

Archaeological watching brief and building recording at Eastham Bridge, Eastham, Worcestershire



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Tim Cornah and Tom Vaughan

Illustrations by Carolyn Hunt

Summary

A programme of archaeological watching brief and building recording was undertaken at Eastham Bridge, Eastham, Worcestershire (NGR SO 65917 69060). It was undertaken on behalf of Worcestershire County Council following the collapse of the bridge on 24 May 2016.

The project involved a watching brief of the soil strip for the compound on the south side of the River Teme, and a photographic survey of the remaining structure, both before and after removal of the collapsed masonry.

An area was stripped of topsoil on the south side of the river in order to create of a compound, along with access to the river. The shallow depth of this work meant that there was no disturbance of the medieval castle motte, which lies adjacent to the south-east. No residual artefacts of this period were noted within the topsoil.

Documentary sources reveal that Eastham Bridge did not replace an earlier structure, but was built new as a toll bridge in 1793, replacing Whitcombes Ford. The bridge was largely rebuilt in 1898 when its ownership was transferred to the county council. A further set of records exist from this date. These give remarkable detail and correspond closely with the structure extant before the recent collapse in terms of both materials and construction methods. Both of these sets of records along, with the remains of the bridge, give a clear picture of the fabric, development and context of the bridge from the point of its initial construction. Tie rods were inserted into the structure in the latter half of the 19th century, although no records of this work have been found to date them more closely.

A drone flight was undertaken, and a three dimensional model created, which can be accessed here: <https://skfb.ly/P9VC> .

Report

1 Background

1.1 Reasons for the project

A programme of archaeological watching brief and building recording was undertaken at Eastham Bridge, Eastham, Worcestershire (NGR SO 65917 69060). It was commissioned by Worcestershire County Council, following the collapse of this historic bridge on 24 May 2016. A planning application will be submitted to Malvern Hills District Council.

The site is considered to include heritage assets and potential heritage assets, the significance of which may be affected by the works (WSM 00282 and 37006).

The project conforms to the standard brief prepared by Worcestershire County Council (WCC 2014) and the scope of works discussed in correspondence dated 6 June 2016, for which a project proposal (including detailed specification) was produced (WA 2016).

The project also conforms to the *Standard and guidance: Archaeological watching brief* (ClfA 2014a), *Standard and guidance for the archaeological investigation and recording of standing buildings or structures* (ClfA 2014b) and the *Standards and guidelines for archaeological projects in Worcestershire* (WCC 2010).

The event references for this project, given by the Historic Environment Record (HER) are WSM 67959 for the watching brief, and WSM 67960 for the building recording.

2 Aims

The aims of the watching brief were to observe and record archaeological deposits and structures, and to determine their extent, state of preservation, date and type, as far as reasonably possible within the constraints of the works.

The Chartered Institute for Archaeologists defines the aims of building recording as 'a programme of work intended to establish the character, history, dating, form and archaeological development of a specified building' (ClfA 2014b).

3 Methods

3.1 Personnel

The project was led by Timothy Cornah (BA (hons.), MSc) who joined Worcestershire Archaeology in 2006 and has been practicing archaeology since 2003, assisted by Tom Rogers (BA (hons.); MSc). The project manager responsible for the quality of the project was Tom Vaughan (BA (hons.); MA; ACIfA). Illustrations were prepared by Carolyn Hunt (BSc (hons.); PG Cert; MCIfA).

3.2 Documentary research

Documentary research for this project included the cartographic evidence, original documents for the bridge held by the owners of Eastham Court Farm, original documents relating to a rebuild of the bridge held at Worcestershire Archives and research undertaken by Eastham Historical Society.

Prior to fieldwork commencing a search was made of the Historic Environment Record (HER).

3.3 List of sources consulted

Cartographic sources

- 1839 Tithe Plan of Eastham (WRO ref X760-274) (Fig 3)
- 1840 Tithe Plan of Lindridge (HER; transcribed by David Gyatt)
- 1884 Ordnance Survey Map, 25":1 mile

- 1903 Ordnance Survey Map, scale 25":1 mile (Fig 4)
- 1949 Ordnance Survey Map 1:25,000

Documentary sources

Published and grey literature sources are listed in the bibliography.

3.4 Fieldwork strategy

A detailed specification has been prepared by Worcestershire Archaeology (WA 2016).

Fieldwork was undertaken between 8 and 22 June 2016. The site reference numbers and site codes are WSM 67959 and 67960. It involved a watching brief of the topsoil strip for the works compound and access ramp down to the river, and a photographic survey of the collapsed bridge before and after removal of the debris within the riverbed and loose masonry within the surviving structure.

3.4.1 Watching brief

The topsoil strip for the works compound within the field and the access rampart down to the river was archaeologically monitored (Fig 2; Plates 1-3).

Deposits considered not to be significant were removed using a 360° tracked employing a toothless bucket. Clean surfaces were inspected and selected deposits were hand excavated to retrieve artefactual material and environmental samples, as well as to determine their nature, as appropriate. Deposits were recorded according to standard Worcestershire Archaeology practice (WA 2012).

3.4.2 Building Recording

Building recording consisted of a photographic survey of the bridge (Plates 10-16) and analysis of its development. All photographs were taken with photographic scales visible in each shot where possible, although this was rarely the case. The photographic survey was carried out with a Sony α350 digital SLR camera. All photographs were recorded on a pro-forma Photographic Record Sheet.

A further photographic survey was undertaken by Aerial-Cam using a UAV (drone) and a camera elevated on a pole for the purpose of producing an archive from which rectified photographs could be produced in the future. The latter was undertaken. The three dimensional model created by Aerial-Cam is accessible here: <https://skfb.ly/P9VC>.

The accurate completion of pro-forma Building Record and Building Phase sheets was not possible due to the lack of safe access to the structure. Similarly, no scale drawings of the bridge could be completed.

The project conformed where possible to the specification for a level 3 survey as defined in the Historic England document *Understanding historic buildings: a guide to good recording practice* (HE 2016). This level of survey is described as 'an analytical record' comprising of 'an introductory description followed by a systematic account of the building's origins, development and use' (*ibid.*). This required the following elements of survey.

