Part 7 ▸ Structures

7.1 Introduction

7.1.1 Objectives of Part

This part of The Warwickshire Design Guide shall inform the planning, design, construction and adoption of structures over, under, adjacent to or otherwise affecting;

(i) the public highway including the carriageway, footway and all verges, or

(ii) Public Rights of Way within the County of Warwickshire.

This guidance shall be applied to structures classified as Category 0 or above as defined under The Design Manual for Roads and Bridges Section CG 300: Technical Approval of Highway Structures. This guide shall be applied where it is intended Warwickshire County Council shall become the maintaining authority in the future and those structures which affect the Public Highway but shall remain in private ownership.

Developers and their consultants shall use this guidance to map the processes and consultations required by WCC in the execution of its statutory responsibilities as Highway Authority under the Highways Act 1980 and the role of the Technical Approval Authority for the purposes of Technical Approval of Highway Structures to CG 300.

The guide is structured according to the key stages of the project which are summarised as follows:

Planning Stage	Early consultations to inform Planning Applications for new Structures and Alterations to Existing Structures
Section 278 and Section 38 Processes	Agreeing where responsibilities lie for design, procurement, construction and adoption
Approval in Principle	Agreeing the structural form, materials to be used, design/assessment methodology and technical standards to be applied
Detailed Design and Check	Certification of the Design and Check and Acceptance of the Construction Drawings and Specifications
Construction Compliance	Supervision or Inspection of the Works and Certification that the completed works comply with the standards set out in the AIP
Adoption of New Structures	Process for handing over new structures to the Highway Authority on Completion of Section 278 and Section 38 Agreements
Adoption of Existing Structures	Process for Adopting Existing Structures, currently under private ownership, which affect the Public Highway, or which are expected to affect the Public Highway once new infrastructure has been constructed

The process described in this Design Guide is mapped as a flowchart in Figure 7.1.1 in Annex 7.1.

It is recommended this guidance is read in conjunction with CG 300 which is available from: The Stationery Office (TSO) e-mail: book.orders@tso.co.uk Online: www.tso.co.uk. Online viewing of CG 300 and all other Highways Agency Technical Memoranda that comprise the Design Manual for Roads & Bridges (DMRB) is available on the Standards for Highways webpage www.standardsforhighways.co.uk/dmrb

7.2 Planning

7.2.1 Pre-planning Consultations

As discussed in Part 1.4, early consultation with the Highway Authority is recommended to discuss new structural proposals and to determine whether Technical Approval processes need to be applied. CG 300 sets out a series of Geometric Criteria for the application of Technical Approval processes and these are summarised in Table 7.2.1 in Annex 7.2.

Advance fees will be agreed prior to any consultation and calculated according to the scale of the undertaking. The purpose of these consultations will be:

- To determine the appropriate form of the structure
- To determine the structural category of the structure to CG 300
- To understand the Highway Authority's maintenance requirements if the structure is to be adopted

For Category 0 and 1 structures to CG300 with an estimated construction cost not in excess of £0.5M (not including Bridges), the consultation is optional and may be based upon preliminary general arrangement drawings. As a minimum the design will need to incorporate the following maintenance requirements.

Access for future maintenance and inspection	A designated 1m wide access path from the highway to any visible elements of the structure or associated gullies, rodding eyes, or access chambers which are not directly accessible from the highway. Permanent steps, ramps or level platforms shall be provided where necessary
Parking	Parking facilities to be identified within 200m of the highway

Table 7.1 Minimum Maintenance Access Requirements for Minor Structures

For Category 0 and 1 structures with an estimated construction cost in excess of £0.5M or any Category 1 Bridge or any Category 2 or 3 structure, consultation is mandatory and will involve preparing a Structures Option Report demonstrating how the preferred structural solution has been chosen and agreed with the Highway Authority. Guidance on the appropriate category for a structure is provided on Table 7.3.1 in Annex 7.3.

For all new highway structures, the Special Vehicle (SV) load models to be used in the design for the individual structure must be agreed at an early stage with the TAA before design work commences. Various routes are regularly used by abnormal loads across the county and will therefore be required to be designed to satisfy SV80, SV100 and SV196 loading.

7.2.2 Structure Options Report

The Designer will need to produce a Structure Options Report (SOR) for the following types of structure:

- Any Category 0 or 1 Structure with an estimated construction cost in excess of £0.5M
- Any Category 1 Bridge Structure

- Any Category 2 or 3 structure

The structure and content for the Structures Option Report shall be agreed in advance with the Highway Authority before it is commenced. As a minimum, the report shall be produced in accordance CG 300 Appendix O, supplemented by the following:

- A description of the existing site and the design constraints including ground conditions
- Technical Options Appraisal of structural forms including structural geometry and proposed foundations
- A summary of technical standards to be applied and departures from standard required
- Qualitative Impact Assessment of traffic disruption on the network during construction
- Vehicle and pedestrian restraint requirements
- Utilities apparatus to be protected or diverted
- Whole Life Cost Appraisal
- Health and Safety and Environmental Risk Register
- Project Delivery Programme
- Future maintenance requirements, including the facilitation of future maintenance and inspection activities. As a minimum the design will need to incorporate the following maintenance requirements as in the table below.
- Maintenance access including clearances, headroom, maintenance strips, wayleaves, space requirements for temporary structures e.g., bailey-bridges, etc.

