YORK ARCHAEOLOGICAL TRUST

Archaeological Monitoring of Geotechnical Investigations

York Flood Alleviation Scheme: Flood Cell B12 Scarborough Bridge to Lendal Bridge left bank

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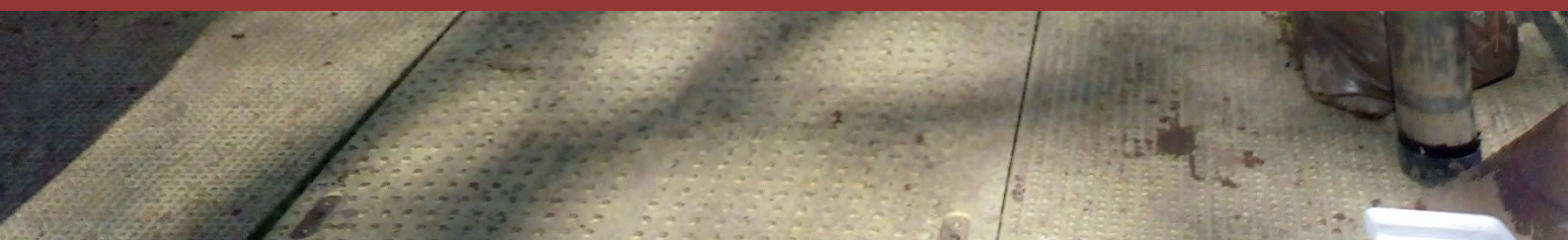
YAT Evaluation Report 2018/74 July 2018



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Abbreviations

YAT - York Archaeological Trust

CBM - Ceramic Building Material

CP - Cable Percussion borehole

WS - Windowless Sample borehole

TP - Trial Pit

AOD - Above Ordnance Datum

OS - Ordnance Survey

Non-technical Summary

York archaeological Trust was commissioned by Capita AECOM on behalf of the Environment Agency to undertake archaeological monitoring of site investigations for the York Flood Alleviation Scheme (FAS) at Flood Cell B12: Scarborough Bridge to Lendal Bridge left bank (SE 59840 52049). The programme of works was carried out between 12th March and the 21st March 2018.

Monitoring of the site investigation works revealed natural deposits between 1.80m and 5.90m BGL. Above the natural, in the southern part of the site, were medieval made ground deposits and potential structures, despite previous flood defence works in the area. These deposits were overlain by post-medieval levelling and demolition layers, which were present across the site and were subsequent overlain by 19th century garden soils.

KEY PROJECT INFORMATION

Project Name	York Flood Alleviation Scheme (FAS) at Flood Cell B12: Scarborough Bridge to Lendal Bridge left bank
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Type of Project	Archaeological monitoring of boreholes and trial pits
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NGR	SE 59840 52049
Museum Accession No.	Pending
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REPORT INFORMATION

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1 INTRODUCTION

Between the 12th March and the 21st March 2018 YAT undertook archaeological monitoring of site investigations for the York Flood Alleviation Scheme (FAS) at Flood Cell B12: Scarborough Bridge to Lendal Bridge left bank (SE 59840 52049) (Figure 1 Site Location).

The work was undertaken for Capita AECOM on behalf of the Environment Agency to produce information on the deposit sequence revealed by the GI investigations through a variety of interventions including; cable percussive (CP) boreholes, windowless sampling and hand-dug trial pits.

For the purpose of the York FAS, ten communities have been identified across York and these communities have been further sub-divided on the basis of 'flood cells' (FC). A flood cell is defined as an area where the flood risk can be addressed independently of the areas up- and downstream. The Environment Agency is exploring a range of potential flood management options for each cell.

2 METHODOLOGY

As stated in the WSI (Appendix 3) the aims of the GI was to investigate the deposit sequence along the bank of the River Ouse and to assess the character of deposits within the flood cell. Particular objectives of the archaeological monitoring in Flood Cell B12 include:

- To record the character and sequence of the deposits within each GI intervention
- To assess the potential for deposits where possible
- To retrieve dating evidence for deposits where possible
- To minimise disturbance to significant archaeological remains if encountered or if this is unavoidable to ensure that the remains are investigated and recorded in a controlled archaeological manner
- To record the character and foundations of St. Mary's Abbey precinct wall
- To assess the extent to which the construction of the present flood embankment may have affected deposits in the immediate area
- To assess the extent to which landscaping associated with the setting out of the gardens has affected the preservation and relative depths of earlier archaeological evidence

2.1 Boreholes/Trial Pits

A total of four cable percussion boreholes, five windowless sample boreholes, and ten trial pits were monitored (Figure 2):

Borehole Ref No.	Easting	Northing	Notes
B12-BH01	459789	452079	
B12-BH02	459863	452044	Monitored to c.10.30m BGL as had reached natural sands
B12-BH03	459796	452110	Monitored to c.5.9m BGL as had reached natural sands
B12-BH04	459842	452139	

Borehole Ref No.	Easting	Northing	Notes
B12-WS01	459805	452066	Halted at 2m BGL due to stiff clay
B12-WS01A	459803	452067	Extra WS to see if could get greater depth. Halted at 2m BGL due to very stiff clay
B12-WS02	459844	452047	Halted at 3m BGL due to obstruction
B12-WS03	459889	452038	Halted at 3m BGL due to obstruction
B12-WS04	459860	452040	
B12-TP01A	459799	452059	Moved from original position due to presence of services
B12-TP03	459830	452045	
B12-TP04	459859	452033	
B12-TP05	459882	452021	
B12-TP08	459770	452076	Unable to excavate due to tree roots
B12-TP09	459771	452081	
B12-TP10	459776	452092	Unable to excavate due to tree roots
B12-TP11	459776	452093	
B12-TP12	459786	452109	
B12-TP13	459789	452117	
B12-TP14	459808	452137	Halted at 0.68m BGL due to tree roots
B12-TP15	459814	452147	

Key: The borehole reference number provides flood cell location and exploratory hole type. The first two digits provide the cell number. The next two digits provide exploratory type; where BH is cable percussion borehole, WS is windowless sample and TP is trial pit. E.g. B12-BH07 is a cable percussion borehole located in flood cell B12.

Table 1 GI interventions monitored

Methodology for boreholes

Inspection pits for the windowless sampling and cable percussion boreholes were hand excavated by the GI contractor to a depth of 1.2m and observed by YAT. Deposit characteristics and depths were recorded on pro forma sheets and digital photographs were taken.

Cable Percussion Boreholes

A cable percussion rig was used to drill to a depth of around 15m BGL, which produced SPT and bulk samples to be collected by the GI team every 5m. The exception to this was BH01 which was drilled to approximately 18m in order to reach the sandstone bedrock. Archaeological monitoring was conducted for the full extent of the excavation on boreholes BH01 and BH04, however it was deemed pertinent to monitor only until natural sands were reached on boreholes BH02 and BH03.

A total of five environmental samples were taken from boreholes BH02 (2) and BH03 (3) when deposits which contained potential organic material were encountered. The depth of samples

taken was recorded on standardised pro forma sheets, as well as the presence, depth and description of each deposit.

