# Scarborough Bridge, York
# Statement of Significance
## Prepared for Network Rail
## October 2017

Alan Baxter

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# Executive Summary

This report has been prepared for Network Rail by Alan Baxter Ltd (ABA), to support a planning application to replace the footway on Scarborough Bridge with a new cycle path.

Scarborough Bridge (YMS/1) is an operational railway bridge owned by Network Rail. It carries the line between York and Scarborough over the River Ouse and on its east side also carries a footway which links the foot/cycle paths which run along each bank of the river. It stands on the edge of the historic core of York, immediately to the north of the railway station. The bridge is not designated as a listed building or a locally listed building; it forms the boundary of the Central Historic Core Conservation Area.

The structure consists of stone abutments with classical detailing, rusticated stone wing walls and a central stone pier supporting a steel deck for the railway tracks and a separate deck for the footway. It has developed in three main phases:

1. The original construction in 1845, with modifications soon after;
2. A new superstructure in 1873–75 and alterations to the masonry elements of the bridge, in association with the construction of York Station;
3. A new steel deck and other alterations in 2015.

The original Scarborough Bridge was part of the heroic age of railway building, when 'railway mania' gripped the country, but it was not innovative in its design or, in a national context, a major railway structure. It is, however, part of York's history as an important railway centre and forms a minor part of the setting of the historic core of the city.

The primary significance of Scarborough Bridges lies in the surviving stonework from the 1845 bridge, which is attractively detailed and embodies associations with Robert Stephenson, George Hudson and York's early railway history. Later alterations have not been of comparable historic or architectural interest. The bridge is of local rather than national significance.

# 1.0 Introduction

This report has been prepared for Network Rail by Alan Baxter Ltd (ABA), to support a planning application to replace the footway on Scarborough Bridge with a new, fully accessible, foot and cycle way. The proposed upgrade will provide a wider bridge with improved access on the approaches for cyclists and those using pushchairs and wheelchairs.

The report sets out the history of the bridge, places it in historical context and gives an independent assessment of its heritage significance.

## 1.1 Methodology

The report is based on the primary and secondary sources which are listed in section 4 of the report. A site visit was made on 2 October 2017. We are also greatly indebted to Dr Bill Fawcett, a copy of whose brief history of the bridge, presented to the Conservation Area Advisory Panel (CAAP) in August 2017, was supplied by Network Rail and forms the basis of the historical narrative in the report.

It is the nature of existing buildings that details of their construction and development may be hidden or may not be apparent from a visual inspection. The conclusions and any advice contained in this report – particularly relating to the dating and nature of the fabric – are based on our research, and on observations and interpretations of what was visible at the time of our site visits. Further research, investigations or opening up works may reveal new information which may require such conclusions and advice to be revised.

# 2.0 Understanding

Scarborough Bridge (YMS/1) is an operational railway bridge owned by Network Rail. It carries the line between York and Scarborough over the River Ouse and on its east side also carries a footway which links the foot/cycle paths which run along each bank of the river. It stands on the edge of the historic core of York, immediately to the north of the railway station (Fig. 1). The structure consists of stone abutments with classical detailing, rusticated stone wing walls and a central stone pier supporting a steel deck for the railway tracks and a separate steel deck for the footway (Fig. 2).

## 2.1 Heritage designations

Scarborough Bridge is not designated in any way for its historic or architectural interest. It is not included in the National Heritage List for England (the statutory list) and is not recognised by local listing. It forms the boundary of the Central Historic Core Conservation Area, but is not part of it. The Conservation Area Appraisal notes that ' Scarborough Bridge is well used by pedestrians but is in a poor condition. The pedestrian walkway could be replaced with a more attractive and well lit design' (Alan Baxter Ltd, 143). The Bridge stands within the York Area of Archaeological Importance.

## 2.2 History of Scarborough Bridge

The bridge has developed in three main phases:

1. The original construction in 1845, with modifications soon after;
2. A new superstructure in 1873–75 and alterations to the masonry elements of the bridge, in association with the construction of York Station;
3. A new steel deck and replacement of some 1870s wrought-ironwork with replica steelwork in 2015.

