York Archaeology

Archaeological Investigations at Baile Hill, York

By G. Loffman

YAT Report YA/2022/92 August 2022

York Archaeology

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AOD above ordnance survey

BGL below ground level

NON-TECHNICAL SUMMARY

On the 3rd August 2022 York Archaeology conducted geoarchaeological monitoring of geotechnical investigations (GI) on the scheduled monument of Baile Hill, York (SE 60266 51274).

The work was undertaken for Ana Heitor/Phillip Windslow for a research project for slope stability assessment. A Written Scheme of Investigation was produced by YA (Banfield & Parker 2022). The works involved the monitoring and recording of a single window sample borehole located at the top of the monument.

Deposits relating to the construction of the motte, a levelling deposit and soil deposits probably formed by the raising of the mound during the Civil War and landscaping in the 18th Century were recorded.

KEY PROJECT INFORMATION

Project Name	Baile Hill, York
YAT Project No.	6310
Document Number	2022/92
Type of Project	Watching Brief
Client	Ana Heitor/ Phillip Windslow
Planning Application No.	N/A
NGR	SE 60266 51274
Museum Accession No.	N/A
OASIS Identifier	yorkarch3-508567

REPORT INFORMATION

Version	Produced by		Edited by		Approved by	
	Initials	Date	Initials	Date	Initials	Date
V1	GL	04/08/22	KS	30/08/22	LB	31/08/22

1 INTRODUCTION

On the 3rd August 2022 York Archaeology conducted geoarchaeological monitoring of geotechnical investigations (GI) on the scheduled monument of Baile Hill, York (SE 60266 51274) (Figure 1).

The work was undertaken for Ana Heitor/Phillip Windslow for a research project for slope stability assessment, in line with a Written Scheme of Investigation (WSI) produced by YA (Banfield & Parker 2022). The works involved the monitoring and recording of a single window sample borehole located at the top of the monument.

The aims of the work as stated in the WSI were:

- To provide an assessment of the formation processes responsible for the deposit sequences and their development through time;
- To provide insights into the stability of the Baile Hill slopes;
- To identify the presence or absence of primary and secondary archaeological remains within the buried sediments

The objectives of the work were :

- To monitor the proposed GI survey point
- To create a lithological record of the sediments which compose Baile Hill.
- To identify evidence for slope erosion and sediment redeposition
- To recover sub-samples, if possible, from notable sedimentary deposits for further investigation, including palaeoenvironmental assessment and rangefinder dating.
- To determine the degree to which bioturbation from overlying vegetation has impacted the Scheduled Monument.

The work was a requirement of the Scheduled Monument Consent which had the following conditions:

> *'(i)The works to which this consent relates shall be carried out to the satisfaction of the Secretary of State, who will be advised by Historic England. At least 2 weeks' notice (or such shorter period as may be mutually agreed) in writing of the commencement of work shall be given to Dr Keith Emerick, Inspector of Ancient Monuments, Historic England, 37 Tanner Row, York, YO1 6WP; 01904 601988; keith.emerick@historicengland.org.uk in order that an Historic England representative can inspect and advise on the works and their effect in compliance with this consent.*
>
> *(ii) The specification of work for which consent is granted shall be executed in full.*
>
> *(iii) This consent may only be implemented by Dr Ana Heitor, University of Leeds.*

(iv) All those involved in the implementation of the works granted by this consent must be informed by the developer that the land is designated as a scheduled monument under the Ancient Monuments and Archaeological Areas Act 1979 (as amended); the extent of the scheduled monument as set out in both the scheduled monument description and map; and that the implications of this designation include the requirement to obtain Scheduled Monument Consent for any works to a scheduled monument from the Secretary of State prior to them being undertaken.

(v) Equipment and machinery shall not be used or operated in the scheduled area in conditions or in a manner likely to result in damage to the monument or ground disturbance other than that which is expressly authorised in this consent.

(vi) Any ground disturbance works to which this consent relates shall be carried out under the detailed archaeological supervision of Lindsay Banfield, York, 47, Aldwark, York, YO1 7BX or his/her nominated representative who shall be given 2 weeks' notice (or such shorter period as may be mutually agreed) in writing of the commencement and timetable of work. No works shall commence until Lindsay Banfield has confirmed in writing to Historic England that he is willing and able to carry out the agreed supervision.

(vii) The borehole shall be backfilled within one month (or such other period as may be mutually agreed) of the completion of the excavation, to the satisfaction of the Secretary of State, who will be advised by Historic England.

(viii) The specification (including analysis, post-excavation and publication proposals) for which consent is granted shall be executed in full, unless variations have been agreed under the terms of condition 1.

(ix) A report on the archaeological recording shall be sent to: Claire MacRae, Principal Archaeologist, City of York Council, West Offices, Station Rise, York YO1 6GA (the City Historic Environment Record) and to Dr Keith Emerick, Inspector of Ancient Monuments at Historic England within 3 months of the completion of the works (or such other period as may be mutually agreed).

(x) The archaeological contractor shall complete and submit an entry on OASIS (On-line Access to the Index of Archaeological Investigations - http://oasis.ac.uk/england/) prior to project completion, and shall deposit any digital project report with the Archaeology Data Service, via the OASIS form, upon completion.

(xi) Should appropriate archaeological samples be recoverable from the borehole, the assessment of those samples is to be conducted according to the assessment documentation produced by York Archaeology (June 2022).'