Photography

- Detailed coverage of the building's external appearance.
- Any detail, structural or decorative, relevant to the building's design, development and use, which does not show on general photographs.

Building analysis

Analysis of the building was based on the study of the photographic record. It was also informed by the documentary sources listed above. This allowed a descriptive phasing of the building to be produced, highlighting the structural development of the building.

3.5 Structural analysis

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

3.6 Artefact methodology

3.6.1 Artefact recovery policy

Recovery of artefacts was undertaken according to standard Worcestershire Archaeology practice (WA 2012). In the event no artefacts pre-dating the modern period were identified, and none of these were retained.

3.7 Environmental archaeology methodology

3.7.1 Sampling policy

Sampling was undertaken according to standard Worcestershire Archaeology practice (WA 2012). In the event no deposits were identified which were considered to be suitable for environmental analysis.

3.8 Statement of confidence in the methods and results

The methods adopted allow a high degree of confidence that the aims of the project have been achieved, particularly in relation to the watching brief. A detailed record of the bridge structure was not possible due to a lack of safe access. However, the data collected did allow the production of a detailed description along with the phasing of the structure.

4 The application site

4.1 Topography, geology and archaeological context

The site lies within the floodplain of the River Teme. The compound is within a field on the southern bank of the river, which the bridge spans. The bedrock geology of the area is recorded as Raglan Mudstone Formation, overlain by alluvium such as clay, silt, sand and gravel (BGS 2016)

The following is taken from a search of the Worcestershire HER with a radius of 500m centred on the bridge.

The earliest known activity within the area relates to the medieval era. Just outside the south-east corner of the site is a former castle motte of about 50m diameter and surrounded by a ditch of about 10m in width (WSM 00282). The ditch extended slightly into the site boundary. No specific date or documentary evidence for this earthwork is recorded. The field containing the monument is noted as Castle Tump Meadow on the tithe plan of 1839 (Fig 3), although it is considered most likely to have been a watch tower to guard the river ford, rather than an actual castle.

A similarly broad medieval date is given to the settlement of Eastham, thought to have been centred on the current village to the south-west of the site, where earthworks indicate that it may have been a larger settlement in the medieval period which subsequently shrank (WSM 06703). The possible presence of a former moat (WSM 06704) around Eastham Court Farm (WSM 62135) also indicates a medieval date, although the current house is 17th century. The church of St Peter and Paul (WSM 08101), within the centre of the village, dates from the 12th century, although there is noted to have been a priest in Eastham at the time of the Domesday survey (Thorn and Thorn 1982). To the south of the church nave are the remains of a 14th century cross (WSM 37007). A holloway of a broadly medieval date leads towards the south-west from the south-west corner of the churchyard, a position maintained by the current road.

The village developed through the post-medieval era with Eastham Court Farm constructed in the early 17th century. The Old Rectory Cottage (WSM 37008) is likely to be of late 16th century date,

although it has previously been suggested it was part of an earlier monastic precinct. Also registered are two sets of agricultural buildings. One is a barn north-west of the church (WSM 05936) and the other are those associated with Eastham Court Farm (WSM37010). Eastham bridge itself and its associated toll house (WSM 37006) are noted to have been constructed in 1793, and modified at various later dates (Figs 3 and 4). These details shall be further described below. The latest feature of note is the site of a former Second World War pill box on the northern side of the bridge (WSM 17803).

4.2 Documentary information

A significant collection of original documents relating to the construction of the bridge in 1792 are in the ownership of Eastham Court Farm (reproduced as Plates 4-8, courtesy of Celia Adams), and have been summarised by the Eastham Historical Society (Eastham Historical Society n/d). The documents are considered to have been part of the correspondence of the Reverend Christopher Whitehead.

One document (Plate 4) states that the bridge was to be built at a spot called Whitcombes Ford, where people had previously been "going through the water at the hazard of their lives". The bridge was to consist of three arches with piers of stone at an estimated cost of £600, though half of this was for a toll house as seen on later mapping on the northern side of the river. Further more detailed estimates of costing and materials existed (Plate 5), which included 130,000 bricks for the construction of the bridge. Ashlar was detailed for the "springing of the arches" (Plate 6), stone coping for the side walls and "backing up the arches with rubble stone work". Two sketches of the bridge location and one of the arches compare favourably with the bridge as it stood before the recent collapse (Plate 7). A watercolour of 1830-1853 shows the northern half of the eastern elevation of the bridge and the toll house adjacent on the north bank (Plate 17; Figs 3 and 4)), which appears to have been demolished in the latter half of the 20th century.

A list details those who had contributed to paying for the bridge, along with the amount of their contribution (Plate 8). Further information includes the source of the bricks, made c 200 yards from the site, the stone from Orelton three miles downstream, and lime, also made locally. It further details the contract with Thomas Nelson, the bridge's builder, the timescale for its construction and the toll rates (Eastham Historical Society u/d).

Records available at Worcestershire Archives detail the reconstruction of the bridge which commenced in August 1898 and had been completed by May 1899, when the bridge was bought by Worcestershire County Council. A detailed specification set out by the council catalogues the works required, from removing elements of the old structure to its rebuilding (primarily the southern half). The new bricks were specified as "the best Staffordshire Brindle bricks" and the old bricks were to be taken down to be reused in the inner part of the bridge. Cement mortar using best heavy Portland was to be used. The tie rods running through the bridge were to be repaired and reused where possible, so must have been present before this point. The document also details the construction of a temporary footbridge whilst the works take place (WRO BA5512 ref 250-1). Various documents exist documenting Thomas Vale of Stourport as the contractor to undertake the repairs, at a cost of £503 (WRO BA2324 ref 250-1). The scope of the intended rebuild is indicated on a surviving proposed elevation drawing (Plate 9, WRO BA2324 ref 250-1).

Further repair works were undertaken in 1994 including repointing, brickwork repairs and divers inspection (Eastham Historical Society u/d).