Access for future maintenance and inspection	A designated 2.5m wide access track from the highway to any visible elements of the structure or associated gullies, rodding eyes, or access chambers which are not directly accessible from the highway. Gradient of the access track to be no greater than 1 in 20
Access for maintenance of drainage systems	A designated 1m wide access path from the highway to gullies, rodding eyes, or access chambers associated with the structure
Parking	Parking bay shall be provided within 100m of a structure
Headroom	Where access is required to inspect and repair interiors and soffits a minimum headroom of 2m will be required
Security	A lockable field gate shall be provided at the entrance of the access track adjacent to the highway
Access to watercourses	For structures over watercourses a designated 2.5m access track shall be provided from the highway to a suitable launching and berthing location at the water's edge

Table 7.2 Minimum Access Requirements for Major Structures

A suitably experienced and competent civil engineering design engineer should be appointed to produce the Structure Option Report. Alternatively, for an agreed fee the Warwickshire County Council Bridge and Structural Design Team can also provide this service.

The Structure Options Report must be submitted for acceptance by the Highway Authority and later included with the Planning Application.

7.2.3 Existing Structures

Where the project affects an existing structure the Highway Authority must be consulted on the proposals before a Planning Application is submitted. This includes any project which requires the widening, improvement, repair (where structural integrity may be affected), change of use, highway layout or loading or demolition of an existing highway structure. The purpose of the consultation is as follows:

- To request existing records of inspections, assessments and as-constructed information, if available. Charges may apply
- To identify known restrictions e.g., weight limits, listed status, existing defects, presence of utilities, etc which could affect the proposals
- To carry out a Structural Review and agree Assessment Requirements
- To agree the appropriate form of any alterations or establish the brief for a Structure Options Report
- To determine the structural category of the proposals or assessment to CG 300
- To understand the Highway Authority's future maintenance requirements

For all existing structures, consultation with the Highway Authority shall include a Structural Review to CS 451 to be prepared by the developer or their consultants and submitted for approval by the Highway Authority. This shall set out the requirements for inspection and assessment of the affected structure as necessary to inform the development of structural proposals. If existing records of inspections and assessments are available and provide information that is current and sufficiently comprehensive to adequately inform the development of the design, then this could negate the need for further inspection and assessment work to be undertaken.

Where the proposals affect a Category 1 Bridge or Category 2 or 3 structure, similar to that noted above, a Structure Option Report will be required to establish the preferred solution for acceptance by the Highway Authority. Guidance on the appropriate Category for a structure is provided in Table 7.3.1 in Annex 7.3. For further details of the minimum requirements for a Structure Option Report, please refer to 7.2.2 of this guide. However, the Highway Authority should always be contacted in advance to agree the brief for the Structure Option Report before work on it commences.

7.2.4 Planning Consultations

Information submitted with Planning Applications will be reviewed by the Highway Authority as a statutory consultee. If the proposals are to construct a large structure i.e., Category 2 or 3 to CG 300 or if they affect an existing large structure and have not been subject to a rigorous Structure Option Report, the Highway Authority are likely to object to the proposals.

Where an existing structure is to be altered significantly or extended beyond its existing footprint and elevation, a Planning Application will be required. If the Highway Authority have not been consulted on proposals which alter or affect an existing structure, the Highway Authority is likely to object at the planning stage. Similarly, if proposals affecting an existing large structure i.e., Category 2 or 3 to CG 300 are not supported by an accepted Structure Option Report, the Highway Authority is likely to object to the proposals.

For Category 2 and 3 structures, where there is already an approved Structure Option Report, it should not be assumed that planning consent is guaranteed. As part of planning consultations, the details of the proposed structure will be reviewed by other authorities separate from the Highway Authority, who may have different views on the form and aesthetics. For example, Historic

England, the Local Planning Authority, or the Local Conservation Team with jurisdiction at the location of the structure, may have different opinions about the proposed form of a new bridge and whether the materials and finishes of the parapets and cladding are sympathetic to the surrounding environment.

