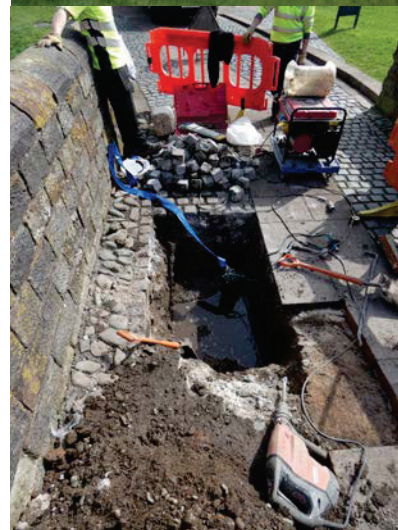


# CARLISLE CASTLE, CARLISLE, CUMBRIA

## Archaeological Watching Brief



Client: English Heritage

NGR: NY 39710 56170

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April 2021



<b>The Site</b>	
Site Name	Carlisle Castle, Carlisle
County	Cumbria
NGR	NY 39710 56170
Scheduled Monument No.	1014579
Listed Building Name, Grade, and No.	Carlisle Castle Bridge, Grade I, No. 1297365

<b>Client</b>	
Client Name	English Heritage
Client's architect/agent	n/a

<b>Planning</b>	
Pre-planning?	n/a
Planning Application No.	n/a
Plans (e.g. conversion, extension, demolition)	Investigation into leaking water pipe
Condition number	n/a
Local Planning Authority	Carlisle City Council/Historic England
Scheduled Monument Consent No.	n/a – Tier 2 Standing Consent
Planning Archaeologist	Jeremy Parsons, Cumbria County Council/Andrew Davison, Historic England
Groundworks subject to watching brief	Excavation following line of pipe in order to identify and repair leak

<b>Archiving</b>	
Relevant Record Office(s)/Archive Centre(s)	Carlisle/English Heritage
Relevant HER	Cumbria
Relevant museum	Tullie House Museum and Art Gallery/English Heritage

<b>Staffing</b>	
Desk-based assessment	Dan Elsworth
Watching brief	Tom Mace
Report writing	Dan Elsworth Tom Mace
Report editing	Jo Dawson
Illustrations	Tom Mace
Date(s) site work carried out	31 <sup>st</sup> March 2021

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## Non-Technical Summary

An archaeological watching brief was conducted during the course of groundworks associated with repairs to a damaged drainpipe crossing the bridge over the moat at Carlisle Castle, Cumbria. The site is located within the Scheduled Monument area for the castle, and the archaeological work was carried out on 31<sup>st</sup> March 2021.

Carlisle Castle is located on the site of a Roman fort established in the 1<sup>st</sup> century AD, which became the focus for a major Roman city and went on to be the focus of an important early medieval and medieval settlement on the River Eden and the border with Scotland. A castle was first established on the site at the end of the 11<sup>th</sup> century but the earliest surviving fabric is largely 12<sup>th</sup> century and later. It remained of strategic importance into the 16<sup>th</sup> century but as conflict on the border decreased by the end of the 18<sup>th</sup> century it gradually became less significant and poorly maintained. During the 19<sup>th</sup> and into the 20<sup>th</sup> century it became an important garrison and, although not used for defence, was at least maintained. The current stone bridge is thought to have been constructed in the late 18<sup>th</sup> or early 19<sup>th</sup> century.

A small area of the sett paving and sandstone pathway on the top of the bridge was lifted to pinpoint the origin of the leak. The damaged pipe was buried within a mixed silt deposit below the bedding material for the current surface of the road from which a small quantity of post-medieval finds was recovered. These finds potentially range in date from the late 17<sup>th</sup> to early 20<sup>th</sup> century; however, the deposit from which they were recovered probably dates from when the bridge was heightened and arched with stone in the late 18<sup>th</sup> century or shortly thereafter, perhaps when the site was used as a garrison during the 19<sup>th</sup> century.

## Acknowledgements

Greenlane Archaeology would like to thank English Heritage for commissioning the project and Young Construction Services for their assistance on site.

# 1. Introduction

## 1.1 Circumstances of the Project

1.1.1 The circumstances of the project are set out in the tables on the inside cover of this report.

## 1.2 Location, Geology, and Topography

1.2.1 Carlisle is located towards the northern edge of the Cumberland Plain, c15km south of the Scottish border (Figure 1). The castle is to the south side of the River Eden and east of the River Caldew, approximately 20m above sea level (*ibid*; Countryside Commission 1998, 65). The surrounding area is now urbanised.

1.2.2 Limestone, mudstone and sandstone deposits of the Jurassic and Triassic periods underlying the city (Mosely 1978, plate 1) are overlain by glacial drift deposits of boulder clay, glacial sands and gravels (McCarthy *et al* 1990, 3-4).

1.2.3 The watching brief took place within the grounds of Carlisle Castle, which is a Scheduled Monument (No. 1014579); the groundworks were carried out as part of a Tier 2 Standing Consent. The monument includes '*the upstanding and buried remains of Carlisle medieval tower keep castle, two lengths of Carlisle city wall, a 16<sup>th</sup> century battery, and the buried remains of much of the Roman fort*' (Historic England 2021b). The castle is enclosed by a curtain wall and accessed by a bridge across the outer ditch (or moat) on the south side. The bridge is a Grade I Listed Building (No. 1297365) and is part medieval, with 18<sup>th</sup> century and later rebuilds and additions (Historic England 2021a).

