

Transpennine Route Upgrade West, Toad Holes Underbridge (MDL1/12) and Ming Hill Underbridge (MDL1/14) Dewsbury, West Yorkshire

Historic Building Investigation and Recording

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TRU, Toad Holes (MDL1/12) and Ming Hill (MDL1/14) Underbridges

Historic Building Investigation and Recording

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SUMMARY

In April 2023, Oxford Archaeology (OA) was commissioned by BAM Nuttall to undertake an Historic Investigation and Building Recording of the Grade II Listed Toad Holes Underbridge (MDL1/12) (NHLE 1450704) and Ming Hill Underbridge (MDL1/14) (NHLE 1451887), Dewsbury, West Yorkshire (NGR SE 23888 21297; SE 24028 21464). The work was stipulated by Kirklees Council as a condition of Listed Building Consent, was undertaken ahead of an increase in line speed from 60/75 mph to 100 mph above both structures, (with the tracks above Ming Hill Underbridge (MDL1/14) requiring re-alignment), and their sympathetic infilling, as part of a series of works along the Transpennine Route Upgrade (TRU). The survey was carried out on the 31st January 2024.

The two underbridges are separated by c 0.2km, being c 0.5km south-west of Dewsbury Station and 11km to the north-west of Huddersfield, and lie on the east side of the A644 Huddersfield Road. Their western elevations face onto a public right of way with their eastern elevations facing land in third party ownership (currently used as a waste management business and a carwash). Both underbridge accesses are partially infilled and no longer act as underbridges.

Toad Holes Underbridge (MDL1/12) and Ming Hill Underbridge (MDL1/14) were constructed between 1845 to 1847 for the Leeds, Dewsbury & Manchester Railway, for the purpose of providing access beneath the railway. Both structures were of similar construction with a masonry substructure supporting a single-span cast-iron level beam bridge, they are rare surviving examples of their type as many cast-iron beams were a common form of bridge construction until the late 1840s when a series of bridge failures led to a dramatic decline in their use. Decorative architectural features such as ashlar panelled pilasters, ashlar parapet end pillars and embellished fascia edge beams provide them with an aesthetic quality that raises them above purely functional engineering structures. Both have undergone substantial alterations since their construction, with works during the early and latter part of the twentieth century negatively impacting their authenticity, legibility and elements of their historic value.

1 INTRODUCTION

1.1 Project Background

1.1.1 In April 2023, Oxford Archaeology (OA) was commissioned by BAM Nuttall to undertake an Historic Investigation and Building Recording of the Grade II Listed Toad Holes Underbridge (MDL1/12) (NHLE 1450704; SE 23888 21297) and Ming Hill Underbridge (MDL1/14) (NHLE 1451887; SE 24028 21464), (Fig 1). Both were constructed between 1845 to 1847 for the Leeds, Dewsbury & Manchester Railway, and comprise important elements of the supporting infrastructure of the original Transpennine Route (Network Rail 2022). Both have been partially infilled during the twentieth century, and no longer act as underbridges.

1.1.2 Toad Holes (MDL1/12) and Ming Hill (MDL1/14) underbridges are subject to Listed Building Consent (LBC) following proposals for the line speed on the tracks above the structures to be increased from 60/75 to 100 mph, (with those above Ming Hill Underbridge requiring re-alignment), and for both structures to be sympathetically infilled (Network Rail 2021a and 2021b). The LBCs form part of an agreed mitigation strategy within a programme of works along the Transpennine Route Upgrade (TRU) granted by Conservation Officers at Kirklees Council, acting on advice of the Senior County Archaeologist at West Yorkshire Archaeological Advisory Service (WYAAS). The condition was that the underbridges be subject to Level 2 historic building surveys, in accordance with Historic England guidance (2016), prior to the commencement of works. Due to their proximity, the similar nature of the proposed programme of works and material construction, it was deemed appropriate to compile them into a single report. The fieldwork was completed on the 31st January 2024.

1.2 Aims and Objectives

1.2.1 The principal aim of this report is to document the current form and survival of Toad Holes (MDL1/12) (NHLE 1450704) and Ming Hill (MDL1/14) (NHLE 1451887) underbridges prior to any alteration or removal of materials, to provide a lasting record of their present state. To achieve these aims, the following objectives were proposed:

- To record Toad Holes and Ming Hill underbridges to a Level 2 standard as defined in Sections 5.2 of the WSI (*Appendices B and C*), in line with the Historic England Standards (2016);
- To disseminate the results of the recording works through deposition of an ordered digital archive and detailed report with the West Yorkshire Historic Environment Record (HER); and West Yorkshire Archive Service, in accordance with the requirements of the West Yorkshire Archaeological Advisory Service (WYAAS); and
- To disseminate the results of the recording works through deposition of the digital data and report with the Archaeological Data Service (ADS) and submit details of the project to the Online Access to Index of Archaeological Investigations (OASIS) project.

1.3 Location

- 1.3.1 Toad Holes (MDL1/12) (NHLE 1450704) and Ming Hill (MDL1/14) (NHLE 1451887) underbridges are single-span underbridges forming part of the supporting infrastructure of the section of the Transpennine Route between the River Calder and Dewsbury Station, Kirklees, West Yorkshire (SE 23888 21297 and SE 24028 21464). The two underbridges are separated by c 0.2km, being c 0.5km south-west of Dewsbury Station and 11km to the north-west of Huddersfield (Network Rail 2022; 2021b). Both lie on the east side of the A644 Huddersfield Road. Both underbridge accesses are infilled, with their western elevations facing a public right of way and their eastern elevations facing land in third party ownership (currently used as a waste management business and a carwash).
- 1.3.2 The solid geology of the site is mapped as mudstone, siltstone and sandstone of the Pennine Lower Coal Formation formed in the Carboniferous Period (BGS 2024). The soils are mapped as loamy and clayey floodplain soils with naturally high groundwater (Cranfield University 2024).

2 METHODOLOGY

2.1 Introduction

- 2.1.1 A Level 2 record is defined in the Historic England guidance as: ‘a descriptive record’ which will produce an analysis of the building’s development and use, but which will not discuss in detail the evidence on which this analysis is based (Historic England 2016). A detailed outline of the methodology is included in the project Written Scheme of Investigation (WSI; *Appendices B and C*).

2.2 Measured Survey

- 2.2.1 **Analytical / Descriptive Record:** written records were made of all principal building elements, as well as any features of historical or architectural significance. Particular attention was paid to the relationship between those areas of the underbridges where their development, and any alterations, could be observed.
- 2.2.2 **Drawings:** plans and elevations supplied by the client in PDF format, formed the basis for the drawn record, and were checked for accuracy before being enhanced with pertinent detail and annotation. The final plans were created within an industry-standard CAD package, enhanced and annotated to show the form and location of all architecturally and historically significant features.
- 2.2.3 **Photographic Record:** a Canon EOS 2000D digital SLR (24 megapixel) camera, with a selection of lenses, was used for the photographic record. The record comprises landscape and detailed photography; the detailed photographs of archaeological features incorporated a scale bar where appropriate. Archive photographic locations are presented on the relevant plots (Figs 4 and 5). Archival images comprise jpgs and Canon RAW format files (cr2) saved as 8-bit TIFFs. The data is stored on two separate servers on different sites, with appropriate back-up and disaster plans in place.
- 2.2.4 **Archive:** a full professional archive has been compiled in accordance with current ClfA (2020b) and Historic England guidelines (2015). The paper and digital archive will be deposited with the West Yorkshire Historic Environment Record (HER) on completion of the project.

3 BACKGROUND HISTORY

3.1 Introduction

- 3.1.1 A detailed historical background of the Transpennine Route and the two underbridges has been produced for the Heritage Assessment (Network Rail 2021a and 2021b) and the individual WSIs (*Appendix B*), and, as such, is not reproduced here. The following comprise historic map regressions depicting the development of the underbridges and the surrounding area.

3.2 Map Regression

Toad Holes Underbridge (MDL1/12)

- 3.2.1 The earliest map to depict Toad Holes Underbridge (MDL1/12) is the first edition Ordnance Survey (OS) map of 1855 (surveyed 1850 to 1851), but greater detail is discerned from the OS town plan of 1852 (surveyed during the same period in 1851), where it is shown to carry two tracks of the 'London and North Western Railway (Leeds and Dewsbury Section)' (Plate 1). The town plan shows the underbridge providing access between two groups of buildings, possibly associated with Watergate woollen Mill to the east, that appear to have been separated following the construction of the railway (Network Rail 2021a).

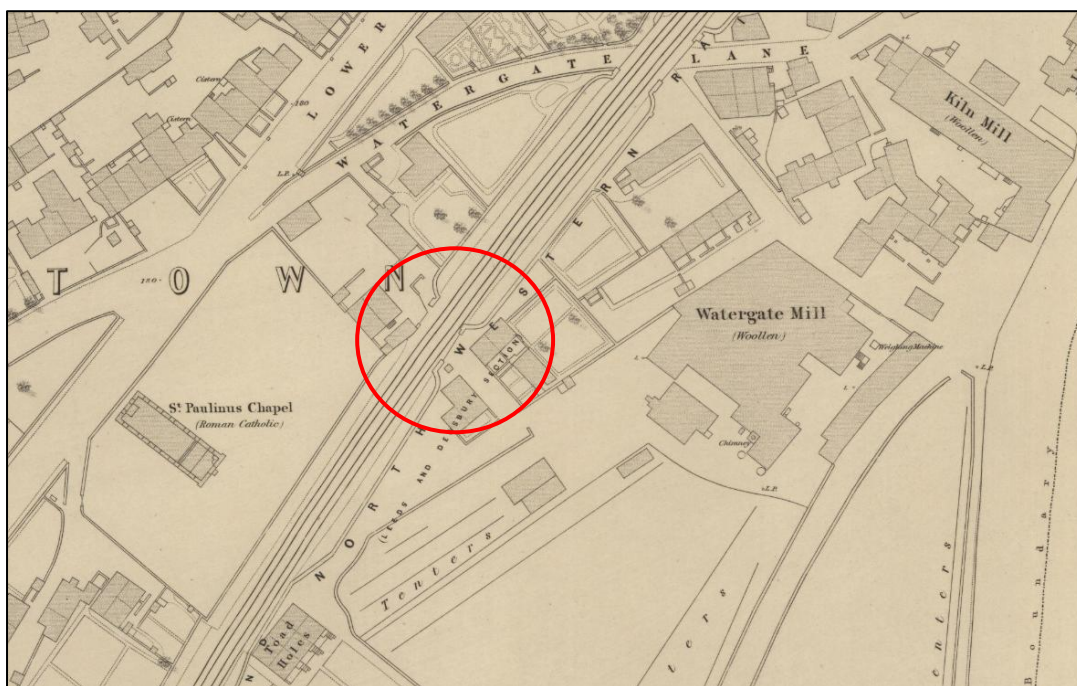


Plate 1: Excerpt of 1:1056 OS Town Plan of Dewsbury Sheets 4 (Surveyed 1851, published 1852) showing Toad Holes Underbridge (MDL1/12) (in red circle)

- 3.2.2 The map shows Toad Holes Underbridge comprising three curved wing walls extending north and south and forming retaining walls running parallel with the railway. The south-western wing wall is shown to be incorporated into the south-eastern wall of a structure possibly associated with the mill. Detailing on the map shows parapets and pillars identified by the building survey (*Section 4.3 and 4.5*).

- 3.2.3 To the west of Toad Holes Underbridge, Watergate Lane is shown to connect with Lower Road and the sprawl of the urbanised area of West Town beyond. To the south-west, St Paulinus Chapel is depicted, surrounded by open land. To the south, against the eastern side of the railway, is a group of buildings named 'Toad Holes', with Occupation Underbridge (MDL1/10) (NHLE 1450702), part of the Transpennine Route infrastructure, beyond it to the south. Immediately to the east are structures associated with Watergate woollen mill, with open ground used as tenterfields to the south and south-east, and the River Calder beyond.
- 3.2.4 The OS map of 1894 (surveyed 1888 to 1889) shows minor structural changes to Toad Holes Underbridge (Plate 2), associated with expansion of buildings, including what may be small cottages for mill workers in its surroundings. Hachures denoting the steep railway embankment are not depicted on the section leading south of the south-western wing wall, indicating that the lines run on relatively flat land on its north side at this location.



Plate 2: Excerpt of 1:2500 OS map of Yorkshire CCXLVII.3 (Surveyed 1888 to 1889, published 1894) showing Toad Holes Underbridge (MDL1/12) (in red circle)

- 3.2.5 The area to the west of Toad Holes Underbridge has undergone various changes with an increase in structures and the renaming of 'Lower Road' to 'Huddersfield Road', 'Watergate Lane' to 'Watergate Road' and 'Heckmondwike Road' to 'Cemetery Road'. The area of land associated with St Paulinus Chapel to the south-west has been developed with the inclusion of domestic structures, with the chapel now labelled as 'R.C. Schools'.
- 3.2.6 To the east of Toad Holes Underbridge, the area has developed considerably with an increase of industrial buildings associated with the former Watergate Mill, renamed 'West End Mills', and new complexes (Victoria Foundry Providence Mill and Calder Banks Mill) on the western bank of the River Calder.

- 3.2.7 The OS map of 1907 (revised 1905) shows further minor alterations to Toad Holes Underbridge (Plate 3) with surrounding structures having been removed. Within the surrounding area there has been a new school building constructed next to the site of the former St Paulinus Chapel, and detail is provided of the type of manufacturing carried out by the Mills / Works to the east: Kiln Mills (Spinning & c); West End Mills (Mungo); Victoria Works (Moulding); Providence Mill (Spinning & c.); and Calder Bank Mills (Shoddy & Mungo).

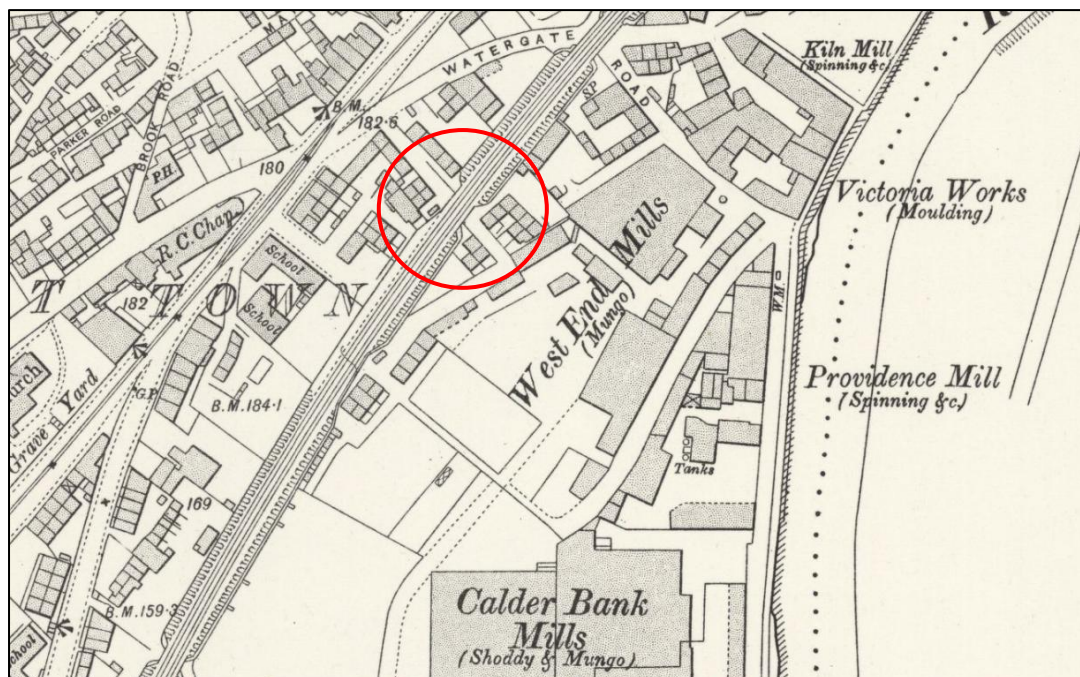


Plate 3: Excerpt of 1:2500 OS map of Yorkshire CCXLVII.3 (Revised 1905, published 1907) showing Toad Holes Underbridge (MDL1/12) (in red circle)

- 3.2.8 The remaining available OS maps produced during the first half of the twentieth century show no notable changes, except for the OS map of 1942 (revised 1938), which shows the wall attached to either the south-eastern wing wall or central span having been removed (Plate 4). Changes to the industrial area to the east of Toad Holes Underbridge has also taken place with the type of manufacturing either being replaced or closed.

