

ARCHAEOLOGICAL  
WATCHING BRIEF AT  
TEME BRIDGE,  
TENBURY WELLS,  
WORCESTERSHIRE

Graham Arnold

Illustrations by Carolyn Hunt

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Project 3730  
Report 1912  
WSM 46030



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## Archaeological watching brief at Teme Bridge, Tenbury Wells, Worcestershire

**Graham Arnold**

### Part 1 Project summary

An archaeological watching brief was undertaken at Teme Bridge, Tenbury Wells, Worcestershire (SO 5955 6859).

The Highways, Contracts and Programme Unit of Worcestershire County Council was carrying out substantial strengthening and improvement works which included the removal, strengthening and replacement of the carriageway and pavements, replacement of damaged keystones and refurbishment and repainting of the concrete spandrels and railings along the bridge. The bridge is a graded II listed structure and scheduled monument and it following the granting of Scheduled Monument Consent for the works, the watching brief was advised by English Heritage as the removal of sections of the carriageway afforded the chance to observe the early fabric of the bridge. The bridge is six a arched sandstone structure the core of which dates from the late medieval period. It was widened and encased in concrete in the 19<sup>th</sup> and early 20<sup>th</sup> century. The watching brief afforded the opportunity to observe the earlier fabric of the bridge beneath the road surface.

The fabric of the bridge exposed within Trench 1 on the south side of the bridge comprised roughly hewn sandstone blocks, with squared sides, overlain by an original undulating cobbled bridge surface. This was covered by modern levelling material and road surfacing. The concrete extensions, made to the bridge in 1908 were also exposed and these were bonded into the original bridge to strengthen the structure. The fabric of the bridge on the south side was slightly different as this had been rebuilt in the 1770s due to flood damage. Here the bridge was again constructed of roughly hewn sandstone blocks with squared sides and packed with sand and occasional river gravels. The surface above the bridge keystones in the arches was made of a smooth shaped sandstone with sharp packing and gravels above. This was tied into the 1908 concrete extensions, which were wider on the eastern side and was overlain by the modern road surfacing.

The works also afforded a chance to observe the fabric of the bridge within two access holes. These exposed the original sandstone arch wall and demonstrated the thickness of both the 1908 brick built extension and later breeze block and concrete capping of the arches.

Although the scope of the works to the bridge was scaled down from what was originally expected, useful information about the fabric and condition of the bridge was still gained.



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## Part 2 Detailed report

### 1. Planning background

An archaeological watching brief was undertaken at Teme Bridge (NGR 5955 6859), Tenbury Wells, Worcestershire (Fig 1), on behalf of the Highways and Contracts and Programme Unit of Worcestershire County Council. The work involved repairs and structural changes to the bridge and has received Scheduled Monument Consent from English Heritage for the works (reference ref. BR2001\_DEC11\_SMC).

The project conforms to the *Standard and guidance for an archaeological watching brief* (IfA 2008) *Standard and guidance for the archaeological investigation and recording of standing buildings or structures* (IfA 2008). The project also conforms to conditions set out in a letter from Jacqueline Allonby, Casework Assistant, English Heritage, dated 15 December 2011, for which a detailed specification was produced (HEAS 2011).

### 2. Aims

Informed by existing records and understanding of the bridge and its archaeology, the aims and scope of the project were to observe and record the character of the fabric exposed by the works, archaeological deposits which may be associated with the construction of the bridge and any other features revealed by the works which may be associated with the fabric of the bridge or the history of its use, and to determine their extent, state of preservation, date and type, as far as reasonably possible.

Significant deposits may be defined as those likely to be of medieval and later date.

### 3. Methods

#### 3.1 Documentary search

The archaeological background to the site (National Grid ref. SO 5955 6859) is presented in a recent Conservation Plan for the bridge (Rogers and Robson-Glyde 2011). Teme Bridge, Tenbury is a listed building and is designated as a scheduled monument (Worcestershire SAM 332) under the Ancient Monuments and Archaeological Areas Act 1979 (as amended). Preparatory investigative works were reported in 2011 (Arnold and Vaughan 2011) in advance of the refurbishments.

