HIGHWAYS & STREETSCENE
HIGHWAYS STRUCTURES

Civic Centre 1
High Street
Huddersfield
HD1 2NE

APPROVAL IN PRINCIPLE FOR DESIGN OF

Proposed Private Blockwork Gravity Retaining Wall to facilitate the construction of a new parking area at No.121, Wakefield Road, Fenay Bridge adjacent to the A642 Wakefield Road

Structure reference:	**K????**
Date:	**5th December 2023**
Revision:	**1**
Status:	**Draft**
Prepared by:	**B. Rahma**
Checked by:	**D. Haigh**

DOCUMENT CONTROL

Structure title: Private Blockwork Gravity retaining wall adjacent to A642 Wakefield Road

Structure reference: K????

Date: 5th December 2023

Revision: 01

Status: Draft

Document issue record

Issue	Status	Prepared	Date	Checked	Date	Approved	Date
01	Draft	B. Rahma	5.11.23	D. Haigh	5.11.23		

PROJECT DETAILS

Name of project: Private gravity blockwork retaining wall adjacent to A642 Wakefield Road at 121, Wakefield Road, Fenay Bridge.

Name of Bridge or Structure: Proposed Blockwork Gravity Retaining Wall to form a New Parking Area.

Structure reference no: K?????

Summary: This AIP is for a private blockwork gravity retaining wall supporting private gardens at No 121, Wakefield Road, Fenay bridge, above the A642 Wakefield Road highway. The new retaining wall is required to level off the sloping garden area to form a new off road parking area.

1. HIGHWAY DETAILS

1.1. Type of highway

1.1.1. Location and OS Map / Grid reference

Location: A642 Wakefield Road

OS Map: SE 183161

Grid Ref (X, Y): (418613, 616125)

1.2. Permitted traffic speed

40mph

1.3. Existing restrictions

None

2. SITE DETAILS

2.1. Obstacles crossed

Not Applicable

3. PROPOSED STRUCTURE

3.1. Description of structure and design working life

A blockwork gravity retaining wall to support private gardens above the highway. The retaining wall will be supported on a mass concrete footing foundation. There is no vehicle access above the retaining wall.

The proposed blockwork gravity retaining wall is required to level off sloping gardens to form an off road parking area. It be designed to have a design working life category 5 (120 years) in accordance with CD 350 “The design of highway structures”: Table 7.1.

3.2. Structural type

Blockwork gravity retaining wall.

3.3. Foundation type

Mass concrete foundations.

3.4. Span arrangements

The proposed retaining wall will have a maximum retained height of 1.5m high above highway level. The length of wall to be rebuilt will be approximately 7.0m long, with a 2.8m return at the free end of the retaining wall.

3.5. Articulation arrangements

The blockwork gravity retaining wall will only be designed to support the private gardens adjacent to the highway. Adjacent properties are at a distance where their foundation loadings will not influence the construction of the proposed retaining wall.

The stability of the proposed retaining wall structure by its own self-weight does not rely upon the passive pressures from the earth in front of the retaining wall which could be excavated at a future date.

A 25mm thick polystyrene or cork based compression material is to be installed in the expansion joint along the interfaces with any existing structures.

3.6. Classes and levels

The classes and levels stated below apply to both the whole structure as well as all individual structural components.

3.6.1. Consequence class

CC 2

3.6.2. Reliability class

RC 2

3.6.3. Inspection level

IL 2

3.7. Road restraint systems requirements

A 1.1m high (min) balustrade will be provided on top of the retaining wall adjacent to the upper ground level to prevent accidental fall from the top of the retaining wall onto the highway below.

3.8. Proposals for Water Management

A 100mm diameter perforated longitudinal drain will discharge any water accumulated behind the wall to a suitable outlet. 75mm diameter weep holes will also be provided through the wall at 1.2m centres.

3.9. Proposed arrangements for future maintenance and inspection

3.9.1. Traffic management

No traffic management will be required to inspect the wall. During future maintenance of the proposed retaining wall and its balustrade, any required traffic management will be agreed with local Highways Authority prior to any works being undertaken. Localised partial closure of the pavement footpath may be required, and this will be undertaken by using Heras fencing along the boundary of the site. During the construction of the retaining wall, pedestrian access along the pavement will be managed by the contractors on site with any temporary tower scaffolding removed overnight.

3.9.2. Arrangements for future maintenance and inspection of structure. Access arrangements to structure.

Access to the site will be provided directly from the highway.

3.10. Environment and sustainability

There are no environmental factors which need to be considered in the close proximity to the proposed reconstruction of the retaining wall.

3.11. Durability. Materials and finishes

Item	Material	Finish / Location
Retaining Wall Base	Mass concrete Grade C40/45 in accordance with BS 8500-1 and BS EN 206-1.	
Retaining Wall Stem	Mortar bonded mass concrete blockwork with a minimum compressive strength of 7.3 N/mm^2	The wall will be faced with clay brickwork, mortar bonded and tied using stainless wall ties at 5 No per sqm.
Drainage	100mm diameter perforated longitudinal drain behind the heel of the retaining wall base will be encased in free draining material and taken to a suitable outlet together with 75mm PVC weep pipes at 1.2m centres.	The perforated land drain will be taken to a suitable outlet so that it does not discharge onto the adjacent highway.
Waterproofing	Bituthene 'blackjack' type waterproofing will be provided to the back, top and front face of toe of the retaining wall	
Parapet	A 1.1m high balustrade will be provided on the top of the retaining wall.	
Backfill Material	Class 6N in compliance with specification for highway works.	Backfill to structure

3.12. Risks and hazards considered for design, execution, maintenance and demolition. Consultation with and/or agreement from Overseeing Organisation

For the coordination of the requirements under CDM Regulations 2015, the principal designers for the project have yet to be appointed.

Some factors to be considered will include, but not be limited to:

- Maintenance of vehicular/pedestrian access during construction
- Working at height

- Stability of the adjacent land and existing structures
- Existing utility services including street lighting pole.
- Manual handling of heavy objects
- Pumping of concrete and lean fill mix: spillages onto the highway.
- Deliveries of materials to site from the highway (if applicable)
- Use of large heavy (and high) plant adjacent to the highway.

3.13. Estimated cost of proposed structure together with other structural forms considered (including where appropriate proprietary manufactured structure), and the reasons for their rejection (including comparative whole life costs with dates of estimates)

The estimated cost of the proposed structure is excluding/including Statutory Undertakers costs.

£ 15,000 (fifteen thousand pounds) excluding Statutory Undertakers costs.

3.14. Proposed arrangements for construction

3.14.1. Construction of structure

The site will be secured using Heras type fencing along the highway and above the section of wall to be rebuilt.

Temporary propping will be installed to the existing unaffected retaining structures to prevent their collapse onto the highway during construction of the retaining wall.

Excavations will be undertaken carefully from below the site, gradually reducing the levels as the works proceed.

The land at the back of the retaining structure will be graded back to a safe angle to facilitate access to build the retaining wall.

Upon completion of the main blockwork gravity retaining wall structure, it will be waterproofed using a Bituthene ‘blackjack’ type product, the longitudinal drain will be installed, and weep holes cleaned prior to backfilling with proposed free draining hardcore material.

