

Terms and definitions

Terms

Term	Definition
Designer	The organisation responsible for the overall design including proprietary components.

NI/1. General (CG 302, 3.1)

NI/1.1 It shall be determined which, if any, of the records listed in CG 302, clause 3.1 need to be put into or be referenced in the health and safety (H&S) file.

NI/1.1.1 The designer should determine which records are relevant with the Overseeing Organisation's application of the principles of the Construction (Design and Management) Regulations CDM (NI) 2016 [Ref 5.N] and Approved Code of Practice HSE L153 [Ref 3.N].

NI/1.2 A set of as-built records for road structures, as defined in this annex, shall be submitted to the appropriate Department for Infrastructure Roads divisional office within six months from the date of issue of the maintenance certificate.

NOTE *The as-built records received in the Structures Management System-Roads (SMS-R) are issued to the appropriate parties for retention by their bridges maintenance personnel.*

NI/2. Scope (CG 302, 1.1 and 1.4)

NI/2.1 This document shall apply to highway structures over, under or alongside all roads in Northern Ireland.

NI/2.2 CG 302 shall apply to the structures described in CG 302 clause1.4, and any amplification specific to Northern Ireland, contained in CG 300 [Ref 4.N].

NI/3. As-built records

NI/3.1 As-built records for each highway structure shall consist of the following:

1) two full sets of A2 size as-built drawings on coated matt paper of 90 gsm (each marked "As Built Drawing" in red). These are to be accompanied by a list of all drawings submitted.
2) two compact disc copies of all drawings relating to individual structures, drawings to be AutoCad and saved in *.dwg format. The structure name and structure reference number are to be recorded on each compact disc together with the drawing numbers.
3) two paper copies and an electronic copy (stored on compact disc) of the structural manual (for each structure or group of minor structures);
4) two prints of photograph(s) (completed structure) plus electronic copy stored on compact disc. Colour prints – not less than 150mm x 100mm;
5) one set of database input sheets as-built for the SMS-R, the latest versions of these sheets can be obtained from the Overseeing Organisation.
6) two copies of general arrangement drawings, showing the extent of pore lining impregnation carried out and marked up with the following information:
   a) date of impregnation;
   b) type of product (including specification);
   c) manufacturer;
   d) applicator and employer.

NI/3.1.1 Electronic versions only of all the above documents may be acceptable by the appropriate Department for Infrastructure Roads Divisional Office.

NI/4. Structure manual (CG 302, 3)

NI/4.1 For each structure or for a group of minor structures of the same design (e.g. culverts, sign gantries), an individual structure manual of information from the design and construction phases shall be prepared.

NI/4.1.1 All information that is relevant to future maintenance should be included.

NOTE *The manual is complementary to the as-built drawings.*

NI/4.2 The contents of the structure manual shall comply with the requirements set down in CG 302 Section 3.

NOTE *The forms to use for materials and components, and examples of the information to be included, are provided in Appendix A of CG 302.*

NI/5. Normative references

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

Ref 1.N	Highways England. CS 452, 'Inspection and records for road tunnel systems'
Ref 2.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 3.N	HSE. HSE L153, 'Managing health and safety in construction. Construction (Design and Management) Regulations 2015. Guidance on Regulations'
Ref 4.N	Highways England. CG 300, 'Technical approval of highway structures'
Ref 5.N	The National Archives. CDM (NI) 2016, 'The Construction (Design and Management) Regulations (NI) 2016'

Highway Structures & Bridges
General information

CG 302
Scotland National Application Annex to CG 302 As-built, operational and maintenance records for highway structures

(formerly BD 62/07)

Revision 0

Summary
This National Application Annex sets out the Transport Scotland's specific requirements on as-built, operational and maintenance records for highway structures.

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

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	Transport Scotland National Application Annex to CG 302.

Foreword

Publishing information

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

This document supersedes BD 62/07, which is withdrawn.

Contractual and legal considerations

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

Introduction

Background

This National Application Annex gives the Transport Scotland specific requirements for as-built, operational and maintenance records for highway structures.

This document describes certain records required for highway structures on motorways and all purpose trunk roads, but should be read in conjunction with CS 452 [Ref 1.N] when dealing with highway tunnels.