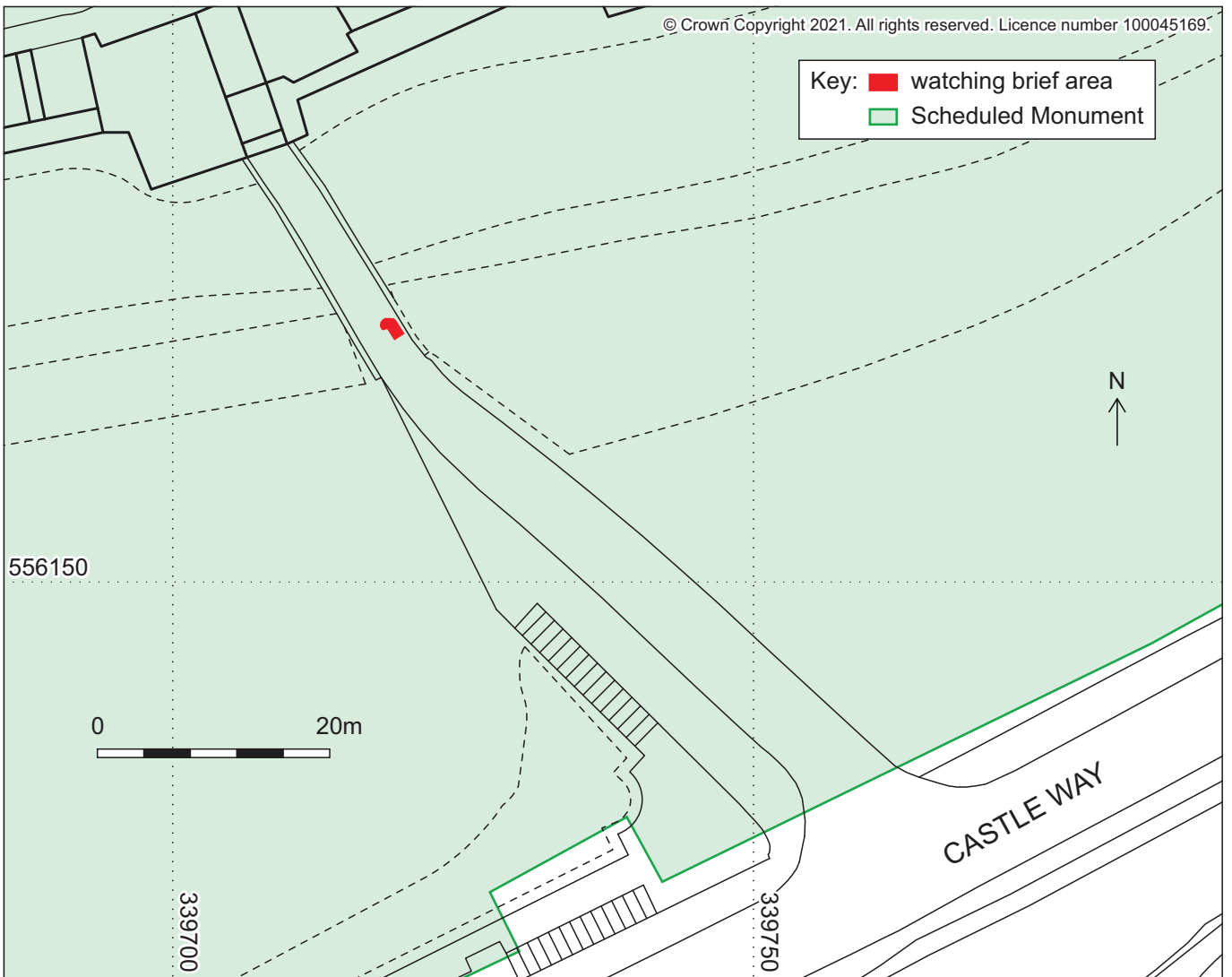
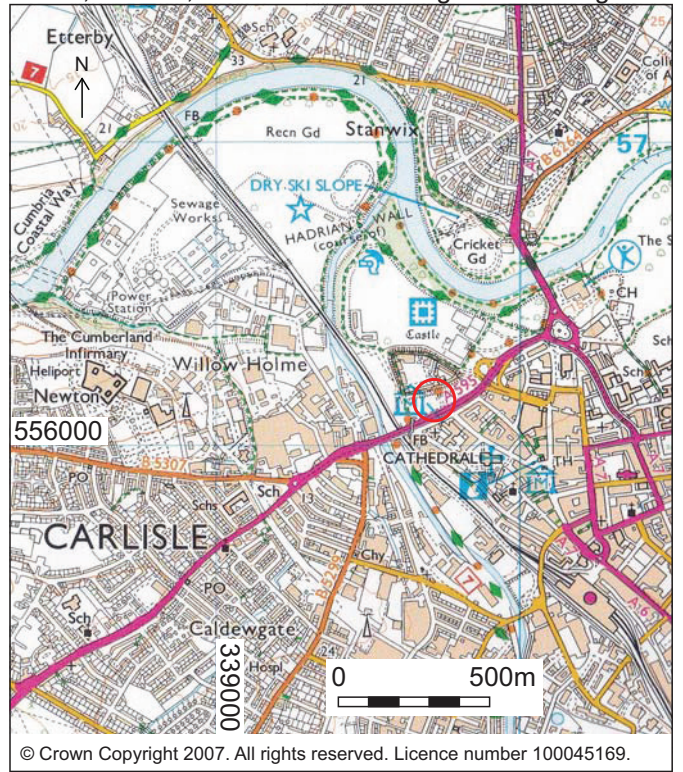
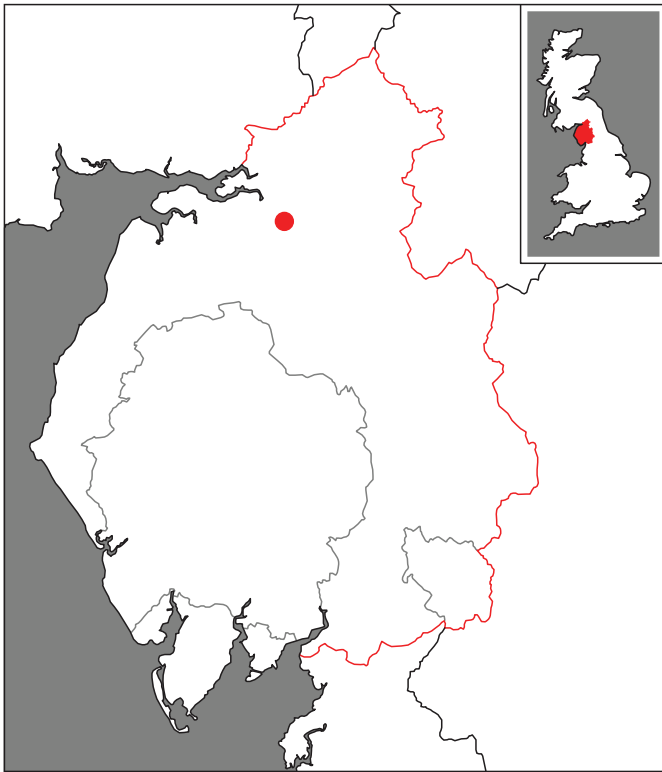