#### 3.2 Fieldwork methodology

##### 3.2.1 Fieldwork strategy

A detailed specification has been prepared by the Service (HEAS 2011). Fieldwork was undertaken between 9 January and 22 March 2012. The site reference number and site code is WSM 46030. The scope of the works was reduced from those originally foreseen and interventions to the bridge were scaled down due to the final results from the assessment stage.

The following works were observed:

- Replacement and strengthening to the road surface and pavements
- Replacement of two areas of damaged keystones over Span 2 and Span 6 on the bridge
- Opening two access holes in the voids under the arches on the south-east side of the bridge

##### 3.2.2 Structural analysis

All fieldwork records were checked and cross-referenced. Analysis was effected through a combination of structural evidence, allied to the information derived from other sources.

### 3.3 **Statement of confidence in the methods and results**

Although the works afforded less of a view of the historic fabric than originally anticipated, the methods adopted allow a high degree of confidence that the aims of the project have been achieved.

## 4. **Topographical and archaeological context**

The history of the bridge has been described in a recent Conservation Plan (Rogers and Robson-Glyde 2011) prepared in advance of the works on the advice of English Heritage. The following description is reproduced from section 2.3 of this report.

The bridge over the River Teme at Tenbury is formed partly of a sandstone structure with reinforced concrete abutments. It has six spans with five large piers, the central being the largest, and is formed of two parts set at an angle and joining in the middle at the central pier. The southern (Worcestershire) part has a concrete causeway and is aligned south-south-east to north-north-west. The northern (Shropshire) part is aligned north-north-east to south-south-west.

The sandstone bridge has large semi-circular arches with triangular cutwaters and modern concrete starlings. The southern three spans have simple arches with keystones. The stonework on these arches has been heavily eroded and there is evidence of repair and the use of iron ties to prevent further movement of the structure. The northern three spans have been constructed in a different style. These arches are ribbed, springing from a string mould.

The concrete bridge sits above the stone structure creating a wider roadway. The concrete structure has segmental arches with concrete corbels above. The spandrel walls over the arches are of concrete marked to represent ashlar construction. Sitting adjacent to the roadway are cast iron railings with posts. A plaque marks the date of the concrete structure and the county boundary is also marked on the railings.

### 4.1 **Structural analysis**

The trenches and features recorded are shown in Fig 2 and 3. The results of the structural analysis are presented in Appendix 1.

#### 4.1.1 **The road and footpath replacement (Area 1 shown in fig 2)**

The road and pavement repairs and replacements (Plates 1-4) did not impact upon the medieval fabric of the bridge, as only the modern road surfaces and levelling hardcore was removed to the level of the concrete extensions and replaced to a total depth of 0.40m below the surface. Modern current service pipes were exposed beneath the hardcore levelling and pavement surfacing. They ran above the 1908 concrete extensions (Plates 1-3 and 6). The centre of the road overlying the bridge was planed off to a depth of 0.95mm and replaced.

In Trench 2, excavations exposed an original sandstone road surface with smooth, well defined sandstone paving and sand packing the surface. This surface was slightly undulating (Plate 13). The original surface within Trench 1 was less well defined as this area was re-built with smooth slabs, probably in the 1770s after flood damage to the bridge (Plate 7).

#### 4.1.2 **Degraded keystone replacement (Trenches 1 and 2)**

Two areas on the bridge had heavily degraded and damaged keystones, in Span 2 (Tr. 2 Plates 11-16) and Span 6 (Tr. 1 Plates 5-10). These two trenches were excavated by hand and by using hand-held electric concrete breakers. Keystones were originally planned to be hoisted out in one piece but due to damage and degradation had become too friable and had to be drilled out in pieces.