This document should be read in conjunction with the latest health and safety legislation in the highway construction industry.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 3.N] apply to this document.

Abbreviations

Abbreviations

Abbreviation	Definition
ACoP	Approved Code of Practice
CDM	Construction (Design and Management) Regulations SI 2015/51 [Ref 4.N]

Terms and definitions

Terms

Term	Definition
Engineer	The person responsible for the supervision of the works.
Substantial completion certificate	Certificate issued upon substantial completion of a scheme or project.

S/1. General

S/1.1 A set of as-built records for each trunk road structure, as defined in this annex, shall be submitted to the Overseeing Organisation prior to the issue of the substantial completion certificate.

S/1.1.1 The details for the delivery of the records should be communicated to those responsible for the preparation of the records prior to submission.

NOTE *The as-built records received in the structures management system (including major bridges database) are issued to the appropriate agent for retention by their bridges maintenance personnel.*

S/1.1.2 The as-built records should be completed, overseen by the the person responsible for the supervision of the works, for each trunk road scheme.

NOTE *As-built records are a necessary requirement for the successful inspection and maintenance of road structures throughout their lives.*

S/1.1.3 The provision of records of the works may make future investigations into their construction unnecessary.

S/1.1.4 The records of the works should be prepared by site staff during the course of construction.

S/1.2 The as-built records of any subsequent changes shall be submitted following acceptance of the work by the Overseeing Organisation.

S/1.2.1 Where the agent is responsible for the submission of the as-built records then only one set should be submitted to the Overseeing Organisation together with confirmation that the other set is being retained by the agent on the bridge record file.

S/2. Scope

S/2.1 This document and this annex shall apply to the structures described in CS 450 [Ref 2.N].

S/3. As-built records

S/3.1 As-built records for each highway structure shall consist of the following:

1) as-built drawings to be pdf, or other electronic format agreed with the Overseeing Organisation, (each marked "As Built") and accompanied by a drawing list;
2) electronic copies of the structure manual in agreed format, indexed for ease of use and future updating;
3) electronic copies of completed structure photographs, to include at least elevations and arrangement of substructures, of suitable resolution and submitted in an agreed format; and,
4) data input sheets.

S/3.1.1 The format of the data input sheets and other records should be as described in the relevant guidance for the structures management system or major bridges database.

S/3.1.2 The relevant forms for materials and components provided in CG 302 Appendix A should be used.

S/4. Structure manual

S/4.1 For each structure or for a group of minor structures of same design (e.g. culverts, sign gantries), an individual manual of information shall be prepared from the design and construction phases.

S/4.1.1 All information that is relevant to future maintenance should be included.

NOTE The manual is complementary to the as-built drawings.

S/4.2 The contents of the structure manual shall meet the requirements set down in CG 302 Section 3.

NOTE The forms to use for materials and components, and examples of the information to be included, are provided in Appendix A.

S/5. Normative references

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

Ref 1.N	Highways England. CS 452, 'Inspection and records for road tunnel systems'
Ref 2.N	Highways England. CS 450, 'Inspection of highway structures'
Ref 3.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 4.N	The National Archives. legislation.gov.uk. SI 2015/51, 'The Construction (Design and Management) Regulations 2015'

Llywodraeth Cymru
Welsh Government

Highway Structures & Bridges
General information

CG 302
Wales National Application Annex to CG 302 As-built, operational and maintenance records for highway structures

(formerly BD 62/07)

Revision 0

Summary
This National Application Annex sets out the Welsh Government specific requirements on as-built, operational and maintenance records for highway structures.

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

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	Welsh Government National Application Annex to CG 302.

Foreword

Publishing information

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

This document supersedes BD 62/07, which is withdrawn.

Contractual and legal considerations

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

Introduction

Background

This National Application Annex gives the Welsh Government specific requirements for as-built, operational and maintenance records for highway structures.

This document describes certain records required for highway structures on motorways and all purpose trunk roads, but should be read in conjunction with CS 452 [Ref 1.N] when dealing with highway tunnels.

This document should be read in conjunction with the latest health and safety legislation in relation to the highway construction industry.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 2.N] apply to this document.