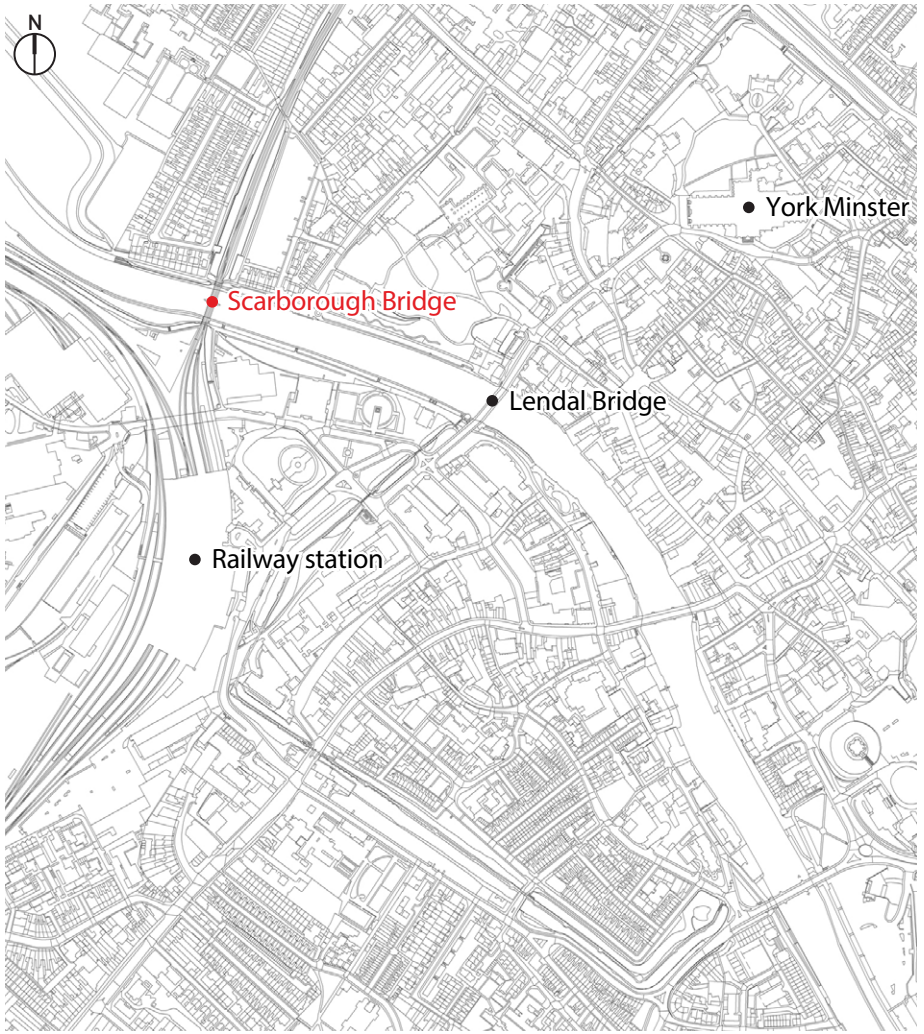
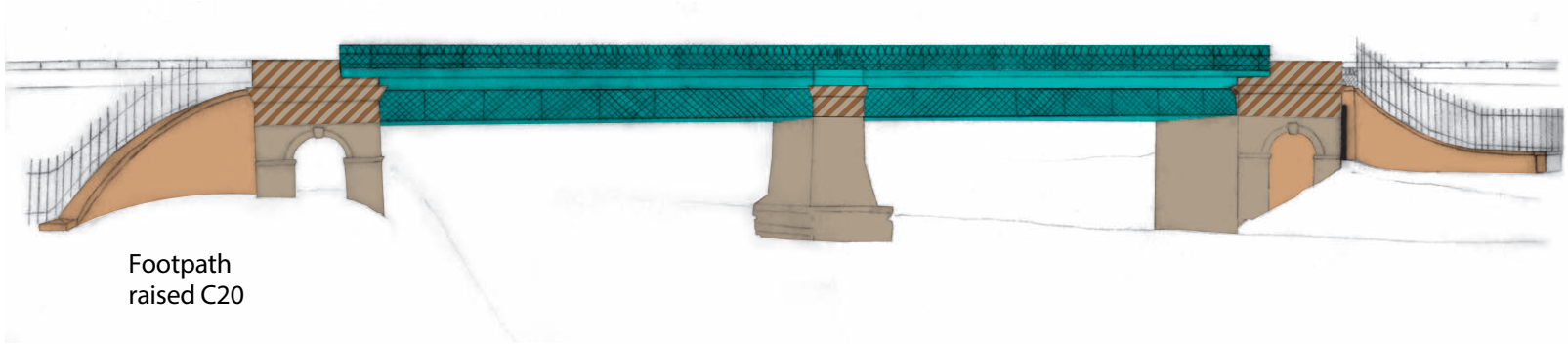



Fig. 1: Location plan.

**West elevation**




**East elevation**

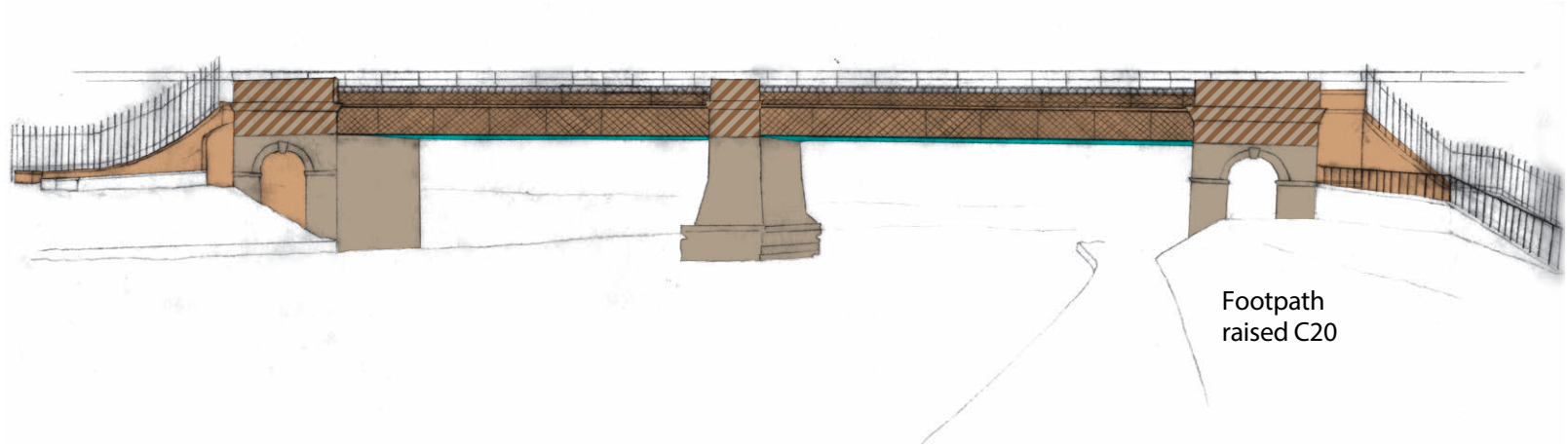



Fig. 2: Scarborough Bridge: age of fabric.

## Phase I: 1845–73

The bridge was first constructed in 1845 (Fig. 3) as part of the York and North Midland Railway line from York to Scarborough. It carried two railway tracks and, between them, a pedestrian footway. The foundation stone of the first abutment was laid on 28 March 1845 and the bridge opened for traffic on 7 July, a remarkably quick construction process.