The bridge was designated as Grade II listed in 1952 and described as follows within the listing information (List Entry Number 1081429 and 1081439):

Road bridge over the River Teme. 1793 with mid- to late C19 repairs. Part red brick, part red and blue brick with sandstone ashlar dressings. Three elliptical arches of regular size, the central one is larger than the outer two; the central and north arch have stone keyblocks; two circular flood outlets in central spandrels and short angled buttresses to central piers; two-course band beneath parapet which is splayed at both ends and terminated by square piers with pyramidal capping. The bridge

was originally in private ownership and a toll was charged for crossing it; in [1898] it was bought by the County Council and freed from toll.

4.3 Current land-use

The field to the south-east of the bridge was in cultivation and the bridge itself remained in use connecting with the A443 along the north side of the river, up until the collapse on 24 May 2016.

5 Watching Brief Results

5.1 Structural analysis

The area recorded is shown in Fig 2 and Plates 1-3.

5.1.1 Phase 1: Natural deposits

No clear geological deposits were present although a mid red-brown silty clay deposit (102) was seen at points on the slope down to the river which may have been the top of the natural deposits, but may similarly have been an undated alluvial deposit (Plates 2-3).

Subsoil deposits were noted across the site (Plate 1), though the machining depth was not always sufficient to reach it. This deposit (101) was compact homogenous orange clay silt. No dating material was recovered from this layer.

5.1.2 Phase 2: Modern deposits

Topsoil (100) was a firm mid brown clay, and extended across the site to a depth of approximately 0.25m.

A single small dump of modern material (103) was recorded in the north-west corner of the area, immediately below the topsoil and contained coal and small, undiagnostic brick fragments

The topsoil and subsoil profile was clearly visible in the strip for the access ramp on the bank sloping down to the river (Plates 2 and 3).

5.2 Artefact and ecofactual analysis

No artefactual or ecofactual evidence suitable for further analysis were present on the site.

6 Building Recording Results

6.1 Building development

6.1.1 Phase 1: 1792-3

The bridge as it remained before its collapse kept the general shape and layout of its first phase (Plates 10 and 17). This can be seen by the two piers within the river which were not rebuilt in Phase 2 or after. These positions demonstrate that the bridge was designed with three arches, the central arch being slightly wider than the two others. Only about one third of this phase of the bridge remained after the Phase 2 rebuild.

The river was spanned by elliptical brick arches, one and a half bricks length in depth (Plate 12). These arches were further supported by rough stonework on their upper side (Plate 14) and two circular holes within the spandrels above the two piers to allow flood water through, though only one of this phase remained. The fill within the bridge appears to have been compacted clay marl, visible within the section closest to the northern bank (Plate 14). This was held in place by flanking walls either side, also of one and a half brick lengths in width. This wall had a brickwork string course at broadly road surface height and was capped with stones.

Stone work detailing was used elsewhere on the bridge, most noticeably at the base of the piers where triangular shaped 'cut water' buttresses was used, topped with pyramid shaped capping (Plate 15). Keystones were also used at the centre of the bridge. All of these details appear to

have been limestone, a rock type which was available locally. Sandstone ashlar, also available locally, was visible on the northern side closest to the bank at water level (Plate 14).

The flanking walls splayed outwards on the northern side, a style copied during the repair work on the southern side (Plate 11). The flanking walls ended at a brick pillar. No original road surfaces remained, presumably having been removed during later alterations. As the debris of the collapsed bridge was removed by machine, no bricks certain to have originated from this phase could be recovered for detailed recording.

Two metal plates (Plate 12), indicating the position of tie rods running through the structure, were visible. These are unlikely to be part of the original design as they were not specified in the original documentation, but were identified as present before the Phase 2 rebuild. This suggests a currently unknown phase of repair of the bridge, which post-dates the watercolour painting of 1830-1853 (Plate 17).

6.1.2 Phase 2 1898

This phase involved the rebuild of the southern half of the bridge, with the southernmost arch replaced from the top of the southern pier within the river (Plate 9). The southern support of the arch where it met the bank was also entirely replaced and it was dug back into the bank. The whole structure above this was replaced with the interior filling being concrete and rubble (Plate 16) and the side was being purple engineering bricks, the same as the new southern arch. The side walls were replaced as far as the centre of the bridge, though some of the interior fill was replaced as far as the northern flood hole. These repairs maintained the general character of the Phase 1 bridge, although without the use of a keystone in the southern arch.

The extent of the works can be seen from a late 20th century photograph of the bridge (Plate 10), which compares closely with the intended repairs (Plate 9), the only significant visual difference being a change in the height of the side wall.

6.1.3 Phase 3 20th century

A tarmac road surface with a pipe running along the western side of the road was added at some point in the 20th century, probably along with the hardcore surfaces below (Plate 12). In the late 20th the bridge was repointed and some areas of brickwork repaired, although these alterations were not obvious after the bridge had collapsed.

7 Synthesis

A study of the archaeological background shows that Eastham developed in the medieval era, primarily based upon the current village centre. During the watching brief no remains or evidence was seen of medieval activity, which is striking given the presence of the medieval castle motte adjacent. This may indicate that occupation of the motte was short lived, although it may also be due to the shallow depth stripped, with only topsoil generally removed, and only a small patch of natural, possibly alluvial clay, noted along the edge of the river bank.

Records indicate that the river was crossed by a ford known as Whitcombes Ford prior to construction of the bridge in 1792-3. No evidence has been found, either documentary, or archaeological, for a bridge structure before this date.

The detailed records illuminate a great deal in relation to the original construction of the bridge, including its patrons and their subscriptions, the toll charges, the materials used, along with their cost and provenance, the conditions of the river and surrounding fields as well as the original design of the bridge. It also documented the construction of a tollhouse on the northern side of the river, which no longer remains.

The remaining elements of the bridge constructed in 1793 fit closely with records, it having been constructed of three brick arches, set upon two piers in the river and further brickwork set into the banks. Of these, only that on the northern side remained. Many of the visible construction details fit

closely with the records, even the "ashlar for the springing of the arches" and "backing up the arches with rubble stone work".

Further records relate to the rebuilding of the southern half of the bridge in 1898. This shows the rebuild using Staffordshire Brindle bricks and concrete mortar with a concrete and rubble infill. All of these were visible in the remaining fabric. Otherwise, the rebuild broadly continued the earlier style.

