

Highway Structures

25.1 Introduction

25.1.1 Where a development includes the construction or modification of one or more structures with potential highway implications, Technical Approval (TA) by the Local Highway Authority (LHA) will be required. Technical Approval procedures must be strictly adhered to due to the significant design, safety, inspection and maintenance considerations associated with highway structures and their impact on highway users and local communities.

25.1.2 Early engagement with the Local Highway Authority is essential. Developers and designers should consult the Technical Approval Authority (TAA) at concept stage to agree requirements, avoid abortive work, and ensure timely approvals.

25.1.3 The TA process also applies to the design and construction of temporary works, where these works interface with areas accessible to the public including highways open to traffic.

25.1.4 For the purposes of this document, and with reference to the Design Manual for Roads and Bridges (DMRB) and the Manual of Contract Documents for Highway Works (MCHW), North Yorkshire Council (NYC) shall be considered as the Technical Approval Authority (TAA) and the Overseeing Organisation.

25.1.5 DMRB Document CG300 is a document produced by National Highways and details TA procedures for highway structures.

25.2 Definition of a Highway Structure

25.2.1 The Technical Approval process applies to any structural works that are within the highway boundary or works that are outside of the highway boundary but would potentially affect the safety or stability of the highway. Highway structures for the purposes of these guidelines are:

- Any structure with a clear span or internal diameter greater than 0.90m, including:
 - Highway Bridges.
 - Pipes and Culverts.
 - Footbridges.
 - Bridleway and Cycleway Bridges.
 - Subways, Underpasses and Cattle Creeps.
 - Aqueducts.
 - Cattle Grids.
 - Tunnels and Buried Structures.
 - Overhead Crossings and Gantries (for signs, pipes, conveyors, etc.).
 - Cellars and Basements.
 - Mineshafts and Mineshaft Caps.
 - Soakaways, Drainage Attenuation Systems and Buried Tanks.
- Multiple pipes laid adjacent to each other, where the spacing between the pipes is less than the diameter of the largest pipe and the total overall width exceeds 0.90m.
- Chambers (Oversized Manholes) with an internal diameter greater than 1.25m.
- Earth retaining structures with a retained height greater than the thickness of the wall, including:
 - Retaining walls of all types and materials.
 - Headwalls.
 - Reinforced/strengthened soil structures with hard facings.
 - Reinforced/strengthened soil structures without hard facings, with an angle of inclination exceeding 45 degrees.

Note 1 - Typically, a structure outside of the highway boundary would be deemed to have an impact on the highway if it intercepts an influence line at 45° up or down from the nearest point on the highway boundary.

25.2.2 The above is not an exhaustive list, see CG 300 Section 3 for further details on the types of structures where the TA process applies. The TAA may request that the TA process is followed for a given structure, where this is deemed as an appropriate way to manage the risks presented to the highway.

25.2.3 It is essential that land, structures and apparatus to be adopted are identified during the design stage and in the case of any doubt the LHA will decide whether a structure requires the procedures to be followed.

25.3 Standards and Specifications

25.3.1 All structures are to be designed by suitably qualified engineers and adhere to the following standards and specifications (or any subsequent revision):

Design Manual for Roads and Bridges
Manual of Contract Documents for Highway Works
British Standards and Eurocodes
NYC Application Annex to CG 300
NYC Provision of Vehicle Restraint System Assessment Sheet

25.3.2 The Highway Authorities and Utilities Committee (HAUC) specification will not be accepted for reinstatement works over structures throughout North Yorkshire.

25.3.3 Prior to any structural works including preparatory works commencing on site, a full Specification shall be submitted to the TAA with the Design Certificate. The specification shall be based around the MCHW and include relevant appendices as required to supplement the MCHW. Further information on NYC requirements are detailed in this document.

25.3.4 All products shall be CE/UKCA and Kitemarked approved. Where any work, goods or materials are required to have a British Board of Agreement (BBA) Roads and Bridges Certificate, only works, goods or materials so certified shall be used. The Developer shall in each case submit to the TAA a copy of the certificate prior to any use on site.

25.3.6 Unless agreed otherwise in writing by the TAA prior to structural works commencing on site, the following shall apply in addition to any clauses within the MCHW and shall be incorporated into the works specification appendices.