This activity exposed the top of the medieval arch as shown in Plate 8. This plate shows that the keystones were roughly hewn on the top, with squarely shaped sides



#### 4.1.3 Access Holes to voids under south-east arches

Access holes were created into the two arches underlying the south side of the bridge. These had been sealed by brick and concrete during the extensions and refurbishments in 1908. The access holes were created and metal gates attached so that air could circulate under the arch and to allow the condition of the bridge arches to be inspected more frequently. The location of the access holes is shown on both Figure 2 in plan and Figure 3 on a profile of the east side of the bridge. The brick wall and reinforced concrete facing sealing the arch was broken out using a circular saw steel cutter and a handheld breaker.

Within Access Hole 1 the arch comprised of concrete to the outer, south-east, side of the bridge measuring 0.55m in thickness. The inner, approximately two-thirds of the arch, was of red stock brick, measuring 1.08m. The brick and concrete arches butted against one another. The brick arch butted against the brick wall, covered by corroded metal shuttering which lay 1.90m back from the front of the in filled arch (Plates 17-19).

Within Access Hole 2 the arch was comprised almost entirely of red stock brick, although the outer edge was comprised of concrete. As in Access Hole 1, the brick arch butted against the earlier sandstone block wall, which lay approximately 2.70m to the rear of the front of the in-filled arch (Plates 20-21).

#### 4.1.4 Other works to the bridge

The damaged concrete was repaired and replaced (Plate 22) and the bridge concrete and railings repainted in a cream colour previously agreed, in consultation with English Heritage (Plates 23-24).

### 5. Synthesis

The watching brief afforded a limited view of medieval fabric of the bridge and a later road surface otherwise hidden beneath later structures. On the north side of the bridge exposed in Trench 2, the bridge consisted of roughly hewn sandstone blocks in a sandy matrix. On the south side, where refurbishments were made to Span 6 (Tr. 1) was a layer of flat, smooth degraded sandstone blocks that were added when the south side of the bridge was rebuilt in 1770. This overlaid the roughly hewn sandstone blocks that made up the bridge keystones of the arch.

### 6. Publication summary

The Service has a professional obligation to publish the results of archaeological projects within a reasonable period of time. To this end, the Service intends to use this summary as the basis for publication through local or regional journals. The client is requested to consider the content of this section as being acceptable for such publication.

*A watching brief was undertaken on behalf of the Highways, Contracts and Programme Unit of Worcestershire County Council at Teme Bridge, Tenbury, Worcestershire (NGR SO 5955 6859; HER ref WSM 46030). Keystones in two locations across the bridge were replaced due to erosion and flood damage. Concrete was strengthened and the bridge surfacing was replaced. Two access holes to voids under the Southern arches were also made to allow inspections at a later date.*

*The fabric of the bridge exposed showed a difference between the north and south sections. Within span 2 on the north side an earlier undulating cobbled surface was exposed. Underlying this the bridge consisted of large roughly hewn sandstone ashlar masonry blocks with squared sides within a sandy matrix. On the southern side of the bridge at span 6 the large roughly hewn sandstone blocks were packed with sand and some river gravels and was overlain by a smooth sandstone slab surface and red sand as this section was rebuilt in the 1770s due to flood damage.*

## 7. **Acknowledgements**

The Service would like to thank the following for their kind assistance in the successful conclusion of this project, Richard Attwood (Worcestershire Highways Agency), Douglas Barnett (Senior Bridge Engineer, Halcrow Group Limited) and Anthony Fleming (English Heritage Inspector of Ancient Monuments).