The materials and construction methods used for the bridge, along with the extensive documentary evidence, make a remarkably complete picture of the construction and development of the bridge.

8 The impact of the development

There was no significant archaeological impact upon subsurface features during the strip for the compound and access to the river. This was due to largely only topsoil being stripped.

The impact upon the bridge itself has been heavier with the removal of all of the collapsed material and much of the rest of the bridge. The latter was undertaken in order ensure the stability of the remaining structure. Further works for the same purpose may require the removal of elements of the bridge remaining within the bank. Given that no earlier bridge is thought to have existed before 1793, the remaining impact is likely to be upon the extant fabric.

9 Publication summary

Worcestershire Archaeology has a professional obligation to publish the results of archaeological projects within a reasonable period of time. To this end, Worcestershire Archaeology 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 programme of archaeological watching brief and building recording was undertaken at Eastham Bridge, Eastham, Worcestershire (NGR SO 65917 69060). It was undertaken on behalf of Worcestershire County Council, who intends to rebuild the historic Eastham Bridge following its collapse on 24 May 2016.

The project involved a watching brief of the soil strip for the compound on the south side of the River Teme, and a photographic survey of the remaining structure, both before and after removal of the collapsed masonry.

An area was stripped of topsoil on the south side of the river in order to create of a compound, along with access to the river. The shallow depth of this work meant that there was no disturbance of the medieval castle motte, which lies adjacent to the south-east. No residual artefacts of this period were noted within the topsoil.

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A drone flight was undertaken, and a three dimensional model created, which can be accessed here: <https://skfb.ly/P9VC>.

10 Acknowledgements

Worcestershire Archaeology would like to thank the following for their kind assistance in the successful conclusion of this project, Claire Lockwood (Bridge Engineer, CH2M), Nick Twaite, Infrastructure Asset Manager, Worcestershire County Council), Adam Stanford (Aerial-Cam), Celia Adams (Eastham Court Farm), and Adrian Scruby (Historic Environment Advisor, Worcestershire County Council).

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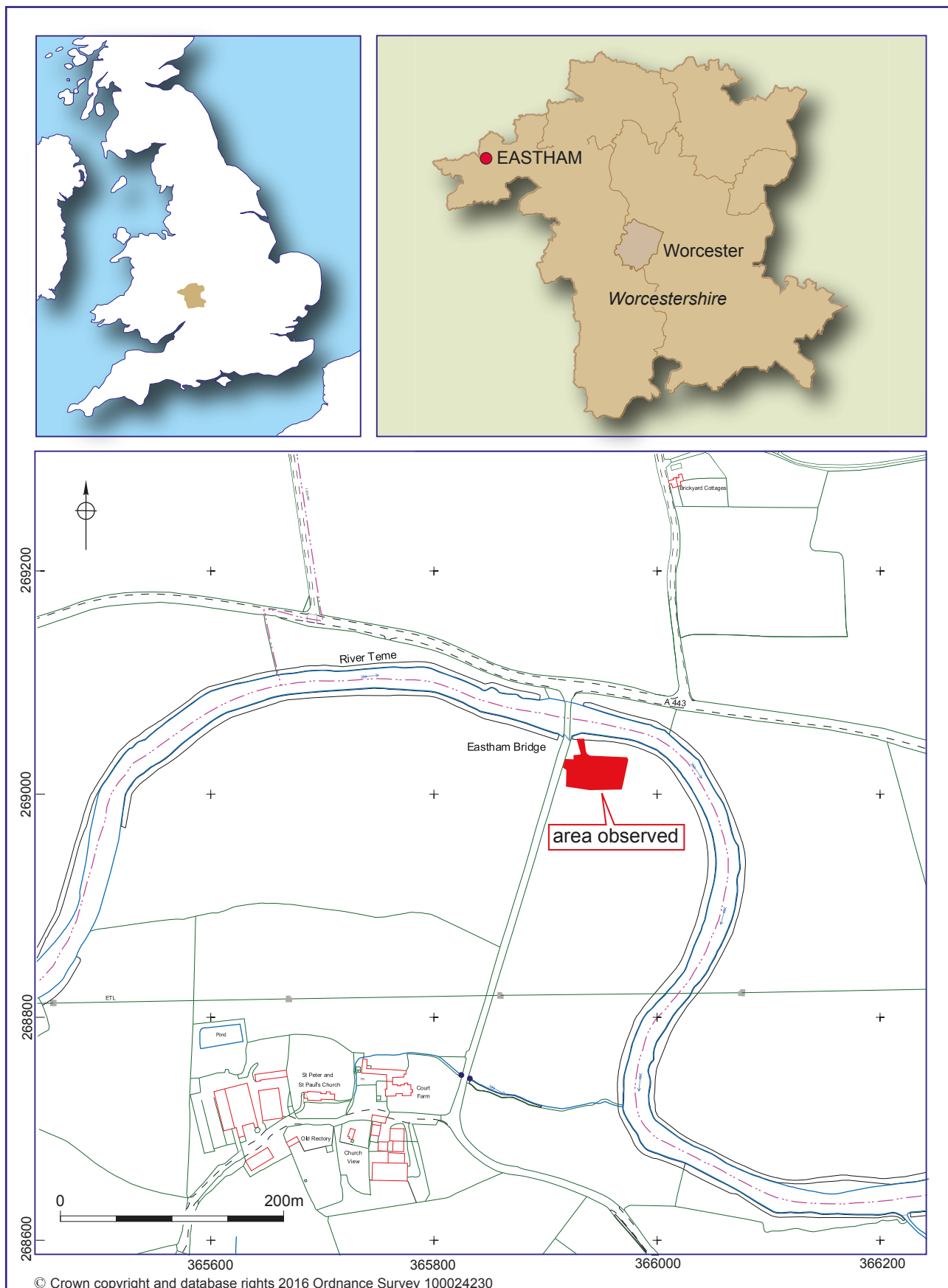
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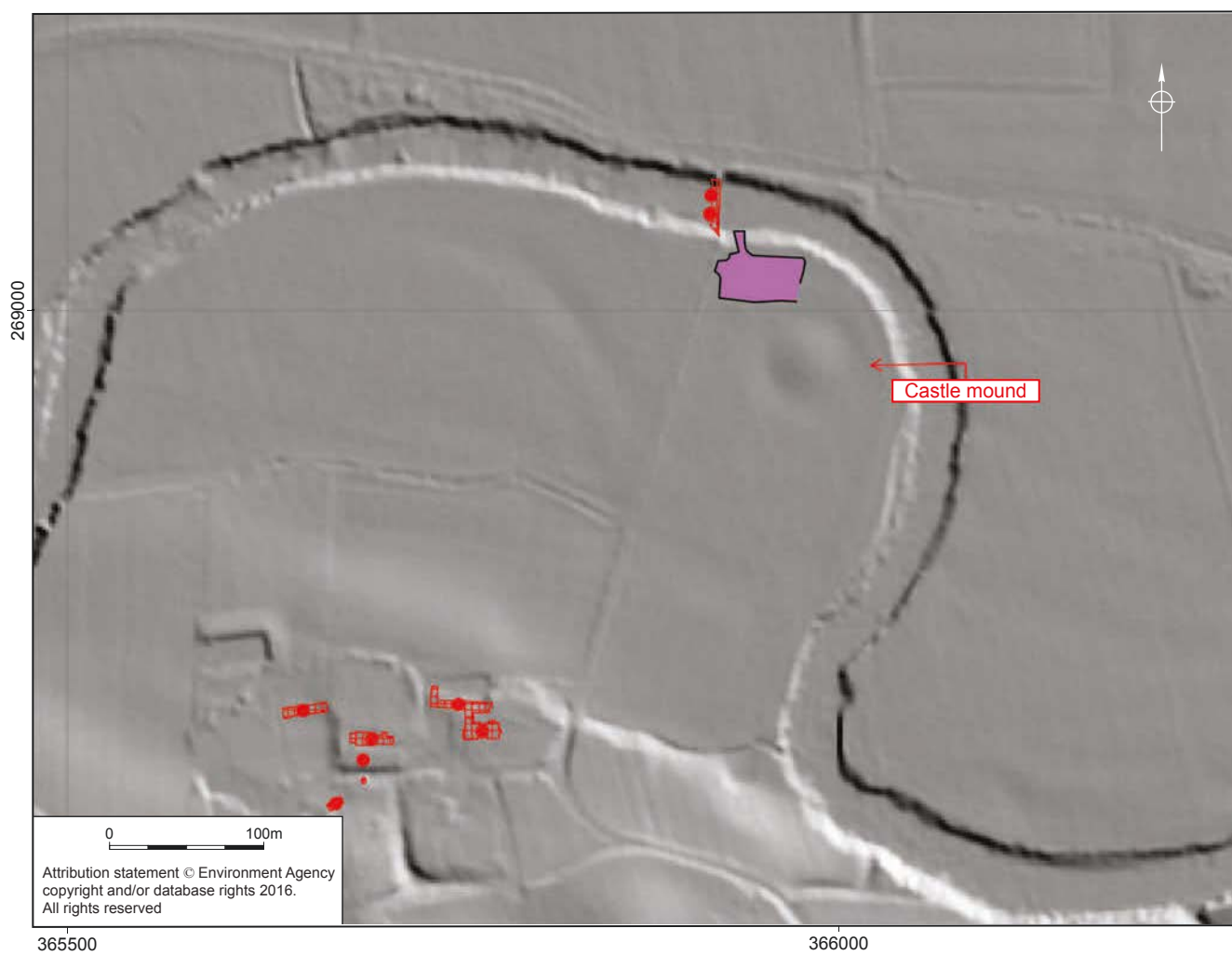
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Figures