7.3 Section 278 and Section 38 Processes

7.3.1 The Highways Act 1980

If planning consent is granted, the developer will need to decide upon the appropriate legal framework under which to deliver the project and handover ownership of infrastructure to the Highway Authority as provided for under the Highways Act 1980. In Warwickshire, there are three principal instruments that a developer may employ for these purposes

Section 38 Agreement	Where the Highway Authority enters into a legal agreement with a developer to adopt a structure provided it has been constructed to a specified standard and to the satisfaction of the Highway Authority.
Section 278 Agreement	Where the Highway Authority enters into a legal agreement with a developer (in order to facilitate development) for the developer to pay for the construction or modification of a structure by the Highway Authority on the existing highway network.
Minor Section 278 Agreement	Where the Highway Authority enters into a legal agreement with a developer (in order to facilitate development) for the developer to construct or modify a minor structure on the existing highway network to a specified standard and to the satisfaction of the Highway Authority

Further information on entering into the relevant Agreement is described in Part 2 and Part 10 of this Design Guide.

On entering into a Section 278 Agreement involving the construction of a new highway structure, it is recommended the developer facilitates a risk workshop in order to properly understand the potential financial risks during construction and to inform suitable contingencies.

7.4 Technical Approval: Approval In Principle (AIP)

7.4.1 Technical Approval

Included amongst the conditions attached to the planning decision for a new or modified structure, there is a requirement for it to be Technically Approved. Technical Approval processes for new structures are required to comply with CG 300.

All structures which support, form part of, or affect the public highway or other Public Rights of Way will require Technical Approval to CG 300 by the Technical Approval Authority, Warwickshire County Council. Under CG 300, structures requiring Technical Approval include all those that are situated wholly or partly within; under, or over the existing or proposed highway and which exceed defined geometric criteria.

Where the project affects an existing highway structure, any resulting assessment will also be subject to Technical Approval processes described in CG 300. Typically, an assessment of an existing structure will be required under the following circumstances:

- Works are to be undertaken to the structure that affect structural integrity, whether refurbishment, maintenance or strengthening

- The use of the structure will change exceeding the loading for which it was originally designed or previously assessed
- The use of the structure will change without exceeding the loading for which it was originally designed or previously assessed, but the condition of the critical structural elements has subsequently deteriorated to the extent that a reassessment is required.

For a detailed summary of the types of structures which require Technical Approval under CG 300, refer to Table 7.1.1 in Annex 7.1.

At various stages of the Technical Approval process, the developer or their design consultant is required to submit information to the Technical Approval Authority for approval. The stages of the process are listed below and described in greater detail in the following sections of this guide.

Approval in Principle	Agreeing the structural form, materials to be used, design/assessment methodology and technical standards to be applied
Detailed Design/ Assessment and Check	Certification of the Design and Check and Acceptance of the Construction Drawings and Specifications
Construction Compliance	Inspection and Certification of the Works

It is to be noted that, depending upon the quality of the submissions and complexity of the project, the time required to complete the Technical Approval processes can vary.

7.4.2 Determining the Structural Category

Before preparing the Approval in Principle submission, the Technical Approval Authority should be consulted to agree the structural category as defined in CG 300. The geometric criteria for determining the structural category are presented in detail in Table 7.3.1 in Annex 7.3. However, where any of the following criteria apply, the structure is automatically designated as Category 3

(i) Any structure designed to have high structural redundancy

(ii) Any structure possessing unconventional, novel or esoteric design aspects

(iii) Any structure with a span exceeding 50m

(iv) Any structure with a skew exceeding 45°

(v) Any structure with difficult foundation problems

For lighting columns, traffic sign/signal posts, cantilever masts for traffic signals and/or speed cameras, masts for camera, radio and telecommunication transmission equipment and other high masts, the structural category will be affected by the exposure conditions at the location of the structure. The exposure conditions referred to in Table 7.3.1 in Annex 7.3 are defined in CD 345 as follows:

Within the United Kingdom, very exposed sites are defined as:

(a) sites at high altitude, above 250m

(b) sites within 5km from the coast

(c) sites subject to significant local funnelling

7.4.3 Approval in Principle (AIP) Document

The purpose of this submission is to agree the form of the proposed structure, choice of materials, details of the principal elements, traffic loadings, technical standards to which it will be designed, category of the design check and to identify buildability and sustainability issues and Health and Safety risks.

The Approval in Principle (AIP) document should be submitted before the detailed design of the structure or the assessment and detailed design of alterations commences. However, in some circumstances, this can be undertaken retrospectively with the agreement of the Technical Approval Authority (TAA).

The format and layout of the document should follow the appropriate pro-forma set out in Appendix A of CG 300. Any deviation from this format should be agreed with the Technical Approval Authority first.

