

**NetworkRail**

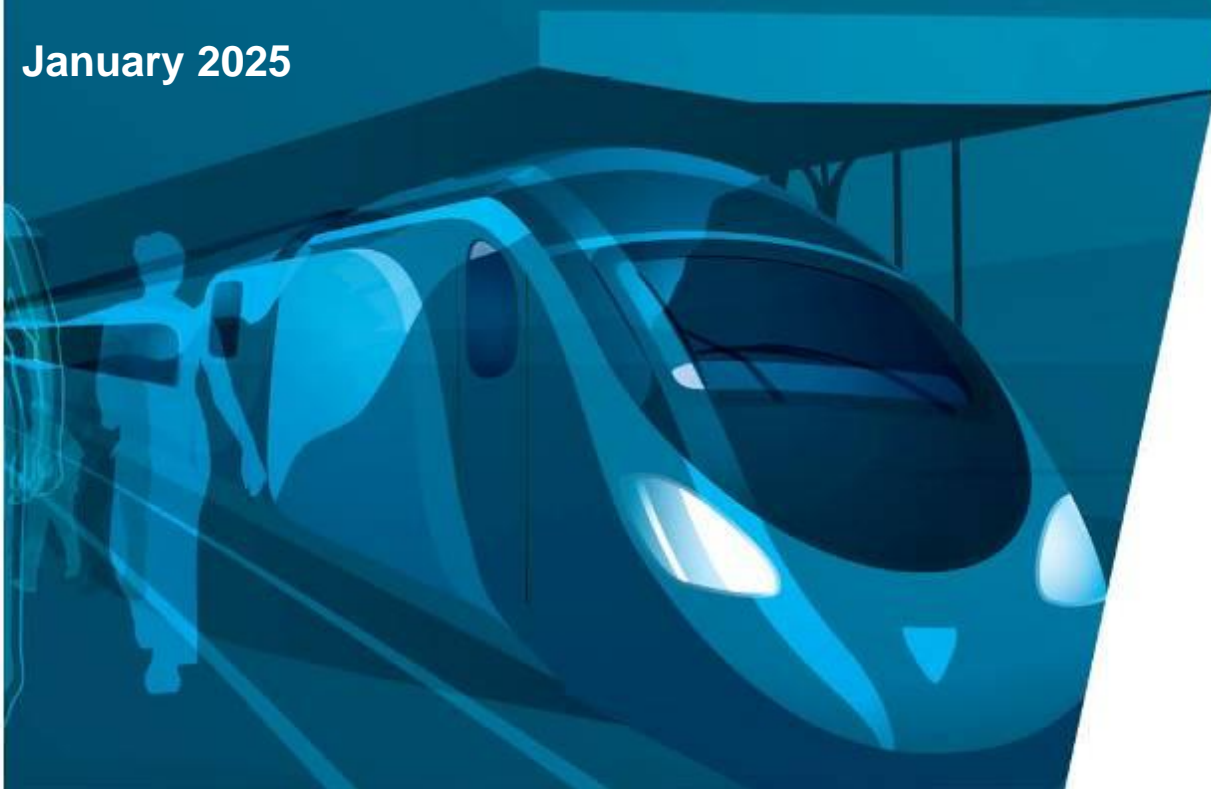
# **Network Rail (Dewsbury to Leeds W4 Scheme) Trans-Pennine Route Upgrade**

## **Jack Lane Underbridge (MDL1/24) - Heritage Statement**

**Network Rail**

TP/LNE/2025-009

**January 2025**



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## 1. INTRODUCTION

### 1.1 Report objective

1.1.1 The Trans-Pennine Route Upgrade (TRU) is a programme of works which will improve the Trans-Pennine railway between Manchester, Huddersfield, Leeds and York and improve connections between key towns and cities across the north of England. The section of TRU between Westtown (Dewsbury) and Leeds is known (and henceforth referred to) as the W4 Scheme; it will contribute to the overall TRU aims of increasing service capacity and offering journey time benefits through:

- Electrification of the line;
- Increase in line speeds;
- Remodelling of stations including platform extension works at Dewsbury and Morley, as well as the construction of a new footbridge to replace the existing station subway at Batley;
- Replace the existing Lady Anne level crossing north of Batley with a footbridge.

1.1.2 As well as the works identified above, various other engineering works are required including strengthening of bridge decks (rail and highway); electrification of the line and provision of associated infrastructure will require alterations to bridge structures, including raising the height of parapets and the attachment of OLE fixings.

1.1.3 Under the Planning (Listed Buildings and Conservation Areas) Act 1990, consent is required from the local planning authority for any proposed works that would affect the character of a Listed Building. This Heritage Statement has been compiled in support of an application for Listed Building Consent by Network Rail in respect of the proposed works on the Grade II Listed Jack Lane Underbridge (MDL1/24) (NHLE 1452193), Dewsbury, Kirklees, West Yorkshire. A location plan is provided in Appendix A.

1.1.4 Jack Lane Underbridge (MDL1/24) was designated a Grade II Listed building in March 2018. The Historic England list description (included in full in Appendix B) names the listed building as 'Railway Underbridge MDL1/24, Jack Lane.' Throughout this Heritage Statement the structure is referred to as 'Jack Lane Underbridge (MDL1/24)'.

1.1.5 This Heritage Statement will seek to:

- Identify and discuss the heritage significance of the listed structure;
- Present the design requirements of the Scheme at the structure;
- Present the process of design development and optioneering which has led to the design proposal for the Scheme in relation to the structure;
- Identify the impacts of the design proposal on the significance of the structure, in the context of current national and local planning policy and guidance;
- Discuss any mitigation and/or compensation recommended in relation to the structure; and
- Consider the public benefits to be gained from the Scheme, weighed against the impact on significance of the Listed Building, in line with the National Planning Policy Framework, (as revised 2024) and Kirklees Local Plan, 2019.

### 1.2 Current conditions

1.2.1 Jack Lane Underbridge (MDL1/24) (Insert 1-1) is a Grade II listed bridge designed by Thomas Grainger for the Leeds Dewsbury & Manchester Railway (1845-7) during the 'Heroic Age' of railway building (1841-50). The underbridge is located approximately 1km northeast of the Dewsbury Station and is centred at NGR SE 24657 22866. The structure is

a surviving example of shallow arched cast-iron level bridge with sandstone piers, albeit with a later deck (see below). The bridge is faced with ashlar stone on both sides, with the angled abutments constructed with rusticated stone blocks. The bridge has a simple cast-iron balustrade, composed of stick balusters supported by cast-iron fascia beams that spring from a moulded impost band. These architectural features and quality of the craftsmanship are recognised as a contributing towards the overall significance of the structure.

- 1.2.2 In the early 1900s, the deck was rebuilt with riveted steel beams and transverse joints, with these being the only recorded notable changes to the bridge since its construction. As the structure has undergone limited alterations following its inception, the bridge has retained the legibility for its original form.



**Insert 1-1 Jack Lane Underbridge (MDL1/24) – Eastern Elevation.**

- 1.2.3 Jack Lane Underbridge (MDL1/24) has been subject to routine detailed and visual inspections in 2014 and 2021 which identified that the underbridge is in overall fair condition, albeit with some notable defects. However, since these inspections, further assessment of the structure was undertaken in November 2021 which raised concerns over the condition of the existing girders, and ultimately identified that the overall condition of the bridge was poor. This inspection identified extensive heavy corrosion, loss of thickness and loss of section in the webs and flanges particularly to the main girders (see below, Insert 1-2). Similarly, the internal girders were found to have horizontal section loss due to the concrete deck slab haunching, while visible web bearing stiffeners had suffered notable section loss. The assessment also noted that a number of the web bearing stiffeners are hidden behind the bearing under each end of the deck; these couldn't be inspected and pose considerable risk as hidden critical elements with potential for unknown levels of degradation.



**Insert 1-2 Examples of corrosion, including evidence of section loss and loss of thickness, on steel girders of MDL1/24 Jack Lane (Network Rail, 2024).**

### 1.3 Summary of proposal

- 1.3.1 In order to successfully achieve the TRU Programme objectives of improving the reliability and resilience of the railway, the Scheme will involve replacing the existing bridge deck at Jack Lane Underbridge (MDL1/24) with a pair of U-Type decks as well as new handrails which comply to Network Rail safety regulations, designed to respond to the significance and form of the Grade II Listed Building.
- 1.3.2 The proposed works to Jack Lane Underbridge (MDL1/24) are required to ensure the historic structure is capable to support the anticipated increase in line speed from 74mph to 100mph due to the electrification of the railway. The design has been sympathetically developed in order to retain the historic integrity of Jack Lane Underbridge (MDL1/24) as a Grade II Listed structure and a component feature of the historic railway. This would be achieved by retaining features which contribute towards its aesthetic value and overall significance, as well as ensuring modern additions, namely the parapet and moulded cornice, replicate the original design. These works will ensure the underbridge remains in operational use, whilst meeting the TRU programme objectives.
- 1.3.3 The proposals were developed through a process of optioneering and assessment, which has included engagement with historic environment stakeholders (see Section 1.5). The proposals facilitate the wider requirements of TRU and the associated economic, environmental and social benefits, whilst minimising, where practical, impacts to the heritage significance of the structure (see Section 3.2). These proposals are discussed in detail in

Section 3 and their impact upon heritage assets in Section 4.

## 1.4 Legislative and policy context

### Legislation

- 1.4.1 The Planning (Listed Buildings and Conservation Areas) Act 1990 (as amended) governs the designation and works to listed buildings and conservation areas in England.
- 1.4.2 The Act states in **s.1 (5)**:
- 'In this Act "listed building" means a building which is for the time being included in a list compiled or approved by the Secretary of State under this section; and for the purposes of this Act—*
- (a) any object or structure fixed to the building;*
- (b) any object or structure within the curtilage of the building which, although not fixed to the building, forms part of the land and has done so since before 1st July 1948, shall be treated as part of the building.'*
- 1.4.3 Under the Act, no one is permitted to undertake or cause to be undertaken any works that would affect the character of a listed building unless the works are authorised. **Section 16** of the Act identifies that whether such works can be carried out is determined by the local planning authority or the Secretary of State:
- '(1) Subject to the previous provisions of this Part, the local planning authority or, as the case may be, the Secretary of State may grant or refuse an application for listed building consent and, if they grant consent, may grant it subject to conditions.*
- (2) In considering whether to grant listed building consent for any works the local planning authority or the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.*
- (3) Any listed building consent shall (except in so far as it otherwise provides) ensure for the benefit of the building and of all persons for the time being interested in it.'*
- 1.4.4 In relation to the granting of Listed Building Consent, **Section 17** of the Act stipulates that conditions attached to Listed Building Consent may include those with respect to:
- '(a) the preservation of particular features of the building, either as part of it or after severance from it;*
- (b) the making good, after the works are completed, of any damage caused to the building by the works; [and]*
- (c) the reconstruction of the building or any part of it following the execution of any works, with the use of original materials so far as practicable and with such alterations of the interior of the building as may be specified in the conditions'.*
- 1.4.5 It is also defined in **s.17 (2)** that a condition *'may also be imposed requiring specified details of the works (whether or not set out in the application) to be approved subsequently by the local planning authority or, in the case of consent granted by the Secretary of State, specifying whether such details are to be approved by the local planning authority or by him'.*
- 1.4.6 The Act also states in **s.66 (1)**:

*'In considering whether to grant planning permission or permission in principle for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses'.*

### National policy

1.4.7 The National Planning Policy Framework (NPPF, revised 2024) provides the Government's national planning policy on the conservation of the historic environment, supported by the Planning Practice Guidance (updated February 2024)<sup>1</sup>. This Heritage Statement aims to address relevant policy within the NPPF in relation to Section 16 'Conserving and enhancing the historic environment' and includes an assessment of significance of the heritage assets and their setting that may be affected by the proposed works, in compliance with paragraphs 207-221.

1.4.8 The following paragraphs as set out in the NPPF include key provisions considered of particular importance to this application.

- **Paragraph 207** - *In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance.*
- **Paragraph 212** - *When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss, or less than substantial harm to its significance.*
- **Paragraph 213** - *Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:*
  - a) *grade II listed buildings, or grade II registered parks or gardens, should be exceptional;*
  - b) *assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II\* listed buildings, grade I and II\* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.*
- **Paragraph 214** - *Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:*
  - a) *the nature of the heritage asset prevents all reasonable uses of the site; and*
  - b) *no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and*
  - c) *conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and*
  - d) *the harm or loss is outweighed by the benefit of bringing the site back into use.*

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<sup>1</sup> Department for Levelling up, Housing and Communities (DLHC). 2023. National Planning Policy Framework (NPPF). London: Department for Levelling up, Housing and Communities.