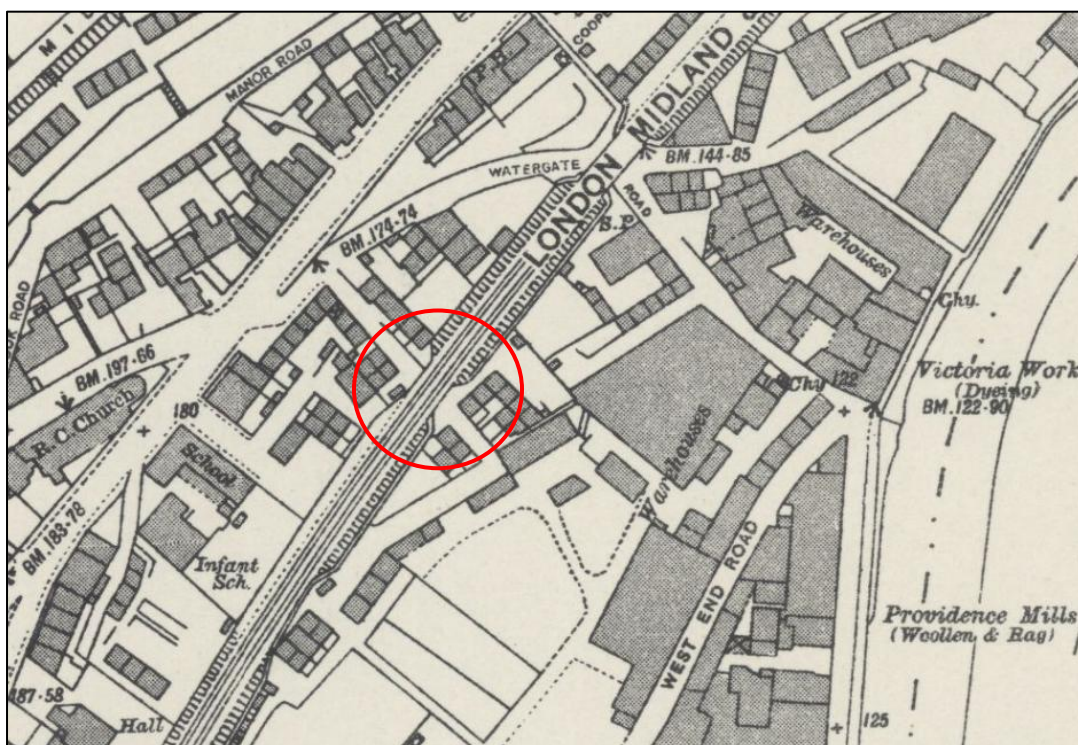


Plate 4: Excerpt of 1:2500 OS map of Yorkshire CCXLVII.3 (Revised 1938, published 1942) showing Toad Holes Underbridge (MDL1/12) (in red circle)

- 3.2.9 Although not depicted on any available historic mapping, clearance of the buildings surrounding Toad Holes Underbridge took place during the 1970s to facilitate the widening of the A644 and the realignment of Watergate Road. This resulted in the infilling of the north-western approach to the level of the bridge, removing the access beneath the railway and burying most of the north-western elevation.

Ming Hill Underbridge (MDL1/14)

- 3.2.10 The earliest map to depict Ming Hill Underbridge is the first edition Ordnance Survey (OS) map of 1855 (surveyed 1850 to 1851), but greater detail is discerned from the OS town plan of 1852 (also surveyed in 1851; Plate 5), where it is shown to carry two tracks of the 'London and North Western Railway'. The town plan indicates that Ming Hill Underbridge was provided for access between Dam Hill and Ing Mill, on the south-eastern side of the railway (Network Rail 2022). Detailing on the map shows the underbridge comprising four curved wing walls which extend to form the retaining walls running parallel to the railway. Attached to the south-western wing wall is a series of walled enclosures. Extending from the western side of the underbridge are two walls forming the boundaries of Dam Hill lane.



Plate 5: Excerpt of 1:1056 OS Town Plan of Dewsbury Sheet 4 (Surveyed 1851, published 1852) showing Ming Hill Underbridge (MDL1/14) (in red circle)

- 3.2.11 To the west of Ming Hill Underbridge, Dam Hill is depicted with structures against its northern edge, with the structures on the southern side forming an L-shaped arrangement around a courtyard. Dam Hill connects with Webster Hill, then merges with Lower Road. Beyond this to the west are domestic and industrial buildings, public houses, a school and a chapel at Daw Green. To the south-east of Ming Hill Underbridge, there are mills on the western bank of the River Calder and to the south-west along the railway is Toad Holes Underbridge (MDL1/12) (NHLE 1450704).
- 3.2.12 The OS map of 1894 (surveyed 1888 to 1889) shows the Dam after which the Dam Hill lane was named, against the railway embankment, immediately to the south (Plate 6). Minor structural changes to Ming Hill Underbridge are apparent, with most of the small enclosures and a wall attached to the western wing wall having been removed. A small rectangular structure with a wall positioned across the north-western approach to the underbridge seems to restrict access beneath it, and a building has been placed across the former lane at its northern end, where the lane formerly met Webster Hill. To the south-east, buildings have been added to the Ing Mills complex with some having been demolished and replaced or reconfigured.

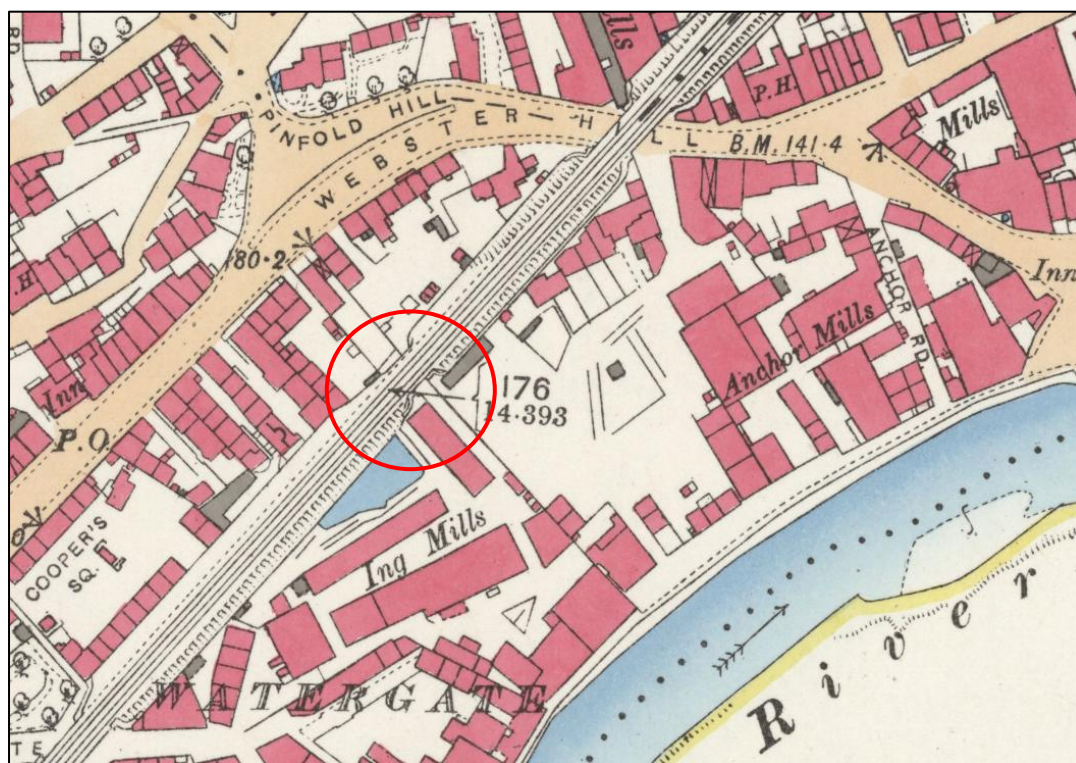


Plate 6: Excerpt of 1:2500 OS map of Yorkshire CCXLVII.3 (Surveyed 1888 to 1889, published 1894) showing Ming Hill Underbridge (MDL1/14) (in red circle)

- 3.2.13 On the eastern side of the underbridge, the curved northern and southern wing walls appear more pronounced than those on the western side. Hachures denoting the slope of the embankment are only present along the railway's eastern edge, indicating less of a gradient on the along the western edge. Attached to the north-eastern wing wall and the retaining wall is a large rectangular wooden or iron structure, probably a shed.
- 3.2.14 The OS map of 1907 (surveyed 1905) shows no obvious structural changes to Ming Hill Underbridge. Against the south-western wing wall, the small shed is now shown to be a roofless enclosure. To the south-east of the south-eastern wing wall, the large building and other structures associated with Ing Mills (now labelled as 'disused' are no longer present, and Anchor Mills is also labelled 'disused'. To the east, the Anchor Works has re-opened as a hat factory.
- 3.2.15 By the OS map of 1922 (surveyed 1915) the structure against the south-western wing wall has been removed, and by 1942 (surveyed 1938) the section of wall across the north-western approach of the underbridge, forms an enclosure separating the northern and southern ends of Dam Hill (Plate 7).



Plate 7: Excerpt of 1:2500 OS map of Yorkshire CCXLVII.3 (Revised 1938, published 1942) showing Ming Hill Underbridge (MDL1/14) (in red circle)

- 3.2.16 Although not depicted on any available historic mapping, clearance of the surrounding buildings to the north-west of the underbridge took place during the 1970s to facilitate the widening of the A644. This resulted in the infilling the underbridge's north-western approach, removing any remaining access beneath the railway and burying most of its north-western elevation.

4 BUILDING RECORD

4.1 Outline Description

4.1.1 Both Toad Holes and Ming Hill underbridges were single span, carrying two railway tracks across former carriageways beneath. Their north-western approaches were infilled during the 1970s to facilitate the widening of the A644. Measuring approximately 9m in length, both were aligned north-east/south-west, but for the purposes of description, this has been simplified to north/south. The following section provides separate written descriptions of both underbridges, as recorded on 31st January 2024. Close access to both structures was limited due to modern land ownership.

4.2 Toad Holes Underbridge (MDL1/12)

4.2.1 Toad Holes Underbridge (MDL1/12) was constructed of Pennine Lower Coal Measures rock-faced sandstone laid in regular coursing and bedded in lime mortar. Decorative classical features included projecting panelled ashlar pilasters, moulded cornices, parapet end pillars and curved wing walls. Supported above the masonry construction was a cast iron level beam bridge with decorative panels and balustrades with closely spaced simple round balusters with floral decoration (Historic England 2024). Toad Holes Underbridge's original cast iron level beam bridge had undergone substantial alterations since its original 1840's construction, with the central portion of the deck replaced with steel cross-girders and concrete decks in the early 1900s (Network Rail 2021a). As a result of this alteration, it is thought the only original beams are the cast iron fascia edge beams (*ibid*). Toad Holes Underbridge's classical detailing and decoration raised it above a purely functional engineering structure (*ibid*).

4.3 External Descriptions

Eastern elevation

4.3.1 The eastern elevation faced onto the southern area of an active waste management site, formerly the access route to the site of West End Mills, as depicted on the OS town plan of 1852 (Plate 8). Within the centre of the elevation was the (largely infilled) arch of the underbridge, flanked by panelled ashlar pilasters sat above rock-faced masonry plinths with tooled margins, and finished with lighter-sectioned moulded cornices (Historic England 2024a) (Plate 9). Inscribed onto some of the stones of the pilaster plinths were mason's marks (Plate 10). The pilasters were wider at the base, gradually narrowing as they ascended, to emphasise their height (*ibid*). Above, the pilasters were topped with ashlar parapet end pillars with plain plinths and corniced capstones (*ibid*) (Plates 11 – 12). Behind, the pilasters were attached to rock-faced masonry abutments with tooled margins that sat above rock-faced masonry plinths, also with tooled margins, and finished with robust moulded ashlar cornices (*ibid*) (Plates 13 – 14). The stones of the upper courses of both abutments appeared narrower than those stones beneath. Supported above the abutments was a cast iron level beam bridge deck with embellished decorated fascia panels of the edge girders (Plate 15). Attached above, and spanning between the two parapet end pillars, was a wrought-iron balustrade

comprising closely spaced rounded balusters with mirrored tulip-formed mid-sections topped by a plain handrail (Historic England 2024a) (Plate 16).



Plate 8: Eastern elevation of Toad Holes Underbridge (MDL1/12) with 2m scale. View facing north-west (IMG_1811)



Plate 9: Example of tooled margins on northern pilaster plinth and plinth of northern abutment (eastern elevation). View facing north (IMG_1695)



Plate 10: Example of mason's mark on southern pilaster plinth with 10cm scale (eastern elevation). View facing west (IMG_1709)



Plate 11: Southern parapet end pillar (eastern elevation). View facing south-west (IMG1663)



Plate 12: Northern parapet end pillar (eastern elevation). View facing north (IMG_1689)



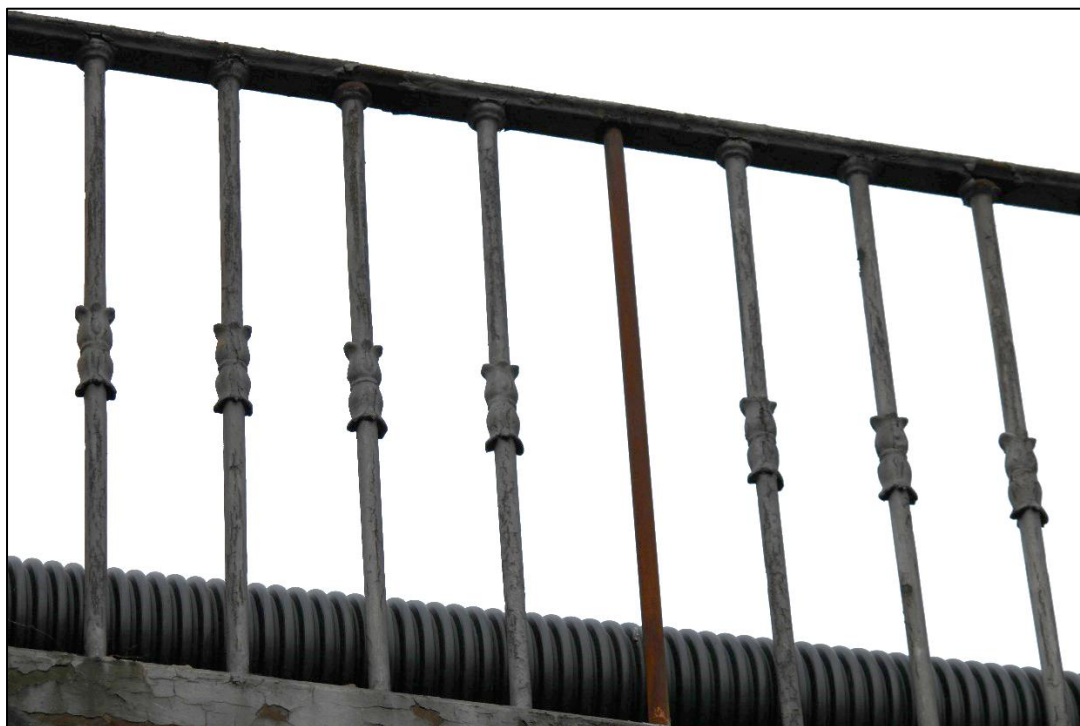
Plate 13: Southern abutment. View facing south-west (IMG_1698)



Plate 14: Northern abutment. View facing north-west (IMG_1696)



Plate 15: Cast iron level beam bridge deck (eastern elevation). View facing south-west (IMG_1664)



*Plate 16: Close-up of iron balusters with tulip-formed mid-sections (eastern elevation).
View facing north-west (IMG_1716)*

- 4.3.2 Attached to both abutments at both the northern and southern ends were two curved wing walls, constructed of rock-faced sandstone that narrowed in width as they ascended (Plates 17 – 18). Both wing walls were ramped and topped with plain ashlar coping, and divided from the retaining walls by shallow buttresses that contained tooled margins and squared ashlar tops. Their function provided structural stability between the two wall builds (the wing and the embankment) and are keyed into the embankment. Present on both the northern and southern wing walls were mason's marks depicting a variety of symbols (Plate 19). Present at the base of the northern wing wall were large gaps between some of the stones where the original bonding material had degraded, evidencing possible structural movement (Plate 20).