The first Scarborough Bridge was designed in the office of Robert Stephenson (1803–59), one of the leading early railway engineers. It employed iron beams spanning between classically-detailed stone abutments (Fig. 4) and a central pier founded on cast-iron piles. The abutments were flanked by massive rusticated wing walls. The beams were a compound of cast iron, with wrought iron tie rods to add strength and enable spans of 70ft, longer than could be achieved with cast iron alone. This was a common method for early railway bridge building, until the disastrous failure of the bridge over the River Dee at Chester, also designed by Robert Stephenson's office, in May 1847.

Fig. 3: Watercolour by unknown artist, c.1845.



Fig. 4: Detail of stonework on the northern abutment.

After the Dee bridge disaster, Scarborough Bridge was strengthened by the addition of bracing under the deck, fixed to cast iron beams built into the abutments and pier (Fig. 5). The bracing was later removed but the beams and the sockets for the bracing survive (Fig. 6). They were cast in York and bear the founder's name, 'E Thompson', probably Edwin Thompson who established the Phoenix Iron Foundry in York in 1838 and provided ironwork for the construction of the first railway station at York.

Construction details of the early bridge can be seen in the drawings in the appendix to this report.



Fig. 5: View of the bridge from the east, c.1850s–60s. Note the bracing under the deck of the bridge which was added after 1847.

Fig. 6: One of the cast-iron beams built into the bridge to support the bracing added in 1847.

## Phase 2: 1875–2015

The creation of the new York Station (1872–77) necessitated the raising of the level of the track on Scarborough Bridge. So between 1873 and 1875 the original deck (and the bracing underneath) was removed and replaced with a new superstructure of wrought iron lattice girders (Fig. 7). As well as being more robust than the original deck structure, these provided the extra height needed for the new track bed.




Fig. 7: The bridge in 1948, virtually unchanged since its rebuilding in 1875.

The stonework on both elevations was also raised, by inserting additional courses between the original string course and the cornice and adding an extra course to the parapet. The wing walls were also rebuilt so that they reached the new, higher level of the embankment. Whereas the original wing walls matched the smooth ashlar on the abutments, their replacements are robustly rusticated.

At the same time the footway was removed from between the tracks and relocated to the east side of the bridge (Fig. 8). This meant that the wing walls on the east side of the bridge had to be built further out from the abutments, to create space for the steps from the footway to land on the river bank (Fig. 9).

Fig. 8: The footway on the east side of the bridge, looking north.

Fig. 9: The east side of the northern abutment.

Shortly after this work was done, settlement of the southern abutment became apparent, so the archway through it was blocked up in matching stonework (Fig. 10) and a new opening made in the bridge for the diverted footpath. This presumably involved further work to the south-east and south-west wing walls, which would account for their curious serpentine shape (Fig. 11).

After that, the structure of the bridge appears to have remained essentially unchanged for the next hundred years and more (Fig. 12), although the steps at both ends of the bridge have clearly been rebuilt, probably in the late twentieth century. Photographs in the National Railway Museum collections show that the trackbed was renewed in 1955.

At some time between 1912 and 1948, the level of the footpath on the north bank of the river was raised, filling in the lower part of the passageway through the abutment and burying the lower part of the wing wall.

Fig. 10: The east side of the southern abutment, showing the infilled archway.

Fig. 11: South-east wing wall.


Fig. 12: View of the west side of Scarborough Bridge, 9 June 1977.

### Phase 3: 2015–

In 2015, an entire new steel deck was dropped in to replace the 1870s superstructure (Fig. 13). This raised the track level once again and in order to accommodate a maintenance walkway on the west side of the bridge the stonework above the cornice on west side of the central pier and some of the stonework on the west side of the northern abutment were removed (Fig. 14).

The 1870s wrought-iron lattice girder and wrought-iron scrollwork on the west sitde of the bridge were replaced with replica steelwork. On the east side the scrollwork was removed and reinstated (Fig. 15), and the lattice girders retained *in-situ*.

Fig. 14: The west side of the bridge after the 2015 alterations. Note the loss of stone work over the pier and northern abutment.

Fig. 13: Underside of the bridge showing the new steel deck.

Fig. 15: 1870s wrought-iron scrollwork reset on the new bridge deck.

## 2.3 Historical context

### York as a railway centre

Scarborough Bridge is part of York's history as a major railway centre. The city's first railway was constructed by George Hudson (the 'Railway King') and his York and North Midlands Railway Company (Y&NMR). In 1841 the first permanent station opened; it was built jointly by the Y&NMR and Great North of England Railway (GNER) and was located inside the city walls at Toft Green. The bridge was built as part of the York and North Midland Railway's York to Scarborough line, which opened to traffic on 7 July 1845.

In 1854, following George Hudson's fall from grace due to his fraudulent dealings in company shares, the North Eastern Railway Company (NER) was formed through the amalgamation of several of Hudson's railway companies, including the Y&NMR and GNER .

The 1870s saw York become a busy junction and the location of the NER's headquarters and engineering works. The construction of the present station, at the time the largest in the country, from 1872 to 1877, prompted the reconstruction of Scarborough Bridge.

By 1905 the NER employed 6,000 people in York, out of a population of 75,000 (Biddle 2011: 467). However, by 1972 most goods traffic had ceased and the railway no longer played such a large role in the city. The large engine sheds on the site of the NER engineering works have become the National Railway Museum and in 2010 the headquarters office block became a hotel.

### Railway history

Historic England's *Listing Selection Guide: Transport Buildings* identifies four historic periods in the creation of the national railway network, with descending levels of importance.