- **Paragraph 215** – *Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal, including, where appropriate, securing its optimum viable use.*
- **Paragraph 216** – *The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgment will be required having regard to the scale of any harm or loss and the significance of the heritage asset.*

1.4.9 The National Planning Practice Guidance (Historic Environment) (PPG, 2014, updated 2019) gives further information on how national policy is to be interpreted and applied locally. The PPG includes particular guidance on matters relating to protecting the historic environment. The PPG (Historic Environment) document was significantly updated in 2019 to reflect the changes made in 2018/19 to Section 16 of the NPPF policy<sup>2</sup>.

#### Local policy

1.4.10 The Kirklees Local Plan was adopted in February 2019 and is now the statutory development plan for Kirklees providing a set of planning policies.

1.4.11 Kirklees Council recognises that *heritage assets are an irreplaceable resource and should aim to conserve them in a manner appropriate to their significance*<sup>3</sup>. Section 14 Historic Environment of the Local Plan sets out **Policy LP35** relating to the historic environment, which is reproduced below.

#### Policy LP35 Historic Environment

1. Development proposals affecting a designated heritage asset (or an archaeological site of national importance) should preserve or enhance the significance of the asset. In cases likely to result in substantial harm or loss, development will only be permitted where it can be demonstrated that the proposals would bring substantial public benefits that clearly outweigh the harm, or all of the following are met:
  - a) the nature of the heritage asset prevents all reasonable uses of the site;
  - b) no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation;
  - c) conservation by grant-funding or some form of charitable or public ownership is demonstrably not possible; and
  - d) the harm or loss is outweighed by the benefit of bringing the site back into use.
2. Proposals which would remove, harm or undermine the significance of a non-designated heritage asset, or its contribution to the character of a place will be permitted only where benefits of the development outweigh the harm having regard to the scale of the harm and the significance of the heritage asset. In the case of developments affecting archaeological sites of less than national importance where development affecting such sites is acceptable in principle, mitigation of damage will be ensured through preservation of the remains in situ as a preferred solution. When in situ preservation is not justified, the developer will be required to make adequate provision for excavation and recording

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<sup>2</sup> No further updates have been made to the historic environment-specific PPG document since July 2019.

<sup>3</sup> Kirklees Council, Kirklees Local Plan Strategy and Policies, 2019, 141. <https://www.kirklees.gov.uk/beta/planning-policy/pdf/local-plan-strategy-and-policies.pdf>.

before or during development.

3. Proposals should retain those elements of the historic environment which contribute to the distinct identity of the Kirklees area and ensure they are appropriately conserved, to the extent warranted by their significance, also having regard to the wider benefits of development. Consideration should be given to the need to:
  - a) ensure that proposals maintain and reinforce local distinctiveness and conserve the significance of designated and non-designated heritage assets;
  - b) ensure that proposals within Conservation Areas conserve those elements which contribute to their significance;
  - c) secure a sustainable future for heritage assets at risk and those associated with the local textile industry, historic farm buildings, places of worship and civic and institutional buildings constructed on the back of the wealth created by the textile industry as expressions of local civic pride and identity;
  - d) identify opportunities, including use of new technologies, to mitigate, and adapt to, the effects of climate change in ways that do not harm the significance of heritage assets and, where conflict is unavoidable, to balance the public benefit of climate change mitigation measures with the harm caused to the heritage assets' significance;
  - e) accommodate innovative design where this does not prejudice the significance of heritage assets;
  - f) preserve the setting of Castle Hill where appropriate and proposals which detrimentally impact on the setting of Castle Hill will not be permitted.

## 1.5 Consultation

- 1.5.1 Historic England and Kirklees Council have been involved in ongoing stakeholder consultation with Network Rail through the development of the Trans-Pennine Route Upgrade between Dewsbury and Leeds.
- 1.5.2 Meetings with both these historic environment stakeholders have been held to discuss design development of the Scheme in relation to Jack Lane Underbridge (MDL1/24). Meetings and key correspondence took place on the following dates:
  - 06 February 2024 - W4 Bridges and Structures – Kirklees Council (Conservation) Engagement (1st round); and
  - 09 February 2024 - W4 Bridges and Structures – Historic England (Conservation) Engagement (1st round).
- 1.5.3 The meetings on **6th and 9th February 2024** introduced the requirement for works to be undertaken at Jack Lane Underbridge (MDL1/24) to Kirklees Council and Historic England, respectively. An overview of the structure, its historic significance, design drivers and an optioneering assessment were presented. It was acknowledged and accepted that a deck replacement is necessary at Jack Lane Underbridge (MDL1/24) to comply with safety and modern construction standards. Optioneering was presented to the stakeholders, and the 'Network Rail Standard U Type Deck' option was highlighted as the preferred design proposal. The option would allow the retention (albeit with the potential for temporary removal and reinstatement during construction) of the pilasters, cast iron fascia edge beams, corner cill units and wingwalls as well as the replacement of the central cill beams and parapets in a sympathetic manner to aesthetically mimic the original designs. The stakeholders were satisfied with the preferred option and the proposed design mitigation.
- 1.5.4 Ongoing engagement with the Kirklees Council Conservation Officer was undertaken throughout the preparation of the Jack Lane Underbridge (MDL1/24) Listed Building Consent application. This included discussions around the level of detail submitted and likely conditions to be attached to the Listed Building Consent. As a result, a Material Schedule,

details of masonry repairs and a Historic Building Recording Written Scheme of Investigation (WSI) have been produced to accompany this application.

## 2. HISTORY AND SIGNIFICANCE OF HERITAGE ASSETS

### 2.1 Jack Lane Underbridge (MDL1/24) (Grade II Listed, NHLE 1452193)

#### Historic Background

##### History of the Trans-Pennine Route

- 2.1.1 The Trans-Pennine Route between Dewsbury and Leeds was constructed and opened between 1845 and 1847. The route today forms part of the wider Trans-Pennine Route between York, Selby and Manchester, which comprises sections of rail line developed by different railway companies. 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 railways<sup>4</sup>.
- 2.1.2 Between Dewsbury and Leeds, the Trans-Pennine Route comprises the line constructed by The Leeds, Dewsbury & Manchester Railway. The line formed part of 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, built by the Huddersfield & Manchester Railway, under the Pennine watershed to connect the line between the Upper Tame and Colne Valleys. Between Dewsbury and Leeds, 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.
- 2.1.3 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 Trans-Pennine Route between Dewsbury and Leeds certainly had an influence on towns, forming an additional infrastructure element of the expansion of settlements such as Dewsbury and Batley, already underway as a result of the growth of textile, mining and maltings industries.
- 2.1.4 Jack Lane Underbridge (MDL1/24) was built by Thomas Grainger for the Leeds, Dewsbury & Manchester Railway, and built between 1845 and 1857. This line and its supporting structures were constructed during the Heroic Age of railway building (1841-50)<sup>5</sup>. Opening in stages between 1846 and 1849, when railway mania was at its height, the Leeds, Dewsbury & Manchester Railway was constructed under the oversight of the principal engineer Thomas Grainger. Grainger was one of the leading railway engineers in Scotland at this time, working on Pioneering Age (1825-41) railways such as the Monkland and Kirkintilloch Railway (1824-1826) and the Glasgow and Garnick Railway (1826-1831), which he delivered in conjunction with the engineer John Miller. He is best known in England for his work on lines including the Leeds, Dewsbury & Manchester Railway (1845-1848), the East and West Yorkshire Junction Railway (1846); and the Leeds & Thirsk Railway (1845-1852). Grainger's work is notable for the imaginative way in which he tailored these lines to the difficult surrounding terrain and his bold masonry and distinctive iron bridge design.<sup>6</sup>
- 2.1.5 In 1847, the Leeds, Dewsbury & Manchester Railway along with the Huddersfield and Manchester Railway were absorbed into the London and North Western Railway (LNWR),

<sup>4</sup> Alan Baxter Associates, 2019. TransPennine Route Upgrade Route-wide Statement of Significance. 14.

<sup>5</sup> Alan Baxter Associates, 2019. TransPennine Route Upgrade Route-wide Statement of Significance. 14.

<sup>6</sup> Alan Baxter Associated, 2017. MDL1/6 & MDL1/8 Bridges Statement of Significance, 13.

providing a more direct route from Manchester to the West Riding and enabling the LNWR to access the textile and coal industries of West Yorkshire. By 1851, the LNWR was the most prominent railway company of the period, with over 800 miles of track and was the largest joint-stock concern of its time, capitalised at £29 million<sup>7</sup>.

- 2.1.6 The history and significance of the Trans-Pennine Route is discussed at more length in the Route-Wide Statement of Significance<sup>8</sup>. This was produced to characterise the overall heritage significance of the Trans-Pennine Route as a whole.

#### MDL1/24 Jack Lane Underbridge

- 2.1.7 Jack Lane Underbridge (MDL1/24) was built between 1845 and 1847 to the design of Thomas Grainger for the Leeds, Dewsbury & Manchester Railway. The underbridge is initially depicted in the 1851 1:1056 Town Plan Map (not reproduced here) which illustrated the accommodation of Jack Lane under the railway, and in turn access to an Oil Mill and Bridge Mill in the area of Batley Carr, between Dewsbury and Batley. At this time, the environs of the bridge were semi-rural and semi-industrial in character as per the open landscape and scattered mills. In the Six-Inch OS Map 1854, additional mills are shown in the vicinity of the underbridge, including Ings Mill, Victoria Mill, Ellis Mill, a sandstone quarry and Springwell Mill (Insert 2-2). Tents for drying cloth, used within industrial textile process, line the hill sides between the mills and railway, and the small village of Common Side (Commonside) borders Jack Lane Underbridge (MDL1/24) to the east, with the larger settlement of Batley Carr encircling the area from both the south and west.



#### Insert 2-1 County Series OS Map 1854-55 (Jack Lane Underbridge (MDL1/24) outlined in blue)

- 2.1.8 Development surrounding Jack Lane Underbridge (MDL1/24) was shown as having further expanded in the 1:500 Town Plan Map 1890 (Insert 2-2). By this time, the Great Northern Railway (GNR), Dewsbury and Batley Branch had been established to the west of the

<sup>7</sup> Alan Baxter Associates, 2017. Transpennine Route Statement of History and Significance: West of Leeds. 5.

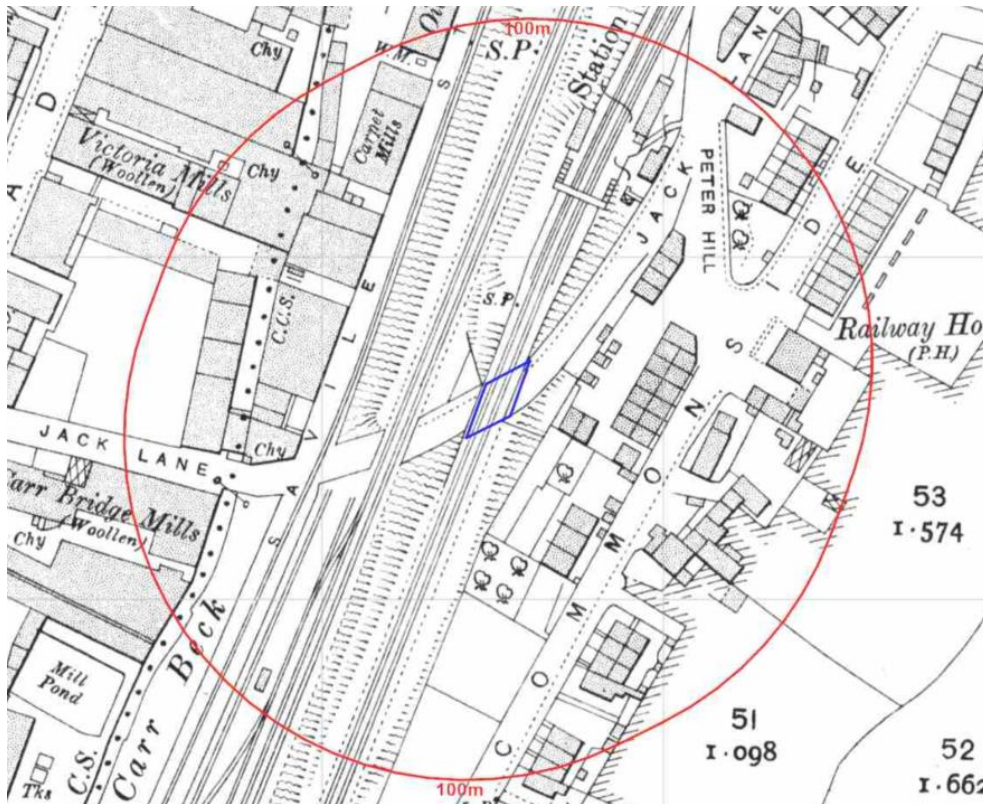
<sup>8</sup> Alan Baxter Associates, 2019. TransPennine Route Upgrade: Route-wide Statement of Significance.