The blockwork gravity wall will be faced in mortar bonded clay brickwork walling, which will have a minimum of 5 No. stainless ties per square metre of walling.

The upper section of the facing stonework and installation of the balustrade will be built off removable tower scaffolding, thus ensuring that access along the pavement is unrestricted when contractors are not on site.

3.14.2. **Traffic management**

It is highly likely that no traffic management along the public highway will be required during the construction of the new retaining wall.

If any traffic management is required, this shall be agreed with the Kirklees Council's Highways Service prior to the commencement of the works.
It is noted that the requirement for 9 weeks (min) notice period required for the implementation of a Temporary Road Closure should this become necessary.

3.14.3. **Service diversions**

Statutory Service plans to be obtained and presence of services to be confirmed before construction of the new retaining wall is started.

3.14.4. **Interface with existing structures**

Where applicable, a 25mm polystyrene or cork based compression joint will to be installed along the interfaces with any existing structures.

3.15. Resilience and security

The site will be secured using Heras type fencing to prevent access from the highway. The garden above the retaining structure is private land with no vehicle access above the retaining wall.

4. DESIGN CRITERIA

4.1. Actions

4.1.1. Permanent actions

All permanent actions as outlined in BS EN 1991-1-1:2002 and the associated National Annex.

4.1.2. Snow, Wind and Thermal actions

Snow loading not considered (NA to BS EN 1991-1-3 NA.4.1.1).

Thermal – movement joints will be specified where necessary.

Wind loading will not be considered, since the surcharge loads from the highway will far exceed any expected wind loads acting upon the proposed wall.

4.1.3. Actions relating to normal traffic under AW regulations and C&U regulations

Not Applicable

4.1.4. Actions relating to General Order traffic under STGO regulations

Not Applicable

4.1.5. Footway or footbridge variable actions

5.0 kN/m^2 to BS 8002:2015 Cl 4.4.1.5 (Table 7).

4.1.6. Actions relating to Special Order traffic, provision for exceptional abnormal indivisible loads including location of vehicle track on deck cross-section

Not Applicable.

4.1.7. Accidental actions

There is no vehicle access above the retaining wall.

A 1100mm high balustrade will be provided on top of the retaining wall structure to protect pedestrians falling off the top of the retaining wall.

4.1.8. Action during construction

Not Applicable. No construction traffic will be used above the retaining wall.

The retaining wall is to be backfilled in accordance with the MCHW and surcharge loadings are to be derived based on the requirements of PD 6694-1:2011. Therefore, compaction pressures imposed on the wall during construction do not need to be considered. (PD 6694-1:2011 CL 7.3.3).

4.1.9. **Any special action not covered above**

None

4.2. Heavy or high load route requirements and arrangements being made to preserve the route, including any provision for future heavier loads or future widening

Not Applicable

4.3. Proposed minimum headroom provided

Not applicable.

4.4. Authorities consulted and any special conditions required

Kirklees Council

4.5. Standards and documents listed in the Technical Approval Schedule

TAS dated 3rd October 2023 - See appendix A.

Additional relevant DoT standards published since the above edition of the TAS including amendments, are listed as follows:

None

4.6. Proposed departures from standards listed in 4.5

None

4.7. Proposed departures from standards concerning methods for dealing with aspects not covered by standards listed in 4.5

The proposed reinforced concrete retaining wall will be a private structure and as such its maintenance liability will solely rest with the adjoining land title holder/s.

4.8. Proposed safety critical fixings

None

5. STRUCTURAL ANALYSIS

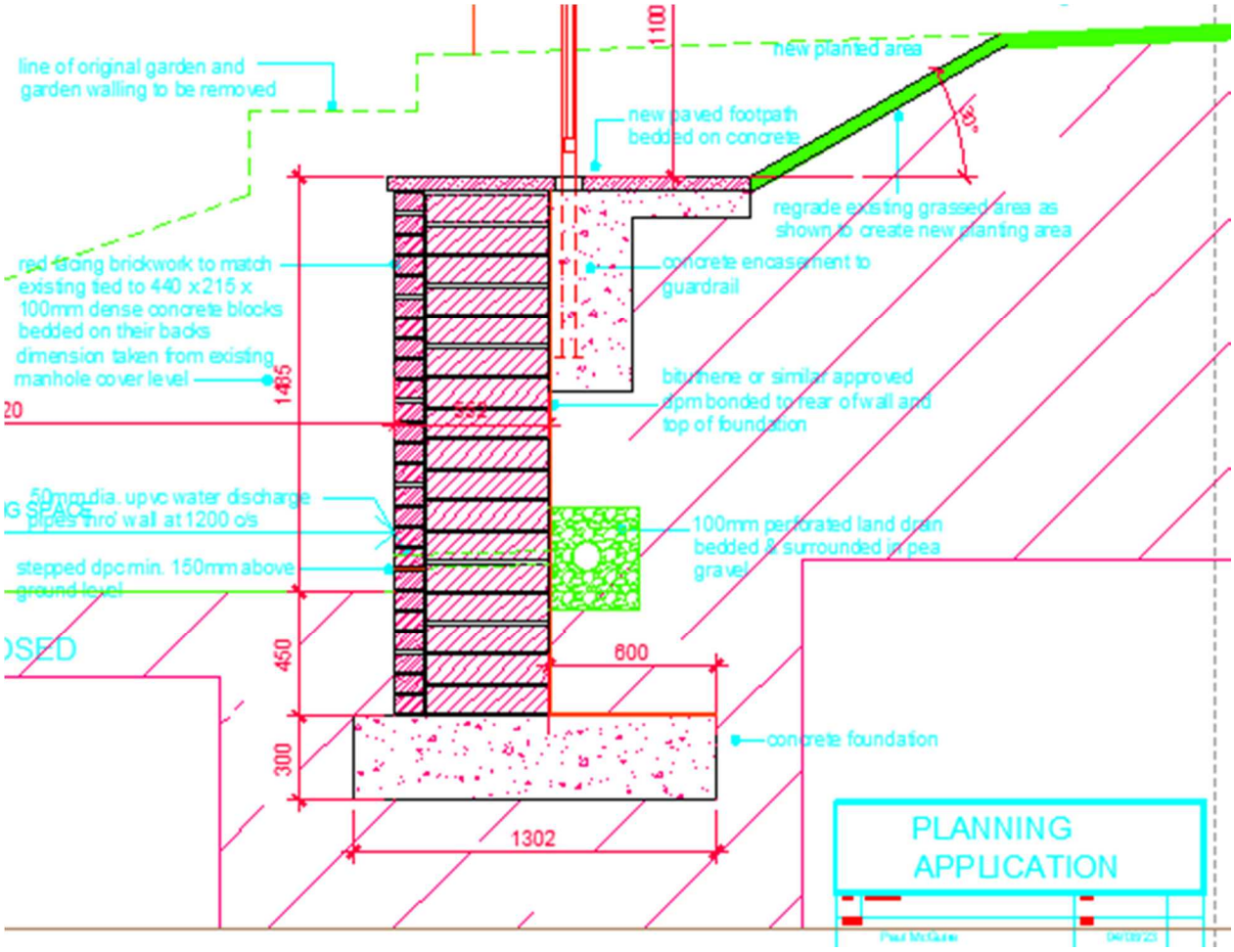
5.1. Methods of analysis proposed for superstructure, substructure and foundations

The method of analysis employed is to BS EN 1997-1:2004 incorporating Corrigendum dated February 2009 and UK National Annex incorporating Corrigendum No 1.