Plate 17: Southern wing wall with 2m scale (eastern elevation). View facing south-west (IMG_1809)



Plate 18: Northern wing wall with 2m scale. View facing north (IMG_1677)



Plate 19: Example of mason's mark on southern wing wall with 10cm scale (eastern elevation). View facing south-west (IMG_1693)



Plate 20: Stones at base of northern abutment with 1m scale (eastern elevation). View facing north-east (IMG_1710)

Western elevation

- 4.3.3 Due to the widening of the A644 and realignment of Watergate Road during the 1970s, Toad Holes Underbridge's western elevation was almost entirely buried as a result of the structure being infilled to the level of the deck (Plate 21). The only visible structural elements were two parapet end pillars of the same construction and design as those of the eastern elevation, with a wrought-iron balustrade associated with the cast-iron level beam bridge comprising closely spaced rounded balusters with mirrored tulip-formed mid-sections topped by a plain handrail, spanned between them. On the eastern side of the two railway tracks, the rear of the two east-facing parapet end pillars and iron balustrade could be seen.



Plate 21: Western elevation of Toad Holes Underbridge (MDL1/12) (left) and rear of eastern elevation (right). View facing north-east (IMG_1657)

4.4 Internal Descriptions

- 4.4.1 The infilling of Toad Holes Underbridge (MDL1/12) from its north-western approach covered much of the internal space, with the surface of the former carriageway entirely covered (Plate 9). The eastern ends of the internal walls of the northern and southern abutment elevations showed there to be 13 courses above projecting abutment plinths, with both walls' western ends largely covered by the infill (Plates 22 – 23). The robust moulded ashlar cornices running longitudinally across the top of both abutments were separated into individual sections, with adjoining smaller sections placed between larger single sections (Plates 24 – 25). This may be associated with alterations made to the deck in the early 1900s.



Plate 22: Internal elevation of southern abutment. View facing south-west (IMG_1682)



Plate 23: Internal elevation of northern abutment. View facing north-west (IMG_1684)



Plate 24: Moulded ashlar cornice above southern abutment. View facing south-west (IMG_1692)



Plate 25: Moulded ashlar cornice above northern abutment. View facing north-west (IMG_1690)

- 4.4.2 The remaining edge girders of the deck's underside are thought to be the only surviving elements of the bridge's original design and construction, however, only the eastern girder was visible during the survey as the western

girder was hidden by the infill of the north-western approach (Network Rail 2021a) (Plate 26). The early twentieth century alteration replacing the original cast-iron beam structure was visible within the central portion of the deck's underside, comprising riveted steel cross-girders and concrete decks (Plate 26).



Plate 26: Underside of bridge deck with original cast-iron edge beam (top) and twentieth century alteration (centre) (IMG_1685)

4.5 Ming Hill Underbridge (MDL1/14)

- 4.5.1 The substructure of Ming Hill Underbridge (MDL1/14) was constructed of squared, rock-faced Pennine Lower Coal Measures Sandstone laid in regular coursing and bedded in an original lime mortar with decorative features that included projecting panelled ashlar pilasters, moulded ashlar impost bands, parapet end pillars and deeply curving, raked wing walls. Supported above the masonry construction was a cast-iron level beam bridge comprising embellished decorative panels and balustrades with closely spaced simple round balusters with floral detailing (Historic England 2024b). Ming Hill Underbridge's cast-iron level beam bridge had undergone substantial alterations since its original 1840s construction, with the central portion of the deck replaced with brick jack arches supported by riveted plate steel girders in the early 1900s, with additional ties later installed between all the girders that supported the jack arches (Network Rail 2021b). As a result of this alteration, it is thought the only surviving cast iron beams of the original bridge are the cast iron fascia edge beams (*ibid*). Ming Hill Underbridge's aesthetic quality exhibited through its masonry and ironwork construction raise it above a purely functional engineering structure (*ibid*).

4.6 External Descriptions

Eastern elevation

- 4.6.1 The eastern elevation was divided between two separate sites, the northern area of an active waste management site (southern end) and a car park associated with an active car wash (northern end), both located on the former site of Ing woollen mill as depicted on the OS town plan of 1852 (Plates 27 – 28). Close access and visibility was restricted due to the presence of a raised earthen bank, trees and a portacabin.



Plate 27: Eastern elevation of Ming Hill Underbridge (MDL1/14). View facing north-west



Plate 28: Eastern elevation of Ming Hill Underbridge (MDL1/14). View facing west

- 4.6.2 Ming Hill Underbridge contained a central, partially infilled, single-span / carriageway flanked by projecting panelled ashlar pilasters sat above rock-faced masonry plinths with finished lighter-sectioned moulded cornices (Historic England 2024b) (Plates 27 – 28). Above, the pilasters were topped with ashlar parapet end pillars with plain plinths and corniced capstones (*ibid*) (Plates 29 – 30). Behind, the pilasters were attached to rock-faced masonry abutments with tooled margins that sat above rock-faced masonry plinths, also with tooled margins, finished with robust moulded ashlar cornices (*ibid*) (Plates 31 – 32). Attached to the base of the northern abutment on a north-west / south-east alignment was a roughly coursed sandstone rubble boundary wall, first depicted on the OS town plan of 1852 (Plate 33). Supported above the abutments was a cast-iron level beam bridge deck with embellished decorated fascia panels of the edge girders, thought to be the only surviving cast-iron beams of the original 1840s construction (Network Rail 2021b) (Plate 34). Attached above, and spanning between the two parapet end pillars, was a wrought-iron balustrade comprising closely spaced rounded balusters with mirrored tulip-formed mid-sections topped by a plain handrail (Historic England 2024b). Attached to the outside of both parapet end pillars was modern timber fencing.



Plate 29: Southern Pilaster (eastern elevation). View facing north-west



Plate 30: Northern pilaster (eastern elevation). View facing north-west



Plate 31: Southern abutment (eastern elevation). View facing north-west



Plate 32: Northern abutment (eastern elevation). View facing north



Plate 33: Attached rubble sandstone wall aligned north-west / south-east (lower centre / right). View facing north



Plate 34: Cast-iron level beam bridge deck (eastern elevation). View facing west

- 4.6.3 Attached to both abutments at both the northern and southern ends were two raked, curved wing walls constructed of squared, rock-faced sandstone blocks (Plate 35). Both wing walls were ramped and topped with plain, ashlar coping stones and divided from the extending retaining walls by shallow buttresses that contained tooled margins and a plain ashlar top (Plates 35). Their function provided structural stability between the two wall builds (the wing and the embankment) and are keyed into the embankment.



Plate 35: Southern wing wall with shallow buttress (eastern elevation). View facing west (IMG_1750)

Western elevation

- 4.6.4 Ming Hill Underbridge's western elevation was almost entirely buried as a result of the structure being infilled to the level of the deck during the widening of the A644 in the 1970s (Plate 36). The only visible elements were the two parapet end pillars of the same construction and design as those of the eastern elevation, the wrought-iron balustrade and embellished fascia panels associated with the cast-iron level beam bridge, the robust moulded ashlar corncicing of the northern and southern abutments, and the upper section of the projecting ashlar panelled pilasters (Plates 37 – 38). Either side of the pilasters on the northern and southern ends, the squared ashlar tops of the curved wing walls were visible, with a later roughly coursed sandstone boundary wall constructed on top (Plates 39 – 40). The raised embankment enabled close access to the upper section of the structure, revealing narrow vertical tooling marks on the ashlar pilasters and plain plinths of the parapet end pillars, and fine decorative detailing within the mirrored tulip-formed mid-sections of the balusters and embellished fascia panel (Plates 41 – 44). Attached to the flange of the edge girder were the ends of ties used to support the brick jack arches beneath the deck.



Plate 36: Western elevation of Ming Hill Underbridge (MDL1/14) with 2m scale. View facing south-east (IMG_1764)



*Plate 37: Northern pilaster and parapet end pillar with 2 x 1m scales (western elevation).
View facing east (IMG_1773)*



*Plate 38: Southern pilaster and parapet end pillar with 2m scale (western elevation). View
facing south-east (IMG_1765)*



Plate 39: Northern wing wall with later boundary wall addition with 1m scale (western elevation). View facing north-east (IMG_1772)



Plate 40: Southern wing wall with later boundary wall addition with 1m scale (western elevation). View facing east (IMG_1790)



Plate 41: Vertical tooling marks on pilaster cornice and parapet end plinth with 10cm scale (western elevation). View facing south-east (IMG_1775)



Plate 42: Tulip-formed mid-sections of balusters (western elevation). View facing east (IMG_1793)



Plate 43: Embellished fascia panel (western elevation). View facing north-east (IMG_1783)



Plate 44: Southern end of embellished fascia beam with robust moulded ashlar cornice (right) (western elevation). View facing south-east (IMG_1784)

4.7 Internal Descriptions

- 4.7.1 Access within the internal span was not possible due to restricted access, preventing an accurate description of its appearance. The central portion of the deck's underside, which comprised brick jack arches supported on riveted steel girders installed in the early twentieth century, had replaced an original cast iron beam bridge structure (Plate 45). The remaining edge girders with embellished fascia panels were the only surviving elements of the bridge's original design and construction, from which Ming Hill Underbridge derives notable heritage significance (Network Rail 2021b). Present between all the girders that supported the brick jack arches were later installed ties.



Plate 45: Brick jack arches and riveted steel girders beneath deck. View facing north-west (IMG_1745)

5 DISCUSSION

5.1 Introduction

- 5.1.1 The following discussion draws upon both the historic background and archaeological evidence identified during the historic building surveys to produce a narrative of the origins, function and development of both Toad Holes Underbridge (MDL1/12) (NHLE 1450704) and Ming Hill Underbridge (MDL1/14) (NHLE 1451887). Due to the similarity of their design and material construction, they will be discussed together in the following sections.

5.2 Origins, Function and Development

- 5.2.1 The origins of the Transpennine Route, constructed between 1836 to 1849, reflected the 'Railway Mania' of the mid-Victorian period as an amalgam of lines were created at different times by different railway companies between Manchester and York (Baxter 2019). Toad Holes Underbridge (MDL1/12) and Ming Hill Underbridge (MDL1/14), located on the section of the Transpennine Route constructed by the Leeds, Dewsbury & Manchester Railway (1845 to 1847), were constructed between 1845 and 1847 under the oversight of the principal engineer Thomas Grainger (1794-1852), forming an integral part of the railway infrastructure on the section of the line between the River Calder and Dewsbury Station (Network Rail 2022). Grainger, one of the leading railway engineers in Scotland from 1823 onwards, later worked on a number of Yorkshire railways during the 1840s until his death following a railway accident in 1852 (Baxter 2019; Historic England 2024a and b).
- 5.2.2 The depiction of both Toad Holes and Ming Hill underbridges on the OS town plan of 1852 (surveyed 1851) shows them just after they were constructed (between 1845 and 1847), providing an illustrative record of their near original form. With masonry substructures and bridges of cast- and wrought-iron, detailing on the early OS town plan depicted architectural elements on both structures comprising wing walls and parapet end pillars, with the underbridges providing access between structures associated with woollen mills which had been separated by the construction of the railway.
- 5.2.3 Although both underbridges continue to function as integral parts of the Transpennine Route, the widening of the A644 and the realignment of Watergate Road during the 1970s impacted their primary function, with the infilling of their north-western approaches blocking their former through carriageways. These alterations have resulted in both structures losing their historic function as access points beneath the railway, which, along with the removal of many of the surrounding industrial buildings, has diminished the legibility of their historic function.
- 5.2.4 Toad Holes and Ming Hill underbridges were single-span, cast-iron beam bridges supported by a substructure of masonry abutments. Despite cast-iron beam bridges being a common form of bridge construction, widely used during the early part of railway development, a series of bridge failures in the late 1840s led to a decline in their use, resulting in widespread replacement due to concerns over structural capacity and safety (Network Rail 2021a/b). Toad Holes and Ming Hill underbridges, however, survived this replacement, along

- with two other Grainger-designed beam bridges, George Street (MDL1/16) (NHLE 1451888) and Jack Lane (MDL1/24) (NHLE 1452193). Substantial alterations during the early twentieth century to the central lower decks of the two underbridges likely evidenced the weakness in the beam bridge design.
- 5.2.5 In addition to the practical function of Toad Holes Underbridge and Ming Hill Underbridge providing access beneath the railway and the mechanics of their form, decorative features included within their design. The quality and detailing of the classically-derived stonework alongside the ornamental cast-iron and wrought-iron adornments provided both structures with an aesthetic quality, lifting them above the purely functional.
- 5.2.6 Consultation of available historic mapping showed Toad Holes Underbridge and Ming Hill Underbridge retained much of their original form by the early-mid twentieth century and were not subject to a programme of widening undertaken by London and North Western Railway (LNWR) during the 1880s evidenced at Wheatley's Viaduct (MVN2/192; NHLE 1313676) and 1930s evidenced on the route between Ravensthorpe and Huddersfield, to accommodate additional tracks.
- 5.2.7 Although Toad Holes and Ming Hill underbridges represent surviving examples of cast-iron level beam bridges dating to the 1840s, they have undergone substantial alterations not visible on historic OS mapping, both having had the underside of their central decks replaced in the early twentieth century. In the case of Toad Holes Underbridge, this was with steel cross-girders and concrete decks, and at Ming Hill Underbridge, with brick jack arches supported on riveted plate steel girders.
- 5.2.8 The current condition of both structures, documented within their respective Heritage Assessment reports (2022a/b) and photographed during the survey, recognise them as being in poor condition, with recent interventions in the case of Ming Hill Underbridge, having tie-bars installed to stabilise the structure. The only surviving elements of the original cast-iron decks are the I beams / edge girders with embellished fascia panelling present at either end of both decks. The survival of these features contributes to the heritage significance of both Toad Holes Underbridge and Ming Hill Underbridge as they form an extant part of the bridges original design and construction (National Rail 2021b) (Plate 46).

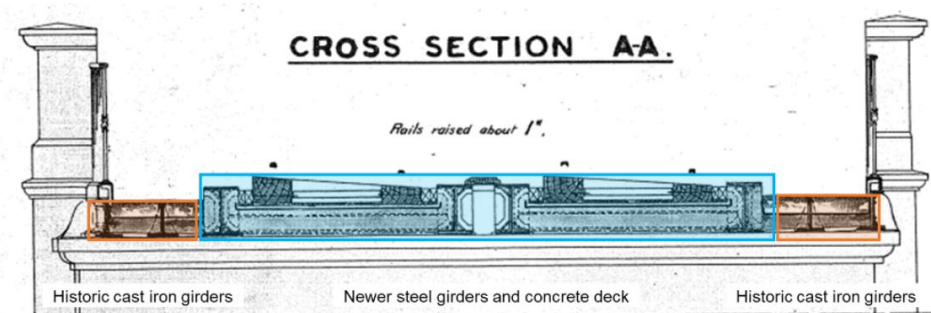


Plate 46: Cross- section of Toad Holes Underbridge (MDL1/12) with original cast-iron girders highlighted in orange and the later twentieth century concrete decks highlighted in blue.
(Source: Network Rail 2022)

- 5.2.9 The development of the surrounding area during the 1970s with the widening of the A644 (Huddersfield Road), the clearance of surrounding buildings, and in the case of Toad Holes Underbridge, the re-alignment of Watergate Road, has led to further alterations to both underbridges which has impacted both structures negatively. Both have been partially infilled which has resulted in their north-western approaches being largely hidden / buried by a raised embankment. These works, although not changing their physical form, has diminished their authenticity and historic significance by degrading the legibility of understanding of their historic use and form, alongside degrading the visibility of both structures from the western side (Network Rail 2021a).