25.3.7 Fixings

- All fixings shall be either galvanised or stainless steel with appropriate nylon isolating washers to prevent bi-metal corrosion where required. Screws must not be used for timber fencing.

25.3.8 Parapets and Fencing

- All parapets shall have mesh infill panels as a minimum requirement. Solid panels shall be required by standards, or when considered appropriate due to equestrian use or to prevent climbing or damage to the parapets where mesh is not suitable.
- The top and bottom of any mesh or solid infill shall be secured to a rail fixed back to the parapet posts with a suitable support tab.
- All timber used as part of a structure shall be in accordance with the MCHW, however it must be naturally durable to ensure a 30-year service life for the relevant use class. Certificates and delivery notes shall be required as proof of the timber's origin and durability.
- For fencing adjacent to structures, treated timber may be used to achieve the durability requirements of the MCHW. All timber shall be cut and notched prior to treatment. Cutting on site shall not be permitted except for rail ends which must be treated with a preservative approved by the TAA.
- New vehicle parapets shall be galvanised steel except by agreement with the TAA.
- Cold rolled sections shall not be accepted.
- Pressure relief holes shall be provided in all metal parapet systems.

25.3.9 Service Ducts

- Arrangements for service ducts and other apparatus over structures shall be approved in writing by the TAA prior to the start of any works and included on AIP submissions. NYC reserves the right to require spare ducts to be installed at the developer's expense.
- Under no circumstances shall apparatus be attached to the outside of a structure.
- Ducts shall have marker tape laid on-top and that it must say what the service is and if possible, the undertaker who is using the duct. As-built drawings shall be issued indicating which duct is used or owned by statutory undertakers.

25.3.10 Drainage

- Buried plastic or reinforced plastic pipes over 0.90m in diameter are prohibited from use in any highway adoptable area within North Yorkshire. With the exception to in instances they are used as permanent formwork.
- All bridge decks shall have sub-surface drainage provided, details shall be issued to and approved in writing by the TAA prior to construction works commencing on site.
- Around structures only twinwall pipe shall be used. Flexible pipes shall not be used.

25.3.11 Backfill to Structures

- The use of recycled back fill material against structures is prohibited for structures to be adopted by NYC. The TAA shall not accept nor approve such material unless it is derived from natural stone.
- Granular fill material 6N/6P granular stone is the preferred back fill material that shall be used.
- Back of wall drainage shall be provided as follows:
 - A dished concrete plinth shall be formed to support a semi perforated rigid pipe.
 - All sections of the pipe shall incorporate measures to enable rodding.
 - The semi perforated rigid pipe shall have a no fines concrete surround placed above.
 - Above the no fines concrete, hollow concrete blocks filled with 10mm single sized gravel shall be used.
 - Suitable rodding points and access shall be provided and agreed with the TAA.
 - An outfall must be provided. Discharge to a soakaway will not normally be permitted.
 - On retaining walls and deep abutments, weep holes with a backfall shall be provided a minimum of 200mm above the back of wall drainage.

25.3.12 Surfacing

- Clause 943 Hot Rolled Asphalt (HRA) (35/14 or 30/14) WTR2 with pre-coated chippings shall be surface course. The PSV of the chippings shall be no less than 60 and be greater if required by the designer. The HRA mix above shall be the only permitted material for surface course on all highway structures.
- On all concrete bridges decks / slabs and arch structures, hot rolled asphalt shall be used for base, binder and regulating course layers as appropriate. This includes verge, footway and cycleway areas. It is permissible to use Heavy Duty Macadam (HDM) binder and base coarse material over existing structures in the following circumstances when the total bituminous thickness will be 180mm or more:
 - Masonry arches with more than 150mm of granular fill.
 - Precast culverts or pipes with more than 150mm of granular fill, providing that the HDM binder is not laid directly on bridge deck waterproofing.
- Between all cement and bituminous bound layers, a tanker applied bond coat shall be applied without exception.

25.3.13 Kerb, Footways and Paved Areas

- HRA 15/10 or 0/2 with pre-coated chippings shall be used for all verges on highway structures subject to foot or cycle traffic. For verges not subject to foot or cycle traffic the verge fill may be used as the finished surface provided a brush finish is achieved.