A 5.0kN/m2 surcharge has been applied at the top of the wall in accordance with Section 4.5.1.5 (Table 7) of BS 8002:2015 Code of Practice for Earth Retaining Structures

The design of mass concrete gravity retaining wall will be in accordance with all applicable Eurocodes, adopting a design life of 120 years.

5.2. Description and diagram of idealised structure to be used for analysis



5.3. Assumptions intended for calculation of structural element stiffness.

Weight of backfill behind wall is 17.0 kN/m^3.

Surcharge is taken at 5.0 kN/m^2 above the retaining wall.

Angle of internal friction of sub strata, Φ= 30°

Angle of internal friction of retained soil, Φ= 38°

Ground bearing pressure of the bedrock sub strata upon which the wall will be constructed = 100 kN/m^2.

5.4. Proposed range of soil parameters to be used in the design of earth retaining elements.

The retaining will be designed using active pressures, assuming the wall is immobile and with NO passive pressure.

In the global stability conditions, the active pressure, Ka, has been used.

Ka = 0.217

Ko = 0.783

The ground forming the highway (i.e. passive pressure) in front of the retaining wall will not be considered in the stability checks of the wall, to allow for any unplanned excavations which may occur to the highway in the future.

6. GEOTECHNICAL CONDITIONS

6.1. Acceptance of recommendations of the ground investigation report (references/dates) to be used in the design and reasons for any proposed changes

In the absence of detailed ground investigations, a conservative minimum ground bearing pressure (GBP) of 100 kN/m^2 has been assumed for the substrata upon which the wall will be constructed. This will be confirmed on site when excavations have commenced with revisions to the design of the wall undertaken accordingly.

6.2. Summary of design for highway structure in the ground investigation report

As 6.1 above, otherwise not applicable.

6.3. Differential settlement to be allowed for in the design of the structure

The new retaining wall structure only covers a small area, and it will be constructed in sections, therefore it is considered that differential settlement across the base slab will not occur.

6.4. If the ground investigation report is not yet available, state when the results are expected and list the sources of information used to justify the preliminary choice of foundations

It is not intended to undertake a detailed geotechnical investigation of site prior to construction commencing.

The assumptions made in relation to the underlying sub-strata are based upon sound engineering experience and knowledge of the ground conditions in the surrounding area.

7. CHECK

7.1. Proposed Category and Design Supervision Level

Category 0

7.2. If Category 3, name of proposed Independent Checker

Not Applicable

7.3. Erection proposals or temporary works for which Types S and P Proposals will be required, listing structural parts of the permanent structure affected with reasons

The earth behind the retaining structure will be graded back to allow safe access during the construction phase. This negates the need for any temporary shoring works required to the face of the excavation.

Temporary propping will be provided to the adjacent retaining structures to prevent their possible collapse during the reconstruction of the defective section of wall.

Temporary ‘Heras’ type fencing will be used to protect the site boundaries during the construction program.

8. DRAWINGS AND DOCUMENTS

8.1. List of drawings (including numbers) and documents accompanying the submission

8.1.1. Drawings (See appendix B)

Reference	Title
MDL-9549-001 (yet to be issued)	Reinforced Concrete Retaining Wall Details

8.1.2. Documents (See appendix C)

Reference	Title
MDL-9549	Structural Calculations for Retaining Wall

9. THE ABOVE IS SUBMITTED FOR ACCEPTANCE

Design Team Leader	
Signed	
Name	B. Rahma
Engineering Qualifications	BSc. Civil Engineering
Name of Organisation	Marsh Design Limited
Date	5th December 2023

Check Team Leader	
Signed	
Name	David Haigh
Engineering Qualifications	B. Eng. (Hons) Civil Engineering
Name of Organisation	Marsh Design Limited
Date	5th December 2023

10. THE ABOVE IS REJECTED/AGREED SUBJECT TO THE AMENDMENTS AND CONDITIONS SHOWN BELOW

Signed	
Name	**Farhad Khatibi**
Position held	**Bridges & Structures Manager**
Engineering Qualifications	**BSc (Hons) Civil Eng, MSc**
TAA	**Kirklees Council**
Date	

For and on behalf of Kirklees Council

APPENDIX A

LIST OF RELEVANT DESIGN DOCUMENTS

Scheme Title: 121, Wakefield Road, Fenay Bridge
Structure Title: Private Blockwork Gravity Retaining Wall for the Construction of a New Parking Area.

Structure Ref: K?????
REV.01: 5/12/2023

TECHNICAL APPROVAL SCHEDULE (TAS)

Schedule of Documents Relating to Design of Highway Bridges and Structures

(All documents are taken to include revisions current as of 03 October 2023)

Additional standards needed for a particular design should be added to the section at the bottom of the TAS.

The Designer is responsible for ensuring that the standards and references given in the schedule are correct and up to date. Tick all the documents used (✓)

Eurocodes and associated UK National Annexes				
Used	**Eurocode part**	**Title**	**Amendment/ Corrigenda**	***Notes***
	Eurocode 0	**Basis of structural design**		
✓	**BS EN 1990:2002 +A1:2005**	**Eurocode 0: Basis of structural design**	**+A1:2005 Incorporating corrigenda December 2008 and April 2010**	**See CD 350 section 7 for additional guidance.** **This document is to be used until 30 March 2028. After which it will be superseded by BS EN 1990:2023**
✓	NA to BS EN 1990:2002 + A1:2005	UK National Annex to Eurocode 0 Basis of structural design	National Amendment No.1	See CD 350 section 7 for additional guidance.
	Eurocode 1	**Actions on structures**		
✓	BS EN 1991-1-1:2002	Eurocode 1: Actions on structures. General Actions. Densities, self-weight, imposed load for buildings	Corrigenda December 2004 and March 2009	
✓	NA to BS EN 1991-1-1:2002	UK National Annex to Eurocode 1: Actions on structures. General Actions. Densities, self-weight, imposed load for buildings	Corrigenda July 2019	
	~~BS EN 1991-1-3:2003 +A1:2015~~	~~Eurocode 1: Actions on structures. General Actions. Snow loads~~	~~+A1:2015 Incorporating corrigenda December 2004 and March 2009~~	
	~~NA + A2:18 to BS EN 1991-1-3:2003+A1:2015~~	~~UK National Annex to Eurocode 1: Actions on structures. General Actions. Snow loads~~	~~+A2:2018 Incorporating corrigenda June 2007, December 2015 and October 2018~~	
	~~BS EN 1991-1-4:2005 +A1:2010~~	~~Eurocode 1: Actions on structures. General Actions. Wind actions~~	~~+A1:2010 Corrigenda July 2009 and January 2010~~	
	~~NA to BS EN 1991-1-4:2005 + A1:2010~~	~~UK National Annex to Eurocode 1: Actions on structures. General Actions. Wind actions~~	~~National Amendment No.1~~	
	~~BS EN 1991-1-5:2003~~	~~Eurocode 1: Actions on structures. General Actions. Thermal actions~~	~~Corrigenda December 2004 and March 2009~~	
	~~NA to BS EN 1991-1-5:2003~~	~~UK National Annex to Eurocode 1: Actions on structures. General Actions. Thermal actions~~	~~-~~	