Abbreviations

Abbreviations

Abbreviation	Definition
ACoP	Approved Code of Practice
CDM	Construction (Design and Management) Regulations SI 2015/51 [Ref 4.N]

Terms and definitions

Terms and definitions

Term	Definition
Engineer	The person responsible for the supervision of the works.
Substantial completion certificate	Certificate issued upon substantial completion of a scheme or project.
Transport Electronic Document and Drawing Management System	Data management system used in the management of transportation assets.

W/1. General (additional to CG 302)

W/1.1 A set of as-built records for trunk road structures, as defined in this annex, shall be submitted to the Overseeing Organisation at the address below, within three months from the date of issue of the substantial completion certificate.

NOTE 1 *Head of Structures, Network Management Division, Welsh Government, Cathays Park. Cardiff, CF10 3NQ*

NOTE 2 *As-built records are recorded in the Welsh Government Transport Electronic Document and Drawing Management System where it is made available to the appropriate agent for undertaking this activity.*

W/1.1.1 The as-built records should be completed, overseen by the the person responsible for the supervision of the works, for each trunk road scheme.

NOTE *As-built records are a necessary requirement for the successful inspection and maintenance of road structures throughout their lives.*

W/1.1.2 The provision of records of the works may make future investigations into their construction unnecessary.

W/1.1.3 Records of the works should be prepared by site staff during the course of construction.

W/1.2 Where the agent is responsible for the submission of the as-built records then they shall save these into the appropriate structure file in the Transport Electronic Document and Drawing Management System.

W/1.3 The requirements in the latest version of the Welsh Government Structures Inspection Manual SIM(W) [Ref 5.N] shall be followed by those responsible for the provision and maintenance of records.

NOTE *These requirements are in addition to those contained in the CG 302 core document and this annex.*

W/2. Scope

W/2.1 This document and this annex shall apply to the structures described in CG 300 [Ref 3.N].

W/3. As-built records

W/3.1 As-built records for each highway structure shall consist of the following:

1) two full sets of as-built drawings on coated matt 90 gsm A1 size paper (each marked "As Built Drawing" in red), accompanied by a list of all drawings submitted;
2) two compact disc (or other agreed electronic transfer device) copies of all as-built drawings relating to individual structures, drawings to be in .pdf format. The structure name and structure reference number to be recorded on each compact disc and each compact disc to have a searchable electronic index of drawing numbers and titles;
3) two paper and two electronic copies of the structural manual (for each structure or group of minor structures). The electronic copies are to be on compact disc and be in.pdf format. The structure name and structure reference number to be recorded on each compact disc and each compact disc to have a searchable electronic index of contents;
4) two prints of photograph(s) (completed structure.) colour prints – not less than 150mm x 100mm. The photographs to be submitted electronically on compact disc in .jpg format. The structure name and structure reference number to be recorded on each compact disc. Each compact disc to have a searchable electronic index of contents;
5) one set of trunk road bridge database sheets for the trunk road bridges database system (refer to Welsh Government Guidance);
6) two paper copies of Form ROADS 277 (refer to Welsh Government Guidance); and,
7) two copies of general arrangement drawings, showing the extent of hydrophobic pore lining impregnation carried out and marked up with the following information:
   a) date of impregnation;
   b) type of product (including specification);
   c) manufacturer; and,
   d) applicator and their employer.

W/4. Structure manual (CG 302, 3)

W/4.1 For each structure or for a group of minor structures of the same design (e.g. culverts, sign gantries), an individual manual of information from the design and construction phases shall be prepared.

W/4.1.1 All information that is relevant to future maintenance should be included.

NOTE The manual is complementary to the as-built drawings.

W/4.2 The contents of the structure manual shall meet the requirements set down in CG 302 Section 3.

NOTE The forms to use for materials and components, and examples of the information to be included, are provided in Appendix A.

W/5. Normative references

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

Ref 1.N	Highways England. CS 452, 'Inspection and records for road tunnel systems'
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Ref 3.N	Highways England. CG 300, 'Technical approval of highway structures'
Ref 4.N	The National Archives. legislation.gov.uk. SI 2015/51, 'The Construction (Design and Management) Regulations 2015'
Ref 5.N	Welsh Government. SIM(W), 'Welsh Government Structures Inspection Manual'