Queensberry DESIGN LIMITED

Civil, Structural, Architectural & Geotechnical Consultants

APPROVAL IN PRINCIPLE

Highway Retaining Walls Over Watercourse

Keresforth Road, Barnsley

Keepmoat Homes

QD0010

2nd December 2024

Issue Sheet

Prepared By	Darren Rogers Structural Engineering Director
Reviewed By	Darren Phillipson Senior Structural Associate
Issue **02.12.24**	- – Initial Issue
20.12.24	A – Updated following Comments from BMBC Structures Team
23.01.25	B – Updated following Comments from BMBC Structures Team
24.01.25	C – Updated following Comments from BMBC Structures Team
28.01.25	D – Updated following Comments from BMBC Structures Team
29.01.25	E – Updated following Comments from BMBC Structures Team

Design Brief

This Approval in Principle records the criteria for the detailed design of a proposed retaining wall to support a proposed single carriageway connecting a new housing development off Keresforth Road, Barnsley. The structure also crosses an existing watercourse. Retaining walls are required each side of the carriageway in order to lift levels and provide access across the watercourse.

1.0 Highway Details

1.1 Type of Highway

The highway consist of a single 6m carriageway with a 2m footpath on each side.

Grid Ref (E, N): - 432419, 405252

1.2 Permitted traffic speed

Proposed new road - 20mph

1.3 Existing restriction

None

2.0 Site Details

2.1 Obstacles crossed

Existing watercourse, with part culverted.

3.0 Proposed Structure

3.1 Description of the structure and design working life

There are 2 No. highway retaining walls positioned either side of the proposed highway. The northern highway wall has a length of 23.5m, the southern highway retaining wall has a length of 27.5m. The walls have been designed as a reinforced concrete cantilever retaining wall. The concrete base is laid on a blinding layer on to the natural ground. The existing ground conditions at this time is unconfirmed however, ground investigation works to the adjacent site note that sandstone is expected at a shallow depth. The retained height of the wall varies up to 4.5m retained height. As the wall is crossing an existing watercourse, this watercourse will be culverted through the proposed wall.

In line with CD350 table 7.1. The design life of the wall is to be a minimum of 120 years.

3.2 Structure type

Insitu reinforced concrete cantilever retaining wall.

3.3 Foundation type

Reinforced concrete spread foundation onto existing ground.

3.4 Span arrangements

The height of the wall varies from 1.8m to 4.7m.

3.5 Articulation arrangements

There is no requirement for bearings of mechanical articulation. Movement joints will be present in the external cladding, reinforced stem and the reinforced concrete base to allow for horizontal movement of the materials. Refer to drawings for locations.

3.6 Classes and levels

3.6.1 Consequence class

All retaining walls should be Consequence Class CC2 in line with table 7.2 of CD 350/ BS EN 1990

3.6.2 Reliability Class

All retaining walls shall be Reliability Class RC2 in accordance with table 7.2 of CD 350.

3.6.3 Inspection Level

All retaining walls shall have an inspection level of IL2 in accordance with table 7.2 of CD 350.

3.7 Road restraint systems and requirements

The speed limit for the road adjacent to the structure is 20mph and therefore falls below the assessment criteria in CD377.

Assessment has been carried out using 'Provision of Road Restraint Systems on Local Authority Roads'. The scoring matrix has classified the site as a medium priority meaning a non-RRS approach to reducing risk may prove sufficient, given the scoring and risk category the design proposes to include containment kerbing for the unlikely event of a vehicle exiting the carriageway.

3.8 Proposals for Water Management

The pavements are to have a cross fall to discharge into the channel and then into road gullies, to be then discharged into the main drainage network for the development.

All buried surfaces accessible after casting upto 150mm of the top of the wall shall be coated with two coats of bituminous paint in accordance with Series 2000 of MCHW.

Back of wall vertical drainage shall comprise of a geo-composite drainage and protective layer, feeding into a perforated drainage pipe just above the foundation and discharging to an agreed location, to be determined at detailed design stage.

3.9 Proposed arrangements for future maintenance and inspection

3.9.1 Traffic management

The low side of the retaining walls is accessible by following the soft landscaping down to the watercourse level. Should any higher level inspections be required using a negative reach MEWP, a temporary single lane closure will be required.

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

Access to the structure is via the carriageway with the high level aspects such as handrailing being inspected from the footpath. The low level is accessible via the soft landscaping down the watercourse level. Should closer inspection be required to the higher sections of the wall, this may be accessed via a MEWP from the carriageway. This will require a temporary lane closure as per 3.9.1.

3.10 Environment and sustainability

Prior to construction, a construction environment management plan (CEMP) will be produced in order to minimise the impact of the development on the highway network. The CEMP will contain:

- An ecological mitigation strategy to identify measures to mitigate the impact on recognised ecological assets.
- A strategy for prevention of pollution during construction including with how site will deal with any spillages, contaminated soils, oil storage. It will contain measures for highlighting pollution prevention and awareness to the workforce.
- A strategy for controlling noise, vibration, lighting and egress of mud and dust in and around the site.
- Methods so the structure will be constructed with a minimum of waste and maximum re-use of on-site materials and using materials that can be recycled. Any materials must meet the requirements of the National Highways' Specification (MCHW).

3.11 Durability – Materials and Finishes

3.11.1 Materials

In-situ Structural Concrete
Minimum C35-45 strength class concrete conforming to BS 8500-1:2023 and BS EN 206-1:2013 + A1: 2016

Blinding
ST2 concrete conforming to BS 8500-1:2023 and BS EN 206-1:2013 + A1: 2016

Steel Reinforcement
Grade B500B conforming to BS 4449:2005

Structural Backfill
Class 6N in accordance with Table 6/1 Specification of Highway Works and Appendix 6/1.

Waterproofing
Buried concrete surfaces accessible after casting to be coated with two coats of bituminous paint in accordance with Series 2000 of MCHW.

Brickwork
Brickwork to be in accordance with Specification for highway works series 2400, table 24/4 – Class B Engineering brick, Water absorption< 7%, Freeze/ thaw level F2, Soluble salts S2.

3.11.2 Durability

All exposure class designations shall be in accordance with BS 8500-1: 2023 and BS EN 206-1:2013, the exposure class designations conservatively ignore any surface protection provided.

Concrete Surface	XC	XD	XF	Comments
Buried concrete less than 1m below carriageway level	XC3/4 (1)	XD3 (2)	XF2 (3)	(1) Reinforced and prestressed concrete surfaces exposed to alternate wetting and drying. (2) Buried highway structures less than 1 m below carriageway level. (3) Vertical and non-vertical concrete surfaces exposed to moderate saturation, freezing and de-icing salts
Exposed concrete horizontal and vertical surfaces	XC3/4 (1)	XD3 (2)	XF2 (3)	1) External reinforced concrete surfaces sheltered from, or exposed to, direct rain. (2) Reinforced concrete walls and structure supports within 10 m of a carriageway. (3) Vertical and non-vertical concrete surfaces exposed to rain, freezing and de-icing salts

3.11.3 Concrete Finishes

Class	Comments
F1	Finish to all buried formed surfaces
F2	Finish to all exposed formed surfaces
U1	Finish to all buried unformed surfaces
U3	Finish to all exposed unformed surfaces

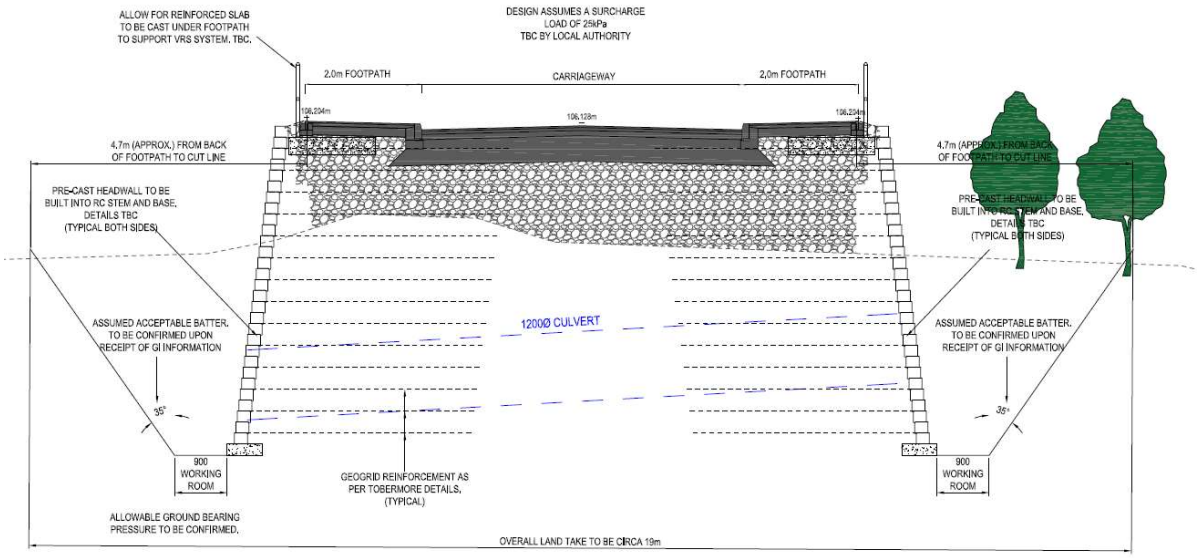
3.12 Risks and hazards considered for design, execution, maintenance and demolition. Consultation with and/or agreement from Overseeing Organisation

The Principal Designer will review the hazards and associated risks documented within the Designers Risk Assessment contained within the pre-construction H & S file as documented on the relevant drawings as per CDM 2015. Refer to Designers Risk Assessment in Appendix C for details. Note that this document may be updated as the detailed design and discussions with contractors progresses.

3.13 Estimated cost of proposed structure together with other structural forms considered and the reasons for their rejection

The following two structural forms were considered for the preliminary design:

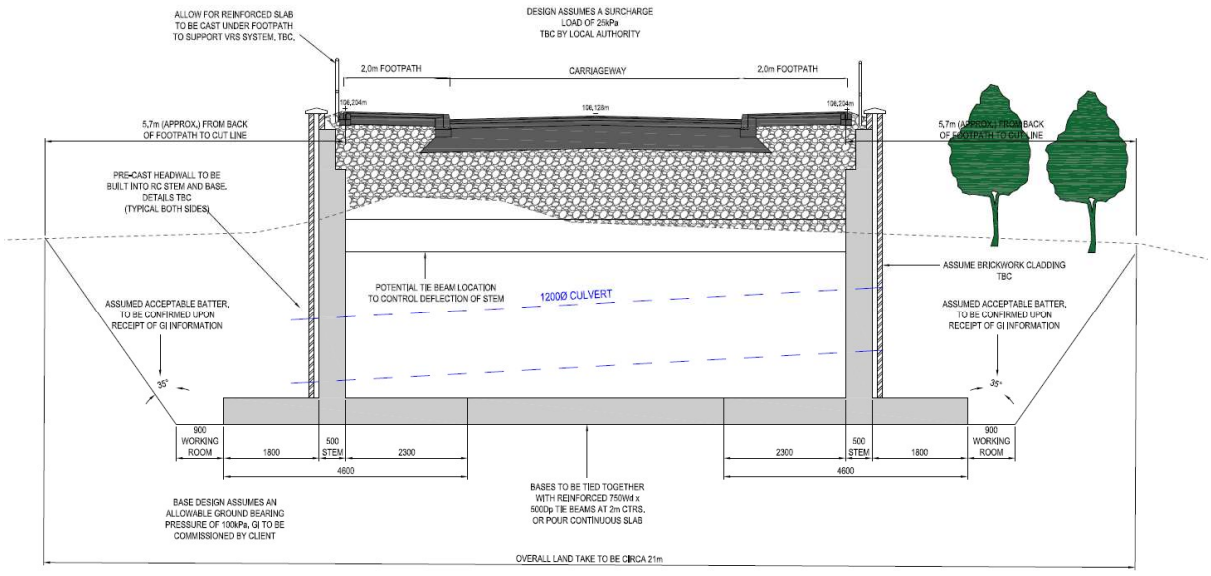
Option A – Tobermore Proprietary System



PROPOSED SECTION ASSUMING TOBERMORE SYSTEM

Advantages	Disadvantages
BBA and HAPAS Certified which enable a smooth AIP Process and 120 year design life	Site won material may not be suitable for backfill
Reduced labour and time installation	Extent of geogrid beneath the road structure will need coordinating with drainage and services.
System is generally 20-40% cost reduction	
Lower carbon footprint than RC Option	
Blocks are a finished product with good aesthetics	
Construction of the wall and backfill happen at the same time which offers a good approach in terms of health and safety and good access in terms of inspections throughout the AIP process.	
Reduced land take	

Option B – Insitu reinforced concrete cantilever wall



PROPOSED SECTION ASSUMING REINFORCED CONCRETE STEM

Advantages	Disadvantages
High durability and minimum maintenance requirements.	Requires a large amount of concrete which has a significant environmental impact
Can be installed with or without cladding	Depending on allowable bearing pressures may require large foundations
Aesthetically pleasing	Wet works adjacent to a running watercourse
Having a combined base with the culvert allows the structure to settle together and minimise issues between the precast elements and the insitu.	Increased land take due to projection from the wall
	Long build duration
	On site works are more likely to result in defects than off site manufacture options due to quality control.

Alternative structural forms were discussed early in the feasibility stage but were deemed not viable/ suitable for the scheme.

Option	Advantages	Disadvantages
Precast interlocking mass concrete retaining wall	**Doesn't require specialist plant or skill to construct.** Cost-effective compared to other solutions. **High durability and minimum maintenance due to lack of reinforcement**. Fast and efficient Installation with reduced need for onsite works	**The considerable Mass of the blocks can demand specialist lifting equipment and present H&S risk.** Large concrete blocks while functional, are utilitarian in appearance. **Have a significant environmental impact compared to other solutions due to demands for large volumes of concrete.** Requires temporary works and/or significant lateral space beyond final retained soil plane.
Sheet Pile / King Sheet Pile Wall	**Excavation behind the wall is not required, reducing lateral space needed and/or temporary works**. Individual sheet piles are lighter than RC options allowing for quick installation.	**Durability of sheet piles is less than that compared to an RC option – would require sacrificial layer or galvanising.** Buildability problems if obstructions are encountered.

	Sheet piles are readily recyclable and reusable.	**Installation creates disturbance through noise and vibration.** Appearance can be viewed as unappealing due to 'industrial' look, particularly in residential settings.
King Post Wall	**Spacing of posts can readily be changed to accommodate obstructions encountered in the ground.** Fast and efficient Installation with reduced need for onsite Works. **Less lateral space required compared to other solutions.**	**Steel/concrete posts protruding from the ground can appear very industrial/utilitarian.** Durability of steel king posts is less than that compared to an RC option, would require sacrificial layer or galvanising. **Specialist plant is required to pile foundations or drive posts into the ground.** Not economical for walls of 4m in height.

Following discussions with the Local authority it was deemed that an Insitu reinforced concrete retaining wall was the preferred option.

3.14 Proposed arrangements for construction

3.14.1 Construction of the Structure

The Principal Contractor is responsible for confirming the final construction sequence; however an indicative sequence has been outlined below. The indicative sequence will be considered during the detailed design stage where intermediate stages of construction of permanent works are required to be self-supporting with no additional structural elements other than permanent works. The design and installation of all temporary works required to facilitate the construction falls under the Principal contractors responsibility.

- Establish a safe working perimeter with the site compound to be located as per wider scheme, this is to provide a suitable protection perimeter around the watercourse
- Cut back existing slopes and establish a temporary slope.
- Form temporary diversion to the watercourse. This may be via secondary piped system or a pumped system. This will be reviewed at a later stage.
- Excavate to the structure formation level, preparing the founding surface, and cast foundations.
- Install the PC culvert
- Install the formwork for the insitu concrete walls and begin pouring concrete in lifts as set out/ agreed with temporary works designer.
- Complete wall construction and install back of wall drainage.
- Apply waterproofing to the structure with the necessary drainage surrounding.
- Backfill the structure with 6N material and compact earthworks as necessary.
- Construct new carriageway.

3.14.2 Traffic Management

N/A

3.14.3 Service Diversions

Further liaison with the statutory service providers during the detailed design phase is required in order to determine if that are any services which will need to be protected of diverted.

3.14.4 Interface with existing structures

The watercourse is currently culverted for a small section as per the below survey. This will be removed and replaced by the rectangular culvert as noted in the attached drawings.