Windowless Sample Boreholes

Due to the location of the boreholes on a narrow bund a hand-held hydraulic hammer with hydraulic jack was used to drill to a maximum depth of 5m BGL, producing 1m long, either 8" or 6" in width, cores sleeved in plastic tubing. The tubes were split open on site, hand-cleaned, recorded and photographed with an appropriate scale by the onsite archaeologist. A total of two environmental samples for GBA were collected from WS04 when deposits which contained potential organic material were encountered. The depth of samples taken was recorded on standardised pro forma sheets, as well as the presence, depth and description of each deposit.

The location of the boreholes and depths of deposits relating to Ordnance Datum were determined based on survey information provided by the GI contractor.

Methodology for trial pits

Trial pits were excavated as part of ground investigations by Geotechnics, the GI contractor commissioned by Capita AECOM. The pits were hand excavated under the direction of the geotechnical team and measured approximately 0.4m by 0.4m to a depth of 1.2m BGL; however the length of trial pits adjacent to the abbey precinct wall increased to 0.6m. The presence of a Tree Protection Order meant that both TP08 and TP09 were abandoned, and TP14 was not excavated to full depth as it was located on top of substantial tree roots. The location and AOD of the trial pit was provided by AECOM's survey team.

Archaeological observations were carried out during digging of the trial pits. Deposit characteristics and depths were recorded on pro forma sheets, a representative section was drawn to scale and digital photographs were taken with an appropriate scale.

3 LOCATION, GEOLOGY & TOPOGRAPHY

The following is taken from the Capita AECOM WSI (2018) for the archaeological monitoring of geotechnical investigations in Museum Gardens Flood Cell B12:

> *Flood cell B12 is located on the left bank of the Ouse. It is bounded to the west by Marygate, to the north by Bootham and High Petergate, to the east by Museum Street and Duncombe Place and to the south by the River Ouse*.
>
> *The site lies within the Museum Gardens, a Grade II Registered Park and Garden (NHLE 1000117) which holds two Scheduled Monuments; St Mary's Abbey (NHLE 1004919) and St Mary's Abbey precinct walls (NHLE 1004920). The observations also took place close to Grade II listed building the Hospitium (NHLE 1257129).*

The monitored boreholes were located within and immediately adjacent to the south-west corner of Museum Gardens. The trial pits were sited along the inner and outer bounds of the western abbey precinct wall, whilst the windowless sample boreholes were located along the top of an existing flood defence bund to the rear of the Hospitium. The cable percussion boreholes were evenly spread across this corner of the gardens.

The underlying geology consists of alluvial clay, silt, sand and gravel overlying sandstone of the Sherwood Sandstone Group (www.bgs.ac.uk accessed 24/05/18). Previous boreholes undertaken within the site vicinity recorded natural deposits from around 3.25m BGL.

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The abbey was founded in 1086 when Count Alan Rufus granted St Olave's Church to the Benedictine order. William II made a further grant of land in 1088, which established the extent of the Abbey. The earliest sections of the precinct wall are thought to have been constructed around 1266 and it was extended and fortified in 1318. It was during these extension works that the section of wall subjected to trial pit investigations was constructed. On 26th November 1539 the abbey surrendered to the Crown during the Dissolution and was retained by the King. By the early 17th century much of the cloistral buildings were in disrepair and a commercial plant nursery had been set up in the ruins of the abbey in the 1660s, becoming a tourist attraction of exotic plants and ruins.

The Yorkshire Philosophical Society purchased part of the abbey in 1827 and conducted archaeological excavations there between 1827 and 1829, subsequently constructing Yorkshire Museum which was opened in 1830. The gardens were developed and expanded through the 19th century and the study site area once contained a swimming pool which was demolished in 1969. The site is now occupied by a 20th-century flood embankment which runs between the Hospitium and the Ouse.

Archaeological monitoring of the boreholes sunk prior to the construction of the embankment encountered the base of the swimming pool at 1.75m BGL (YAT 1984.1011). Outside the area of the swimming pool the boreholes recorded potential archaeological deposits to a depth of around 3.25m, though no dating evidence was recovered. Monitoring of a tree removal by the western precinct wall during the same works revealed its foundations at depth of 8.8m AOD, which were overlain by a post-medieval rebuild at 9.80m AOD (YAT 1985.10).

Further observations during the construction of the flood embankment encountered features relating the construction of the swimming baths and the creation of the ornamental gardens (*ibid.*). Medieval walls of dressed limestone, aligned north-north-east/south-south-west were also observed and were interpreted as the eastern wall of a passage down to a gateway through the southern precinct wall, giving access to the river. Two further, parallel walls were recorded along with a 19th-century well shaft. Evidence of medieval activity was also recorded north of the southern precinct wall. A trench dug to construct a pumping machine for the flood defences was observed and a surface of limestone, brick and tile was recorded sloping down to the river and was interpreted as the floor surface of the passage to the river (YAT 1987.17).

5 RESULTS

In order to differentiate between the different exploratory hole types blocks of context numbers were assigned corresponding to their designation; trial pits were assigned numbers in the 10's,WS boreholes had numbers in the 100's and CP boreholes were assigned numbers in the 1000's. In addition to this the borehole or trial pit reference number also corresponded with the assigned context number; windowless sample borehole WS01 commenced with

context 100 onwards, WS02 commenced with context 200 onwards and so on. These contexts were then allocated to a group which represented one of five broad phases of activity (Figs. 5 & 6). Due to the paucity of finds recovered from the boreholes, it should be noted that the designation of these phases are tentative and rely on observations by the experienced attendant archaeologist.

Full descriptions of these deposits and their phase designations can be found in the context table which forms Appendix 2 of this report.

5.1 Cable Percussion Borehole BH01

CP BH01 (Figures 1, 2, 3, 6, 8 & 10; Plates 1 & 2) was monitored on 12th March 2018. Ground level on top of the garden topsoil was 9.77m AOD.

Phase 1 Natural Sandstone bedrock

Degraded natural sandstone bedrock was encountered at approximately 17.60m BGL (-7.83m OD).

Phase 2 Natural and alluvial deposits

A thick band of natural river sand and gravels and alluvial deposits were encountered from 2.30m–17.60m BGL (7.47m AOD to -7.83m OD). The earliest deposits encountered were a series of interspersing layers of river gravels (1008, 1006) and sand (1007), the top of which was recorded at 9.50m BGL (0.27m AOD). The deposits were wet and loose, with cobbles of sandstone recovered from around 14.50m BGL (-4.73m OD).

Above the river gravels and sand were a succession of clay deposits; blue grey (1004, 1005) and mid brown (1003) in colour with inclusions of fine sand. Traces of degraded animal bone were noted at around 7.70m BGL (2.07m AOD), whilst the water level was reached at approximately 9m BGL (0.77m AOD).

Plate 1 Alluvial deposit 1005

Phase 5 Modern garden landscaping

Beneath the dark brown clayey silt garden topsoil (1000), at 0.24m BGL (9.53m AOD), were the demolished remains of the swimming baths that existed in this part of the gardens until the late 20th century. Dark brown, almost black silt 1002 contained frequent bricks, both whole and fragmentary and was overlain by a lighter brown silt which contained smaller fragments of CBM (1001).