2 METHODOLOGY

A single window sample was taken using a window sample rig mounted on rubber tracks. The borehole was a 101mm diameter windowless sample undertaken to a depth of 5m BGL. The samples were removed in 1m sections within plastic sleeves which were then split on site for inspection. A sealed sample was taken from 4.6m to 5m BGL for geotechnical testing. Standard

Penetration Tests were undertaken every 1m within the borehole and Dynamic Probe was used to 10m BGL.

The methodology followed the WSI (Banfield & Parker 2022).

The deposits were recorded by a geoarchaeologist using the Troels-Smith (1955) system of sediment classification (Appendix 2). The scheme breaks down a sediment sample into four main components and allows the inclusion of extra components that are also present, but that are not dominant. Key physical properties of the sediment layers are darkness (Da), stratification (St), elasticity (El), dryness of the sediment (Sicc) and the sharpness of the upper sediment boundary (UB). A summary of the sedimentary and physical properties classified by Troels-Smith (1955) and a stratigraphic breakdown of the deposits was recorded on proforma log sheets. The logs are supplemented by digital photography.

3 LOCATION, GEOLOGY & TOPOGRAPHY

The site is located at Baile Hill, York, SE 60266 51274. Baile Hill is an anthropogenic earth mound on the inner side of the York City Walls. It is bounded by Cromwell Road and Baile Hill Terrace to the north-east and north-west. The top of the mound is approx. 23m AOD in height with the base at approx. 15m AOD. The mound is currently covered with trees and grass.

The British Geological Survey (BGS Viewer – accessed 31/08/22) has mapped the underlying bedrock as Sherwood Sandstone Group, a sedimentary bedrock formed during the Permian and Triassic periods at approximately 272 to 237 million years ago. Overlying these are deposits of York Moraine Member consisting of clay, sand and gravel of sedimentary deposits formed during the Quaternary period. During the Devensian glaciation, ice flowed south-eastwards over the Vale of York (Bateman et al 2015). A terminal moraine was formed at Escrick marking the Last Glacial Maximum within the Vale of York. Subsequent retreating of the glacier formed another moraine further north at York. This formed a ridge of material running broadly east/west, as the ice retreated beyond the moraine.

The BGS survey records alluvium deposits approximately 10m to the east of the site. It is therefore possible that alluvium deposits underlie the mound rather than those of the moraine (BGS Viewer – accessed 31/08/22).

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The following archaeological and historical background is from the WSI (Banfield & Parker 2022).

As no archaeological desk-based assessment (DBA) has been produced for the site, the following archaeological and historical information is taken from the HER entry provided on Heritage Gateway (https://www.heritagegateway.org.uk/Gateway/).

Baile Hill is a Scheduled Monument which represents the last remnants of a motte-and-bailey castle constructed by William I. The motte (known now, confusingly, as Baile Hill) is the only upstanding portion of the castle remaining. The fortification, like York Castle on the opposite side of the River Ouse, was built in 1068 or 1069, and destroyed later in 1069 before being rebuilt almost immediately.

The original motte-and-bailey castle consisted of a circular mound surrounded by a ditch and with a quadrilinear yard of around 3 acres on the south-western side. Excavations have revealed the remains of 12th century buildings on top of the motte (Baile Hill). During the early 12th century the fortification had become disused; by the late 12th century it appears to be in the possession of the Archbishop of York, before being granted in 1466 to the Mayor and Commonalty of the city. By this time the remaining elements of the castle had been integrated into the circuit of defences surrounding the city.

Excavations in 1979 revealed the remains of 12th century timber buildings and a strong fence at the summit of the mound, together with a staircase up one side. These excavations took place in two quadrants of the mound top, with a trench cut into the mound base to locate the pre-mound surface and investigate the make-up of Baile Hill (Addyman & Priestley, 1977). The earliest and possibly natural deposits were found at this spot, at the foot of the hill, which comprised a sandy red-brown clay. Into this was cut a Roman pit containing pottery and a coin of Theodora (AD 337-41). Elsewhere, there was a sandy soil with pottery and mortar, none of which was identified as dating after the 11th century (ibid).

Considerable erosion was apparent down the side of Baile Hill and this was shown in areas that were above the old surface of the mound where approximately 2m of orangey-brown clayey material had accumulated in varying degrees of thickness. The interface between this and the original surface was defined by runs of small stones of the type usually found in Boulder Clay and limestone. Few finds were recovered from these erosion layers, but bone and a sherd of pot give a picture of possible rubbish disposal down the side of the hill at a time when it was occupied (ibid).

The mound top was excavated to a depth of 1.5-2.25m and revealed several phases of occupation. At the lowest level, an orangey-brown clay with amorphous red patches was uncovered. Into this had been cut several holes and shallow trenches that were filled with a charcoal-rich soil. 12th century pottery was recovered from some of these features. A spread of stone overlaid this level, comprising rounded pebbles and limestone blocks, and may consist of a relevelling deposit. Above this was 0.8m of silty mid-brown soil, which did not yield any evidence of timber structures. The lower part of this deposit contained mixed finds, including some from the 12th century, clay pipes, many arrowheads and other post-medieval material (ibid).

The motte was raised in height by an unknown amount during the Civil War in 1642 prior to the siege of York, and two platforms may have been installed for use as gun emplacements (Addyman & Priestley, 1977).

The motte survives to an average height of 7.7 metres and there is now no visible evidence of a surrounding ditch or bailey. It is a tree-covered grassy mound that faces a companion motte under Clifford's Tower, which is located on the eastern side of the Ouse (York HER). The city walls run along its south-eastern flank. A terrace around the southern flank from the city wall may have been added as an access path during 18th century landscaping. The sides of the hill have been eroded by paths and children's slides (Addyman & Priestley, 1977).