Eurocodes and associated UK National Annexes				
Used	**Eurocode part**	**Title**	**Amendment/ Corrigenda**	***Notes***
✓	BS EN 1991-1-6:2005	Eurocode 1: Actions on structures. General Actions. Actions during execution	Corrigenda July 2008, November 2012 and February 2013	
✓	NA to BS EN 1991-1-6:2005	UK National Annex to Eurocode 1: Actions on structures. General Actions. Actions during execution	-	
✓	BS EN 1991-1-7:2006 +A1:2014	Eurocode 1: Actions on structures. General Actions. Accidental actions	+A1: 2014 Corrigendum February 2010	
✓	NA+A1 to BS EN 1991-1-7:2006+A1:2014	UK National Annex to Eurocode 1: Actions on structures. Part 1-7 : Accidental actions	+A1:2014 Incorporating corrigenda August 2014 and November 2015	See CD 350 for additional guidance.
✓	BS EN 1991-2:2003	Eurocode 1: Actions on structures. Traffic loads on bridges	Corrigenda December 2004 and February 2010	See CD 350 section 7 for additional guidance.
✓	NA +A1:2020 to BS EN 1991-2:2003	UK National Annex to Eurocode 1: Actions on structures. Traffic loads on bridges	Corrigendum No.1 Amendment June 2020	See CD 350 section 7 for additional guidance.
	Eurocode 2	**Design of concrete structures**		
✓	BS EN 1992-1-1:2004 + A1:2014	Eurocode 2: Design of concrete structures– Part 1-1: General rules and rules for buildings	Incorporating corrigendum January 2008, November 2010 and January 2014	
✓	NA + A2:2014 to BS EN 1992-1-1:2004 + A1:2014	UK National Annex to Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings		
✓	BS EN 1992-2:2005	Eurocode 2: Design of concrete structures – Part 2: Concrete bridges – Design and detailing rules	Corrigendum July 2008	
✓	NA to BS EN 1992-2:2005	UK National Annex to Eurocode 2: Design of concrete structure – Part 2: Concrete bridges – Design and detailing rules	-	
	~~BS EN 1992-3:2006~~	~~Eurocode 2: Design of concrete structures – Part 3: Liquid retaining and containment structures~~	-	
	~~NA to BS EN 1992-3:2006~~	~~UK National Annex to Eurocode 2: Design of concrete structures – Part 3: Liquid retaining and containment structures~~	-	
	~~BS EN 1992-4:2018~~	~~Eurocode 2: Design of concrete structures – Part 4: Design of fastenings for use in concrete~~		
	~~NA to BS EN 1992-4:2018~~	~~UK National Annex to Eurocode 2: Design of concrete structures – Part 4: Design of fastenings for use in concrete~~		
	~~**Eurocode 3**~~	~~**Design of steel structures**~~		
	~~**BS EN 1993-1-1:2005 + A1:2014**~~	~~**Eurocode 3: Design of steel structures – Part 1-1 General rules and rules for buildings**~~	~~**Corrigenda February 2006 and April 2009**~~	~~**This document is to be used until 30 March 2028. After which it will be superseded by BS EN 1993-1-1:2022**~~
	~~NA + A1:2014 to BS EN 1993-1-1:2005 + A1:2014~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 1-1 General rules and rules for buildings~~	-	

Scheme Title: 121, Wakefield Road, Fenay Bridge
Structure Title: Private Blockwork Gravity Retaining Wall for the Construction of a New Parking Area.

Structure Ref: K?????
REV.01: 5/12/2023

Eurocodes and associated UK National Annexes				
Used	**Eurocode part**	**Title**	**Amendment/ Corrigenda**	***Notes***
	~~BS EN 1993-1-3:2006~~	~~Eurocode 3: Design of steel structures – Part 1-3 General rules – Supplementary rules for cold-formed members and sheeting~~	~~Corrigendum November 2009~~	
	~~NA to BS EN 1993-1-3:2006~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 1-3 Supplementary rules for cold-formed members and sheeting~~	~~-~~	
	~~BS EN 1993-1-4:2006 + A2:2020~~	~~Eurocode 3: Design of steel structures – Part 1-4 General rules – Supplementary rules for stainless steels~~	~~+ A1:2015 Amendment No. 1 + A2:2020 Amendment No. 2~~	~~Supersedes BS EN 1993-1-4:2006 + A1:2015~~
	~~NA+A1:15 to BS EN 1993-1-4:2006+A1:2015~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 1-4 Supplementary rules for stainless steels~~	~~+ A1:2015 Amendment No. 1~~	
	~~BS EN 1993-1-5:2006+A2:2019~~	~~Eurocode 3: Design of steel structures – Part 1-5 Plated structural elements~~	~~Corrigendum April 2009, +A1:2017 Amendment No. 2, +A2:2019~~	
	~~NA+A1:2016 to BS EN 1993-1-5:2006~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 1-5 Plated structural elements~~	~~+ A1:2016 Amendment No. 1~~	
	~~BS EN 1993-1-6:2007+ A1:2017~~	~~Eurocode 3: Design of steel structures – Part 1-6 Strength and stability of shell structures~~	~~+ A1:2017 Amendment No. 1~~	
	~~BS EN 1993-1-7:2007~~	~~Eurocode 3: Design of steel structures – Part 1-7 Plated structures subject to out of plane loading~~	~~Corrigendum April 2009~~	
	~~BS EN 1993-1-8:2005~~	~~Eurocode 3: Design of steel structures – Part 1-8 Design of joints~~	~~Corrigenda December 2005, September 2006, July 2009 and August 2010~~	
	~~NA to BS EN 1993-1-8:2005~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 1-8 Design of joints~~	~~-~~	
	~~BS EN 1993-1-9:2005~~	~~Eurocode 3: Design of steel structures – Part 1-9 Fatigue~~	~~Corrigenda December 2005, September 2006 and April 2009~~	
	~~NA to BS EN 1993-1-9:2005~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 1-9 Fatigue~~	~~-~~	
	~~BS EN 1993-1-10:2005~~	~~Eurocode 3: Design of steel structures – Part 1-10 Material toughness and through-thickness properties~~	~~Corrigenda December 2005, September 2006 and March 2009~~	
	~~NA to BS EN 1993-1-10:2005~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 1-10 Material toughness and through thickness properties~~	~~-~~	
	~~BS EN 1993-1-11:2006~~	~~Eurocode 3: Design of steel structures – Part 1-11 Design of structures with tension components~~	~~Corrigendum April 2009~~	
	~~NA to BS EN 1993-1-11:2006~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 1-11 Design of structures with tension components~~	~~-~~	
	~~BS EN 1993-1-12:2007~~	~~Eurocode 3: Design of steel structures – Part 1-12 Additional rules for the extension of EN 1993 up to steel grades S 700~~	~~Corrigendum April 2009~~	