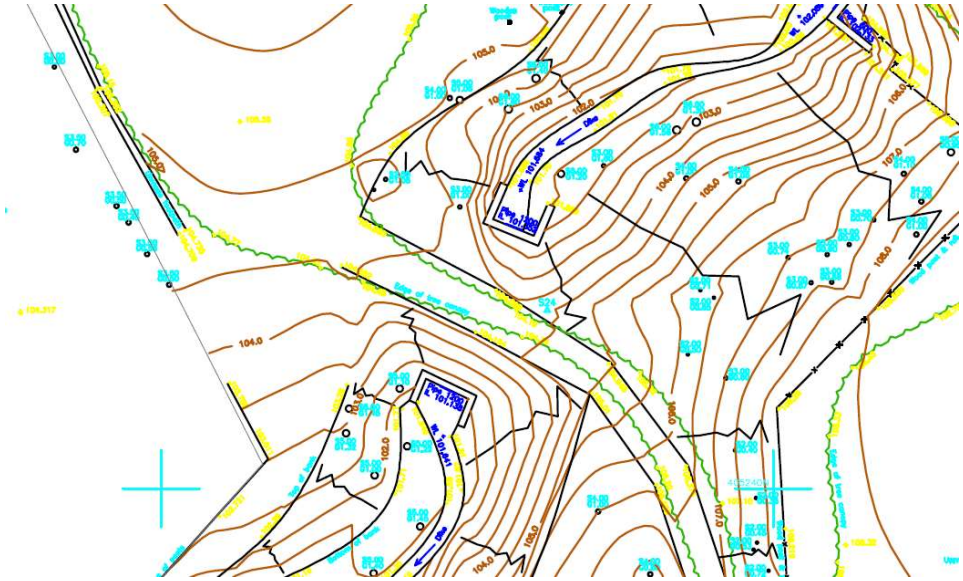


Figure 1 - Extract of topographical survey showing existing culvert position

3.15 RESILIENCE AND SECURITY

In situ reinforced concrete retaining walls are inherently resistant to accidental and deliberate damage. The masonry cladding to the front of the wall is also a robust material that does not suffer adverse affects to fire. The culvert will have a bespoke cover to prevent unauthorised access. The cover will be galvanised mild steel with a suitable paint coating in line with the MCHW Vol 1 Series 1800, including all fixings/ fittings.

4 DESIGN CRITERIA

The design is carried out in accordance with PD6694-1:2011 which follows the principles and requirements for the geotechnical design of the structure.

4.1 ACTIONS

4.1.1 PERMANENT ACTIONS

Material densities and load factors shall be in accordance with BS EN 1990 and BS EN 1991-1-1.
Selected values of material densities are as shown below:

Unhardened Normal Weight Reinforced Concrete	26 kN/m^3
Hardened Normal Weight Reinforced Concrete	25 kN/m^3
Structural Backfill (6N)	23 kN/m^3
Steel	78.5kN/m^3

4.1.2 SNOW, WIND AND THERMAL ACTIONS

Snow actions - snow loads may generally be ignored in the UK, see NA to BS EN 1990:2002+A1:2005 clause NA.2.3.3.3 and NA to BS EN 1991-1-3 clauses NA.4.1.1 and NA.4.1.2.

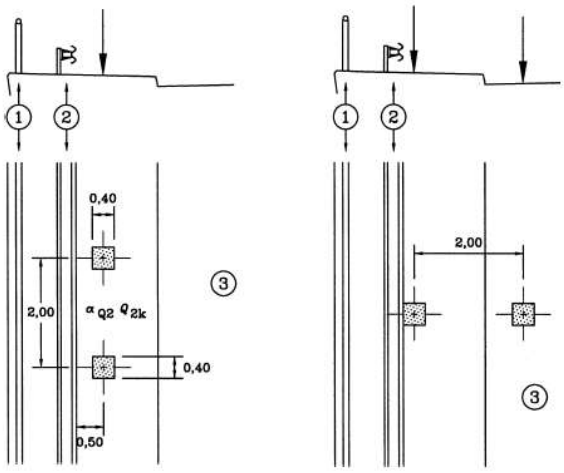
Wind actions - Wind actions will be applied in accordance with BS EN 1991-1-4:2005+A1:2010 and as modified by the corresponding UK National Annex.

Thermal actions - Thermal action will be applied in accordance with BS EN 1991-1-5:2003 and as modified by the corresponding UK National Annex. Early thermal cracking will be controlled in accordance with CIRIA Document C766 Early-age thermal crack control in concrete.

Combination of wind and thermal actions - The combination of wind and thermal actions may generally be ignored in the UK, see NA to BS EN 1990:2002+A1:2005 clause NA.2.3.3.4.

4.1.3 ACTIONS RELATING TO NORMAL TRAFFIC UNDER AW REGULATIONS

Wall has been designed allowing for the recommendations set out in PD6694-1:2011 following figure 3.



Key
(1) Pedestrian parapet (or vehicle parapet if a safety barrier is not provided)
(2) Safety barrier
(3) Carriageway

Figure 2 - Position of loading allowing for the containment kerbs

4.1.4 Actions relating to General Order traffic under STGO regulations

Assume that these do not apply as road serving a housing development only.

4.1.5 Footway or footbridge variable actions

To be calculated in accordance with PD6694-1:2011.

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

Assume that these do not apply as road serving a housing development only.

4.1.7 Accidental actions

Accidental actions on the retaining walls shall be considered in accordance with BS EN 1991-2:2003 Clause 4.7.3.4 modified by NA to BS EN 1991-2:2003 Clause NA.2.31.

4.1.8 Action during construction

Actions during construction will be calculated in accordance with BS EN 1991-1-6:2005 as modified by the UK NA to BS EN 1991-1-6. The actions during execution will consider all stages during the construction sequence.

4.1.9 Any special action not covered above

Allowance made for a service vehicle in accordance section 5.3.2.3 with BS EN 1991- and UK National Annex.

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

None

4.3 Proposed minimum headroom to be provided

Not applicable.

4.4 Authorities consulted and any special conditions required

Barnsley Metropolitan Borough Council

4.5 Standards and documents listed in the Technical Approval Schedule (TAS)

4.5.1 List of relevant documents from the TAS

Refer to Appendix A.

4.5.2 Additional relevant standards

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

Not applicable

4.8 Proposed safety critical fixings

None

5 STRUCTURAL ANALYSIS

5.1 METHODS OF ANALYSIS PROPOSED FOR SUPERSTRUCTURE, SUBSTRUCTURE AND FOUNDATIONS

The design of the wall is in line with the recommendations set out in PD6694-1:2011, these refer back to the requirements set out in BS-EN 1997-1.

The retaining wall components shall be designed in accordance with BS EN 1997-1 Geotechnical Design, General Rules.

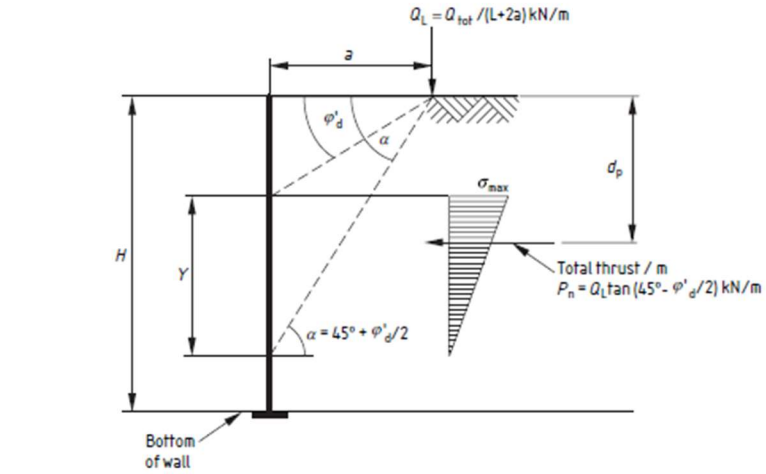
The wall shall be analysed based on a metre strip method for Design Approach 1, Combinations 1 & 2 in accordance with BS EN 1997-1.
Each element shall be designed for the worst combination of loads with those stated in Section 4.1.

Ultimate limit state checks shall include, but are not limited to:

- Bearing capacity failure
- Overturning
- Sliding
- Global Instability

5.2 DESCRIPTION AND DIAGRAM OF IDEALISED STRUCTURE TO BE USED FOR ANALYSIS

The loading has been calculated by using Figure 3 in PD6694-1:2011



b)

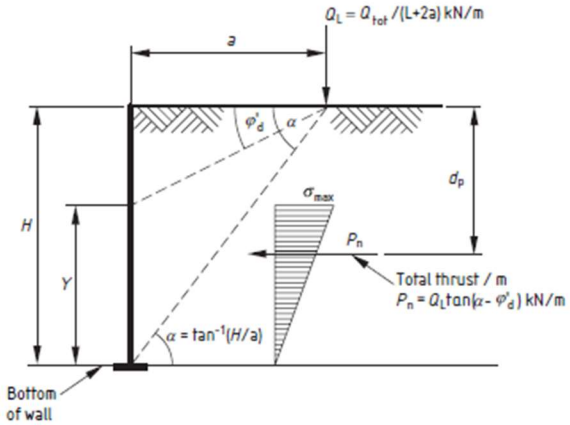


Figure 3 - Analysis method (P6694)

As part of the design, a precast culvert is proposed to pass through the wall stem. In order to accommodate this, a deep beam section will be added to the wall stem.
The final design will allow for the over dig to the lower side of the wall.

5.3 ASSUMPTIONS INTENDED FOR CALCULATION OF STRUCTURAL ELEMENT STIFFNESS

For the ultimate limit state analysis, gross uncracked section properties shall be used for all concrete elements of the structure. It is assumed that the soil is a linear isotropic material.

5.4 PROPOSED RANGE OF SOIL PARAMETERS TO BE USED IN THE DESIGN OF EARTH RETAINING ELEMENTS

Backfill behind the retaining wall will comprise selected granular material (Class 6N in accordance with the Specification for Highways Works). The specified angle of internal friction for the backfill material is set to be a minimum of 35º, Youngs modulus 38Mpa. This will

provide at rest lateral earth pressure coefficient (Ko) – 0.426, Active lateral earth pressure (Ka) 0.227 and passive lateral earth pressure (Kp) 6.680.

6 GEOTECHNICAL CONDITIONS

6.1 Acceptance of recommendations of the Ground Investigation Report to be used in the design and reasons for any proposed changes

The Ground Investigation Report (GIR) is not yet available for these structures.

6.2 Summary of design for highway structure in the Ground Investigation Report

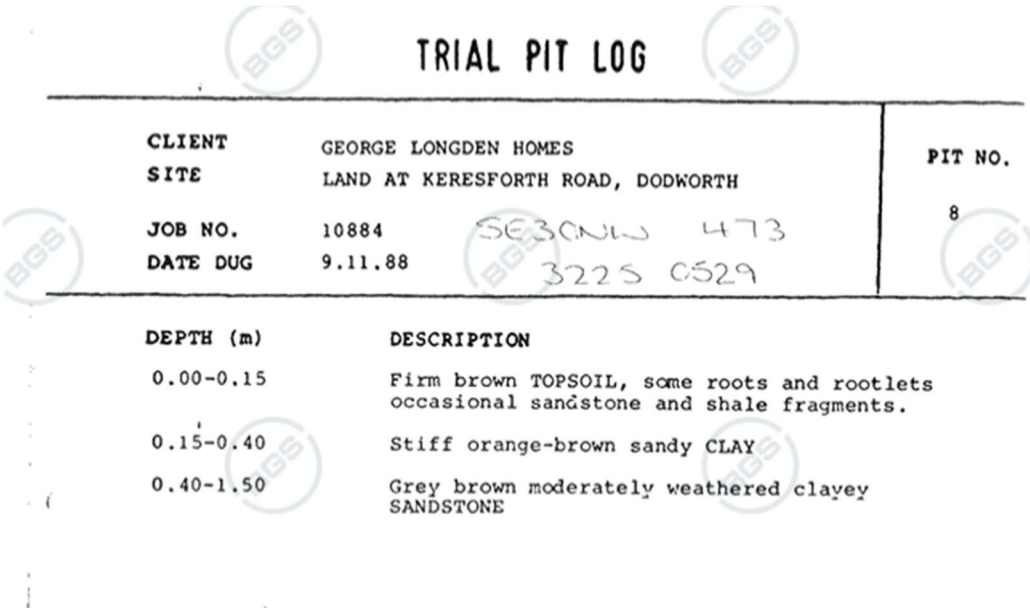
Refer to Section 6.1.

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

Differential settlement within each length of retaining wall is anticipated to be negligible (less than 25mm) as the loads in adjacent positions along each wall, and the ground conditions beneath each wall, are anticipated to be very similar.
Flexible construction joints are to be included between lengths of retaining wall with significant differences in retained height in the event that differential settlement does 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

A ground investigation report is expected to be commissioned in the first quarter of 2025. The BGS website has borehole information available to the site to the West. These boreholes that sandstone rockhead is potentially very shallow across the site. Based on this an allowable ground bearing pressure of 200 kPa has been assumed. See below extract which is taken from a trial pit to the East of the site to the West.

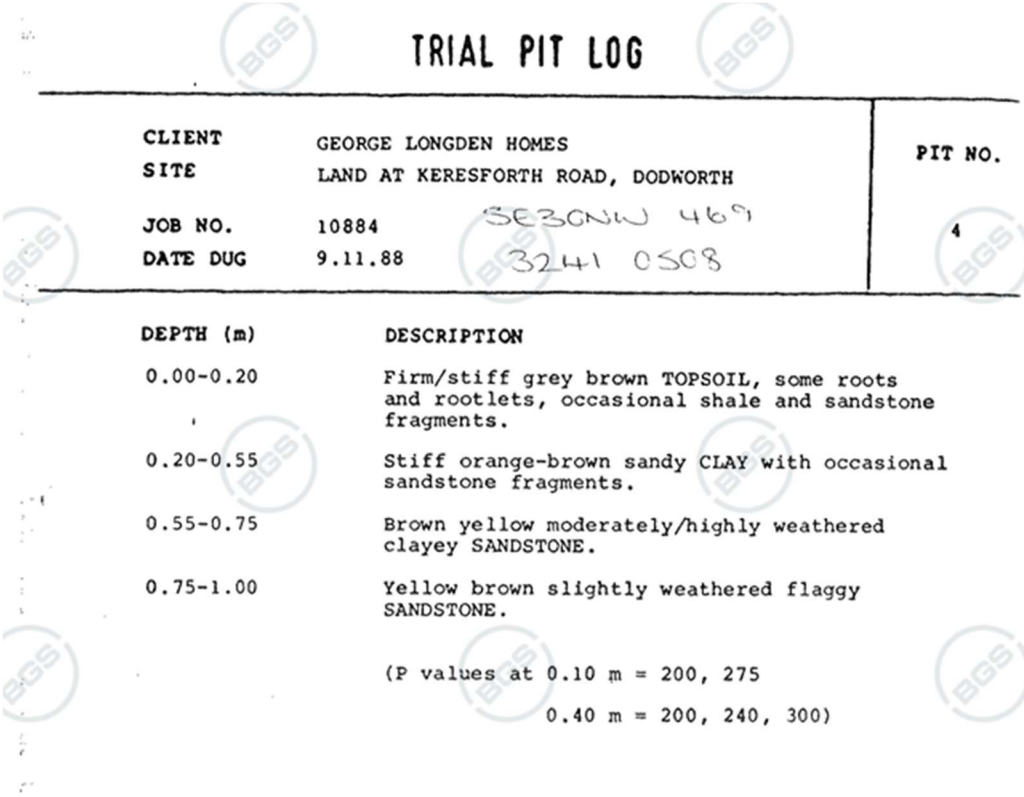


TRIAL PIT LOG

CLIENT	GEORGE LONGDEN HOMES	PIT NO.
SITE	LAND AT KERESFORTH ROAD, DODWORTH	
JOB NO.	10884 SE30NW 473	8
DATE DUG	9.11.88 3225 0529	

DEPTH (m)	DESCRIPTION
0.00-0.15	Firm brown TOPSOIL, some roots and rootlets occasional sandstone and shale fragments.
0.15-0.40	Stiff orange-brown sandy CLAY
0.40-1.50	Grey brown moderately weathered clayey SANDSTONE

Figure 4 - Extract from www.bgs.ac.uk



TRIAL PIT LOG

CLIENT	GEORGE LONGDEN HOMES	PIT NO.
SITE	LAND AT KERESFORTH ROAD, DODWORTH	
JOB NO.	10884 SE30NW 469	4
DATE DUG	9.11.88 32141 0508	

DEPTH (m)	DESCRIPTION
0.00-0.20	Firm/stiff grey brown TOPSOIL, some roots and rootlets, occasional shale and sandstone fragments.
0.20-0.55	Stiff orange-brown sandy CLAY with occasional sandstone fragments.
0.55-0.75	Brown yellow moderately/highly weathered clayey SANDSTONE.
0.75-1.00	Yellow brown slightly weathered flaggy SANDSTONE.
	(P values at 0.10 m = 200, 275 0.40 m = 200, 240, 300)

Figure 5 - Extract from www.bgs.ac.uk

The ground conditions are fundamental to ensuring a safe retaining wall structure, particularly due to the potential high loading from the carriageway over. The calculations prepared and appended to this document allow for an allowable bearing pressure of 200 kPa, Sandstone will often have an allowable ground bearing pressure of over 250kPa.