5 RESULTS

5.1 Lithology

5.1.1 Redeposited natural/mound construction deposit (2.35m to 4.9m BGL)

The earliest deposit consisted of a firm, mid brown sandy clay with occasional orange patches. There were moderate sub-rounded limestone fragments, occasional charcoal flecks and sub-rounded red sandstone. The deposit was dry and inclusions became rarer beyond 3m BGL. It is likely that this represents material deliberately deposited to construct the mound, possibly deriving from nearby York Moraine Member material.

5.1.2 Levelling deposit (1.52m to 2.35m BGL)

Overlying the redeposited natural was a crushed limestone deposit. This contained frequent sub-angular limestone fragments and white mortar. Animal bone was also recovered from this deposit. This probably corresponds to the stony levelling deposit identified during the 1977 excavations (Addyman & Priestley, 1977).

5.1.3 Soil deposit (0.3m to 1.52m BGL)

A soil deposit was found overlying the crushed limestone deposit. This consisted of a soft to friable, mid brown sandy silt with occasional sub-angular limestone inclusions and small fragments of CBM. Rooting was present towards the top of the deposit, and two nearly complete oyster shells were recovered. It is possible that this represents the raising of the mound during the Civil War, however, the top of the mound underwent a number of levelling episodes and a programme of tree planting during 17th and 18th centuries (Addyman & Priestley, 1977) which could also account for this deposit.

5.1.4 Topsoil (0m to 0.3m BGL)

The latest deposit was topsoil with moderate rooting activity present.

6 DISCUSSION

The aims of the work as stated in the WSI were:

- To provide an assessment of the formation processes responsible for the deposit sequences and their development through time;
- To provide insights into the stability of the Baile Hill slopes;
- To identify the presence or absence of primary and secondary archaeological remains within the buried sediments

The project was able to identify a deposit sequence related to the formation of the present monument, some of which corresponds to that recorded during the 1977 excavations on the top of the motte. This has enabled an accurate height to be recorded for these deposits, including material related to the construction of the mound, a levelling deposit and soil related to the heightening of the mound. Unfortunately, deposits containing suitable material for dating were not encountered.

Insights into the stability of the mound will be assessed by geotechnical tests..

No archaeological features were detected during the borehole sampling. This may have been due to the small area investigated; boreholes in different locations may detect the occupation deposits found in the 1977 excavation which were not identified here.

LIST OF SOURCES

British Geological Survey Viewer https://www.bgs.ac.uk/

City of York HER https://her.york.gov.uk/

Heritage Gateway https://www.heritagegateway.org.uk/gateway/

REFERENCES

Addyman, P V and Priestley, J 1977. 'Baile Hill, York'. *The Archaeological Journal 134*, 115-156

Banford, L and Parker, L. *Written Scheme of Investigation for Geoarchaeological Monitoring at Baile Hill, York.* YA Report 2022/90

Bateman, M D, Evans, D J A, Buckland, P C, Connel, E R, Friend, R J, Hartmann, D, Moxon, H, Fairburn, W A, Panagiotakopulu, E, and Ashurst, R A 2015. 'Last glacial dynamics of the Vale of York and North Sea lobes of the British and Irish Ice Sheet'. *Proceedings of the Geologists' Association 126*, 712-730

ACKNOWLEDGEMENTS

YA would like to thank Ana Heitor and Phillip Windslow for their assistance during the monitoring work. YA would also like to thank Keith Emerick (Historic England).

APPENDIX 1 – INDEX TO ARCHIVE

Item	Number of items
Context sheets	0
Levels register	0
Photographic register	0
Sample register	1
Drawing register	0
Original drawings	0
B/W photographs (films/contact sheets)	0
Colour slides (films)	0
Digital photographs	15
Written Scheme of Investigation	1
Report	1

Table 1 Index to archive

APPENDIX 2 – CORE LOG

Darkness	
nig.4	black
nig.3	
nig.2	
nig.1	
nig.0	white

Degree of Stratification	
strf.4	well stratified
strf.3	
strf.2	
strf.1	
strf.0	no stratification

Degree of Elasticity	
elas.4	very elastic
elas.3	
elas.2	
elas.1	
elas.0	no elasticity

Degree of Dryness	
sicc.4	very dry
sicc.3	
sicc.2	
sicc.1	
sicc.0	water

	Sharpness of Upper Boundary
lim.4	< 0.5mm
lim.3	< 1.0 &> 0.5mm
lim.2	< 2.0 &> 1.0mm
lim.1	< 10.0 &> 2.0mm
lim.0	> 10.0mm

	Sh	*Substantia humosa*	Humous substance, homogeneous microscopic structure
I Turfa	*Tb*	*T. bryophytica*	Mosses +/- humous substance
	Tl	*T. lignosa*	Stumps, roots, intertwined rootlets, of ligneous plants
	Th	*T. herbacea*	Roots, intertwined rootlets, rhizomes of herbaceous plants
II Detritus	*Dl*	*D. lignosus*	Fragments of ligneous plants >2mm
	Dh	*D. herbosus*	Fragments of herbaceous plants >2mm
	Dg	*D. granosus*	Fragments of ligneous and herbaceous plants <2mm >0.1mm
III Limus	*Lf*	*L. ferrugineus*	Rust, non-hardened. Particles <0.1mm
IV Argilla	*As*	*A.steatodes*	Particles of clay
	Ag	*A. granosa*	Particles of silt
V Grana	*Ga*	*G. arenosa*	Mineral particles 0.6 to 0.2mm
	Gs	*G. saburralia*	Mineral particles 2.0 to 0.6mm
	Gg(min)	*G. glareosa minora*	Mineral particles 6.0 to 2.0mm
	Gg(maj)	*G. glareosa majora*	Mineral particles 20.0 to 6.0mm
	Ptm	*Particulaetestaemolloscorum*	Fragments of calcareous shells