- Kerbs laid on bridge decks shall have the following bedding provision:

Bedding Depth	Mix
Greater than 75mm	ST4 concrete with 20mm aggregate
50-75mm	ST4 concrete with 10mm aggregate
10-50mm	1:3 mix of sulphate resisting cement and granolithic dust

- Bridge deck kerb drains shall not be permitted except in exceptional circumstances subject to the prior written approval of the TAA through the TA process.

25.3.14 Hollow Piles

- All hollow piles used for construction of adoptable highway structures shall be driven with a sealed pile shoe. Piles shall as a minimum then be filled with a designed mass concrete mix.

25.3.15 Concrete

- All external corners shall have 25mm x 25mm fillets formed, both above and below ground unless agreed otherwise in writing by the TAA.
- All blow/bug holes on finished surfaces with a dimension greater than 3mm shall be filled. The number of construction joints shall be kept to a minimum and be detailed on drawings.
- Unless otherwise agreed with the TAA, structural concrete will be formed using formwork. Requirements for finish shall be included on drawings.

25.3.16 Waterproofing

- Bridge deck waterproofing shall be in accordance with the MCHW.
- The following testing of bridge deck waterproofing shall be undertaken to verify that the thickness and adhesion of the installed membrane conform to the criteria stated in the BBA Roads and Bridges Certificate:
 - Cut out tests - 1 No. per every 50m² of membrane applied or proportion thereof.
 - Pull-off tests - 1 No. per every 50m² of membrane applied or proportion thereof.
- The requirements above represent the minimum rate of testing. Additional testing may be required by the TAA if either of the properties being tested is non-conforming. The Contractor shall reinstate the test areas including primer if necessary. Areas that do not conform to the stated criteria shall be removed and re-sprayed.
- Bridge deck waterproofing membrane shall be "Holiday Tested" for pinholes. Any imperfections detected shall be rectified.
- For existing stone or brick arches receiving a concrete saddle, waterproofing may be omitted if all the following apply:
 - The arch is unreinforced, or if reinforced stainless steel or composite reinforcement is used.
 - A suitable designed concrete mix is used.
 - Concrete receives a tanker applied bituminous bond coat prior to surfacing.
- Protection to bridge deck waterproofing shall be provided when granular fill is to be used above. The detail of which shall be agreed with the TAA.
- Surfacing over laying waterproofing shall be a hot rolled asphalt mix, compliant with the BBA Roads and Bridges Certificate.

25.3.17 Lighting

- Lighting columns shall where possible be positioned so that it is not on any bridge or retaining wall. If this is not possible any detail shall be discussed and agreed with the TAA.

25.3.18 Brickwork, Blockwork and Stonework

- All brickwork used for structures shall be Class A or B solid engineering bricks, unless agreed otherwise with the TAA.
- Any concrete brick or blockwork used either above or below ground level shall have a minimum compressive strength of 22.5N/mm².
- All ties and associated fixings shall be stainless steel.
- Unless agreed in writing by the TAA at AIP stage any brick, block and stone facework should be built after concrete has cast. A propriety channel fixing system for brick ties shall be specified and cast into the concrete element.
- The following mortar mix ratios shall be used. Sand should be suitably selected from a local source and agreed in writing with the TAA prior to been used. A trial panel prepared at the developer's expense may be required by the TAA.

	Cement	Hydrated Lime	Sand
New engineering brickwork	1	0.25	3
Walls - Stonework and old brickwork	1	1	6
Arches - Stonework and old brickwork	1	2	9

- Joints should be solidly filled with mortar and later brushed back with a stiff bristle brush to expose the aggregate and the edges of the adjacent masonry.
- Joints should never be struck, finished proud of the masonry, or feathered over the edge of the stonework. Instead, the mortar joint should be slightly recessed or flush.
- For work on listed bridges, a designed hot lime mix shall be used. The exact mix is to be agreed through the TA process, further details can be provided of example mixes for different structural elements. The use of natural hydraulic lime (NHL) mortars is not permitted on NYC owned or to be adopted structures.
- Mechanical fixings are required for coping stones, along with a styrene-butadiene rubber (SBR) & cement slurry priming solution to be applied to the underside of the coping prior to it being laid.