5.3 Conclusion

- 5.3.1 This report follows an archaeological historic buildings investigation of Toad Holes Underbridge (MDL1/12) (NHLE 1450704) and Ming Hill Underbridge (MDL1/14) (NHLE 1451887), presenting the results of the historic building survey with support from an historic map regression. Toad Holes and Ming Hill underbridges' survival and continued use in carrying an operational railway reflects the engineering achievements of the Victorian period. Documented evidence the structures' construction (1845 to 1847) by railway engineer Thomas Grainger (1794 – 1852), alongside their early depiction on the OS town plan of 1852 (surveyed 1851), mark them out as original components of the Transpennine Route and more specifically, the Leeds, Dewsbury & Manchester Railway (1845 – 1847).
- 5.3.2 Although historic mapping showed few alterations to the original form of the two underbridges, known alterations made to their undersides in the early twentieth century and the development of the A644 during the 1970s, has impacted the structures negatively, causing them to lose their authenticity, legibility and elements of their historic value. Despite this, they are still rare surviving, albeit altered, examples of cast-iron level beam bridges (Network Rail 2021a/b). Collectively, they have a group value which reflects the characteristic design features of Thomas Grainger on the Leeds, Dewsbury & Manchester Railway (see Network Rail 2021a and b).

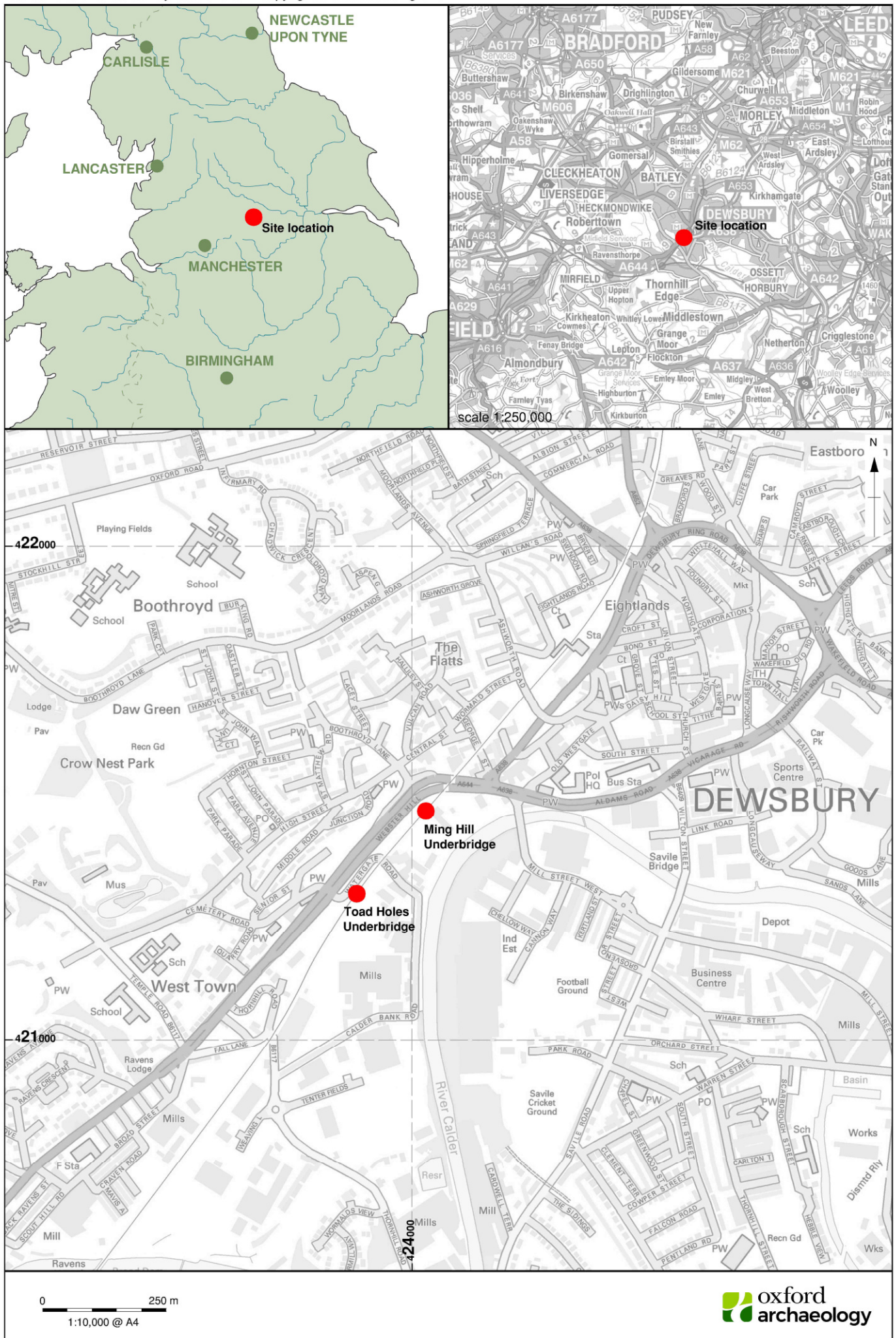


Figure 1: Site location

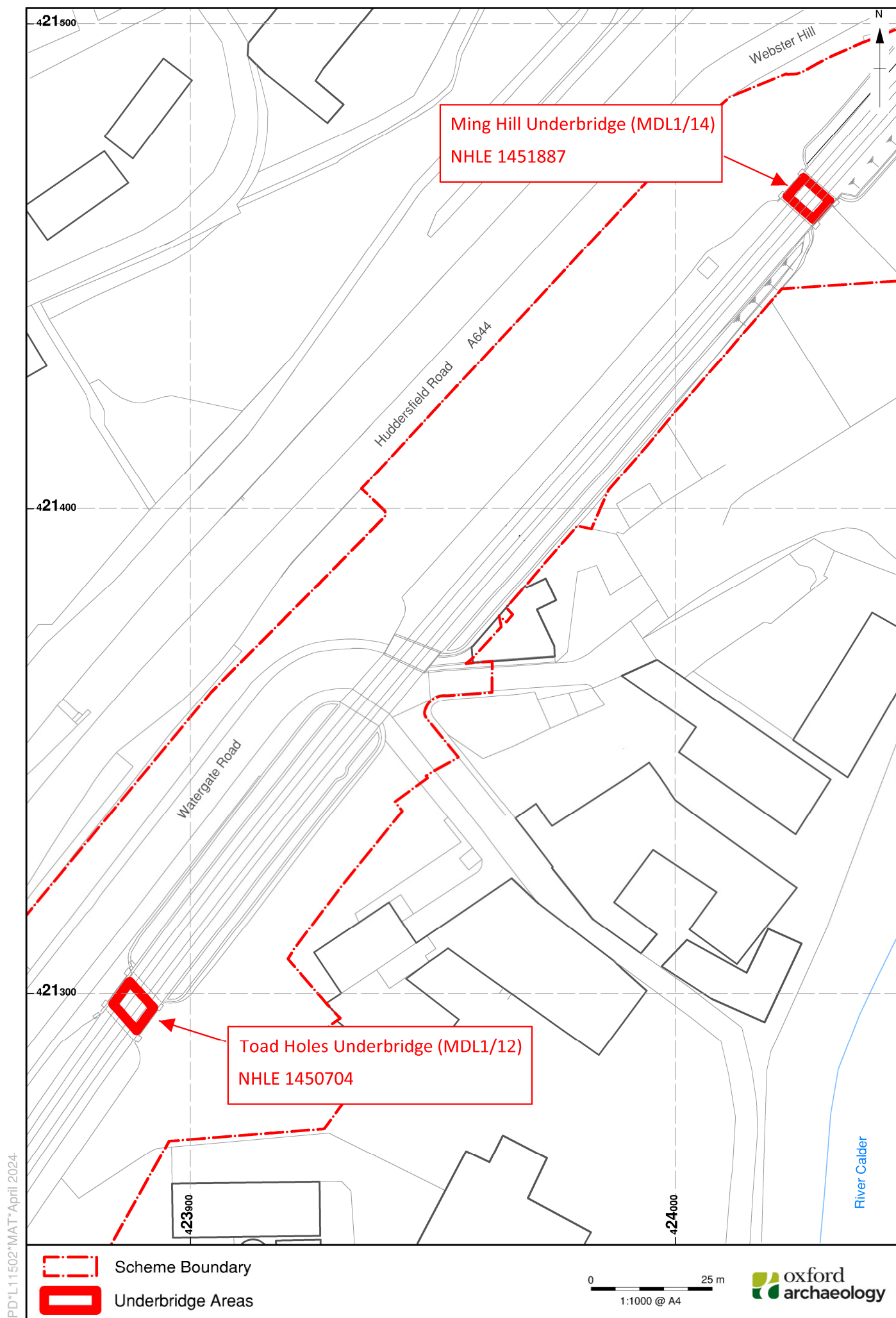


Figure 2: Listed assets plan

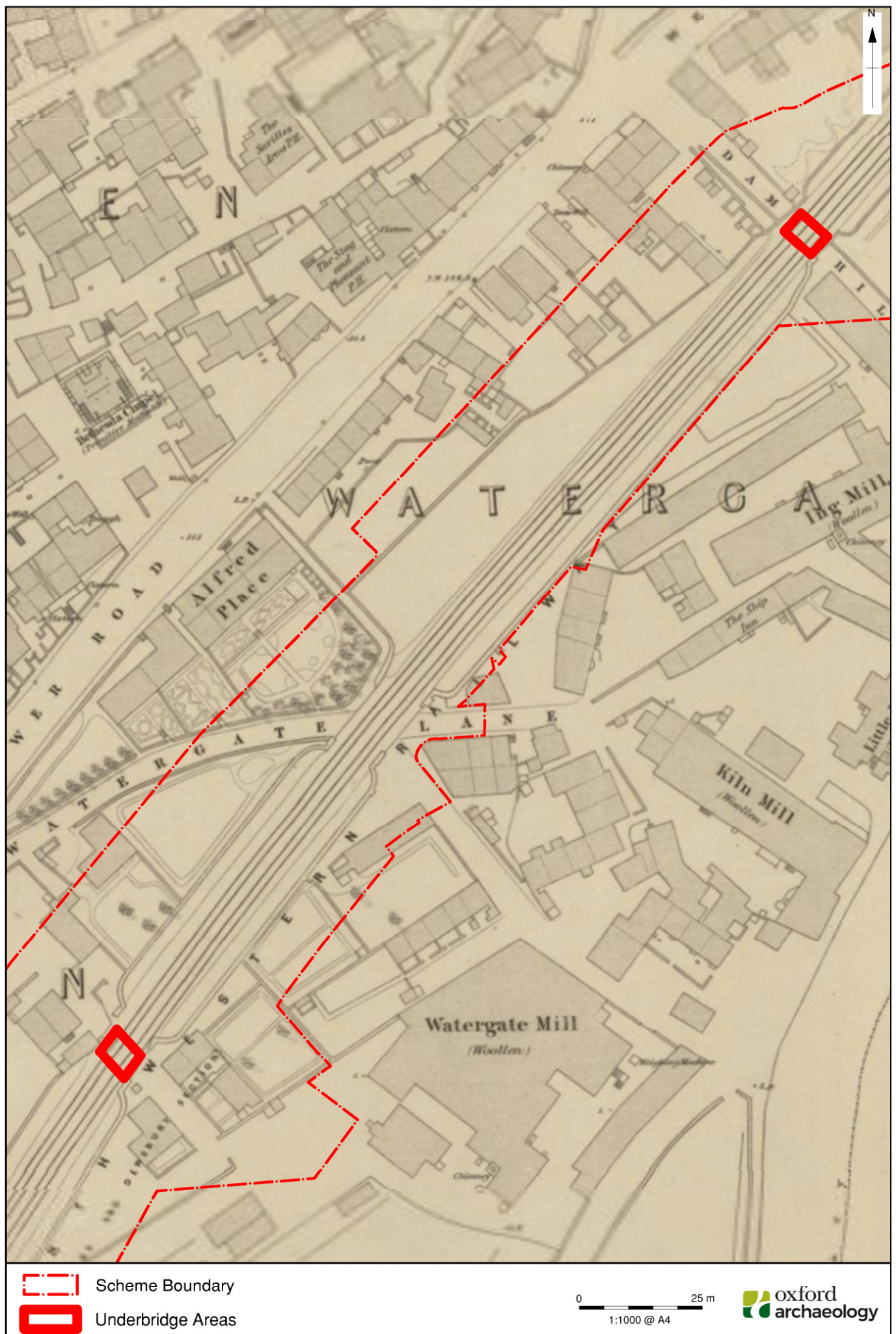


Figure 3: Structures superimposed on the Ordnance Survey town plan of 1852

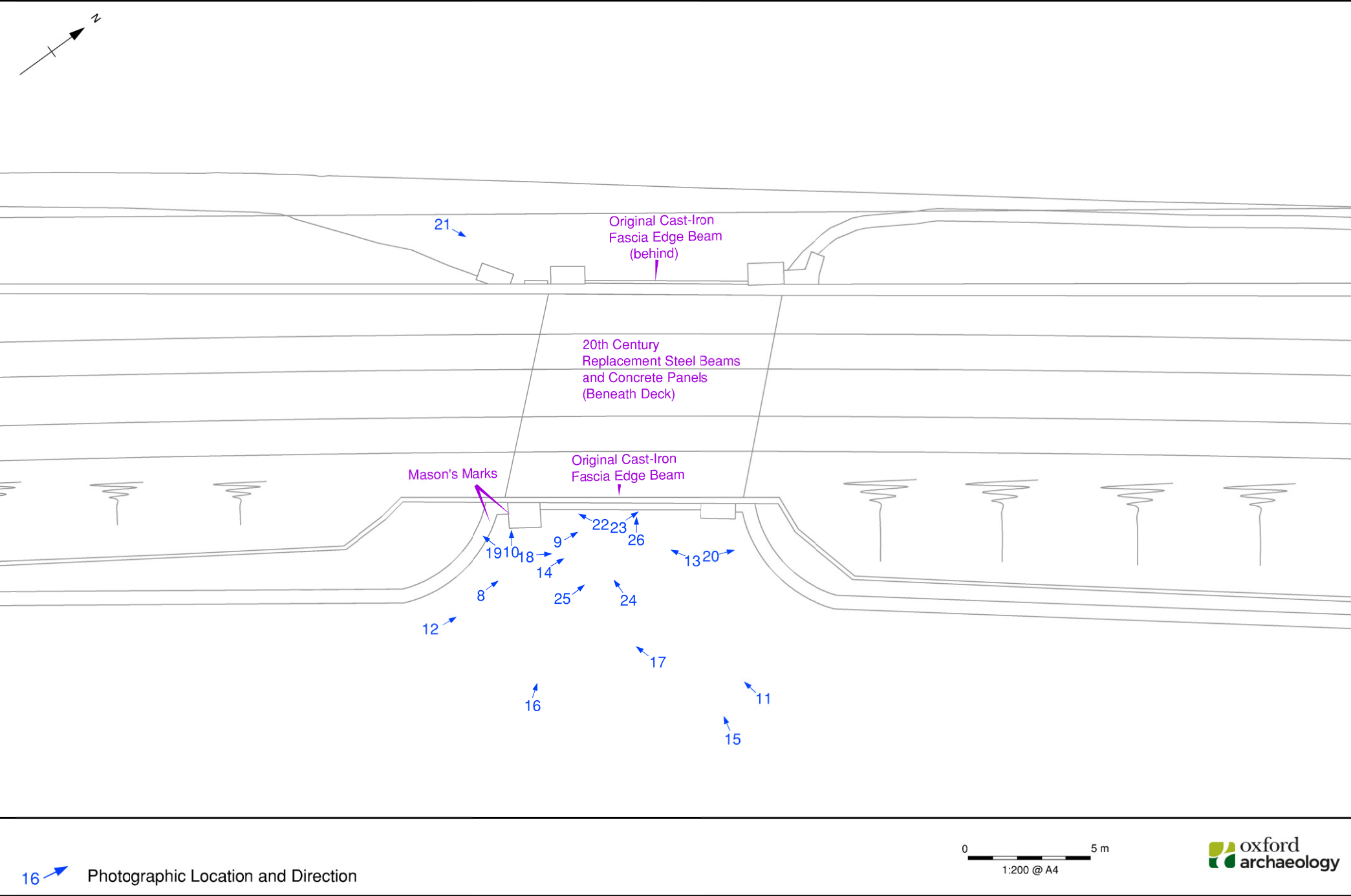


Figure 4: Toad Holes Underbridge (MDL1/12) photographic plan

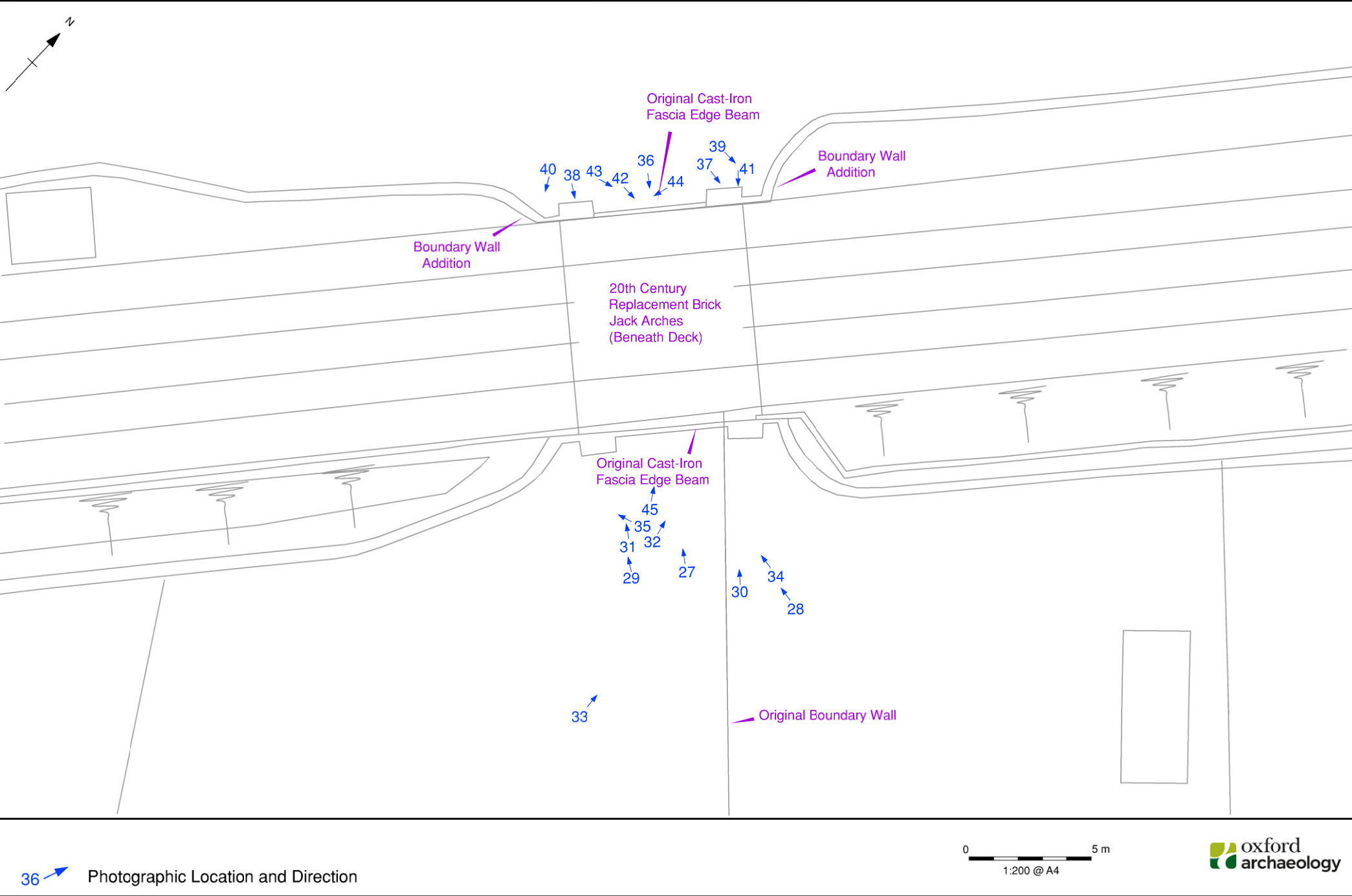


Figure 5: Ming Hill Underbridge (MDL1/14) photographic plan

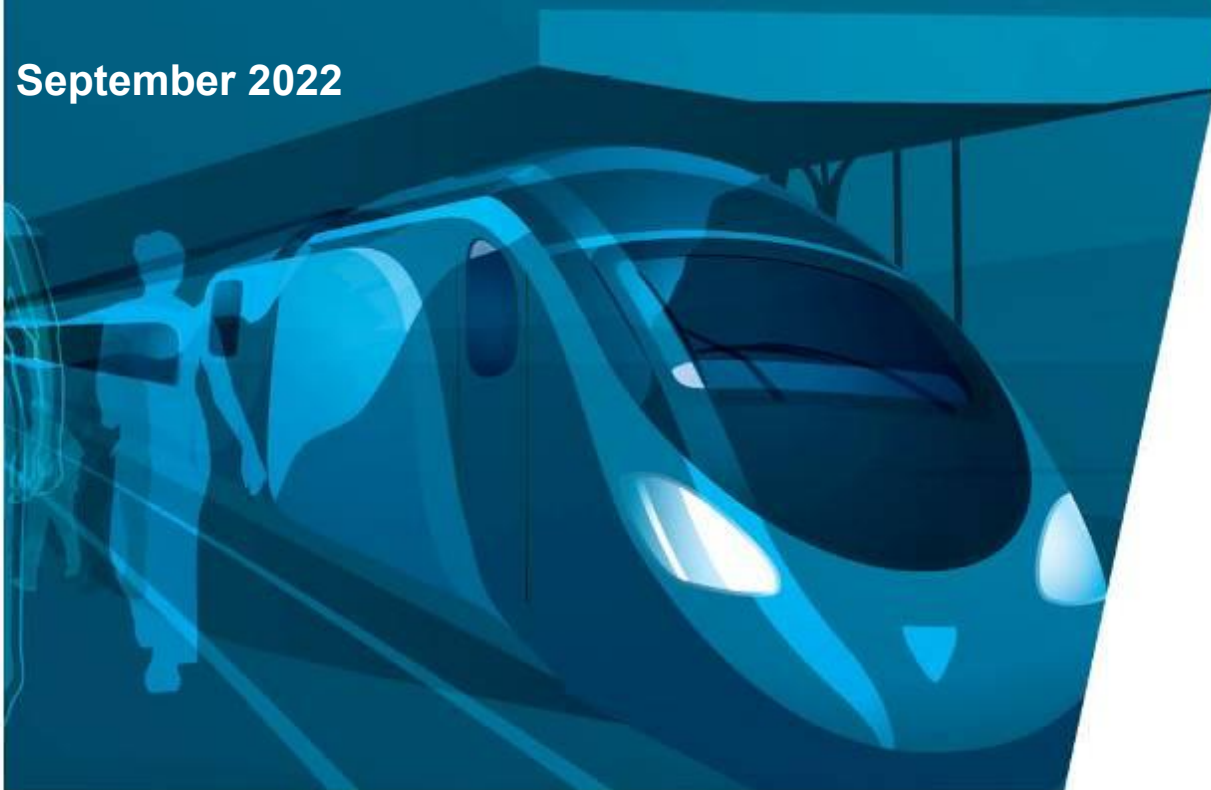
APPENDIX A WRITTEN SCHEME OF INVESTIGATION

Transpennine Route Upgrade

Written Scheme of Investigation – Toad Holes Underbridge (MDL1/12) and Ming Hill Underbridge (MDL1/14)

Network Rail

September 2022



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Insert 2-2 First Edition Ordnance Survey Six-inch map of Yorkshire (surveyed 1850-51, published 1855) showing Ming Hill Underbridge (MDL1/14) (in blue circle).....	9
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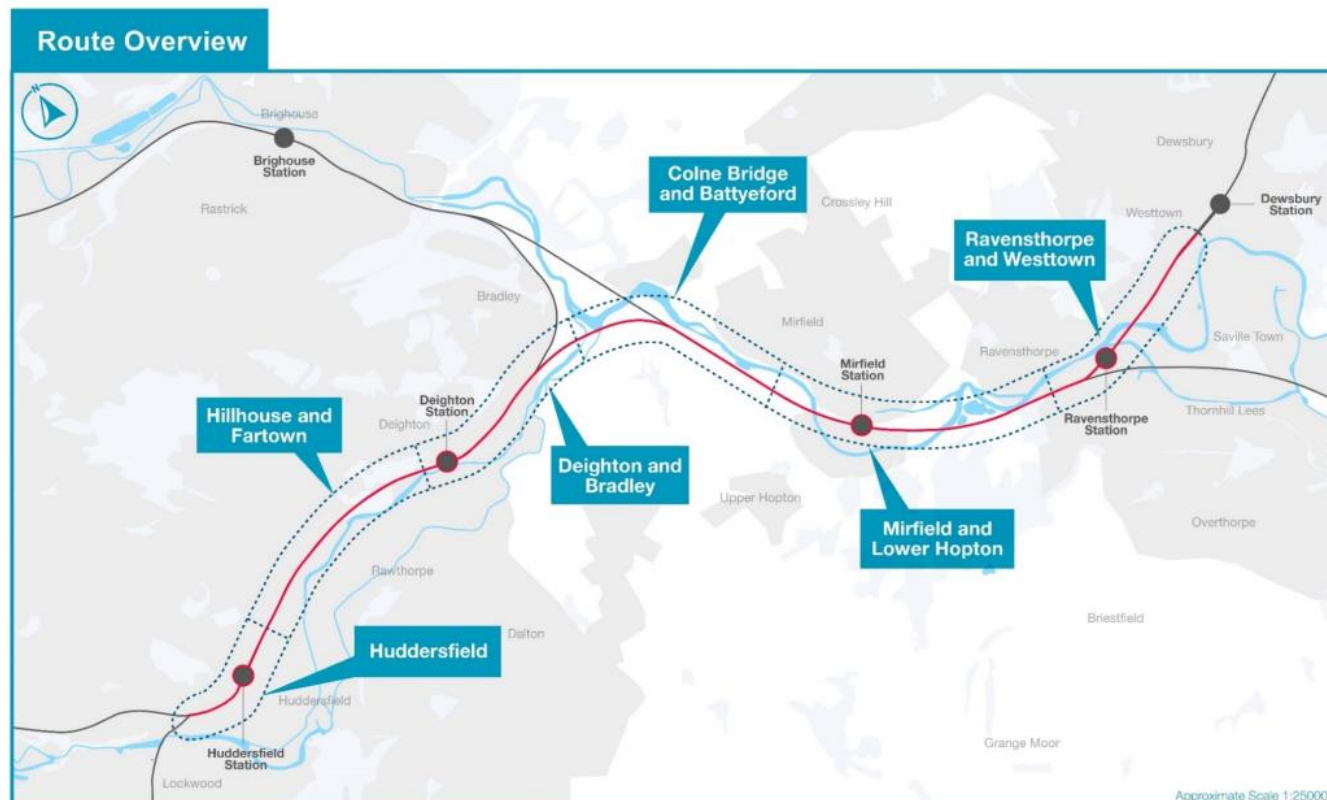
1. INTRODUCTION

1.1 The Scheme

1.1.1 The objective of the Transpennine Route Upgrade (TRU) is to improve the Transpennine railway between Manchester, Huddersfield, Leeds and York and improve connections between key towns and cities across the north of England. The works to which this document relate lie within the Network Rail (Huddersfield to Westtown (Dewsbury) Improvements) Order and will contribute to the overall TRU aims of increasing service capacity and offering journey time benefits. This will deliver four tracking and upgrading of the existing railway line including track realignment, electrification of the line, increase in line speeds and remodelling and replacement of stations, as well as various other engineering works necessary to realise the benefits of the scheme including alterations to, or replacement or demolition of, existing bridge structures.

1.1.2 For the purposes of engineering and construction, this section of TRU has been split into six sub-sections ("Route Sections") as set out below and presented indicatively in Insert 1-1.

- Route Section 1 – Huddersfield;
- Route Section 2 – Hillhouse to Fartown;
- Route Section 3 – Deighton and Bradley;
- Route Section 4 – Colne Bridge and Battysford;
- Route Section 5 – Mirfield and Lower Hopton; and
- Route Section 6 – Ravensthorpe and Westtown



Insert 1-1 Route overview of the Huddersfield to Westtown (Dewsbury) section of the Transpennine Route Upgrade (TRU), showing Route Sections.

1.1.3 Toad Holes Underbridge (MDL 1/12) and Ming Hill Underbridge (MDL 1/14) are both