Figure 1: Site location

Client: English Heritage

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## 2. Methodology

### 2.1 Desk-Based Assessment

2.1.1 A desk-based assessment was carried out in accordance with the guidelines of the Chartered Institute for Archaeologists (CIfA 2020b). This principally comprised an examination of published secondary sources in order to produce a historical and archaeological background to the site and provide some context for the results. A number of sources of information were used during the compilation of the desk-based assessment:

- **Greenlane Archaeology:** Greenlane Archaeology's office library includes maps, local histories, and unpublished primary and secondary sources. These were consulted where relevant, in order to provide information about the history and archaeology of the site and the general area.

### 2.2 Archaeological Watching Brief

2.2.1 The watching brief monitored groundworks associated with the project set out in the tables on the inside cover of this report.

2.2.2 All aspects of the archaeological recording were carried out according to the standards and guidance of the Chartered Institute for Archaeologists (CIfA 2020a) and Greenlane Archaeology's own excavation manual (2007). The deposits encountered were recorded in the following manner:

- **Written record:** descriptive records of all deposits were made using Greenlane Archaeology's *pro forma* record sheets. A detailed description of the contexts encountered is presented in *Appendix 1*;
- **Photographs:** photographs in colour digital format (both 12 meg JPEG and RAW file format) were taken of the site as well as general working shots. A selection of the colour digital photographs is included in this report. A written record of all of the photographs was also made using Greenlane Archaeology's *pro forma* record sheets;
- **Drawings:** drawings were produced on site as follows:
  - i. a location plan was produced on site by annotating Ordnance Survey mapping for the area at a scale of 1:100;
  - ii. a measured sketch plan was drawn of the main area at a scale of 1:20.

### 2.3 Environmental Samples

2.3.1 No environmental samples were taken as no appropriate deposits were encountered.

### 2.4 Finds

2.4.1 **Processing:** all of the artefacts recovered from the watching brief were washed, with the exception of metal objects, which were dry-brushed. They were then naturally air-dried and packaged appropriately in self-seal bags with white write-on panels.

2.4.2 **Assessment and recording:** the finds were assessed and identified in the first instance by Jo Dawson. The finds were recorded directly into the catalogue produced as part of this report (*Appendix 2*).

### 2.5 Archive

2.5.1 The archive of the project will be deposited with the relevant Record Office or Archive Centre, as detailed on the cover sheet of this report, together with a copy of the report. The archive has been compiled according to the standards and guidelines of the CIfA guidelines (CIfA 2020c). In addition, details will be submitted to the *Online Access to the Index of Archaeological Investigations* (OASIS) scheme. This is an internet-based project intended to improve the flow of information between

contractors, local authority heritage managers and the general public. A copy of the report will be provided to the client and a digital copy of the report will be provided for the relevant Historic Environment Record, as detailed on the cover sheet of this report.