The table below notes typical characteristic geotechnical parameters for the anticipated ground conditions for the site. These will be confirmed upon completion of the ground investigation report with the design being updated accordingly.

Stratum	γ (kN/m³)	Cu (kPa)	Φ' (°)	C' (kPa)
Made Ground	**20**	**50**	**26**	**0**
Firm Clay	**20**	**60**	**27**	**0**
Sandstone	**20**	**200+**	**40**	**0**
Class 6N (fill)	**20**	**-**	**35**	**0**

All of the above is to be confirmed upon completion of the ground investigation report.

7 CHECK

7.1 PROPOSED CATEGORY AND DESIGN SUPERVISION LEVEL

The proposed category for the retaining walls is Category 1 following CG 300. According to Table 7.2 of CD 350 and BS EN 1990 Table B4, this category corresponds to a Design Supervision Level DSL2, which involves checking by different persons than those originally responsible and in accordance with the procedures of the organisation.

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 design and installation of all temporary works to facilitate the construction will be the responsibility of the Principal Contractor. The Designer of the permanent works shall be consulted for effects on the permanent works.

8 DRAWINGS AND DOCUMENTS

8.1 LIST OF DRAWINGS (INCLUDING NUMBERS) AND DOCUMENTS ACCOMPANYING THE SUBMISSION

SEE APPENDIX A FOR TECHNICAL APPROVAL SCHEDULE (TAS)

SEE APPENDIX B FOR AIP DRAWINGS

0010-QD-XX-S-DR-S-41-60 – REV A, HIGHWAY RETAINING WALL FOUNDATION PLAN

0010-QD-XX-S-DR-S-41-61 – REV A, HIGHWAY RETAINING WALL ELEVATIONS AND SECTION

0010-QD-XX-S-DR-S-41-62 – REV A, HIGHWAY RETAINING WALL SECTIONS AND DETAILS SHEET 1 OF 2

0010-QD-XX-S-DR-S-41-63 – REV A, HIGHWAY RETAINING WALL SECTIONS AND DETAILS SHEET 2 OF 2

SEE APPENDIX C FOR DESIGNERS RISK ASSESSMENTS

SEE APPENDIX D FOR STATUTAORY UNDERTAKERS PLANS

9 THE ABOVE IS SUBMITTED FOR ACCEPTANCE

Prepared by

Signed……	
Name……	Darren Rogers
Position……	Structural Engineering Director
Engineering Qualifications……	BSc (Hons), MSc
Name of Organisation……	Queensberry Design Limited
Date……..	23.01.25

Reviewed by

Signed……	
Name……	Mr D.J. Phillipson
Position……	Senior Structural Associate
Engineering Qualifications……	BEng, CEng, IStructE
Name of Organisation……	Queensberry Design Limited
Date……..	23.01.25

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

Signed……..

Name……

Position Held……..……

Engineering Qualifications……

TAA……..……...

Date…….

Appendix A – Technical Approval Schedule (TAS)

Schedule of Documents Relating to Design of Highway Bridges and Structures

Eurocodes and associated UK National Annexes				
Used	Reference	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.
✓	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	-	
✓	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	-	

Eurocodes and associated UK National Annexes				
Used	Reference	Title	Amendment / Corrigenda	Notes
	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	
	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	-	
	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	

Eurocodes and associated UK National Annexes				
Used	Reference	Title	Amendment / Corrigenda	Notes
	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	-	

Eurocodes and associated UK National Annexes				
Used	Reference	Title	Amendment / Corrigenda	Notes
	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	
	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	

Eurocodes and associated UK National Annexes				
Used	Reference	Title	Amendment / Corrigenda	Notes
	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	Corrigendum October 2015	
	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	
	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	
✓	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	-	

Eurocodes and associated UK National Annexes				
Used	Reference	Title	Amendment / Corrigenda	Notes
	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	
	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	
	BS EN 1999-1-3:2007 + A1:2011	Eurocode 9: Design of aluminium structures – Part 1-3 Structures susceptible to fatigue	+ A1:2011	
	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	
	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			
Used	Reference	Title	Notes
For guidance only unless clauses are otherwise specified in BD 100/16 Annex B.			
✓	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.
	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 Eurocodes			
Used	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	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*
	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.)*

Product Standards referenced in British Standards or Eurocodes			
Used	Reference	Title	Notes
	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	Hot rolled products of structural steels Part 4: Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels.	Supersedes BS EN 10025-4:2004
	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	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 10025-6:2004+A1:2009
	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

Product Standards referenced in British Standards or Eurocodes			
Used	Reference	Title	Notes
	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.

British Standards			
Used	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
✓	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 Contract Document for Highway Works (MCHW)			
Used	Reference	Title	Notes
✓	MCHW Volume 1: November 2021	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 November 2021*
	MCHW Volume 2: November 2021	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 November 2021*
	MCHW Volume 3: February 2017	Highway Construction Details	

The Design Manual for Roads and Bridges (DMRB)			
Used	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
	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

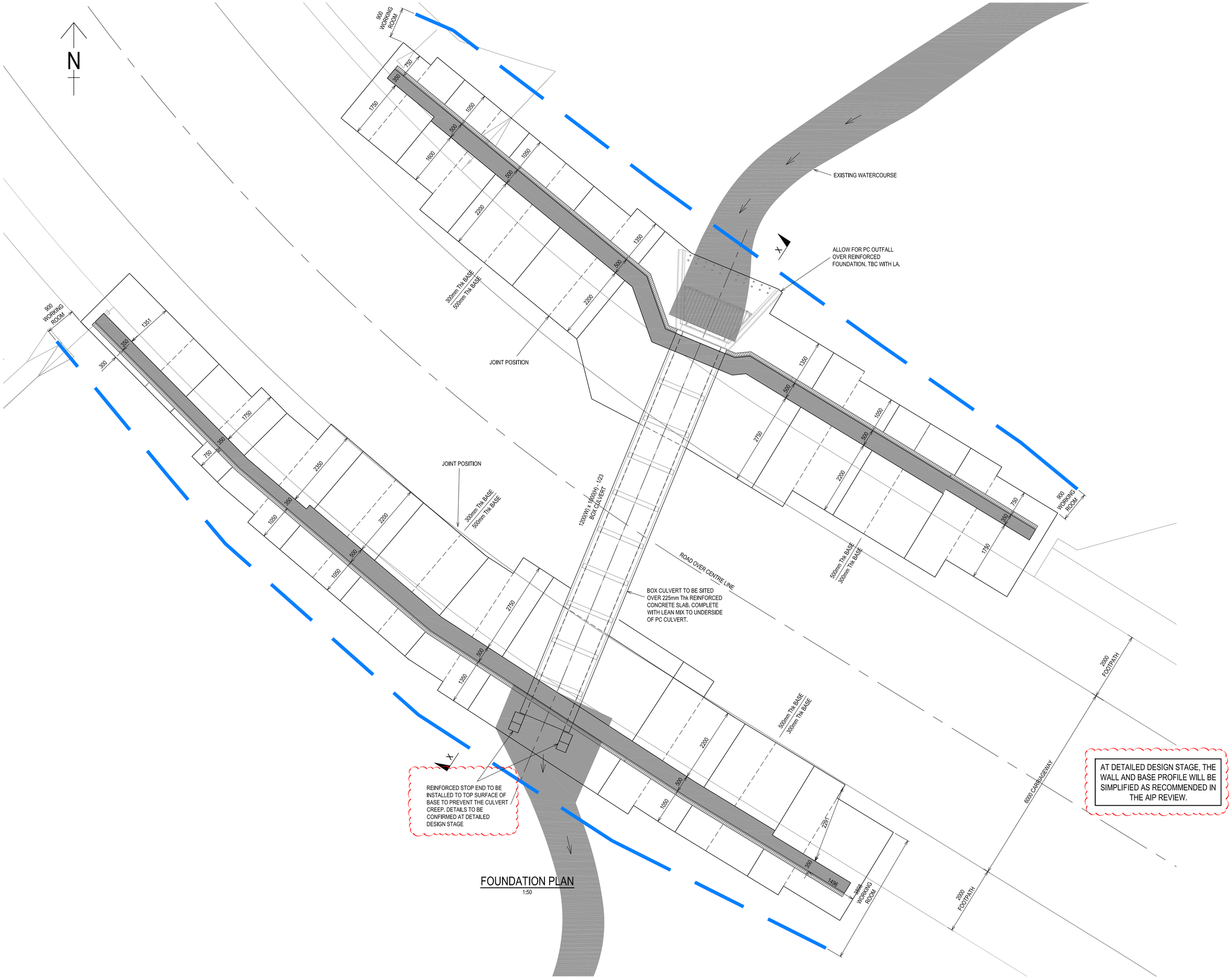
The Design Manual for Roads and Bridges (DMRB)			
Used	Reference	Title	Notes
	CD 360 Revision 2	Use of compressive membrane action in bridge decks	Supersedes BD 81/02
	CD 361 Revision 0	Weathering steel for highway structures	Supersedes BD 7/01
	CD 362 Revision 1	Enclosure of bridges	Replaces BD 67/96 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
	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

The Design Manual for Roads and Bridges (DMRB)			
Used	Reference	Title	Notes
	LA 106 Revision 1	Cultural heritage assessment	Supersedes HA 208/07, HA 60/92, HA 75/01

Interim Advice Notes		
Used	Reference	Title
	IAN 105/08	Implementation of construction (design and management) 2007 and the withdrawal of SD 10 and SD 11

Miscellaneous			
Used	Reference	Title	
✓	CIRIA C543	Bridge Detailing Guide	
✓	CIRIA C766	Control of cracking caused by restrained deformation in concrete	Supersedes C660
	CIRIA C686	Safe Access for Maintenance and Repair	
	CIRIA C760	Guidance on embedded retaining wall design	

Appendix B – AIP DRAWINGS



FOUNDATION PLAN
1:50

HEALTH AND SAFETY
1. CONTRACTOR SHOULD BE AWARE OF GENERAL CONSTRUCTION RISKS TO PREVENT SLIPS, TRIPS AND FALLS AND TAKE ANY NECESSARY PRECAUTIONS WITHOUT SPECIAL INSTRUCTION.

FOUNDATIONS
2. CONTRACTOR TO PROVIDE TRENCH SUPPORTS AS APPROPRIATE AND ENSURE THAT PLANT REMAINS A SAFE DISTANCE FROM TRENCHES PRIOR TO CONCRETING FOUNDATIONS. THE TIME THAT FOUNDATIONS ARE LEFT OPEN ON SITE SHOULD BE KEPT TO A MINIMUM.
3. THESE WORKS INVOLVE WORKING AROUND A LIVE WATERCOURSE. THE CONTRACTOR IS TO PROVIDE ALL NECESSARY RISK ASSESSMENTS AND ETHOD STATEMENTS IN ORDER TO ENSURE A SAFE WORKING E ENVIRONMENT THROUGH THE COURSE OF THESE WORKS.

PIPES/ CABLES/ SERVICES
4. SERVICE RECORDS FOR THE SITE ARE TO BE SOURCED PRIOR TO ANY WORKS COMMENCING. THESE SHOULD BE SOUGHT ALLOWING SUFFICIENT TIME TO DIGEST THE INFORMATION BEFORE BEGINNING WORKS ON SITE. ANY SERVICES LOCATED WITHIN THE WORK AREA ARE TO BE FOUND USING HAND DIG METHODS.

EXCAVATION/ FILL
5. CONTRACTOR TO ENSURE THAT SUITABLE PROTECTIVE MEASURES ARE TAKEN TO ENSURE PLANT AND PEOPLE ARE KEPT A SAFE DISTANCE FROM STEEP SLOPES AND EXCAVATIONS DURING THE WORKS.
6. CONTRACTOR TO ENSURE THAT PROCEDURES ARE IN PLACE TO KEEP PEOPLE AT A SAFE DISTANCE FROM ANY OPERATING PLANT WHERE NECESSARY.
7. THE CONTRACTOR SHOULD REFER TO THE GROUND INVESTIGATION REPORT FOR CONTAMINATION TESTS AND TO PROVIDE ADEQUATE FACILITIES AND PROTECTIVE CLOTHING AS REQUIRED.

GENERAL CONSTRUCTION NOTES
1. THE EXCAVATED FACE SHALL BE BATTERED TO A SAFE INCLINE OR TEMPORARILY PROPPED AND SHORED TO ENSURE THAT A SAFE WORKING SPACE IS MAINTAINED.
2. THE WALL BASE SHALL BE CAST ON A MINIMUM OF 50mm CONCRETE BLINDING (C10).
3. BACKFILL SHALL COMPRISE WELL GRADED, FREE DRAINING STONE (6N/6P)
4. RETAINING WALLS HAVE BEEN DESIGNED TO AN ALLOWABLE GROUND BEARING PRESSURE OF 200kPa. IT IS ASSUMED THAT THE SITE HAS SHALLOW SANDSTONE BEDROCK. THIS IS TO BE CONFIRMED UPON RECEIPT OF A SITE SPECIFIC GROUND INVESTIGATION REPORT.
5. THE CONTRACTOR/ CLIENT SHALL BRING THE THE ATTENTION OF THE ENGINEER ANY UNNATURAL OR UNSUITABLE GROUND CONDITIONS AS THESE WILL REQUIRE SPECIAL CONSIDERATION.
6. THE REINFORCED CONCRETE RETAINING WALL SHALL CONSIST OF RC35/45 CONCRETE AND BE FULLY VIBRATED.
7. THE BRICKWORK EXTERNAL CLADDING SHALL BE TIED TO THE STEM USING PROPRIETARY TIES AT THE CENTRES AS SHOWN ON THE SECTIONS AND DETAILS.
8. COVER TO THE REINFORCEMENT IS TO BE NOMINAL 45mm+10mm.
9. REINFORCING BARS LAP LENGTHS
   16mm Dia. 650mm
   10mm Dia. 400mm
10. REINFORCED CONCRETE WALL TO HAVE EXPANSION JOINTS AT MAXIMUM 12m CENTRES. REFER TO DRAWING 0010-QD-XX-S-DR-S-41-63 FOR EXPANSION JOINT DETAILS
11. WATERPROOFING DETAILS HAVE BEEN SHOWN TO THE REAR OF THE WALL. SHOULD THE CONTRACTOR WISH TO CHANGE TO A DIFFERENT SYSTEM THEY ARE TO MAKE SUGGESTIONS FOR COMMENTS.
12. 38mm Dia. WEEP HOLES ARE TO BE PLACED AT Max. 1.0m Ctrs.
13. BACK OF WALL DRAINAGE TO CONSIST OF 100mm PERFORATED LAND DRAIN OR WAVIN PIPE TO AN APPROPRIATE DISCHARGE POINT.