Location of the site

Figure 1



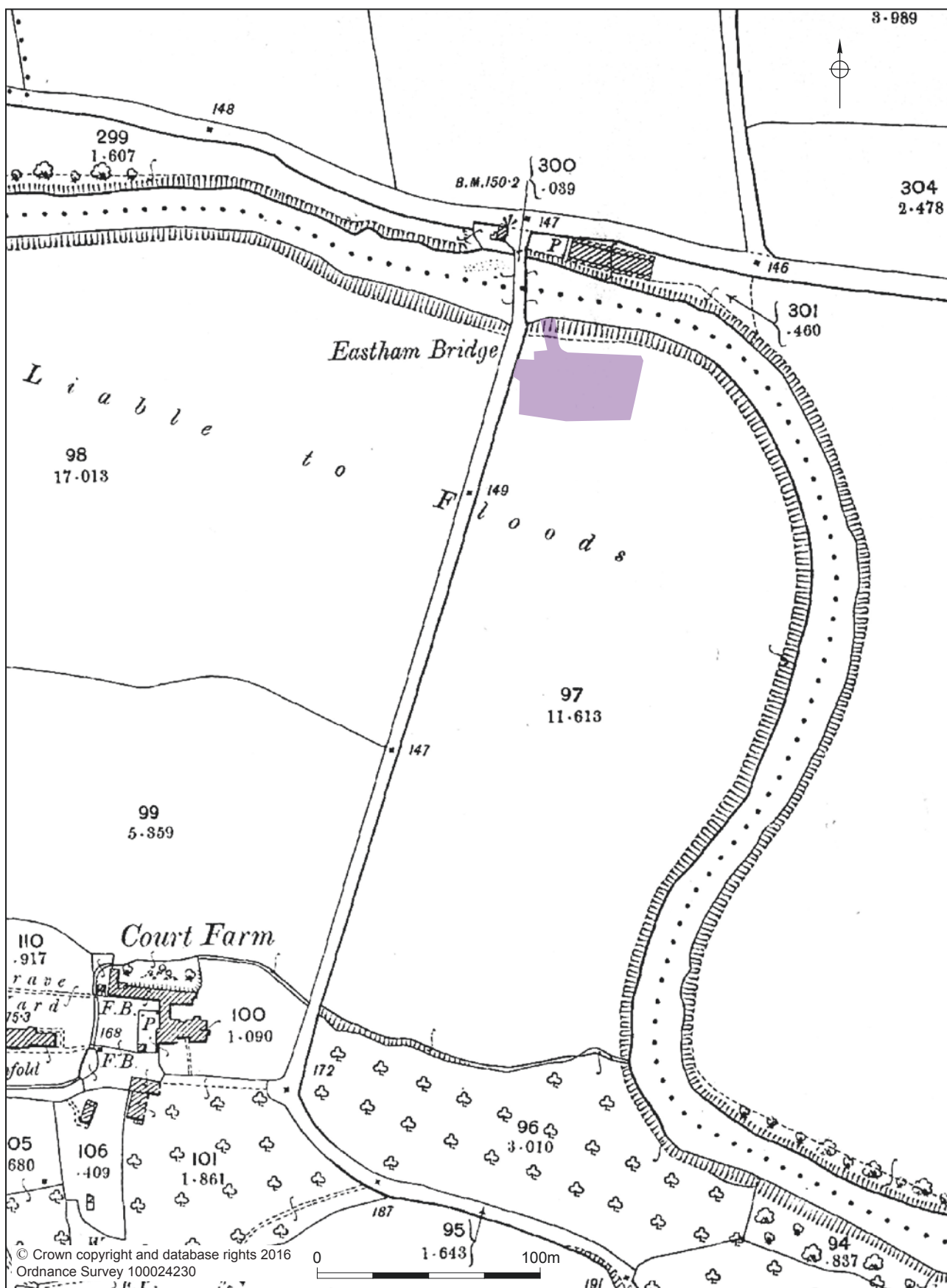
LiDAR survey showing location of castle mound