Plate 2 Contexts (from top to bottom) 1000–1002

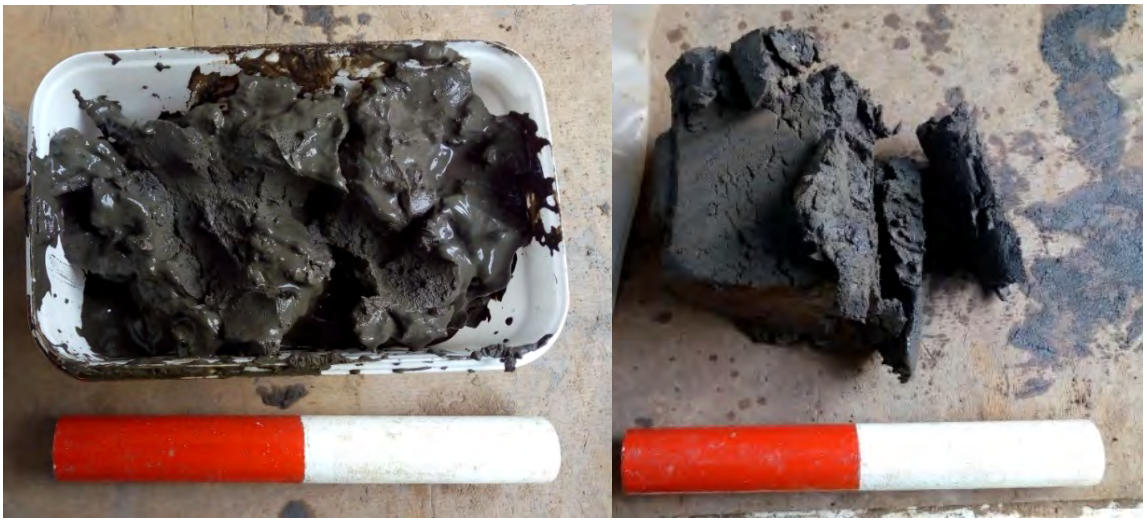
5.2 Cable Percussion Borehole BH02

CP borehole (Figures 1, 2, 3, 6 & 10; Plates 3–8) was monitored on 19th March 2018. Ground level was given as 9.81m AOD.

Phase 2 Natural and alluvial deposits

Natural sand and alluvial deposits were recorded from 5.50m to 12m BGL (4.31m AOD to -2.19m OD). The earliest deposit was compacted light grey sand (2008), the top of which was recorded at 10.30m BGL (-0.49m OD), over which lay a firm mid grey brown clay (2007), recorded at around 7m BGL (2.81m AOD). The latest deposit in this phase comprised of a very

wet and loose dark blue grey clay silt (2006); the top of which also coincided with the height of the water level at approximately 5.3m–5.5m BGL (4.51m AOD to 4.31m AOD).



Plates 3 & 4 Alluvial deposits (l–r) 2007 and 2006, scale 0.2m

Phase 3 Medieval activity

This phase predominantly relates to activity associated with St Mary's Abbey; in this locale of the museum gardens this pertains to evidence of the Abbey's southern precinct wall along with structures and deposits belonging to the outlying buildings of the abbey, including the industrial and craft buildings that were located adjacent to the Hospitium.

The earliest deposit recorded within this phase was a friable dark grey brown silt (2005), observed from around 3.00m BGL (6.81m AOD) and found to be rich in organics with occasional CBM and small limestone fragments. Late-12th–13th century green-glazed and York white ware pottery sherds were also recovered from the material and the deposit probably formed part of an early attempt to build up ground levels in this part of the site. A further build-up deposit sealed 2005 from around 1.40m BGL (8.41m AOD) and comprised of a friable mid-brown, coarse sand (2004) with contained frequent mortar flecks and occasional CBM and limestone fragments. Charcoal flecks increasingly occurred from about 2.45m BGL (7.36m AOD) upwards in the sequence, along with occasional fragments of animal bone. Environmental samples were taken from both deposits.

Plates 5 & 6 Contexts (l–r) 2005 and 2004, scale 0.2m

A number of limestone blocks were recovered from the borehole between 1.02m and 1.40m BGL (8.79m AOD to 8.41m AOD) and were likely part of a mortar bonded wall (2003). The drilling rig was unable to drill through the limestone, which meant smaller casing tubes were used down the side of the wall.

Plate 7 Limestone block from context 2003, scale 0.2m

Phase 4 Post-medieval activity

This phase of deposition was characterised by demolition deposits relating to after the dissolution in 1539 and the grounds subsequent use as a plant nursery and garden.

The earliest layer in this phase likely relates to the demolition and/or disrepair of wall 2003; a mid-grey brown silty clay (2002) containing frequent flecks of mortar and moderate CBM and medium sized sandstone fragments lay immediately above 2003 and became increasingly mortar rich the closer it reached the top of the wall. The top of the deposit was recorded at 0.82m BGL (8.99m AOD).

Overlying the demolition deposit was a made ground layer of dark brown slightly silty clay (2001) which contained frequent fragments of CBM and was recorded at 0.20m BGL (9.61m AOD).

Phase 5 Modern garden landscaping

Dark brown silty clay topsoil and turf (2000) was recorded to 200mm below the current ground level.

Plate 8 Contexts (from top to bottom) 2000–2003. Scale 0.5m

5.3 Cable Percussion Borehole BH03

CP borehole BH03 (Figures 1, 2, 3, 6, 8 & 10; Plates 9–10) was monitored on 22nd March 2018. Ground level on the garden soil was 9.61m AOD.

Phase 2 Natural and alluvial deposits

Natural light to mid grey river sand (3009) was encountered at 5.9m BGL (3.71m AOD). Alluvial clays and silts sealed 3009; the top of which was recorded at 1.65m BGL (7.96m AOD). Notably in this borehole a number of the deposits contained a high organic content; context 3007 comprised of mid to dark grey, increasingly turning black towards 5m BGL (4.61m AOD), slightly sandy silt. The silt contained laminations of fine sand and a large amount of organic material including wood fragments, and was recorded at a depth of 4m BGL (5.61m AOD). The alluvial silt above this contained less organic content and though the deposit was of similar make-up to 3007 an arbitrary division between it and context 3006 was given due to this noticeable decrease in organic material.

The latest organic rich deposit comprised of a light to mid grey sandy silt (3005) with laminations of black organic material and charcoal throughout the length of the deposit. The top of 3005 was recorded at 2.15m BGL (7.46m AOD).

Plate 9 Contexts (l–r) 3006 & 3007, scale 0.2m

Phase 3 Medieval activity

Build-up deposit of firm light grey to brown slightly sandy clay (3003) was recorded at a depth of around 1.20m BGL (8.41m AOD). The deposit contained moderate inclusions of limestone flecks and CBM fragments and is possibly a levelling deposit formed from the remnants of a construction phase of the Abbey precinct subsidiary buildings and walls.

Phase 4 Post-medieval activity

The composition of context 3002, silt containing frequent medium to large fragments of tile, mortar and limestone, suggests it derives from demolition activity, and probably relates to the mid 16th–19th century period of disrepair. A deposit of sand which contained the same material in a similar composition (3001) lay above 3002 and was recorded at a depth of 0.40m BGL (9.21m AOD).