FOUNDATION NOTES
1. THE FORMATION LEVELS SHOWN ON THESE DRAWINGS ARE PROVISIONAL AND ARE SUBJECT TO APPROVAL OF THE LOCAL AUTHORITY AND THE ENGINEER.
2. ALL TOP SOIL AND EXISTING FILL SHALL BE REMOVED BELOW THE FOUNDATION AREA AND THE GENERAL FORMATION LEVEL BE APPROVED BY THE ENGINEER.
3. WHERE IT IS NECESSARY TO EXCAVATE BELOW THE PROVISIONAL FORMATION LEVELS TO REACH AN APPROVED STRATUM, AND ADDITIONAL EXCAVATIONS ARE TO BE BACKFILLED WITH SUITABLE FILL MATERIAL.
4. THE PERMISSIVLE DEVIATION IN LEVELS OF THE TOP OF THE BLINDING CONCRETE SHALL BE BETWEEN +0mm AND -25mm.
5. THE QUANTITY OF THE TEST CUBES CAST BY THE CONTRACTOR AND THE AGE AT WHICH THEY ARE TO BE TESTED WILL BE AS DIRECTED BY THE ENGINEER.
6. MESH REINFORCEMENT TO BE MEASURED AND ORDERED AS REQUIRED BY THE GENERAL CONTRACTOR.

MATERIAL SPECIFICATION
CONCRETE
a) COMPRESSIVE STRENGTH C35/45
b) EXPOSURE CLASS - XD3
c) COVER TO REINFORCEMENT, NOMINAL 45mm + 10mm U.N.O.
d) MAX W/C RATION 0.4
e) MIN CEMENT CONTENT 380kg/m³ (TBC) - DEPT ON GI.
f) CEMENT TYPE (TBC) - DEPT ON GI.
g) MASS CHLORIDE CONTENT - 0.4 (TBC) - DEPT ON GI.
h) MAXX AGG - 20mm
i) CONSISTENCE CLASS - S3
j) SURFACE SPECIFICATION FOUNDATION - U1
SOIL FACE OF WALL - F1
MASONRY FACE OF WALL - F2

MASONRY - SHW SERIES 2400 TABLE 24/2
a) SUPERSTRUCTURE BRICKWORK - >75N/mm²
b) MORTAR STRENGTH - M6 (ii)
c) FROST PROTECTION = F2
d) SOLUBLE SALTS = S2

FINAL REINFORCEMENT DRAWINGS TO BE COMPLETE UPON RECEIPT OF GROUND INVESTIGATION REPORT

THIS DRAWING IS SUBJECT TO THE APPROVAL OF ALL RELEVANT AUTHORITIES

Rev.	Date	Revision Details	Drawn	Checked
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QUEENSBERRY DESIGN
CIVIL, STRUCTURAL, ARCHITECTURAL & GEOTECHNICAL CONSULTANTS
NORTH EAST OFFICE
5, THE STAITHES, THE WATERMARK, GATESHEAD, TYNE AND WEAR NE11 9SN
T: 0191 460 9090
NORTH WEST & YORKSHIRE OFFICE
2A ST MARTINS LANE, YORK, YO1 6LN
01904 500662
www.queensberrydesign.co.uk

Client: KEEPMOAT

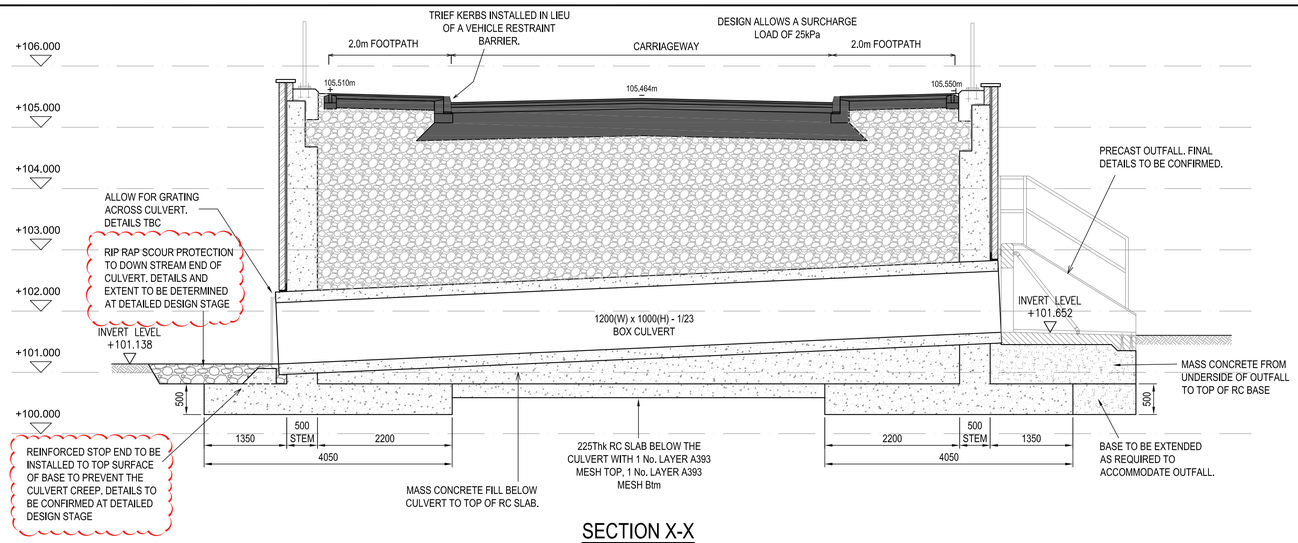
Project: KERESFORTH ROAD, BARNSLEY

Title: HIGHWAY RETAINING WALL FOUNDATION PLAN

Drawn	Checked	Date
DZ	DR	Nov' 24

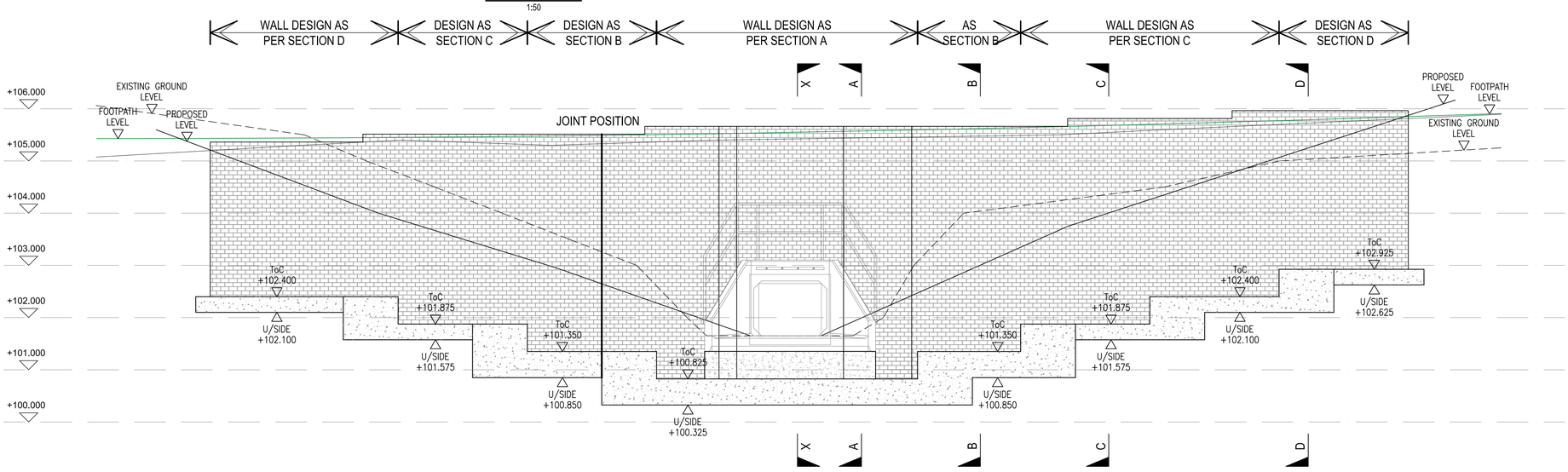
Drawing Number: 0010-QD-XX-S-DR-S-41-60

Drawing Status	Scale	Rev.
PRELIMINARY	1:50 @ A1	B



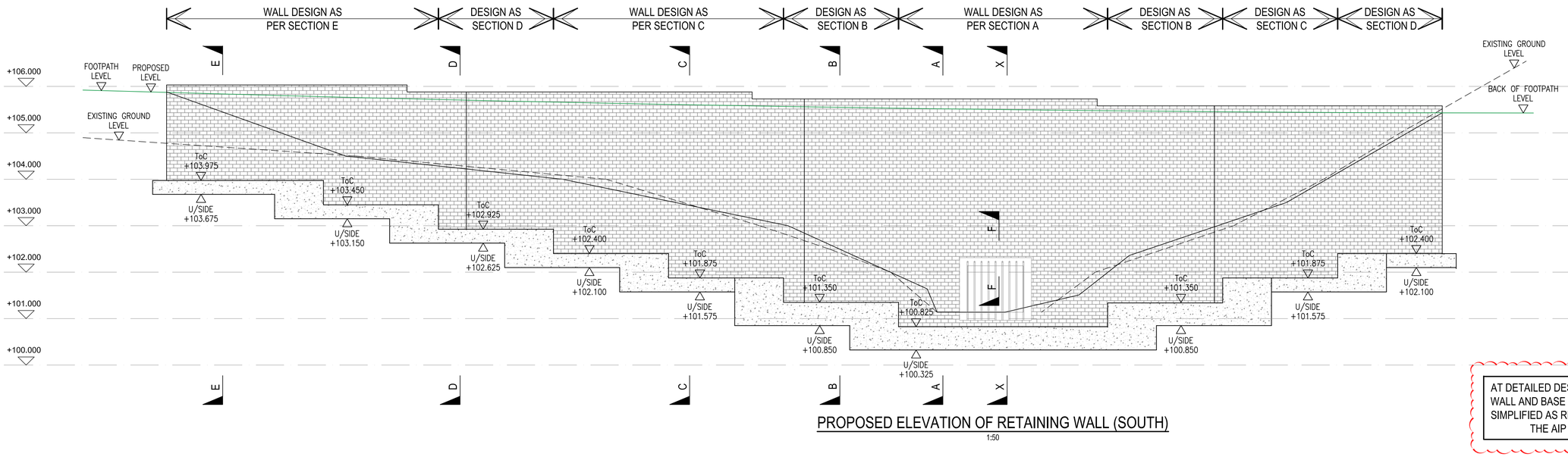
SECTION X-X

1:50



PROPOSED ELEVATION OF RETAINING WALL (NORTH)

1:50



PROPOSED ELEVATION OF RETAINING WALL (SOUTH)

1:50

AT DETAILED DESIGN STAGE, THE WALL AND BASE PROFILE WILL BE SIMPLIFIED AS RECOMMENDED IN THE AIP REVIEW.

Only PDF/ DWF Issues of this drawing are controlled. All other formats (eg. DWG AutoCAD FILES) are UN-controlled and are used at your own risk.

HEALTH AND SAFETY

1. CONTRACTOR SHOULD BE AWARE OF GENERAL CONSTRUCTION RISKS TO PREVENT SLIPS, TRIPS AND FALLS AND TAKE ANY NECESSARY PRECAUTIONS WITHOUT SPECIAL INSTRUCTION.

FOUNDATIONS

2. CONTRACTOR TO PROVIDE TRENCH SUPPORTS AS APPROPRIATE AND ENSURE THAT PLANT REMAINS A SAFE DISTANCE FROM TRENCHES PRIOR TO CONCRETING FOUNDATIONS. THE TIME THAT FOUNDATIONS ARE LEFT OPEN ON SITE SHOULD BE KEPT TO A MINIMUM.
3. THESE WORKS INVOLVE WORKING AROUND A LIVE WATERCOURSE. THE CONTRACTOR IS TO PROVIDE ALL NECESSARY RISK ASSESSMENTS AND ETHOD STATEMENTS IN ORDER TO ENSURE A SAFE WORKING E ENVIRONMENT THROUGH THE COURSE OF THESE WORKS.

PIPES/ CABLES/ SERVICES

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EXCAVATION/ FILL

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GENERAL CONSTRUCTION NOTES

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3. BACKFILL SHALL COMPRISE WELL GRADED, FREE DRAINING STONE (6N/6P)
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7. THE BRICKWORK EXTERNAL CLADDING SHALL BE TIED TO THE STEM USING PROPRIETARY TIES AT THE CENTRES AS SHOWN ON THE SECTIONS AND DETAILS.
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FOUNDATION NOTES

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6. MESH REINFORCEMENT TO BE MEASURED AND ORDERED AS REQUIRED BY THE GENERAL CONTRACTOR.

MATERIAL SPECIFICATION

CONCRETE

a) COMPRESSIVE STRENGTH C35/45
b) EXPOSURE CLASS - XD3
c) COVER TO REINFORCEMENT. NOMINAL 45mm + 10mm U.N.O.
d) MAX W/C RATION 0.4
e) MIN CEMENT CONTENT 380kg/m³ (TBC) - DEPT ON GI.
f) CEMENT TYPE (TBC) - DEPT ON GI.
g) MASS CHLORIDE CONTENT - 0.4 (TBC) - DEPT ON GI.
h) MAXX AGG - 20mm
i) CONSISTENCE CLASS - S3
j) SURFACE SPECIFICATION FOUNDATION - U1; SOIL FACE OF WALL - F1; MASONRY FACE OF WALL - F2

MASONRY - SHW SERIES 2400 TABLE 24/2

a) SUPERSTRUCTURE BRICKWORK - >75N/mm²
b) MORTAR STRENGTH - M6 (ii)
c) FROST PROTECTION = F2
d) SOLUBLE SALTS = S2

FINAL REINFORCEMENT DRAWINGS TO BE COMPLETE UPON RECEIPT OF GROUND INVESTIGATION REPORT

THIS DRAWING IS SUBJECT TO THE APPROVAL OF ALL RELEVANT AUTHORITIES

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QUEENSBERRY DESIGN
Civil, Structural, Architectural & Geotechnical Consultants
NORTH EAST OFFICE
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T: 0191 460 9090
NORTH WEST & YORKSHIRE OFFICE
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01904 500662
www.queensberrydesign.co.uk