- Pioneering phase, 1825–41
- Heroic age, 1841–50
- Consolidation of the network, 1850s–70s
- Completion of the network, up to 1914

The original Scarborough Bridge was part of the heroic age of railway building, when commercial speculation and the competition for routes led to the frantic construction of new lines as 'railway mania' gripped the country. The technology of railways was still relatively new and much of it untested. By the 1870s much of the early railway infrastructure was being rebuilt, to correct flaws in the original design or simply to increase capacity as the volume of railway traffic continue to grow. The consolidation of the original, small railway companies into larger concerns such as the North Eastern Railway led to greater standardisation of railway structures.

## Development of railway bridges in the nineteenth century

Early railway bridges took a number of forms and employed a variety of materials. Masonry arched structures were a tried-and-tested technology, but where wider spans with flat soffits were needed – to cross roads, rivers or canals – timber or iron were used.

Beam bridges were well suited to railway use since they provided a level deck on which to lay tracks and created larger clearances than arched bridges, so that where they crossed roads or rivers they did not obstruct the traffic below. They were also quicker to construct than masonry arched structures. Cast iron beams were more durable than timber but there was a limit to the distances they could span.

For spans longer than about 50 feet a compound girder or 'trussed beam' was developed. This was formed of cast-iron beams with wrought iron tie rods, as at Scarborough Bridge. The form of trussed beam that came into common usage was designed by George Parker Bidder, working for Robert Stephenson, and was probably first used in 1839 for a bridge over the River Lea at Tottenham for the Northern and Eastern Railway (RPS, 68).

This was a common method for railway bridge-building until the disastrous failure of the bridge over the River Dee at Chester, also designed in Robert Stephenson's office, in May 1847. This discredited the compound girder and bridges of this type were, over the next few years, strengthened with further trussing or props or rebuilt. However, 'Even the strengthened examples had gone by the end of the century' (RPS, 69).

Various forms of wrought iron construction then became standard practice up until the introduction of steel construction in c.1890. These included tubular and box girders, plate girders and, as used for the rebuilding of Scarborough Bridge, lattice truss girders. The lattice truss was first developed in timber in America in 1820 and was introduced to Britain in the mid-1830s, where it was adapted to wrought iron construction.

The world's first all iron lattice truss bridge was built for the Dublin and Drogheda Railway in Ireland in 1843. This form of bridge was structurally robust and economical to build since it involved a large element of pre-fabrication. As a result it was widely adopted and used throughout the rest of the nineteenth century.

Many of the early railway bridges were later rebuilt, in response to structural weakness, or to meet the demands of heavier locomotives and rolling stock and the need for greater capacity on the network. Scarborough Bridge was typical in this regard. The re-use of the masonry abutments and pier were a pragmatic and economical measure. A similar example can be found in Bath, where the timber arches of Brunel's bridge of 1839–40 were replaced with wrought iron lattice trusses in 1876–79, but the original stone abutments and cutwater were retained.

## 2.4 The bridge in its setting

Scarborough Bridge was built on undeveloped ground outside the city walls, but within sight of the historic centre of York (Fig. 16). Although the earliest view of the bridge (Fig. 3) exaggerates its picturesque isolation (in reality, it was within a few hundred yards of a tannery and a coal staith) it has always been experienced at least partly in a context of grass and trees. John Bell's romanticised view of 1863 (Fig. 17) associates the bridge with the riverside walks and views towards the city.

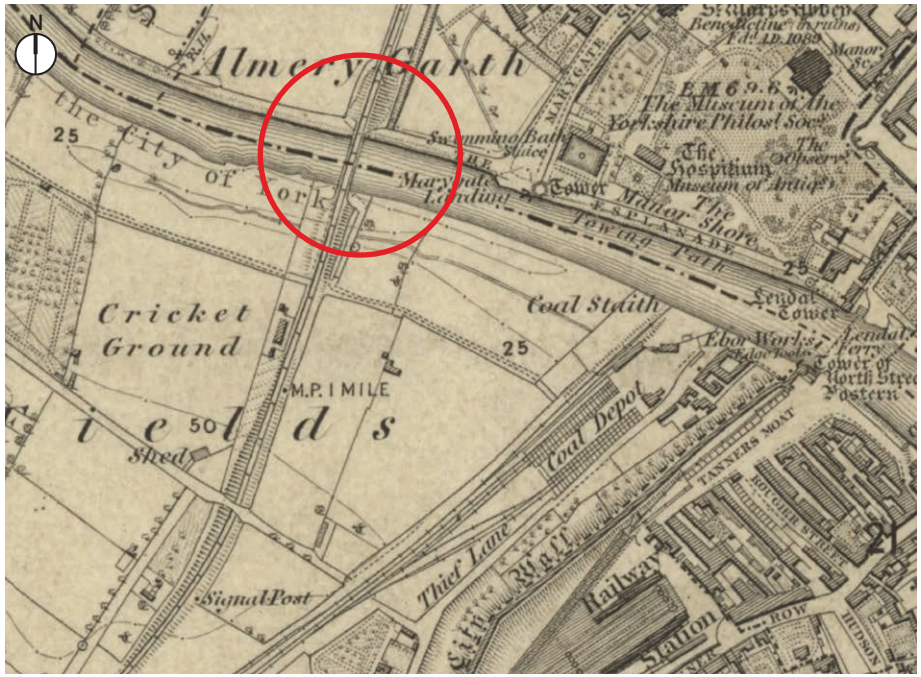



Fig. 16: 1853 Ordnance Survey.

Fig. 17: *York from the Scarborough Railway Bridge* by John Bell, c.1863 (from *Views of York*).

Since 1863, when Lendal Bridge was opened, Scarborough Bridge has also appeared in views from the city, experienced by hundreds of people each day passing between the railway station and the city centre. Even after the railway had spread over several acres to the south of the bridge, the immediate setting remained open into the twentieth century (Fig. 18).