When preparing the AIP Document, the designer/assessor should refer to the AIP Guidance Notes provided in Annex 7.4. The designer/assessor may request an example of an AIP for a similar approved structural design or assessment from the Technical Approval Authority as a useful reference to help inform the content and quality of their submission. The Technical Approval Fee Estimate outlined in Section 7.2 is sufficient for up to three reviews of the AIP Submission by the Technical Approval Authority. If further reviews are required, the Technical Approval Authority will request additional fees to be paid in advance before the process resumes.

The Approval in Principle is valid for three years from the date it is signed by the TAA. If the construction has not commenced within this period, the AIP shall be reviewed by the designer against current standards and amended as necessary. The document shall be submitted to the Technical Approval Authority for review and acceptance as if it were a new submission.

7.4.4 Technical Standards Applied in Design

The standards to be used on the detailed design shall be listed in the Technical Approval Schedule appended to the AIP document. A standard list of technical standards relevant to highway structures projects can be obtained free of charge on the DMRB website.

Warwickshire County Council's policy is that highway structures should comply in all respects with the following technical standards and guidance:

- Eurocodes and associated National Annexes
- BSi published guidance
- Execution Standards referenced in British Standards and Eurocodes
- Product Standards reference in British Standards and Eurocodes
- British Standards
- The Manual of Contract Documents for Highway Works
- The Design Manual for Roads and Bridges
- Interim Advice Notes Issued by National Highways
- CIRIA Published Guidance

Any proposal to depart from these standards must be justified and agreed with the Highway Authority by applying for a relaxation or a formal Departure from Standard. For further information on Departures, see Annexures 2.3 and 2.4. The designer should consult with the Technical Approval Authority where there is conflict or ambiguity between different applicable standards.

7.4.5 Drawings Accompanying the AIP

As a minimum a general arrangement drawing is to be included in the AIP and shall include the following:

- A location plan of the structure showing the structure in relation to the nearest town or village
- A further larger scale location plan should also be provided to show the location of the structure within a new development if applicable, and where appropriate, the nearest existing highway affected by the works
- The position of the existing and proposed highway boundary
- The structural form, including articulation
- The obstacle to be crossed, including clearances
- The geometry of principal structural elements including initial section sizes
- The preliminary substructure proposals
- Proposed construction materials
- Existing and proposed ground levels
- The proximity and effect of the proposals on any existing highway structure
- If applicable, the structural elements to be later adopted by the Highway Authority shall be highlighted
- The features that ensure long-term durability e.g., waterproofing, drainage, joint details, etc.

Further details may be requested by the Technical Approval Authority.

7.4.6 The Idealised Structure Diagram

For Category 0 or 1 Structures, the Idealised Structure Diagram shall define the geometry of the simplified critical section to be used for analysis as well as the forces and pressures to be applied.

For Category 2 or 3 Structures this is to be supplemented by visualisations of the structural models input to the analysis software.

7.4.7 Geotechnical Information

For Category 1 structures, the AIP shall include relevant extracts of a Ground Investigation Report factual and interpretative geotechnical report, or if this is not available, the soil parameters that will be used in the detailed design whether based upon assumptions or supported by factual geotechnical data. For Category 2 and 3 Structures, the AIP shall include a Geotechnical Design Report.

7.4.8 Temporary Works

Sufficient consideration will need to be given to the buildability of a new structure to understand the nature of any temporary works required to enable the construction and for these to be identified in the AIP. Once a contractor and Temporary Works designer have been appointed, the Temporary Works design will in turn will require Technical Approval to CG 300 prior to construction. The process for submitting Temporary Works AIPs to the Technical Approval Authority is identical to permanent works AIPs. However,

please note there is a specific Temporary Works AIP pro forma in CG 300. Developers and their contractors will need to allow for a minimum of six weeks in their construction programme for Temporary Works AIPs to be submitted, reviewed, commented on and approved prior to construction. Please note the duration of the approval process may be extended if multiple reviews and revisions of the documents are required to achieve approval.

7.4.9 Future Maintenance Requirements

For all structural categories, the pro forma Approval in Principle in CG 300 requires details on provisions made for enabling future inspection and maintenance activities. Access to the elevations and, where appropriate, the interior of the structure will need to be considered. Safe routes will need to be identified from the highway to the various structural elements, whether by foot or by vehicle, highlighting the necessity of specialised access equipment and risks associated with confined spaces and working at height. To enable access for inspections and maintenance, it may be necessary to gain access to private land. An easement or license will need to be established with the affected landowner permitting access for inspection and construction working space for future maintenance activities.

7.4.10 Submission Requirements

The signatory to the AIP must be a Chartered Engineer with suitable relevant experience. Where multiple design organisations are involved in the scheme, it is preferred that a single signatory takes responsibility for the collective submission. If this is not achievable, the Technical Approval Authority should be contacted to agree alternative arrangements before the AIP is submitted.