Figure 2



Extract of 1839 tithe

Figure 3



Extract of 2nd edition OS, 1903

Figure 4

Plates



Plate 1 Topsoil strip of main compound area, view south-east



Plate 2 Topsoil strip for access ramp down the riverbank, view north



Plate 3 Topsoil strip for access ramp down the riverbank, west section, view west

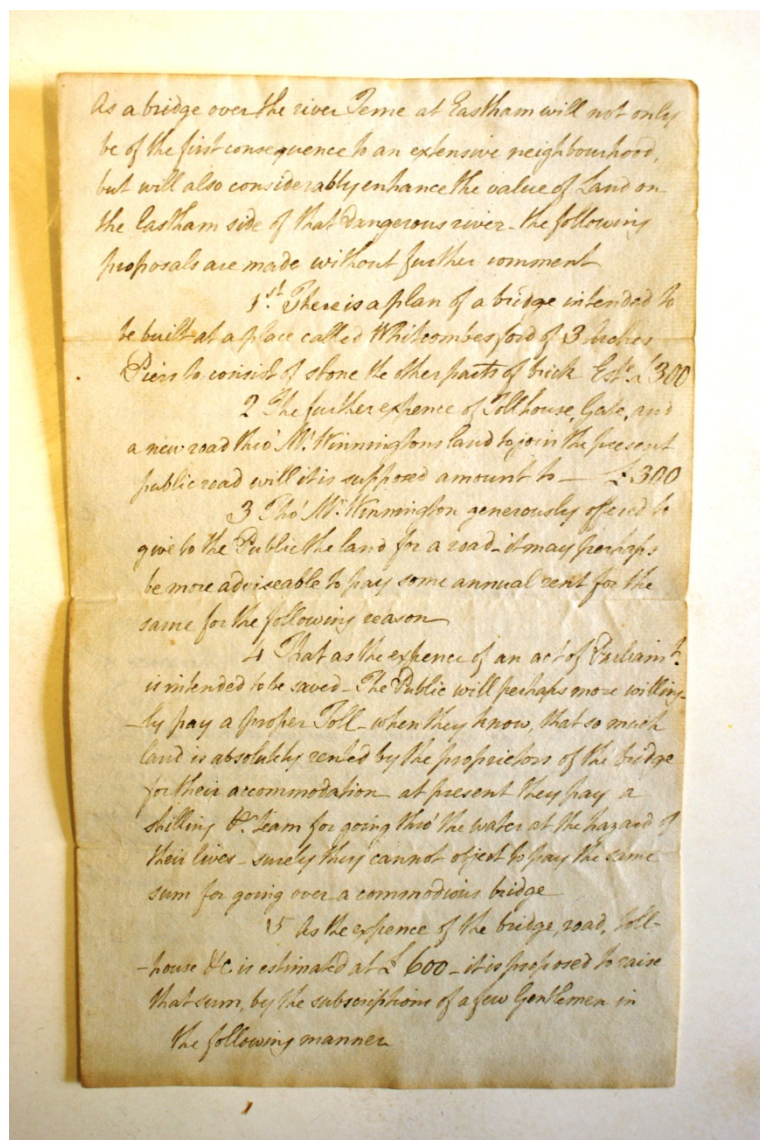


Plate 4 Original document relating to the construction of the bridge in 1792-3 (courtesy of Celia Adams)