## 3. Historical and Archaeological Background

### 3.1 Introduction

3.1.1 The background to the site is intended to place the results of the watching brief in its local context. More specifically, information regarding the development and use of the site, where known, is also presented, which allows a more detailed understanding of the results of the watching brief.

### 3.2 Prehistoric Period (c11,000BC – 1<sup>st</sup> century AD)

3.2.1 While there is limited evidence for human activity in the county in the period immediately following the last Ice Age, this is typically found in the southernmost part on the north side of Morecambe Bay in the south of the county. Excavations of a small number of cave sites in this area have found the remains of animal species common at the time but now extinct in this country and artefacts of Late Upper Palaeolithic type (Young 2002). Human remains from one of these have also recently been dated to approximately 7,100 BC (Smith *et al* 2013). No remains of this date are known from the immediate area of the site, although a pair of barbed spearheads made from antler were found at Crosby-on-Eden (Hodgson 1895), which, although undated, may belong to the end of the Palaeolithic or early Mesolithic. The county was clearly more densely inhabited during the following period, the Mesolithic (c8,000 – 4,000 BC), as large numbers of artefacts of this date have been discovered during field-walking and eroding from sand dunes along the coast, but these are typically concentrated in the west coast area and on the uplands around the Eden Valley (Cherry and Cherry 2002). More recently a particularly large assemblage has been recovered during excavations, directly on the edge of the River Eden, immediately outside Carlisle, as part of work carried out for the construction of the Carlisle Northern Development Route (Clark 2010; Brown 2021). In addition, field-walking has found additional scatters of some significance also in the Eden valley near Penrith (Clarke *et al* 2008). Coastal areas and river valleys are notably places where such material is frequently found in the wider region (Middleton *et al* 1995, 202; Hodgkinson *et al* 2000, 151-152; Hodgson and Brennand 2006, 26).

3.2.2 In the following period, the Neolithic (c4,000 – 2,500 BC), large scale monuments such as burial mounds and stone circles begin to appear in the region and the population became generally more settled, although there is still some continuity from the hunter gatherer lifestyle of the Mesolithic, as demonstrated by the work on the CNDR project. There are relatively few in the immediate area around Carlisle, although sites such as the possible cursus near Scotby (Webster and Newman 2007, 8), and the stone circle at Long Meg, which has seen recent new investigation (Frodsham 2021), probably only give a small insight into the extent of such activity at the time. One of the most recognisable tool types of this period, the polished stone axe, is found in large numbers across the county, having been manufactured at Langdale in the central Lake District and transported over a wide area (Hodgson and Brennand 2006, 45), with examples found during the CNDR excavations, and increasing work on the Neolithic is beginning to more fully demonstrate the extent of activity in the county as a whole (Evans *et al* 2021). During the Bronze Age (c2,500 – 600 BC) monuments, particularly those thought to be ceremonial in nature, become more common still. These perhaps include enigmatic features known as burnt mounds which have been recorded on the outskirts of Carlisle near Garlands Hospital to the east (LUAU 1996; Neighbour and Johnson 2005) and on the CNDR site to the west. At Garlands a considerable amount of Bronze Age pottery was also found in 1861 when erecting new hospital buildings, and this is thought to represent a Bronze Age cemetery. Hodgson lists 15 urns, but Spence says there were 13 cinerary urns of overhanging rim type, five burial urns of food vessel type, four incense cups, and one beaker (Hodgson 1956, 6-12; Spence 1940, 101-4). A flint implement was also found in one of the urns, which is now held at Tullie House Museum (*ibid*).

3.2.3 It is likely that settlement sites thought to belong to the Iron Age have their origins in this period. Sites of this type are typically recorded as cropmarks revealed in aerial photographs in the rural area around Carlisle (Webster and Newman 2007, 7), although they are often undated and not understood in detail. In addition, there is likely to have been a considerable overlap between the end of the Iron Age and the beginning of the Romano-British period; it is evident that in this part of the country, initially at

least, the Roman invasion had a minimal impact on the native population in rural areas (Philpott 2006, 73-74).

### 3.3 Romano-British to Early Medieval Period (1<sup>st</sup> century AD – 11<sup>th</sup> century AD)

3.3.1 The site is located within the site of the Roman fort at Carlisle and immediately north of the Roman city, known as *Luguvalium*. The fort at Carlisle was first established in the autumn or winter of AD 72-73 (Zant 2009; Zant 2011, 35) but was soon altered, in AD 83-84 (Zant 2011, 36-37). It was abandoned for a time, before being rebuilt in the early 2<sup>nd</sup> century, cAD 105, but its character changed by the AD 120s, probably on account of the construction of Hadrian's Wall, which began in AD 122-123 (*op cit*, 42-43). This led to the construction of a new fort at Stanwix, but the fort at Carlisle continued and in the early 3<sup>rd</sup> century AD it was rebuilt in stone (*op cit*, 48). Both Carlisle and Stanwix continued to be occupied into the 4<sup>th</sup> century and beyond, along with an extensive civilian settlement at the former. Evidence for post-Roman habitation is limited and inconclusive (*op cit*, 50-51) but it is apparent that Carlisle remained an important place into the early medieval period, with an historical account of the 7<sup>th</sup> century famously describing the extant walls of the Roman town and a working fountain (Zant 2009, 15). Excavations within the fort have found evidence for a build up 'dark earth' in the post-Roman period and evidence for limited activity within this area, primarily in the form of stray finds of up to 9<sup>th</sup> and 10<sup>th</sup> century date (Zant 2009, 363-367). Elsewhere in Carlisle there is some more substantial evidence of continuous activity and settlement, in particular around the priory church, which evidently formed a site of Christian worship in the Anglian and Norse periods (McCarthy 2014).