Today, views of the bridge are limited to those from Lendal Bridge (Fig. 19) and the riverside walks to the west of it. Although the bridge almost abuts the north end of the station (and has an important historic link to it) one has to go to the extreme end of the station platforms to see it (Fig. 20). The visual connection of the bridge to the city, in views under the bridge and from the footway on the bridge itself, continues to be an important part of its identity (Fig. 21 and Fig. 22).

Fig. 19: View from the Lendal Bridge.



Fig. 18: West side of the bridge, c.1912.

Fig. 20: View from platform end at York Railway Station.

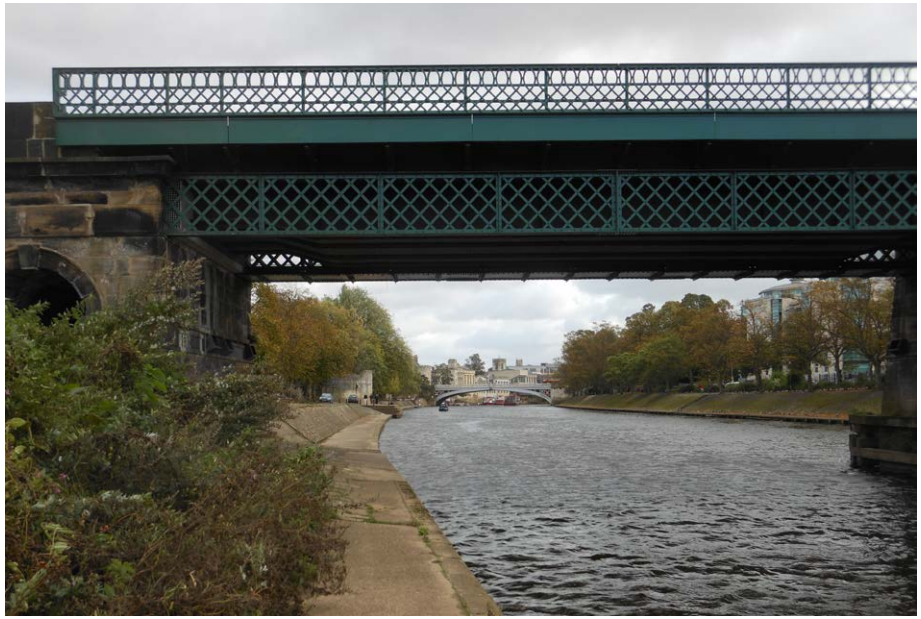


Fig. 21: View eastwards under the bridge towards the historic city centre.

Fig. 22: View from the footway on Scarborough Bridge towards Lendal Bridge.

# 3.0 Assessment of significance

## 3.1 Methodology

Assessing significance is the means by which the cultural importance of a place and its component parts is identified and compared. The identification of elements of higher and lower significance, based on a thorough understanding of a site, enables owners and designers to develop proposals that safeguard, respect and where possible enhance the character and cultural values of the site. Assessment can identify areas where no change or only minimal change should be considered, as well as areas where more intrusive changes might be acceptable.

Statutory designation is the legal mechanism by which the most significant historic places are identified in order to protect them. As noted in the Introduction to this report, Scarborough Bridge is not a designated heritage asset, but this does not mean that it lacks significance entirely or that there are not distinctions to be drawn between the relative significance of different parts.

The terminology and criteria used in this assessment come from the *National Planning Policy Framework* (NPPF, 2012). This document places the concept of significance at the heart of the planning process.

Annex 2 of the NPPF defines significance as:

> *The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.*

Historic England's *Conservation Principles, Policies and Guidance* (2008) includes a methodology for assessing significance by considering 'heritage values'. In this instance NPPF terms are used because their adoption simplifies the preparation and assessment of planning and listed building consent applications, but the equivalent heritage values are given in brackets for reference.

Annex 2 of the NPPF defines **archaeological interest ['evidential value']**

in the following way:

> *There will be archaeological interest in a heritage asset if it holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them.*

DCLG has previously (in PPS5) given these definitions for the other types of interest:

- **Architectural and Artistic Interest ['aesthetic value']:** These are the interests in the design and general aesthetics of a place. They can arise from conscious design or fortuitously from the way the heritage asset has evolved. More specifically, architectural interest is an interest in the art or science of the design, construction, craftsmanship and decoration of buildings and structures of all types. Artistic interest is an interest in other human creative skill, like sculpture.
- **Historic Interest ['historical value']:** An interest in past lives and events (including pre-historic). Heritage assets can illustrate or be associated with them. Heritage assets with historic interest not only provide a material record of our nation's history, but can also provide an emotional meaning for communities derived from their collective experience of a place and can symbolise wider values such as faith and cultural identity **['communal value']**.

## 3.2 Significance by type of interest

### Archaeological

The history of alterations to the bridge, which can be read in its fabric, is of some archaeological interest. In particular the survival of the cast-iron beams which held the bracing added after 1847 is of interest, nationally in terms of the response to the River Dee bridge disaster, and locally in terms of the evidence of York's local industries.

### Architectural and artistic interest

The bridge's original elegance has been eroded by successive changes, although its basic form – stone abutments and central pier supporting two metal bridge spans – survives and thus its structural legibility remains apparent. The detailing of the stonework is of some architectural interest, particularly in the northern abutment where some exquisite workmanship remains inside the tunnel and in the archivolts on each face. The superstructure of the bridge is largely functional, with the exception of the scrollwork, which adds a small element of gaiety. Although it features in important views from Lendal Bridge, its effect on the view is at best neutral.

### Historic interest

Scarborough Bridge has some historic interest through its association with Robert Stephenson, 'one of Britain's three great early railway engineers' (Biddle, 779), and with George Hudson, the railway king, but the level of alterations to the bridge, as they created it, diminishes that interest. It also has some historic interest in a local context as an early part of the railway landscape in York. From 1839 onwards the railways had a huge impact on York and have directly shaped the development and form of the city. The railway landscape of York is unusual for its quality (particularly the old and new stations) and range, encompassing passenger and goods stations, hotels, locomotive, carriage and wagon works, workers' housing and the headquarters of a railway company, as well as other more minor structures. The bridge plays a minor part in the overall significance of this group of structures.