Documentation can be submitted to the Technical Approval Authority either in paper form with an ink signature or as a .pdf file with an electronic signature. Once signed by the TAA, the developer or their consultant will receive a .pdf copy of the signed document via email. If the developer or their consultant wish to receive approved hard copies of the AIP document signed in ink by the TAA, they must submit sufficient hard copies, as necessary.

7.5 Technical Approval: Detailed Design / Assessment and Check

Once the AIP Document is signed off by the Technical Approval Authority, the developer may commission their design consultant to proceed with the detailed design/assessment in accordance with the agreed parameters in the Approved AIP Document and the production of the construction drawings and specifications.

The completed design information will then be subject to a formal check. The Structural Category to CG 300 will determine the type of check to be performed on the design calculations, drawings and associated reinforcement schedules. Table 7.3 below sets out the Design/Assessment Check Criteria in CG 300.

Structural Category	Design Check Criteria
Category 0	An independent Check by another engineer from the Design/Assessment Team
Category 1	An independent Check by another engineer from the Design/Assessment Team
Category 2	A Check by a Check Team which may be from the same Organisation but must be independent of the Design/Assessment Team
Category 3	A check by a Check Team from a separate Organisation proposed by the Designer or Assessor and Agreed by the TAA

Table 7.3 Design/Assessment Check Criteria

The Design/Assessment Team will address any issues or comments raised by the Check Team. Once agreement has been reached that the design or assessment is accurate, satisfies the relevant standards and the design has been accurately translated to the construction drawings and bar bending schedules, the Design/Assessment and Check Certificates can be prepared and submitted to the TAA.

7.5.1 Design/Assessment and Check Certificates

The format and layout of the certificates must follow the appropriate proforma set out in Appendix A of CG 300. The wording of the certificate may vary depending upon the Category of Structure and whether it is a design, assessment or check that is being certified. Any deviation from the standard format and wording must be agreed with the Technical Approval Authority before submission, otherwise, it will be automatically rejected. Each Design/Assessment and Check Certificate shall include the CDM Principal Designer as signatory.

Accompanying the submission of the certificate(s) the developer shall provide:

- Construction drawings, accompanying specifications and reinforcement schedules
- A copy of the structural design or assessment calculations
- A copy of the Geotechnical Design Report for the structure
- A copy of the Topographical Survey
- Where the works affect the existing highway, a copy of the Ground Penetrating Radar Survey and records of utility trenches to investigate unidentified apparatus
- Where the works affect an existing structure, a copy of the Inspection and Assessment Reports

7.5.2 Design Review for New Structures and Modifications to Existing Structures

The Technical Approval Authority shall carry out a formal review of the information submitted with the Design and Check Certificates. The purpose of the review is:

- To ensure the construction drawings and accompanying specifications are consistent with the Approved AIP Document and comply with the relevant Technical Standards
- To capture ambiguous or incomplete information that would have a cost implication for Section 278 Works
- To identify materials, components or details that could adversely affect the buildability or quality of the construction or ease of future maintenance

- To inspect the design/assessment calculations to ensure they comply with the AIP

Any inconsistency or inaccuracy shall be brought to the attention of the Design/Assessment Team and must be addressed before the certificates will be signed by the TAA. The TAA do not accept any liability or errors in the information that has been reviewed.

7.5.3 Submission Requirements

The signatories to the Design and Check Certificates must be Chartered Engineers with suitable relevant experience. Where multiple design organisations are involved in the scheme, each must provide a signature on the certificate. The certificate will therefore need to clearly distinguish which the elements of the structure were designed by the respective design organisations. A principal of the lead design organisation must sign the certificates and take responsibility for the collective submission. If this is not achievable, the Technical Approval Authority should be contacted to agree alternative arrangements before the certificates are submitted.

The Design and Check Certificates can be submitted to the Technical Approval Authority either in paper form with an ink signature or as a .pdf file with an electronic signature. Once signed by the TAA, the developer or their consultant will receive a .pdf copy of the signed document via email. If the developer or their consultant wish to receive an approved hard copy of the certificates signed in ink by the TAA, they must submit sufficient hard copies, as necessary. Supporting information should be submitted electronically.

For new highway structures or modifications to existing highway structures, the Design and Check Certificates are valid for a period of three years from the date that the AIP was signed off. If construction has not commenced before the AIP and the Certificates expire, the design and check certificates shall be resubmitted with reference to an updated AIP document.

7.6 Technical Approval: Construction Compliance

Construction shall not commence until the AIP and Design/ Assessment and Check Certificates have been signed by the Technical Approval Authority. The Technical Approval Authority will not accept certificates for Technical Approval for structures that have already been constructed. For details of how to seek adoption of an existing structure, refer to 7.7 Managing Geotechnical Risk to CD 622 below.