Client: KEEPMOAT

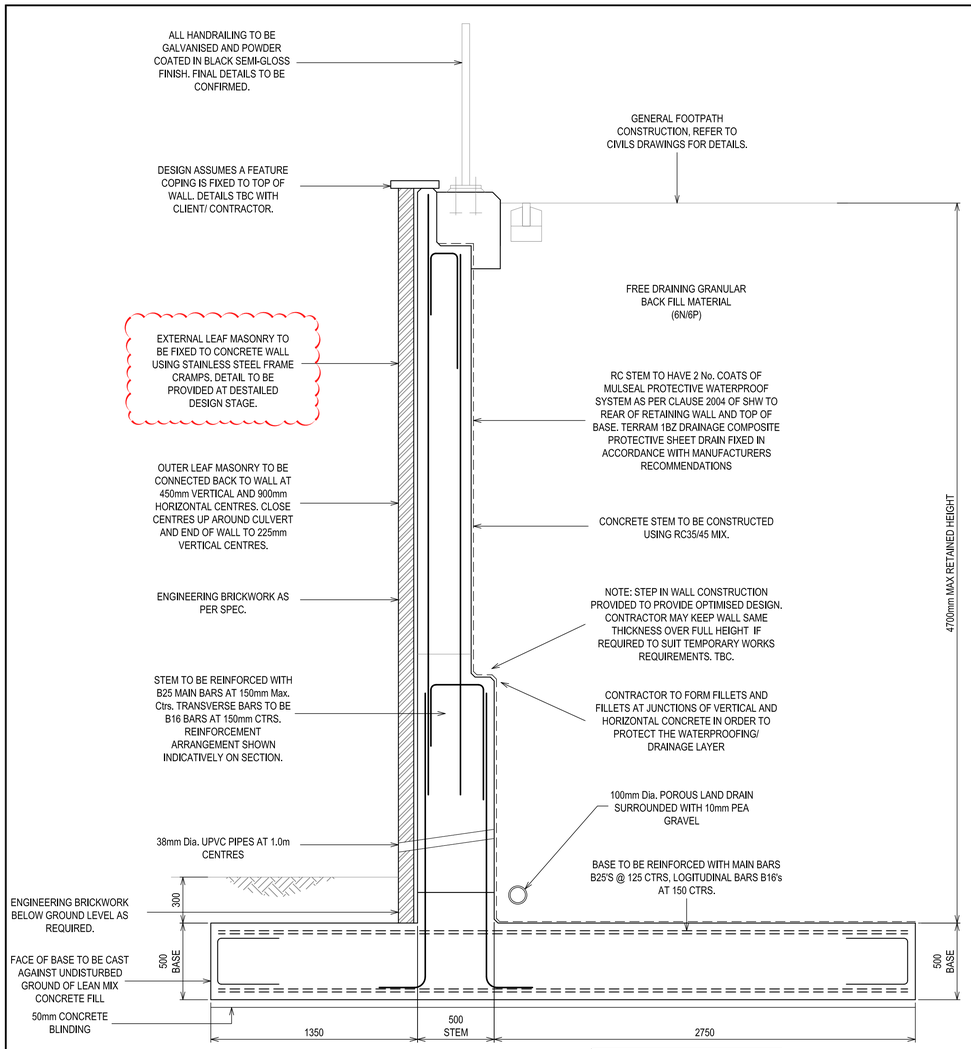
Project: KERESFORTH ROAD, BARNSLEY

Title: HIGHWAY RETAINING WALL ELEVATIONS & SECTION

Drawn	Checked	Date
DZ	DR	Nov' 24

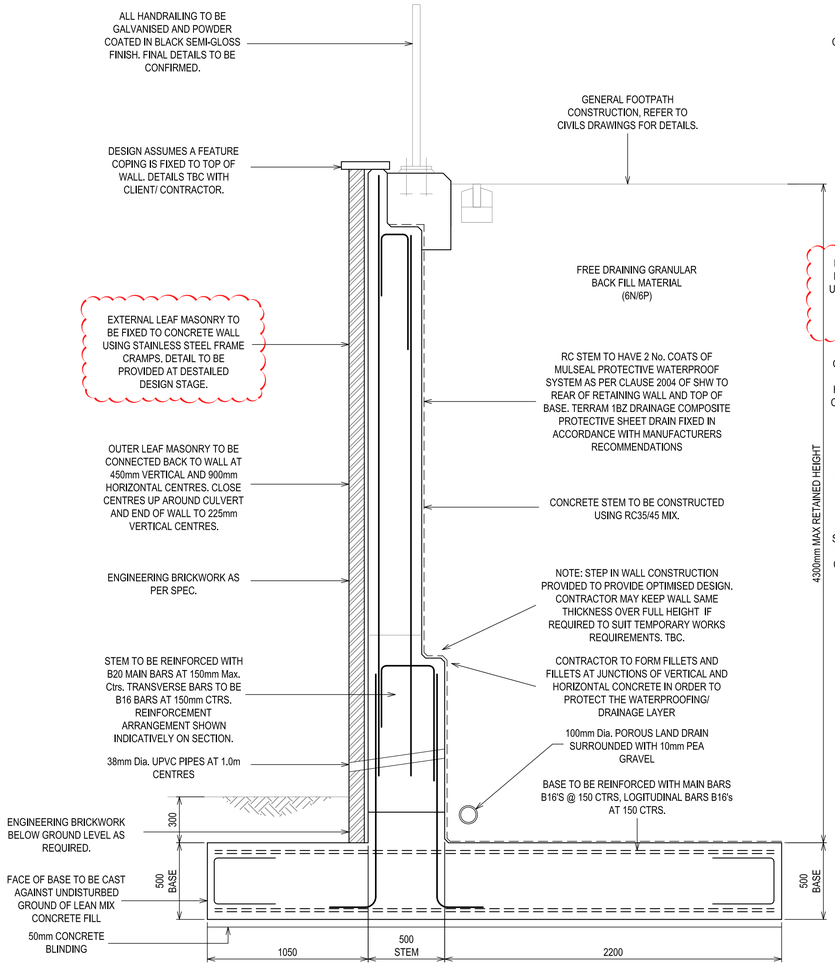
Drawing Number: 0010-QD-XX-S-DR-S-41-61

Drawing Status	Scale	Rev.
PRELIMINARY	1:50 @ A1	B



SECTION A - A
1:20

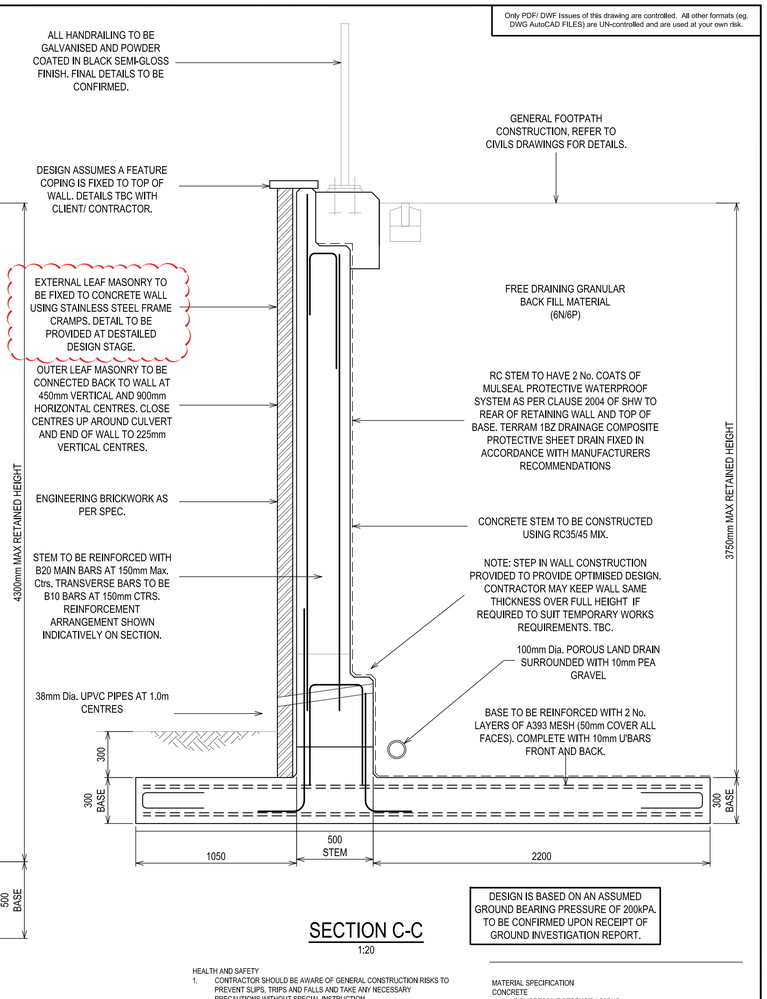
DESIGN IS BASED ON AN ASSUMED GROUND BEARING PRESSURE OF 200kPA, TO BE CONFIRMED UPON RECEIPT OF GROUND INVESTIGATION REPORT.



SECTION B-B
1:20

DESIGN IS BASED ON AN ASSUMED GROUND BEARING PRESSURE OF 200kPA, TO BE CONFIRMED UPON RECEIPT OF GROUND INVESTIGATION REPORT.

AT DETAILED DESIGN STAGE, THE WALL AND BASE PROFILE WILL BE SIMPLIFIED AS RECOMMENDED IN THE AIP REVIEW.



SECTION C-C
1:20

DESIGN IS BASED ON AN ASSUMED GROUND BEARING PRESSURE OF 200kPA, TO BE CONFIRMED UPON RECEIPT OF GROUND INVESTIGATION REPORT.

HEALTH AND SAFETY
1. CONTRACTOR SHOULD BE AWARE OF GENERAL CONSTRUCTION RISKS TO PREVENT SLIPS, TRIPS AND FALLS AND TAKE ANY NECESSARY PRECAUTIONS WITHOUT SPECIAL INSTRUCTION.

FOUNDATIONS
2. CONTRACTOR TO PROVIDE TRENCH SUPPORTS AS APPROPRIATE AND ENSURE THAT PLANT REMAINS A SAFE DISTANCE FROM TRENCHES PRIOR TO CONCRETING FOUNDATIONS. THE TIME THAT FOUNDATIONS ARE LEFT OPEN ON SITE SHOULD BE KEPT TO A MINIMUM.
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3. BACKFILL SHALL COMPRISE WELL GRADED, FREE DRAINING STONE (6N/6P)
4. RETAINING WALLS HAVE BEEN DESIGNED TO AN ALLOWABLE GROUND BEARING PRESSURE OF 200kPa. IT IS ASSUMED THAT THE SITE HAS SHALLOW SANDSTONE BEDROCK. THIS IS TO BE CONFIRMED UPON RECEIPT OF A SITE SPECIFIC GROUND INVESTIGATION REPORT.
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FOUNDATION NOTES
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6. MESH REINFORCEMENT TO BE MEASURED AND ORDERED AS REQUIRED BY THE GENERAL CONTRACTOR.

MATERIAL SPECIFICATION
CONCRETE
a) COMPRESSIVE STRENGTH C35/45
b) EXPOSURE CLASS - XD3
c) COVER TO REINFORCEMENT. NOMINAL 45mm + 10mm U.N.O.
d) MAX W/C RATION 0.4
e) MIN CEMENT CONTENT 380kg/m³ (TBC) - DEPT ON GI.
f) CEMENT TYPE (TBC) - DEPT ON GI.
g) MASS CHLORIDE CONTENT - 0.4 (TBC) - DEPT ON GI.
h) MAXX AGG - 20mm
i) CONSISTENCE CLASS - S3
j) SURFACE SPECIFICATION FOUNDATION - U1
   SOIL FACE OF WALL - F1
   MASONRY FACE OF WALL - F2

MASONRY - SHW SERIES 2400 TABLE 24/2
a) SUPERSTRUCTURE BRICKWORK - >75N/mm²
b) MORTAR STRENGTH - M6 (ii)
c) FROST PROTECTION = F2
d) SOLUBLE SALTS = S2

FINAL REINFORCEMENT DRAWINGS TO BE COMPLETE UPON RECEIPT OF GROUND INVESTIGATION REPORT

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www.queensberrydesign.co.uk

Client: KEEPMOAT

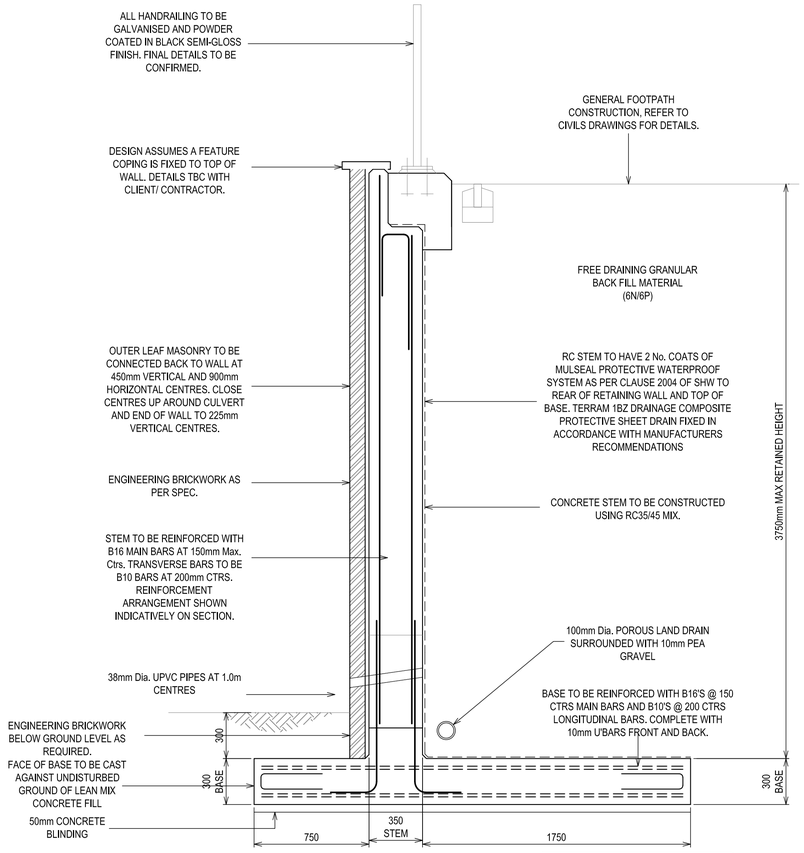
Project: KERESFORTH ROAD, BARNSLEY

Title: HIGHWAY RETAINING WALL SECTIONS & DETAILS SHEET 1 OF 2

Drawn	Checked	Date
DZ	DR	Nov' 24

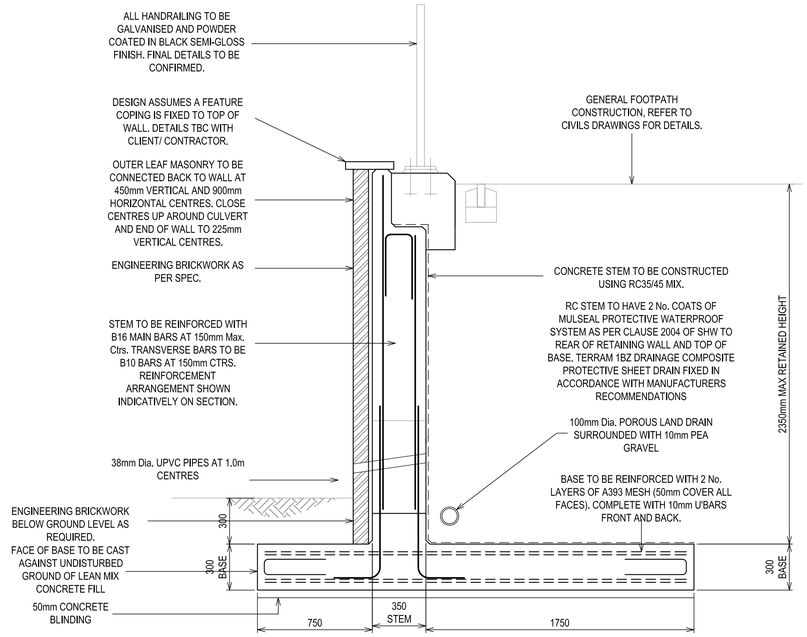
Drawing Number: 0010-QD-XX-S-DR-S-41-62

Drawing Status	Scale	Rev.
PRELIMINARY	1:50 @ A1	B



DESIGN IS BASED ON AN ASSUMED GROUND BEARING PRESSURE OF 200kPA. TO BE CONFIRMED UPON RECEIPT OF GROUND INVESTIGATION REPORT.

SECTION D-D
1:20



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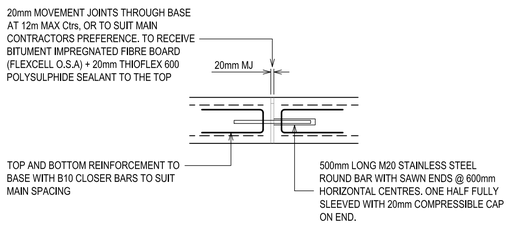
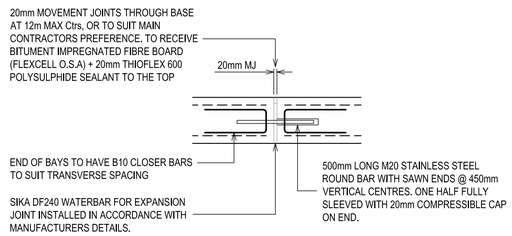
SECTION E-E
1:20

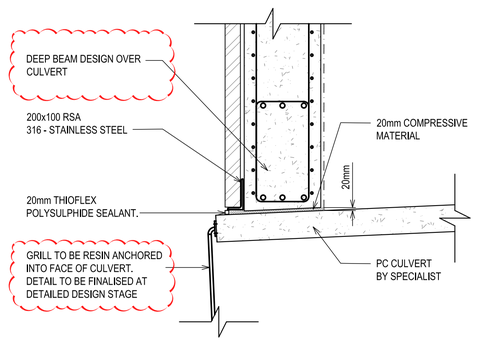


MOVEMENT JOINT DETAIL (BASE)
1:20



MOVEMENT JOINT DETAIL (STEM)
1:20

FINAL JOINTS TO BE POSITIONED ON GA'S AND SECTIONS AT DESIGN STAGE, ONCE WALL AND BASE PROFILE HAS BEEN SIMPLIFIED



SECTION F-F
1:20

AT DETAILED DESIGN STAGE, THE WALL AND BASE PROFILE WILL BE SIMPLIFIED AS RECOMMENDED IN THE AIP REVIEW.

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3. THESE WORKS INVOLVE WORKING AROUND A LIVE WATERCOURSE. THE CONTRACTOR IS TO PROVIDE ALL NECESSARY RISK ASSESSMENTS AND ETHOD STATEMENTS IN ORDER TO ENSURE A SAFE WORKING E ENVIRONMENT THROUGH THE COURSE OF THESE WORKS.