Plate 10 Context 3002, scale 0.2m

Phase 5 Modern garden landscaping

A layer of modern made ground comprised of brown sand, concrete and CBM rubble was encountered from the ground level to 0.40m BGL.

5.4 Cable Percussion Borehole BH04

CP borehole BH04 (Figures 1, 2, 3, 6 & 8; Plates 11–13) was monitored on the 14th March 2018 and the ground level was given as 11.21m AOD.

Phase 2 Natural and alluvial deposits

Blue-grey clay alluvial deposits (4009) interspersed with brown clays (4005 & 4007) and sands (4006 & 4008) within this phase in BH04. The top of the natural deposits were encountered at 1.80m BGL (9.41m AOD) and extended to the full 15m of the borehole (-3.79m OD).

Plate 11 Context 4007

Phase 3 Medieval activity

Three layers of made ground were conducive of this phase; context 4004 comprised of soft mid grey brown clayey silt with medieval plain and ridge tiles and limestone fragments, charcoal flecks, 10 fragments of animal bone and medieval green-glazed pottery inclusions. Sealing this was a friable light grey clayey silt (4003) which contained occasional limestone fragments, which in turn was overlain by friable mid grey clayey silt 4002 which contained occasional CBM and limestone fragments and oyster shell. The top of these deposits were recorded at 0.80m (10.41m AOD), 0.56m (10.65m AOD) and 0.46m BGL (10.75m AOD) respectively.

Plate 12 Contexts (from top to bottom) 4002 and 4003. Scale 0.5m

Phase 4 Post-medieval activity

During the post-medieval period this area of the site was laid out in formal gardens; a crushed limestone and mortar deposit (4001) recorded just under the modern garden topsoil in BH04 was a possible remnant of this garden. The deposit was only 0.10m thick and recorded at 0.36m BGL (10.85m AOD).

Plate 13 Inspection pit for BH04, showing deposit 4001 just under topsoil 4000. Scale 0.2m

Phase 5 Modern garden landscaping

Dark brown silty clay topsoil and turf (4000) was recorded to 0.36m below the current ground level.

5.5 Windowless Sample Borehole WS01

WS borehole WS01 (Figures 1, 2, 4, 7, 9 & 10; Plate 14) was monitored on the 14th March 2018 and the ground level was given as 10.92m AOD.

Phase 5 Modern garden landscaping

The earliest deposit recorded in this borehole was made ground comprising of dark brown clay (102) that contained fragments of CBM and a piece of modern ceramic pipe.

A significant portion of the modern deposits recorded within the windowless samples relate to the makeup of the flood defence mound on which they are located. The mound, or bund, clay comprised of mid brown very stiff clay (101) with very occasional fragments of mortar. The top of the deposit lay immediately below the dark brown silty clay topsoil (100) at 0.30m BGL (10.62m AOD) and within this borehole measured 1.70m in thickness.

Plate 14 Core 1m–2m showing (l–r) contexts 101 and 102, scale 0.5m

5.6 Windowless Sample Borehole WS01A

WS borehole WS01A (Figures 1, 2, 4 & 7) was monitored on the 14th March 2018 and the ground level was given as 10.92m AOD. As the borehole was located immediately adjacent to WS01 it is unsurprising that it contained the same composition of material, to similar depth though WS01A reached 2.20m BGL.

5.7 Windowless Sample Borehole WS02

WS borehole WS02 (Figures 1, 2, 4, 7, 9 & 10; Plate 15) was monitored on the 14th March 2018 and the ground level was given as 10.58m AOD.

Phase 5 Modern garden landscaping

The earliest deposits recovered from this core formed a series of thin made ground or levelling layers; context 204 comprised of black silt in which modern glass shards were noted, and was recorded at a depth of 2.90m BGL (7.68m AOD), over which lay mid brown clay 203, recorded at a depth of 2.74m BGL (7.84m AOD). Just beneath the bund clay (201) at 2.5m BGL (8.08m AOD) was dark grey brown silty clay 202 from which occasional fragments of CBM and animal bone was recovered.

Plate 15 Core 2m–3m showing (l–r) contexts 204–202. Scale 0.5m

In WS02 the bund clay (201) measured 2.57m in thickness and was recorded at 0.24m BGL (10.34m AOD) below the topsoil (200).

5.8 Windowless Sample Borehole WS03

WS borehole WS03 (Figures 1, 2, 4, 7, 9 & 10; Plates 16–18) was monitored on 16th March 2018 and the ground level was given as 10.58m AOD.

Phase 3 Medieval activity

The earliest deposit recorded in WS03 comprised of fragments of sandstone and limestone, along with lime mortar (305). The deposit was over 0.30m thick, extending beyond the limits of the borehole and the top of the deposit was encountered at 2.30m BGL (8.28m AOD). It is likely that the deposit related to the remains of the former Abbey subsidiary buildings that were located in this part of the site; possibly the remains of a wall foundation.

Plate 16 Core 2m–3m showing the spilt context 305, scale 0.5m

Phase 4 post-medieval activity

This phase of activity in WS03 was predominantly characterised by a layer of demolition material, relating to the period of 16th–19th century disuse and disrepair after the dissolution

of the abbey. The layer comprised of light grey brown silt and mortar (304) along with fragments of CBM and flecks of charcoal and was recorded at 1.48m BGL (9.10m AOD).

Plate 17 Context 304, top of cores to the right, scale 0.5m

Sealing the demolition layer 304 was a made ground layer of dark brown silty clay (303), containing very occasional small fragments of CBM, limestone and mortar and encountered at 0.68m BGL (9.90m AOD).

Plate 18 Core 1m–2m, showing contexts (l–r) 304 & 303. Scale 0.5m

The latest deposit from this phase of activity was a thin layer of dark brown clay silt garden soil (302); a remnant of the open grassy area that was established in this part of the site sometime in the late 17th/early 18th centuries. The top of the deposit was recorded at 0.59m BGL (9.99m AOD).

Phase 5 Modern garden landscaping

The clay bund (301) in this part of site measured 0.38m in thickness and was sealed by the present garden soil (300) at 0.21m BGL (10.37m AOD).

5.9 Windowless Sample Borehole WS04

WS borehole WS04 (Figures 1, 2, 4, 7, 9 & 10; Plates 19-23) was monitored on the 14th March 2018 and the ground level was given as 10.65m AOD.

Phase 2 Undated alluvial deposits

Borehole WS04 was the only windowless sample intervention that reached alluvial deposits; the top of which were encountered at 4.10m BGL (6.55m AOD) and comprised of mid orange

brown (406 & 409) or light to mid grey (411) wet and loose sands, mid blue grey clay (407) and dark grey brown slightly sandy silt (410), which contained organic material. Notably, an organic rich almost black slightly sandy silt (408) was recorded at 4.73m BGL (5.92m AOD) and was 0.47m thick.

Plate 19 Core 4m–5m, top to the right, showing (l–r) contexts 408, 407 and 406. Scale 0.5m

Plate 20 Core 5m–6m, top to the right, showing (l–r) contexts 411, 410 and 409. Scale 0.5m

Phase 3 Medieval activity

A deposit of mid grey sandy clay (405) containing flecks of charcoal, a fragment of horse tibia and a single piece of medieval plain tile was tentatively dated to the medieval period. The top of the clay was recorded at 3.50m BGL (7.15m AOD) and possibly was related to the evidence of medieval activity recorded during the excavations done prior to the current flood defence bund.

