

Upperton Road Viaduct Leicester



Building Recording and Investigation



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Upperton Road Viaduct, Leicester

BUILDING RECORDING AND INVESTIGATION

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UPPERTON ROAD VIADUCT, LEICESTER

BUILDING RECORDING AND INVESTIGATION

SUMMARY

Oxford Archaeology (OA) was commissioned by Leicester City Council to carry out a programme of built heritage recording at Upperton Road Viaduct, Leicester. The viaduct was constructed c.1898 and carries the Upperton Road over the course of the Great Central Railway. It is a good example of late Victorian engineering and includes an elegant skew arch bridge over the Old River Soar with a box girder bridge on the approach from the west. The expanse of brickwork gives it a solid and substantial appearance which is enhanced by riveted steel girders visible on its underside. Incorporated into its design is some attractive brick detailing. It represents a complex network of transport links with the Upperton Road being carried across another road, a right of way, several railway tracks, and a river.

It is due to be demolished and replaced with a new low-level highway, a new bridge over the old River Soar, and a pedestrian/cycle crossing. The recording was undertaken at English Heritage Level II as defined in 'Understanding Historic Buildings: a Guide to Good Recording Practice' (2006).

The overall aim of this project was to investigate and record the viaduct in advance of its demolition, concentrating on the structure's construction, history, use, phasing, and how it fitted into the overall local railway network. The main objective of this work was to create an ordered and permanent record to be deposited with the Leicester City Archives.

1 INTRODUCTION

1.1 Background

1.1.1 Oxford Archaeology (OA) has been commissioned by Leicester City Council to undertake a programme of built heritage recording at Upperton Road Viaduct, Leicester. The Viaduct carries the Upperton Road over the course of the Great Central Railway and dates from c.1898. The viaduct is to be demolished and replaced with a new low-level highway, a new bridge over the old River Soar, and a pedestrian/cycle crossing. The bridge is not listed but is a good example of late Victorian engineering and a well known local landmark. Due to this, planning permission for the work was granted with a condition that the bridge be recorded in situ prior to demolition. The level of work required was discussed with Leicester City Archaeologist Chris Wardle.

1.1.2 In April 2000, the Environment, Regeneration & Development Directorate of Leicester City Council carried out a Principal Inspection Report of Upperton Viaduct in order to assess its structural condition. The report concluded that although the sub-structure was generally in good condition, many aspects of the bridge were sub-standard and did not comply with the current Department of Transport Standard.

1.2 Aims and objectives

1.2.1 The overall aim of this project was to investigate and record the viaduct in advance of its demolition. The work concentrates on the structure's construction, history, use, phasing and how it fitted into the overall local railway network. The main objective was to create an ordered and permanent record to be deposited with the Leicester City Museum Service.

1.3 Methodology

1.3.1 The archaeological built heritage recording was undertaken at English Heritage Level II as defined in '*Understanding Historic Buildings: a Guide to Good Recording Practice*' as discussed with Chris Wardle, Leicester City Archaeologist. The work was also completed in accordance with the Institute of Field Archaeologists *Standards and Guidance for the Archaeological Investigation and Recording of Standing Buildings and Structures* (2001).

1.3.2 The recording covered the entire structure and the overall objective was to investigate the fabric of the viaduct and elucidate its structural development. The recording comprises three principal elements: a photographic record, a drawn record, and a written record.

1.3.3 The **photographic record** forms the main element of the work and was undertaken using 35 mm film (black and white prints, colour slides) as well as with a digital camera. It includes both general shots of the viaduct and the surrounding landscape,

as well as specific details (internal and external). This photographic survey forms a comprehensive record of all elements and features of the structure.

- 1.3.4 The *drawn record* utilises existing drawing undertaken by Jacobs Babbie Nuttall. These drawings were used in the study and annotations made to them by adding interpretative detail. The recording follows IFA Standards and Guidance and uses conventions outlined in the English Heritage document 'Understanding Historic Buildings: a Guide to Good Recording Practice'.
- 1.3.5 The *written record* complements the drawn record and includes a description of the structure and an analysis of its construction, function and use.
- 1.3.6 In addition to the main site recording, a programme of historical research was undertaken to add to the overall understanding of the history and development of the viaduct. This was primarily undertaken at the Leicester Record Office and was based on map evidence, principal secondary sources and any primary documents (both written and graphic sources). The historical research also considered the wider historical industrial context of the Great Central Railway and its development in the 19th century.