3.3.2 Documentary and place-name evidence points to the north of Cumbria, undoubtedly including Carlisle, becoming part of the kingdom of Strathclyde, which expanded from the north in what is now Scotland into much of present-day Cumbria in the 9<sup>th</sup> and 10<sup>th</sup> centuries (Clarkson 2010), although how far is debatable (Elsworth 2018). Place-name evidence from the area around Carlisle certainly demonstrates that by this time it was populated by a range of different peoples including the decedents of the native Britons, those of Anglian descent, and Norse people who arrived in the area via Ireland and the Isle and Man (Paterson *et al* 2014). Again, archaeological evidence for this pre-Norman Conquest period is extremely limited, with the exception of stray finds and more substantial discoveries such as a group of Viking burials from Cumwhitton (*ibid*).

### 3.4 Medieval Period (11<sup>th</sup> century AD – 16<sup>th</sup> century AD)

3.4.1 By the medieval period Carlisle had already been inhabited for several centuries and was an important strategic location overlooking the River Eden; it remained an important city in the medieval period and the site of the former Roman fort was made use of continuously. A castle was built there by William Rufus after he took the city in 1092; nothing of this now remains as it was probably constructed from earth and timber (McCarthy *et al* 1990, 5-11), although the large ditch that it sat inside was probably retained in later phases (*op cit*, 28). The earliest surviving elements are most likely from the 12<sup>th</sup> century, when a stone keep and later curtain walls with a gatehouse were built (*op cit*, 28). Subsequent alterations in the medieval period essentially amounted to repairs and alterations to this existing fabric into the 16<sup>th</sup> century, when various parts were evidently in poor condition (*op cit*, 29-30). Recent excavations immediately to the south of the castle revealed extensive evidence for activity right up to the edge of the castle's outer ditch including various phases of buildings, roads, and other features associated with medieval tenements (Zant 2009, 371-412).

### 3.5 Post-Medieval (16<sup>th</sup> century AD – present)

3.5.1 The castle continued to be used into the post-medieval period, although following the end of cross-border conflicts with Scotland after the second Jacobite rebellion of 1745 its importance waned. While some substantial repairs and improvements were made in the 17<sup>th</sup> century, there are increasing reports of the walls being in poor condition by the 18<sup>th</sup> century and in 1834 Queen Mary's Tower was demolished (McCarthy *et al* 1990, 30). At the beginning of the 19<sup>th</sup> century, after a period of stagnation during the 18<sup>th</sup> century when the castle had become little more than a romantic ruin, it was used once again by the military. Initially this was largely as an arms depot, but from 1819 it housed a garrison and

this ultimately led to a range of alterations and the construction of new barrack buildings, although older buildings were modified to suit the new requirements, a situation that continued into the 20<sup>th</sup> century (*op cit*, 232-264).

3.5.2 Of more particular relevance is the development of the bridge during this period. Views of the castle show that the timber framing of the drawbridge was removed and replaced with the extant vaulted stone between c1778 and 1812 (*op cit*, 14). The current surface was reset in the late 1980s (Historic England 2021a).



## 4. Fieldwork Results

### 4.1 Pre-excavation photographic record

4.1.1 As general good practice the site was recorded prior to the commencement of groundworks associated with the proposed groundworks.

4.1.2 The base of the bridge over the outer moat includes the medieval drawbridge abutments, which were heightened and arched in stone in the late 18<sup>th</sup> century, and the east parapet was part rebuilt in the 20<sup>th</sup> century (Historic England 2021a). The current road surface (**100**) across the bridge comprises cobbles against the parapets and sett paving both sides of a central sandstone pedestrian walkway (Plate 1).



Plate 1: The bridge across the outer moat at Carlisle Castle

### 4.2 Watching Brief

4.2.1 The location of the water leak had been approximately located to the south-east end of the bridge to the north-east side of the central sandstone walkway (Plate 2). The leak was initially investigated by removing part of the sett paving to the north-east side using a jackhammer and hammer and chisel (Plate 3). Below the sett flooring was a pale pinkish concrete up to 0.1m thick and below that was a compacted light grey gravel, up to 0.04m thick. This bedding material (**101**) overlay a compacted, mixed, dark grey silt matrix (**102**) with gravel and small pebble inclusions and included a lens of fine sand (Plate 4).





**Plate 2: The road surface across the bridge**



**Plate 3 (left): Removal of the sett paving**

**Plate 4 (right): Section below the sett paving**

4.2.2 The area of excavation began to fill with water at a depth of c0.55m below the top of the setts. A sump was dug to the north-east side and water from the leaking pipe was pumped around the edge of the parapet and into the moat (Plate 5 and Plate 6).