Plate 21 Core 3m–4m, top to the right, showing (l–r) contexts 405 and 406

Sealing the clay 405 was a layer of CBM and mortar (403) laying on mid orange brown bedding sand (404). It is considered that the CBM was either the remnants of a tile and stone wall recorded during the previous flood defence works, or a floor surface. The top of the deposit was recorded at 3.30m BGL (7.35m AOD).

Plate 22 Core 3m–4m, top to the right, showing (l–r) 405, 404, 403 and 402. Scale 0.5m

Phase 5 Modern garden landscaping

A layer of made ground (402) lay above context 403 and comprised of demolition rubble and clay. Above this at 2.90m BGL (7.75m AOD) was a limestone fragment (412) that filled the core sleeve and was around 0.10m in length.

Plate 23 Core 2m–3m, top to the right, showing (l–r) contexts 412 and 401. Scale 0.5m

The clay bund (401) in this part of the site reached 2.90m BGL (7.75m AOD), measured 2.61m thick and was overlain by topsoil (400).

5.10 Trial Pit TP01A

The excavation of TP01A (Figures 1, 2, 5 & 10; Plate 24) was monitored on 15th March 2018 and the ground level was given as 9.89m AOD.

Phase 5 Modern garden landscaping

The earliest deposit comprised of light grey brown gritty clayey silt (12) which contained occasional fragments of limestone and CBM. The top of the deposit was encountered at 0.60m BGL (9.29m AOD) and likely related to the demolition of the swimming pool that existed in this locale until the 20th century.

Above deposit 12 was modern black silty garden subsoil 11, measuring 0.32m in thickness, which in turn was overlain by 0.28 metres of topsoil and turf 10.

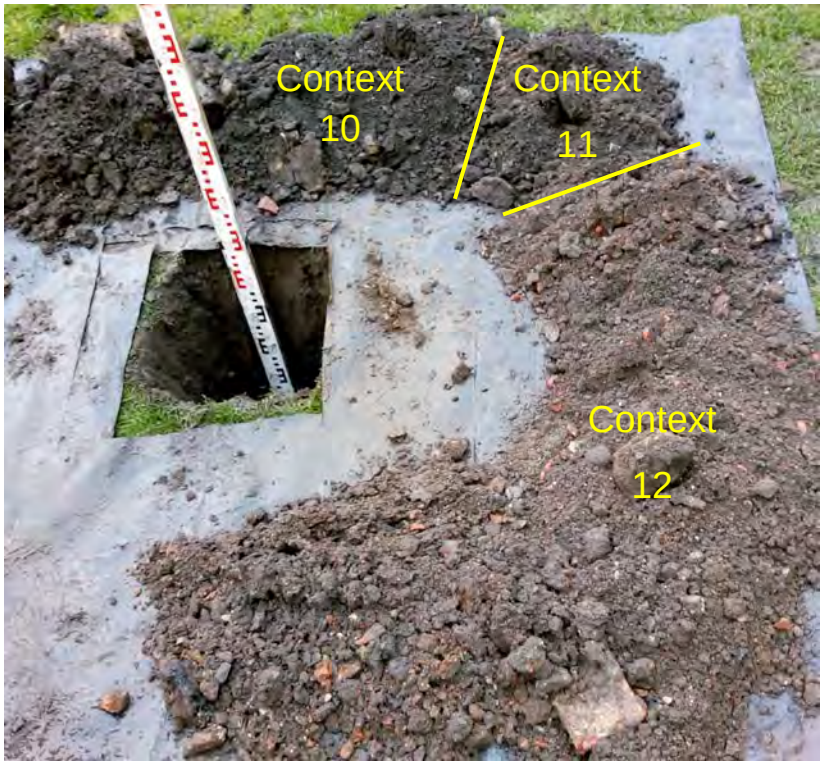


Plate 24 TP01A, view north, showing contexts 11 & 12

5.11 Trial Pit TP03

The excavation of TP03 (Figures 1, 2, 5 & 10; Plate 25) was monitored on 15th March 2018 and the ground level was given as 8.99m AOD.

Phase 4 Post-medieval activity

The earliest deposit comprised of mid greyish brown silt 32, the top of which was recorded at 1.10m BGL (7.89m AOD) and was thought to be a former garden soil from the 18th–19th century when a formal garden and fountain was present in this part of the site.

Phase 5 Modern garden landscaping

Above deposit 32 was modern black silty garden subsoil 31 (same as 11), measuring 0.74m in thickness, which in turn was overlain by 0.34 metres of topsoil and turf 30.

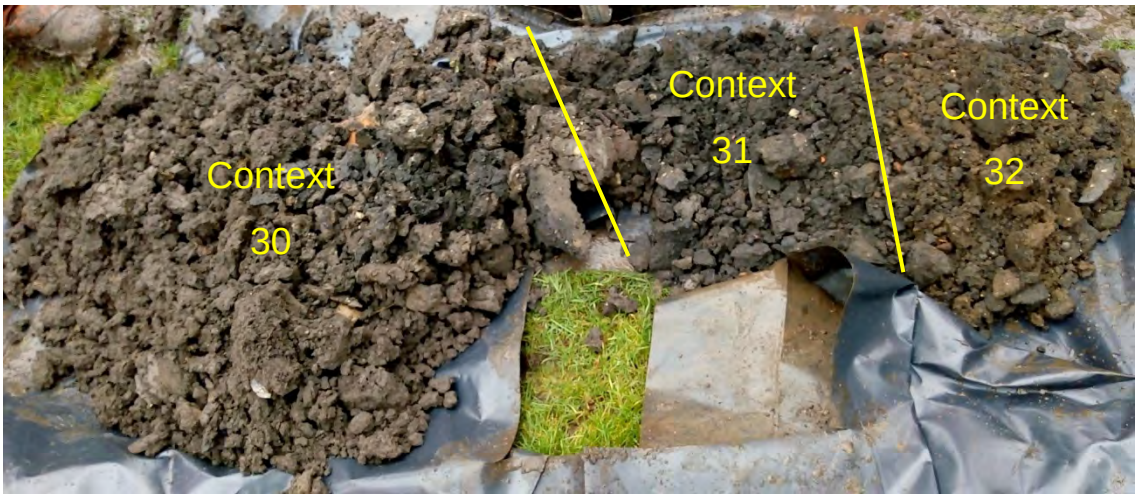


Plate 25 showing contexts taken from TP03

5.12 Trial Pit TP04

TP04 (Figures 1, 2, 5 & 10; Plate 25) was monitored on 15th March 2018 and the ground level was given as 8.97m AOD.

Phase 5 Modern garden landscaping

A made ground layer comprising of mid grey brown gritty clayey silt (43), which contained occasional fragments of limestone and CBM was encountered at 0.86m BGL (8.11m AOD).

Above deposit 43 was a thin layer of soft mid brown clay (42) measuring 0.10m in thickness and recorded at 0.66m BGL (8.31m AOD), which in turn was sealed by black silty garden subsoil 41 (same as 11), measuring 0.38m in thickness. This was sealed by 0.34 metres of topsoil and turf 40.