## 8. **Personnel**

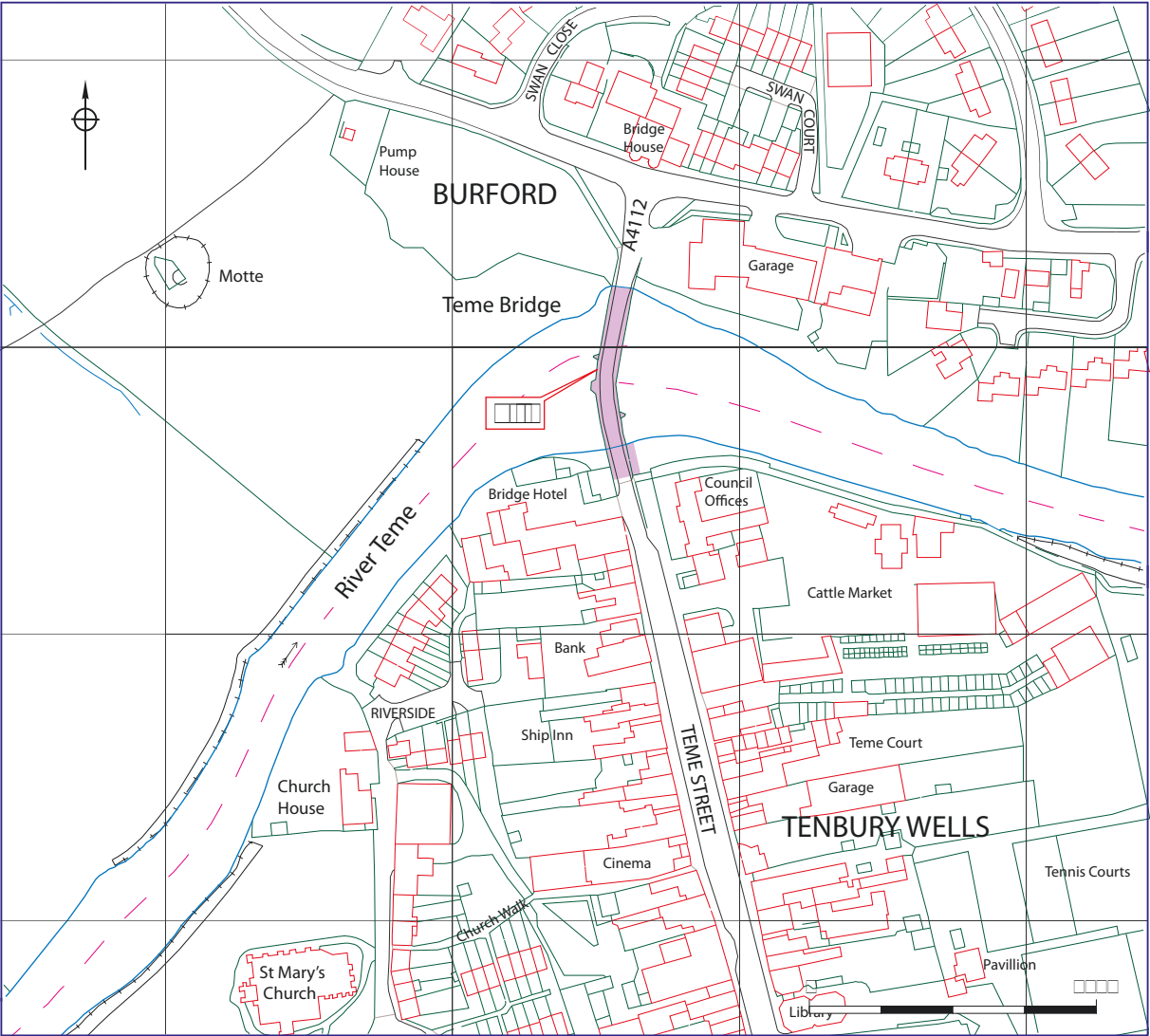
The fieldwork and report preparation was led by Graham Arnold. The project manager responsible for the quality of the project was Tom Rogers. Fieldwork was undertaken by Graham Arnold and illustration was by Carolyn Hunt.