During construction, WCC as the Highway Authority and Technical Approval Authority will monitor the quality of the construction with in situ inspections and/or supervision. The inspection or supervision regimes will vary depending upon which process is being used to deliver the works under the Highways Act 1980.

7.6.1 Site Inspection by the Technical Approval Authority under a Section 38 Agreement or Minor Section 278 Agreement or of a Privately-owned Structure

At the start of the Construction Phase, the developer or their consultant is required to provide the Technical Approval Authority with a construction programme. The Technical Approval Authority will organise the inspection of the works as required to confirm that the quality of construction meets the standards set out in the AIP and, where appropriate, the structure is suitable for adoption. During construction, the developer and their contractor will be responsible for facilitating safe and comprehensive access to the works to enable the Inspector to perform this role. For Category 2 or 3 Structures, the developer and their contractor will be required to provide a furnished office and a site vehicle on site for use by the TAA Inspector.

If the works are being constructed under a Section 38 Agreement, a Minor Section 278 Agreement or a Third-Party Contract, the Highway Authority is not party to the construction contract. It is therefore the responsibility of the developer to appoint an independent Work's Examiner in accordance with CG 300, who shall ensure the works are constructed to the required standards set out in the AIP. Before construction commences, details of the independent Work's Examiner which demonstrate their competence to perform the role, are to be provided to the Technical Approval Authority for their acceptance. For Category 2 or 3 structures, the Works Examiner shall be a Chartered Engineer with suitable relevant experience. During construction, the Works Examiner will carry out and document inspections of the works recording their findings. These are to be included in the maintenance manual.

The developer will need to establish and advise the TAA on the appropriate channels of communication through which to raise any comments or concerns regarding the quality of the construction so they may be dealt with in a timely fashion and resolved without adversely affecting the quality of the completed works. Ultimately, the acceptance of the Construction Compliance Certificate will depend upon the findings of the site inspections by the TAA during construction and where necessary, agreement on the appropriate rectification of defects and non-compliance with quality standards.

On completion of the works, the CDM Principal Designer appointed by the Developer will need to compile the CDM Health and Safety File.

The contents of the CDM Health and Safety File are set out in The Design Manual for Roads and Bridges: CD 302

7.6.2 Procurement of Works Delivered under a Section 278 Agreement

WCC deliver Section 278 works using the WCC Construction Framework. The developer can either opt for a competitive tender or engage with a single Framework Contractor to agree a price. If the developer chooses the latter option, WCC will invite a single tender under the Framework from that contractor to establish a legally binding Call-off Contract.

The WCC Construction Framework uses the NEC3 ECC Option A Contract. Further details of the contractual terms and the division of contractual risk are provided elsewhere in Part 10 of this Design Guide

7.6.3 Construction Contract Roles and Responsibilities for Works Delivered under a Section 278 Agreement

Warwickshire County Council will act as the NEC Employer and shall retain discretion over the appointment of the NEC Site Supervisor and the NEC Project Manager. The developer may propose a suitable appointment to perform the commercial aspects of the NEC Project Manager role and retain oversight of construction costs. Please note however the NEC Project Manager is the Employer's appointment and under the NEC ECC Contract the NEC Project Manager is required to act fairly and impartially. If the NEC Project Manager fails to adequately perform the role or behaves in a manner which breaches the terms of the contract to unfairly protect the developer's interests, WCC shall appoint a new NEC Project Manager. See Part 10 for more details.

7.6.4 Other Roles and Responsibilities for Works Delivered under a Section 278 Agreement

At the start of the construction phase, the responsibilities of the CDM Client will be transferred from the developer to WCC and updated on to the HSE (Health and Safety Executive) F10 form accordingly.

During construction, the developer is required to ensure the continuity of the CDM Principal Designer role to ensure that Health and Safety risks are appropriately managed in respect of any design changes and to prepare the CDM Health and Safety File on completion of the works.

Where the design has been produced by a third-party Design Consultant employed by the developer, the services of the designer are to be retained during construction to answer technical queries and if necessary, implement any design changes required along with the associated changes to the Works Information.

Under a Section 278 Agreement, the NEC Site Supervisor Role performed by WCC shall incorporate the responsibilities of the Work's Examiner and certify the quality of construction meets the standards set out in the AIP and any additional checks and inspections required by the Highway Authority to ensure that the structure is suitable for adoption.

7.6.5 Submission Requirements

On completion of the works, the Construction Compliance Certificate will be signed by the contractor and the Works Examiner. For works delivered under a Section 278 Agreement, the Work's Examiner will be the WCC NEC Site Supervisor. For privately-owned works or works delivered under a Section 38 or Minor Section 278 Agreement, this will be the Developer's Independent Work's Examiner. Please note, for Category 2 or 3 structures, the signatories for the contractor and the Developer's Independent Work's Examiner shall be Chartered Engineers with suitable relevant experience. The certificate is then submitted to the Technical Approval Authority for acceptance. Please note the Construction Compliance Certificates are valid for a period of three years from the date the Certificate was signed by the TAA. If the adoption process is not complete before the certificate expires, then the process for adopting an existing structure will be applied.