situated in Route Section 6 – Ravensthorpe and Westtown.

- 1.1.4 The Written Scheme of Investigation (WSI) covers historic building recording (HBR) of the Grade II Listed Toad Holes Underbridge (MDL 1/12) and Ming Hill Underbridge (MDL 1/14). This document sets out the methodology for historic building recording to Level 2 standard.
- 1.1.5 The methodology for recording has been developed in accordance with the guidance set out in Historic England's *Understanding Historic Buildings: A Guide to Good Recording Practice*¹, which provides best practice guidance for historic building recording.
- 1.1.6 The requirement for historic building recording of these structure was identified in the Heritage Assessments² submitted in support of the Listed Building Consent applications and forms part of the agreed mitigation under the Transport and Works Act Order (TWAO) and Listed Building Consents granting the scheme consent. Prior to being formally submitted to discharge the relevant listed building consent condition, a copy of this WSI has been sent for review to the Conservation Officers at Kirklees Council and the Senior County Archaeologist at West Yorkshire Archaeology Advisory Service.

1.2 Aims and Objectives

- 1.2.1 Historic building recording of bridges and railway stations proposed for alterations and removal was identified in the Environmental Statement³ for the scheme. The requirements for historic building recording of these structures was identified as a requirement to discharge Condition 3 attached to each granted Listed Building Consent for the two structures. The wording of each condition is the same for each structure, and is as follows:

3. (Historic Structures Recording) *No works of demolition shall take place until a methodology for full structure recording has been approved in writing with the local planning authority. Subsequent recording will take place prior to demolition and be deposited with the West Yorkshire Archive Service and West Yorkshire Historic Environment Record in accordance with the timescales agreed in the approved methodology.*

- 1.2.2 The aims of the historic building recording are:
 - To document the current form and survival of historic railway structures proposed for alteration or removal on the Huddersfield to Westtown (Dewsbury) section of TRU; and
 - To provide an objective documentary record of the structures.
- 1.2.3 The objectives of the recording works are:
 - To record Toad Holes Underbridge (MDL 1/12) and Ming Hill Underbridge (MDL 1/14) to a Level 2 standard, as defined in Section 5.2 of this WSI, in line with the

¹ Historic England, 2016. *Understanding Historic Buildings: A Guide to Good Recording Practice*.

² Network Rail, 2021. *Network Rail (Huddersfield to Westtown (Dewsbury) Improvements) Order Toad Holes Underbridge (MDL1/12) – Heritage Assessment*; Network Rail, 2021. *Network Rail (Huddersfield to Westtown (Dewsbury) Improvements) Order Ming Hill Underbridge (MDL1/14) – Heritage Assessment*.

³ Network Rail, 2020. *Network Rail (Huddersfield to Westtown (Dewsbury) Improvements) Order application Environmental Statement, Volume 2i – Scheme-wide Assessment, Chapter 6 – Historic environment*.

Historic England guidance on recording within *Understanding Historic Buildings: A Guide to Good Recording Practice*⁴;

- To disseminate the results of the recording works through deposition of an ordered digital archive and detailed report with the West Yorkshire Historic Environment Record (HER); and West Yorkshire Archive Service, in accordance with the requirements of the West Yorkshire Archaeological Advisory Service (WYAAS); and
- To disseminate the results of the recording works through deposition of digital data and report with the Archaeology Data Service (ADS) and submit details of the project to the Online Access to Index of Archaeological Investigations (OASIS) Project.

⁴ Historic England, 2016. *Understanding Historic Buildings: A Guide to Good Recording Practice*.