Eurocodes and associated UK National Annexes				
Used	**Eurocode part**	**Title**	**Amendment/ Corrigenda**	***Notes***
	~~NA to BS EN 1993-1-12:2007~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 1-12 Additional rules for the extension of EN 1993 up to steel grades S 700~~	~~-~~	
	~~BS EN 1993-2:2006~~	~~Eurocode 3: Design of steel structures – Part 2 Steel bridges~~	~~Corrigendum July 2009~~	
	~~NA + A1:2012 to BS EN 1993-2:2006~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 2 Steel bridges~~	~~+ A1:2012~~	
	~~BS EN 1993-5:2007~~	~~Eurocode 3: Design of steel structures – Part 5 Piling~~	~~Corrigendum May 2009~~	
	~~NA + A1:2012 to BS EN 1993-5:2007~~	~~UK National Annex to Eurocode 3: Design of steel structures – Part 5 Piling~~	~~+ A1:2012~~	
	~~**Eurocode 4**~~	~~**Design of composite steel and concrete structures**~~		
	~~BS EN 1994-1-1:2004~~	~~Eurocode 4: Design of composite steel and concrete structures – Part 1-1 General rules and rules for buildings~~	~~Corrigendum April 2009~~	
	~~NA to BS EN 1994-1-1:2004~~	~~UK National Annex to Eurocode 4: Design of composite steel and concrete structures – Part 1-1 General rules and rules for buildings~~	~~-~~	
	~~BS EN 1994-2:2005~~	~~Eurocode 4: Design of composite steel and concrete structures – Part 2 General rules and rules for bridges~~	~~Corrigendum July 2008~~	
	~~NA to BS EN 1994-2:2005~~	~~UK National Annex to Eurocode 4: Design of composite steel and concrete structures – Part 2 General rules and rules for bridges~~	~~-~~	
	~~**Eurocode 5**~~	~~**Design of timber structures**~~		
	~~BS EN 1995-1-1:2004 + A2:2014~~	~~Eurocode 5: Design of timber structures – Part 1-1 General – common rules and rules for buildings~~	~~+ A2:2014 Incorporating corrigendum June 2006~~	
	~~NA to BS EN 1995-1-1:2004 + A2:2014~~	~~UK National Annex to Eurocode 5: Design of timber structures – Part 1-1 General – common rules and rules for buildings~~	~~+ A2:2014~~	
	~~BS EN 1995-2:2004~~	~~Eurocode 5: Design of timber structures – Part 2 Bridges~~	~~-~~	
	~~NA to BS EN 1995-2:2004~~	~~UK National Annex to Eurocode 5: Design of timber structures – Part 2 Bridges~~	~~-~~	
	~~**Eurocode 6**~~	~~**Design of masonry structures**~~		
	BS EN 1996-1-1:2005+A1:2012	**Eurocode 6: Design of masonry structures – Part 1-1 General rules for reinforced and unreinforced masonry structures**	**+A1:2012 Corrigenda February 2006 and July 2009**	**This document is to be used until 30 March 2028. After which it will be superseded by BS EN 1996-1-1:2022**
	NA to BS EN 1996-1-1:2005 +A1:2012	UK National Annex to Eurocode 6: Design of masonry structures – Part 1-1 General rules for reinforced and unreinforced masonry structures	+A1:2012	
	BS EN 1996-2:2006	Eurocode 6: Design of masonry structures – Part 2 Design considerations, selection of materials and execution of masonry	Corrigendum September 2009	
	NA to BS EN 1996-2:2006	UK National Annex to Eurocode 6: Design of masonry structures – Part 2 Design considerations, selection of materials and execution of masonry	Corrigendum No.1	

Eurocodes and associated UK National Annexes				
Used	**Eurocode part**	**Title**	**Amendment/ Corrigenda**	***Notes***
	BS EN 1996-3:2006	Eurocode 6: Design of masonry structures – Part 3 Simplified calculation methods for unreinforced masonry structures	Corrigendum October 2009	
	NA +A1:2014 to BS EN 1996-3:2006	UK National Annex to Eurocode 6: Design of masonry structures – Part 3 Simplified calculation methods for unreinforced masonry structures	+A1:2014	
✓	**Eurocode 7**	**Geotechnical design**		
✓	**BS EN 1997-1:2004+A1:2013**	**Eurocode 7: Geotechnical design – Part 1 General rules**	**+A1:2013 Corrigendum February 2009**	**This document is to be used until 30 March 2028. After which it will be superseded by BS EN 1990:2023**
✓	NA+A2:2022 to BS EN 1997-1:2004+A1:2013	UK National Annex to Eurocode 7: Geotechnical design – Part 1 General rules	+A1:2013 Incorporating Corrigendum No.1, Amendment 1 – July 2014 and Amendment 2 - 2022	Supersedes NA+A1:2014 to BS EN 1997-1:2004+A1:2013
✓	BS EN 1997-2:2007	Eurocode 7: Geotechnical design – Part 2 Ground investigation and testing	Corrigendum June 2010	
✓	NA to BS EN 1997-2:2007	UK National Annex to Eurocode 7: Geotechnical design – Part 2 Ground investigation and testing	-	
	~~**Eurocode 8**~~	~~**Design of structures for earthquake resistance**~~		
	~~BS EN 1998-1:2004 + A1:2013~~	~~Eurocode 8: Design of structures for earthquake resistance – Part 1 General rules, seismic actions and rules for buildings~~	~~Corrigendum June 2009, January 2011 and March 2013~~	
	~~NA to BS EN 1998-1:2004~~	~~UK National Annex to Eurocode 8: Design of structures for earthquake resistance – Part 1 General rules, seismic actions and rules for buildings~~	~~-~~	
	~~BS EN 1998-2:2005+A2:2011~~	~~Eurocode 8: Design of structures for earthquake resistance – Part 2 Bridges~~	~~Corrigenda February 2010 and February 2012~~	
	~~NA to BS EN 1998-2:2005~~	~~UK National Annex to Eurocode 8: Design of structures for earthquake resistance – Part 2 Bridges~~	~~-~~	
	~~BS EN 1998-5:2004~~	~~Eurocode 8: Design of structures for earthquake resistance – Part 5 Foundations, retaining structures and geotechnical aspects~~	~~-~~	
	~~NA to BS EN 1998-5:2004~~	~~UK National Annex to Eurocode 8: Design of structures for earthquake resistance – Part 5 Foundations, retaining structures and geotechnical aspects~~	~~-~~	
	~~**Eurocode 9**~~	~~**Design of aluminium structures**~~		
	~~**BS EN 1999-1-1:2007 + A2:2013**~~	~~**Eurocode 9: Design of aluminium structures– Part 1-1 General structural rules**~~	~~**+ A2:2013 Incorporating corrigendum March 2014**~~	~~**This document is to be used until 30 March 2028. After which it will be superseded by BS EN 1999-1-1:2023**~~
	~~NA to BS EN 1999-1-1:2007 + A1:2009~~	~~UK National Annex to Eurocode 9: Design of aluminium structures – Part 1-1 General structural rules~~	~~National Amendment No.1 Corrigendum No.1~~	