The format and layout of the certificate should follow the appropriate pro forma set out in Appendices I to N of CG 300. Any deviation from this format should first be agreed with the Technical Approval Authority.

Accompanying the submission of the certificate the Developer shall provide:

- The As-constructed drawings
- A Maintenance Manual including the CDM Health and Safety File. The contents of the Maintenance Manual are provided in Annex 7.6
- The complete set of design calculations, separately bound for each structure, with all sections of the design separately titled and indexed with page numbers

For works constructed under a Section 38 Agreement where the Developer is responsible for construction quality management, the Developer's Independent Work's Examiner will need to be suitably empowered to effectively manage the quality of the construction and provide their assurance of the quality of the finished works by signing the Construction Compliance Certificate.

Documentation can be submitted to the Technical Approval Authority either in paper form with an ink signature or as a .pdf file with an electronic signature. Once signed by the TAA, the developer or their consultant will receive a .pdf copy of the signed document via email. If the developer or their consultant wish to receive an approved hard copy of the certificates signed in ink by the TAA, they must submit sufficient hard copies, as necessary.

7.7 Managing Geotechnical Risk to CD 622

In parallel with the Technical Approval Process, the Technical Approval Authority shall also act as the principal point of contact for processes associated with Managing Geotechnical Risk to CD 622. Under this standard, the developer must demonstrate that geotechnical risk is appropriately managed and certified by the TAA through the design and construction phases by following the procedures described in the standard. These are to be implemented during the process of planning and reporting ground investigations and during the planning, design and construction of geotechnical works affecting the highway. However, where it is clear from the outset of a project that no geotechnical design or construction activities are necessary, then it can be assumed that the CD 622 process will not apply.

7.7.1 Designer's Geotechnical Advisor

It is the responsibility of the developer and their design consultant to appoint the designer's Geotechnical Advisor to oversee and act as focal point for the planning, procurement, interpretation and implementation of the geotechnical aspects of the project. The appointed person will be a geotechnical engineer with experience appropriate to the project being undertaken and with the experience and qualifications of a Geotechnical Designer as described in the Site Investigation in Construction Series Documents, published by the Institution of Civil Engineers. Details of the appointment shall be submitted to the TAA for their acceptance.

The Technical Approval Authority shall appoint their own Geotechnical Advisor to review and approve documents submitted by the developer.

7.7.2 The CD 622 Process

To ensure that geotechnical risks are identified and correctly managed, CD 622 requires the developer and their design consultant to follow a sequence of geotechnical design processes through planning, design and construction. At each stage information and certificates will be submitted to the Technical Approval Authority who will comment on and/or approve the submitted documents subject to the guidance of their Geotechnical Advisor.

7.7.3 Geotechnical Classification

Depending upon the complexity of the proposed geotechnical works and the geotechnical risk implications to Health and Safety, CD 622 requires that all projects have their geotechnical classification established with reference to the geotechnical categories given in BS EN 1997-1 and that this classification is reviewed when appropriate. Table 7.4 below outlines the principal criteria by which the Geotechnical Category is determined. Please note these categories do not correspond to the Structural Categories defined in CG 300.

Geotechnical Category	CD 622 Criteria
Category 1	• Small simple structures, earthworks and geotechnical activities • Qualitative Geotechnical Investigations and Local experience • Negligible Geotechnical Risk associated with stability, ground movements and ground conditions (only where there are no excavations below the Water Table or where comparable local experience indicates that a proposed excavation below the Water table will be straightforward)
Category 2	• Conventional structures, earthworks and geotechnical activities • Quantitative Geotechnical Data and Analysis with routine field and laboratory testing • No exceptional Geotechnical Risks, unusual or difficult ground conditions or structural loading
Category 3	• Very large or unusual structures and earthworks and complex geotechnical activities • Quantitative Geotechnical Data and Analysis with bespoke field and laboratory testing, if necessary • Abnormal Geotechnical Risks or exceptionally difficult ground conditions

Table 7.4 The CD 622 Process: Geotechnical Categories

7.7.4 Geotechnical Reporting Requirements

Once the Geotechnical Category has been agreed, the developer's designer guided by the designer's Geotechnical Advisor shall then progress through the CD 622 process producing and submitting to the Technical Approval Authority for approval of the sequence of reports. The scope of each report and direction to the relevant pro forma provided in Appendices of CD 622 are summarised in Table 7.5 below.