2 HISTORICAL BACKGROUND

2.1 The Great Central Railway

- 2.1.1 A number on detailed works on this railway line have been undertaken and the information in the following section largely comes from *The Great Central: Then And Now* by Mac Hawkins (1991), *The Last Days of The Great Central Main Line* by Robert Robotham (1986), and *The Great Central Rail Tour* by M.C. Healy (1989).
- 2.1.2 The Great Central Railway, of which the viaduct in the current study forms a part, came into being when the Manchester, Sheffield and Lincolnshire Railway (MS&LR) changed its name in 1897 in anticipation of the opening in 1899 of its London Extension.
- 2.1.3 The London Extension was founded through a desire for a line that was able to run direct to London without the financial implications and potential difficulties crossing other companies lines. It was largely through the determination and resolve of the MS&LRs chairman, Sir Edward Watkins. He planned to link his company with the continent via a tunnel under the English Channel. For his vision to be realised, it would be necessary for a high speed route linking the southern companies with the MS&L. This line was to become the London Extension and was the last main line to be built in Britain.
- 2.1.4 The London Extension needed to be highly engineered in order to meet its objectives. A series of large embankments, tall viaducts, and deep cuttings were required which were to carry the line for 135 miles southwards through middle England. There would be no footpaths or road crossings over the line as it was

intended that everything would be carried above or below it. The line would start at Annesley Junction in Nottinghamshire and run to Quainton Road in Buckinghamshire where it would meet the Metropolitan line and run to the companies new terminus at Marylebone.

2.1.5 The MS&LR first applied to Parliament in 1891 for permission to build the London Extension. It was faced with opposition from rival companies who already ran to London, however two years later it received Royal Assent. The line was divided into two Divisions, the North running from Annesley in Nottinghamshire to Rugby in Warwickshire, and the South from Rugby to Quainton Road in Buckinghamshire. Work commenced in 1894 and continued for almost four years. In 1897 the company changed their name to the Great Central Railway and in 1898 it began running goods traffic along the line to settle the earthworks. It was officially opened in March 1899 and soon earned itself a reputation for providing a fast service.

2.1.6 Between 1897 and 1903 a photographer by the name of S.W.A. Newton took it upon himself to record the building of the London Extension. He was not the official photographer of the company and undertook the work through his own interest. He travelled the length of the railway by bicycle as building progressed documenting every aspect of its construction. His work provides an invaluable archive of around 5000 images and represents an important account of social and engineering history at the end of the 19th Century. Plates 1-3 are photographs by Newton of Upperton Road Viaduct in varying stages of construction.

2.1.7 In 1923 many of the small railway companies in Britain were grouped into four larger companies. The Great Central Railway became amalgamated into the London and North Eastern Railway (LNER) and continued under this ownership until nationalisation in 1948. At this point it became part of the Eastern Region of the new British Railways (BR). In 1958 the London Extension passed to the Midland Region of BR, and from this point on was considered to be a duplicate main line. In 1960 Express services were reduced, and two years later a number of local services were cancelled and several stations were closed. In 1965 express freight and parcels service was terminated and in 1966 the Great Central line finally ceased to be a trunk route. A diesel service ran over the stretch of line between Nottingham and Rugby for a few more years but in 1969 when this service was withdrawn. The Great Central Railway was laid to rest just 70 years after its founding.

2.1.8 The majority of the line now lies derelict and overgrown, however some sections still survive and are used and managed by preservationists and enthusiasts who aim to reinstate missing sections and form an 18 mile long railway between Leicester and Nottingham. A great deal of work is required in order to return the line to its former glory.

2.2 Upperton Road Viaduct

- 2.2.1 This was built in c.1898 by The Great Central Railway Company, as part of their 'London Extension'. The local objective of the viaduct was to provide access for vehicles and pedestrians from the west to the eastern part of the city, over the Great Central Railway and the Old River Soar. The line closed in the 1960's as the overall scheme was not achieved and deemed an unnecessary connection between the Midlands and London. The viaduct is now in a poor state of repair, and much of the area surrounding the railway has been lost to development although isolated industrial buildings, redundant railway sidings, and historic canal features are extant.
- 2.2.2 Upperton Road is approx. 400 metres long, linking Narborough Road in the west with the Eastern Boulevard and Walnut Street to the east. The viaduct comprises twelve spans which were designed to span from east to west over the River Soar, former railway sidings and tracks, the Great Central Way (a public footpath), former industrial structures and warehousing, and the Western Road. The viaduct is constructed from both brick and steel spans, and was designed and built as a single structure. The landscape surrounding the viaduct provides an indication of the area's former use as an important communication route, and illustrates the historical context of the viaduct.