Physical and sedimentary properties of deposits according to Troels-Smith (1955)

Project No	6310		**Date**	03/08/2022	**Borehole No**	**WS01**
Site code			**Type**	WS	**Sheet 1 of __1_**	
					Sample	**Depth in core (m)**
DA	**ST**	**EL**	**SICC**	**UB**		
3	0	0	3	2		0-0.3
Topsoil. Loose, greyish brown, sandy silt. Moderate roots and small rocks.						
DA	**ST**	**EL**	**SICC**	**UB**		
3	0	0	3	3		0.3-1.52
Soft to friable, mid brown, sandy silt. Occasional rooting (close to top of deposit). Occasional rounded and subangular limestone. Occasional CBM small fragments.						
DA	**ST**	**EL**	**SICC**	**UB**		1.52-2.35
1	0	0	4	2		
Loose, greyish white, crushed limestone and sandy silt. Occasional medium limestone fragments. Animal Bone found.						
DA	**ST**	**EL**	**SICC**	**UB**		2.35-5
2	0	1	3	2		
Firm, mid brown with orange flecks, sandy clay. Moderate subrounded limestone and occasional red sandstone. Occasional flecks of charcoal.						
DA	**ST**	**EL**	**SICC**	**UB**		
Easting						
Northing						
Height	m AOD					

PLATES

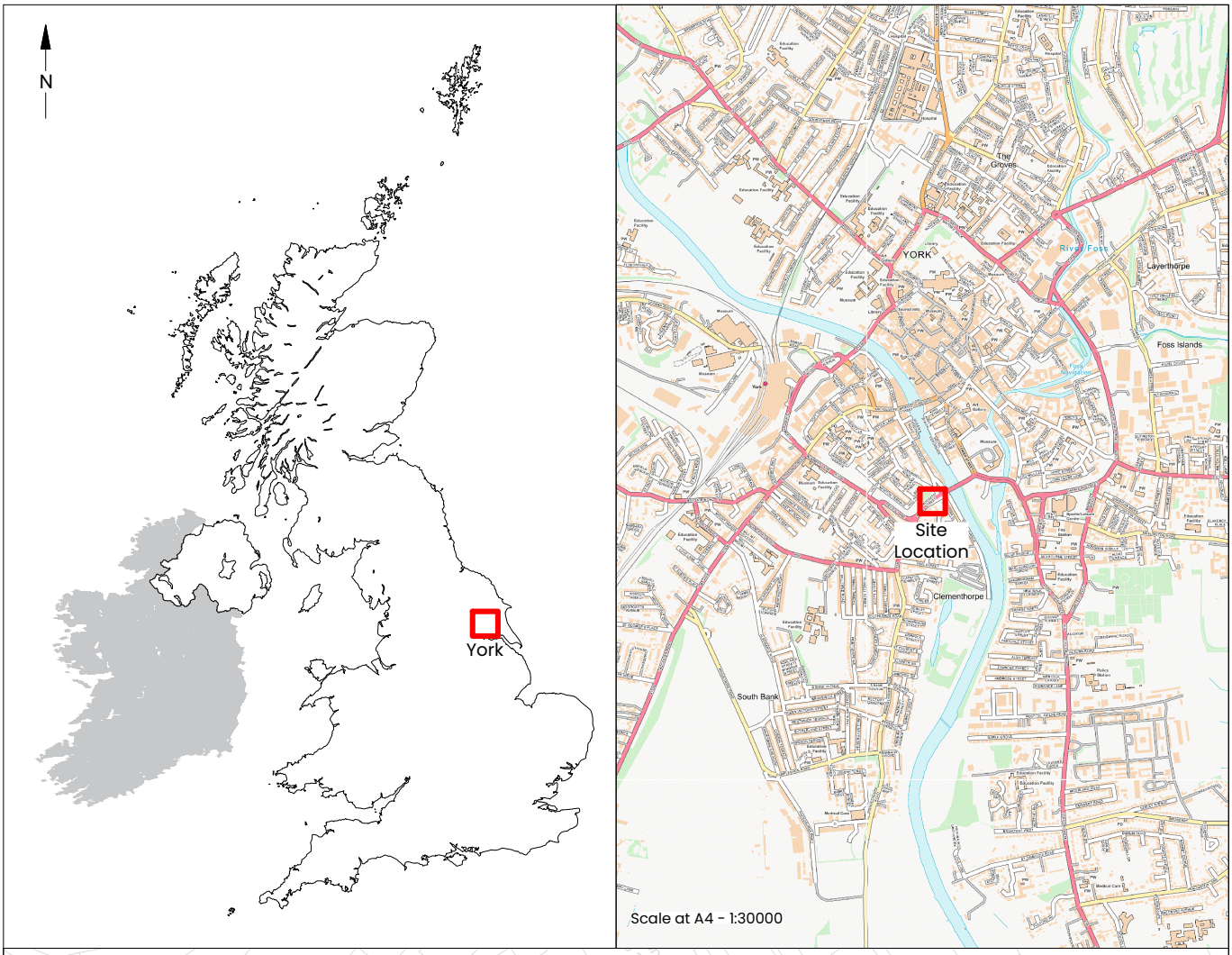
Plate 1 WS01 4m to 4.6m BGL top to the right