## 3.3 Comparative assessment

How does Scarborough Bridge compare to other nineteenth-century railway bridges, in terms of age, rarity, intactness and design interest?

Survival of early railway bridges wholly or largely intact is rare. The exceptions are mostly masonry arched structures, which were tried-and-tested technology and formed of durable materials. Several of these survive that are earlier than Scarborough Bridge.

Bridges that used masonry abutments and piers with an iron or timber superstructure have mostly, like Scarborough Bridge, been rebuilt. Some, such as the Skew Bridge at Bath (1840), retain most of their 1870s replacement fabric, but more typically they have been altered again in the twentieth or twenty-first century. Carlisle (or Lune) Bridge at Lancaster (1847) for instance has massive stone piers which first carried a laminated timber superstructure that was replaced in 1866 with wrought-iron and again in 1963 with steel and concrete.

The greatest achievements using a combination of masonry and iron were truly monumental; structures such as the Britannia Bridge over the Menai Straits (1850) or the Royal Albert Bridge, Saltash (1859). When compared to these, Scarborough Bridge is clearly in a more minor category.

Robert Stephenson, in whose office Scarborough Bridge was designed, was one of the heroes of the heroic age of railway development, as confirmed by his burial among other great national figures at Westminster Abbey. Compared to his other works, Scarborough Bridge is less significant than the monumental structures of the High Level Bridge in Newcastle–upon-Tyne (1849) or the Royal Border Bridge, Berwick (1850) and was not innovative in its use of iron, unlike the Conway and Britannia tubular bridges (1849 and 1850). As described above, the trussed beam had been in use since 1839 and the combination of solid masonry abutments and piers with iron decks was typical of larger nineteenth-century bridges. Even Stephenson's masonry is very much-altered.

The nineteenth-century fabric of Scarborough Bridge relates to two important phases of the development of Britain's railway network but the fragmentary nature of the fabric from each of those phases means that it does not compare well with other surviving nineteenth-century railway bridges.

## 3.4 Significance of phases of the bridge

The fabric of Scarborough Bridge relates to three phases of railway history, each with a different level of significance.

### Phase I: 1845–73

The most important phase is the first, to which date most of the stonework of the central pier and the abutments and wing walls. Not only is it the oldest fabric in the bridge, but the quality of the surviving stonework is also high, particularly in the northern abutment. This phase is associated with one of the great early railway engineers, Robert Stephenson, which gives it some historic interest. It also has historic interest as part of the early development of York as a railway centre. The survival of the (locally-made) cast-iron beams inserted as part of efforts to strengthen the bridge after 1847 is of both archaeological and historic interest. Had it survived in its original form the bridge would undoubtedly be of high significance, but in its fragmentary state it is of only local significance.

### Phase 2: 1873–2015

The second phase of the bridge survives in the lattice girders and the scrollwork screens, and the general layout of the bridge, with the footway on the east side, and the altered stonework of the wing walls. The adoption of lattice girders was widespread in the second half of the nineteenth century, both for new bridges and, as here, for the rebuilding of bridges. It is therefore neither rare nor innovative and has little aesthetic interest. The alterations to the original stonework which date from this phase have some minor archaeological and historic interest, but they detract from the overall architectural interest of the bridge, which lost some of its original elegance as a result. The scrollwork is a relatively unusual and attractive design. This second phase survives better than the first, but is of less interest generally and has also been altered.

### Phase 3: 2015–

The new deck inserted two years ago is, in 2017, of no historic, architectural or archaeological interest. The loss and alteration of earlier fabric as part of the works reduced the overall historic, architectural and archaeological interest of the bridge.

# 4.0 Sources

## 4.1 Archives

### The National Archives

RAIL 1006/115 Plan, section and elevation of first phase of Scarborough Bridge (n.d.)

RAIL 1157-2-8 Photograph of nineteenth-century topographical drawing of Scarborough Bridge (n.d.)

### Historic England *England's Places* collection

Card reference 6517_057 View of Scarborough Bridge with Postern in the foreground, c.1850s–1860s

