



**University of
Leicester**

Archaeological Services

**A Photographic Survey of 'Bowstring Bridge',
the Former Great Central Railway Bridge,
Braunstone Gate, Leicester
(NGR SK 580 041)**

Gerwyn Richards



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the Former Great Central Railway Bridge,
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For: Leicester City Council

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Summary

University of Leicester Archaeological Services was commissioned by Leicester City Council to undertake a photographic survey of the former Great Central Railway Bridge, Braunstone Gate, Leicester – known as the ‘Bowstring Bridge’. The structure is being demolished in advance of the proposed re-development of an adjacent site.

The bridge was completed in 1899 as part of the Great Central Railway’s London extension. After completion, the line remained in use throughout the greater part of the twentieth century. Following nationalisation, it became apparent that the line was unviable and was closed in 1969.

The photographic survey provided a permanent visual (photographic) record of the bridge in its current state. The archive will be held by Leicester City Museums, under the museums accession number A16.2009.

1. Introduction

University of Leicester Archaeological Services was commissioned by Leicester City Council to undertake a photographic survey of Bowstring Bridge, the former Great Central Railway Bridge, Braunstone Gate and the exterior of the Pump & Tap Public House, Duns Lane, Leicester (SK 580 041). Both the bridge and the pub are to be demolished in preparation for the redevelopment of adjacent sites. This process does not require planning permission and therefore lies outside the provisions of Planning Policy Guidance 15 and 16. However, in order to provide a permanent record, the client has commissioned ULAS to undertake a historic building survey of the structure.

The City Archaeologist, Leicester City Council has recommended that the record should be undertaken to level 1 as defined in *Understanding Historic Buildings: A guide to good recording practice* (English Heritage 2006). This is essentially a photographic record.

All work followed the Institute for Archaeologists (IfA) Code of Conduct and adhered to their *Standard and Guidance for Archaeological Investigation and Recording of Standing buildings or Structures*. In addition, Leicester City Council’s *Guidelines and Procedures for Archaeological Work in Leicester* was adhered to. *Understanding Historic Buildings* (English Heritage 2006) has been used as a basis for defining levels of recording.



Figure 1. Site location

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Bowstring Bridge is located approximately 500 metres to the south-west of the historic urban centre of Leicester. The bridge itself crosses the junction of New Park Street, Braunstone Gate, Duns Lane and Western Boulevard (originally part of The Newarke). As expected the bridge has become to be known by a variety of names, including the Braunstone Gate Bridge, Duns Lane Bridge and, most commonly, as Bowstring Bridge. Bowstring is a colloquial name given to a tied arch bridge design which resembles to some extent a bow and string. Technically, Bowstring Bridge is a steel truss bridge, the top chord being curved and the bottom chord being straight, and as a result the design has been confused with that of a tied arch and in this instance, the name has stuck. Officially the bridge's title is Duns Lane Bridge, Bridge Number 1041; the original Great Central Railway Bridge Number was 345 374.

The bridge was completed in 1899, by Henry Lovatt of Wolverhampton as part of the Great Central Railway's London extension and is an early example of the use of steel in a railway bridge. The line originally crossed Leicester on a viaduct of blue bricks and bridges over a mile and a half long; there were originally two steel truss bridges, this one and the one which crossed Northgate Street (demolished in the 1980s). After completion, the line remained in use throughout the greater part of the twentieth century. Following nationalisation, it became apparent that the line was unviable as it closely mirrored the route of the London & North West Railway which passed through

Leicester between London and the North West and was closed in 1969; most of the infrastructure was soon demolished, leaving only isolated stretches of viaducts across the city. Leicester City Council eventually purchased the stretch between Duns Lane and Glen Pava including the Bowstring Bridge which became part of the Great Central Way footpath.

The bridge itself is unusual as the main lattice girders are of different lengths, the eastern frame measures 175 feet, while the western frame measures 136 feet; the frame is said to weigh 400 tons. No doubt this design was chosen to take into account the angle at which the bridge crossed the River Soar below.

2. Aims and Methodology

The aim of the survey was to provide a permanent photographic record of the buildings in their current state, prior to alteration or repair, to standards set down by English Heritage (2006).

The photographic survey was undertaken by Gerwyn Richards. Photographs, in 35mm monochrome negative and digital format taken as raw image files and converted to TIFFs (Tagged Image File Format) covered items 1-6 of the English Heritage guidelines (2006, 4; Appendix 4.1.2). In addition, selective images were taken using a medium format twin lens reflex camera with black & white film to replicate similar views to those in the Newton collection of photographs. The site visits were carried out between September 11th and September 15th 2009. Further visits were carried out during the demolition work during November and December 2009.