**Plate 5 (left): The trench filling with water**

**Plate 6 (right): Sandstone slabs removed and water being pumped from the trench**

4.2.3 The damaged cast iron pipe was located c0.6m below the road surface, heading underneath the sandstone paving slabs at a slight angle to the walls of the bridge, and it was necessary to lift two sandstone slabs to follow the line of the leaking pipe (Plate 7; Figure 2). A bedding material had been laid under the slabs on top of the mixed dark grey silt matrix (**102**) that was apparent below the concrete under the sett paving to the north-east side. The damaged pipe had a clear crack in it. The damaged section was cut out (Plate 8) and replaced with a modern repair.





**Plate 7 (left): The damaged pipe exposed and cut through**

**Plate 8 (right): Detail showing location of the pipe with damaged section removed**

4.2.5 **Finds:** nine finds were recovered from **102** during the watching brief, and these are summarised in *Appendix 2*. A brief discussion of these is given below.

4.2.6 **Pottery:** four fragments of pottery were recovered from **102** (see *Appendix 2*). The wares comprised mottled ware, slip-decorated ware, pearlware and creamware/earthenware. Overall, the assemblage potentially ranges in date from the late 17<sup>th</sup> to early 20<sup>th</sup> century and reflects typical domestic ware types; however, the potential date range for many of these wares is very broad due to the persistence of the styles and fabrics.

4.2.7 **Animal bone:** three unidentified animal bone fragments of uncertain date were recovered from **102**.

4.2.8 **Clay tobacco pipe:** a plain stem fragment was recovered from **102**. The wide borehole diameter potentially indicates that the fragment is of 17<sup>th</sup> century date (following Davey 2013); however, it is difficult to make chronological judgments with any degree of confidence in terms of stem-bore analysis on the basis of one fragment.

4.2.9 **Metal:** a single nail with a round shaft and square head, which was industrially-produced and of post-medieval date, was recovered from **102**.