	Scope	Format
Statement of Intent	A letter or statement which includes a preliminary assessment of the scope of geotechnical activities involved in the project, identifying known or suspected geotechnical risks, establish the preliminary Geotechnical Risk Register and to state the scope, purpose, estimated programme and cost of initial geotechnical assessments	CD 622 Appendix C
Preliminary Sources Study Report (PSSR)	A desk study including site reconnaissance, the Geotechnical Risk Register, risks, an appraisal of implications and feasibility of all scheme options	CD 622 Appendix D
Ground Investigation Scope Report (GISR)	The exploratory investigation described in the GISR shall gather geotechnical and geoenvironmental data in those areas where the provision of extra data reduces the geotechnical risks.	CD 622 Appendix E
Ground Investigation Report (GIR)	Presentation and evaluation of all available geotechnical information including factual data and test results produced from a ground investigation undertaken by a specialist contractor stating the assumptions made in the interpretation.	CD 622 Appendix F
Geotechnical Design Report (GDR)	The Designer's detailed report on their interpretation of all the investigations and the design of the geotechnical elements of the project	CD 622 Appendix G
Special Geotechnical Measures (SGM)	The Designer's detailed report on their interpretation of all the investigations and the design of strengthened earthworks elements	CD 622 Appendix H
Geotechnical Feedback Report (GFR)	A record of location and nature of materials encountered and utilised based upon construction data; problems encountered on site and their solutions.	CD 622 Appendix I

Table 7.5 The CD 622 Process: Key Documents

7.7.5 The Relationship between CD 622 Geotechnical Process and CG 300 Technical Approval Process

Whilst CG 300 and CD 622 describe separate processes which run in parallel during the life of the project, the Technical Approval Authority recognise there is a relationship between them. To establish a consistent approach, it is the policy of the TAA the approval of Technical Approval Certification will be subject to the completion and certification of specific Key Stages within the CD 622 process. These requirements are set out in greater detail in Table 7.5.1 in Annex 7.5.

7.7.6 Submission Requirements

Geotechnical Certificates can be submitted to the Technical Approval Authority either in paper form with an ink signature or as a .pdf file with an electronic signature. Once signed by the TAA, the developer or their consultant will receive a .pdf copy of the signed document via email. If the developer or their consultant wish to receive an approved hard copy of the certificates signed in ink by the TAA, they must submit sufficient hard copies, as necessary. Supporting information should be submitted electronically.

Geotechnical Certificates are valid for a period of three years from the date they are signed. If construction has not commenced before the Certificates expire, key documents will need to be reviewed and updated and re-signed by the responsible parties and submitted to the Technical Approval Authority, along with new certificates.

7.8 Adoption

7.8.1 Section 38 and Minor Section 278 Process

The adoption of a new highway structure under a Section 38 Agreement occurs contemporaneously with the associated adoption of the new highway. The legal processes for transfer of ownership, dedication of highways and payment of Commuted Sums for Future Maintenance is explained elsewhere in this Design Guide.

The developer shall be responsible for the inspection, maintenance and repair of the structure following completion of the works, until adoption is complete.

Before the adoption process for a new highway structure can commence the following documents must be in place:

- A signed Construction Compliance Certificate, approved by the Technical Approval Authority
- A Maintenance Manual incorporating the CDM Health and Safety File accepted by WCC Bridge Maintenance, Annex 7.6
- Easements and licenses permitting access to private land to enable future inspection and maintenance activities
- Details of Drainage Outfall Agreements, including rights to maintain drainage assets on private land or private assets serving the highway drainage
- A Principal Pre-opening Inspection Report to CS 450, produced by WCC Bridge Maintenance

Finally, once WCC is in receipt of these documents, the Commuted Sums for future maintenance are paid by the developer and the County Council takes ownership of the completed works.

7.8.2 Adoption of Existing Structures

The adoption of existing structures is agreed through a bespoke agreement of sale. The terms of such agreements are drawn up and agreed between the respective parties on a case-by-case basis. Before considering the adoption of any existing structure, the seller will first demonstrate to the Highway Authority's satisfaction the structure is in use by the public and can reasonably be considered part of the public highway.

The seller will commission Warwickshire County Council Bridge Maintenance to perform a Transfer Inspection in accordance with CS 450 and, where appropriate, a structural assessment to determine the structure is in good condition and working order and has sufficient capacity to support the highway to assessment loading for the classification of the road or footpath carried by it.

The seller will then either agree to remedy any defects identified by the inspection or allow for their remediation within a Commuted Sum for Future Maintenance. The Commuted Sum is calculated in accordance with guidance provided by the Association of Directors of Environment, Economy Planning and Transport (ADEPT) and included within the terms of the associated agreement of sale.

As part of the Agreement of Sale, the developer will be required to provide a Maintenance Manual. Details of the contents of this document can be found in Annex 7.6.