Eurocodes and associated UK National Annexes

Used	Eurocode part	Title	Amendment/ Corrigenda	*Notes*
	~~**BS EN 1999-1-3:2007 + A1:2011**~~	~~**Eurocode 9: Design of aluminium structures – Part 1-3 Structures susceptible to fatigue**~~	~~**+ A1:2011**~~	~~**This document is to be used until 30 March 2028. After which it will be superseded by BS EN 1999-1-3:2023**~~
	~~NA to BS EN 1999-1-3:2007 + A1:2011~~	~~UK National Annex to Eurocode 9: Design of aluminium structures – Part 1-3 Structures susceptible to fatigue~~	~~+ A1:2011~~	
	~~**BS EN 1999-1-4:2007 +A1:2011**~~	~~**Eurocode 9: Design of aluminium structures – Part 1-4 Cold formed structural sheeting**~~	~~**+ A1:2011 Corrigendum November 2009**~~	~~**This document is to be used until 30 March 2028. After which it will be superseded by BS EN 1999-1-4:2023**~~
	~~NA to BS EN 1999-1-4:2007~~	~~UK National Annex to Eurocode 9: Design of aluminium structures – Part 1-4 Cold formed structural sheeting~~	-	

BSI Published Documents

For guidance only unless clauses are otherwise specified in CD 350 Appendix A.

Used	Published Document reference	Title	Notes
✓	PD 6687-1:2020	Background paper to the UK National Annexes to BS EN 1992-1 and BS EN 1992-3	Supersedes PD 6687-1:2010 See CD 350 clauses 3.6, 4.1, 4.2 and Appendix A for additional guidance. Clause 3.6 in CD 350 refers to clause 2.5 in PD 6687-1, this is now clause 4.5 in PD 6687-1 Clause 4.2 in CD 350 refers to clause 2.22 in PD 6687-1, this is now clause 4.21.4 in PD 6687-1
✓	PD 6687-2:2008	Recommendations for the design of structures to BS EN 1992-2:2005	See CD 350 clauses 4.1, 4.2 and Appendix A for additional guidance.
✓	PD 6688-1-1:2011	Recommendations for the design of structures to BS EN 1991-1-1	See CD 350 Appendix A for additional guidance.
✓	PD 6688-1-4:2015	Background paper to the UK National Annex to BS EN 1991-1-4	See CD 350 Appendix A for additional guidance.
✓	PD 6688-1-7:2009 +A1:2014	Recommendations for the design of structures to BS EN 1991-1-7	See CD350 clause 3.7 and Appendix B for additional guidance.
✓	PD 6688-2:2011	Recommendations for the design of structures to BS EN 1991-2	See CD 350 Appendix A for additional guidance.
✓	PD 6694-1:2011 + A1:2020	Recommendations for the design of structures subject to traffic loading to BS EN 1997-1	Incorporating Corrigendum January 2022 See CD 350 Appendix A for additional guidance.
✓	PD 6695-1-9:2008	Recommendations for the design of structures to BS EN 1993-1-9	See CD 350 Appendix A for additional guidance.
✓	PD 6695-1-10:2009	Recommendations for the design of structures to BS EN 1993-1-10	See CD 350 Appendix A for additional guidance.
✓	PD 6695-2:2008 + A1:2012 Incorporating Corrigendum No.1	Recommendation for the design of bridges to BS EN 1993	See CD 350 Appendix A for additional guidance.
	~~PD 6696-2:2007 + A1:2012~~	~~Background paper to BS EN 1994-2 and the UK National Annex to BS EN 1994-2~~	~~See CD 350 Appendix A for additional guidance.~~

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BSI Published Documents

For guidance only unless clauses are otherwise specified in CD 350 Appendix A.

Used	Published Document reference	Title	Notes
	~~PD 6698:2009~~	~~Recommendations for the design of structures for earthquake resistance to BS EN 1998~~	~~See CD 350 section 7 for additional guidance.~~
	~~PD 6702-1:2009+A1:2019~~	~~Structural use of aluminium. Recommendations for the design of aluminium structures to BS EN 1999~~	~~Amended 31 May 2019~~
	~~PD 6703:2009~~	~~Structural bearings – Guidance on the use of structural bearings~~	
	~~PD 6705-2:2020~~	~~Structural use of steel and aluminium. Execution of steel bridges conforming to BS EN 1090-2. Guide~~	~~Replaces PD 6705-2:2010 + A1:2013~~
	~~PD 6705-3:2009~~	~~Recommendations on the execution of aluminium structures to BS EN 1090-3~~	

Execution Standards referenced in British Standards or Eurocode

Used	Execution Standard reference	Title	Notes
	BS EN 1090-1:2009+A1:2011	Execution of steel structures and aluminium structures - Part 1: Requirements for conformity assessment of structural components	
	BS EN 1090-2:2018	Execution of steel structures and aluminium structures. Technical requirements for the execution of steel structures	Supersedes BS EN 1090-2:2008+A1:2011
	BS EN 1090-3:2019	Execution of steel structures and aluminium structures – Part 3: Technical requirements for aluminium structures	Supersedes BS EN 1090-3:2008
✓	BS EN 13670:2009 Incorporating corrigenda October 2015 and November 2015	Execution of concrete structures	

Product Standards referenced in British Standards or Eurocodes

Used	Product Standard reference	Title	Notes
✓	BS EN 206:2013+A2:2021	Concrete – Specification, performance, production and conformity	Supersedes BS EN 206:2013+A1:2016
	~~BS EN 1317-1:2010~~	~~Road Restraint Systems – Part 1 – Terminology and general criteria for test methods~~	
	~~BS EN 1317-2:2010~~	~~Road Restraint Systems – Part 2 – Performance classes, impact test acceptance criteria and test methods for safety barriers.~~	
	~~BS EN 1317-3:2010~~	~~Road Restraint Systems – Part 3 – Performance classes, impact test acceptance criteria and test methods for crash cushions.~~	
	~~DD ENV 1317-4:2002~~	~~Road Restraint Systems – Part 4 – Performance classes, impact test acceptance criteria and test methods for terminals and transitions of safety barriers.~~	~~*Draft BS EN 1317-4 for public comment published in June 2012*~~