LNWR line, on which a secondary underbridge to the immediate west of Jack Lane Underbridge (MDL1/24) was established to accommodate this new line. During the second half of the 19<sup>th</sup> century, the development of the LNWR line had also continued, with Staincliffe & Batley Carr Station opening in 1878, to the north of Jack Lane Underbridge (MDL1/24). An industrial tramway was also shown by this point, running parallel to the railway lines along Savile Street, connecting Batley Carr to the Batley Corporation Gas Works and Soothill Colliery to the north-east.



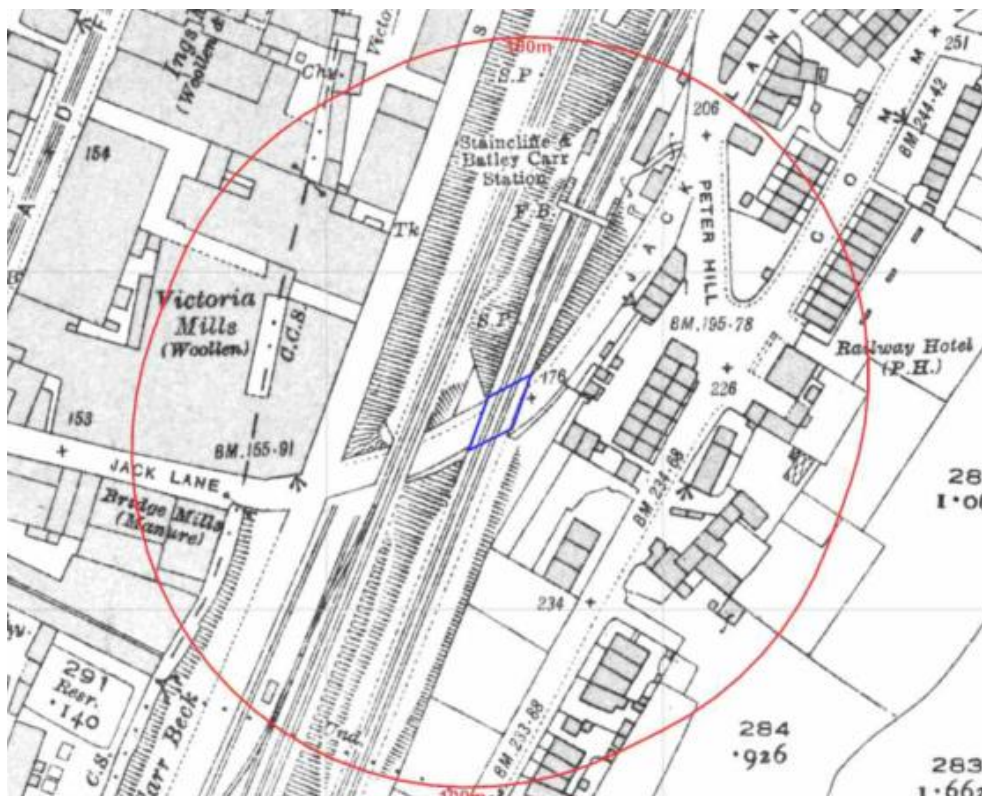
**Insert 2-2 County Series Town Plan, 1890 (Jack Lane Underbridge (MDL1/24) outlined in blue)**

- 2.1.9 Subsequent OS mapping from 1907 shows rapid expansion to the settlement of Commonsidge immediately east of Jack Lane Underbridge (MDL1/24) and the growth of industrial and suburban housing within Batley Carr to the west (Insert 2-3). This local boom in settlement and industrial areas are likely to have resulted in Jack Lane accommodating more traffic than previously, as the road became one of the key connectors within the area. To the east of the railway lines was a considerable amount of terrace rows along the hillside across Commonsidge and Crackenedge.



**Insert 2-3 County Series Map 1907 (Jack Lane Underbridge (MDL1/24) outlined in blue)**

2.1.10 Later alterations within the area around Jack Lane Underbridge (MDL1/24) in the early to mid-20<sup>th</sup> century display a similar pattern of continued expansion recognised throughout other industrial settlements in the region. In the 1933 25-inch OS map, increased development in Batley Carr effectively merged the neighbourhood with the former bankside settlement of Commonsides (Insert 2-4). By the mid-20<sup>th</sup> century, transportation networks in the area included the railway lines and associated infrastructure (including the bridges) and the public tramways which enabled accessibility for people and goods into and out of the area (though the earlier industrial tramway along Savile Street had ceased operation by the 1930s). However, as the textile industry declined from the mid-20<sup>th</sup> century onwards and mills in the area and wider region were closing, the character of Batley Carr changed, with more residential development, superseding the former industrial and semi-rural environment.



**Insert 2-4 County Series Map 1933 (Jack Lane Underbridge (MDL1/24) outlined in blue)**

- 2.1.11 Aerial photography belonging to Historic England dating to 1949 (EAW027476) illustrates Jack Lane Underbridge (MDL1/24) on the edges of the industrial area of Batley Carr. The GNR underbridge immediately to the west of Jack Lane Underbridge (MDL1/14) remains intact and operational at this point, somewhat obscuring the presence for Jack Lane Underbridge (MDL1/24) beneath the railway when viewed together from the south-west.
- 2.1.12 The section of the GNR between Dewsbury and Batley closed in September 1964, and satellite imagery shows that by the end of the 20<sup>th</sup> century the former GNR Dewsbury and Batley Branch underbridge over Jack Lane had been removed, which better revealed the presence of Jack Lane Underbridge (MDL1/24) from the western peripheries of Batley Carr. Jack Lane Underbridge (MDL1/24) now remains the only defining feature between the industrial areas of Batley Carr and the semi-rural settlement of Commonsidge
- 2.1.13 Through the later 20<sup>th</sup> century and first decades of the 21<sup>st</sup> century, although there is evidence for small scale expansion of industrial development within proximity of Jack Lane Underbridge (MDL1/24) and some demolition; the prevailing character of the setting remains largely similar to what is experienced at present, with no further alterations to the railway bridge.

### Description

- 2.1.14 Jack Lane Underbridge (MDL1/24) is a shallow arched cast iron beam underbridge carrying the railway line over Jack Lane, which occupies a deep gully within the hillside, requiring the abutments and wing walls to be substantial structures. The structure comprises a single span skew underbridge, a surviving example of shallow arched cast-iron level bridge with sandstone piers, albeit supporting a later deck consisting of two half-through decks with riveted steel girders, with cast iron edge girders.
- 2.1.15 Jack Lane Underbridge (MDL1/24) represents a surviving example of a cast iron beam railway bridge commonly used in the late 1840s, albeit with later alterations to the deck. Cast iron structural elements were subsequently identified as being the cause of a number of

bridge failures, which resulted in the widespread replacement of the material across the railway networks during the later 19<sup>th</sup> and 20<sup>th</sup> centuries, in favour of less brittle metals such as steel. However, three consecutive underbridge structures along this section of the Leeds, Dewsbury & Manchester railway remain having survived this mass rebuilding. This includes Toad Holes Underbridge (MDL1/12) (Grade II Listed, NHLE 1450704) and Ming Hill Underbridge (MDL1/14) (Grade II, NHLE 1451887) and George Street Underbridge (MDL1/16) (Grade II, NHLE 1451888); the latter is the closest of the surviving cast iron Grainger bridges and is situated approximately 1.3km south of Jack Lane Underbridge (MDL1/24).

- 2.1.16 The angled abutments of Jack Lane Underbridge (MDL1/24) are constructed of rectangular, rusticated stone blocks with a plinth and moulded cornice that showcases demi-acorn finials to the corners. The abutments terminate at the square ashlar piers, which rise to track level, atop of which there is a moulded cornice, which is superseded by narrower square parapet piers. Attached to the piers, there are gently curving and angled wing walls with square ashlar coping, terminating with the square piers with shallow pyramidal caps. The south-east wing wall has a later stone wall constructed upon part of it, and the stone coursing of the south-west wing wall continues into a further section of walling with stone bands associated with the second GNR railway bridge that formerly stood immediately to the west of Jack Lane Underbridge (MDL1/24).
- 2.1.17 The bridge is similarly detailed on both sides and hosts a simple cast-iron balustrade of stick balusters supported on cast-iron fascia beams. The balustrade sits atop a moulded impost band on abutments of quarry-faced local sandstone, with each fascia beam being formed by an arched girder with infilled spandrels above. Finally, the early 20<sup>th</sup> century bridge deck which replaced the original deck structure has riveted steel beams and transverse joints.
- 2.1.18 Whilst Jack Lane Underbridge (MDL1/24) is a surviving example of the 1840s railway structures, it has undergone some alterations since its construction. In the early 1900s, the deck was replaced and strengthened with wrought iron by the LNWR. Nevertheless, the remainder of the structure remains in situ and continued to accommodate the railway. Similarly, the south-east wing wall has a later stone wall constructed upon part of it, and the stone coursing of the south-west wing wall continues into a further section of stone bands associated with the second GNR railway bridge that formally crossed over Jack Lane immediately west of the listed railway bridge.
- 2.1.19 The bridge remains in-situ as an operational underbridge servicing the railway network. The present-day Jack Lane links the settlement to the east on Commonsides to Batley Carr and provides access two-way traffic to various businesses along its route. The underbridge accommodates the up and down lines of the railway between Dewsbury and Batley.
- 2.1.20 As noted above, the setting of Jack Lane Underbridge (MDL1/24) forms a distinctive transitional area between the historically industrial area of Batley Carr in the valley to the west and the semi-rural settlement on Commonsides bank. To the east the prevailing character of the area is defined by the steep upwards topography rising eastwards, the rows of stone houses which line the bank and narrow windy roads to traverse this steep gradient. Due to the change in topography, the approach to the bridge is elongated from the eastern side and provides an extended and dramatic curved approach downhill enhancing the visibility of the presence of the railway along Jack Lane. From the west, the bridge forms a considerable presence as the road rises up the hillside. The abutment walling and remains of the former GNR railway underbridge to the west of Jack Lane Underbridge (MDL1/24) extend the experience of the underbridge, channelling views towards the structure along Jack Lane from the west. Views offered while traveling by train over the bridge are somewhat limited due to the vegetation and trees along the line through this portion of the hillside. However, passengers do get glimpsed views of the surrounding landscape, particularly across the townscape of Batley Carr to the west, for example during winter when

vegetation cover is reduced.

- 2.1.21 Moving west through the Jack Lane Underbridge (MDL1/24) the landscape transitions to become a more industrial environment within the flatter land of the valley floor. A concentration of historical mills on the western fringes of Batley Carr characterise this area, wherein variations in the local vernacular with red brick buildings prove to be striking in between the stone-faced former mills. The area is more developed than the settlement to the east and clearly indicates the beginning of entering Batley Carr.

### Significance

- 2.1.22 Jack Lane Underbridge (MDL1/24) was designated a Grade II Listed Building in March 2018. The Historic England list description<sup>9</sup> identified the following elements of significance from which the structure is considered to have special interest:

- Historic interest
  - An original and little-altered 1840s underbridge constructed during the Heroic Age (1841-50) of railway building on what is now one of the main railway lines in north England;
  - Designed by the notable Scottish engineer Thomas Grainger, who worked extensively in England and Scotland.
- Architectural interest
  - A good example of a mid-19<sup>th</sup> century cast iron underbridge, that is imposing in scale and displays craftsmanship in its construction and detailing;
  - It reflects engineering practice of the time in utilising cast-iron shallow-arched girders, acknowledging the inherent structural problems in constructing cast-iron beam bridges.
- Group Value:
  - With the other Listed structures designed by Grainger on the Leeds, Dewsbury & Manchester Railway line.

- 2.1.23 Jack Lane Underbridge (MDL1/24) derives inherent historical and aesthetic value for being a rare survival as a cast-iron level beam bridge dating to the Heroic Age (1841-50) of railway development. As a structure built to the design of railway engineer Thomas Grainger for the historic Leeds, Dewsbury & Manchester Railway during the Heroic Age (1841-50) of railway building, it derives associative historical value. Through its continued presence and use as part of the operational railway network, the structure communicates this significance in the current landscape, in spite of the alterations that the railway network and the structure has undergone.

- 2.1.24 As one of four surviving examples of cast-iron beam bridges along the former Leeds, Dewsbury & Manchester Railway, the structure also derives evidential value. It has the potential to reveal further information about cast-iron bridge construction dating to the 19<sup>th</sup> century, and the methods of conservation undertaken to repair the structure. Although the bridge has undergone some alteration, namely the deck replacement undertaken in the early 20<sup>th</sup> century, it still provides the opportunity to reveal further information about historic construction, structural techniques, sourcing of material and management of repair which contributes to its overall significance.