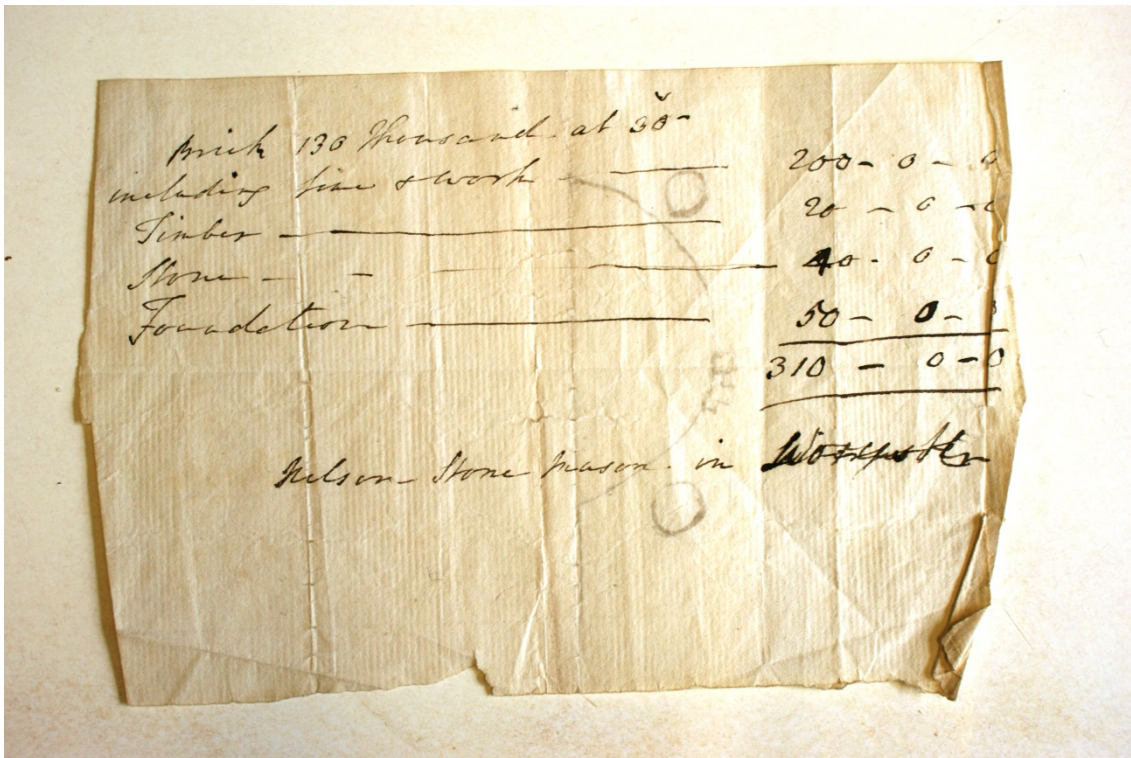


Plate 5 Original document relating to the construction of the bridge in 1792-3, part of the correspondence of the Reverend Christopher Whitehead (courtesy of Celia Adams 2016)

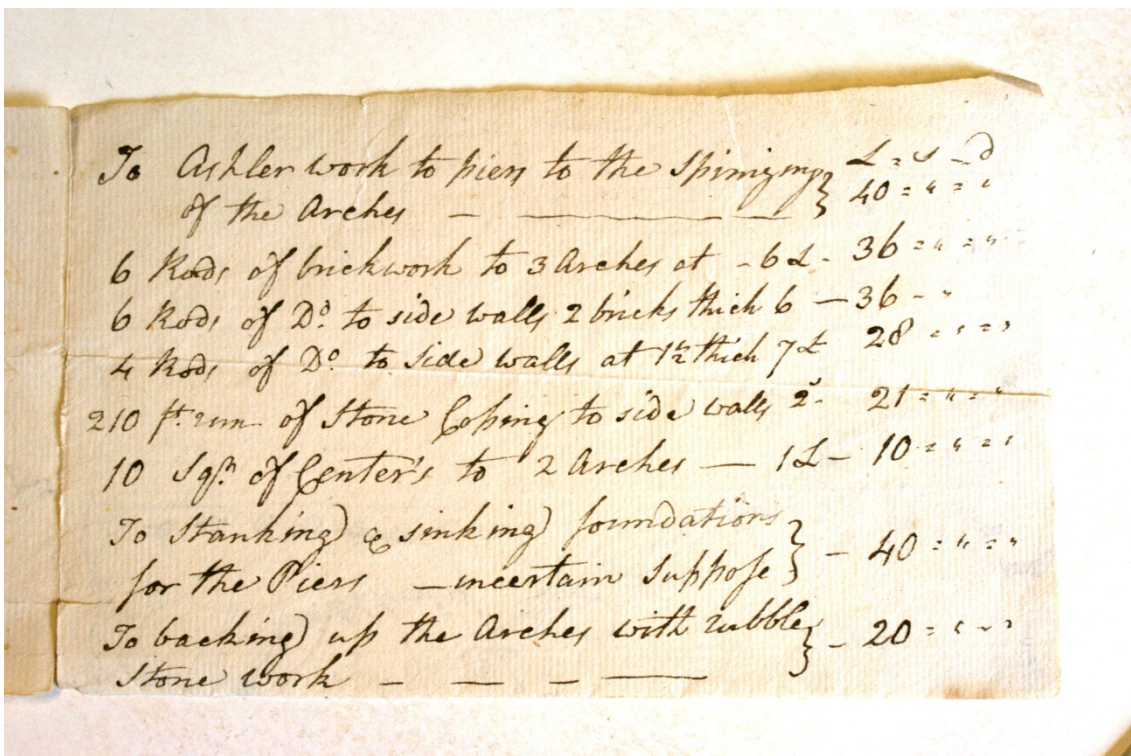


Plate 6 Original document relating to the construction of the bridge in 1792-3 (courtesy of Celia Adams)