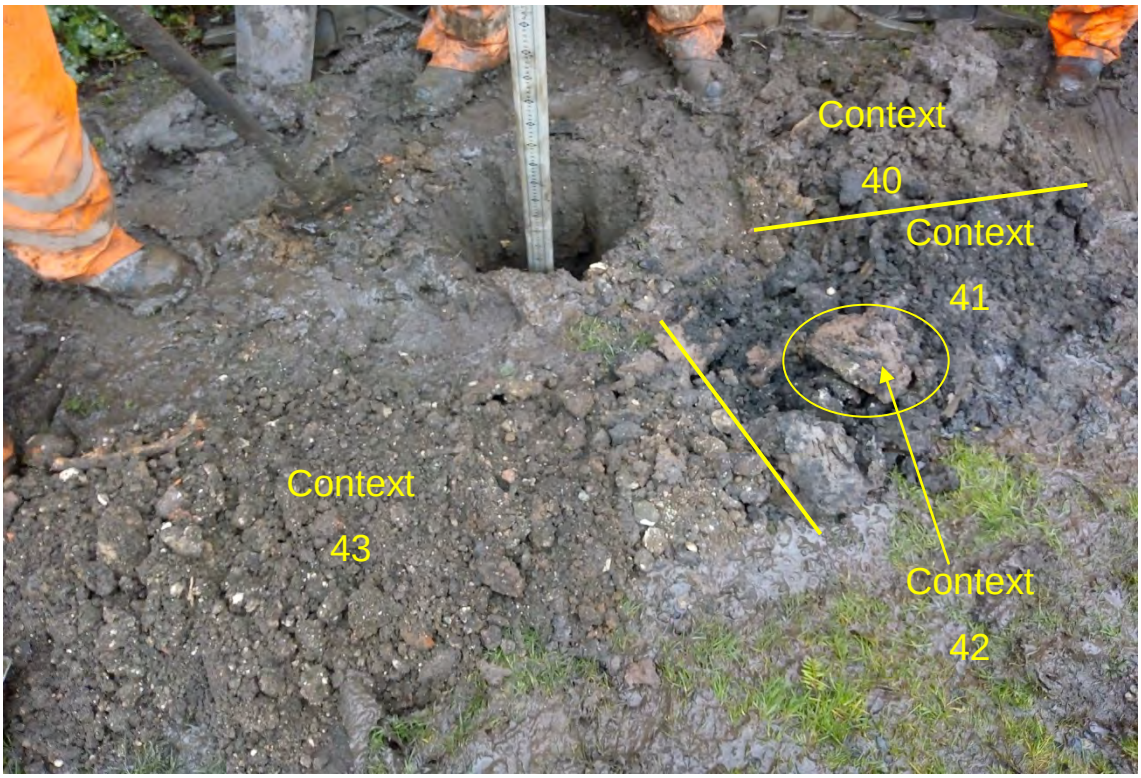


Plate 25 showing contexts taken from TP04

5.13 Trial Pit TP05

The excavation of TP05 (Figures 1, 2, 5 & 10; Plate 26) was observed on 15th March 2018 and the ground level given was 8.64m AOD.

Phase 4 Post-medieval activity

The earliest deposit encountered was mid grey clay 54 which contained flecks of charcoal and which was likely a post-medieval made ground layer. The deposit was encountered at 0.90m BGL (7.74m AOD) and was overlain by a layer of demolition material comprising of medium sized CBM and limestone fragments along with frequent pieces of mortar (53). The demo rubble was probably remnants of the Abbey southern precinct wall that ran east-west close to the location of the trial pit.

Phase 5 Modern garden landscaping

A made ground deposit of dark grey clayey silt containing occasional limestone and CBM fragments (52) was the earliest deposit encountered within this phase and it measured 0.12m thick at 0.64m BGL (8.00m AOD). Above this was garden subsoil 51 (same as 11) which consisted of friable and soft dark grey brown clay, the top of which was recorded at 0.23m BGL (8.41m AOD). Topsoil and turf was encountered from the ground level.

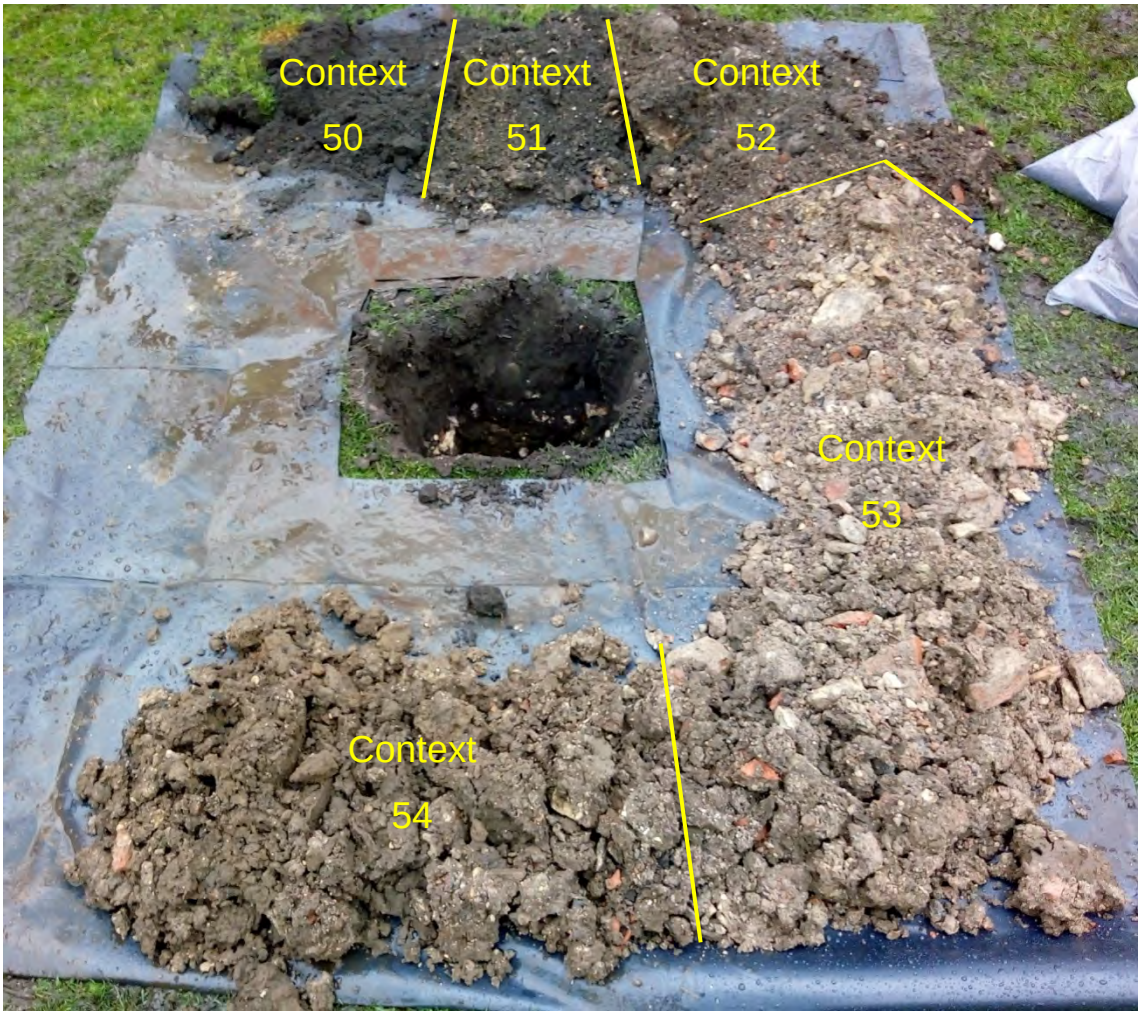


Plate 26 showing contexts taken from TP05

5.14 Trial Pit TP09

TP09 (Figures 1, 2, 5 & 10; Plate 27) was monitored on 21st March 2018 and the ground level was given as 8.52m AOD.