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<sup>9</sup> [Railway underbridge MDL1/24, Jack Lane, Non Civil Parish - 1452193 | Historic England](#)

- 2.1.25 The underbridge also retains inherent aesthetic value which derives from its architectural quality and design interest. The structure features characteristic elements from Grainger's design, namely cast-iron edge beams. However, other notable elements also contribute to its significance, as acknowledged in the list description, including the ashlar pillars, cornices and parapet railing, all of which lift the design of the structure above the purely functional. Though the structure has undergone alterations through the replacement of the deck in the early 20<sup>th</sup> century, the retention of a majority of its historic fabric continued to communicate the legibility of its historic form, Grainger's design and the former Leeds, Dewsbury & Manchester Railway.
- 2.1.26 Although the bridge continues to communicate the historic and aesthetic value of the underbridge, the structure and its immediate setting has undergone some alterations since its inception. The original cast-iron beam was replaced in the early 20<sup>th</sup> century, removing this element of the original fabric. Nevertheless, the key structural features have not been altered and the overall appearance of the bridge, particularly as experienced from those traveling underneath it along Jack Lane, has remained unchanged. Consequently, the overall legibility of the bridge as a historic structure and a component feature to the historic railway has been maintained and what changes have occurred have done little to affect the overall significance of the bridge.
- 2.1.27 The setting of Jack Lane Underbridge (MDL1/24) provides a limited contribution to the overall significance of the structure. Due to the skewed angle of the bridge to its approach along Jack Lane, the bridge is obscured from the majority of its surroundings. Only when located within c. 50 metres to the north of the structure (approximately at the beginning of the extended and curved wing walls, where the pilasters define the approach to the bridge) can the full extent of the structure be appreciated from Jack Lane. Again, to the southwest, along Jack Lane, the bridge is largely masked from the industrial peripheries of Batley Carr. This is the result of the opposing alignment of the bridge and road and the intervening mature vegetation and imposing wing wall and red brick viaduct which formerly hosted the GNR line. Consequently, the bridge only provides a meaningful contribution to the immediate areas surrounding the structure (c. within 50m either side). However, in this localised area, it is the dominating feature of this stretch of Jack Lane, evidencing the engineering achievement of the railway construction.
- 2.1.28 Similarly, the Grade II Listed underbridge is considered to derive a limited contribution to its significance from its setting on the eastern edges of Batley Carr. As discussed above, the structure is located within a confluence of multiple locally significant historical transportation networks which divide the industrial mills of Batley Carr to the west from the semi-rural settlement to the east. The bridge acts as a dividing point within this transitional landscape, which is further enhanced by the dramatic change in topography, with steep undulating topography to the east and relatively flat developed landscape to the west. Despite the transitional nature of the landscape, the alignment of the bridge over the road, topography and development means that that views from the bridge are largely restricted when viewed from Jack Lane. Views from atop the bridge, are themselves restricted by a mature bounding treeline and vegetation which borders the railway line to both the east and west, though train passengers are afforded glimpsed views of the surviving 19<sup>th</sup> and early 20<sup>th</sup> century mill buildings along Bradford Road.

#### Group Value

- 2.1.29 Jack Lane Underbridge (MDL1/24) is one of eleven cast-iron structures built to the design of Thomas Grainger on the Leeds Dewsbury and Manchester Railway line. Of those, five survive on the current operational railway, with which Jack Lane Underbridge (MVL1/24) derives group value. These are:
- MDL1/6 Calder and Hebble Underbridge (Grade II Listed, NHLE 1183782)

- MDL1/8 River Calder Underbridge (Grade II Listed, NHLE 1313646)
- MDL1/12 Toad Holes Underbridge (Grade II Listed, NHLE 1450704)
- MDL1/14 Ming Hill Underbridge (Grade II Listed, NHLE 1451887)
- MDL1/16 George Street Underbridge (Grade II Listed, NHLE 1451888)

2.1.30 Given that these were designed by the same engineer, they share a common design language which communicates the alignment of the Leeds, Dewsbury & Manchester Railway line in the contemporary landscape. In particular, the relationship with the Grade II Listed underbridges of Toad Holes (MDL1/12) (NHLE 1450704), Ming Hill (MDL1/14) (NHLE 1451887) and George Street (MDL1/16) (NHLE 1451888) form a particularly interesting sequence of cast iron structures all of which are located in close proximity to each other. Though Jack Lane Underbridge (MDL1/24) differs slightly in design from these other three, nevertheless the common design approach is still legible, lending weight to the extent to which the structures derive significance from their value as a group.

2.1.31 In addition to the structures listed above, other structures which Grainger designed and survived along the operational network include MDL1/10 Occupation Underbridge (Grade II Listed, NHLE1450702), MDL1/35 Howley Mill Lane Underbridge (Grade II Listed, NHLE 1452199) and MDL1/39 Churwell Underbridge (Grade II Listed, NHLE 1451051).

2.1.32 Group value therefore makes a contribution to the overall significance of Jack Lane Underbridge (MDL1/24). The succession of surviving underbridges constructed to a similar design language and materiality, including Jack Lane Underbridge (MDL1/24), helps to communicate the significance of the overall route and the notable engineering work of Thomas Grainger. The succession of structures on this section of the route provide an understanding of the wider trends and engineering achievements which characterise both the Leeds, Manchester & Dewsbury Railway as well as the Heroic Age of railway building (1841-50) more generally, particularly through how these sequential structures are experienced by those following the rail line (traveling on it or near it) as coherent features of a single historic route.

## 2.2 Other Heritage Assets

2.2.1 The location of the designated and non-designated heritage assets discussed below are shown in Appendix A.

### Listed Buildings

2.2.2 Beyond the Grade II Listed Jack Lane Underbridge (MDL1/24) (NHLE 1452193), there are two other Grade II Listed Buildings within a 250m study area around Jack Lane Underbridge (MDL1/24). These comprise:

- 231 Bradford Road (NHLE 1268334); and
- 233 Bradford Road (NHLE 1268335).

2.2.3 Both Listed Buildings comprise former textile and wool warehouses dating to the late 19<sup>th</sup> century, characteristic of the historic industrial development of Batley and Dewsbury during that period, and are located c. 185 metres northwest of Jack Lane Underbridge (MDL1/24). Due to the intervening distance and built features, differing orientation, and the concealed nature of the bridge, there is no shared visibility between either of the two Listed warehouses and Jack Lane Underbridge (MDL1/24). As such, they do not contribute towards the setting or overall significance of the underbridge.

### Non-Designated Heritage Assets

2.2.4 The West Yorkshire Historic Environment Record (HER), acquired in July 2021, records

eight non-designated assets located within a 250m study area around Jack Lane Underbridge (MDL1/24). These include:

- Earthworks of a post medieval field system (PRN 733), approximately 150m east of Jack Lane Underbridge (MDL1/24)
- Bridge Mill / Carr Bridge Mills / Jumma Mosque (PRN 17780), approximately 135m southwest of Jack Lane Underbridge (MDL1/24)
- Victoria Mills (PRN 17783), approximately 85m west of Jack Lane Underbridge (MDL1/24)
- Ings Mill (17784), approximately 100m northwest of Jack Lane Underbridge (MDL1/24)
- Springwell Mills (PRN 17776), approximately 110m northwest of Jack Lane Underbridge (MDL1/24)
- Triangle Mill / Springwell Mills (PRN 17769), approximately 180m west of Jack Lane Underbridge (MDL1/24)
- Albion Mill (PRN 3614), approximately 180m southwest of Jack Lane Underbridge (MDL1/24)
- Albert Mills (PRN 8298), approximately 250m southwest of Jack Lane Underbridge (MDL1/24)

2.2.5 These non-designated heritage assets comprise almost exclusively textile mills and warehouses associated with the heavy textile industry, with one asset representing a medieval earthworks system (PRN 733). The closest and therefore most relevant of these assets is the former Victoria Mills (PRN 17783) which is located c. 87m west of Jack Lane Underbridge (MDL1/24). The original 19<sup>th</sup> century Victoria Mills building is no longer extant, though a later redevelopment of the same mill complex does survive, forming the character of the northern side of Jack Lane between Savile Street and Bradford Road. This non-designated asset does have some relationship with Jack Lane Underbridge (MDL1/24) consequently, forming a notable surviving element of the early 20<sup>th</sup> century industrial townscape of Batley Carr, which would have historically characterised this part of the bridge's setting. However, the underbridge only derives very limited overall significance from this relationship.

2.2.6 Whilst they make a contribution to understanding the historic development of the wider area, none of the remaining non-designated assets recorded by the West Yorkshire HER within the study area share any visual, physical, or historic relationship with Jack Lane Underbridge (MDL1/24). Therefore, none of these non-designated assets contribute to or derive any significance from the Listed underbridge.

### 3. PROPOSALS

#### 3.1 Background to proposals

3.1.1 The Trans-Pennine Route Upgrade (TRU) has been designed to provide upgrade to the existing railway network from Manchester Victoria and York, via Huddersfield and Leeds to increase capacity, reduce journey times, improve reliability, and contribute to the sustainability agenda of a carbon neutral Britain by 2050. To achieve the TRU objectives of improving the reliability and resilience of the railway, works to Jack Lane Underbridge (MDL1/24) are required to ensure the structure is suitable to accommodate the required increase in line speed from 75 mph to 100 mph and meet safety requirements.

3.1.2 As mentioned in Section 1.2, Jack Lane Underbridge (MDL1/24), has been deemed unsuitable to accommodate the new line speed increase and electrification of the wider TRU Programme, given the poor condition of metallic elements of its superstructure. Proposals therefore seek to replace the existing the existing pair of mild steel twin half through decks installed in the early 1900s in order to maintain the active operational use of the bridge whilst adapting it for the evolving needs of the Trans-Pennine Route. The Scheme will also involve updating the handrail and walkway, and replacing the internal masonry cills, both of which would be undertaken in a like-for-like manner.

#### 3.2 Design development and justification

3.2.1 The design development process for Jack Lane Underbridge (MDL1/24) was undertaken via a rigorous optioneering process which took its consideration various criteria including heritage considerations, health and safety, structural integrity, cost, sustainability and operational requirements.

##### Discounted Strengthening Approach

3.2.2 During the early stages of the design development process, it was initially considered whether the existing deck of Jack Lane Underbridge (MDL1/24) could be retained and strengthened to facilitate the line speed increase while minimising change to the historic structure.

3.2.3 Though this approach was initially considered as a way to limit impact on the historic fabric, it became clear that the condition of the metallic elements of the existing early 20<sup>th</sup> century deck would make strengthening the structure very challenging. The extent of corrosion and degradation, particularly to the main girders and bearing web stiffeners, would prevent any simple strengthening approach such as through the introduction of tie girders. It was consequently not considered to be a viable long-lasting solution and would in turn result in a greater level of harm to the structure's historic significance in the long term.

3.2.4 Further to this, assessment of the existing clear width of the structure between the deck beams identified that the track alignment required for the increase in line speed could not be accommodated on the existing decks. Even if the structure could have been strengthened, alteration would also have been required to provide the required track geometry over the underbridge.

3.2.5 Given that strengthening the bridge would be highly problematic, full deck replacement was considered more feasible and as such, the approach to strengthen the bridge was discounted in agreement with the stakeholders and has not been considered further in the optioneering process.

##### Deck replacement optioneering

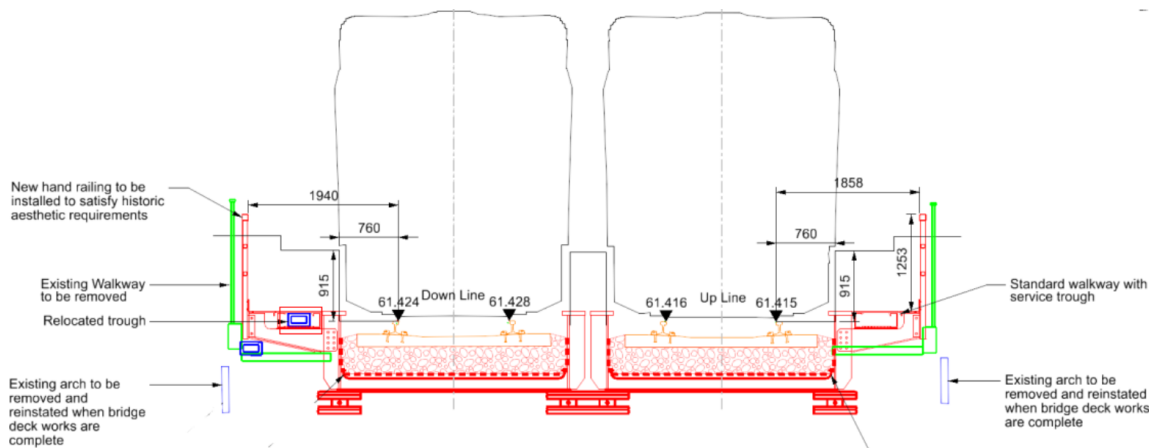
3.2.6 Following the agreement that a deck replacement at Jack Lane Underbridge (MDL1/24) was the preferred option to accommodate the requirements of the new high speed track and due to the poor condition of the existing structure, design optioneering was undertaken to determine the most suitable and feasible solution to deliver the objectives of TRU whilst taking into account the sensitivities of the Grade II Listed structure. Four options were progressed for the replacement deck and were considered during this optioneering process. These comprised:

- Option 1 – Network Rail Standard U Type Deck
- Option 2 – Network Rail Standard Z Type Deck
- Option 3 – Reinforced Concrete Filler Beam
- Option 4 – Prestressed Concrete Box Beams

3.2.7 The design development process has appraised these options, taking into consideration a number of elements around the suitability of the approaches. These include:

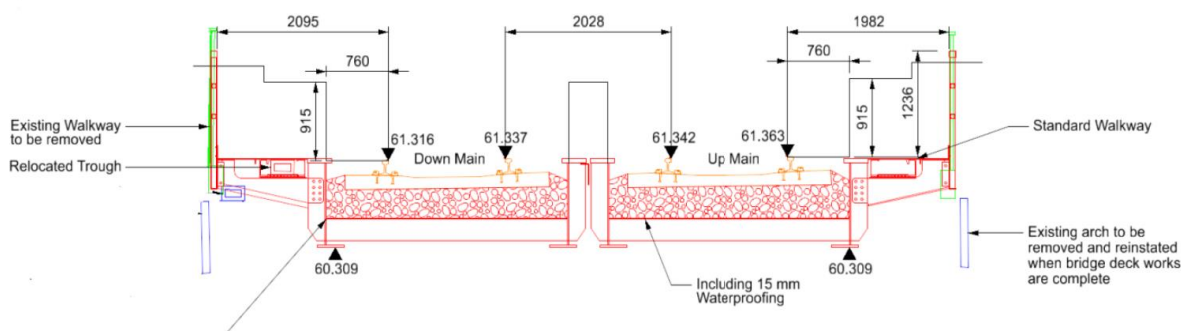
- Impact on heritage significance, including loss of historic fabric and potential for retention or reinstatement of historic elements, or design features which positively respond to the significance of the Listed bridge;
- Constructability, including any issues posed by required construction approach or programme, and health and safety;
- Cost of construction and embodied carbon cost involved in fabrication and installation of each deck option; and
- Operational suitability, including whole life cost and maintenance.