### National Railway Museum (accessible via Science and Society Picture Library)

SSPL image 10689980 Watercolour of the first Scarborough Bridge, c.1845

SSPL image 10321251 View of a train crossing Scarborough Bridge, 15 August 1948

## 4.2 Books

Biddle, G. 2001 *Britain's Historic Railway Buildings*

Hoole, K. 1983 *Rail Centres: York*

Brown, Peter B. 2012 *Views of York*

## 4.3 Reports

Alan Baxter Ltd 2014 *York Central Historic Core Conservation Area Appraisal*

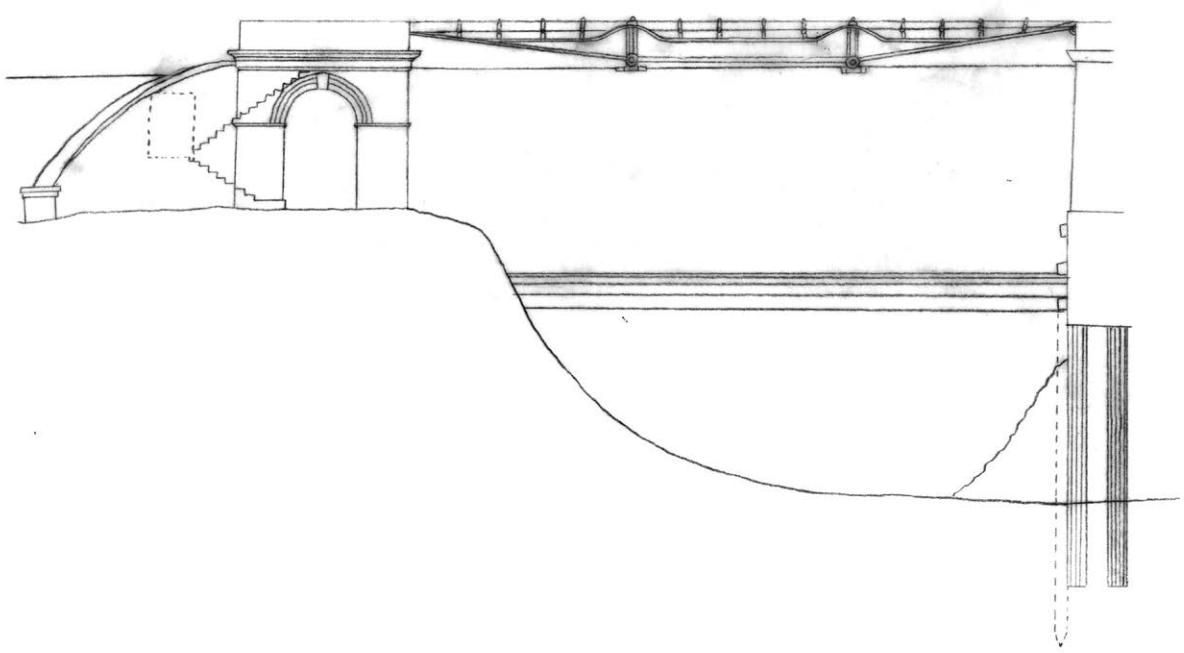
Dr Bill Fawcett 2017 Outline history of Scarborough Bridge presented to the Conservation Area Advisory Panel, August 2017

Dr Bill Fawcett 2011 *York: Leeman Road: Former Permanent Way Workshops Interim Report on Historic Structures*

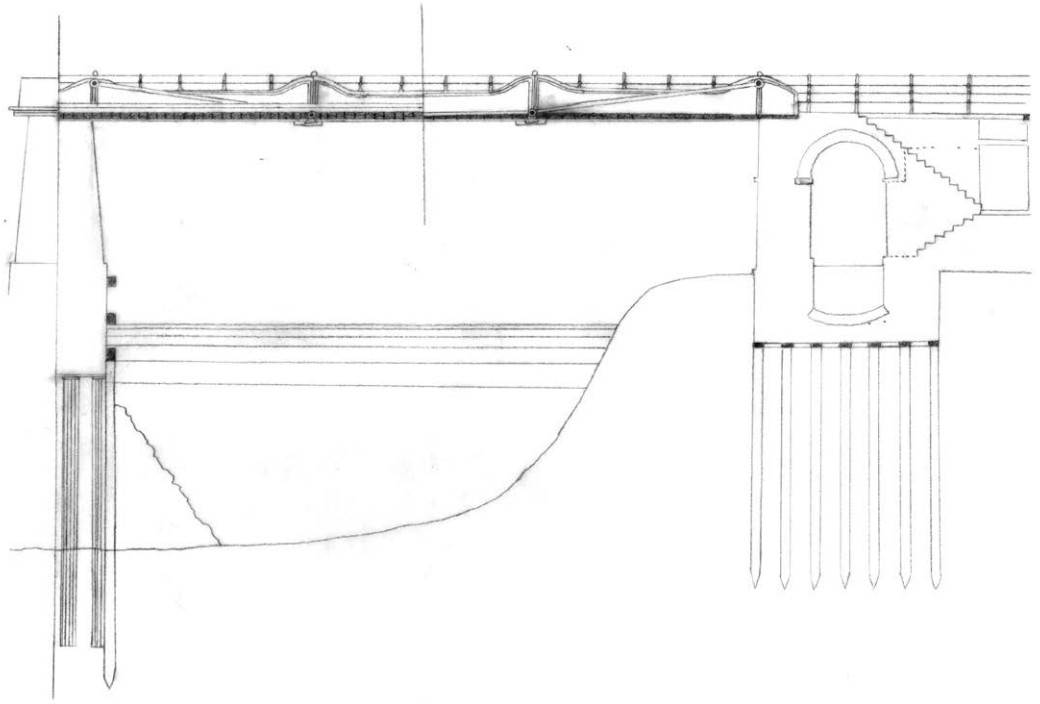
Historic England 2011 *Listing Selection Guide: Transport Buildings*

RPS Group Ltd 2016 *National Heritage Protection Plan, NHPP 4B3: Transport and Communications, 4B3.102: Historic Railway Buildings and Structures: Overview of Development Pressure and Review of Significance Volume 2: Statements of Significance*

# Appendix: Historic drawings



Elevation of Scarborough Bridge (part). Traced from RAIL 1006/115 Plan, section and elevation of first phase of Scarborough Bridge (n.d.).