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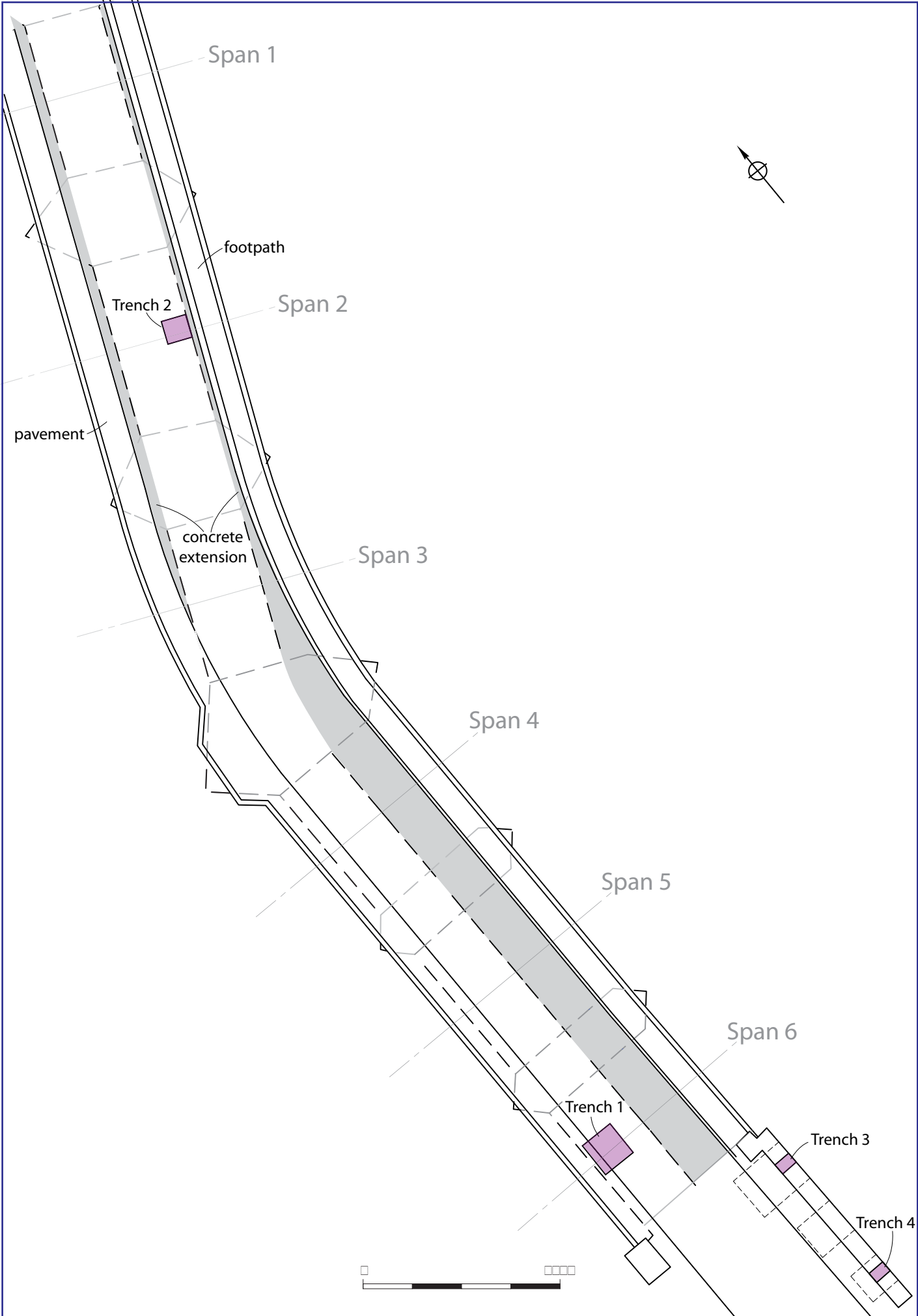
## **Figures**