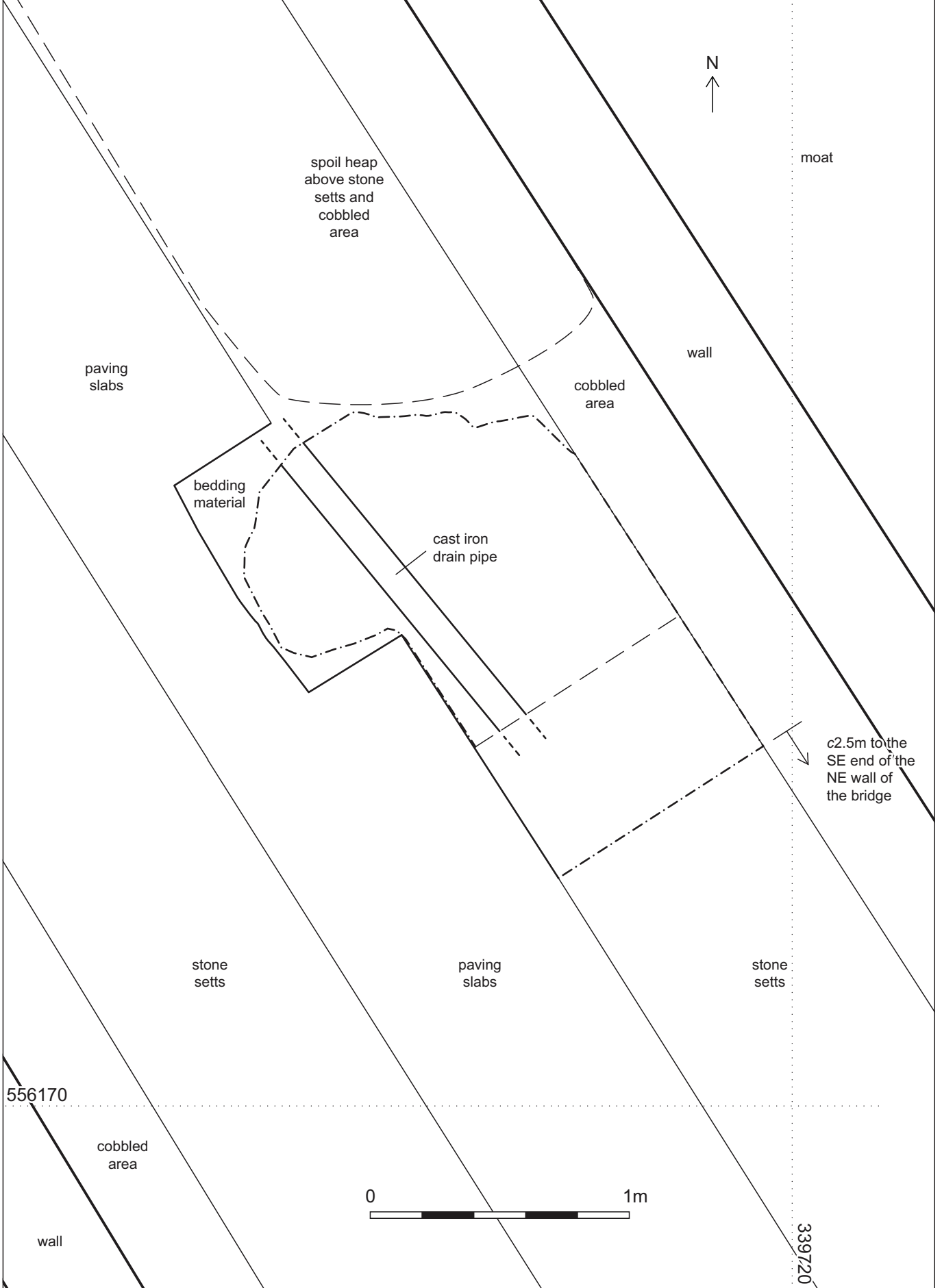


Figure 2: Plan of the watching brief area

## 5. Discussion

### 5.1 Results

5.1.1 The watching brief recorded the removal of the sett paving and sandstone slabs in the area of the damaged drain. The leak was located and repaired and the road surface, which is known to have been reset in the 1980s (McCarthy *et al* 1990), is to be reinstated.

5.1.2 A mixed deposit of post-medieval date was recorded below the bedding material for the current roadway and a small quantity of post-medieval finds, dated from the late 17<sup>th</sup> to early 20<sup>th</sup> century, was recovered.

### 5.2 Conclusions

5.2.1 The finds from the watching brief are fairly limited in terms of what they add to our existing knowledge of the castle and the history of the bridge across the moat. The clay tobacco pipe potentially dates from the 17<sup>th</sup> century on the basis of its relatively wide borehole diameter and some of the post-medieval pottery finds also potentially date from the late 17<sup>th</sup> or 18<sup>th</sup> century. The mixed deposit from which the finds were recovered probably dates to when the bridge was heightened and arched with stone in the late 18<sup>th</sup> century (McCarthy *et al* 1990, 14) and presumably continued to build up after that point when the castle was used as a garrison during the 19<sup>th</sup> and 20<sup>th</sup> centuries.

## 6. Bibliography

### 6.1 Primary and Cartographic Sources

Ordnance Survey, 2007 *Carlisle, Brampton, Longtown & Gretna Green*, **315**, 1:25,000

### 6.2 Secondary Sources

Brown, F, 2021 Stainton West: a Late Mesolithic and Early Neolithic Site on the Banks of the River Eden, in G Hey and P Frodsham (ed), *New Light on the Neolithic of Northern England*, Oxford, 17-30

Chartered Institute for Archaeologists (CIfA), 2020a *Standard and Guidance: Archaeological Field Evaluation*, revised edn, Reading

CIfA, 2020b *Standards and Guidance for Historic Desk-Based Assessment*, revised edn, Reading

CIfA, 2020c *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives*, revised edn, Reading

Cherry, PJ, and Cherry, J, 2002 Coastline and Upland in Cumbrian Prehistory – A Retrospective, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 3<sup>rd</sup> ser, **2**, 1-20

Clark, P, 2010 Excavations at Stainton, Carlisle, Ahead of the Carlisle Northern Development Route, *CWAAS Newsletter*, **64**, 4-5

Clarke, J, Watson, A, Dickson, A, and Hamilton-Gibney, A, 2008 *Fieldwalking in the Vale of Eden*, interim report **01**, Penrith

Countryside Commission, 1998 *Countryside Character, Volume 2: North West*, Cheltenham

Davey, PJ, 2013 'The Clay Tobacco Pipes', in J Walker and M Graham (eds), *St. Mary's Abbey, Holme Cultram, Abbeytown Cumbria*, Bowness on Windermere, 88-92

Elsworth, DW, 2018 *Boundaries and Bought Land: the Extent of Strathclyde in Cumbria*, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 3<sup>rd</sup> ser, **18**, 87-104

Evans, H, Dickson, A, and Druce, D, 2021 Recent Work on Neolithic Landscapes of Cumbria and North Lancashire, in G Hey and P Frodsham (ed), *New Light on the Neolithic of Northern England*, Oxford, 111-124

Frodsham, P, 2021 'A Most Noble Work', at the Heart of Neolithic Britain. Some Thoughts on the Long Meg Complex in the Light of Recent Fieldwork, in G Hey and P Frodsham (ed), *New Light on the Neolithic of Northern England*, Oxford, 147-176

Greenlane Archaeology, 2007 *Archaeological Excavation Manual*, unpubl rep

Historic England, 2021a *BRIDGE OVER OUTER MOAT*, <https://historicengland.org.uk/listing/the-list/list-entry/1297365>

Historic England, 2021b *Carlisle Castle; Medieval Tower Keep Castle, Two Lengths of City Wall, a 16th Century Battery, and Part of an Earlier Roman Fort Known as Luguvalium*, <https://historicengland.org.uk/listing/the-list/list-entry/1014579>

Hodgkinson, D, Huckerby, E, Middleton, R, and Wells, CE, 2000 *The Lowland Wetlands of Cumbria*, North West Wetlands Survey **6**, Lancaster Imprints **8**, Lancaster

Hodgson, J, and Brennand, M, 2006 'The Prehistoric Period Resource Assessment', in M Brennand (ed) *The Archaeology of North West England: An Archaeological Research Framework for the North West Region, Volume 1: Resource Assessment*, Manchester, 23-58