PIPES/ CABLES/ SERVICES
4. SERVICE RECORDS FOR THE SITE ARE TO BE SOURCED PRIOR TO ANY WORKS COMMENCING. THESE SHOULD BE SOUGHT ALLOWING SUFFICIENT TIME TO DIGEST THE INFORMATION BEFORE BEGINNING WORKS ON SITE. ANY SERVICES LOCATED WITHIN THE WORK AREA ARE TO BE FOUND USING HAND DIG METHODS.

EXCAVATION/ FILL
5. CONTRACTOR TO ENSURE THAT SUITABLE PROTECTIVE MEASURES ARE TAKEN TO ENSURE PLANT AND PEOPLE ARE KEPT A SAFE DISTANCE FROM STEEP SLOPES AND EXCAVATIONS DURING THE WORKS.
6. CONTRACTOR TO ENSURE THAT PROCEDURES ARE IN PLACE TO KEEP PEOPLE AT A SAFE DISTANCE FROM ANY OPERATING PLANT WHERE NECESSARY.
7. THE CONTRACTOR SHOULD REFER TO THE GROUND INVESTIGATION REPORT FOR CONTAMINATION TESTS AND TO PROVIDE ADEQUATE FACILITIES AND PROTECTIVE CLOTHING AS REQUIRED.

GENERAL CONSTRUCTION NOTES
1. THE EXCAVATED FACE SHALL BE BATTERED TO A SAFE INCLINE OR TEMPORARILY PROPPED AND SHORED TO ENSURE THAT A SAFE WORKING SPACE IS MAINTAINED.
2. THE WALL BASE SHALL BE CAST ON A MINIMUM OF 50mm CONCRETE BLINDING(C10).
3. BACKFILL SHALL COMPRISE WELL GRADED, FREE DRAINING STONE (6N/6P)
4. RETAINING WALLS HAVE BEEN DESIGNED TO AN ALLOWABLE GROUND BEARING PRESSURE OF 200kPa. IT IS ASSUMED THAT THE SITE HAS SHALLOW SANDSTONE BEDROCK. THIS IS TO BE CONFIRMED UPON RECEIPT OF A SITE SPECIFIC GROUND INVESTIGATION REPORT.
5. THE CONTRACTOR/ CLIENT SHALL BRING THE THE ATTENTION OF THE ENGINEER ANY UNNATURAL OR UNSUITABLE GROUND CONDITIONS AS THESE WILL REQUIRE SPECIAL CONSIDERATION.
6. THE REINFORCED CONCRETE RETAINING WALL SHALL CONSIST OF RC35/45 CONCRETE AND BE FULLY VIBRATED.
7. THE BRICKWORK EXTERNAL CLADDING SHALL BE TIED TO THE STEM USING PROPRIETARY TIES AT THE CENTRES AS SHOWN ON THE SECTIONS AND DETAILS.
8. COVER TO THE REINFORCEMENT IS TO BE NOMINAL 45mm+10mm.
9. REINFORCING BARS LAP LENGTHS
   16mm Dia. 650mm
   10mm Dia. 400mm
10. REINFORCED CONCRETE WALL TO HAVE EXPANSION JOINTS AT MAXIMUM 12m CENTRES. REFER TO DRAWING 0010-QD-XX-S-DR-S-41-63 FOR EXPANSION JOINT DETAILS
11. WATERPROOFING DETAILS HAVE BEEN SHOWN TO THE REAR OF THE WALL. SHOULD THE CONTRACTOR WISH TO CHANGE TO A DIFFERENT SYSTEM THEY ARE TO MAKE SUGGESTIONS FOR COMMENTS.
12. 38mm Dia. WEEP HOLES ARE TO BE PLACED AT Max. 1.0m Ctrs.
13. BACK OF WALL DRAINAGE TO CONSIST OF 100mm PERFORATED LAND DRAIN OR WAVIN PIPE TO AN APPROPRIATE DISCHARGE POINT.

FOUNDATION NOTES
1. THE FORMATION LEVELS SHOWN ON THESE DRAWINGS ARE PROVISIONAL AND ARE SUBJECT TO APPROVAL OF THE LOCAL AUTHORITY AND THE ENGINEER.
2. ALL TOP SOIL AND EXISTING FILL SHALL BE REMOVED BELOW THE FOUNDATION AREA AND THE GENERAL FORMATION LEVEL BE APPROVED BY THE ENGINEER.
3. WHERE IT IS NECESSARY TO EXCAVATE BELOW THE PROVISIONAL FORMATION LEVELS TO REACH AN APPROVED STRATUM, AND ADDITIONAL EXCAVATIONS ARE TO BE BACKFILLED WITH SUITABLE FILL MATERIAL.
4. THE PERMISSIVLE DEVIATION IN LEVELS OF THE TOP OF THE BLINDING CONCRETE SHALL BE BETWEEN +0mm AND -25mm.
5. THE QUANTITY OF THE TEST CUBES CAST BY THE CONTRACTOR AND THE AGE AT WHICH THEY ARE TO BE TESTED WILL BE AS DIRECTED BY THE ENGINEER.
6. MESH REINFORCEMENT TO BE MEASURED AND ORDERED AS REQUIRED BY THE GENERAL CONTRACTOR.

MATERIAL SPECIFICATION
CONCRETE
a) COMPRESSIVE STRENGTH C35/45
b) EXPOSURE CLASS - XD3
c) COVER TO REINFORCEMENT. NOMINAL 45mm + 10mm U.N.O.
d) MAX W/C RATION 0.4
e) MIN CEMENT CONTENT 380kg/m³ (TBC) - DEPT ON GI.
f) CEMENT TYPE (TBC) - DEPT ON GI.
g) MASS CHLORIDE CONTENT - 0.4 (TBC) - DEPT ON GI.
h) MAXX AGG - 20mm
i) CONSISTENCE CLASS - S3
j) SURFACE SPECIFICATION FOUNDATION - U1
   SOIL FACE OF WALL - F1
   MASONRY FACE OF WALL - F2

MASONRY - SHW SERIES 2400 TABLE 24/2
a) SUPERSTRUCTURE BRICKWORK - >75N/mm²
b) MORTAR STRENGTH - M6 (ii)
c) FROST PROTECTION = F2
d) SOLUBLE SALTS = S2

FINAL REINFORCEMENT DRAWINGS TO BE COMPLETE UPON RECEIPT OF GROUND INVESTIGATION REPORT

THIS DRAWING IS SUBJECT TO THE APPROVAL OF ALL RELEVANT AUTHORITIES

Rev.	Date	Revision Details	Drawn	Checked
B	23.01.25	Updated following BMBC Comments	DGR	DR
A	20.12.24	Updated following BMBC Comments	DGR	DR

QUEENSBERRY DESIGN
CIVIL, STRUCTURAL, ARCHITECTURAL & GEOTECHNICAL CONSULTANTS
NORTH EAST OFFICE
5, THE STATHES, THE WATERMARK, GATESHEAD, TYNE AND WEAR NE11 9SN
T: 0191 460 9090
NORTH WEST & YORKSHIRE OFFICE
2A ST MARTIN'S LANE, YORK, YO1 6LN
01904 500662
www.queensberrydesign.co.uk

Client: KEEPMOAT

Project: KERESFORTH ROAD, BARNSLEY

Title: HIGHWAY RETAINING WALL SECTIONS & DETAILS SHEET 2 OF 2

Drawn	Checked	Date
DZ	DR	Nov' 24

Drawing Number: 0010-QD-XX-S-DR-S-41-63

Drawing Status	Scale	Rev.
PRELIMINARY	1:50 @ A1	B

Appendix C – DESIGNERS RISK ASSESSMENTS

Queensberry DESIGN LIMITED
RESIDENTIAL AND COMMERCIAL DESIGN CONSULTANTS

Designers Risk Assessment

Construction (Design and Management) Regulations 2015

Client	Keepmoat Homes
Site	Keresforth Road, Retaining Walls over Watercourse
Designer	D.Rogers
Date	19 12 24
Date of Current Drawings	19 12 24

Engineering Comments		
Item	**Highlighted Risk**	**Design Comments**
Existing Services	Risk of injury during excavation. Risk of damaged to existing infrastructure during construction.	To be fenced off and kept separate from site working areas. Existing service records / utility survey required to confirm exact positions – a Sub Scan survey is recommended. Contractor to familiarise with all current service records and carry out hand digs to when excavating in close proximity to anticipated locations. Contractor to use appropriate RAMS during all excavations.
Retaining Structure	Ground retaining features within the design – maximum retaining height 0.9m (highway wall at eastern boundary) Hazard of falling, collapse of embankments and or structures.	The retaining structures are needed to overcome the level differences across site. Fall protection measures to be installed. Contractor to ensure adequately installed trench support/ temporary works as required.
Foundations	Deep Foundation depths Risk of falls / collapse.	Deep foundations required due to the depth of the existing water course.

DESIGNER HAZARD IDENTIFICATION AND RISK ASSESSMENT								
Item Ref.	**Highlighted Hazard**	**P**	**S**	**R**	**Response/Control Measure**	**P**	**S**	**R**
0.1	The risk of a crane toppling whilst lifting heavy loads	2	3	6	Minimise need for crane lifts by trying to design out hazard. Try and ensure cranes not operated alongside excavations or unstable/steep ground. All operatives to be duly qualified working to a written lift plan suitable for the level of the task, addressing the foreseeable risks and resources necessary complying with the LOLER 1998.	1	3	3
0.2	Risk to members of the public and operatives from air pollution (associated with dust and visual intrusion)	3	3	9	Designer to minimise the need for saw cutting and other operations resulting in airborne pollution. Operatives to use water to damp down dust clouds, for the duration of any cutting works and lower energy tools if possible. Full PPE to be used at-all-times including RPE.	1	2	2
0.3	Risk to operatives from removing asbestos cement or old lead (old manholes, pipes, lamp columns, paint etc)	2	4	8	To be identified on site. Potential risk to Contractor of asbestos being uncovered is to be identified in H & S Plan. Should asbestos containing material be suspected, NCC to be notified so tests can be arranged to confirm presence of asbestos. All materials suspected to contain asbestos are to remain in situ until testing/safe removal can be arranged.	1	4	4
0.4	Risk to operative exposure to vibration and noise from use of vibrating roller, road breaker or other tools	4	4	16	Only operatives trained in the use of equipment to undertake such work using only well-maintained plant suitable for the purpose. Use job rotation methods to reduce exposure to vibration and noise. Use	2	3	6

					tools with reduced noise/vibration level. Plant & vehicles to be turned off when not in use. Provide correct PPE, especially ear defenders for noise control. Method statements to control hand-arm vibration must follow HSE guidance document HSE 246/30.			
0.5	Risk of back injury as a result of lifting heavy loads and/or crushing from dropping heavy loads	4	4	16	Allow enough room for the use of mechanical lifting equipment for weights over 20kg when setting out temporary traffic management.	2	4	8
0.6	Risks to operatives and members of the public due to falling objects during lifting operations or whilst working at height	2	3	6	Ensure all lifting operations are covered by an adequate method statement and personnel are aware of all lifting operations. Ensure adequate drop zone is cordoned off during works at height. Hard hats to be worn by all operatives.	1	3	3
0.7	The risk to members of the public from the hazards of a construction site near to a residential area	4	4	16	Provide alternative routes for pedestrians/cyclists. Residents to be informed prior to commencement of works. Pedestrian barriers should be used to provide adequate safety zones.	1	2	2
0.8	Risk of oil spillage entering existing watercourses	3	3	9	Existing highway drains to be cleaned using appropriate method which removes effluent/detritus. Operatives to carry and be trained in the use of spill kits. Cover existing highway drainage where there is a risk of oil spillage.	2	3	6
0.9	The risk of contracting Leptospirosis/Weils disease whilst working near or over water	1	5	5	Ensure all staff are aware of the hazards involved and provide hand washing facilities. Provide registered leptospirosis cards for all site operatives. Provide guidance information for all operatives relating to the risk of working in proximity to a watercourse, river, pond or sewer. Ensure adequate supply of sterile wipes and waterproof plasters for minor cuts/grazes. All operatives to have up to date Tetanus inoculation.	1	5	5
1.0	Hazard to construction operatives when entering confined spaces (i.e. gas)	3	3	9	Attempt to design out the need for entering confined spaces. All operatives to be trained to work with a confined space and to have a safe system of work in place. Access into excavations and sewers must be controlled and only undertaken in accordance with the Confined Spaces Regulations 1997 with monitoring for Oxygen and hazardous gas (Methane & Carbon Dioxide), prior to personnel entering such excavations.	1	3	3
1.1	Risk of flooding due to effect on existing watercourses/drainage system by highway proposal	1	3	3	Minimise effect on existing system. Ensure a suitable temporary diversion/ pump system is in place.	1	3	3

1.2	Risk of wall/earth collapse during construction of retaining walls/batters.	1	4	4	Not to be undertaken in adverse weather conditions. Contractor to ensure adequately installed temporary support and a safe rate of construction as required.	1	3	3

EXPLANATORY NOTE ON RISK CLASSIFICATION

Risk is the likelihood of potential harm from a hazard being realised. The extent of risk will depend on:

-The likelihood/probability of that harm occurring

-The potential severity of that harm i.e. of any resultant injury or adverse health effect

-The population which might be affected by the hazard i.e. the number of people who might be exposed

This risk assessment shall be reviewed if there is any reason to suspect that it may no longer be valid or there has been a significant change in the matters to which it relates.

RISK CLASSIFICATION AND REQUIRED ACTION:

Probability (P) *		**Severity (S) ****					
		0	**1**	**2**	**3**	**4**	**5**
		No harm	**Minor harm**	**Moderate harm**	**Serious harm**	**Major harm**	**Catastrophic harm**
0	**Almost impossible**	-	-	-	-	-	-
1	**Extremely unlikely**	-	1	2	3	4	5
2	**Unlikely**	-	2	4	6	8	10
3	**Likely**	-	3	6	9	12	15
4	**Extremely likely**	-	4	8	12	16	20
5	**Almost certain**	-	5	10	15	20	25

RISK RATING (R)

1 = Very Low – No action required.

2-6 = Low – Ensure control measures are maintained and reviewed as necessary to ensure so far as is reasonably practicable the appropriate control of residual risk.

8-16 = Medium – Control measures to reduce risk rating to a level which is as low as is reasonably practicable.

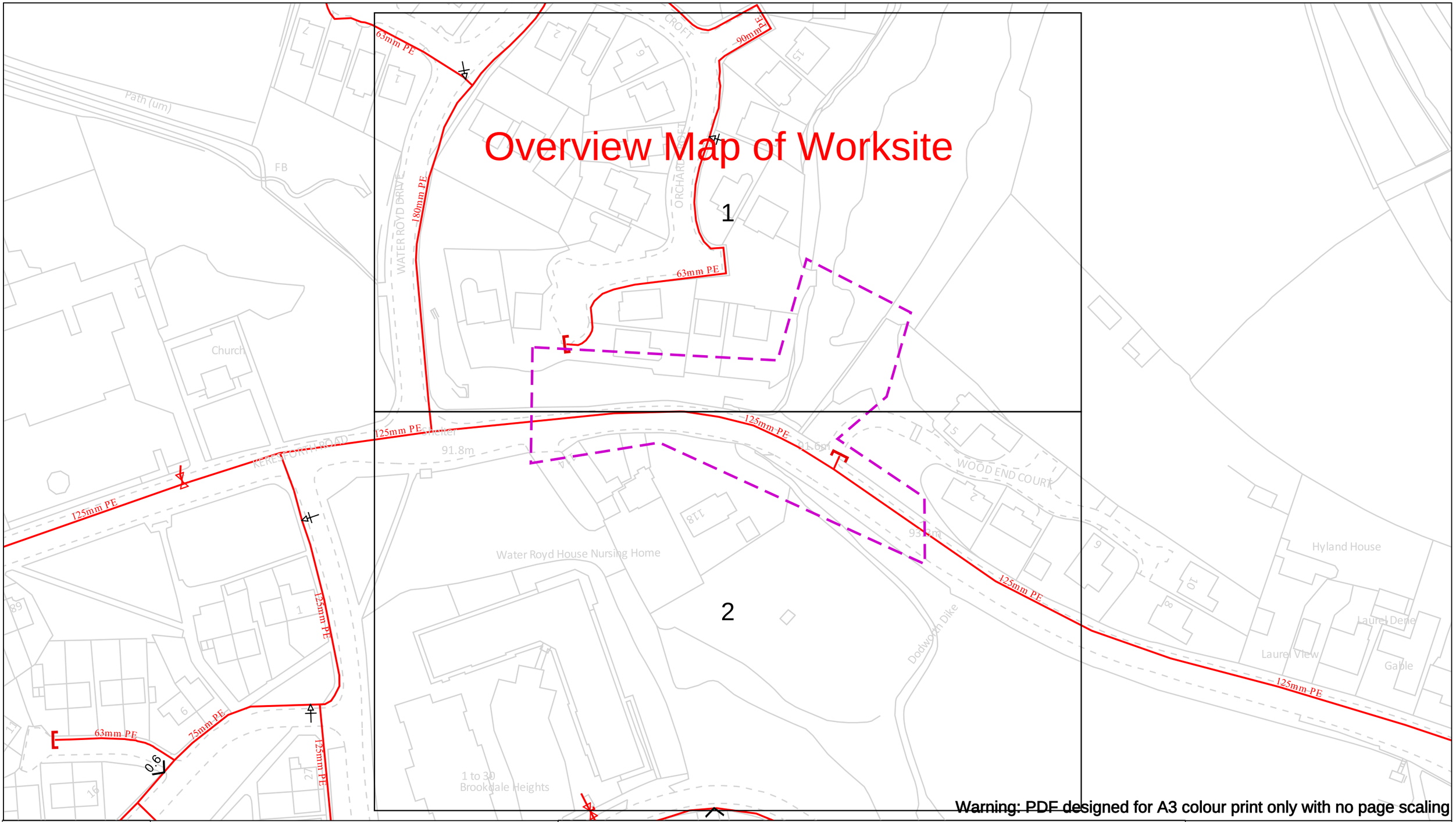
20-25 = High – Activity not permitted – hazard to be avoided or risk to be considerably reduced.