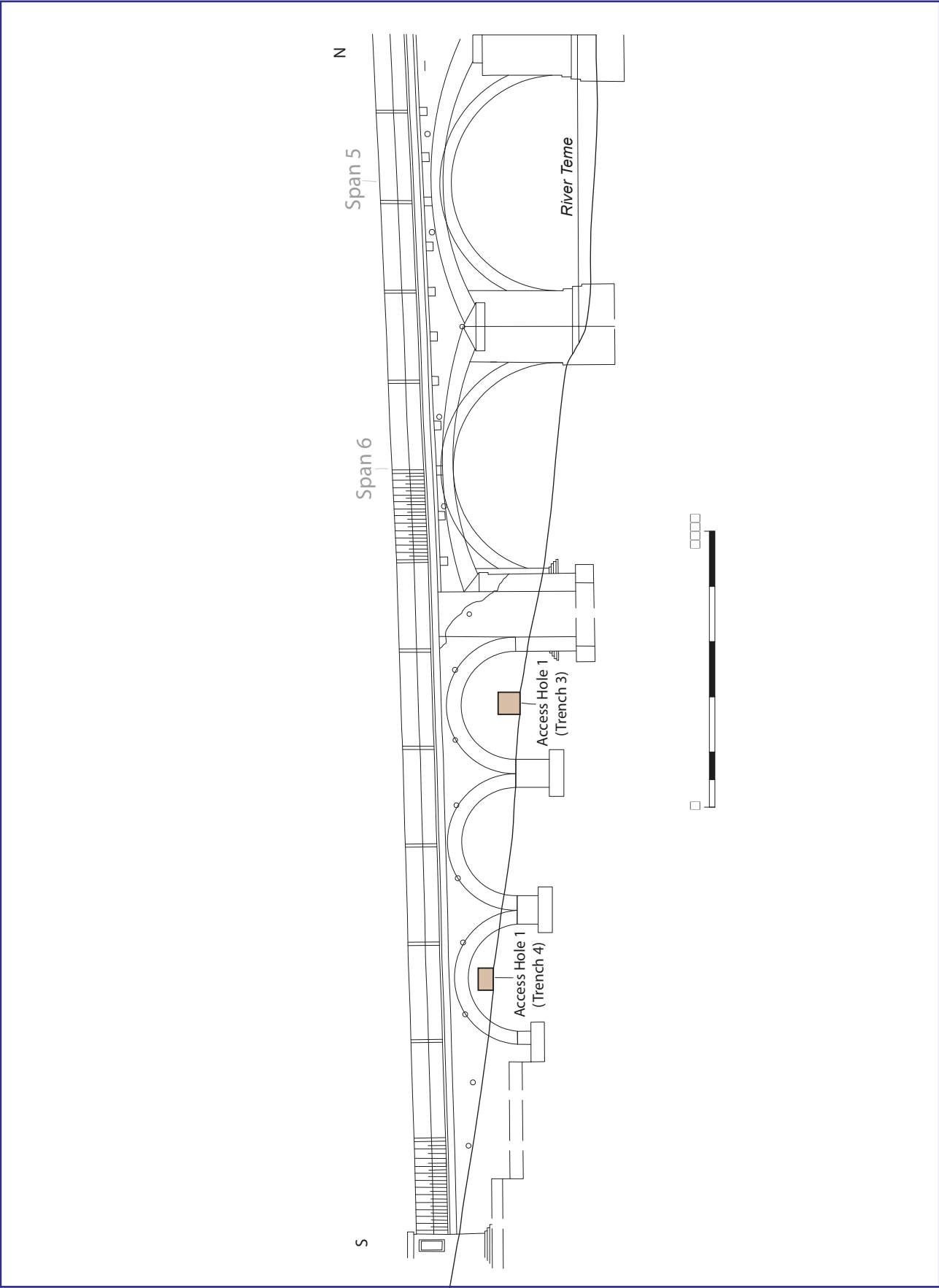
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© [Scale Bar]







