Historic Building Recording

Chalfont Viaduct
Buckinghamshire

Historic Building Recording

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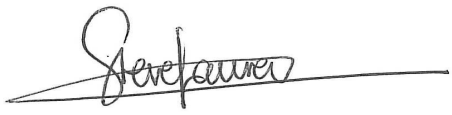
Approved by:	Steve Lawrence Signed 
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Chalfont Viaduct (M25)

Historic Building Recording

Written by Alison Kelly

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Chalfont Viaduct (M25)

Summary

Constructed between 1902 and 1906, the Chalfont viaduct is of a standard design commonly seen on Great Western rail lines and is constructed of blue/black engineering brick with decorative brickwork including projecting brick imposts on the piers and parapet wall and bullnose brickwork defining the semi-elliptical archways. The brickwork has several areas of mortar repair and occasional loose or missing bricks but is generally of good condition.

The viaduct remains largely as constructed, despite the addition of the M25 motorway beneath its central arches in the mid 1980s. These works included the raising of the ground level for the carriageway and the re-routing of the River Misbourne through concrete culverts beneath ground level. A low brick retaining wall was added to the westernmost pier to provide stability for a farm track. Further concrete supports are used above the track to support the embankment.

Current works to expand the M25 at this point will include the replacement of the crash barriers and removal of the hard shoulder, thus allowing the motorway to have four lanes in each direction running beneath the viaduct. New crash barriers fixed to the base of the piers adjacent to the motorway will be narrower and provide the viaduct with protection.

The viaduct is one of many surviving viaducts of similar construction from this date, however it is unique in being the only brick built bridge on this stretch of the M25 and is a local landmark for road users. This report serves as a record of the viaduct condition, appearance and function prior to these works.

1 INTRODUCTION

1.1 Background

1.1.1 Oxford Archaeology (OA) was commissioned by Skanska Balfour Beatty JV to undertake archaeological recording of the Chalfont Viaduct, which is located between junctions 16 and 17 of the M25 at Chalfont St Peter near Gerrards Cross in Buckinghamshire. The recording forms part of a series of archaeological works associated with the widening of the M25 to the north west of London (Junctions 16-23).

1.1.2 In 2007 the Highways Agency produced an Environmental Statement related to the proposed widening of the M25 and this included a technical report on the impact on the cultural heritage of the area. The Environmental Statement included an assessment that the M25 widening works will have a negative impact on the setting of the Chalfont Viaduct through the construction of new crash barriers around the base of the structural piers and it was recommended that building recording be undertaken prior to the work.

1.1.3 The Chalfont Viaduct was constructed between 1902 and 1906 to carry part of the Great Western and Great Central Joint Railway (London to High Wycombe) across undulating countryside. It is c.12.5 m high and has five arches through two of which the M25 now passes. At this point the road will go from having three lanes and a hard shoulder to four lanes with no hard shoulder and with narrower barriers around the viaduct piers. The viaduct is not listed but it is an impressive and attractive feature which dominates the landscape in this area and is no doubt very well known to the huge number of motorists who use this stretch of the M25 each day.

1.1.4 A specification for historic building survey was produced by Atkins which outlines the mitigation required at the viaduct and this specifies that the recording should be undertaken at Level 1 (as defined by English Heritage in *Understanding Historic Buildings: a Guide to Good Recording Practice*, 2006). The relatively low level of recording reflects the fact that the structure is only seeing minor works to the bases of the structural piers rather than demolition or substantial works.

1.2 Aims and objectives

1.2.1 The overall aim of the project is to investigate and record for posterity the Chalfont Viaduct prior to the addition of replacement crash barriers in the proposed works. A second aim is to make that record publicly accessible through a report (a public document) and a project archive deposited with a public institution.

1.3 Methodology

1.3.1 The survey took place on 10th and 11th August 2009 and was carried out by Alison Kelly from Oxford Archaeology Buildings Archaeology Department.