3.2.8 Option 1 proposed to replace the existing deck with a single profile Network Rail Standard U-Type deck with two single track half-through decks (Insert 3-1). The U-Type deck would be constructed off-site using steel and installed over a concrete slab on top of the steel floor plate girders to provide support and conform to its existing geometric requirements. This approach constituted the lightest of the options considered; consequently, this approach would omit the need for geotechnical substructure analysis and avoid the potential for additional strengthening and/or modifications to the historic stone abutments. Deeper girders would be used for the edge beams, whilst the inner beams between the tracks would be kept below the structure gauge. New concrete cill beams would be required to the underside of the deck to transfer the bearing loads, resulting in the removal of the middle sections of the historic moulded stone cornice. The structure would require a standard parapet atop its cantilevered walkway, with the consequent loss of the existing iron parapet handrail. Though this option would maintain the overall form of the deck and would be a close comparator to the existing historic form, it would still result in some slight changes in visual appearance of the deck and walkways.



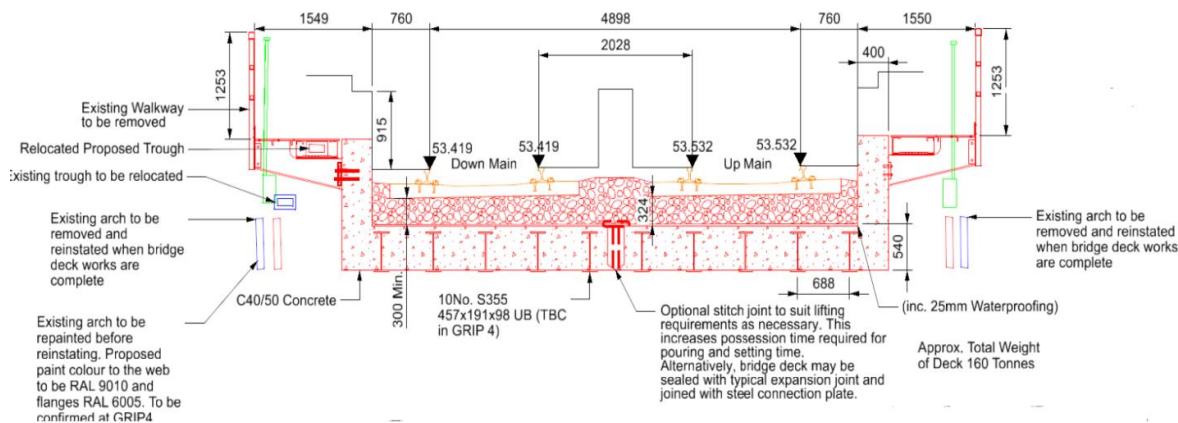
**Insert 3-1 Option 1 – Network Rail Steel U-Type Deck**

3.2.9 Option 2 consisted of a standard Z Type Deck incorporating two single track half-through decks (Insert 3-2). As with Option 1, the appearance of the bridge would be slightly altered as the Z Type Deck would again have a shallower structural depth, however, the external appearance of the deck would remain similar to that existing. Overall maintenance and longevity would be better for Option 2 than concrete options, as is also the case with Option 1. Similarly, as with Option 1, a new cill beam would be required to transfer bearing loads from the four bearings, resulting in the removal of the historic moulded stone cornice, though again significant features such as the arched cast iron edge girder could be removed, retained and reinstated as a non-structural element. Option 2 offers a lighter deck compared to concrete options (see below), but at more capital cost, and importantly it was also heavier than both the existing deck and Option 1. This would result in the potential to require additional works to the historic abutments and substructure. Option 2 was also estimated to have the highest embodied carbon cost of any of the four options.



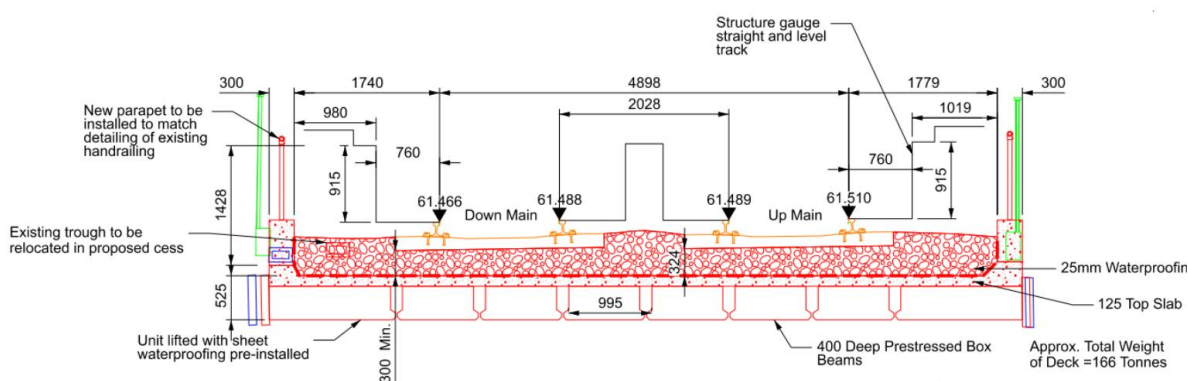
Insert 3-2 Option 2 - NR Standard Steel Z Type Deck

3.2.10 Option 3 sought to use a reinforced concrete filler beam. This would consist of a series of steel gliders spanning longitudinally, encased in reinforced concrete infill. Lower steel flanges would be installed below the soffit, and the transverse reinforcement would be threaded through the steel girders to strengthen the deck (Insert 3-3). This would require a shallower structural depth than the existing deck, and as with Options 1 and 2, would potentially require new cill beams. Option 3 would have resulted in a considerable change to appearance from the existing deck structure, however similarly to Options 1 and 2, the existing cast-iron edge girder arch could be reinstated as part of the works of deck. As this option would be heavier than existing deck, it would require geotechnical analysis to determine suitability, and the potential requirement for strengthening or alterations to the existing stone abutments, due to its designation as >110% of the original structure load. Standard walkways would be connected via anchors to reduce overall weight of the deck, but a bespoke handrail would need to be attached to the walkways for this option to reflect the character of the lost historic parapet.



Insert 3-3 Option 3 - Reinforced Concrete Filler Beam

3.2.11 Option 4 comprised a prestressed concrete box beam spanning on bearings. The structure would be formed by box beams and an insitu reinforced concrete top slab, cast *in situ* and connected with the box beams with steel reinforcement (Insert 3-4). A new parapet would be installed and made to match the existing to retain legibility of its historic form. As with Option 3, the concrete box beam would have a shallower structural depth than existing and may require new cill beams to adjust the deck level. Similar to Option 3, Option 4 would result in significant change to the appearance of deck, however again the cast iron fascia arch would be retained and reinstated. As with Option 3, the concrete box beam would be heavier than the existing deck, and would require geotechnical analysis to determine suitability and likely intervention into the historic abutments, due to designation as >110% of the original structure load.



**Insert 3-4 Option 4 - Prestressed Concrete Box Beam**

3.2.12 It was acknowledged that all four options would result in the loss of the existing deck, plus an amount of additional historic fabric, depending on the specific option, for example the cast iron parapets or moulded cornice stonework. However, it was acknowledged that the current deck is of limited historic interest given that it was replaced in the early 20<sup>th</sup> century (see above, Section 2). Option 1 was agreed in consultation with historic environment stakeholders to be the most favourable option due to its heritage benefits in addition to construction considerations. In comparison to the other options considered, Option 1 was more preferable in terms of:

- **Historic Value:** Option 1 would allow the retention of the masonry pilasters, cast iron edge beam, corner cills and wing walls which contribute towards the structure's overall significance. Other features, including the parapet railing and the central cill beams will be sympathetically replaced to retain the overall appearance of the underbridge.
- **Structural Integrity:** The use of the U-Type deck represents the lightest deck option, in turn protecting the structural integrity of the historic structure. Notably, it avoids the risk of requiring any intervention into the historic stone abutments of the bridge in order to carry additional load.
- **Sustainability:** This option presented the second lowest embodied carbon and reduced whole life costs.
- **Constructability:** This option would enable precast units to be lifted into place using a crane which would provide benefits in terms of the construction methodology and timescale.
- **Operation:** Give that significant defects have been identified at the structure which deem it unsuitable to accommodate the line speed increase, the proposed deck replacement

in Option 1 would therefore extend the lifetime of the structure and its historic features whilst ensuring it remains a component features of the operational railway.

### 3.3 Description of proposals

3.3.1 As identified above, the agreed preferred option to accommodate the increase in line speed is to replace the existing bridge deck at Jack Lane (MDL1/24) with a pair of half-through decks integrated in a single U-Type structure (Option 1). This approach would ensure the ongoing use of the structure as part of the upgraded railway, whilst adopting a sympathetic design towards its historic fabric and retaining its overall historic significance as far as reasonably practicable.

3.3.2 The proposed works to replace the deck at Jack Lane (MDL1/24) would include the removal of the existing deck, including measures to protect, remove or reinstate, as appropriate, those historic elements for retention which contribute to the structure's significance, followed by the installation of the replacement.

3.3.3 The construction process to remove the existing deck would involve:

- Carrying out substructure repairs as specified in Appendix C and drawings (151667-TSA-40-MDL1-DRG-C-ST-042412 and 151667-TSA-40-MDL1-DRG-C-ST-042413).
- Removing the existing 'Up' and 'Down' lines, ballast and sleepers to expose the bridge deck.
- Potential to temporarily remove the ashlar pilaster capitals to prevent the risk of accidental damage during construction (further details see paragraphs 3.3.7 below).
- Removal of existing parapet handrails.
- The existing cast iron edge girders may be temporarily removed to protect against accidental damage during the demolition and construction phases.
- Use of excavator to break down existing deck and walkway to expose girders and transverse beams, before lifting out the girders.
- Excavate and cut down ballast wall to required level and to create stable slope at the back of the existing abutment to enable deck end drainage and waterproofing installation.
- Saw cut the existing corner cill beam units and remove the intermediate cills. The corner cill units (which will be retained) will be temporarily removed, re-bedded on a new grout layer and vertically dowelled into the abutments (see paragraph 3.3.6 below).

3.3.4 Following the above process to remove the existing deck, the new deck would be constructed. Installation of the new deck would comprise:

- Cleaning and preparing the abutments ahead of any works, and ensuring the surface is clear of any dirt before any works commence. Applying a grout layer, ensuring that the grout gains sufficient strength before further works are carried out.
- Land the cill beams units and ballast retention walls using a crane into place ensuring the units are correctly aligned. Cill beam units should be installed sequentially from the outer edge of the abutments.
- Install vertical dowels through predrilled holes in the cill beam units and abutment.
- Install bearings on the completed cill units.
- Secure and bolt the cast iron edge girder in position on the existing abutment with vertical dowels.
- The two U-Type decks to be delivered to the site then lifted into place; the order of installation will be defined based on minimising risk to any retained pilaster capitals. The decks will be landed on the pot bearing pads.