Product Standards referenced in British Standards or Eurocodes

Used	Product Standard reference	Title	Notes
	~~BS EN 1317-5:2007+A2:2012~~	~~Road Restraint Systems – Part 5 – Product requirements and evaluation of conformity for vehicle restraint systems~~	~~Incorporating corrigendum August 2012~~ ~~*Draft prEN 1317-5 for public comment published in December 2013*~~
	~~PD CEN/TR 16949:2016~~	~~Road Restraint System – Pedestrian restraint system – Pedestrian parapets~~	~~*Bsi Published Document / CEN Technical Report published in July 2016*~~ ~~*(This document should not be used. The requirements of BS 7818:1995 apply.)*~~
	~~Draft prEN 1317-7~~	~~Road restraint systems – Part 7: Performance classes, impact test acceptance criteria and test methods for terminals of safety barriers~~	~~*Draft prEN 1317-7 for public comment published in June 2012*~~ ~~*(This document should not be used. All terminals should continue to be in accordance with ENV1317-4.)*~~
	~~PD CEN/TS 17342:2019~~	~~Road restraint systems – Motorcycle road restraint systems which reduce the impact severity of motorcyclist collisions with safety barriers~~	~~*Replaces* PD CEN/TS 1317-8:2012~~ ~~*(This document should not be used.)*~~
	~~PD CEN/TR 17081:2018~~	~~Design of fastenings for use in concrete – Plastic design of fastenings with headed and post installed fasteners~~	
	~~BS EN 1337-1:2000~~	~~Structural bearings – Part 1: General Design Rules~~	
	~~BS EN 1337-2:2004~~	~~Structural bearings – Part 2: Sliding elements~~	
	~~BS EN 1337-3:2005~~	~~Structural bearings – Part 3: Elastomeric bearings~~	
	~~BS EN 1337-4:2004~~	~~Structural bearings – Part 4: Roller bearings~~	~~Corrigendum No.1 March 2007~~
	~~BS EN 1337-5:2005~~	~~Structural bearings – Part 5: Pot bearings~~	
	~~BS EN 1337-6:2004~~	~~Structural bearings – Part 6: Rocker bearings~~	
	~~BS EN 1337-7:2004~~	~~Structural bearings – Part 7: Spherical and cylindrical PTFE bearings~~	
	~~BS EN 1337-8:2007~~	~~Structural bearings – Part 8: Guide bearings and restraint bearings~~	
	~~BS EN 1337-9:1998~~	~~Structural bearings – Part 9: Protection~~	
	~~BS EN 1337-10:2003~~	~~Structural bearings – Part 10: Inspection and maintenance~~	~~Corrigendum No.1 November 2003~~
	~~BS EN 1337-11:1998~~	~~Structural bearings – Part 11: Transport, Storage and Installation.~~	
	~~BS EN 10025-1:2004~~	~~Hot rolled products of structural steels Part 1: General technical delivery conditions.~~	
	~~BS EN 10025-2:2019~~	~~Hot rolled products of structural steels Part 2: Technical delivery conditions for non-alloy structural steels.~~	~~Supersedes BS EN 10025-1:2004~~
	~~BS EN 10025-3:2019~~	~~Hot rolled products of structural steels Part 3: Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels.~~	~~Supersedes BS EN 10025-3:2004~~
	~~**BS EN 10025-4:2019+A1:2022**~~	~~**Hot rolled products of structural steels Part 4: Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels.**~~	~~**Supersedes BS EN 10025-4:2019**~~

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Product Standards referenced in British Standards or Eurocodes

Used	Product Standard reference	Title	Notes
	~~BS EN 10025-5:2019~~	~~Hot rolled products of structural steels – Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance~~	~~Supersedes BS EN 10025-5:2004~~
	~~**BS EN 10025-6:2019+A1:2022**~~	~~**Hot rolled products of structural steels – Part 6: Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition.**~~	~~**Supersedes BS EN 10025-6:2019**~~
	~~BS EN 10080:2005~~	~~Steel for the reinforcement of concrete – Weldable reinforcing steel – General~~	
	~~BS EN 10210-1:2006~~	~~Hot finished structural hollow sections of non-alloy and fine grain steels – Part 1: Technical delivery conditions~~	
	~~BS EN 10210-2:2019~~	~~Hot finished structural hollow sections – Part 2: Tolerances, dimensions and sectional properties~~	~~Supersedes BS EN 10210-2:2006~~
	~~BS EN 10248-1:2023~~	~~Hot rolled sheet piling of non-alloy steels. Technical delivery conditions~~	~~Supersedes BS EN 10248-1:1996~~
	~~BS EN 10248-2:1996~~	~~Hot rolled sheet piling of non-alloy steels. Tolerances on shape and dimensions~~	
	~~BS EN 12063:1999~~	~~Execution of special geotechnical work. Sheet pile walls.~~	
	~~BS EN 13369:2018~~	~~Common rules for precast concrete products~~	
	~~BS EN 14388:2005~~	~~Road traffic noise reducing devices~~	~~There is a 2015 version, however the 2015 version is not harmonised.~~
	~~BS EN 15050:2007 + A1:2012~~	~~Precast concrete products – Bridge elements~~	~~See CD 350 clause 3.8.1 for additional guidance.~~
	~~BS EN 15258:2008~~	~~Precast concrete products – Retaining wall elements~~	

British Standards

Used	British Standard reference	Title	Notes
✓	BS 4449:2005+A3:2016	Steel for the reinforcement of concrete	No longer covers plain round bar. (See BS4482 up to 12mm dia, see BS EN 10025-1 for larger sizes and dowels. See BS EN 13877-3 for dowel bars in concrete pavements.)
	~~BS 5896:2012~~	~~Specification for high tensile steel wire and strand for the prestressing of concrete~~	
	~~BS 7818:1995~~	~~Specification for pedestrian restraint systems in metal~~	~~Incorporating Corrigendum No.1 May 2004 and Corrigendum No.2 September 2006~~ ~~Currently the requirements of BS 7818:1995 are to be used instead of PD CEN/TR 16949:2016~~
✓	BS 8002:2015	Code of practice for earth retaining structures	
✓	BS 8004:2015 +A1 2020	Code of practice for foundations	Amendment +A1:2020
	~~BS 8006-1:2010+A1:2016~~	~~Code of practice for strengthened/reinforced soils and other fills~~	
✓	BS 8500-1:2015+A2:2019	Concrete – Complementary British Standard to BS EN 206: Method of specifying and guidance for the specifier.	Incorporating Corrigendum No.1 and Corrigendum No.2 June 2020 Amendment +A2:2019

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British Standards			
✓	BS 8500-2:2015+A2:2019	Concrete – Complementary British Standard to BS EN 206 : Specification for constituent materials and concrete.	Amendment +A2:2019
✓	BS 8666:2020	Scheduling, dimensioning, bending and cutting of steel reinforcement for concrete	Supersedes BS 8666:2005

The Manual of Contract Documents for Highway Works (MCHW)			
Used	**MCHW reference**	**Title**	***Notes***
✓	MCHW Volume 1: October 2022	Specification for Highway Works	*Specification compliant with the execution standards must be used. A Departure is necessary for the parts where a compliant revision has not been published. Amendments October 2022 Supersedes April 2022 version*
✓	MCHW Volume 2: October 2022	Notes for guidance on the Specification for Highway Works	*Notes for guidance compliant with the execution standards must be used. A Departure is necessary for the parts where a compliant revision has not been published. Amendments October 2022 Supersedes November 2021 version*
✓	MCHW Volume 3: February 2017	Highway Construction Details	