1.3.2 The work concentrated on the viaduct's construction, structure, alteration, function, history and use. It comprised three principal elements: a photographic survey, a drawn survey and a descriptive survey.

1.3.3 The ***photographic survey*** consisted of general shots and specific details and was undertaken using 35mm black and white print film. Digital shots were taken on a Nikon 5600 digital camera. A scale was used where appropriate. The photographic survey included both general views and specific details of the viaduct illustrating its construction and use. The general views recorded the current setting of the structure within the landscape which will be altered in the development.

1.3.4 The ***drawn survey*** was based on an existing metric survey of the viaduct provided by Skanska Balfour Beatty JV which was annotated to add interpretive and descriptive annotation. This annotation explains the viaduct in terms of its construction, use and history.

1.3.5 The ***written descriptive*** survey complemented the other two elements of the project and aimed to explain and interpret the viaduct.

1.3.6 Access was limited to the areas within the hard shoulders and adjoining farm tracks located to the east and west of the viaduct. The upper and central section of the viaduct were completely inaccessible due to motorway and rail traffic and the outer ends could not be seen from ground level due to tree foliage.

2 HISTORICAL BACKGROUND

2.1 Introduction

2.1.1 An extensive background study of the viaduct was undertaken by RPS Planning & Environment in January 2006 and this largely forms the basis for the summary background history below.

2.2 Background history

2.2.1 The Chalfont viaduct forms part of a 'cut off' extension of the Western and Great Central Joint Railway running from Northolt to High Wycombe which was constructed between 1902 and 1906. There are eight viaducts along this line varying in length from three arches to nine arches and there are mostly built to a similar design which forms house style of the Great Western Railway at this time. The viaducts were designed by the Great Western Railway's Chief Civil Engineer, James Inglis and Assistant Engineer RC Sykes. The Chalfont viaduct was constructed by Pauling & Co of Westminster. Historic photographs of the adjoining viaduct at Gerrards Cross (which spans the A 413 Chalfont Road) under construction show the wooden centring used to form the arches.

2.2.2 The construction of the M25 motorway in c.1982/85 meant various changes were made to the viaduct. The motorway at this point has three lanes clockwise going through one of the western arches and three lanes anti clockwise going through the central arch. The ground level was raised at this point and the river Misbourne directed through a concrete culvert which runs underneath the road surface. The Chalfont viaduct is unique as it is the only Edwardian brick bridge on the M25.

3 VIADUCT DESCRIPTION

3.1 General description

3.1.1 The viaduct has five semi-elliptical arches that are 15.5m wide and of varying heights due to the change in ground level. The viaduct is constructed of Staffordshire blue brick which has a very hard, impervious surface and was commonly used in railway bridge construction. The bricks measure approximately 225 x 108 x 75mm and are mostly laid in an English bond, however the bond changes on the arches where six courses of header bond are used to form the arches.

3.1.2 Decorative details are added to the viaduct using moulded bullnosed bricks to define the arches and these are also used on the corners of the piers. Projecting stepped brickwork is used for imposts on each of the four piers and decoration of the parapet wall.

3.1.3 There are variations in the colour of the bricks with a large quantity of visible stretchers now showing a brownish colour, this is probably due to weathering. Overall the bricks are in good condition however there are large areas of calcification and organic growth on the brickwork, particularly to the eastern end of the north elevation. The westernmost arches show large amounts of re-pointing and the brickwork has less calcification than on the eastern side, possibly brushed off during the re-mortaring works. Some bricks have fallen out of the south elevation impost of the pier above the hard shoulder of the anti clockwise carriageway.

3.1.4 The bricks are mostly bonded with Portland cement mortar used in the original construction phase, however there are areas of flat ribbon re-pointing using a modern sand coloured cement mortar on the lower parts of the piers. This re-pointing mostly occurs adjacent to the carriageways and probably dates to the insertion of the M25 beneath the viaduct in c.1982/85.