Phase 3 Medieval activity

The trial pit was excavated against the exterior of the Abbey's western precinct wall which was constructed out of ashlar coursed limestone blocks, measuring between 0.21m and 0.35m deep. A chamfered course was present at 1.05m BGL (7.47m AOD).

Phase 5 Modern activity

The soft ground deposits on the exterior of the precinct wall were predominantly occupied with ground build up; butting up against the wall 94 at 0.88m BGL (7.64m AOD) was a made ground layer composed of friable light to mid grey sand and mortar (93) from which frequent

small limestone fragments and occasional plain tiles were recovered. Above this made ground formed of firm mid orange brown silty clay (92) was also recorded at 0.54m BGL (7.98m AOD), from which frequent CBM and mortar, and moderate small limestone fragments were recovered, along with a sherd of 19th-century white earthenware tea cup.

Beneath the dark brown sandy silty clay topsoil (90), at 0.26m BGL (8.26m AOD), a friable mid grey brown silty sand (91) was recorded which contained frequent CBM fragments and one large rough dressed limestone fragment.

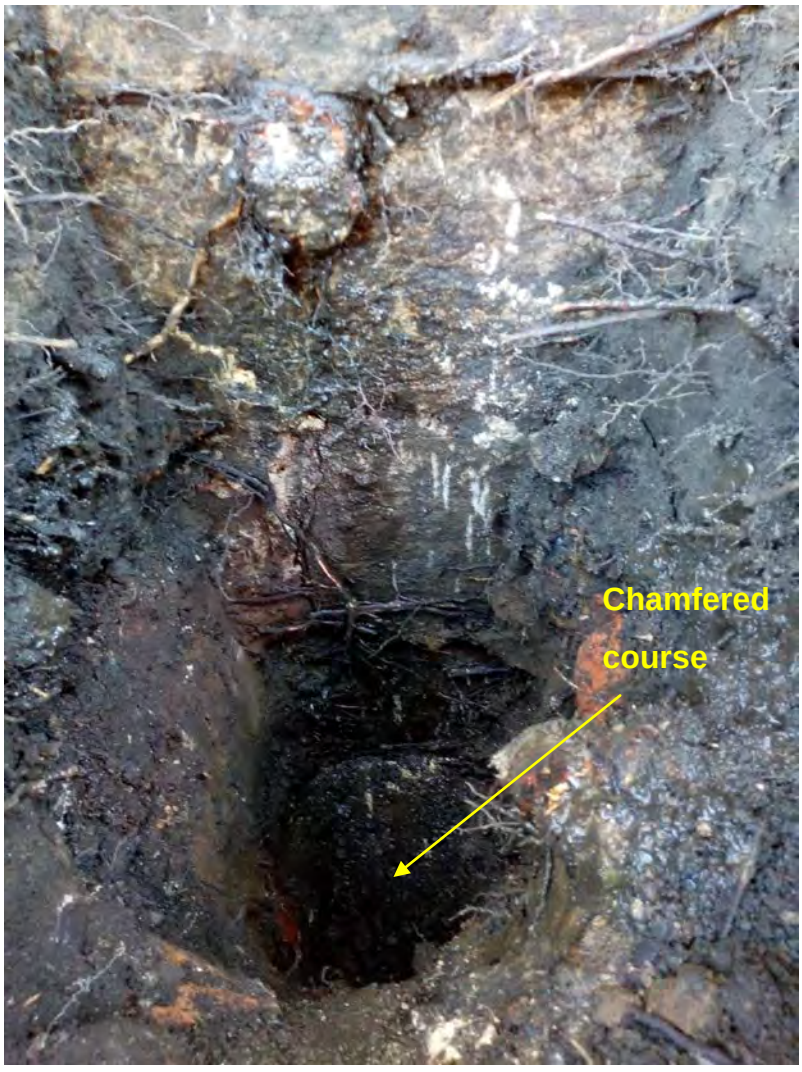


Plate 27 View south-east, showing Abbey wall 94 and contexts 90–92

5.15 Trial Pit TP11

TP11 (Figures 1, 2, 5 & 10; Plate 28) was monitored on 21st March 2018 and the ground level was given as 8.59m AOD.

Phase 3 Medieval activity

The trial pit was excavated against the exterior of the Abbey's western precinct wall which was constructed out of ashlar coursed limestone blocks, measuring between 0.18m and 0.28m deep.

Phase 5 Modern activity

The soft ground deposits on the exterior of the precinct wall were predominantly occupied with ground build up; butting up against the wall at 1.00m BGL (7.59m AOD) was a made ground layer composed of friable light to mid grey sand and mortar (113) from which occasional CBM, plaster and pottery sherds dating to the late 18th to early 19th century were recovered. Above this made ground formed of friable mid orange brown sand and gravel (112) was also recorded at 0.53m BGL (8.06m AOD), from which frequent CBM and mortar, and occasional mortar flecks, oyster shell, glass and six sherds of pottery, dating to the 19th century and later, were found.

Beneath the dark brown sandy silty clay topsoil (110), at 0.25m BGL (8.34m AOD), a friable, mid grey brown silty sand (111) was recorded which contained moderate CBM and mortar fragments.

Plate 28 TP11, view south-east, scale unit 10cm

5.16 Trial Pit 12

TP11 (Figures 1, 2, 5 & 10; Plate 29) was monitored on 15th March 2018 and the ground level was given as 9.61m AOD.

Phase 3 Medieval activity

The trial pit was excavated against the interior of the Abbey's western precinct wall which was constructed out of ashlar coursed limestone blocks, measuring c.0.28m deep. A limestone and mortar footing (120) extended from the base of the wall for 0.17m, at 0.30m BGL (9.31m AOD). At 0.45m BGL (9.16m AOD) the footing extended out from the wall again, 0.45m from the base of the wall. The wall foundation extended vertically down beyond 1.2m BGL (8.41m AOD), past the base of the trial pit.

The soft ground deposits on the interior of the precinct wall were predominantly occupied with the construction backfill for the medieval wall. Underneath the black clayey silt topsoil and turf (121) was a loose fill of limestone pebbles and crushed mortar (122), the top which was recorded at 0.30m BGL (9.31m AOD), just on top of the wall footing 120.

Phase 4 Post-medieval activity

During the post-medieval period the medieval stone wall was underpinned with 5 courses of brick, measuring 200mm x 100mm x 65mm and bonded in an English Garden Wall style (123). The base of the brick courses was recorded at 0.25m BGL (9.36m AOD), whilst the top was one course, or 65mm above the ground level.