The Design Manual for Roads and Bridges (DMRB)			
Used	**DMRB reference**	**Title**	**Notes**
✓	GG 101 Revision 0.1.0	Introduction to the Design Manual for Roads and Bridges	Replaces GG 101 Revision 0
	~~GG 102 Revision 0~~	~~Quality Management Systems for Highway Design~~	~~Replaces GD 02/16~~
	~~GG 103 Revision 0~~	~~Introduction and general requirements for sustainable development and design~~	
	~~GG 104 Revision 0~~	~~Requirements for Safety Risk Assessment~~	~~Replaces GD04/12 and IAN 191/16~~
	~~GG 184 Revision 0~~	~~Specification for the use of Computer Aided Design~~	~~Replaces IAN 184/16~~
✓	CG 300 Revision 0.1.0	Technical approval of highway structures	Supersedes BD 2/12
✓	CG 302 Revision 0	As-built, operational and maintenance records for highway structures	Supersedes BD 62/07
	~~CG 303 Revision 0~~	~~Quality assurance scheme for paints and similar protective coatings~~	~~Supersedes BD 35/14~~
	~~CG 305 Revision 0~~	~~Identification marking of highway structures~~	~~Supersedes BD 45/93~~
	~~CG 501 Revision 2~~	~~Design of highway drainage systems~~	~~Supersedes HD 33/16, TA 80/99~~
	~~CD 127 Revision 1.0.1~~	~~Cross-sections and headrooms~~	~~Replaces TD 27/05 and TD 70/08~~
✓	CD 350 Revision 0	The design of highway structures	Supersedes BD 100/16, BA 57/01, BD 57/01 and IAN 124/11
✓	CD 351 Revision 0	The design and appearance of highway structures	Supersedes BA 41/98
	~~CD 352 Revision 0~~	~~Design of road tunnels~~	~~Supersedes BD 78/99~~
	~~CD 353 Revision 0~~	~~Design criteria for footbridges~~	~~Supersedes BD 29/17~~
	~~CD 354 Revision 1.1.0~~	~~Design of minor structures~~	~~Supersedes CD 354 Revision 1~~

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The Design Manual for Roads and Bridges (DMRB)			
Used	**DMRB reference**	**Title**	**Notes**
	~~CD 355 Revision 0~~	~~Application of whole life costs for design and maintenance of highway structures~~	~~Replaces BD 36/92 and BA 28/92~~
	~~CD 356 Revision 1~~	~~Design of highway structures for hydraulic action~~	~~Supersedes BA 59/94~~
	~~CD 357 Revision 1~~	~~Bridge expansion joints~~	~~Replaces BD 33/94, BA 26/94, IAN 168/12 and IAN 169/12~~
	~~CD 358 Revision 2.4.0~~	~~Waterproofing and surfacing of concrete bridge decks~~	~~Supersedes CD 358 Revision 2.3.0~~
	~~CD 359 Revision 0~~	~~Design requirements for permanent soffit formwork~~	~~Supersedes BA 36/90 and IAN 131/11~~
	~~CD 360 Revision 2~~	~~Use of compressive membrane action in bridge decks~~	~~Supersedes BD 81/02~~
	~~CD 361 Revision 0~~	~~Weathering steel for highway structures~~	~~Supersedes BD 7/01~~
	~~CD 362 Revision 1~~	~~Enclosure of bridges~~	~~Replaces BD 67/96 and BA 67/96~~
	~~CD 363 Revision 0~~	~~Design rules for aerodynamic effects on bridges~~	~~Replaces BD 49/01~~
	~~CD 364 Revision 0~~	~~Formation of continuity joints in bridge decks~~	~~Replaces BA 82/00~~
	~~CD 365 Revision 1~~	~~Portal and cantilever signs/signals gantries~~	~~Replaces BD 51/14, IAN 193/16, BE 7/04~~
	~~CD 366 Revision 0~~	~~Design criteria for collision protection beams~~	~~Replaces BD 65/14~~
	~~CD 367 Revision 0~~	~~Treatment of existing structures on highways widening schemes~~	~~Replaces BD 95/07~~
	~~CD 368 Revision 0~~	~~Design of fibre reinforced polymer bridges and highway structures~~	~~Replaces BD 90/05~~
	~~CD 369 Revision 0~~	~~Surface protection for concrete highway structures~~	~~Replaces BA 85/04~~
	~~CD 371 Revision 0~~	~~Strengthening highway structures using fibre reinforced polymers and externally bonded steel plates~~	~~Replaces BD 85/08, BD 84/02~~
	~~CD 372 Revision 0~~	~~Design of post-installed anchors and reinforcing bar connections in concrete~~	~~Supersedes IAN 104/15~~
	~~CD 373 Revision 0~~	~~Impregnation of reinforced and prestressed concrete highway structures using hydrophobic pore-lining impregnants~~	~~Supersedes BD 43/03~~
	~~CD 374 Revision 0~~	~~The use of recycled aggregates in structural concrete~~	~~Supersedes BA 92/07~~
	~~CD 375 Revision 1~~	~~Design of corrugated steel buried structures~~	~~Supersedes BD 12/01~~
	~~CD 376 Revision 0~~	~~Unreinforced masonry arch bridges~~	~~Replaces BD 91/04~~
✓	CD 377 Revision 4	Requirements for road restraint systems	Supersedes TD 19/06
	~~CD 622 Revision 1~~	~~Managing geotechnical risk~~	~~Replaces HD 22/08, BD 10/97 and HA 120/08~~
	~~CS 461 Revision 0~~	~~Assessment and upgrading of in-service parapets~~	~~Supersedes BA 37/92 and IAN 97/07~~
	~~CS 462 Revision 0~~	~~Repair and management of deteriorated concrete highway structures~~	~~Supersedes BA 35/90 and BA 52/94~~
	~~GD 304 Revision 2~~	~~Designing health and safety into maintenance~~	~~Replaces IAN 69/15~~
	~~LA 104 Revision 1~~	~~Environmental assessment and monitoring~~	~~Supersedes HA 205/08, HD 48/08, IAN 125/15, and IAN 133/10~~
	~~LA 106 Revision 1~~	~~Cultural heritage assessment~~	~~Supersedes HA 208/07, HA 60/92, HA 75/01~~
	~~LA 110 Revision 0~~	~~Material assets and waste~~	~~Supersedes IAN 153/11~~
	~~LA 113 Revision 1~~	~~Road drainage and the water environment~~	~~Supersedes HD 45/09~~

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The Design Manual for Roads and Bridges (DMRB)			
Used	**DMRB reference**	**Title**	**Notes**
	~~LD 119 Revision 0~~	~~Roadside environmental mitigation and enhancement~~	~~Formerly LA 119, which superseded HA 65/94 and HA 66/95~~
	Interim Advice Notes		
	IAN reference	**Title**	**Notes**
✓	IAN 105/08	Implementation of construction (design and management) 2007 and the withdrawal of SD 10 and SD 11	

Miscellaneous			
Used	**Standard reference**	**Title**	**Notes**
	~~CIRIA C543~~	~~Bridge Detailing Guide~~	
✓	CIRIA C686	Safe Access for Maintenance and Repair	
	~~CIRIA C760~~	~~Guidance on embedded retaining wall design~~	
	~~CIRIA C766~~	~~Control of cracking caused by restrained deformation in concrete~~	~~Supersedes C660~~
	~~CIRIA C777~~	~~General fixings – guidance on selection and whole life management~~	

Additional Standards **Additional standards needed for a particular design should be listed here.**		
Reference	**Title**	**Notes**

APPENDIX B

DRAWINGS

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APPENDIX C

ADDITIONAL INFORMATION