Hodgson, KS, 1956 Three Unpublished Collections of Bronze Age Pottery: Netherall, Garlands and Algonby, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2<sup>nd</sup> ser, **56**, 1-17

- Hodgson, TH, 1895 Bone Spear or Harpoon Heads from Terra del Fuego, Found on Peat Near Crosby-on-Eden, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 1<sup>st</sup> ser, **13**, 402
- Lancaster University Archaeology Unit (LUAU), 1996 *Garlands Hospital, Carlisle, Cumbria: Archaeological Report*, unpubl rep
- McCarthy, MR, 2014 A Post-Roman Sequence at Carlisle Cathedral, *Archaeol J*, **171**, 185-257
- McCarthy, MR, Summerson, HR, and Annis, RG, 1990 *Carlisle Castle: A Survey and Documentary History*, Swindon
- Middleton, R, Wells, CE, and Huckerby, E, 1995 *The Wetlands of North Lancashire*, North West Wetlands Survey **3**, Lancaster Imprints **4**, Lancaster
- Moseley, F (ed), 1978 *The Geology of the Lake District*, Yorkshire Geological Society, occ publ **3**, Leeds
- Neighbour, T, and Johnson, M, 2005 A Bronze Age Burnt Mound in Lowland Cumbria: Excavations at Garlands Hospital, Carlisle, 1997, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 3<sup>rd</sup> ser, **5**, 11-24
- Paterson, C, Parsons, AJ, Newman, RM, Johnson, N, and Howard-Davis, C, 2014 *Shadows in the Sand: Excavation of a Viking-Age Cemetery at Cumwhitton, Cumbria*, Lancaster Imprints **22**, Lancaster
- Philpott, R, 2006 The Romano-British Period Resource Assessment, in Brennand, M, (ed) *The Archaeology of North West England: An Archaeological Research Framework for the North West Region – Volume 1, Resource Assessment*, Archaeology North West **8**, Manchester, 59-90
- Smith, I, Wilkinson, DM, O'Regan, HJ, 2013 New Lateglacial Fauna and Early Mesolithic Human Remains from Northern England, *J Quaternary Science*, **28:6**, 542-544
- Spence, JE, 1940 Report of the Committee for Prehistoric Studies, 1937-1939, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2<sup>nd</sup> ser, **40**, 99-117
- Webster, A, and Newman, R, 2007 Earthworks, Parchmarks and Cropmarks: Results of Cumbria County Council's 2006 Aerial Photographic Survey, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 3<sup>rd</sup> ser, **7**, 1-14
- Young, R, 2002 The Palaeolithic and Mesolithic Periods in Northern England: An Overview, in Brooks, C, Daniels, R, and Harding, A, (ed), *Past, Present and Future: The Archaeology of Northern England*, Architect Archaeol Soc Durham Northumberland, res rep **5**, 19-36
- Zant, J, 2009 *The Carlisle Millennium Project Excavations in Carlisle, 1998-2001 Volume 1: the Stratigraphy*, Lancaster Imprints **14**, Lancaster
- Zant, J, 2011 The Roman Army in Carlisle, in M Brennand and KJ Stringer (ed), *The Making of Carlisle: From Romans to Railways*, CWAAS extra ser, **35**, Kendal

## Appendix 1: Summary Context List

Context	Type	Description	Interpretation
<b>100</b>	Surface	Sett paving and sandstone pathway; each roughly cube-shaped block of the paving was approximately 0.1m on a side and the sandstone paving slabs were c0.05m thick	Roadway across the outer moat, known to have been reset in 1980s
<b>101</b>	Deposit	Compacted bedding material and pinkish concrete above a fine gravel; up to 0.1m thick below the sett paving and sandstone path	Bedding material below the current road surface
<b>102</b>	Deposit	A compacted, mixed, dark grey silt matrix, more than 0.3m thick, with gravel and small pebbles inclusions; included a lens of fine sand; finds from this deposit included (post-medieval) pottery, a clay tobacco pipe stem fragment and animal bone	A post-medieval deposit, probably dating from when the bridge was heightened and arched with stone in the late 18 <sup>th</sup> century

## Appendix 2: Summary Finds List

Context	Type	Qty	Description	Date range
102	Iron	1	Round-headed industrially produced nail	Post-medieval
102	Animal bone	3	Unidentified, unburnt fragments	Uncertain
102	Clay tobacco pipe	1	31mm long plain stem fragment, with round section (10.5mm diameter) and central 8/64" diameter borehole	17 <sup>th</sup> century
102	Pottery	1	Base of mottled ware hollow-ware vessel	Late 17 <sup>th</sup> - early 18 <sup>th</sup> century
102	Pottery	1	Slip-decorated brown-glazed buff-bodied earthenware dish body	Late 17 <sup>th</sup> - early 18 <sup>th</sup> century
102	Pottery	1	Blue painted pearlware plate base	Late 18 <sup>th</sup> - early 19 <sup>th</sup> century
102	Pottery	1	Creamware/white earthenware undiagnostic body fragment	Mid-18 <sup>th</sup> - early 20 <sup>th</sup> century