25.3.19 Precast Units

- Joint between precast units shall have a bitumen and butyl rubber jointing strip seals (e.g. TOK-strip) as a minimum.
- For culverts or underpasses with bridge deck waterproofing, a concrete additional protection layer (APL) is be provided on top of the waterproofing. It shall be a minimum of 100mm thick with either 20mm wide fibreboard laid or proprietary crack inducers vertically above joints between precast units.
- On elements with bituminous waterproofing, a cold applied flexible waterproof membrane shall be applied across the joints which is designed for such use.
- For culverts with a bituminous waterproofing to the top a protection board shall be laid to protect the membrane over joints. This shall be a 20mm thick bitumen impregnated fibreboard a minimum of 300mm wide, or similar approved.

- All precast units shall be bedded on a 50mm thick freshly mixed 6L and cement screed.

25.3.20 Bridge Expansion Joints and Sealing of Gaps

- Any proposal shall be discussed and agreed in writing with the TAA.

25.3.21 General Bridge Detailing

- Careful detailing of movement joints is required on structures which would allow water to otherwise get to bearings or structural steelwork. In these circumstances service ducts are not permitted in verges on new structures due to difficulties in adequately sealing the movement joint.
- New bridges must unless otherwise agreed with the TAA be either integral or semi-integral.
- Bearing shelves which have suitable access for nesting birds shall have suitable grating installed to prevent birds from accessing. The grating shall be formed from GRP, stainless or galvanised steel.

25.4 Technical Approval Guidelines

25.4.1 Early engagement with the Technical Approval Authority (TAA) is essential to avoid delays and ensure compliance with standards. Developers and designers must consult the TAA at the concept or feasibility stage to agree the requirements for each structure, confirm the proposed category, and identify any site-specific constraints. This early dialogue will help prevent abortive work and streamline the approval process.

25.4.2 Developers should refer to the TA process set out in CG300. The appropriate stages of this process shall be completed prior to any commencement of works on site.

25.4.3 All documents will be issued to the TAA electronically; signatures shall be compliant with UK eIDAS.

25.4.4 The designer should consult with the TAA to agree the requirements for the scheme, including the proposed category for each structure, before making a submission.

25.4.5 Where required, an Approval in Principle (AIP) must be submitted following the guidance set out in CG 300 and the *NYC Application Annex*. The pro forma shown in CG 300 Appendix A or B shall be used as appropriate.

25.4.6 The Design and Check Certificate(s) will be issued to the TAA at the appropriate stage of the project. The certificate(s) must be accepted before the work proceeds on site. All design information, drawings, calculations and reports, including those for any precast elements, shall be submitted to the TAA with the Design Certificate. Approval certificates for products shall also be submitted to the TAA.

25.4.7 The Certificate of Construction Compliance will be issued to the TAA at the appropriate stage of the project. The certificate must be accepted before public access is granted to the area supported or crossed by the structure. All works shall be inspected by a suitably qualified and experienced supervisor who is to be approved by the TAA. The supervisor shall be independent from the contractor and developer.

25.4.8 Supervision of works shall be continual through out the construction process. Hold points for inspection shall be determined through the use of an Inspection and Test Plan (ITP) and agreed with the TAA prior to implementation.

25.4.9 The TA process applies in full to any proprietary manufactured products unless the product is marked as meeting the requirements of the Construction Products Regulations (or other equivalent product registration system) and is being used for its intended purpose. (See 25.4.7).

25.4.10 For approved proprietary products being used as intended, the TA process is only used to confirm that the declared performance of the product meets the requirements of the situation where it will be used. It is also used to approve any aspects of the installation of the product not covered by the manufacturers marked approval. The designer will:

- Produce an Outline AIP, based on the relevant sections of CG 300 Appendix A and the checklist shown in CG 300 Appendix P. This will effectively set out a performance specification for the required product.
- Review the proposed product against the requirements set out in the Outline AIP to confirm that it is suitable for use.
- If the product is suitable for use, provide a Category 0 Design Certificate as per CG 300 Appendix I, confirming that the declared performance of the product meets the requirements of the Outline AIP.