Plate 2 WS01 3m to 3.9m BGL top to the right

Plate 3 WS01 2m to 3m BGL top to the right

Plate 4 WS01 1m to 2m BGL top to the right

Plate 5 WS01 0m to 1m BGL top to the right



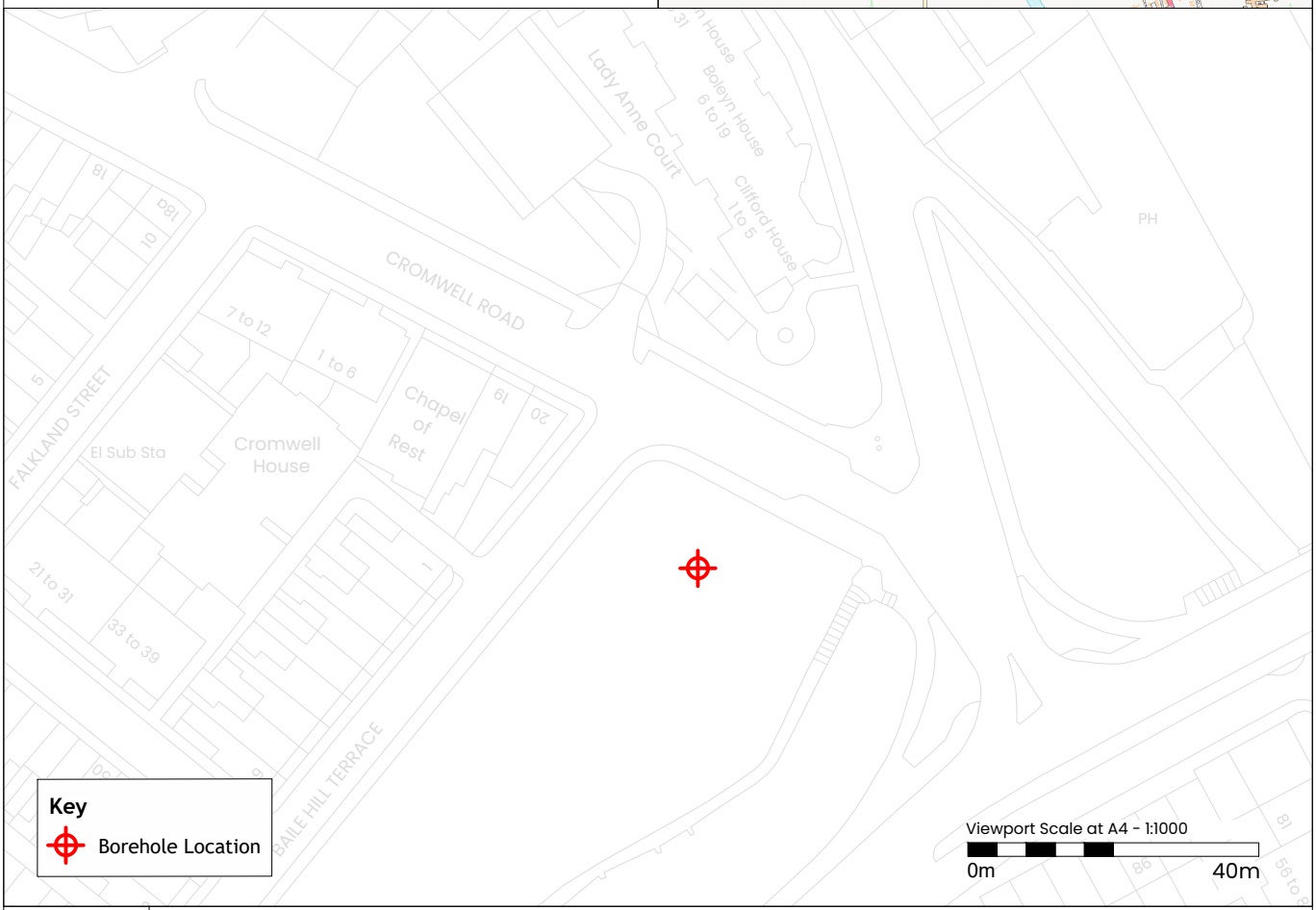


Figure 01 - Location Map
6324 - Baile Hill, York

Scale at A4 - varies
Drawn by MI

YORK ARCHAEOLOGICAL TRUST

Written Scheme of Investigation for Geoarchaeological Monitoring at Baile Hill, York

By Lindsay Banfield and Luke Parker

YAT Assessment Report 2022/90 August 2022

YORK ARCHAEOLOGICAL TRUST

York Archaeological Trust undertakes a wide range of urban and rural archaeological consultancies, surveys, evaluations, assessments and excavations for commercial, academic and charitable clients. We manage projects, provide professional advice and fieldwork to ensure a high quality, cost effective archaeological and heritage service. Our staff have a considerable depth and variety of professional experience and an international reputation for research, development and maximising the public, educational and commercial benefits of archaeology. Based in York, Sheffield, Nottingham and Glasgow the Trust's services are available throughout Britain and beyond.

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CONTENTS

1 BACKGROUND

1.1 Introduction

1.1.1 York Archaeology has been commissioned by Phillip Windslow to undertake geoarchaeological monitoring of geotechnical investigations (GI) which are being undertaken at the Scheduled Monument of Baile Bill, York (SE 60266 51274) (figure 1).

1.1.2 The GI investigation will comprise two windowless samples being taken for slope stability assessment; one taken at the top of the hill, and one at it's base.