- Installation spray waterproofing on deck and loose laid waterproofing dressed down over cill units, followed by installation of deck end drainage at the low mileage end of the bridge.
- Reinstatement of the historic pilaster capitals, if these were removed.
- Installation of bespoke handrail that matches the existing handrail diameter and centres, onto the new concrete parapet with decorative detailing that matches the bridge's original aesthetic.
- Installation of the troughing, ballast and track.



**Insert 3-5 Visualisation of the proposed eastern elevation of Jack Lane Underbridge (MDL1/24), from the north-east. Note the fascia arch beam will be painted green and white (see accompanying Materials Schedule and LBC drawings).**



**Insert 3-6 Visualisation of the proposed western elevation of Jack Lane Underbridge (MDL1/24), from the south-west. Note, as above, the fascia arch beam will be painted green and white (see accompanying Materials Schedule and LBC drawings).**

- 3.3.5 Additional works to address defects identified in previous inspection reports including general water staining, vegetation growth and open joints, will also be addressed as part of these proposals. These repair works will comprise jet spray cleaning, vegetation removal, cutting down trees, cleaning and repointing open joints. The repair defects and schedule has been set out in Appendix C and drawing 151667-TSA-40-MDL1-DRG-C-ST-042412 and 151667-TSA-40-MDL1-DRG-C-ST-042413. All repair work will be undertaken in a sensitive manner with attention to materiality and colouring which will ensure the repair works will not detract from the existing appearance, will follow Network Rail Rail's standards specification<sup>10</sup> and will align with the approach taken elsewhere on the TRU scheme. The details on the materials to be used in these repairs works has been included in the Material Schedule that accompanies this Listed Building Consent application.
- 3.3.6 The design for the new bridge deck has adopted a sympathetic approach which enables for the retention of various elements of the bridge's historic fabric, such as the regularly coursed stone wingwall, the corner masonry cills, cast iron fascia arch beam, ashlar pilasters and

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<sup>10</sup> Network Rail, 2018, NR/CIV/SD/TUM/101 Technical User Manual: For the Application of Standard Brickworks and Masonry Repair.

masonry abutments which are features which contribute towards the structure's historic and aesthetic values. Additionally, the new U-Type deck, along with retention the existing pilasters, enable the cast iron fascia arch beam to be reinstated, which will maintain the overall profile of the structure. Whilst the cill beams within the bridge span will be removed and replaced with concrete units, the corner masonry cills will be retained. The new concrete cills will also incorporate a corbelled edge profile to mimic the original cornice detailing. These design measures adopted to maintain the overall appearance of the bridge and reinstate historic elements will contribute towards retaining the visual appearance of the bridge's existing form and profile.

- 3.3.7 As a precautionary measure to avoid the risk of accidental damage to the historic fabric during construction activity, the ashlar pilaster capitals, cast iron fascia arch beam and the masonry corner cills would be temporarily removed to avoid damage during the construction programme. To do this the mortar joints on the corner cill and ashlar pier capitals would be carefully tacked out to remove these and number individually. The cast iron fascia arch beam will be carefully lifted out of position and removed from site then carefully stored in a secure location within the compound site and protecting it from environmental elements. At appropriate points in the new deck installation, or once the installation is completed, these elements will be reinstated to their original arrangements, and the masonry elements will be fixed with a colour matched mortar and undertaken by a suitably qualified stone mason.
- 3.3.8 In order to meet Network Rail standards<sup>11</sup>, a new handrail will be fitted atop the new cantilevered walkways which project from the U-Type deck. The new handrail will be designed to match the existing parapet railing in diameter, decorative features and centres, to ensure that they retain a visual representation of the original design. The new parapet handrail will approximately align horizontally with the height of the existing parapet, minimising the difference in appearance when the structure is viewed from ground level along Jack Lane itself. Though this will result in a slight change to the structure's historic form, it will provide legibility of its original design, thereby retaining the ability to appreciate its historic significance.
- 3.3.9 The works will not result in any alterations to the wing walls, abutments or foundations, with the exception of masonry joint repairs (see Appendix C) which will be required to maintain the overall appearance of the bridge and its structural integrity. New trackside timber fencing will be installed at the tops of the wing walls (matching the style of what is already present along the line). The fencing will sit behind the wing wall and will not be fixed into them or the pilasters in any way. The installation of the timber fencing alone would not require Listed Building Consent and does not form part of the works included in this application.
- 3.3.10 The replacement of the bridge deck would be undertaken in a sensitive manner which would retain the elements of historic fabric that contribute to the structure's significance, in particular the surviving cast iron fascia arch beam, and masonry elements (abutments, pilasters and corner cills). Though the deck replacement would result in permanent alterations to the bridge it would retain its overall legibility and its architectural language whilst also increasing the lifetime and longevity of the structure by reinforcing its structural integrity and contributing to the ever-evolving railway.
- 3.3.11 Further information on the specification of materials to be used in the proposed works are included in a Material Schedule which accompanies this application.
- 3.3.12 The proposed works to Jack Lane Underbridge (MDL1/24) are shown in the following

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<sup>11</sup> Network Rail, amend 2015, NR/L3/CIV/020 Level 3 Design of Bridges

drawings which accompany this application:

- Existing and Proposed Plan (151667-TSA-40-MDL1-DRG-C-ST-042470);
- Existing and Proposed West Elevation (151667-TSA-40-MDL1-DRG-C-ST-042471);
- Existing and Proposed Section Through Abutment (151667-TSA-40-MDL-DRG-C-ST-042473);
- Existing and Proposed East Elevation (151667-TSA-40-MDL1-DRG-C-ST-042472);
- Substructure Defects and Repairs 1/2 (151667-TSA-40-MDL1-DRG-C-ST-042412); and
- Substructure Defects and Repairs 2/2 (151667-TSA-40-MDL1-DRG-C-ST-042413).

## 4. IMPACT OF PROPOSALS

### 4.1 Impact on heritage assets

#### Impacts on Jack Lane Underbridge (MDL1/24)

- 4.1.1 The proposed works to replace the existing bridge deck at Jack Lane Underbridge (MDL1/24) would result in permanent alterations to the Grade II Listed structure. Though this would result in alterations to the structure, the design measures have taken into account, and responded to the overall significance of the underbridge, in an effort to retain the historic features which contribute to its significance and limit the impact of the proposals on its appearance as much as reasonably practicable.
- 4.1.2 As previously mentioned, Jack Lane Underbridge (MDL1/24) derives significance from its historical value through its association with the former Leeds Dewsbury & Manchester Railway line and the engineering design of Thomas Grainger. Though the permanent alterations to the bridge deck would result in the loss of historic fabric, the changes would not have appreciable impact on the ability to appreciate the bridge's historic association given that its historic form, presence and features will remain legible, both in their own right as part of the wider network of Grainger's historic railway bridge. This is particularly the case given the existing deck of the structure is a later replacement dating to the early 20<sup>th</sup> century (see below, paragraph 4.1.4). Whilst it is acknowledged that these works would constitute alterations to the structure, the ability to understand and appreciate the overall historic associate value of the structure would be retained.
- 4.1.3 Jack Lane Underbridge (MDL1/24) also derives significance from its aesthetic value attributed to the design of Thomas Grainger, reflecting common approaches taken by Grainger across the whole Leeds, Dewsbury & Manchester Railway line. It is acknowledged that the replacement of the existing bridge deck would result in a permanent alteration to the bridge's visual appearance and impact on the overall significance of the structure. However, the extent of this impact would be limited by the embedded design mitigation measures which have been considered as part of the proposals. This includes the reinstatement of original features including the cast iron arch beams, masonry pier capitals and corner cills (with colour matched mortar), as well as installing a new handrail which would match the dimension and ornamentation of the existing.
- 4.1.4 Though proposals will replace the existing bridge deck, it does not survive in its original form given that it was replaced with the current deck in the early-20<sup>th</sup> century. As such, there will be minimal loss of historic fabric as part of these proposals, and the adopted design will install a new bridge which is similar in overall form as the existing, thereby retaining the current and historic character of the structure. Additionally, the considered design and construction methodology would ensure that features which contribute towards the structure's aesthetic value are retained and/or reinstated, including the cast iron arch beams, masonry pilaster capitals, corner cill stones, abutments and wing walls. The design measures have ensured continuity in the architectural features and, once completed, the overall aesthetic value will continue to be appreciated, particularly from the approaches to the structure along Jack Lane itself.
- 4.1.5 As discussed above, Jack Lane Underbridge (MDL1/24) does not derive any particular significance from its setting given its limited visibility and changes to its former industrial and semi-rural setting throughout the 19<sup>th</sup> to 21<sup>st</sup> centuries. However, the proposal works would ensure that the underbridge remains a viable feature of the operational railway and its historic context in this respect would continue to remain legible and understood in views across and under the structure.
- 4.1.6 The proposed works would have only a slight impact on the extent to which Jack Lane

Underbridge (MDL1/24) derives significance from its group value with other Grainger-designed structures along the Leeds, Dewsbury & Manchester Railway. This is most appreciated in those structures with surviving cast iron elements including Toad Holes Underbridge (MDL1/12) (NHLE 1450704), Ming Hill Underbridge (MDL1/14) (1451887) and George Street Underbridge (MDL1/16) (NHLE 1451888). It is appreciated that alterations are also being undertaken at these underbridges to ensure their ongoing use as part of the operational and upgraded railway network. However, the design mitigation measures carried out at Jack Lane Underbridge (MDL1/24) have sought to maintain its overall appearance and thereby similarities in design languages shared with other structures, to in turn maintain their legibility as a group. Despite the proposed works to Jack Lane Underbridge (MDL1/24), the continued legibility of its historic form maintained through sensitive design would result in only limited impact on the overall significance derived from its group value.

- 4.1.7 Despite changes which will result in permanent alterations to Jack Lane Underbridge (MDL1/24), the design methodology has been conscious of realising opportunities to embed mitigation in order to minimise visual impacts and ensure sensitive integration of these design changes. The loss of historic fabric and change to the structure's appearance, while minimised as far as reasonably practicable, would adversely impact on the overall significance of the Listed bridge. However, a number of the key elements which contribute to this significance would be retained along with the legibility of its historic form. The proposals will also future-proof the structure to ensure its continued operation as part of the upgraded Trans-Pennine Route.

#### Impact on other heritage assets

- 4.1.8 The proposals will not result in direct impact on any other nearby designated or non-designated heritage asset set out above in Section 2.2. There will be no physical changes or changes to setting to any other designated or non-designated asset as a result of the proposed works.
- 4.1.9 As such, the proposals satisfy the National Planning Policy within the NPPF and the Local Planning Policy within the Kirklees Local Plan Policy LP35.

## **4.2 Mitigation and compensation**

- 4.2.1 Mitigation has been used in three separate ways: embedded mitigation; additional mitigation measures and compensation. These are briefly described below and have their basis in the hierarchy of mitigation as detailed in the Design Manual for Roads and Bridges, LA 104 Environmental Assessment and Monitoring.<sup>12</sup>
- 4.2.2 Embedded mitigation occurs within the design stage and is intended to include elements within the design that avoid or substantially reduce negative change to the significance of a historic asset. It can also include elements where loss of historic significance is compensated through high quality new design and use of materials. There may also be changes that enhance or improve the historic asset. Embedded mitigation is discussed as part of the design development (see above, Section 3.2).
- 4.2.3 Additional mitigation measures are applied post-design stage and are intended to include processes and activities that will reduce the level of negative change to the significance of an historic asset.

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<sup>12</sup> Design Manual for Roads and Bridges, LA 104, Sustainability & Environmental Appraisal, Environmental assessment and monitoring. Revision 1 (August 2020).

4.2.4 Compensation measures are applied post-design stage and recognise that the impacts cannot be removed or reduced. These measures are intended as a means of recording the negative change to the significance of a heritage asset, enabling future dissemination of information about this change.

#### Mitigation

4.2.5 The design of the proposals has been shaped to incorporate elements which mitigate potential impacts to the Listed underbridge as far as possible. These elements have been developed in discussions with Historic England and Kirklees Council. Additional information with respect to these elements of design development is included above in Section 3.2.

4.2.6 The adopted design has resulted in mitigation being embedded within the design proposals which have sought to retain features of historical and aesthetic value. The design adopted for the underbridge has been developed in order to retain the legibility of the structure's historic form. The following design considerations have been taken into account in response to the proposed alterations for the Gade II Listed underbridge.

- Retain, as far as reasonably practicable, the maximum amount of historic fabric and features that contribute to its aesthetic value such as the pilasters, iron edge beams, corner cill stones, wing walls and abutments;
- Mimic the diameter and centre of existing parapet railings in the design of the new handrails
- Incorporate corbelled edge detailing on the new concrete cills which will be made and coloured/dyed to reflect the existing

4.2.7 The design development for the Scheme has identified further mitigation measures which aim to reduce potential impacts on the significance of heritage assets arising as a result of the Scheme. Network Rail commits to undertaking such additional mitigation measures as part of the implementation of the construction of the Scheme. In the case of Jack Lane Underbridge (MDL1/24), the additional mitigation measures would comprise:

- Measures to minimise the visibility of construction activity, plan and hoardings, and to reduce dust and noise; and
- Toolbox talk to disseminate best practice for reducing potential impacts in relation to construction activity associated with the underbridge, for example to help avoid accidental damage, this mitigation measure would be secured.