3 DESCRIPTION

- 3.1.1 Upperton Road Viaduct is a 12 arch structure built c.1898. It is on an east-west alignment and carries a two-lane carriageway with pedestrian footways on either side. It is constructed with Staffordshire blue engineering bricks with dressed stone work and steel girders. It consists of several sections, which running east to west, span Western Road, a right of way known as the Great Central Way, several disused railway sidings and tracks, and the old River Soar.
- 3.1.2 For the purposes of continuity this report will use the numbering system adopted by the Environment, Regeneration & Development Directorate in their Principal Inspection Report from April 2000.
- 3.2 **Spans 1 & 2**
- 3.2.1 These are brick arches which span the Old River Soar on a heavy skew of approximately 45 degrees. The substructure consists of Staffordshire blue brickwork abutments and associated pier and wing walls. The parapets are of brickwork with a sandstone string course and brick coping. They both have a skew span of 10.5m.
- 3.2.2 The arch barrels are elliptical in shape when viewed at 90 degrees to the structure. The faces both consist of a five brick ring arch which continue round to the sandstone skewbacks at the abutments and central pier. The spandrel walls are Staffordshire blue brick and in good condition.
- 3.2.3 At the west end of the bridge there is an abutment wall which slopes down at an angle. The bridge is supported on parapets with English bond brickwork to a height of c.3m. The arch is constructed from 5 courses of headers which are stepped in to

provide an interesting angle. This springs up from coping stones which sit on top of the piers. The south face has English bond brickwork above the pier and arch. At the base of the parapet are 2 courses of brickwork which project to form a platband. A string course of stonework sits directly above this. The parapet is 14 courses of English bond brickwork. This steps in after 6 courses and there are coping stones along this sloping edge. Above this the remaining courses have stonework in square blocks.

3.2.4 The coping stones at the tops of the piers slope down and continue along the top of the piers directly beneath the arches for some distance. Pier 1 has an angled face which is straight, whereas pier 2 has triangular edges to help direct water. Below the arches the brickwork is English bond, however the brickwork within the arches themselves is angled creating an impressive visual effect. There are 6 small drainage holes at the base of each of the four walls and a revetment wall continues along the bank of the River Soar from the north face extending downstream. This is the same brickwork as the bridge itself and is presumably part of the same build.

3.2.5 A bridge stretching over the River Soar immediately to the south of the south face of spans 1 & 2 carries a road which runs beneath the 3rd span. This bridge is single span and is supported on a central pier of the same construction as pier 2. Along the eastern edge of the bank this is supported on the revetment wall which runs the length of this bank, however on the western edge it is supported on a brick pier. There are piers at either end of the bridge to which the parapet railings are attached. The bridge now has a tarmac surface but the metal tracks are still evident. The parapet is constructed from wrought iron and to the north consists of 8 sections with a lattice pattern.

3.3 **Span 3**

3.3.1 This is a single span consisting of 12 wrought iron riveted plate girders with 11 brick jack arches. The substructure consists of English bond brickwork in Staffordshire blue brick. The girders each have four rows of bolts running their length. The brick jack arches have 16 courses in stretcher bond with white mortar. Two of these arches have additional iron plates covering the brickwork, presumably to provide extra support. Small iron brackets between each girder also provide additional support.

3.3.2 The skew span of this section is 9.7m. An access road runs underneath this span together with a single disused railway track lying adjacent to the west abutment. The parapets are brick built and are the same as those seen in spans 1 & 2.

3.4 **Spans 4 to 7**

3.4.1 This is a four span section with 12 continuous wrought iron girders which support wrought iron buckle plates along the top flange. These girders again have 11 brick arches. The parapets are wrought iron plate panels and the substructure spans disused rail sidings. Beneath span 6 a disused double railway track is visible, all the

other tracks have been removed. The skew spans of sections 4,5,6, & 7 are 12.1m, 10.5m, 11.9m, and 10.2m respectively. The substructure consists of Staffordshire blue brick abutments with three wrought iron supports which are bolted to brick and stone piers which are approximately 0.7m in height. The stones on the top of the piers are alternate in height. Each of these supports are in the form of five wrought iron cross braces each approximately 3.7 m high. The outer girders of span 7 have been propped using military style trestling.

3.5 **Spans 8 & 9**

3.5.1 This is a two span section again consisting of wrought iron riveted plate girders with brick jack arches. Some of these however within spans 8 & 9 have been replaced with concrete. Both skew spans measure 9.3m. The substructure is again English bond brickwork abutments in Staffordshire blue brick with a single central pier. The parapets are the same as those seen in spans 1 & 2. In the east pier and central pier of span 8 there are three safety refuges which run through to span 9. These all have three rows of headers above the arches. Beneath span 9 runs the Great Central Railway footpath.

3.6 **Spans 10 & 11**

3.6.1 This is a two arch brick built section with each span measuring 9.8m. The substructure consists of Staffordshire brick abutments with a central pier dividing the two spans. The arch barrels are elliptical in shape when viewed at 90 degrees to the structure. The faces both consist of a five brick ring arch. The spandrel walls are blue brick and in good condition. The parapets are the same as those seen in spans 1 & 2.

3.6.2 The spaces beneath the arches have been blocked with red/orange bricks and converted into commercial units with access from two large blue painted doors on the north facing elevation.