1.2 Planning conditions/context

1.2.1 The following archaeological conditions have been imposed:

1.2.2 Any ground disturbance works to which this consent relates shall be carried out under the detailed archaeological supervision of Lindsay Banfield, York 37 TANNER ROW YORK YO1 6WP Telephone 01904 601948 HistoricEngland.org.uk Historic England is subject to both the Freedom of Information Act (2000) and Environmental Information Regulations (2004). Any Information held by the organisation can be requested for release under this legislation. We respect your privacy and the use of your information. Please read our full privacy policy for more information Archaeology, 47, Aldwark, York, YO1 7BX or his/her nominated representative who shall be given 2 weeks' notice (or such shorter period as may be mutually agreed) in writing of the commencement and timetable of work. No works shall commence until Lindsay Banfield has confirmed in writing to Historic England that he is willing and able to carry out the agreed supervision.

1.2.3 The specification (including analysis, post-excavation and publication proposals) for which consent is granted shall be executed in full, unless variations have been agreed under the terms of condition 1.

1.2.4 A report on the archaeological recording shall be sent to: Claire MacRae, Principal Archaeologist, City of York Council, West Offices, Station Rise, York YO1 6GA (the City Historic Environment Record) and to Dr Keith Emerick, Inspector of Ancient Monuments at Historic England within 3 months of the completion of the works (or such other period as may be mutually agreed).

1.2.5 The archaeological contractor shall complete and submit an entry on OASIS (On-line Access to the Index of Archaeological Investigations - http://oasis.ac.uk/england/) prior to project completion, and shall deposit any digital project report with the Archaeology Data Service, via the OASIS form, upon completion.

1.2.6 Should appropriate archaeological samples be recoverable from the borehole, the assessment of those samples is to be conducted according to the assessment documentation produced by York Archaeology (June 2022).

1.2.7 This Written Scheme of Investigation (WSI) has been prepared in response to a Specification supplied by Keith Emerick at Historic England. The work will be carried out in accordance with the Brief and this WSI, and according to the principles of the Institute for Archaeology (CIfA) Code of Conduct and all relevant standards and guidance

2 GEOLOGY AND TOPOGRAPHY

2.1 The proposal site is located at Baile Hill, York, SE 60266 51274 (Figure 1). Baile Hill is a man-made earth mound in the Bishophill area of York, England. The underlying bedrock geology is mapped by the BGS as being the Sherwood Sandstone Group- sedimentary bedrock formed approximately 237-272 million years ago in the Triassic and Permian periods in fluvial environments.

2.2 The superficial geology is mapped by the BGS as the York Moraine member- clay, sandy, gravelly, formed during the Quaternary Period and glacigenic in origin. The York Moraine is a terminal moraine which was formed by glacial advance during the last glacial (Devensian) period. However, the BGS has mapped alluvium within and adjacent to the River Ouse, with Baile Hill being located within 10m of the mapped alluvium boundary. Therefore, there is the possibility that the superficial geology underlying the manmade Baile Hill could be alluvium, rather than moraine deposits.

3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 As no archaeological desk-based assessment (DBA) has been produced for the site, the following archaeological and historical background is taken from the HER entry provided on Heritage Gateway (https://www.heritagegateway.org.uk/Gateway/)

3.2 Baile Hill is a Scheduled Monuments which represents the last remnants of a motte-and-bailey castle constructed by William I. The motte (known now, confusingly, as Baile Hill) is the only upstanding portion of the castle remaining. The fortification, like York Castle on the opposite side of the River Ouse was built in 1068 or 1069, and destroyed later in 1069 before being rebuilt almost immediately.

3.3 The original motte-and-bailey castle consisted of a circular mound surrounded by a ditch and with a quadrilinear yard of around 3 acres on the south-west side. Excavations have revealed the remains of 12th century buildings on top of the motte (Baile Hill). During the early 12th century, the fortification had become disused. By the late 12th century it appears in the possession of the Archbishop of York, before being granted in 1466 to the Mayor and Commonalty of the city. By this time the remaining elements of the castle had been integrated into the circuit of defences surrounding the city.

3.4 The motte was raised in height by an unknown amount during the Civil War in 1642 prior to the siege of York and two platforms may have been installed for use as gun emplacements (Addeyman & Priestley, 1977).

3.5 The motte survives to an average height of 7.7 metres and there is now no visible evidence of a surrounding ditch or bailey. It is tree covered grassy mound that faces a companion motte under Clifford Tower, which is located on the eastern side of the Ouse (York HER). The city walls run along its south-east flank. A terrace round the south flank from the city wall may have been added as an access path during 18th century landscaping. The sides of the hill have been eroded by paths and children's slides (Addeyman & Priestley, 1977).

3.6 Excavations in 1979 revealed remains of 12th century timber buildings and a strong fence at the summit of the mound, together with a staircase up one side. These excavations took place in two quadrants of the mound top, with a trench cut into the mound base to

locate the pre-mound surface and investigate the make-up of Baile Hill (Addeyman & Priestley, 1977).

3.7 The earliest and possibly natural deposits were found at this spot, at the foot of the hill. These comprised a sandy red-brown clay. Into this was cut a Roman pit containing pottery and a coin of Theodora (AD 337-41). Elsewhere, there was a sandy soil with pottery and mortar, none of which could be identified as dating after the 11th century (ibid).