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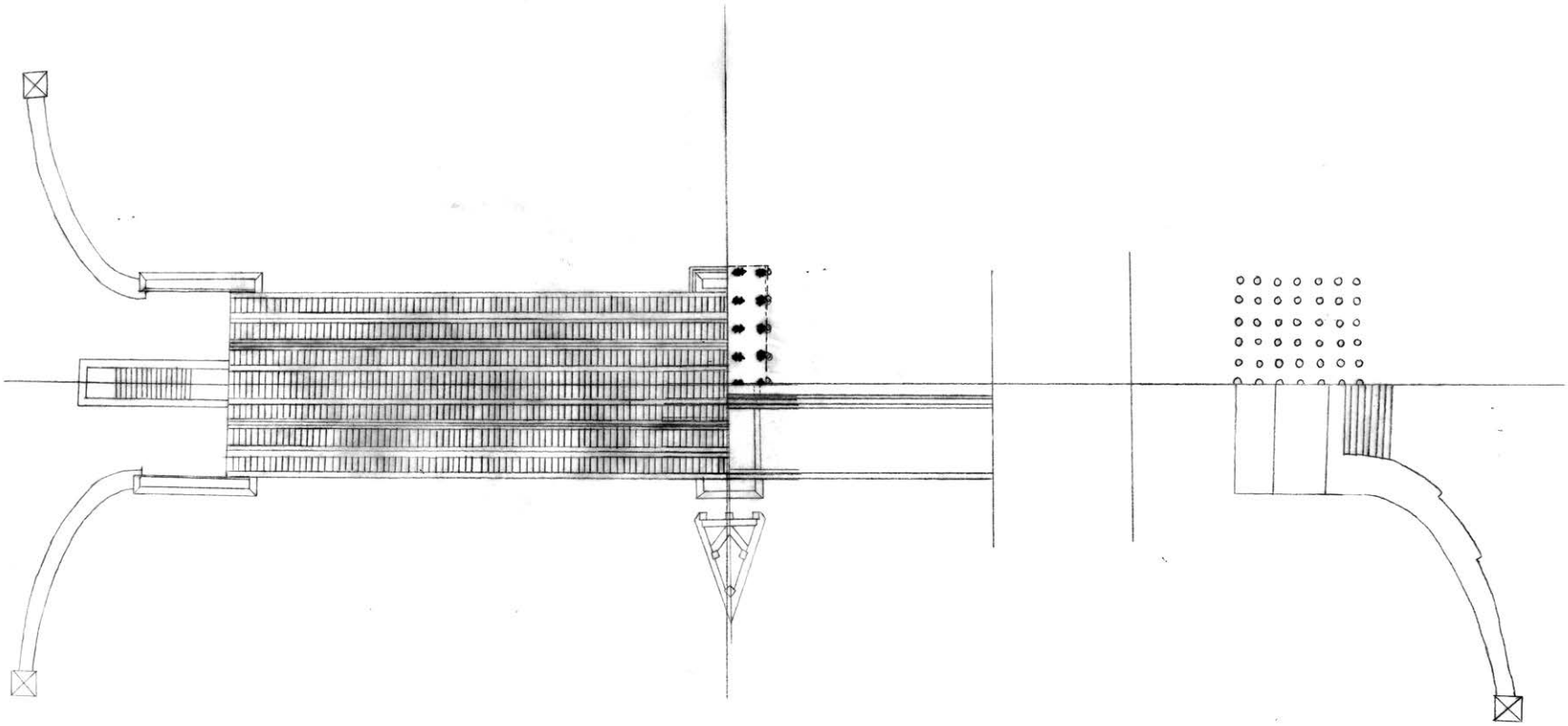
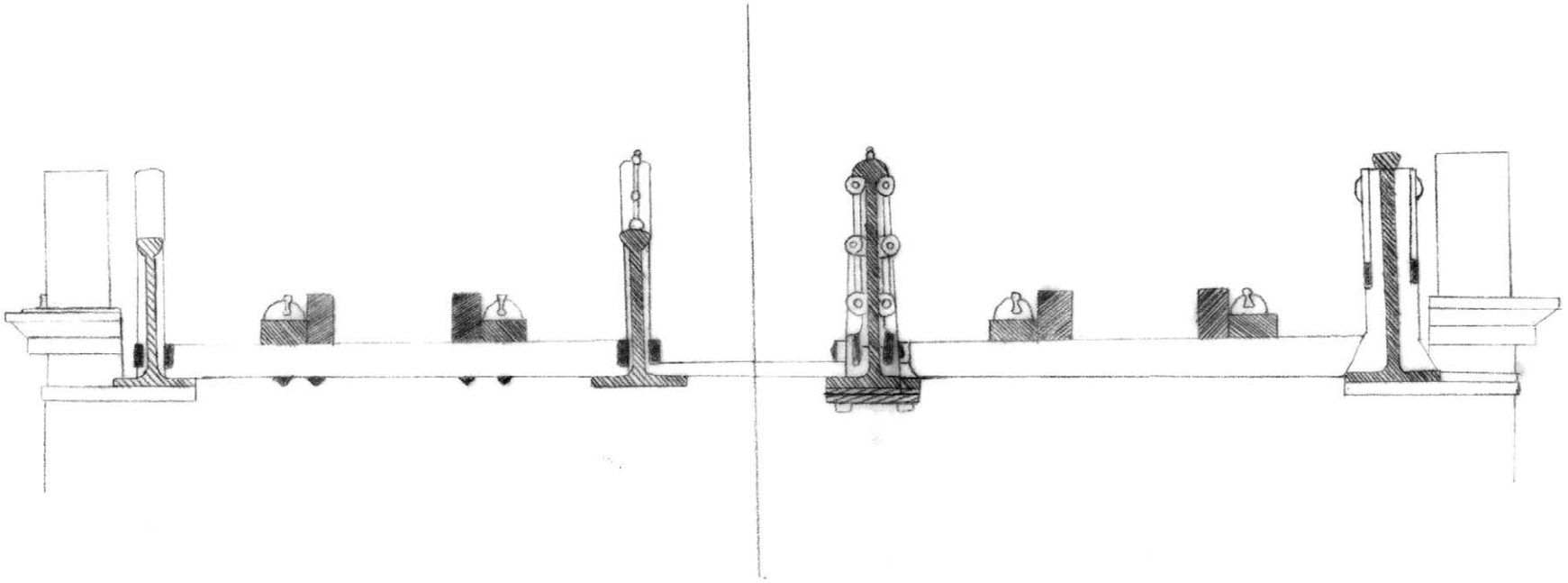


Plan of Scarborough Bridge. Traced from RAIL 1006/115 Plan, section and elevation of first phase of Scarborough Bridge (n.d.).



Cross section of Scarborough Bridge. Traced from RAIL 1006/115 Plan, section and elevation of first phase of Scarborough Bridge (n.d.).

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**Reviewed by** Tom Brooks
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