3.7 **Span 12**

3.7.1 This spans the Western Road at the west end of the bridge and is similar in construction to span 3. It has 12 wrought iron riveted plate girders with wrought iron buckle plates as seen in spans 4 to 7. The substructure consists of English bond brickwork in Staffordshire blue brick. The girders each have four rows of bolts running their length. The brick jack arches have 16 courses in stretcher bond with white mortar. Two of these arches have additional iron plates covering the brickwork, presumably to provide extra support. Small iron brackets between each girder also provide additional support. The parapets are brick built and are the same as those seen in spans 1 & 2.

4 **CONCLUSION**

4.1.1 Built in c.1898, by the Great Central Railway Company, Upperton Road Viaduct is typical of the railway structures constructed during this period. It was built as part of

a larger scheme intended to link the North and Midlands via Leicester, and locally to provide access for vehicles and pedestrians from the west to the east of the city spanning the Great Central Railway and the River Soar.

4.1.2 The overall scheme was never achieved and the line closed in the 1960's since which time the bridge has been disused and neglected. At the time of recording the bridge was in a poor state of repair, and much of the area surrounding the railway had been lost to development. Isolated industrial buildings, redundant railway sidings, and historic canal features were extant.

4.1.3 Upperton Road Viaduct is a good example of late Victorian engineering and includes a complex network of transport links. The aim of this project was to investigate and record the viaduct in advance of its demolition, concentrating on the structure's construction, history, use, phasing, and how it fitted into the overall local railway network. The main objective of this work was to create an ordered and permanent record to be deposited with the Leicester City Archives. This investigation has been a valuable exercise in recording for posterity an example of the engineering and design of the last main railway line to be built in Britain.

Nick Croxson
Oxford Archaeology
19th December 2007

APPENDIX I BIBLIOGRAPHY

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S.W.A. Newton's Manuscript Location Lists of his Photographic Collection, 1897-1903

Maps

1886 Ordnance Survey Map 25'' XXX1.14

1904 Ordnance Survey Map 25'' XXX1.14

Historic Plan, Elevation, and Cross Section of Upperton Road Viaduct, 1904?

APPENDIX II SUMMARY OF SITE DETAILS

Site name: Upperton Road Viaduct

Site code: A27.2006

Grid reference: SK 5787 0345

Type of evaluation: Historic building recording and investigation

Date and duration of project: The main site work was undertaken on 06/09/06, 08/09/06, and 08/03/07

Location of archive: The archive is currently held at OA, Janus House, Osney Mead, Oxford, OX2 0ES. It will be deposited at Leicester City Museum Services