#### Recommended compensation

4.2.8 Requirements to undertake compensation in relation to historic buildings, including Listed Buildings where the proposals of the scheme would result in physical impacts to them, have been identified. These compensation measures would be secured as condition of the Listed Building Consent and aim to offset some of the harm which may occur to the assets significance as a result of the scheme.

4.2.9 **Historic building recording:** A historic building recording of Jack Lane Underbridge (MDL1/24) would be required prior to, or during, the construction phase of the Scheme, as agreed with the appropriate historic environment stakeholders. This would help to compensate the harm to significance resulting from the alterations due to the deck replacement by providing opportunity for recording of the structure and furthering understanding of its development and value. The historic building recording would be

undertaken in Level 3 in accordance with Historic England guidance<sup>13</sup>, and would include:

- Drawings;
- Photography; and
- A written record.

4.2.10 A Written Scheme of Investigation (WSI) defining the methodology for historic building recording has been produced and is included in this submission for Listed Building Consent.

### 4.3 Public Benefit

4.3.1 The proposed replacement of the bridge deck at Jack Lane Underbridge (MDL1/24) is required to realise the public benefits of the W4 Scheme between Dewsbury and Leeds.

4.3.2 The W4 Scheme, as part of the wider TRU Programme, will play a critical role in improving connectivity through journey time, capacity and reliability improvements, enhancing some of Britain's busiest rail network. The purpose of the Scheme is to increase capacity and improve journey time and performance reliability of rail services on the Trans-Pennine Route between both Dewsbury and Leeds and Manchester, Leeds and York.

4.3.3 The Trans-Pennine Route is identified as a key transport corridor for providing connections between cities in the North of England and to support the delivery of economic growth and "levelling up" opportunities across the North of England. The Scheme is essential in supporting the North of England's long-term, low-carbon economic growth, and better connecting people to jobs, services, education and leisure. The vital connection between effective transport systems and local business productivity and district prosperity as well as the full support of the Trans-Pennine Upgrade is recognised in the Kirklees Local Plan 2019 Policy LP19 and the Local Plan Allocations and Designations document (TS7 Public Transport Infrastructure Schemes).

4.3.4 The proposals at Jack Lane Underbridge (MDL1/24) are essential to achieving the overall benefits of the Scheme and wider TRU Programme, and without these changes the Scheme would be unable to go ahead.

4.3.5 There are economic and social benefits to be had from the improved Trans-Pennine Route proposals. These include reduction in journey times along this part of the Scheme with the aim of achieving 43-44 minutes between Manchester Victoria and Leeds. This will be partially facilitated by enabling line speeds of between 70-100mph along the Scheme as well as through other projects on the Route. Electrification also assists with journey time and performance by allowing trains to accelerate faster, and brake more efficiently. The increase in capacity through more train services and longer trains will reduce congestion, increase passenger comfort and improve journey quality. Future passenger modelling has indicated that the numbers of people using the Trans-Pennine Route will increase considerably by the early 2040s. This would be partially achieved through the creation or enhancement of four tracking along other sections of the Route, allowing for express trains to by-pass slower trains and freight services. The Scheme helps to deliver capacity improvements to provide the capability to operate eight 'express services' and two 'local services' an hour, plus a freight path, on the Route. The increased movement of people and goods along this key part of the railway network that connects major cities, towns and transport hubs supports a more economic and socially viable transport solution. It forms a part of the Yorkshire Transport Strategy for harnessing economic prosperity through a better-connected transport network.

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<sup>13</sup> Historic England, 2016, *Understanding Historic Buildings: A Guide to Good Recording Practice*.

- 4.3.6 Though rail travel has been impacted by the COVID-19 pandemic, rail use in the north of England seems to have been sustained better than elsewhere in the UK. Over the longer term, once the immediate crisis has subsided, there is uncertainty regarding any impact on long-term travel demand, and within that, the demand for rail services. The latest Department for Transport (DfT) analysis of post-COVID rail usage scenarios suggests that even in a lower-demand case, demand is likely to have come back to at least the levels seen in 2018/19 by the end of this decade (and may have grown further). Moreover, it is known that, even at static 2018/19 levels of demand, the Scheme route has real and chronic problems that need early investment to rectify existing issues and secure the required improvements in services and performance.
- 4.3.7 As part of the consented W4 Scheme, and the wider TRU Programme, there are environmental and sustainable benefits that arise from the improvements to public transport services and the introduction of more environmentally viable energy solutions. The electrification of the line (through this part of the TRU Programme) is an investment in 'greener' energy technology meeting Network Rail's Decarbonisation Strategy and bolstering national targets for reducing harmful emissions that cause climate change, which are set out in Government legislation for achieving net zero carbon by 2050.
- 4.3.8 The proposed work at Jack Lane Underbridge (MDL1/24) carries considerable public benefit in terms of replacing the existing deck, which has been identified to be in poor structural condition, to accommodate the new line speed which will help to realise improved journey time and the overall reliability of the TRU programme. The replacement of the deck at Jack Lane Underbridge (MDL1/24) would provide public heritage benefits by avoiding the risk of losing a component structure along the TRU network, while adapting the structure for contemporary use in line with the developed aims and objectives of the wider railway network. The improvements to the structural integrity of the reconstructed bridge deck will enhance the structure's longevity while incorporating sympathetic design choices which respond to, and retain legibility of, the structure's heritage significance.

#### 4.4 Assessment on Level of Harm

- 4.4.1 As discussed in Section 4.1, there will be permanent alterations to Jack Lane Underbridge (MDL1/24) as a result of the removal and replacement of the existing deck. In examining the level of harm from the proposals on the significance of Jack Lane Underbridge (MDL1/24), it is considered that this would amount to less than substantial harm under NPPF (para 215). It is considered that the impacts on the significance of the underbridge are limited, and that the replacement of the bridge deck would retain the ability to appreciate the existing underbridge's historic appearance and character, whilst also ensuring its optimum viable use as an operational railway structure.
- 4.4.2 During structural assessment, Jack Lane Underbridge (MDL1/24) was identified to be suffering significant defects to the main heavy girders, due to considerable corrosion, and significant section loss to the bearing web stiffeners. Consequently, the structure was found to be unsuitable to accommodate the changes associated with TRU due to a reduced effective capacity. As such, undertaken the proposed works to replacing the deck and adapting the structure to accommodate the line speed increase to 100mph would result in the retention of the historic structure and the achievement of the overall TRU objectives.
- 4.4.3 Section 4.3 summarises the economic, social and environmental benefits the TRU programme will achieve through delivering an improved rail network to meet public demand and better services, along with the wider route transformation and electrification trains to meet decarbonisation strategies. These works to Jack Lane Underbridge (MDL1/24) will facilitate the operation of the wider railway line and the achievement of the objectives of the TRU programme, a beneficial strategic transport infrastructure scheme as supported by Kirklees Local Plan Policy LP19. These public benefits are extremely significant and, when

applied to the NPPF balance test, outweigh the less than substantial harm to the Listed bridge identified TRU programme.

- 4.4.4 The proposals would preserve the majority of the significance of the underbridge, securing its future use as a historic component of the Trans-Pennine Route and appreciation of it as a nationally important Listed historic structure. This accords with less than substantial harm in Kirklees Local Plan Policy LP35 (policy 1). It would also meet Section 3d of Policy LP35 in realising opportunities to use new technology through electrification of the railway and improvements to support greater regional use of rail travel to mitigate the effects of climate change, which brings public benefits that, on balance, mitigate any harm to heritage asset.
- 4.4.5 It is concluded that the proposals would result in less than substantial harm but meet the test of achieving public benefits which outweigh the harm to significance of the underbridge, in line with paragraph 215 of the NPPF and Kirklees Local Plan Policy LP35.