## Plates



*Plate 1 The pavement on the east side of the bridge looking north*



*Plate 2 Removing tarmac and hardcore overlying the concrete extension looking south*

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*Plate 3 West pavement with tarmac and hardcore removed, showing services, looking north*



*Plate 4 Centre of carriageway tarmac with 0.95mm planed off to reveal sound road base (courtesy of Richard Attwood, Worcestershire Highways Agency)*





*Plate 5 Damage to bridge keystones under span 6*



*Plate 6 Location of Trench 1 looking north*

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*Plate 7 West facing section of Trench 1 road surfacing layers above original sandstone bridge*



*Plate 8 Excavation down to the keystones to be replaced through the original bridge in trench 1*



*Plate 9 View of Trench 1 with damaged keystones removed, showing layers of bridge and extant keystones. Scaffolding platform below to stop sandstone falling through*



*Plate 10 New keystones in place and partially grouted*

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*Plate 11 Damage to keystones under span 2*



*Plate 12 Trench 2 location on bridge looking north*



*Plate 13 Trench 2 showing original road surface and overlaying modern tarmac road. The metal bars spanning the concrete extension and the original bridge can be seen in the bottom left corner of the photograph*



*Plate 14 Degraded keystones removed from trench 2*

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*Plate 15 Replacing the keystones in Trench 2 using a winch*



*Plate 16 Trench 2 keystones replaced and grouted*



*Plate 17 Access Hole 1*



*Plate 18 Internal shot of Access Hole 1 showing shuttering against original wall*

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*Plate 19 Side view of concrete and brick sections of arch with Access Hole 1 looking south*



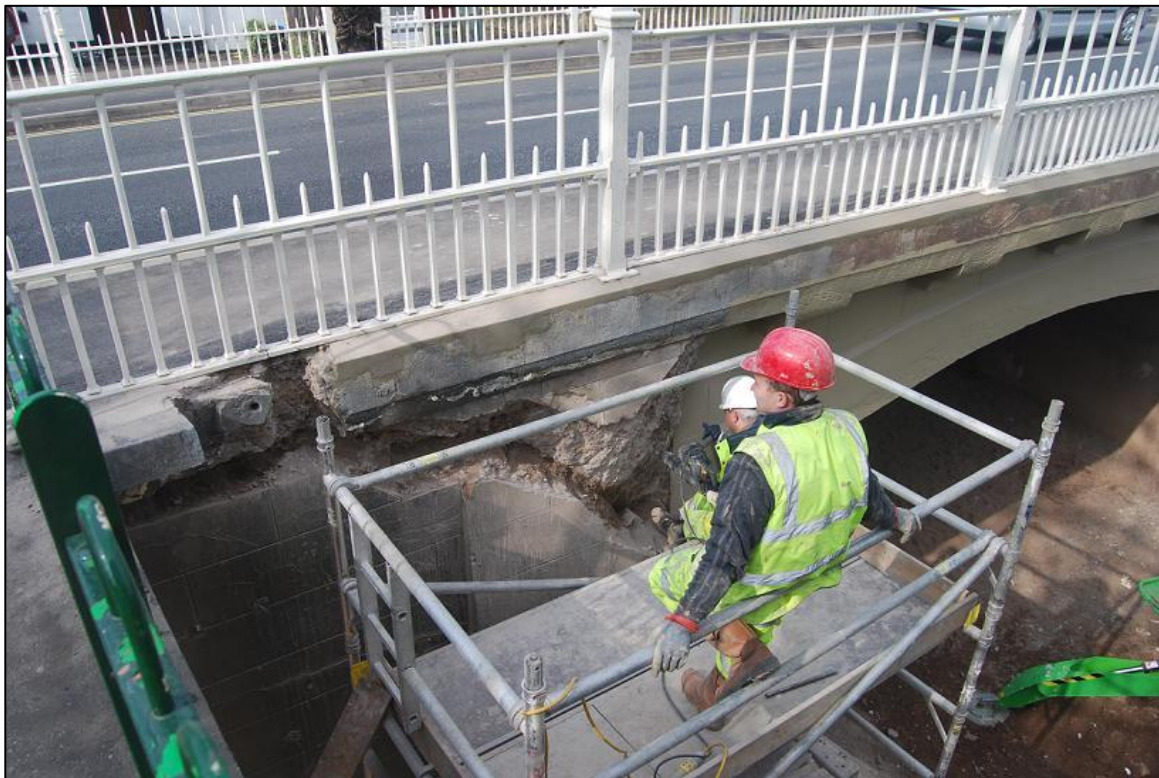
*Plate 20 Access Hole 2 showing original sandstone wall at back of the arch*