No previous historic building recording has been undertaken on the structure. Only exterior images of the Pump & Tap public house were to be taken.

Orientation: The Bridge is orientated north-north east to south-south west, for ease of description this taken hereafter to be north to south.

3. Description of the Structure

Bowstring Bridge is a steel truss bridge with steel deck plates on riveted cross and longitudinal girders and is painted green and cream with red detailing. The steel lattice girder frame is a riveted construction (*Figures 2 & 3*). It sits atop a blue brick viaduct bridging both the River Soar and New Park Street and Western Boulevard. To the north there is a short length of viaduct, to the south, there is a longer length and a second girder bridge. This southern stretch will be un-affected by the proposed works. The northern viaduct consists of six arches, some of which have been walled with a mix of red brick and more recent breeze blocks. The parapet has recessed panels and angled brick corbelling, the brickwork for the whole viaduct is an English Bond and is capped with moulded blue copings. There are shaped sandstone pads at the base of each arch spandrel which project outwards slightly.

On the western face, towards the northern end of the viaduct, there is a modern ramp leading up to the deck, painted in the traditional Great Central Railway colours to match

the original steelwork. Evidence of earlier demolition can also be seen on the northern face of the viaduct where new brickwork holds back the infill of the demolished arch.

On the deck there is very little left of architectural or historical interest; the track bed has been completely covered over when the bridge was used as a footpath. It is unclear, whether any structural remains survive below this recent build up.

The most significant feature observed on the deck was the additional strengthening plates added to the internal faces of the diagonal braces and to a lesser extent the lattice girders themselves (*Figure 5*). These plates are clearly not original – they are held in place by 1¼ inch (32mm) bolts and not visible on any of the early Newton photographs of the bridge. The plates themselves lack the quality finish of the rest of the bridge, with rough edges as opposed the smooth rounded finish of the original steelwork; some of it is also heavily pitted, suggesting it is not such a high quality steel.

The removal of the ballast, prior to demolition exposed both the deck plates and the plate girders. Interestingly the rivets holding the deck plates to the plate girders are very poorly finished (*Figure 6*). All the other rivets, as expected are impeccably finished, those which were out of sight and difficult to finish were not. In places in excess of 150mm (6inches) of solid bitumen was coated onto the upper faces of the deck plates to prevent corrosion. The deck plates also have camber to prevent standing water.

4. Conclusion

The Bowstring Bridge is a fine example of late Victorian railway architecture, dating from the fourth and final phase of railway development in the United Kingdom. It is a purely functional bridge, almost utilitarian in appearance, lacking the grandiose flourishes seen on early Victorian railway architecture. It is also a fine example of a steel truss bridge that looks like a bowstring tied-arch bridge.

5. Bibliography

English Heritage, 2009 *Adviser's Report Braunstone Gate Bridge, Leicester.*
London: English Heritage.

English Heritage, 2006 *Understanding Historic Buildings: A guide to good recording practice.* London: English Heritage.

Pendred, H.W. 1894 *Iron Bridges of Moderate Span.* London.

Taylor, Thompson & Smulski. 1939. *Reinforced-Concrete Bridges.* New York.

6. Archive & Publication

The site archive consists of

CD containing 188 digital images
146 Black & White negatives and contact prints
22 Medium format B&W prints and negatives
6 A4 photo record sheets
Unbound copy of this report (ULAS Report Number 2009-181)

The archive will be held at Leicester City Museums under the Accession Number A16.2009

A version of the summary (above) will be submitted to the editor of the local journal *Transactions of Leicestershire Archaeological and Historical Society* for inclusion in the next edition.