2. HISTORICAL BACKGROUND

Historic Background - Transpennine Route

- 2.1.1 The Transpennine Route between Huddersfield and Westtown was constructed and opened between 1836 and 1849. The route today comprises sections of rail line developed by different railway companies, characteristic of the wider Transpennine Route between York, Selby and Manchester. The complex chain of companies and projects is a typical product of the “Railway Mania” of the mid-1840s, the height of a period of commercial confidence and expansion in the railways⁵.
- 2.1.2 Between Huddersfield and Westtown, the Transpennine Route is made up of sections of:
- The Manchester & Leeds Railway, constructed 1836-39, between Ravensthorpe and Heaton Lodge;
 - The Leeds, Dewsbury & Manchester Railway, constructed 1845-47, between Westtown (Dewsbury) and Ravensthorpe; and
 - The Manchester & Huddersfield Railway, constructed 1846-49, between Heaton Lodge and Huddersfield.
- 2.1.3 The line formed a new, more direct route to the West Riding from Manchester, in competition to the earlier Manchester & Leeds Railway which had been constructed through the Calder Valley in the late 1830s. The more direct route was enabled partly through the advances in tunnel construction and large-scale engineering technology, notably realised through the construction of the 3-mile Standedge Tunnel under the Pennine watershed to connect the line between the Upper Thame and Colne Valleys. Between Huddersfield and Westtown (Dewsbury), the line is partly characterised by such examples of large scale and/or pioneering engineering structures, including tunnels, viaducts and both masonry and cast-iron bridges.
- 2.1.4 The development and expansion of the railways and their associated infrastructure during the first half of the 19th century, was characterised by the considerable influence on those towns which experienced the development of this new mode of transport. The railways resulted in place-making and industrial growth, as towns benefited from the connections and influences which they brought with them. The Transpennine Route between Huddersfield and Westtown (Dewsbury) certainly had an influence on towns, forming an additional infrastructure element of the expansion of settlements such as Mirfield already underway as a result of the growth of textile, mining and maltings industries. The prime example of this is seen through Huddersfield Station, a magnificent exercise in architectural patronage, which itself influenced the growth and development of the town centre and shaped the character of Huddersfield’s architecture. Other stations along the route are more minor examples and have been altered or rebuilt during their lifetime.
- 2.1.5 Toad Holes Underbridge (MDL 1/12) and Ming Hill Underbridge (MDL 1/14) comprise elements of the supporting infrastructure which was constructed as part of this railway development. Under- and overbridges formed integral parts of the railway’s development. Whilst elements of the supporting infrastructure are often modest or functional structures, their significance results from their constituent role as part of the extensive infrastructure required for such railway lines constructed during the 19th century.

⁵ Alan Baxter Associates, 2019. *TransPennine Route Upgrade Route-wide Statement of Significance*. 14.

Historic Background – Toad Holes Underbridge (MDL1/12) and Ming Hill Underbridge (MDL1/14)

- 2.1.6 Toad Holes Underbridge (MDL1/12) and Ming Hill Underbridge (MDL1/14) were built between 1845-1847, both bridges constructed by Thomas Grainger for the Leeds, Dewsbury and Manchester Railway. The 1852 1:1,056 town plan of Dewsbury shows Toad Holes Underbridge (MDL1/12) situated between groups of buildings that were part of a woollen mill known as Watergate Mill (see Insert 2-1 below), suggesting that the bridge provided access between these two groups of buildings that were separated by the construction of the railway line. The same historic mapping indicates that Ming Hill Underbridge was provided for Dam Lane leading to Ing Mill, a textile mill, on the south-eastern side of the railway line (See Insert 2-2 below).



Insert 2-1 First Edition Ordnance Survey Six-inch map of Yorkshire (surveyed 1850-51, published 1855) showing Toad Holes, Dewsbury Underbridge (MDL1/12) (in blue circle).



Insert 2-2 First Edition Ordnance Survey Six-inch map of Yorkshire (surveyed 1850-51, published 1855) showing Ming Hill Underbridge (MDL1/14) (in blue circle).

- 2.1.7 Cast iron beams were a common form of bridge construction and were widely used for early railway bridges until the late 1840s when a series of bridge failures led to a dramatic decline in their use. There was widespread replacement due to concerns over structural capacity and safety, making Toad Holes Underbridge (MDL1/12) and Ming Hill Underbridge (MDL1/14) rare survivals of their type. The bridges are two of three very similar cast iron level beam bridges along a 400m length of the line that also survive the replacement phase; the other comprises George Street (MDL1/16) (Grade II Listed, NHLE 1451888). A fourth bridge Jack Lane (MDL1/24) (Grade II Listed, NHLE 1452193) located approximately 1.6km north-east is another example of a cast iron Grainger designed beam bridge albeit with parapets that have a slightly different design approach.
- 2.1.8 Although the bridges represent surviving examples of cast iron level beam bridges from the 1840s, both have undergone substantial alteration since their construction. In the early 1900s, the central portion of each bridge deck were replaced; in the case of Toad Holes Underbridge (MDL1/12), this was with steel cross-girders and concrete decks, while the central portion of the deck of Ming Hill Underbridge (MDL1/14) was replaced with brick jack arches supported on riveted plate steel girders. In c.1970, the clearance of the buildings surrounding both bridges and the need for a road realignment to facilitate the widened A644 (and, in the case of Toad Holes Underbridge (MDL1/12) the realignment of Watergate Road, c. 10m north-west of the bridge) resulted in the infilling of the north-western approach to both bridges.

3. STANDARDS AND GUIDANCE

3.1.1 The archaeological buildings investigation, recording and reporting shall be undertaken in accordance with the following standards and guidance:

- Chartered Institute for Archaeologists, 2014a (Revised 2021). *Code of Conduct*;
- Chartered Institute for Archaeologists, 2014b. *Standard and Guidance for the archaeological investigation and recording of standing buildings or structures*;
- Chartered Institute for Archaeologists, 2014c. *Standard and Guidance for the creation, compilation, transfer and deposition of archaeological archives*;
- Department of Housing, Communities and Local Government, 2019 (Revised 2021). *National Planning Policy Framework*;
- English Heritage [now Historic England], 2008. *Conservation Principles Policies and Guidance: For the sustainable management of the historic environment*;
- Historic England, 2015a. *Historic Environment Good Practice Advice in Planning: Note 2 – Managing Significance in Decision-Taking*;
- Historic England, 2015b. *Digital Image Capture and File Storage Guidelines for Best Practice*;
- Historic England, 2016. *Understanding Historic Buildings: A guide to good recording practice*;
- Historic England, 2017 (Second Edition). *Historic Environment Good Practice Advice in Planning: Note 3 – The Setting of Heritage Assets*; and
- Institute of Historic Building Conservation (IHBC), 2007. *Code of Conduct*.

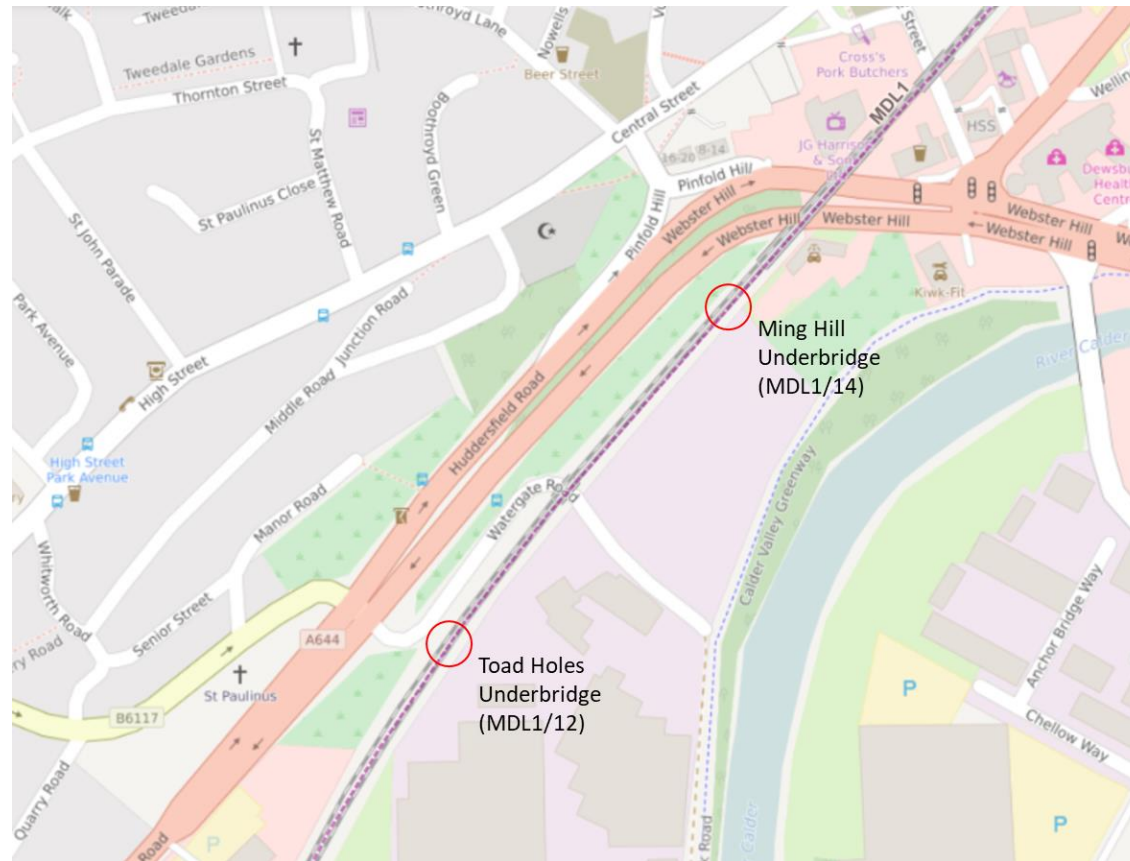
4. SCOPE OF WORKS

- 4.1.1 Historic building recording, as outlined in this WSI, is required to be undertaken of Grade II Listed Toad Holes Underbridge (MDL 1/12) and Ming Hill Underbridge (MDL 1/14) as set out in Table 4-1 below. These structures are shown on the following Drawings submitted as part of the Network Rail (Huddersfield to Westtown (Dewsbury) Improvements) Order submission and the associated Listed Building Consent applications:
- Planning Drawing (151667-TSA-W3-000-DRG-T-LP-162953)
 - Toad Holes Underbridge (MDL1/12)
 - Existing and Proposed Plan (151667-TSA-35-MVN2-DRG-T-LP-163900)
 - Existing and Proposed Elevations (151667-TSA-35-MVN2-DRG-T-LP-163901)
 - Existing and Proposed Sections (151667-TSA-35-MVN2-DRG-T-LP-163902)
 - Ming Hill Underbridge (MDL1/14)
 - Existing and Proposed Plan (151667-TSA-35-MVN2-DRG-T-LP-163920)
 - Existing and Proposed Elevations (151667-TSA-35-MVN2-DRG-T-LP-163921)
 - Existing and Proposed Sections (151667-TSA-35-MVN2-DRG-T-LP-163922).
- 4.1.2 Engineering drawings showing the detailed design developed during the period following the approval of the Order will be provided to the building recorder where appropriate.

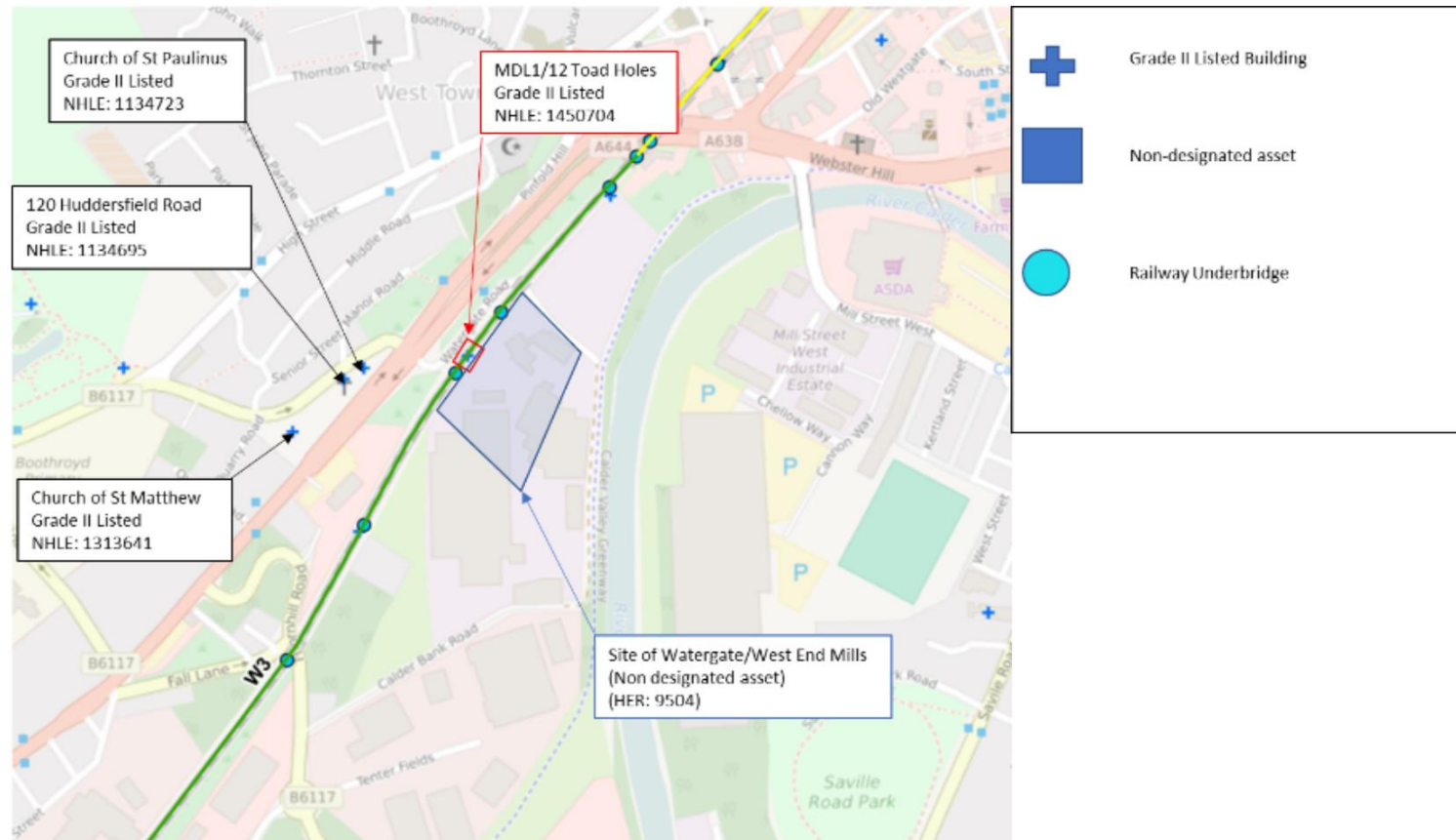
Table 4-1 Structures to be recorded

Asset Reference	Asset name	NGR	Route Section	Summary Description	Level
MDL 1/12	Toad Holes Underbridge	SE 23888 21297	Ravensthorpe and Westtown	Description: A cast iron level bridge, built 1845-1847 as a railway accommodation underbridge designed by Thomas Grainger in the 1830s for the Leeds, Dewsbury and Manchester Railway. Setting: Set in a railway context in an industrial context with industrial units on either side. The structure has been partially infilled. Significance: Notable as a surviving example of a Thomas Grainger bridge on the Transpennine route dating to the Heroic Age (1841-50) of railway building. Has group value with a sequence of three bridges.	Level 2
MDL 1/14	Ming Hill Underbridge	SE 24028 21464	Ravensthorpe and Westtown	Description: A cast iron level beam railway underbridge engineered by Thomas Grainger in the 1830s for the Leeds, Dewsbury and Manchester Railway. Setting: Set in a railway context in a rural environment with wooded land both sides of the bridge. The structure has been partially infilled. Significance: Notable as a surviving example of a Thomas Grainger bridge on the Transpennine route dating to the Heroic Age (1841-50) of railway building. Has group value with a sequence of three bridges.	Level 2