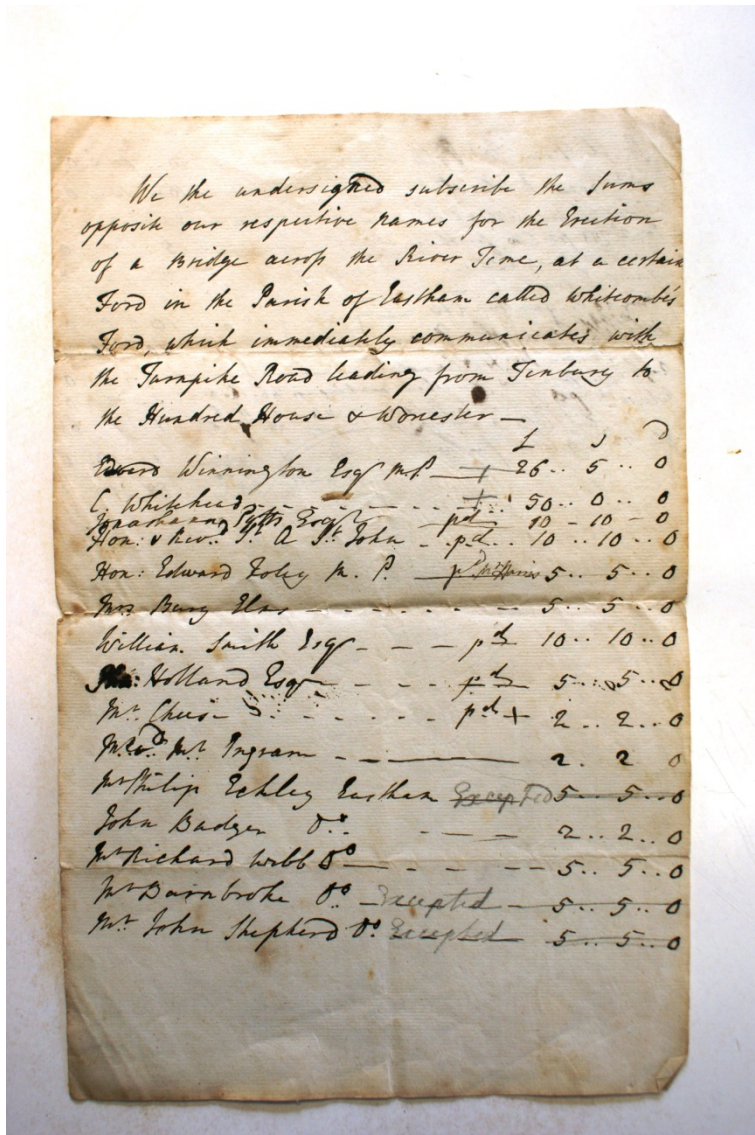


Plate 8 Original document relating to the construction of the bridge in 1792-3 (courtesy of Celia Adams)

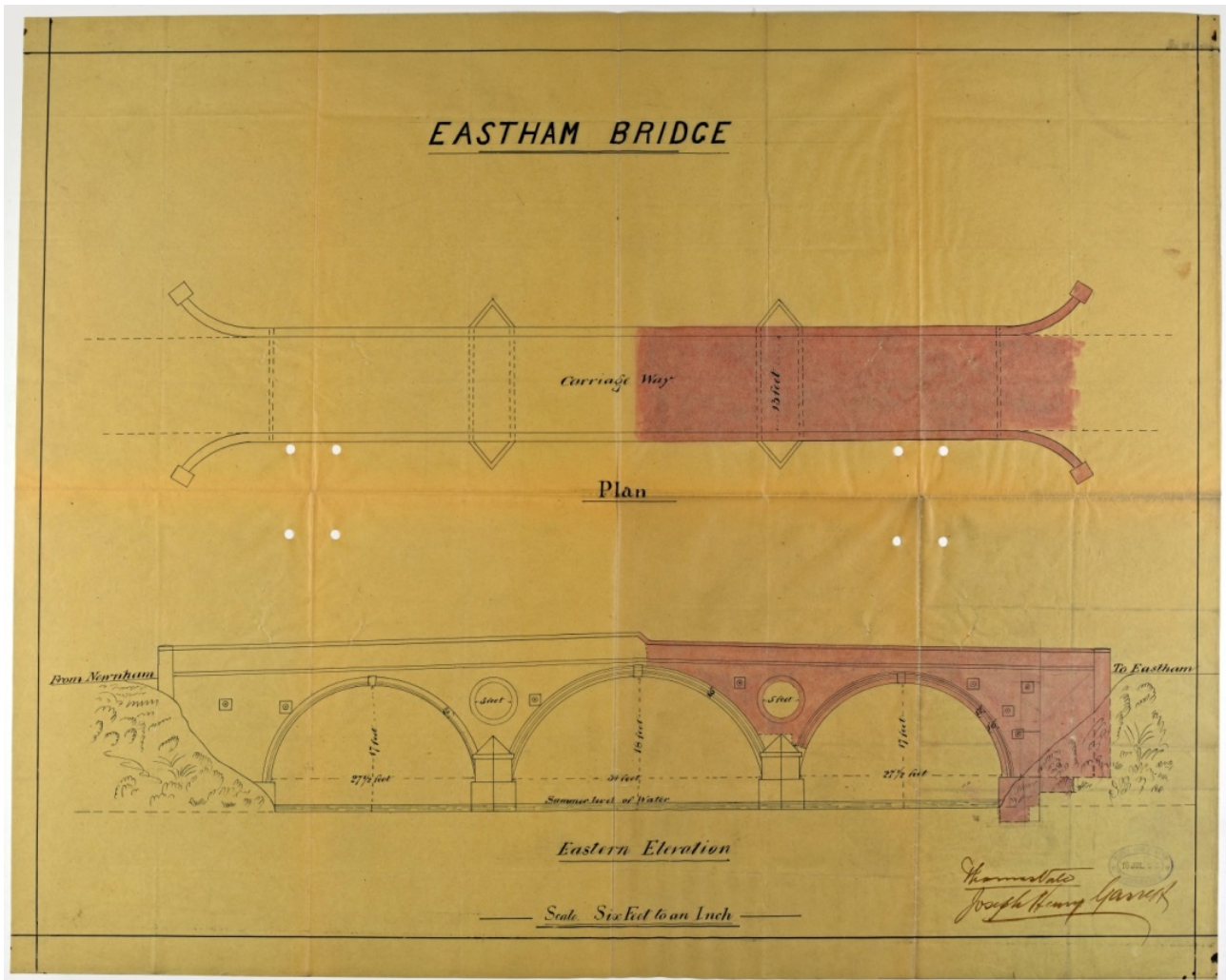


Plate 9 Illustration showing the intended 1890s repairs (The key states this is the eastern elevation, but it is actually the western elevation; WRO BA2324 ref 250-1)



Plate 10 Late 20th century picture of the bridge, looking north-west (Douglas Opperman 2000)



Plate 11 The collapsed bridge, view north-west



Plate 12 The collapsed bridge, view north-west



Plate 13 The collapsed bridge, view north-east



Plate 14 The north spring of the bridge and northern pier after the removal of much of the structure, showing the original infill, ashlar blockwork at its base and stonework backing the brick arch, view north-west



Plate 15 The bridge after the removal of much of the structure and showing the original infill and details of the central piers, looking north-east



Plate 16 The south spring of the bridge and southernmost pier, showing the 1898 infill, view



Plate 17 Watercolour painted by William Lea between 1830 and 1853, view north-west (reproduced in Douglas Opperman 2000; from Museums Worcestershire collections)

Appendix 1 Technical information

The archive (site code: WSM 67959 and 67960)

The archive consists of:

- 1 Field progress reports AS2
- 3 Photographic records AS3
- 408 Digital photographs
- 1 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
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