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7. Photographic Index

Digital	B&W	Med Format	Description	Dir
001	001	001	South East Facing Elevation, General.	NW
002	002	002	South East Facing Elevation, General.	NW
003	003	003	North West Facing Elevation, General.	ESE
004	004	004	North West Facing Elevation, General.	ESE
005			North West Facing Elevation, General.	SE
006			North West Facing Elevation, General.	SE
007	007		South East Facing Elevation, With Old River Soar in Foreground.	NNW
008	008		South East Facing Elevation, With Old River Soar in Foreground.	NNW
009	009		In-fill Below Southern Viaduct.	
010	010		In-fill Below Southern Viaduct.	
011	011		Southern Viaduct.	SSW
012	012		Southern Viaduct.	SSW
013	013		South East Facing Elevation.	WSW
014	014		South East Facing Elevation.	WSW
015	015		Northern Viaduct.	W
016	016		Northern Viaduct.	W
017	017		Northern Viaduct.	NE
018	018		Northern Viaduct.	NE
019	019		Northern Viaduct.	E
020	020		Northern Viaduct.	E
021	021		Pump & Tap Pub, With Bridge in Background.	S
022	022		Pump & Tap Pub, With Bridge in Background.	S
023	023	023	Newton Photograph.	SSE
024	024	024	Newton Photograph.	SSE
025	025		Northern Viaduct, Detail.	
026	026		Northern Viaduct, Detail.	
027	027		South East Facing Elevation.	WNW
028	028		South East Facing Elevation.	WNW
029	029		Southern Viaduct, Detail.	
030	030		Southern Viaduct, Detail.	
031	031		Abutment and Pier on Northern Viaduct.	
032	032		Abutment and Pier on Northern Viaduct.	
033	033		Under Deck, Detail.	
034	034		Under Deck, Detail.	
035	035		Under Deck, Detail.	
036	036		Under Deck, Detail.	
037	037		Northern Abutment.	
038	038		Northern Abutment.	
039	039		Steelwork Detail on North Western Elevation, Trackside.	
040	040		Steelwork Detail on North Western Elevation, Trackside.	
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042	042		Later Ramp Leading to Northern Viaduct.	
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044	044		New Facing Bricks on Northern End of Viaduct.	
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046	046		Northern Viaduct, Detail of South East Facing Elevation.	W
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048	048		Viaduct Arch, Internal Detail.	

049	049		Corbelling on Northern Viaduct.	
050	050		Corbelling on Northern Viaduct.	
051	051		Arch Detail.	
052	052		Arch Detail.	
053	053		Partially Demolished Pier, Northern Viaduct.	
054	054		Partially Demolished Pier, Northern Viaduct.	
055	055		Northern Gable of Pub, with Bridge in the Background.	SE
056	056		Northern Gable of Pub, with Bridge in the Background.	SE
057	057		North West Facing Elevation.	NE
058	058		North West Facing Elevation.	NE
059	059	059	View Northwards Along Track Bed.	NNE
060	060	060	View Northwards Along Track Bed.	NNE
061	061		Pier and Steelwork.	SE
062	062		Pier and Steelwork.	SE
063	063	063	Newton Photograph.	NE
064	064	064	Newton Photograph.	NE
065	065		Construction Detail in Western Frame.	NW
066	066		Construction Detail in Western Frame.	NW
067	067		Overhead Steelwork.	N
068	068		Overhead Steelwork.	N
069	069		Overhead Steelwork, Detail.	
070	070		Overhead Steelwork, Detail.	
071	071		Overhead Steelwork, Detail.	
072	072		Overhead Steelwork, Detail.	
073	073		Riveted and Bolted Ironwork.	
074	074		Riveted and Bolted Ironwork.	
075	075	075	Newton Photograph.	NE
076	076	076	Newton Photograph.	NE
077			Graffiti on Northern Viaduct.	W
078			Graffiti on Northern Viaduct.	W
079			Graffiti on Northern Viaduct.	W
080			Graffiti on Northern Viaduct.	W
081			Graffiti on Northern Viaduct.	W
082			Graffiti on Northern Viaduct.	W
083			Graffiti on Northern Viaduct.	W
084			Graffiti on Northern Viaduct.	W
085			Graffiti on Northern Viaduct.	W
086			Graffiti on Northern Viaduct.	W
087			Graffiti on Northern Viaduct.	W
088			Graffiti on Northern Viaduct.	W
089			Graffiti on Northern Viaduct.	W
090			Graffiti on Northern Viaduct.	W
091			Graffiti on Northern Viaduct.	E
092			Graffiti on Northern Viaduct.	E
093			Graffiti on Northern Viaduct.	E
094			Graffiti on Northern Viaduct.	E
095			Graffiti on Northern Viaduct.	E
096			Graffiti on Northern Viaduct.	E
097			Graffiti on Northern Viaduct.	E
098			Graffiti on Northern Viaduct.	E
099			Graffiti on Northern Viaduct.	E
100			Graffiti on Northern Viaduct.	E

101		Graffiti on Northern Viaduct.	E
102		Graffiti on Northern Viaduct.	E
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8. Colour Plates



Figure 2 Bridge (Looking South East).



Figure 3 Bridge (Looking West).



Figure 4 Pump & Tap with the Bridge in the Background.



Figure 5 Bolted Strengthening Plates.



Figure 6 Poorly Finished Rivets on Deck Plates.



Figure 7 Dismantling in Progress.

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