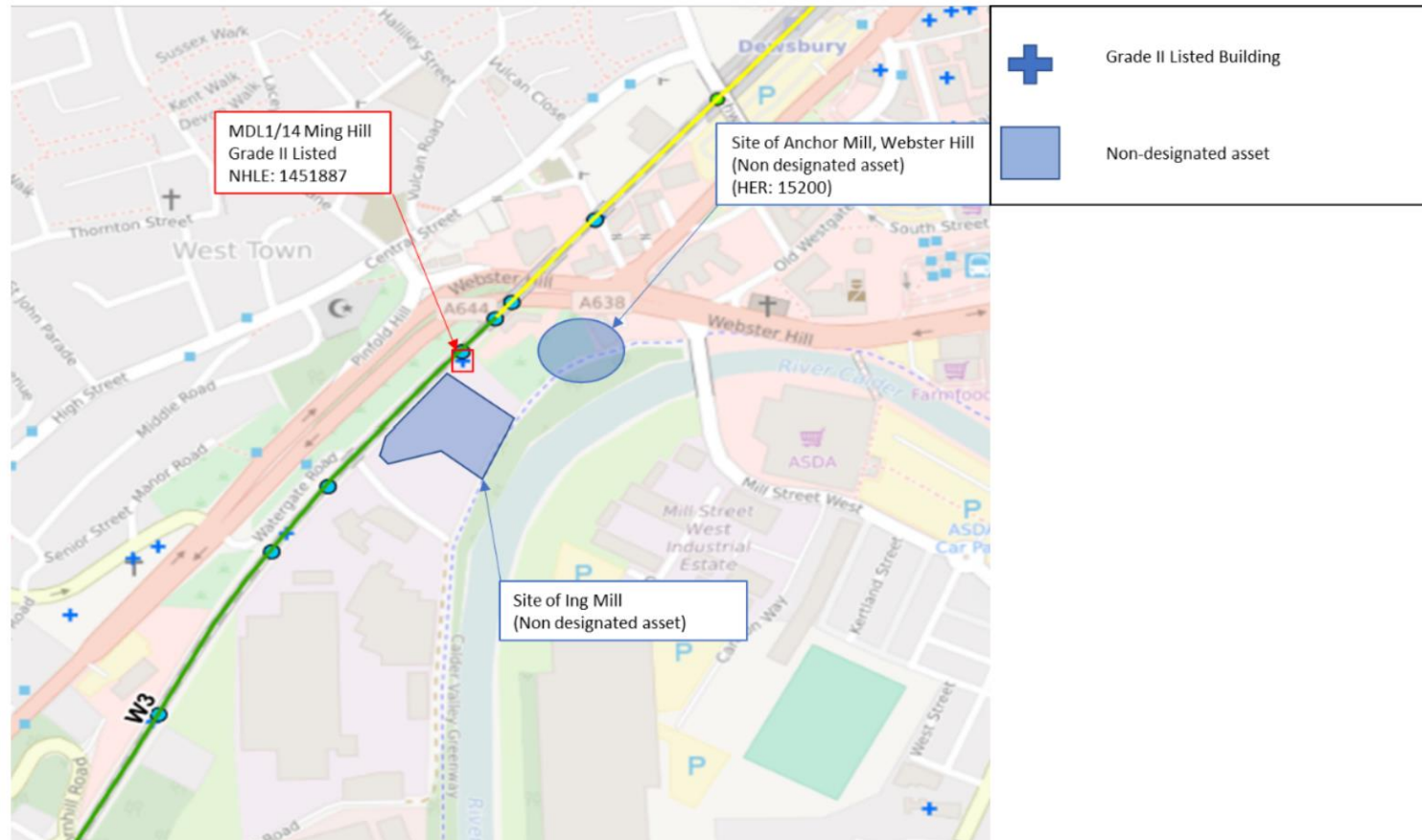
- 4.1.3 The locations of these structures are shown in the location plans in Inserts 4-1 to 4-3 below, with photographs of the structures included in Inserts 4-4 to 4-7.



Insert 4-1 Toad Holes Underbridge (MDL1/12) and Ming Hill Underbridge (MDL1/14) Location Plan.



Insert 4-2 Toad Holes Underbridge (MDL1/12) Location Plan showing nearby heritage assets.



Insert 4-3 Ming Hill Underbridge (MDL1/14) Location Plan showing nearby heritage assets.



Insert 4-4 Toad Holes Underbridge (MDL1/12) - south east elevation.



Insert 4-5 Toad Holes Underbridge (MDL1/12) - infilled north western approach from Watergate Road.



Insert 4-6 Ming Hill Underbridge (MDL1/14) - south-eastern elevation.



Insert 4-7 Ming Hill Underbridge (MDL1/14) – north-western infilled side of structure.

Access requirements

- 4.1.4 The assets covered in this WSI are partly accessible from the public highway or public footpaths. Where access may be required off public rights of way to view certain areas of the asset, the details of this are provided below.
- 4.1.5 If the railway corridor is to be accessed, track access must be in place prior to undertaking the survey and will be arranged. **Track access should be considered as only to be utilised if absolutely essential to the survey.** Other approaches should be exhausted in planning before the need for track access is confirmed.
- 4.1.6 There are additional access requirements/restrictions at the assets as detailed below.
- 4.1.7 Due to the access restrictions for both bridges, liaison with the TRU Alliance, ***must*** be undertaken to arrange a suitable date to undertake the survey.
- 4.1.8 Specific requirements for access procedures will be included in the relevant Work Package Plans (WPPs) and Task Brief Sheets (TBSs) for the surveys (see below, Section 6.2).

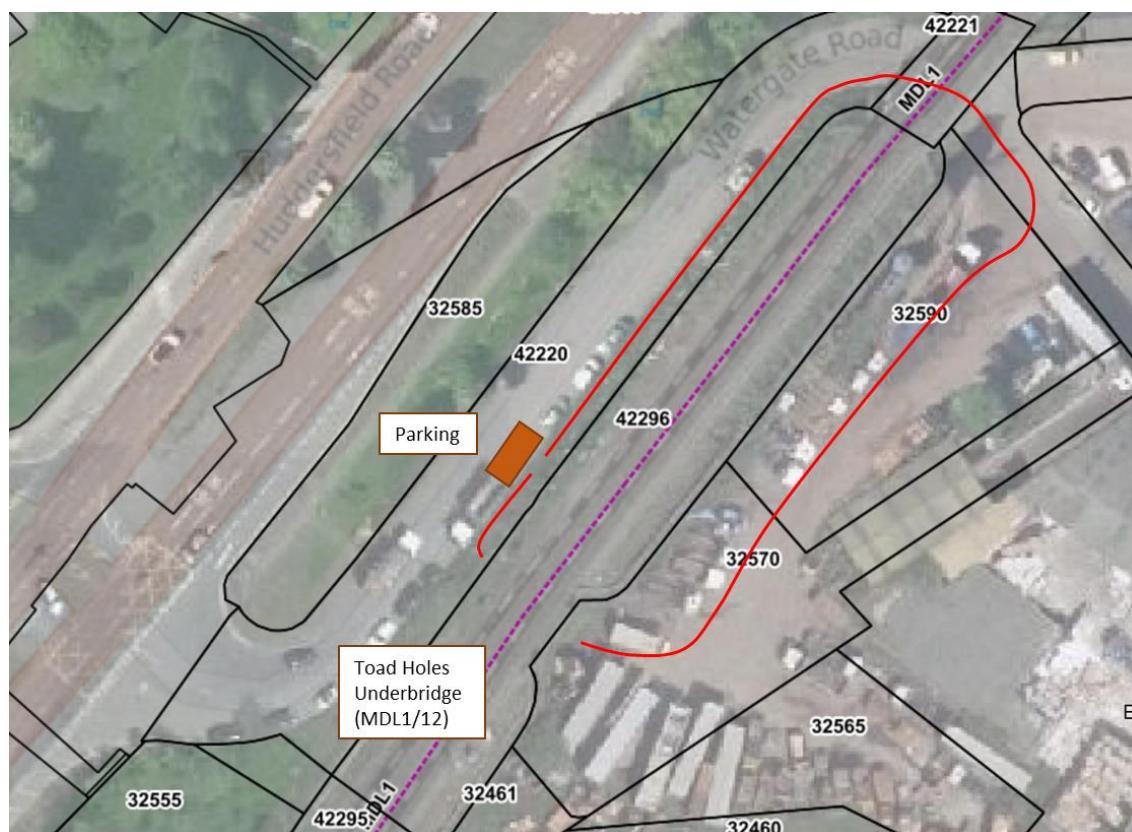
Toad Holes Underbridge (MDL 1/12)

- 4.1.9 Toad Holes Underbridge (MDL 1/12) is located to the south-east of Watergate Road; the north-western side of the structure facing the public right of way of Watergate Road is largely infilled to road level. Access to the south-eastern side of the structure is located across land in third party ownership.
- 4.1.10 To access Toad Holes Underbridge (MDL1/12), vehicles shall park on Watergate Road, with access to the third party land plots for surveying the south-eastern side of the bridge undertaken on foot, via Watergate Road, passing underneath Watergate Road Underbridge (MDL1/13) (see Figure 4-8 below). The infilled north-western side of the structure can be viewed from the publicly accessibly verge of Watergate Road, with care taken due to proximity to the railway.
- 4.1.11 Liaison to agree access arrangements with third party landowners will be undertaken by the TRU Alliance or its representatives. Full details of access arrangements will be provided advance of the survey being undertaken, the building recorder on site will need to adhere to any access parameters agreed with these landowners who may have health and safety protocol in place.

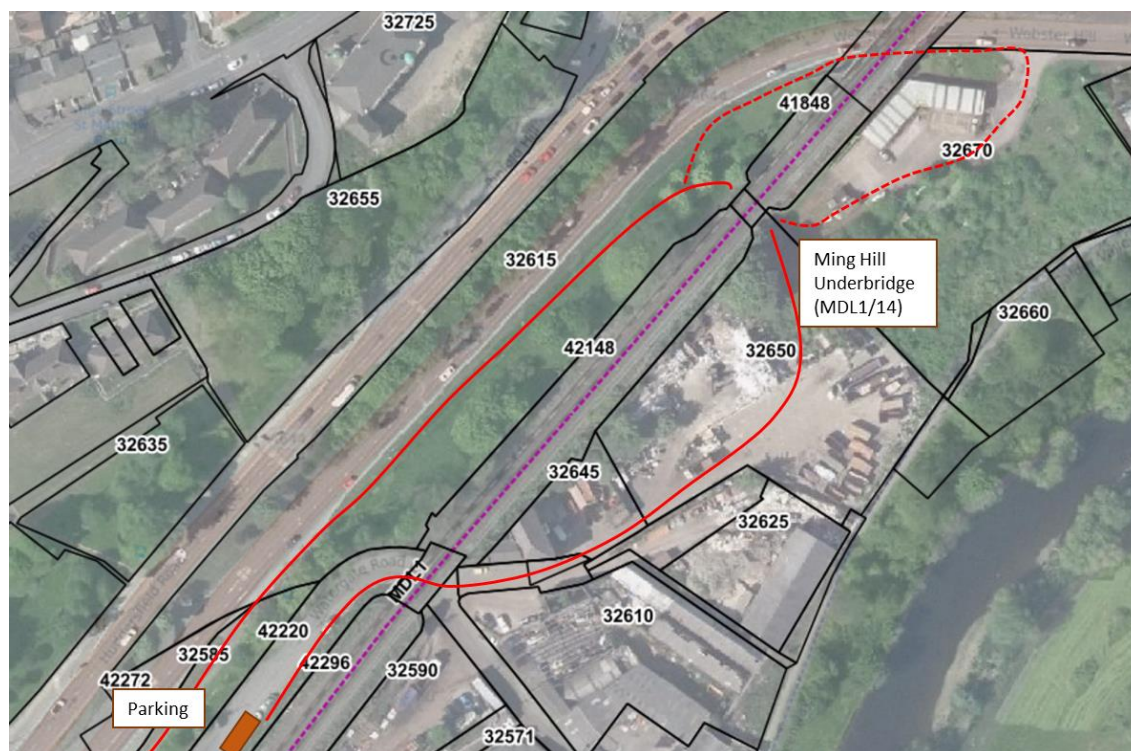
Ming Hill Underbridge (MDL 1/14)

- 4.1.12 Ming Hill Underbridge (MDL 1/14) is located south-east of A644 Huddersfield Road; the north-western side of the structure facing the public right of way of Huddersfield Road is largely infilled to road level. Access to the south-eastern side of the structure is located across land in third party ownership.
- 4.1.13 To access Ming Hill Underbridge (MDL1/14), vehicles shall park on Watergate Road, with access to the third party land plots for surveying the south-eastern side of the bridge undertaken on foot. The majority of the south-eastern side should be accessible via Watergate Road, passing underneath Watergate Road Underbridge (MDL1/13) and through third party land (see Figure 4-9 below). Should further access to enable survey from the north-east be required, this could be achieved on foot via A644 Huddersfield Road and through third party land to the north-east. The infilled north-western side of the structure can be viewed from the publicly accessibly verge on the south-eastern side of A644 Huddersfield Road, with care taken due to proximity to the railway.

- 4.1.14 Liaison to agree access arrangements with third party landowners will be undertaken by the TRU Alliance or its representatives. Full details of access arrangements will be provided advance of the survey being undertaken, the building recorder on site will need to adhere to any access parameters agreed with these landowners who may have health and safety protocol in place.



Insert 4-8 Parking and walking route to survey Toad Holes Underbridge (MDL1/12).



Insert 4-9 Parking and walking route to survey Ming Hill Underbridge (MDL1/14) – note dashed line shows route to north-eastern end of structure, if required.

5. METHODOLOGY

5.1 Documentary research

5.1.1 Documentary research shall be undertaken to supplement the information to understand the historical background of the assets and to supplement the information already provided by the Environmental Statement for the Order Scheme and the Heritage Assessment produced to accompany the Listed Building Consent application. This shall involve examination of available historic maps, photographs, plans and other records held by the local record office, Network Rail or other archives as required.

5.1.2 Some existing resources will be provided to the Contractor by Network Rail. These are identified in the following sections of this WSI.

5.2 Historic building recording to Level 2 standard

5.2.1 A Level 2 record is defined in the Historic England guidance as: “a *descriptive record*” which will produce an analysis of the building’s development and use, but which will not discuss in detail the evidence on which this analysis is based.

Drawn record

5.2.2 A drawn record shall be prepared of Toad Holes Underbridge (MDL 1/12) and Ming Hill Underbridge (MDL 1/14). As a minimum the drawn record shall include:

- Dimensioned / measured plans of the structures as existing. These will identify evidence for phasing, alteration, structural features of historic significance, evidence for fixtures and fittings etc. All plans will have a grid north point and an appropriate drawn metric scale clearly visible. Existing plans may be used where available, these plans will be provided by Network Rail (see below, 5.2.4); and
- Measured drawings of significant structural, functional or architectural detail which cannot be captured in a single photograph or are so complex as to render features difficult to interpret in a photograph.

5.2.3 All drawings shall be annotated with information on structural detail, changes in building material, evidence for phasing, function and alteration, and any other relevant architectural detail. All drawings will be produced using drawing conventions as laid out in *Understanding Historic Buildings: A guide to good recording practice* (Historic England 2016).

5.2.4 Existing plans for each bridge will be supplied by Network Rail and may be employed as the basis for the drawn record, subject to verification and checking for accuracy. In the case of Toad Holes Underbridge (MDL 1/12) and Ming Hill Underbridge (MDL 1/14), existing measured plans of the bridge are available, including:

- Point cloud data from laser scans of the structures (available in CAD and POD format)
- Measured drawings of the structures previously produced for the TWA Order and Listed Building Consent applications; and
- Archival drawings of the structures from the National Rail National Records Group (NRG) archives.

5.2.5 As both bridges are partially infilled, with access under the decks consequently partly restricted, it is recognised that drawn record of the structures may consequently be limited. As a result, where appropriate, approximate dimensions on plans, elevations and sections can be used, identified appropriately for clarity of understanding and interpretation.

Photographic record

5.2.6 A photographic record of the structures will be made using a high resolution DSLR camera with a minimum of 10 megapixel resolution to capture colour images, using a tripod where

necessary. The photographic record of the site shall be used to amplify and illuminate the archive drawings and supplement and verify the written record. Cameras with an FX sensor, which is close to equivalency with 35mm film, are preferable to DX sensor equipped cameras.