3.8 Considerable erosion was apparent down the side of Baile Hill and this was shown in areas that were above the old surface of the mound where approximately 2m of orangey-brown clayey material that had accumulated in varying degree of thickness. The interface between this and the original surface was defined by runs of small stones of the type usually found in Boulder Clay and limestone. Few finds were recovered from these erosion layers, but bone a sherd of pot give a picture of possible rubbish disposal down the side of the hill at a time when it was occupied (ibid).

3.9 The mound top was excavated to a depth of 1.5-2.25m and revealed several phases of occupation. At the lowest level, an orangey-brown clay with some amorphous red patches was uncovered. Into this there were several holes and shallow trenches that were filled with a charcoal rich soil. 12th century pottery was recovered from some of these features. A spread of stone overlay this level, comprising rounded pebbles and limestone blocks, and may consist of a relevelling deposit. Above this was 0.8m of silty mid-brown soil, which did not yield any evidence of timber structures. The lower part of this deposit contained mixed finds, including some from the 12th century, clay pipes, many arrowheads and other post-medieval material (ibid).

4 AIMS AND OBJECTIVES

4.1.1 The aims of the work are:

- To provide an assessment of the formation processes responsible for the deposit sequences and their development through time;
- To provide insights into the stability of the Baile Hill slopes;
- To identify the presence or absence of primary and secondary archaeological remains within the buried sediments

4.1.2 The objectives of the work are:

- To monitor the two proposed GI survey points
- To create a lithological record of the sediments which compose Baile Hill. Additionally, the sediment underlying the hill has the potential to be composed of alluvium. This being the case, it may represent the potential for preservation of further, earlier, archaeological remains within the sediment underlying the hill.
- To identify evidence for slope erosion and sediment redeposition
- To recover sub-samples, if possible, from notable sedimentary deposits for further investigation, including palaeoenvironmental assessment and rangefinder dating.

- To determine the degree to which bioturbation from overlying vegetation has impacted the Scheduled Monument.

4.1.3 All recording will result in 'the preparation of a report and ordered archive', in line with the guidelines of the CIfA Chartered Institute for Archaeologists (Standard and Guidance: for an archaeological watching brief published October 1994, revised September 2001, October 2008, December 2014, 2020).

5 METHODOLOGY

5.1 Fieldwork methodology

5.1.1 All works will be undertaken in accordance with this WSI and to standards defined by CIfA Guidelines for Recording of Archaeological Sites (2019; 2020a; 2020b). The work will comprise the monitoring of two windowless boreholes undertaken as part of a GI project to assess the slope stability of Baile Hill.

5.1.2 Windowless sample locations will be located by the GI operatives. The deposits will be recorded by a geoarchaeologist using the Troels-Smith (1955) system of sediment classification (Appendix 1). The scheme breaks down a sediment sample into four main components and allows the inclusion of extra components that are also present, but that are not dominant. Key physical properties of the sediment layers are darkness (Da), stratification (St), elasticity (El), dryness of the sediment (Sicc) and the sharpness of the upper sediment boundary (UB). A summary of the sedimentary and physical properties classified by Troels-Smith (1955) and a stratigraphic breakdown of the deposits will be recorded on proforma log sheets. The logs will be supplemented by digital photography.

5.1.3 Grab samples may be retained from the cores where possible. The sampling will follow procedures set out within the Historic England Guidelines for Environmental Archaeology and Geoarchaeology (HE 2015a and HE 2015b). The consideration of preservation within the deposits will be made with specific reference to Historic England's guidance document for Preserving Archaeological Remains (2016). Sub-samples for radiometric dating will, where possible, be recovered by hand.

5.2 Project Staffing

5.2.1 Archaeologists will be fully qualified, experienced, and in possession of valid CSCS cards (CVs can be supplied upon request).

5.2.2 The project will be managed by Lindsay Banfield (YA Project Manager)

5.2.3 The project team will consist of 1 member of staff: To be confirmed upon approval of this WSI and determination of date for commencement of groundworks.

5.2.4 The Planning Archaeologist will be given notice of the commencement of the survey and YA will continue to liaise closely throughout the period of the works.

5.3 Reporting and Liaison

5.3.1 Regular site meetings will be held in consultation with the client / advisor to the client and Planning Archaeologist throughout the duration of work. The He science advisor will be invited to attend site/project meetings. Should archaeological remains be

encountered the Planning Archaeologist will be informed and a site meeting will be requested. An interim assessment report on the results of the fieldwork will be prepared in the appropriate format and presented to the client and the curator within 4-6 weeks of the completion of the fieldwork. For further details of the contents of the report see Section 5.9 below.

5.3.2 Should the results warrant full analysis, a further stage of work will be costed and submitted for approval to the client. In addition, should the results warrant publication a journal article will also be submitted for publication in the appropriate local archaeology journal.

5.3.3 **Welfare, Access and Insurance**

5.3.4 The client will ensure safe access to the site, provide up to date service plans including permission to work by the National Grid if required.

5.3.5 As part of York Archaeological Trust, YA carries the appropriate public, third party and employee insurances, copies of which are available for inspection if required.

5.3.6 Any compensation claims for disruption to the land should be directly between the client and landowner.

5.4 Health and Safety

5.4.1 YA will adhere to all relevant health and safety regulations (copies of YAT/YA Health and Safety policies are available on request). No archaeological staff will be allowed to enter the site until they have undergone a health and safety induction organised by YA and/or the principal contractor.

5.4.2 YA will complete a task-specific Risk Assessment Safe-Working Method Statement before the commencement of the drilling and monitoring. Copies of this will be made available to the client, and all site-staff.

5.4.3 This document will be in compliance with the industry guidelines laid out in FAME Manual, Health & Safety in Field Archaeology.