25.4.11 For drainage chambers (oversized manholes), the guidance of 25.4.10 should be followed. The OAIP shall be issued in the format provided in NYC document "Drainage Chamber OAIP Template" The Outline AIP will cover all proposed items, including the manhole shaft units as well as cover, reducing, landing and corbel slabs together with all other ancillary concrete units. Proprietary products for chambers will be deemed to be suitable if they:

- Are Kitemarked / CE / UKCA approved to demonstrate that the product meets the requirements of BS EN 1917 and BS 5911-3.
- Access covers to be a minimum of D400 to BS EN 124-1:2015.
- Have a minimum working life of 100 years based on the Design Chemical Class of the concrete, to ensure the product has adequate durability.
- Are installed following the manufacture's recommendations for its intended use, with a minimum of 300mm of cover to finished road surface level.

25.4.12 Chambers of the same design and diameter/span may be group together on a single Design Certificate, provided that the location of each chamber is clearly identifiable on the submitted OAIP drawings. The certificate will reference the agreed OAIP and identify the type/size of the chambers covered. It will also include a list of the reference numbers and coordinates for each of the chambers covered by the certificate.

25.4.13 For all TA submissions to NYC, the following information shall be included:

- 1:10,000 scale location map and the Ordnance Survey grid reference for the proposed structure.
- Ground investigation report.
- Details of how the 120-year design life will be achieved and what replaceable components are included in the design.
- Details of how the safety for pedestrian and road users will be maintained.
- Details of how future maintenance has been minimised.

- Details of how the impact of vandalism will be minimised.
- Details of how the proposed scheme will be constructed in an environmentally conscious and sustainable way, along with how embodied carbon will be minimised.
- Consideration of the aesthetic harmony of the proposal within the surrounding environment.
- General arrangement drawings.

25.4.14 NYC will seek to recover the costs incurred during the TA process and will provide an estimate of these costs upon receipt of preliminary details of the scheme. Details of the current fees and charges for TA applications can be found on the NYC website: [Highways fees and charges | North Yorkshire Council](#)

25.5 TA Timescales and Risk Management

25.5.1 Developers should note that timescales for review and approval depend on timely responses to comments. Initial feedback is typically provided within four weeks of payment for the TA submission, but overall approval timescales vary based on complexity, number of comments, and responsiveness of all parties.

25.5.2 Effective risk management is essential to avoid delays, additional costs, and safety issues during the design and construction of highway structures. Developers and designers should identify and address risks at the earliest stage of the project and maintain a risk register throughout the Technical Approval process.

Key considerations include:

- **Incomplete or late submissions** – Ensure all required documents and certificates are provided promptly to avoid hold points.
- **Design complexity and changes** – Engage with the TAA early to confirm requirements and minimise redesign risk.
- **Third-party dependencies** – Factor in statutory undertaker approvals, ecological constraints, and land agreements.
- **Construction quality and compliance** – Agree Inspection and Test Plans (ITPs) with the TAA and allow for hold points.
- **Programme risk** – Build contingency into project timelines for review periods and potential revisions.

25.5.3 Developers should note that failure to manage these risks may result in extended approval timescales or refusal of adoption.

25.6 Modifications to Existing Structures

25.6.1 Proposed modifications to existing structures shall be discussed with TAA at the earliest opportunity. It may be possible to provide previous assessments, scheme information and drawings.

25.6.2 All proposed works to existing structures will require the TA process to be followed.

25.7 Highway Loading for Structures

25.7.1 Unless agreed otherwise, all structures shall be designed for LM1, LM2, LM3 and LM4 to BS EN 1991-2:2003 + UK NA. For requirements for LM3 see 25.7.2 and 25.7.3 for more specifics.

25.7.2 For housing roads, forming part of a residential development and not forming a link or potential link road, LM3 SV80 shall be considered unless agreed otherwise with the TAA. The TAA reserves the right to require a more onerous design load be applied.

25.7.3 For all other roads, including access to commercial premises, LM3 SV80, SV100 and SV196 shall be considered a minimum requirement unless otherwise agreed with the TAA in advance of the TA application.

25.8 Retaining Walls

25.8.1 Gabion baskets, concrete filled hollow block and slab on edge will not be accepted as highway structures.

25.8.2 Cavity reinforced masonry structures intended to support the highway will not be accepted. Cavity reinforced masonry structures supporting land will not be accepted for adoption by NYC.