3.1.5 The parapet wall is topped with stone and both elevations include openings within the parapet wall which have metal bars across. The south facing elevation has openings above the outer piers and the north facing elevation has openings above the two inner piers. These are possibly refuges for the gangers and platelayers, allowing them to step clear of the tracks when trains approached, however the design is different to that seen on some of the other viaducts constructed on this line at this time, which have projecting brick refuges.

3.1.6 Set against the inner faces of the arches spanning the carriageways are down pipes. The projecting brickwork at this point has been cut allowing the pipes to sit flack against the elevations. These pipes appear to be a modern addition and may have been connected to the 1980s works during the construction of the M25.

3.1.7 To the eastern and western ends of the viaduct are tracks used for access to adjoining farmland. The western end in particular has seen changes following the insertion of the M25 motorway including a low brick retaining wall which projects outwards from the north and south elevations of the westernmost pier. The wall is 32.5cm deep and is constructed of brownish coloured bricks with concrete coping stones (39.5cm deep). The bricks measure 210 x 100 x 65mm and are laid in an English bond with thick mortar. The height of the wall varies with the adjacent ground levels. The wall has areas of cracking in the brickwork which has been repaired. Above this wall runs a farm track and to the other side of this track is a low retaining wall constructed of concrete posts which forms the base of an embankment and above the concrete supports is a simple wooden fence. It seems likely that this track was rerouted through the westernmost arch which involved the cutting of the embankment at this point. The 1980s work also included the re-routing of the River Misbourne through concrete culverts and the ground level is the road area was raised c. 0.5m.

3.1.8 The piers adjacent to the motorway carriages have steel crash barriers of a type generally seen along motorways. These barriers are approximately 1.2m high and consist of metal barriers fixed to metal posts which in turn are fixed into rough concrete flooring adjacent to the asphalt covered road surface. At time of survey, the crash barriers on the westernmost pier had been removed and the construction of the replacement barriers was in progress. The works included the addition of steel reinforcement covering the base of the pier which had been set within a rough cement base. The majority of the brickwork behind the reinforcement is protected by boarding and could not be seen.

3.2 Graffiti

3.2.1 As with most railway bridges the viaduct has occurrences of graffiti on both the south facing and north facing elevations and these are limited to the parapet walling where access could be obtained from the rail line. No graffiti could be seen at road level. The south facing elevation has large painted graffiti on the parapet wall over the three westernmost arches. This has been painted in two stages, the first being the the word 'PEAS' in stylised capitals. Later the word 'GIVE' has been added in front of the 'PEAS' and 'A CHANCE' has been added after. This later graffiti is less stylised although there is an attempt to match the style used on 'PEAS' and the paint used has weathered and run in places.

3.2.2 'PEAS' is the tag of a London graffiti artist and his tag can been seen in many other locations, particularly on bridges. The additional text changing the graffiti to read 'GIVE PEAS A CHANCE' is thought to refer to his continual arrests. The common misinterpretation of the inscription makes bridge a interesting landmark to users of the M25.

3.2.3 The north facing elevation has less obvious graffiti with 'PEAS06' added in white paint on the parapet walling above the anti clockwise carriageway and to each side of this is the word 'FRET' repeated several times. A more stylised version of 'PEAS' appears on the parapet wall above the clockwise carriageway. All the graffiti is in white, probably spray, paint. No other visible forms of vandalism could be seen.

4 Conclusion

4.1.1 Constructed between 1902 and 1906, the Chalfont viaduct is of a standard design commonly seen on Great Western rail lines and is constructed of blue/black engineering brick with decorative brickwork including projecting brick imposts on the piers and parapet wall and bullnose brickwork defining the semi-elliptical archways. The brickwork has several areas of mortar repair and occasional loose or missing bricks but is generally of good condition.

