

22-00 Bridges and Structures

22-01 Introduction

This section covers specific specification requirements for work on highway structures in North Yorkshire in addition to the Manual of Contract Documents for Highway Works (MCHW) and other related documents. In cases of ambiguity, this document shall take precedence.

22-02 Technical Approval Authority

The Technical Approval Authority (TAA) shall be the Bridges Team of North Yorkshire Council (NYC). In matters relating to bridges and structures all decisions shall be taken by the TAA in consultation with the Engineer.

22-03 Technical Approval (TA)

TA shall be in place prior to any bridge or structural works or preparatory works relating to bridges and structures commencing on site.

22-04 Standards

All works shall comply with the Design Manual for Roads and Bridges (DMRB) and MCHW respectively unless stated otherwise. Other relevant standards shall be referred to where applicable. The HAUC specification alone shall not be accepted for reinstatement works over structures throughout the North Yorkshire Council area.

22-05 Retaining Structures

- a. Gabion baskets, hollow block and stone slab / PCC flag structures shall not be accepted as highway structures.
- b. Cavity reinforced masonry structures intended to support the highway or land will not be accepted for adoption by NYC.

22-06 As-built Drawings and Health and Safety File

All relevant Health and Safety (H&S) information including As-built drawings (pdf and CAD drawings), quality assurance and relevant material information shall be issued to the TAA upon completion along with relevant design reports and calculations. The H&S file shall be compliant with the Construction Design and Management Regulations 2015.

22-07 Fixings

Unless agreed otherwise in writing by the TAA prior to structural works commencing on site 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.

22-08 Inspections

- a. All works shall be inspected by a suitable qualified and experienced supervisor approved by the TAA; upon completion a "Certificate of Construction Compliance" shall be submitted to the TAA by the developer.
- b. For structures to be adopted by NYC, the ongoing works shall be inspection 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. Other inspections as identified by the TAA shall also be undertaken depending on the type and form of structure;
 - Formation or sub-formation prior to blinding or placing fill beneath a structure
 - Reinforcement checks prior to erecting formwork
 - Pre pour check
 - Post pour check
 - Witness waterproofing pull of test and holiday testing

Fees for this shall be charged at the rates as shown on the NYC website for structures approvals, in the "Highways fees and charges" page

<https://www.northyorks.gov.uk/licensing-and-registration/road-licences/skip-permits/highways-fees-and-charges>

22-09 Parapets and Fencing (MCHW Series 0300 and 0400)

- a. Unless agreed otherwise in writing by the TAA prior to structural works commencing on site, all parapets shall have mesh infill panels. 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.
- b. All timber used as part of a structure shall be in accordance with MCHW Series 0300 and specifically shall be treated or 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 treatment process. Timber shall be cut and notched prior to treatment, cutting on site shall not be permitted.
- c. For new structures, vehicle parapet systems installed onto concrete stringcourses shall have cradles cast into the stringcourse.

22-10 Service Ducts / Apparatus (MCHW Series 0500)

- a. 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.
- b. Under no circumstances shall apparatus be attached to the outside of a structure.
- c. All proposed pipe/duct arrangements shall be compatible with the movement joints.
- d. The 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.

22-11 Drainage (MCHW Series 0500)

- a. Plastic or reinforced plastic pipes over 900 in diameter are prohibited from use in any highway adoptable area within North Yorkshire.
- b. 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.

22-12 Backfill to Structures (MCHW Series 0600)

- a. 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.
- b. Granular fill material 6N/6P granular stone is the back fill material that shall be used.
- c. 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.

22-13 Surfacing (MCHW Series 0700)

- a. Clause 943 Hot rolled asphalt (35/14 or 30/14) WTR2 with pre coated chippings. The PSV of the chippings shall be no less than 60 and greater if required by the Engineer. The HRA mix above shall be the only permitted material for surface course on all highway structures unless agreed otherwise with the TAA

- b. 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 unless agreed otherwise with the TAA.
- c. It is permissible to use 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
- d. Between all cement and bituminous bound layers, a tanker applied bond coat shall be applied without exception.

22-14 Kerb, footways and paved areas (MCHW Series 1100)

- a. 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.
- b. Kerbs laid on bridge decks shall have the following bedding provision;

Bedding depth	
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

- c. 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.

22-15 Hollow Piles (MCHW Series 1600)

All hollow piles used for construction of adoptable highway structures shall be driven with a pile shoe as per clause 1605 of the MCHW. Piles shall as a minimum then be filled with designed mass concrete mix.

22-16 Reinforced Concrete (MCHW Series 1700)

The following requirements for reinforced concrete shall be met;

- All external corners shall have 25x25 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

22-17 Waterproofing (MCHW Series 2000)

- a. Bridge deck waterproofing shall be in accordance with Series 2000 of the MCHW.

- b. 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 Agrément 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.
- c. The requirements in b above represents the standard 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.
- d. The finished waterproofing membrane shall be “Holiday tested” for pinholes. Any imperfections detected shall be rectified.
- e. For existing stone or brick arches receiving a concrete saddle, waterproofing may be omitted if;
- Stainless steel reinforcement is used
 - A suitable designed concrete mix is used
 - Concrete receives a bituminous bond coat prior to surfacing
- f. 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

22-18 Bridge Expansion Joints and Sealing of Gaps

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

22-19 Brickwork, Blockwork and Stonework (MCHW Series 2400)

- a. All brickwork used for structures shall be Solid Class A 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.
- b. All ties and associated fixings shall be stainless steel. Unless agreed in writing by the TAA at AIP stage 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. See NG2416 for further details.
- c. The following mortar mix ratios shall be used, sand should be suitable selected 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 - Stone work and old brickwork	1	1	6
Arches – stonework and old brickwork	1	2	9

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 NHL mortars is not permitted on North Yorkshire Council owned or to be adopted structures.

22-20 Specification and Design

- a. 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.
- b. All design information, calculations and reports including that for any precast elements shall be submitted to the TAA with the Design Certificate Prior to any structural works including preparatory works commencing on site.

22-21 British Board of Agreement Roads, Bridges Certificates and Kite Mark Certificates

- a. Where any work, goods or materials are required to have a British Board of Agreement 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. Types of work, goods and materials subject to such requirements are listed Appendix -C of the MCHW.
- b. The requirement for types of goods or materials listed in Appendix C of the MCHW to have a British Board of Agreement Roads and Bridges Certificate shall be satisfied by goods or materials having an equivalent Agreement certificate issued in any member state of the European Union, provided that the goods or materials covered by such a certificate offer in use levels of safety, suitability and fitness of purpose equivalent to those incorporated in the British Board of Agreement Roads and Bridges Certificate. This sub-clause applies also to works only insofar as means of carrying out such works are indivisibly associated with the goods or materials for which an alternative Agreement Certificate is proposed.
- c. All products shall be CE/UKCA and kite marked with the certificate provided within the AIP submission.