25.8.3 All retaining walls shall have adequate drainage within the retained backfill.

25.8.4 Fencing and walling that provides edge protection to retaining structures shall have a minimum height of 1.1m above retained ground level.

25.9 Ecological Mitigation Measures on New Structures

25.9.1 Bat boxes shall not be installed on new structures unless there is no alternative. Where possible bat mitigation/compensation should make use of new or existing buildings prior to mounting to highway structures. Any bat boxes required on the highway structure must be externally mounted and their location agreed with the TAA.

25.9.2 Mammal passes through structures should not be a cantilevered shelf. Instead, they must be built up from the invert of the structure and have suitable ramps at each end.

25.9.3 Any ecological mitigation/compensation measures on or in close proximity to new highway structures should be supported by detailed ecological reports and the location/specification of features must be provided to the Highway Authority for approval with the AIP.

25.9.4 All mitigation measures shall be discussed and agreed with the TAA prior to any formal agreement being made with Natural England.

25.10_ Ecological Mitigation Measures on Existing Structures

25.10.1 Proposed modifications to existing structures shall be discussed with TAA at the earliest opportunity.

25.10.2 Bat boxes shall not be installed on existing structures unless there is no alternative, with evidence provided by a suitably qualified ecologist. Any bat boxes required should be

externally mounted, however, in the cases of masonry arch bridges which are being strengthened using a concrete saddle or concrete fill replacement it is permissible to provide bat tubes sat on the arch connected to a suitable existing void in the masonry.

26.10.3 Mammal ledges where required shall be built up from the invert rather than being a cantilevered shelf, unless this is not possible due causing flow restrictions. Evidence to justify the design should be provided.

25.10.4 Any ecological mitigation/compensation measures on or in close proximity to existing highway structures should be supported by detailed ecological reports and the location/specification of features must be provided to the Highway Authority for approval with the AIP.

25.10.5 All mitigation measures shall be discussed and agreed with the TAA prior to any formal agreement being made with Natural England.

25.11_ Adoption

25.11.1 Structures promoted for adoption may require a commuted sum to be paid to cover the cost of future maintenance, inspections and renewal work. Please refer to Interim Guidance Note 28 - Commuted Sums for further details.

25.11.2 All structures earmarked for adoption must specifically be written into the Section 30, 38 or 278 Agreements and be clearly shown on the relevant adoption drawings. Consideration for access and easements for maintenance must be considered and agreed with NYC.

25.11.3 NYC Highways Authority do not accept attenuation structures underneath the highway, further details on this can be found within Interim Guidance Note 16 - Drainage.

25.11.4 Non-adoptable structures which the highway depends upon will require technical approval and details of ownership but will not be owned or maintained by NYC.

25.11.5 Highways structures will not be adopted until the developer has completed the TA process.

25.11.6 In general, all structures supporting the highway will require to be adopted by NYC or another competent authority in the case of attenuation or drainage systems.

25.11.7 For structures to be adopted by NYC, the ongoing works shall be inspected by NYC staff. Two working days' notice shall be given for a specific time for each inspection required. If the element is not ready at the agreed time a further two working days' notice shall be required to allow the inspection. Example inspection items are listed below for each element of the works:

- Formation or sub-formation prior to blinding or placing fill beneath a structure.
- Reinforcement checks prior to erecting formwork.
- Concrete pre-pour check.
- Concrete post-pour check.
- Witness waterproofing pull off test and holiday testing.

Other inspections as identified by the TAA shall also be undertaken depending on the type and form of structure.

25.11.8 Acceptance inspections shall follow CS 450 Section 6. Access shall be provided by the developer to all parts of the structure. Alternatively, access equipment can be provided by NYC by agreement, see 25.10.9.

25.11.9 The time expended by NYC on all inspections shall be charged to the developer at the rates noted in 25.4.11. Access equipment provided by NYC, will be recharged to the developer at cost plus 7.5%.

25.11.10 For the avoidance of any doubt, along with the certificate of construction compliance, where relevant; as-built drawings, H&S Files, O&M Manuals, Geotechnical Feedback Report (CD622), quality assurance documentation and any other relevant information shall be provided. Examples of documentation which must be provided with the quality assurance documentation are:

- Cover surveys.
- Material tests.
- Quality assurance documentation, pre/ post pour checks.