5.4.4 YA staff will wear appropriate personal protective equipment at all times.

5.5 Post excavation Processing

All finds will be stored as recommended in "First aid for finds" (by the Archaeology section of the United Kingdom Institute for Conservation), and marked with the site and find-codes, and relevant accession numbers. Retention of finds will be according to the selection strategy using the CIfA Toolkit for Selecting Archaeological Archives (http://archaeologists.net/selection-toolkit). These will be deposited with appropriate repository on completion of the final report.

Any artefacts recovered will be submitted to:

- Prehistoric pottery for assessment to Sarah Percival (Independent)
- Romano-British pottery to J Evans (Independent), Ann Irving (Independent)

- Anglo-Saxon/Medieval pottery/tile to Paul Blinkhorn (Independent), Chris Cumberpatch (Independent)
- Flint to P. Webb (University of Southampton)
- Palaeolithic Flint Dr Lynden Cooper (ULAS)
- Human remains to K. Smart (YA)
- Charred and waterlogged plant remains to Stacey Adams (YA)
- Pollen Dr Tom Hill (Natural History Museum)
- Insects Dr David Smith (University of Birmingham)
- Zooarchaeological remains to Dr. K. Poole (YA)
- Wood artefacts/Conservation to I. Panter / Steve Allen (YAT-York)

5.6 **Report**

5.6.1 A verbal report and, where appropriate, textual summary will be provided to the client and the Planning Archaeologist, on the completion of fieldwork.

5.6.2 An interim assessment report on the results of the fieldwork will be prepared in the appropriate format and presented to the client and the curator within 4-6 weeks of the completion of the fieldwork. An updated timetable for delivery of the full report will be provided.

5.6.3 Final discharge of the Planning Condition is contingent upon reporting and completion/deposition of the archive being undertaken to the satisfaction of the Planning Archaeologist.

5.6.4 Subject to this analysis and reporting, in order to comply with planning conditions and NPPF (Paragraph 141), and upon completion of specialist reports, a final archival report on results will be completed. Copies will be provided to:

- The client.
- The Planning Archaeologist for accession to the HER. This will include a copy of the report in PDF/A format on CD along with indexed copies of all digital on-site photography.

The report will include:

- Non-technical summary
- Introductory statement
- Aims and purpose of the project
- Methodology
- An objective summary statement of results

- Conclusion
- Illustrations at appropriate scales, all to include levels tied to Ordnance Datum.
- Illustrative site photography.
- Supporting data, tabulated or in appendices, including as a minimum a basic quantification of all artefacts, ecofacts and structural data including recommendations for retention/discard and proposals for conservation.
- Index to archive and details of archive location; confirmation of archive transfer arrangements including a provisional timetable for deposition.
- References
- A copy of the OASIS form

5.7 **Copyright**

York Archaeology shall retain full copyright of any commissioned reports, tender documents or other project documents, under the Copyright, Designs and Patents Act 1988 with all rights reserved excepting that it hereby provides exclusive licence to the client for the use of such documents by the client in all matters directly relating to the project, with no limitation on the number of times that the client may reproduce any report. The client's contribution will be acknowledged in any future use of the work by YA.

5.8 **Archive**

The archive will be fully indexed and contain where relevant:

- copies of correspondence relating to fieldwork
- site notebooks/diaries
- original photographic records
- site drawings (plans, sections, elevations)
- original context records
- original finds records
- original sample records
- computer discs and printout

5.9 **Archive and Finds Deposition**

5.9.1 Notification to the appointed depository, using the appropriate form will be made once the necessity for a physical archive has been established, in line with current guidelines.

5.9.2 Copies of the Report will be lodged with the HER and OASIS.

5.9.3 Where discoveries are adjudged to be significant and meriting museum deposition the following will still apply:

- Finds will remain the property of the client with deposition at the appointed depository, subject to their approval.

- The paper and digital archive generated by YA will remain the property of the Unit until deposited within the appointed depository:

- All finds and archive will be deposited with the appointed depository, with arrangements and accession number to be agreed. Written notification of completion of fieldwork will be given to the museum curator and County Archaeologist or other appointed representative for Nottinghamshire County Council.

- Depositional arrangements will then proceed in line with Procedures for the transfer of Archaeological Archives (as supported by reference to specialist opinion, regional and national research agendas) whereby a Transfer of Title form will be completed and the archive accessioned. Written notification of final deposition of archive will be given to the Planning Archaeologist.

5.10 **OASIS**

Prior to commencement of the fieldwork an OASIS online record will be initiated (http://ads.ahds.ac.uk/project/oasis/). A copy of this document will be included in the report. Digital archives will be deposited online with the Archaeology Data Service (ADS), a Trusted Digital repository with a Core Trust Seal status, following ADS Guides to Good Practice (Guides to Good Practice: Contents (archaeologydataservice.ac.uk).

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For current Historic England guidance documents see:

https://historicengland.org.uk/advice/latest-guidance/

https://historicengland.org.uk/advice/technical-advice/archaeological-science/

York Archaeology

York Archaeological Trust undertakes a wide range of urban and rural archaeological consultancies, surveys, evaluations, assessments and excavations for commercial, academic and charitable clients. We manage projects, provide professional advice and fieldwork to ensure a high quality, cost effective archaeological and heritage service. Our staff have a considerable depth and variety of professional experience and an international reputation for research, development and maximising the public, educational and commercial benefits of archaeology. Based in York, Sheffield, Nottingham and Glasgow the Trust's services are available throughout Britain and beyond.

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