4.1.2 The viaduct remains largely as constructed, despite the addition of the M25 motorway beneath its central arches in the mid 1980's. These works included the raising of the ground level for the carriageway and the re-routing of the River Misbourne through concrete culverts beneath ground level. A low brick retaining wall was added to the westernmost pier to provide stability for a farm track. Further concrete supports are used on the other side of the track to support the adjoining embankment. It is likely that the bases of the piers were re-pointed with ribbon pointing using sand coloured cement mortar during these works although the re-pointing is now failing in parts.

4.1.3 Works to expand the M25 at this point will include the replacement of the crash barriers and removal of the hard shoulder, thus allowing the motorway to have four lanes in each direction running beneath the viaduct. New crash barriers fixed to the base of the piers adjacent to the motorway will be narrower and provide the viaduct with protection.

4.1.4 The viaduct is one of many surviving viaducts of similar construction from this date, however it is unique in being the only brick built bridge on this stretch of the M25 and is a local landmark for road users.

Alison Kelly

October 2009

APPENDIX A. BIBLIOGRAPHY

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Misbourne Viaduct Technical Assessment of Historic Bridge (2006, RPS Planning and Environment)

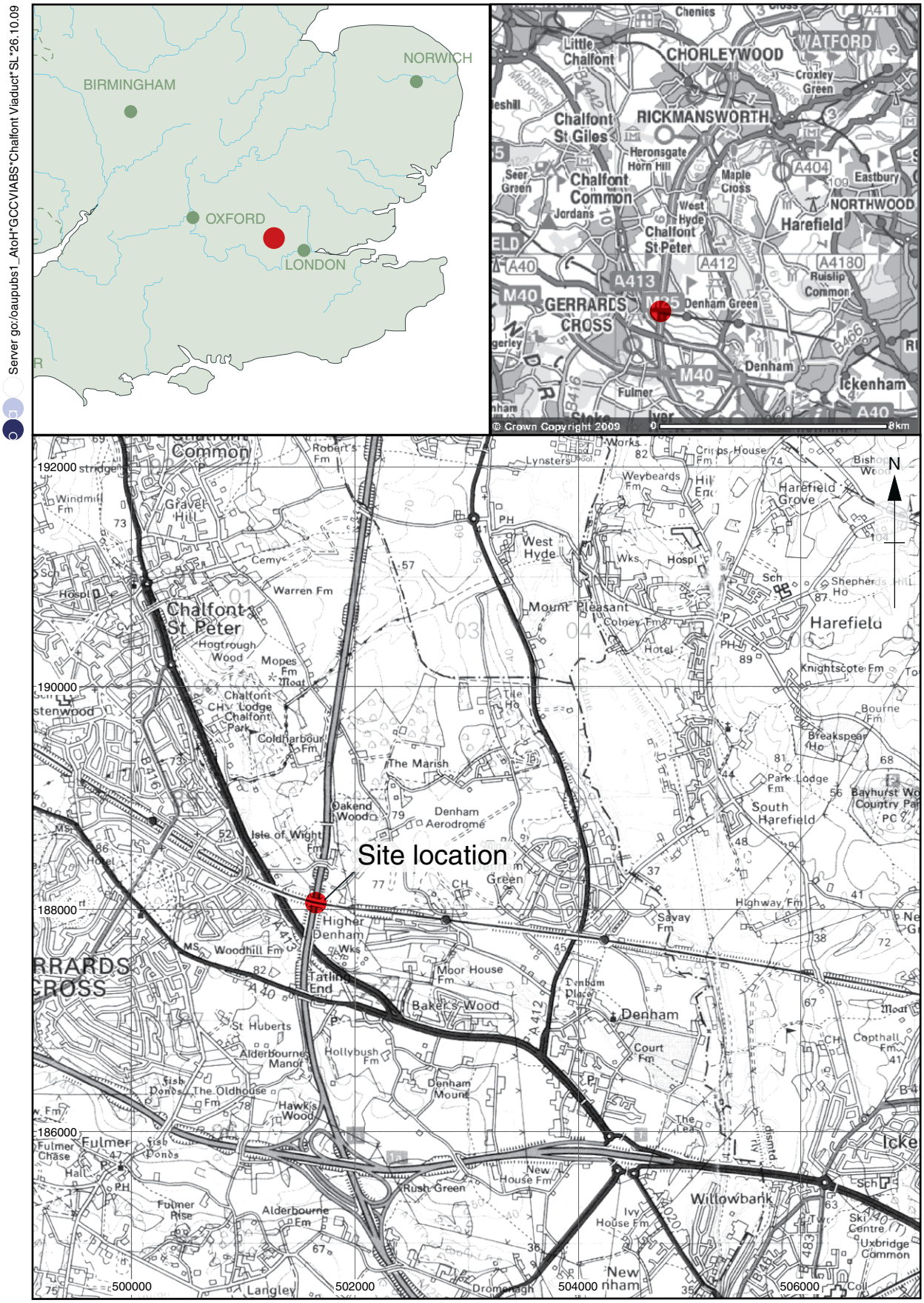

Figure 1: Site location

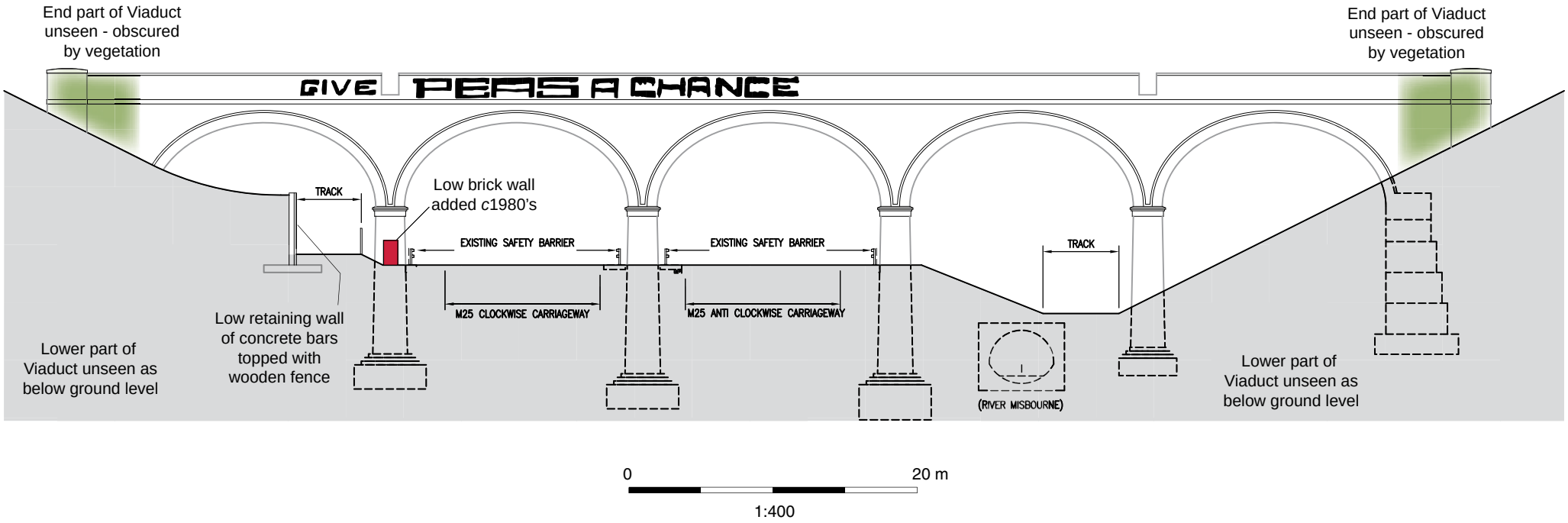

Figure 2: South facing elevation of viaduct (based on drawings provided by Skanska Balfour Beatty JV)

Plate 1: View of south facing elevation from M25 hard shoulder

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Plate 17: View of the track under the western arch of the viaduct

Plate 18: Detail of concrete retaining wall under the western arch of the viaduct

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