- 5.2.7 The photographic record of the site shall be used to amplify and illuminate the archive drawings and supplement and verify the written record.
- 5.2.8 As a minimum the photographic record will include:
- General views of each structure in its wider setting and landscape, where these can be safely obtained from public rights of way or from third party land where access has been granted;
 - The overall appearance of each structure, including oblique and parallel shots. Typically, a series of oblique views showing all external elevations of each bridge, to give an overall impression of its size and shape. Where an individual elevation embodies complex historical information, views at right angles to the plane of the elevation and detail shots will be required;
 - The overall appearance of the principal circulation / accommodation routes over or under the structures (i.e. over or under the deck / arch);
 - Any external architectural detail, structural, functional or decorative, which is relevant to the structures' design, development or use and which does not show adequately on general photographs;
 - Where appropriate, more detailed shots of elements of historic fabric that would be particularly impacted by the works proposed; and
 - Any dates or other inscriptions; any signage, makers' plates or graffiti which contribute to an understanding of the structures. A transcription should be made wherever characters are difficult to interpret.
- 5.2.9 Care should be taken to ensure sharply focused well composed photographs are taken and when appropriate the camera should be set up and levelled on a tripod, for example when recording facades and larger interior spaces. The use of perspective shift lenses or pan and tilt adaptors may be necessary in some situations to achieve an acceptable image. Alternatively, lens distortion may be removed post-capture by software but this must be recorded in the photographic catalogue and details of the software used given in the report. Original pre-correction images should be included in the site archive. Photographs should be taken with a low ISO setting and low shutter speed to reduce noise in the images captured. All photographs will have a suitable scale (for example, 2m rather than 1m ranging pole, 10cm scales for detail) clearly visible in each photo.
- 5.2.10 Digital images shall be supplied in TIFF and JPG format and shall be taken using the highest resolution possible. All digital photography and subsequent data storage shall follow Historic England guidance provided in *Digital Image Capture and File Storage Guidelines for Best Practice*.⁶
- 5.2.11 A photographic register detailing (as a minimum) location, direction and subject of shot must accompany the photographic record. The position and direction of each photograph and slide should be noted on a plan of each structure. The contractor must include metadata embedded in the image file. This metadata must include the following: the commonly used name for the site being photographed, the relevant centred OS grid coordinates for the site to at least six figures, the relevant township name (**Huddersfield**) the date of photograph, the subject of the photograph, the direction of shot and the name of the organisation taking

⁶ Historic England, 2015b. *Digital Image Capture and File Storage Guidelines for Best Practice*.

the photograph.

Written record

- 5.2.12 A written record of each structure will be made on site. This will include the following:
- The precise location of each building as an address and in the form of a National Grid reference (NGR);
 - A note of any statutory designation (i.e. Listing, Conservation Area);
 - The date when the record was made, the name(s) of the recorder(s) and the location of any archive material; and
 - A summary statement describing each building's type or purpose, historically and at present, its materials and possible date(s) so far as these are apparent from the inspection.
- 5.2.13 The written recording of the structures, historic surfaces and associated heritage assets shall be undertaken using pro forma record forms and should include examinations of the buildings' exterior and interior fabric.

5.3 Post-Fieldwork reporting

- 5.3.1 A single historic building report shall be provided presenting the results of the Level 2 Historic Building Recording of both bridges. As a minimum this report shall include:
- A non-technical summary of the results (an 'abstract');
 - A description of the background to and circumstances of the work. This shall include the dates on which the survey was undertaken;
 - The structures' location, parish and National Grid References (NGRs);
 - Aims and objectives of the historic building recording;
 - A description of the methodology used for the survey;
 - Historical background;
 - A statement which will summarise the buildings' form, function, date and sequence of development, and identify the architects, builders, patrons and owners if known;
 - Interpretation of the results and assessment of the significance of the findings of the historic building recording on a local, regional and national basis;
 - General and detailed location plans at appropriate scales, showing the location of the buildings. The general location plan shall be presented at not less than 1:10,000 scale, and detailed location plans shall be presented at not less than 1:100 scale;
 - Plan drawings presenting the results of the Level 2 Historic Building Recording. Drawings shall be presented at an appropriate scale and in accordance with the guidance and conventions provided in *Understanding Historic Buildings: A Guide to Good Recording Practice*.⁷ All elevations will have an appropriate drawn metric scale clearly visible and should be cross-referenced to the relevant plans and overall site plan;
 - Reproduction of the complete photographic record produced at a high resolution and at sufficient size to make the detail in each photograph fully visible upon reproduction;
 - A detailed selection of colour digital photographs to illustrate the written report;
 - Fully referenced bibliography and cartographic sources;

⁷ Historic England, 2016. *Understanding Historic Buildings: A Guide to Good Recording Practice*

- Photographic registers as an appendix in addition to drawn photographic plans detailing the position and direction of each shot at an appropriate scale;
- Index to and location of the archive;
- Copy of this WSI within an appendix; and
- OASIS form within an appendix.

5.3.2 In addition to the specific requirements identified above, the report shall include:

- A title page, which includes the name of the project, the title of the report, the name of the Sub-Consultant.
- The logo of the Client shall appear on the front cover of the report;
- A unique report number or reference;
- Report author(s) and company/organisation details where appropriate;
- Date when the report was completed;
- An accurate 6 figure NGR grid reference centred on the project location;
- Clear reference to the Listed Building Consent applications, including the wording of the relevant conditions; and
- Primary Record Numbers (PRN) referenced for structures recorded in the West Yorkshire HER (where applicable).

5.3.3 A draft of the report shall be submitted to the Project Heritage Lead for comment no later than four weeks after the completion of the fieldwork. Any comments provided shall be addressed within 5 working days of receipt and a revised draft submitted for approval. This revised draft will subsequently be submitted to Kirklees Council and West Yorkshire Archaeology Advisory Service (WYAAS) for comment and any comments provided by the Council or WYAAS shall be addressed within 5 working days of receipt.

5.3.4 When submitted to Kirklees Council for comment, the draft report should be submitted to the appropriate Conservation Officer responding to all discharge of condition applications for this structure. Contact details will be provided to the building recorder in advance of submission of the draft report.

5.4 Submission of report

5.4.1 When complete the historic building recording report shall be submitted to the Project Heritage Lead for it to be sent to the following repositories:

- A digital and hard copy of the final report for Kirklees Council;
- A digital copy for West Yorkshire Historic Environment Record (HER), West Yorkshire Archive Service and the Archaeology Data Service (ADS) which will be accompanied by an archive of digital images and other digital outputs/data where available.

5.4.2 In light of the requirement for the completed historic building report to be submitted to West Yorkshire HER, the Contractor must complete the report in accordance with the archiving requirements set out in the building recording specifications of the West Yorkshire Archaeological Advisory Service (WYAAS) (see below, Section 5.6 for further details).

5.5 Copyright

- 5.5.1 This document and its contents have been prepared and are intended solely for Client Purpose.
- 5.5.2 Network Rail assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.
- 5.5.3 The report will be supplied on the understanding that it will be added to the West Yorkshire Historic Environment Record where it will be publicly accessibly once deposited with the WYAAS unless confidentiality is explicitly requested, in which case it will become publicly accessible six months after deposition. Please note that by depositing this report, the contractor gives permission for the material presented within the document to be used by the WYAAS, in perpetuity, although The Contractor retains the right to be identified as the author of all project documentation and reports as specified in the Copyright, Designs and Patents Act 1988 (chapter IV, section 79). The permission will allow the WYAAS to reproduce material, including for commercial use by third parties, with the copyright owner suitably acknowledged.

5.6 Archiving

- 5.6.1 Post-fieldwork archiving shall be undertaken in accordance with the requirements of the *Standard and Guidance for the creation, compilation, transfer and deposition of archaeological archives* (ClfA 2014b), and the requirements of the building recording specification of WYAAS on behalf of West Yorkshire HER. Digital data generated during the recording works, including the full digital photographic archive shall be prepared in accordance with the requirements of the Archaeology Data Service (ADS). Photographs and reports should be archived used the ADS Easy online service.
- 5.6.2 Immediately upon completion of the finalised report, the report and any data or other documentation produced during the recording works shall be integrated into the site archive. The archive shall be stored in suitable conditions in a secure location until instructions are received from the Project Heritage Lead for its transfer to the final repositories.
- 5.6.3 West Yorkshire HER support the Online Access to Index of Archaeological Investigations (OASIS) Project. The overall aim of the OASIS project is to provide an online index to the mass of archaeological grey literature that has been produced as a result of the advent of large-scale developer funded fieldwork. On completion of the report, the Contractor will make a copy accessible to the wider research community by submitting it to the OASIS Project.

5.7 Programme

- 5.7.1 An outline programme for the historic building recording is provided below:

Table 5-1 Programme for the historic building recording

Stage of Works		Timings
Site works / recording	Toad Holes Underbridge (MDL 1/12)	Winter 2022
	Ming Hill Underbridge (MDL 1/14)	
Submission of draft report to Project Heritage Lead for comment		4 weeks after completion of fieldwork
Project Heritage Lead review of draft report		2 weeks from submission of draft report

Stage of Works	Timings
Submission of draft report to Kirklees Council for comment	1 week from receipt of comments
Kirklees Council review of draft report	2 weeks from submission of draft report
Submission of final report to Project Heritage Lead (which will deposit with Kirklees Council; digital copy with West Yorkshire Historic Environment Record (HER), West Yorkshire Archive Service and the Archaeology Data Service (ADS), OASIS)	1 week from receipt of Kirklees Council comments

6. STANDARDS AND RESPONSIBILITIES

6.1 Project role definitions

6.1.1 The following project roles are relevant to this document:

- Network Rail as Promoter of the Scheme.
- The Employer means BAM Nuttall, who will appoint the Contractor.
- Project Heritage Lead means the individual appointed by the Employer to fulfil this role;
- Contractor means the archaeological organisation appointed by the Employer to carry out the works as defined in this Written Scheme of Investigation (WSI); and
- The Curator means West Yorkshire HER, West Yorkshire Archaeological Advisory Service (WYAAS) and Kirklees Council archaeological officers and conservation officers, or their representatives on this project

6.2 Health and safety considerations

- 6.2.1 All works are to be carried out in accordance with the appropriate Chartered Institute for Archaeologists (CIfA) guidance standards, Health & Safety legislative requirements and TRU project procedures.
- 6.2.2 Staff undertaking the historic building recording shall undertake a project induction, which will be organised and led by the Employer, subject to the requirements of the TRU project.
- 6.2.3 The Contractor shall prepare project-specific Health and Safety Work Package Plans (WPPs) and Task Brief Sheets (TBSs), in line with the TRU project procedures for such WPPs and TBSs, and submit these to the Project Heritage Lead for approval via the TRU Alliance prior to starting on site. No work shall be undertaken on site until these documents have been approved by the TRU Alliance. If amendments are required to these documents during the works, the Project Heritage Lead and the Employer must be provided with the revised document at the earliest opportunity.
- 6.2.4 As detailed above, **track access should be considered as only to be utilised if absolutely essential to the survey.** Other approaches should be exhausted in planning before the need for track access is confirmed. Where required, for example at stations and for trackside surveys, work must be carried out under the direction and supervision of a Safe Work Leader (SWL), Separated Zone Working with Site Warden warning.
- 6.2.5 Any site supervision or accompaniment from the client team during the survey works will be outlined in the required WPP and TBS documents and must be adhered to.

6.3 Monitoring

- 6.3.1 The Curators have a statutory duty to monitor fieldwork. Fieldwork may be subject to monitoring visits by the Project Heritage Lead and the relevant Curator(s). The Project Heritage Lead and Curator(s) will have unrestricted access to the records or any other information. The work will be inspected to ensure that it is being carried out to the required standards and that it will achieve the stated objectives in line with the approved WSI.

6.4 Communication and engagement

- 6.4.1 All enquiries on the archaeological works from Stakeholders and interested parties (including the media) should be referred to the Project Heritage Lead.
- 6.4.2 If confronted by members of the public, ensure communication is polite and respectful. If staff are abused verbally by members of the public or there is clear intent to harm staff, the

Contractor should take appropriate action by either disengaging in conversation or exiting the site to seek safety. Any such incidents must be reported to the Project Heritage Lead immediately.

- 6.4.3 Any emergencies, near misses or close calls must be reported in accordance with the procedures set out within the relevant WPP and TBS for the survey works. This will include reporting both to the TRU West Alliance and any on call supervisors for the works.

7. REFERENCES

Chartered Institute for Archaeologists, 2014a. *Code of Conduct*. Available at:

<https://www.archaeologists.net/sites/default/files/CodesofConduct.pdf>

Chartered Institute for Archaeologists, 2014b. *Standard and Guidance for the archaeological investigation and recording of standing buildings or structures*. Available at:

https://www.archaeologists.net/sites/default/files/CIfAS&GBuildings_1.pdf

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https://www.archaeologists.net/sites/default/files/CIfAS&GArchives_2.pdf

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APPENDIX C OASIS REPORT FORM

OASIS Summary for oxfordar2-530408

OASIS ID (UID)	oxfordar2-530408
Project Name	Transpennine Route Upgrade West, Toad Holes Underbridge (MDL1/12) and Ming Hill Underbridge (MDL1/14) Dewsbury, West Yorkshire Historic Building Investigation and Recording
Sitename	Toad Holes Underbridge (MDL1/12) , Ming Hill Underbridge (MDL1/14)
Sitecode	THMH24
Project Identifier(s)	L11502
Activity type	Building Survey
Planning Id	2023/44/92357/W
Reason For Investigation	Planning: Listed Building Consent
Organisation Responsible for work	Oxford Archaeology (Lancaster)
Project Dates	31-Jan-2024 - 20-Dec-2024
Location	Toad Holes Underbridge (MDL1/12) NGR : SE 23888 21297 LL : 53.687583951834554, -1.63976295068271 12 Fig : 423888,421297 Ming Hill Underbridge (MDL1/14) NGR : SE 24028 21464 LL : 53.68907854878138, -1.6376302301631 12 Fig : 424028,421464
Administrative Areas	Country : England County/Local Authority : Kirklees Local Authority District : Kirklees Parish : Kirklees, unparished area
Project Methodology	Analytical / Descriptive Record: written records were made of all principal building elements, as well as any features of historical or architectural significance. Particular attention was paid to the relationship between those areas of the underbridges where their development, and any alterations, could be observed. Drawings: plans and elevations supplied by the client in PDF format, formed the basis for the drawn record, and were checked for accuracy before being enhanced with pertinent detail and annotation. The final plans were created within an industry-standard CAD package, enhanced and annotated to show the form and location of all architecturally and historically significant features. Photographic Record: a Canon EOS 2000D digital SLR (24 megapixel) camera, with a selection of lenses, was used for the photographic record. The record comprises landscape and detailed photography; the detailed photographs of archaeological features incorporated a scale bar where appropriate.

Project Results	In April 2023, Oxford Archaeology (OA) was commissioned by BAM Nuttall to undertake an Historic Investigation and Building Recording of the Grade II Listed Toad Holes Underbridge (MDL1/12) (NHLE 1450704) and Ming Hill Underbridge (MDL1/14) (NHLE 1451887), Dewsbury, West Yorkshire (NGR SE 23888 21297; SE 24028 21464). The work was stipulated by Kirklees Council as a condition of Listed building Consent, was undertaken ahead of an increase in line speed from 60/75 mph to 100 mph above both structures, (with the tracks above Ming Hill Underbridge (MDL1/14) requiring re-alignment), and their sympathetic infilling, as part of a series of works along the Transpennine Route Upgrade (TRU). The survey was carried out on the 31st January 2024. The two underbridges are separated by c 0.2km, being c 0.5km south west of Dewsbury Station and 11km to the north-west of Huddersfield, and lie on the east side of the A644 Huddersfield Road. Their western elevations face onto a public right of way with their eastern elevations facing land in third party ownership (currently used as a waste management business and a carwash). Both underbridge accesses are infilled and no longer act as underbridges. Toad Holes Underbridge (MDL1/12) and Ming Hill Underbridge (MDL1/14) were constructed between 1845 to 1847 for the Leeds, Dewsbury & Manchester Railway, for the purpose of providing access beneath the railway. Both structures were of similar construction with a masonry substructure supporting a single-span cast-iron level beam bridge, they are rare surviving examples of their type as many cast-iron beams were a common form of bridge construction until the late 1840s when a series of bridge failures led to a dramatic decline in their use. Decorative architectural features such as ashlar panelled pilasters, ashlar parapet end pillars and embellished fascia edge beams provide them with an aesthetic quality that raises them above purely functional engineering structures. Both have undergone substantial alterations since their construction, with works during the early and latter part of the twentieth century negatively impacting their authenticity, legibility and elements of their historic value.
Keywords	Underbridge - POST MEDIEVAL - FISH Thesaurus of Monument Types Underbridge - POST MEDIEVAL - FISH Thesaurus of Monument Types
Funder	Private or public corporation BAM Nuttall on behalf of TRU Alliance
HER	West Yorkshire HER - unRev - STANDARD
Person Responsible for work	Paul Dunn
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