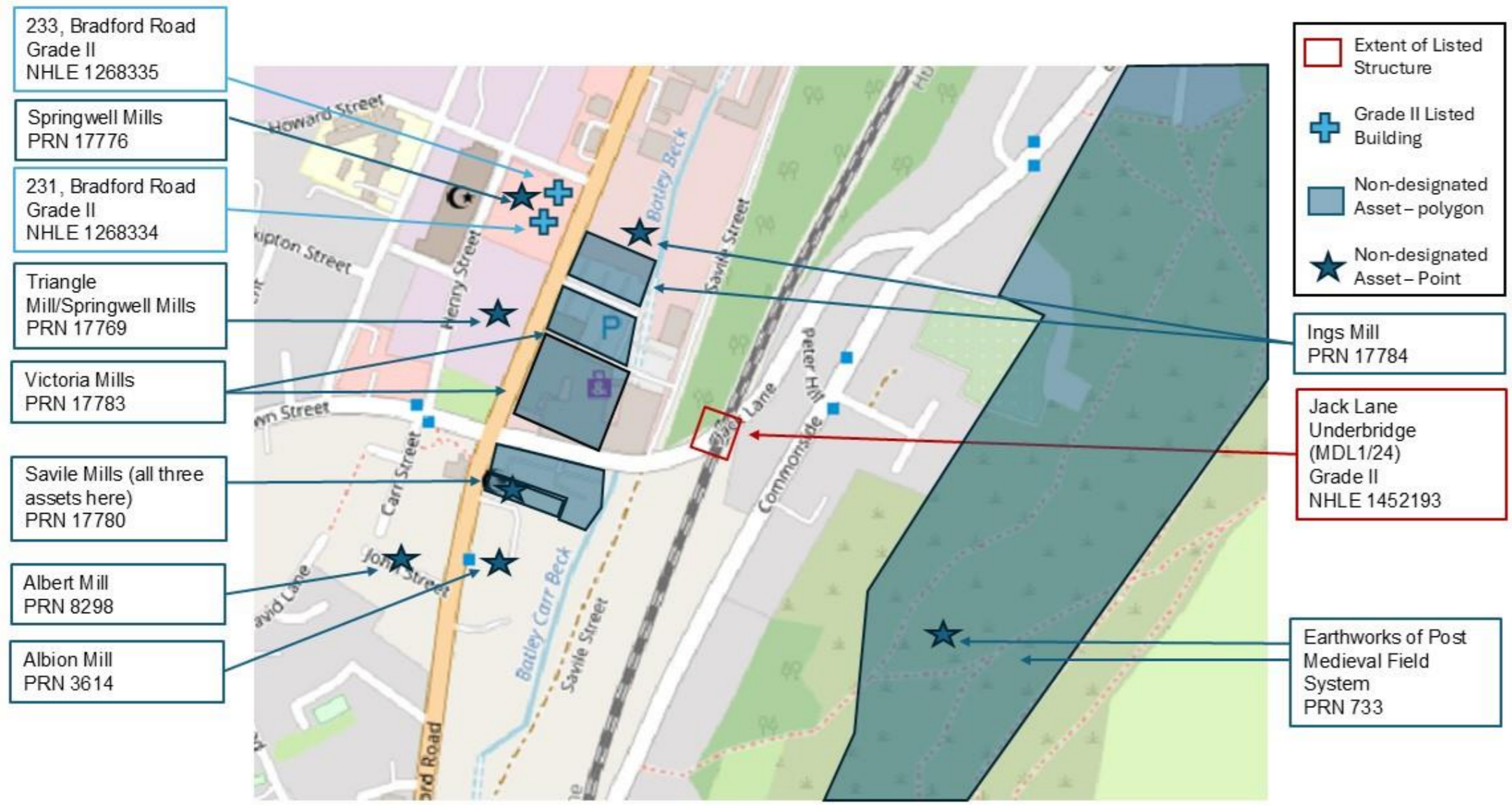
## 5. CONCLUSION

- 5.1.1 Jack Lane Underbridge (MDL1/24) forms a component structure of the historic Trans-Pennine Route and continues to contribute to the operational railway network. The Grade II Listed structure is of significance for its historical associative value with Thomas Grainger, the Heroic Age (1841-50) of railway building and the Leeds, Dewsbury & Manchester Railway. It also derives aesthetic value for the quality of its architectural expression and design, lifting it above the purely functional. The structure shares group value with other structures along the route designed by Grainger, in particular the sequence of underbridges along this portion of the route which retain cast iron features such as Toad Holes (MDL1/12) Ming Hill (MDL1/14) and George Street (MDL1/16) Underbridges.
- 5.1.2 Whilst previous inspections have deemed Jack Lane Underbridge (MDL1/24) to be in overall fair condition, recent assessment of the bridge have determined that it is in poor condition and exhibiting evidence of extensive, heavy corrosion to the main girders, loss of thickness and significant section loss of the bearing web stiffeners. As such, the structure was found to be unsuitable to accommodate the changes associated with the wider TRU programme. The proposed works to replace the bridge deck would seek to retain the structure whilst making it suitable to accommodate the line speed to 100mph. The proposal to install an integrated pair of single-track U-Type decks to replace the existing early 20<sup>th</sup> century deck would suitably accommodate the line speed increase, whilst also retaining the historic form of the structure and features which contribute towards its special interest. Though the works would result in a loss of historic fabric and a slight change in appearance of the structure, the design development has considered various options and adopted sympathetic design mitigation measures. These ensure that the most appropriate approach in terms of responding to the structure's overall heritage significance is maintained whilst realising the requirements of the TRU scheme.
- 5.1.3 The proposals to replace the bridge deck would only slightly diminish the overall significance that the structure derives from its historical and aesthetic values. Although the proposals would constitute a permanent change to the historic fabric of the bridge, the legibility of the structure as a historic, albeit altered, component of the Leeds, Dewsbury & Manchester Railway, along with its association with Thomas Grainger and the Heroic Age (1841-50) of railway building, would be maintained. The design successfully responds to and retains features noted as lifting the design above the purely functional and contributing to its special historic and architectural interest.
- 5.1.4 The proposals would not result in any appreciable impact to the setting of Jack Lane Underbridge (MDL1/24). The setting of the underbridge is largely localised to its relationship with the railway, given that it retains minimal intervisibility with its wider setting due to development and landscape features. As such, the proposed works would not impact the significance that the bridge derives from its setting. Similarly, the works will not impact the significance derives from the structure's group value, as it will retain most of the features contributing to the common design language it shares with other similar structures on the line, and it would still be able to be appreciated as a component feature within this group.
- 5.1.5 Overall, it is considered that the proposals will amount to less than substantial harm in respect of NPPF and Kirklees Local Plan Policy LP35.
- 5.1.6 The proposals would not result in appreciable impacts on the significance of any other designated or non-designated heritage assets.
- 5.1.7 The proposals contribute towards the wider aims of the TRU programme which will play a critical role in enhancing some of Britain's busiest railway network. The installation of a new deck at Jack Lane Underbridge (MDL1/24) would contribute towards the wider TRU objectives of increasing the line speed of the railway to deliver reliable and effective travel.

This approach avoids the risk of the complete removal of the underbridge which would result in a loss of historic fabric and a component feature of the railway.

- 5.1.8 The proposals therefore satisfy both national and local planning policy regarding the balance test of the impact of development on significance of heritage assets, their setting and the public benefits to be realised.

**APPENDIX A – LOCATION PLAN**



## APPENDIX B – HISTORIC ENGLAND LIST DESCRIPTION

### OVERVIEW

Heritage Category: Listed Building

Grade: Grade II

List Entry Number: 1452193

Date First Listed: 23 March 2018

List Entry Name: Railway Underbridge MDL1/24, Jack Lane

Location Description: Jack Lane, Batley

### LOCATION

The building itself may lie within the boundary of more than one authority.

District: Kirklees (Metropolitan Authority)

Parish: Non Civil Parish

National Grid Reference: SE2465722866

### SUMMARY

Underbridge for the Leeds, Dewsbury & Manchester Railway line, mid-1840s, by Thomas Grainger.

### REASON FOR DESIGNATION

Jack Lane Bridge (MDL1/24), constructed in the mid-1840s by Thomas Grainger for the Leeds, Dewsbury & Manchester Railway, is listed at Grade II for the following principal reasons:

Historic interest:\* an original and little-altered 1840s underbridge constructed during the heroic age of railway building on what is now one of the main railway lines in northern England;\* designed by the notable Scottish railway engineer Thomas Grainger, who worked extensively in England and Scotland.

Architectural interest: \* a good example of a mid-C19 cast-iron underbridge, that is imposing in scale and displays craftsmanship in its construction and detailing; \* it reflects engineering practice of the time in utilising cast-iron shallow-arched girders, acknowledging the inherent structural problems in constructing cast-iron beam bridges.

Group value:\* with the other listed structures designed by Grainger on the Leeds, Dewsbury & Manchester Railway line.

### HISTORY

In contrast to the main trunk lines of the late 1830s that were constructed by single railway companies the route from Stalybridge to Leeds had fragmented origins and was the work of three different railway companies: the Huddersfield & Manchester Railway, Leeds, Dewsbury & Manchester Railway, and the Manchester & Leeds Railway.

The Huddersfield & Manchester Railway was authorised in 1845 and followed the route of the Huddersfield Narrow Canal for much of its length, including a railway tunnel through the Pennine hills

set alongside the earlier Standedge Canal Company tunnel of 1811; in 1846 the railway company also acquired the canal. Joseph Locke and Alfred Stanistreet Jee were appointed to survey and design the new line, the two engineers having already worked together on a major project linking Manchester and Sheffield. Jee became the lead engineer for the Huddersfield line, which passed through challenging terrain, assisted by resident engineers that included his brother Moreland Jee (until 1848) and Herbert F Mackworth. Construction of the line was divided into various contracts, with many contractors being only responsible for a single cutting, viaduct or tunnel portal. The largest contract for the Standedge Tunnel between Diggle and Marsden was let to a single contractor, Thomas Nicholson in 1847. The tunnel's completion in 1849 marked the opening of the line.

The Leeds end of the route, which was also authorised in 1845, was constructed by the Leeds, Dewsbury & Manchester Railway. The engineer was Thomas Grainger who had previously largely worked in Scotland, and the line was completed in 1849.

A short three-mile section of the route between Heaton Lodge Junction and Thornhill Junction near Mirfield was developed by the Manchester & Leeds Railway and was constructed between 1837 and 1840, with George Stephenson as the chief engineer. The structures on this line were designed by Thomas Gooch under the oversight of Stephenson. In 1847 the railway company changed its name to the Lancashire & Yorkshire Railway.

In 1847 the Huddersfield & Manchester Railway and the Leeds, Dewsbury & Manchester Railway were acquired by the London & North Western Railway (LNWR) so that the company could access the city of Leeds and the textile towns of West Yorkshire. This pitted them as rivals to the Lancashire & Yorkshire Railway, although at points on the route the two companies had to work together. By 1851 the London & North Western Railway had an overall mileage of railway track of 800 miles and it became the most prominent railway company in the country and the largest joint-stock concern in the world in the late C19. Although the LNWR had a general manager, Captain Mark Huish, the lines of the Stalybridge to Leeds route still managed their own affairs. LNWR later carried out expansion works, including the widening of tracks and bridges, the construction of additional tunnels, and station alterations. In 1923 the line became part of the London Midland & Scottish Railway, and subsequently part of the nationalised British Railways in 1948. The line, its structures and track are currently (2018) owned by Network Rail, and the passenger services operated by TransPennine Express and Northern Rail.

Jack Lane underbridge was designed by Thomas Grainger and dates to the construction of the Leeds, Dewsbury & Manchester Railway between 1845 and 1847. The bridge is depicted on the first edition 1:10,560 OS map surveyed between 1847 and 1851 and published in 1854. It is linked by stone walling to a second railway bridge that formerly stood to the west. After 1895, the track deck was rebuilt with riveted steel beams and transverse joints.

Thomas Grainger (1794-1852), the civil engineer for the Dewsbury and Manchester Railway, had been a leading advocate and designer of early railways in Scotland from 1823 onwards, working in Yorkshire from the 1840s until his death in 1852 following a railway accident. His design for Jack Lane Bridge can be seen as a relatively early acknowledgement of the inherent weakness of cast-iron level beam bridges: cast-iron being strong in compression, but weak in tension. By forming the underside of the beams as arched girders, even though the arch is very shallow, the additional loading on the bridge from passing trains would compress the arch against the abutments: a standard level beam would flex downwards in the middle, placing the beam into tension. Cast-iron beams were very widely used for early railway bridges, their use dramatically declining for new bridges following the Dee Bridge Disaster of 1847. Although cast-iron continued to be widely used for arched bridges (but generally with more pronounced arches) into the 1870s, subsequent bridge failures such as Inverythan, Aberdeenshire (1882) and Norwood Junction, London (1891) led to the wholesale replacement of cast-iron bridges carrying railway lines, with most of those retained having strengthened or replaced decks.

## DETAILS

Railway underbridge for the Leeds, Dewsbury & Manchester Railway line. Mid-1840s by Thomas Grainger.

**MATERIALS:** cast-iron, quarry-faced sandstone with ashlar piers.

**DESCRIPTION:** a shallow arched, cast-iron beam bridge carrying the railway line over Jack Lane, which occupies a deep gully, and hence the abutments and wing walls are substantial structures. The bridge is similarly detailed on both sides. The angled abutments are constructed of rectangular, rusticated stone blocks with a plinth and moulded cornice with demi-acorn finials to the corners. The abutments terminate in square ashlar piers, which rise to track level where there is a moulded cornice, above which are narrower square parapet piers. Attached to the piers are gently curving and angled wing walls with square ashlar coping; they terminate in square piers with shallow pyramidal caps. The south-east wing wall has a later stone wall constructed upon part of it, and the stone coursing of the south-west wing wall continues into a further section of walling with stone bands associated with a second bridge that formally stood here. The bridge has a simple cast-iron balustrade of stick balusters supported on cast-iron fascia beams that spring from a moulded impost band on abutments of quarry-faced local sandstone; each fascia beam is formed by an arched girder with infilled spandrels above, finished with a moulded top flange supporting the iron balustrading above. The re-built track deck has riveted steel beams and transverse

## APPENDIX C – MASONRY REPAIRS

The tables below set out the repair schedule and defects priority at Jack Lane (MDL1/24). These should be read in conjunction with the following drawings that accompany this Listed Building Consent Application:

- Substructure Defects and Repairs (151667-TSA-40-MDL1-DRG-C-ST-042412); and
- Substructure Defects and Repairs (151667-TSA-40-MDL1-DRG-C-ST-042413).

Repair Schedule				
Reference	Location	Defects	Repair Detail	Priority
R1	Wing wall 1 (Low Mileage)	Approx 660mm high 10mm deep open joints.	Rake out, clean and repoint defective mortar joints.	P4
R2	Wing wall 1 (Low Mileage)	Approx 3m x 0.5m open joints of varying depth.	Rake out, clean, and repoint defective mortar joints.	P3
R3	Wing Wall 1 (Low Mileage)	General Vegetation and tree growth.	Vegetation to be treated with herbicide and removed from site. Root system to be removed as reasonably practicable and structural elements made good. Resulting open joint to be raked out and repointed.	P4
R4	Low Mileage Abutment (East Elevation)	Tree growth.	Tree on or within 3m of the structure to be cut down and treated to prevent regrowth. Resulting open joints raked out and repointed.	P3
R5	Wing Wall 2 (Low Mileage)	Approx 5m x 5m area of vegetation through mortar.	Vegetation to be treated with herbicide and removed from site. Root system to be removed as reasonably practicable and structural elements made good. Resulting open joint to be raked out and repointed.	P3
R6	Wing Wall 2 (High Mileage)	Mortar loss of up to 50mm throughout coping.	Rake out, clean and repoint defect mortar joints.	P3

R7	High Mileage Abutment	General water staining and accumulated dirt.	Jet spray cleaning of abutment. Any open joint that appear as a result of cleaning shall be raked out and repointed.	P4
R8	Low Mileage Abutment	General water staining and accumulated dirt.	Jet spray cleaning of abutment. Any open joint that appear as a result of cleaning shall be raked out and repointed.	P4

**Defect Priority Table**

Priority	Description	Action
P1	Urgent' priority defects as identified by remit	As identified within schedules
<b>Stonework</b>		
P2	A) Loose or missing stonework B) Spalling stonework greater than 100mm deep	A) Replace loos, missing spalled stonework with a stone or a similar colour/hardness. All new work to be tied into sound material. Mortar to be coloured to blend in with the original. B) Cut out and replace spalled with a suitable brick or stone of a similar colour/hardness
P3	A) Spalling stonework > 40mm and <=40mm deep	A) Clean open joints and repoint
<b>Stone Block</b>		
P4	A) Spalling stonework <= 40mm deep	A) Clean open joints and repoint
<b>Pointing</b>		
P2	A) Mortar loss greater than 50mm deep in brickwork	A) Rake out any loose mortar. Re-point using sand/cement/lime-based mortar (Mix to suit material). Pointing to have 'Bucket handle' finish. Mortar to be coloured to blend in with the original.
P3	Mortar Loss 20 – 50 mm deep in brickwork. Note: P2 pointing items are only where the remaining mortar is soft	A) Rake out any loose mortar. Re-point using sand/ cement/lime-based mortar (Mix to suit material). Pointing to have bucket

		handle finish. Mortar to be coloured to blend in with the original.
P4	A) Mortar loss 10 – 20mm deep in brickwork. Note: P3 pointing items are only where the remaining mortar is soft	A) Rake out any loose mortar. Re-point using sand/cement/lime-based mortar (Mix to suit material). Pointing to have bucket handle finish. Mortar to be coloured to blend in with original.

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