*** Probability that harm will occur:**		
0	Almost impossible	Probability close to zero
1	Extremely unlikely	Highly improbable, never known to occur
2	Unlikely	Improbable, remote chance
3	Likely	Possible, has happened occasionally
4	Extremely likely	Probable, commonly occurs
5	Almost certain	Inevitable, definite, continually occurs

**** Potential severity of harm:**		
0	No harm	e.g. No injury, damage, sickness or other loss
1	Minor harm	e.g. Minor injury with short term effect, minor damage or loss
2	Moderate harm	e.g. Lost time injury or illness, moderate damage or loss
3	Serious harm	e.g. Over 3day injury or illness, substantial damage or loss
4	Major harm	e.g. Major injury, major damage or loss
5	Catastrophic harm	e.g. Fatality (including the public) or disabling illness, catastrophic damage or loss

Appendix D – STATUTORY UNDERTAKERS DRAWINGS

Overview Map of Worksite



Warning: PDF designed for A3 colour print only with no page scaling

Date Requested: 06/04/2022
Job Reference: 25263332
Site Location: 432367 404905
Requested by:
Mrs Heather Gomersall
Your Scheme/Reference:
CEN23911

Scale: 1:1025 (When plotted at A3)

View extent: 200m, 115m

IMPORTANT NOTICES

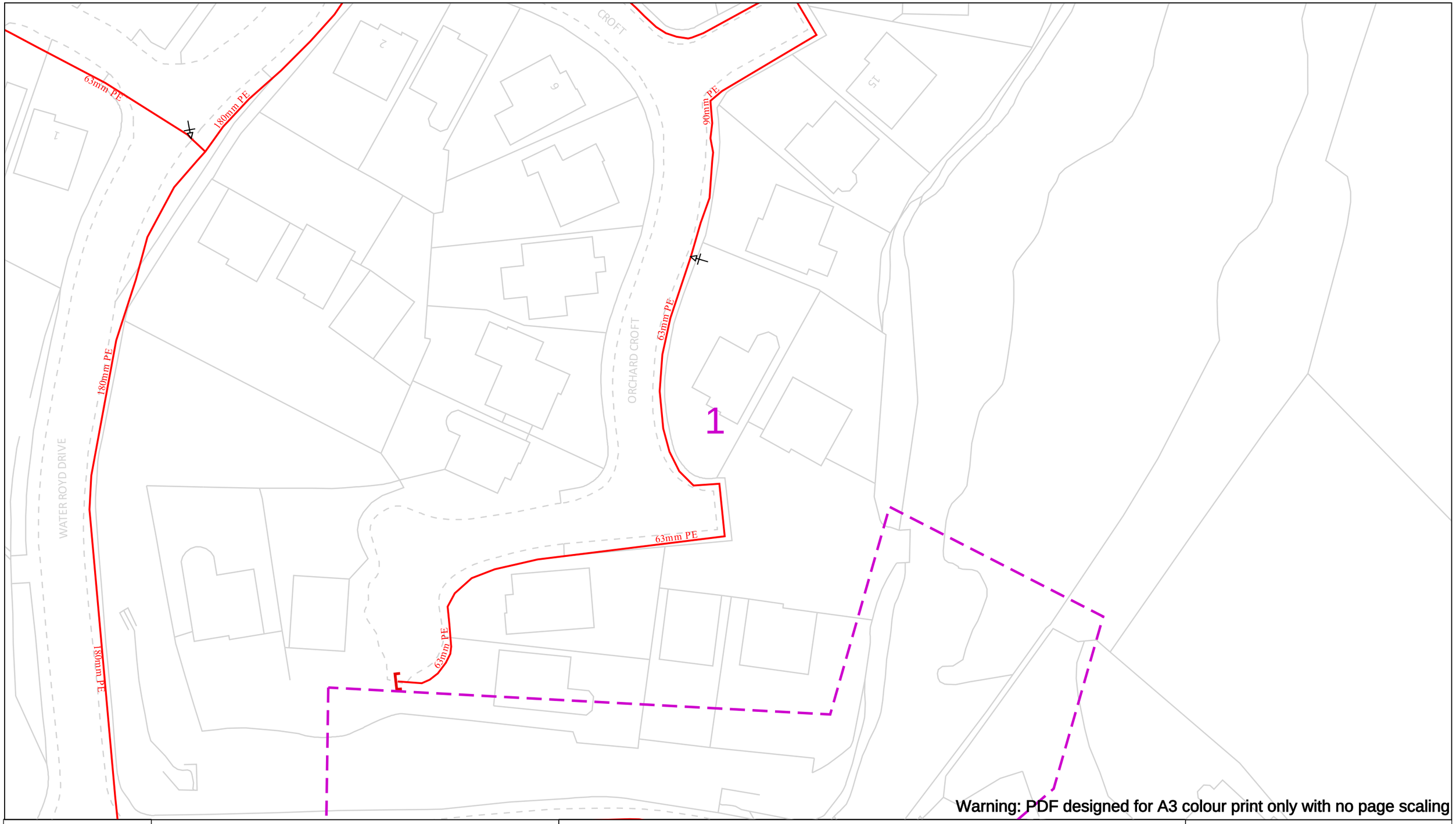
This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

In case of an emergency call 0800 111 999

Dig Sites — Area: Line:

- LP Mains
- MP Mains
- IP Mains
- LHP Mains
- Valve
- Depth of cover
- Syphon
- Diameter Change
- Material Change
- Out of Standard Service

Cadent
Your Gas Network



Warning: PDF designed for A3 colour print only with no page scaling

Date Requested: 06/04/2022
Job Reference: 25263332
Site Location: 432367 404905
Requested by:
Mrs Heather Gomersall
Your Scheme/Reference: CEN23911

Scale: 1:500 (When plotted at A3)

View extent: 200m, 115m

IMPORTANT NOTICES

This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

In case of an emergency call 0800 111 999

50m

Dig Sites

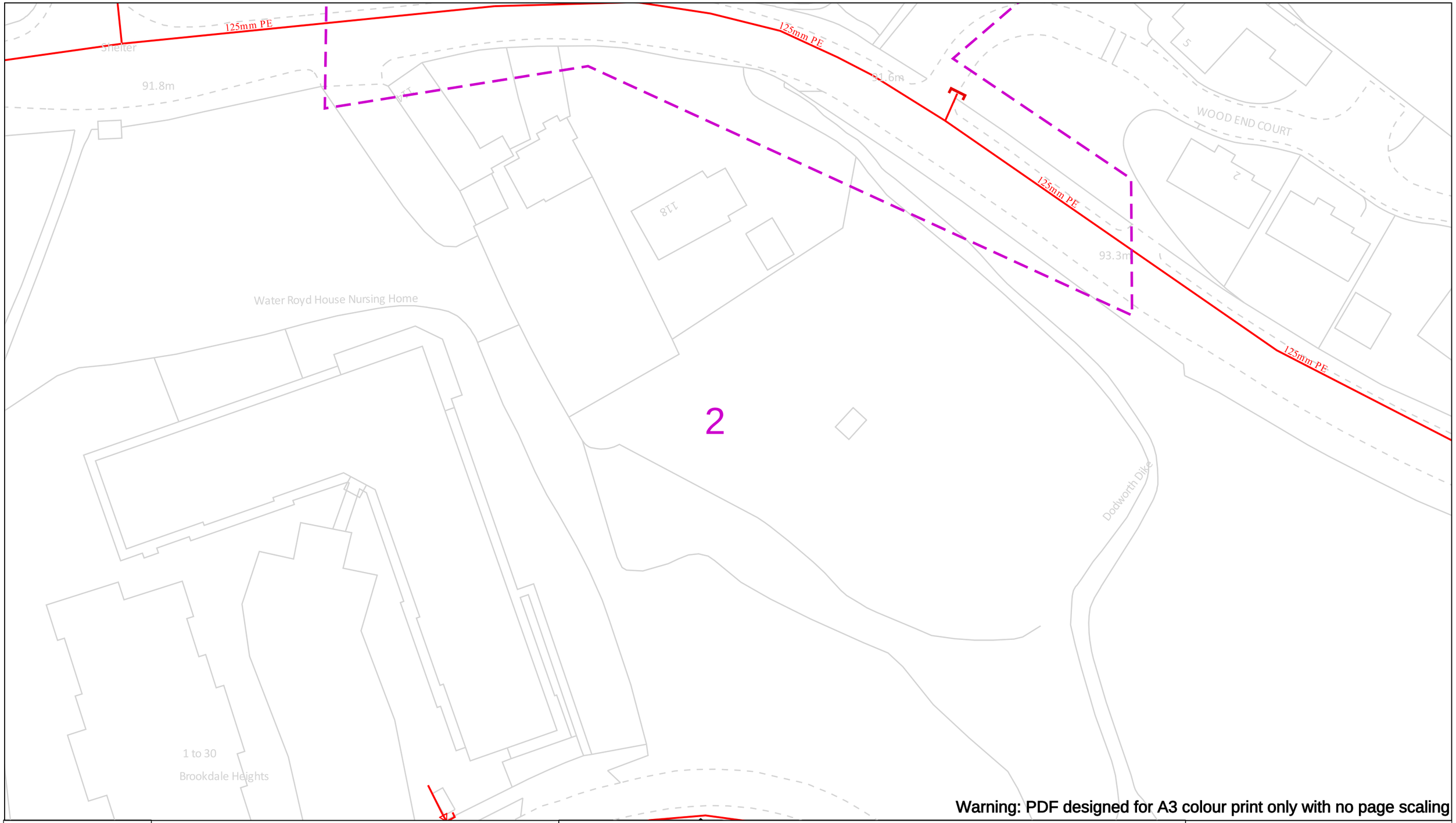
Area:

Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network



Warning: PDF designed for A3 colour print only with no page scaling

Date Requested: 06/04/2022
Job Reference: 25263332
Site Location: 432367 404905
Requested by:
Mrs Heather Gomersall
Your Scheme/Reference: CEN23911

Scale: 1:500 (When plotted at A3)

View extent: 200m, 115m

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In case of an emergency call 0800 111 999

50m

Dig Sites

Area: Line:

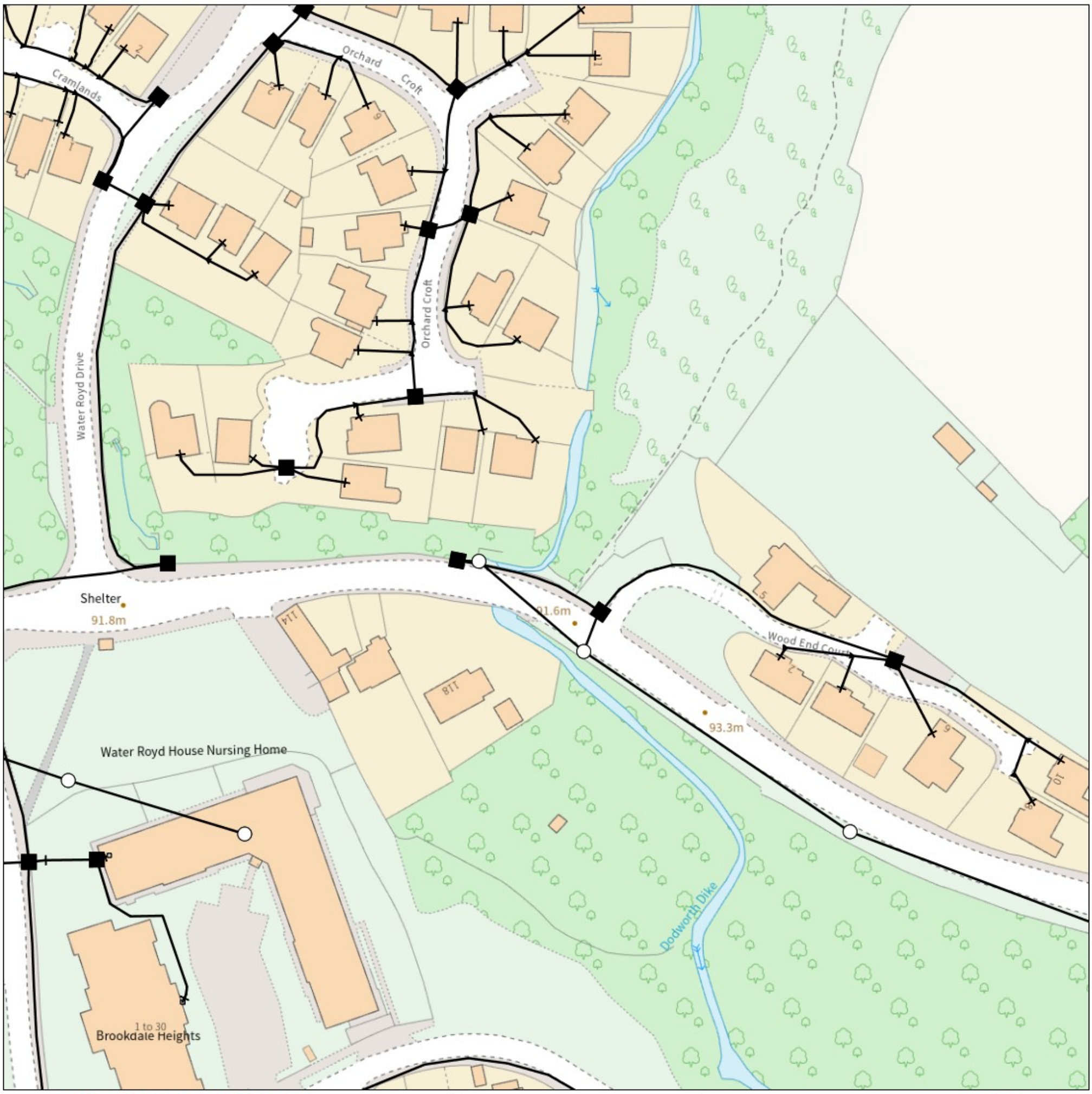
LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon

Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

KEY TO BT SYMBOLS

	Planned	Live
PCP		
Pole		
Box		
Manhole		
Cabinet		

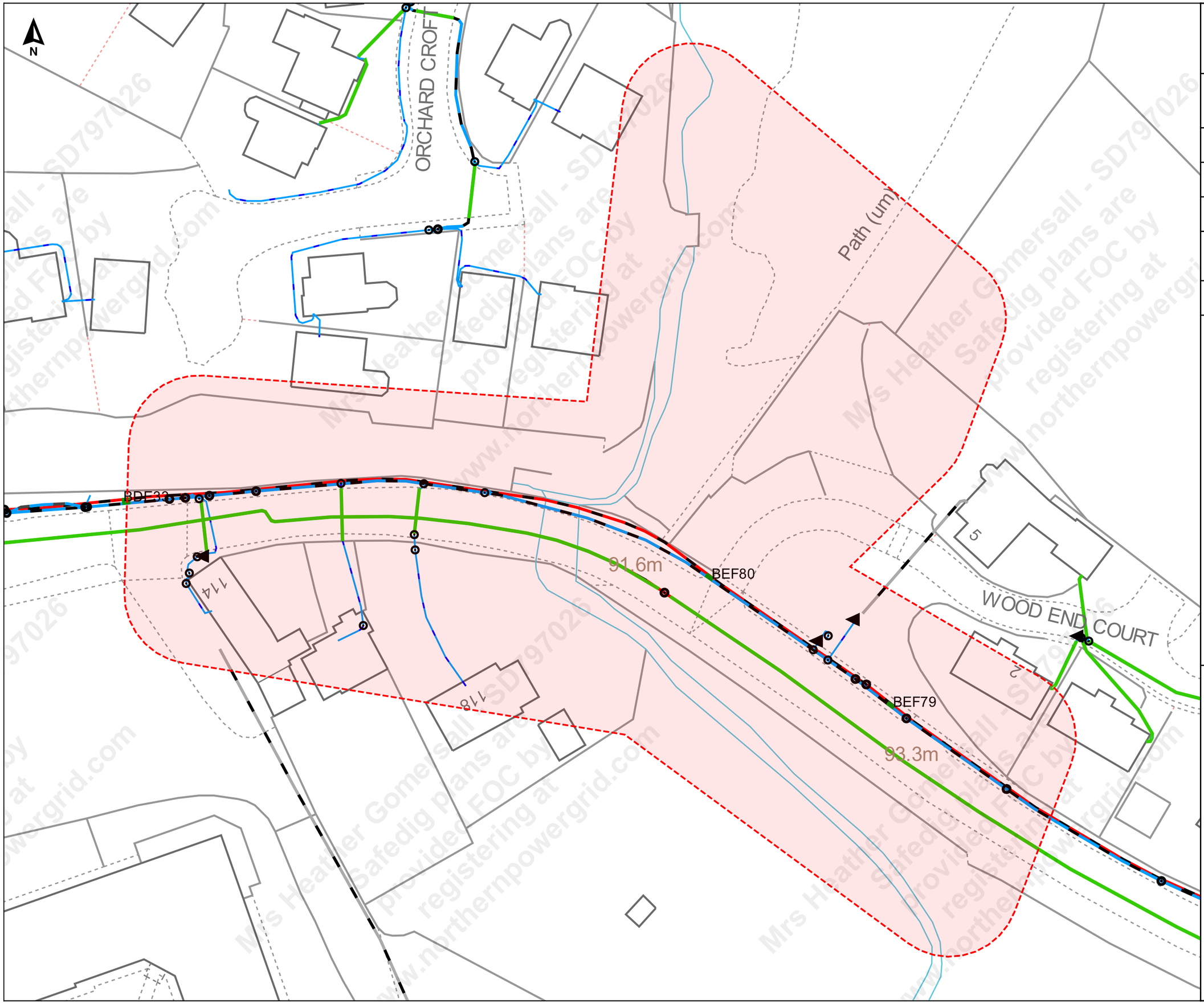
Change Of State	+	Hatchings	
Split Coupling	×	Built	
Duct Tee	▲	Planned	
Building		Inferred	
Kiosk	K	Duct	

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	In Place	Pending Remove	Not In Use
Power Cable				
Power Duct				N/A

BT Ref : NHW02014B
Map Reference : (centre) SE3239004912
Easting/Northing : (centre) 432390,404912
Issued : 06/04/2022 14:01:23

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk



NORTHERN POWERGRID

Job Reference : SD797026

CEN23911

Scale : 1:500

Grid Coordinates : 432388 404907

Date : 06/04/2022

Produced For :
Mrs Heather Gomersall

Terms and Conditions

Electric cables and/or overhead line information shown on the record plans are to be used in accordance with the Health & Safety Executive's Booklet HS(G)47, "Avoiding Danger from Underground Services" and Guidance Note GS 6, "Avoidance of Danger from Overhead Electric Lines".
Record plans do not always show out of commission cables or service cables from Northern Powergrid\'s mains to adjoining or cross road properties.
Plans do not show local authority owned public lighting or sign cables. The information is provided as a service by NorthernPowergrid and does not impart any legal obligation on their part.
Persons using it are reminded of their responsibility to execute works safely to avoid damaging Northern Powergrid\'s apparatus.

Further advice or assistance is available from the Records Information Centre on 0191 2294296
In an emergency or outside normal working hours contact our customer information centre on 0800 668877
Cable depths shown were correct at the time cables were laid however alterations to ground levels or cable disposition may have taken place.

Legend:

Underground Cables:
- 132kV
- 66kV
- 33kV
- 25kV
- Left In Situ
- LV Mains
- LV Service Assumed Route
- LV Service Logical Connection
- Duct Route
- 20kV
- 11kV
- 6kV
- 3kV
- Aux
- LV Service

Overhead Conductors:
- 132kV
- 66kV
- 33kV
- 25kV
- LV Mains
- LV Service
- 20kV
- 11kV
- 6kV
- 3kV
- Aux

0 5 10 15 20m

YORKSHIRE WATER
PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the ***general*** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.

2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.

3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will ***generally*** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will ***generally*** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.

4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.

5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45o and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter *(see illustration below)*. Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.

6. All excavation works near to YW apparatus should be by hand digging only.

7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.

8. Adequate support must be provided where any works pass under YW apparatus.

9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.

10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.

11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.

12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.

13. ***Under no circumstances*** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.

14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversionary Works).

15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.

16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.

17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available*" should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.

18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011.

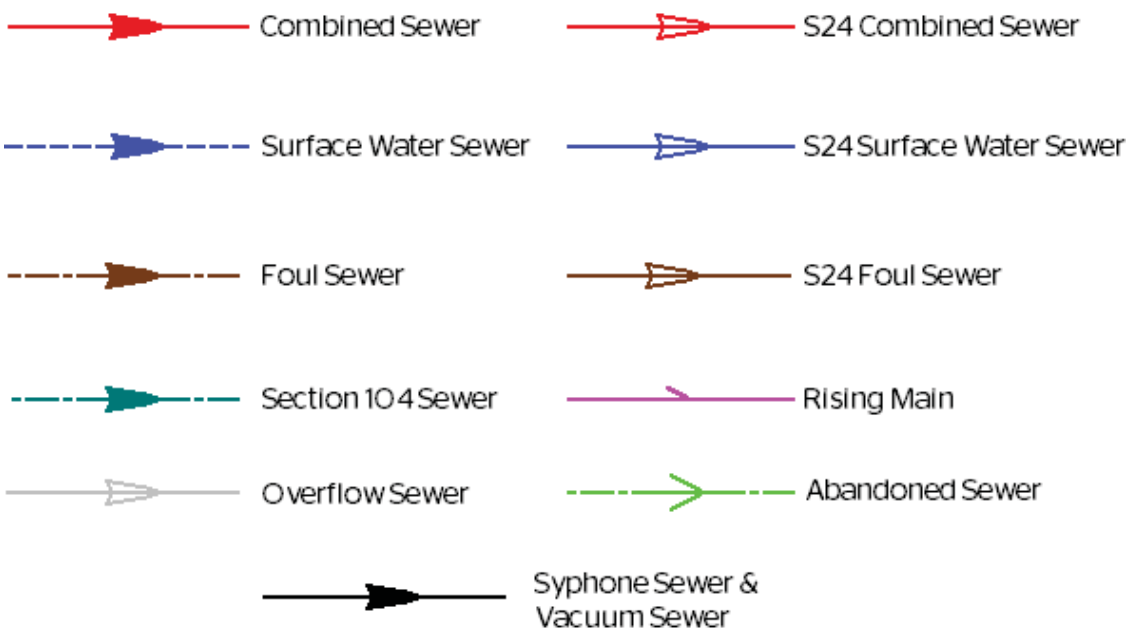
Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).

19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number 1000019559.

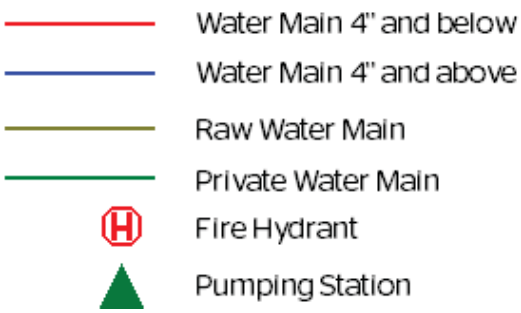
20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trail holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0845 124 24 24.

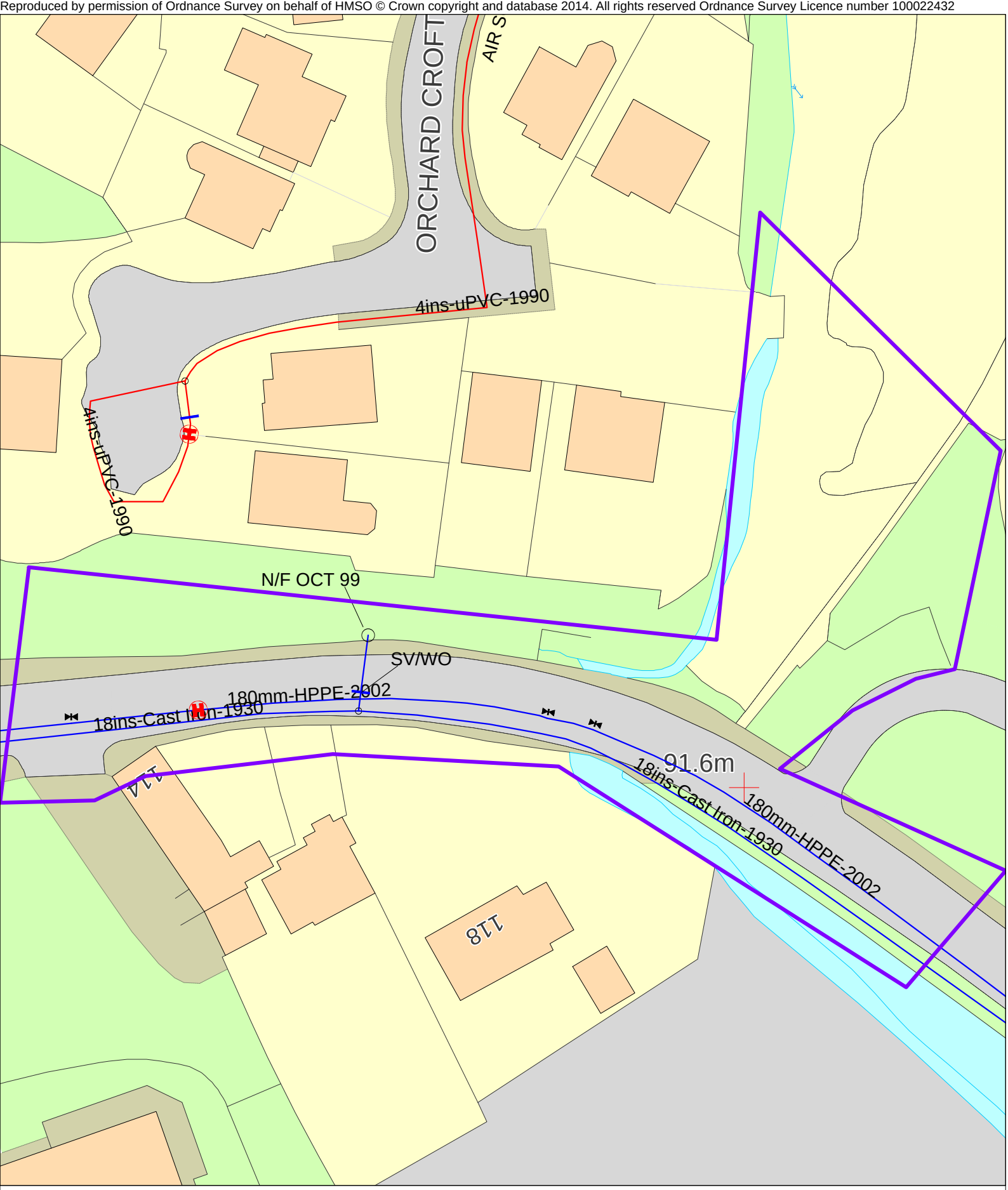
Property Identfier

Sewer Legend

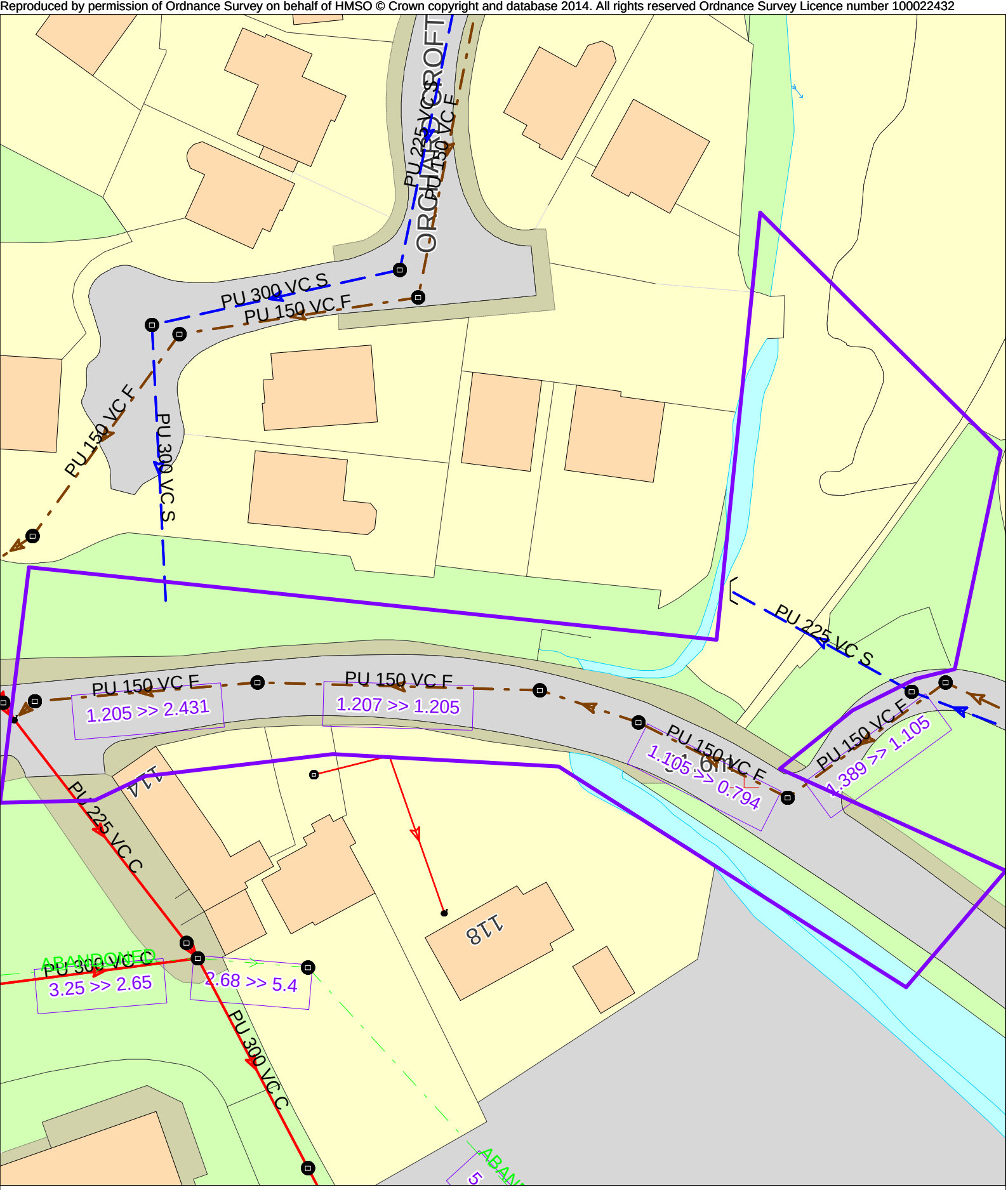


Water Legend





Public Clean Water Network 06/04/2022 14:34:39 OS Grid Coordinates: 432316 : 404851 Map Name : SE3204NW svcGISSafeMovePD



Public Waste Water Network 06/04/2022 14:34:40 OS Grid Coordinates: 432316 : 404851 Map Name : SE3204NW svcGISSafeMovePD