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Figure 1: Site location

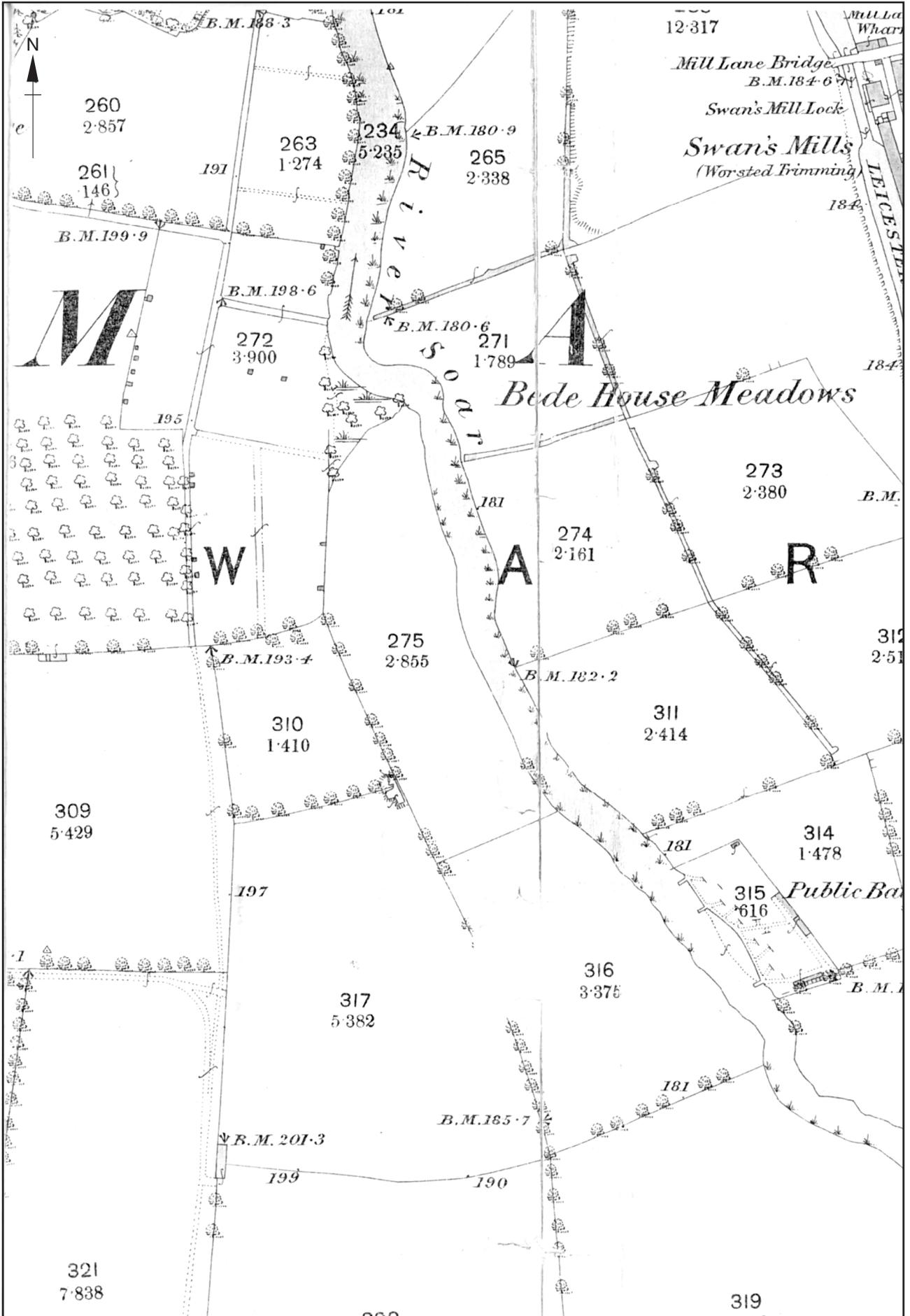


Figure 2 : 1886 OS Map pre-dating Construction of Upperton Road Viaduct

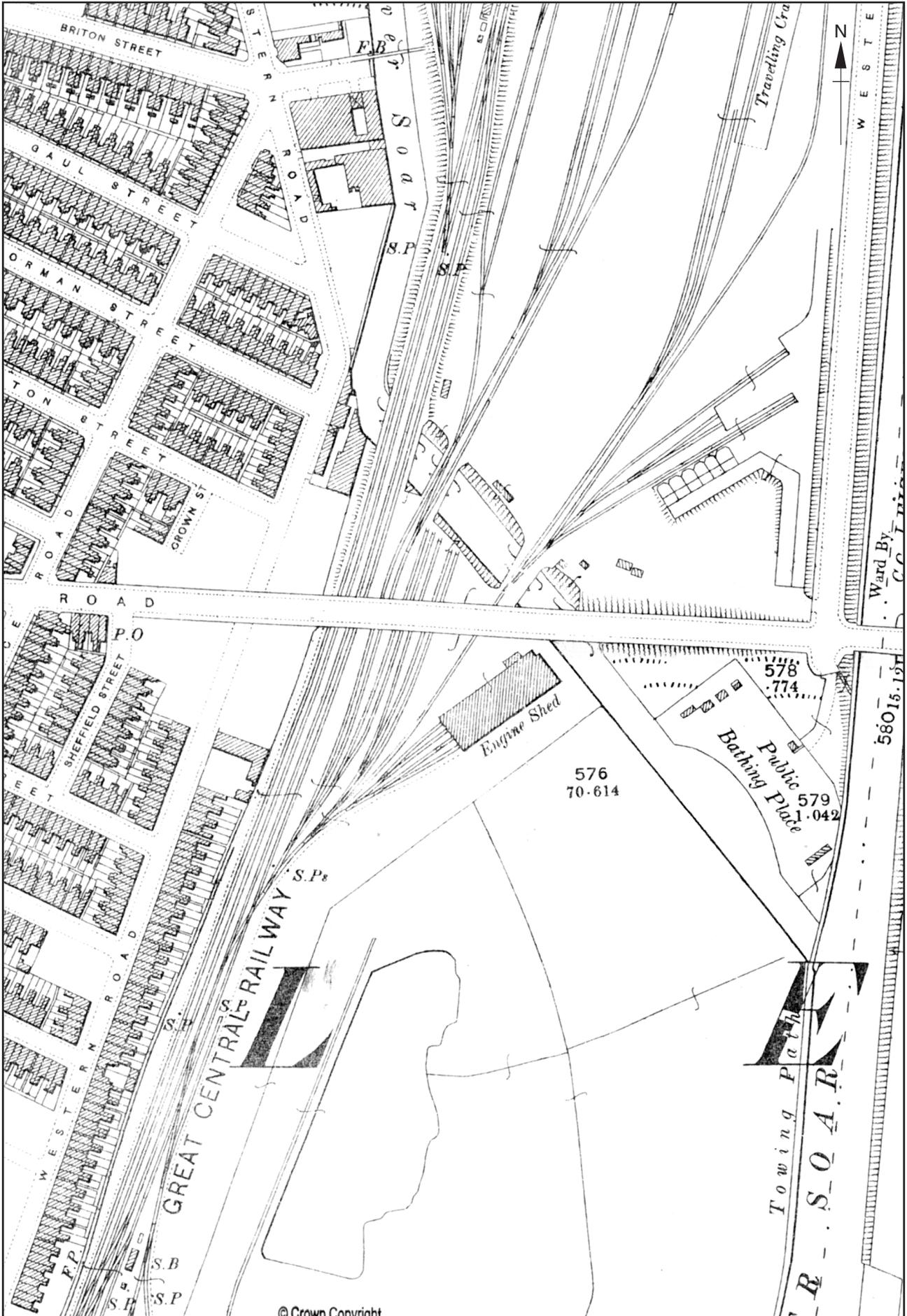


Figure 3 : 1904 OS Map post-dating Construction of Upperton Road Viaduct

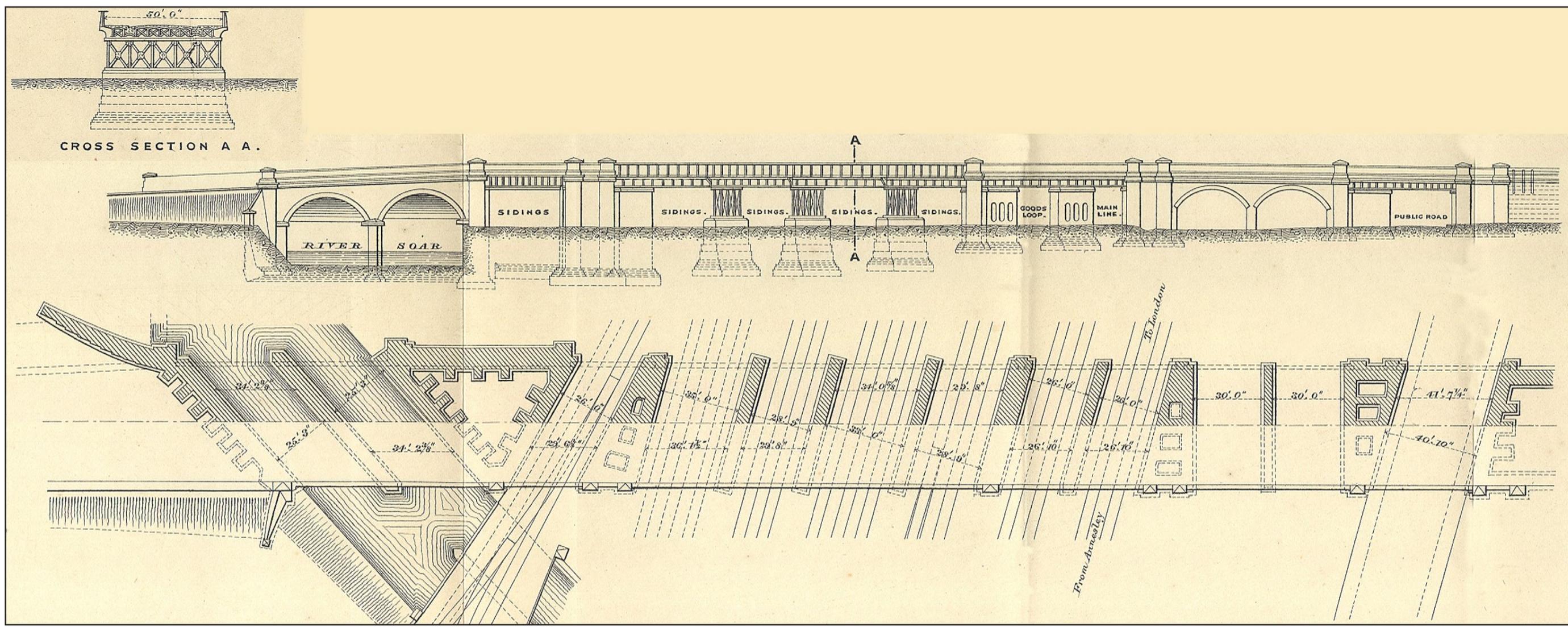


Figure 4 : Original cross section, elevation, and plan, c.1904