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*Plate 21 Access Hole 2 side view of arch, showing brick and concrete sections*



*Plate 22 Replacing damaged concrete facing on the southeast side of the bridge*

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*Plate 23 Access Hole 2 side view of arch, showing brick and concrete sections*



*Plate 24 East side of bridge after works are complete looking north-west*



*Plate 25 View of the west side of the bridge looking south*



*Plate 26 Tenbury Bridge reopened after works to carriageway*

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## Appendix 1 Trench descriptions

### Trench 1

Site area: Span 6

Maximum dimensions: Length: 2.00m Width: 2.00m Depth: 1.00m

#### Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
100	Tarmac	Modern compact black tarmac, previously replaced in some areas	0 - 0.08-m
101	Type 1 hardcore levelling	Loose grey and orange gravels and sand	0.08m – 0.30m
102	Concrete	Compact smooth light grey concrete from later bridge extensions	+ 0.05m – 0.53m
103	Layer	Compact reddish pink sand and gravel bedding material for road surface, protecting original bridge surface	0.30 – 0.48m
104	Bridge Surface	Smooth, flat sandstone slabs, Top of 1770s bridge fabric	0.48m – 0.48m
105	Sandstone bridge structure	Compact sandstone ashlar masonry and slabs with sand infill and occasional large river gravels. Blocks of various sizes. Two courses of original stone bridge survive.	0.48 – 1.00m

### Trench 2

Site area: Span 2

Maximum dimensions: Length: 2.00m Width: 2.00m Depth: 1.00m

#### Main deposit description

Context	Classification	Description	Depth below ground surface (b.g.s) – top and bottom of deposits
200	Tarmac	Modern compact black tarmac, previously replaced in some areas	0 - 0.08-m
201	Type 1 hardcore levelling	Loose grey and orange gravels and sand. Packing material to protect original bridge from modern road surfacing	0.11m – 0.25m
202	Concrete	Compact smooth light grey concrete from later bridge extensions	0.25m
203	Bridge Surface	Slightly undulating sandstone cobbles in compact sand matrix	0.21- 0.25m
204	Sandstone bridge structure	Sandstone ashlar masonry with sand infill and occasional large rounded river gravels as within fill. Blocks of various sizes. Two courses of original stone bridge survive.	0.25 – 1.00m

## **Appendix 2 Technical information**

### **The archive (site code: WSM 46030)**

The archive consists of:

9	Field progress reports AS2
2	Photographic records AS3
144	Digital photographs
1	Drawing number catalogues AS4
2	Scale drawings
4	Trench record sheets AS41
1	CD-Rom/DVDs
1	Copy of this report (bound hard copy)

The project archive is intended to be placed at:

Worcestershire County Museum  
Museums Worcestershire  
Hartlebury Castle  
Hartlebury  
Near Kidderminster  
Worcestershire DY11 7XZ  
Tel Hartlebury (01299) 250416

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