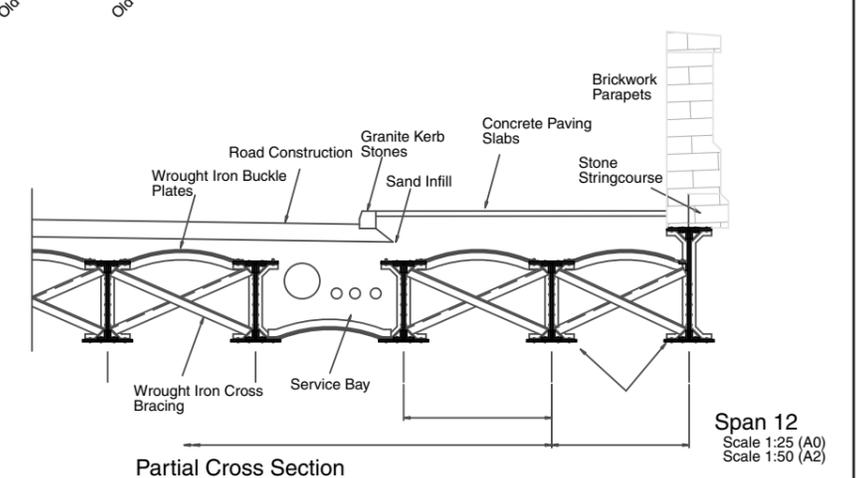
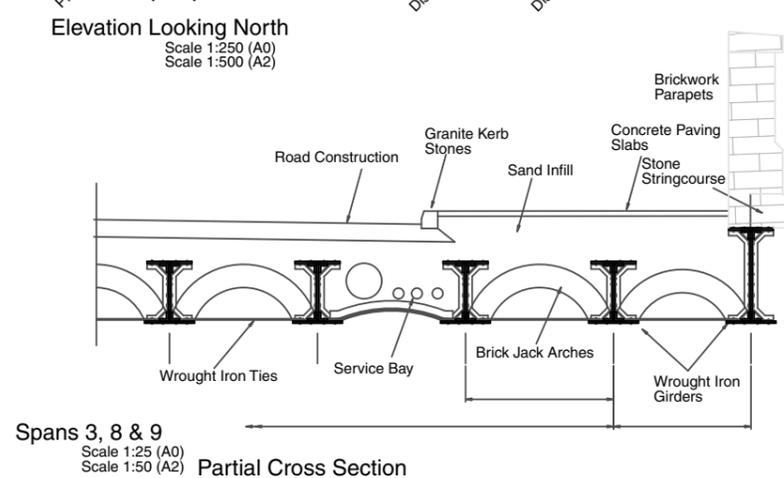
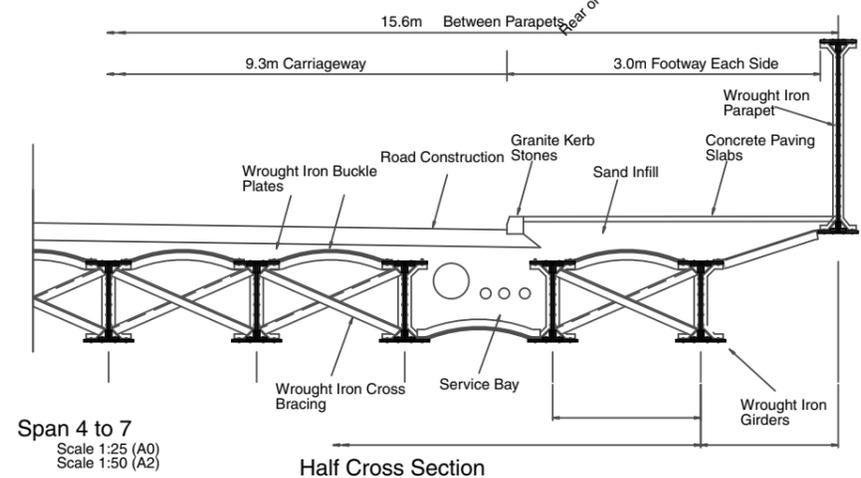
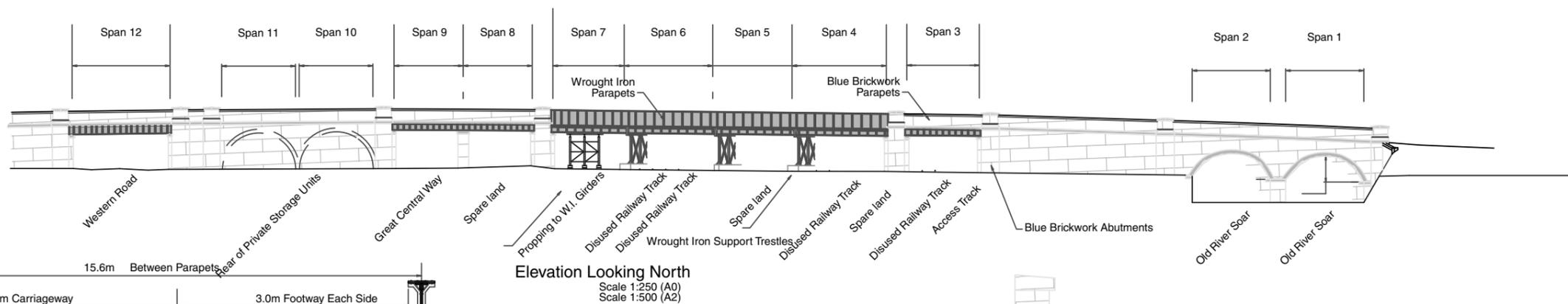
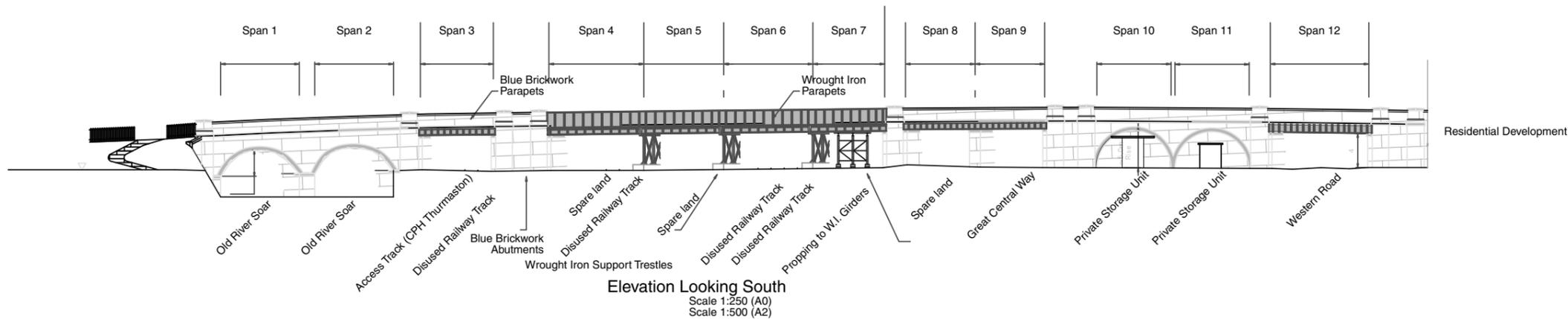
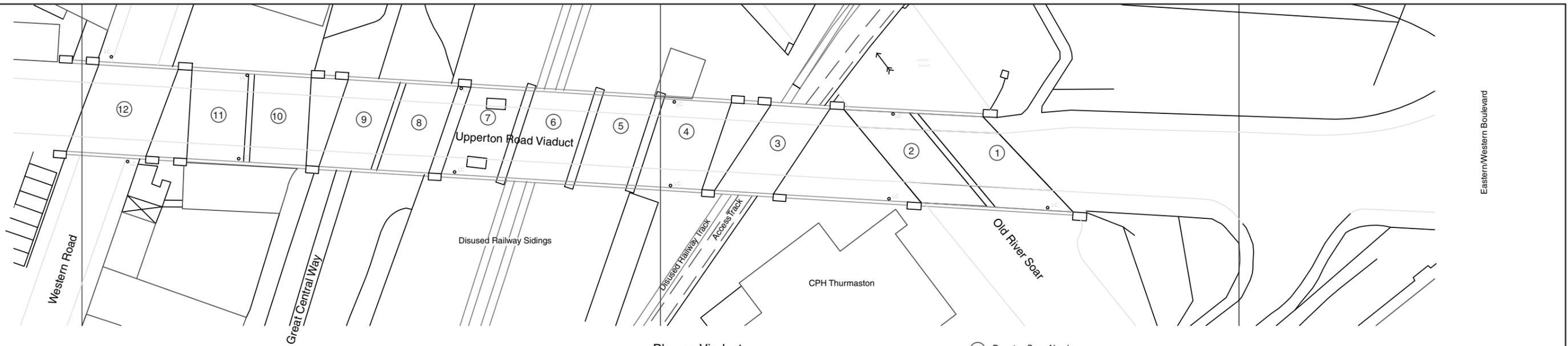


Figure 5 : Existing viaduct plan, elevations, and cross sections supplied by Jacobs Babbie Nuttall



Plate 1 : Spans 1 & 2 View to North c.1897-1903 by S.W.A. Newton



Plate 2 : Spans 4-7 View to North c.1897-1903 by S.W.A. Newton



Plate 3 : Construction of Engine Shed View to NW c.1897-1903 by S.W.A. Newton



Plate 4 : Spans 1 & 2 View to North



Plate 5 : Spans 1 & 2 Arch Detail



Plate 6 : Span 3 View to South-West



Plate 7 : Span 3 Showing Girders and Brick Jack Arches



Plate 8 : Spans 4 to 7 View to North West



Plate 9 : Spans 4 to 7 Internal Structure



Plate 10 : Spans 8 & 9 View to North



Plate 11 : Spans 8 & 9 Showing Safety Refuges



Plate 12 : Spans 10 & 11 View to North



Plate 13 : Spans 10 Interior



Plate 14 : Span 12 View to South



Plate 15 : Span 12 Showing Girders and Buckle Plates



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