Plate 29 TP12, view north-west, scale 0.5m

5.17 Trial Pit 13

TP13 (Figures 1, 2, 5 & 10; Plate 30) was monitored on the 21st March 2018 and the ground level was given as 8.94m AOD.

Phase 3 Medieval activity

The trial pit was excavated against the exterior of the Abbey's western precinct wall which was constructed out of ashlar coursed limestone blocks (134). A mortar, limestone and tile fragment concretion (133) obscured the full extent of the wall below ground level; however it seemed that the wall extended fully down to 1.3m before basing out to form a footing. The narrowness of the trial pit at this depth meant that the full extent of the footing was unclear.

Phase 5 Modern activity

The soft ground deposits on the exterior of the precinct wall were predominantly occupied with ground build up; probably using demolition material from the former row of dwellings that existed along this section of the wall up to the late 19th century. Butting up against the wall at 0.38m BGL (8.56m AOD) was a made ground layer composed of friable mid grey silty sand (132) from which frequent mortar and CBM and moderate limestone fragments were recovered. Above this made ground formed of friable dark brown silty sand (131) was also recorded at 0.20m BGL (8.74m AOD), from which frequent CBM was found.

The dark brown sandy silty clay topsoil (130) sealed the made ground deposits at ground level.

Plate 30 TP13 view north-east, scale 0.5m

5.18 Trial Pit TP14

TP14 (Figures 1, 2, 5 & 10; Plate 31) was monitored on the 15th March 2018 and the ground level was given as 10.42m AOD. The trial pit was located against a 19th century walkway addition to the interior of the medieval precinct wall. The presence of thick roots running along the edge of the walkway, on the western side of the trial pit inhibited the depth of excavation and obscured any observations of the wall beneath ground level.

Phase 5 Modern activity

Beneath the dark brown silt topsoil (140) at 0.4m BGL (10.02m AOD) was a mid grey brown silt subsoil (141) which contained very occasional animal bone, CBM and coal.

Plate 31 TP14, view north-west

5.19 Trial Pit TP15

TP15 (Figures 1, 2, 5 & 10; Plate 32) was monitored on the 21st March 2018 and the ground level was given as 10.08m AOD.

Phase 3 Medieval activity

The trial pit was excavated against the exterior of the Abbey's western precinct wall which was constructed out of ashlar coursed limestone blocks (155) measuring around 0.58m deep. A double chamfered course was present at 0.55m BGL (9.53m AOD).

Phase 4 Post-medieval activity

The earliest deposit butting against the medieval wall comprised of made ground formed from friable mid grey silty sand with frequent small to large fragments of CBM and mortar and occasional limestone fragments (154). The top of the deposit was recorded at 0.90m BGL (9.18m AOD) and was immediately overlain by a brick surface (153) of edge set reused bricks measuring between 245mm x 130mm x 45mm and 200mm x 105mm x 60mm. The top of the brick course was flush with the base of the top course of chamfered stonework at 0.75m BGL (9.33m AOD). The application of reused bricks makes the dating of the surface tricky; however it can be reasonably concluded that it relates to the buildings that were present along this length of precinct wall until the late 19th century.

Phase 5 Modern activity

Evidence of the demolition of the buildings along this wall is evident in deposit 152; a friable mid brown/grey silty sand which contained frequent CBM and mortar fragments with occasional limestone fragments. The deposit was probably the same as 132 in TP13 and was recorded at 0.5m BGL (9.58m AOD). Sealing this was a firm to friable dark to mid brown sandy silt layer (151) from which moderate CBM and mortar fragments were recovered. This layer is comparable to deposit 131 in TP 13 and was encountered at 0.17m BGL (9.91m AOD).

Dark brown sandy silty clay topsoil and turf (150) formed the current ground surface.

Plate 32 TP15, view north-east, scale unit 0.10m

6 DISCUSSION

Natural sandstone bedrock was reached in borehole BH01, at -7.83m OD. Above this natural sand and gravels as well as alluvial deposits were recorded across the study area ranging in depths from 4.31m AOD (BH02) to 9.41m AOD (BH04), with a downward sloping trend of 2m towards the south-east area of the site. The current topography of the site has a 2.50m downward slope from the north of the gardens to the southern area by the river and the results of the boreholes suggest that on the whole this was also the case during the early periods. A notable difference in the height of the alluvial is BH02 which at 4.31m AOD is around 2m deeper than the height of the alluvial at the nearest borehole WS04 (6.55m AOD). One reason for this is that BH02 was a cable percussion borehole, which by its nature makes it hard to gather accurate depth measurements for deposits as subtle changes in deposit make-up are hard to determine. Context 2005from BH02 was recorded between 6.81m AOD and 4.31m AOD and became increasingly clayey towards its base; therefore possibly becoming an alluvial deposit. However, at what depth this change in deposits occurred is unknown.

Medieval ground build-up deposits were recorded in BH02, BH03 and WS02 at depths between 8.41m AOD and 7.36m AOD, and showed early attempts at land management along the southern and western edge of the site. Pottery sherds from context 2005 date the earliest attempts to the late 12th/early 13th century, prior to the construction of the Abbey precinct walls. Above these deposits in BH02 was a potential medieval structure, located close to a series of walls perpendicularly aligned to the southern abbey precinct wall, recorded during the previous flood defence works (Fig 10). A further possible wall was encountered by WS03 and was likely part of the former auxiliary buildings that were once attached to the Hospitium (Fig.10). In WS04 the thin remains of a tile/brick surface or wall foundation was recorded at 7.35m AOD, heavily truncated or disturbed by the previous flood defence works.

Levelling and demolition layers dating to the post-medieval period were present across the study area, recorded at 9.33m AOD to the north of the site and dropping down to around 9m AOD to the south. It is believed that these layers date to the Abbey's period of disrepair, from 16th century through to the 19th century, and of the demolition of the southern abbey precinct wall. Traces of the former gardens were also in evidence in the southern and northern parts of the site; old garden subsoil was recorded at depths of 9.99m AOD (WS03) and 7.89m AOD (TP03) along the southern edge whilst the remains of an old formal garden were recorded at 10.85m AOD to the north.

In the far south western corner of the site the construction and subsequent demolition of a swimming bath complex in the late 20th century had removed any traces of archaeology in that area; up to 2.3m thick layers of demolition material were recorded in BH01 and TP01A directly above alluvial deposits.

Trial pits along the western abbey wall revealed the extent of made ground during the late medieval to modern periods. Evidence of chamfered coursing was recorded along the exterior face of the wall, in trial pits TP09 and TP15, with double chamfering present in TP15, at a depth of up to 1m below present ground level. The decorative nature of this coursing heavily suggests that it was originally designed to be above ground level, generally towards the base of structures. Possible footings were recorded in TP12 and TP13, 1.30m (TP13) and 0.45m (TP12) below the present ground level. No footings were encountered elsewhere, and as these

two pits were in the same locale, on either side of the precinct wall, it is possible that the footings are part of a later attempt to stabilise and create better support for this section of the abbey wall. This supposition is further supported by the presence of a section of brick underpinning on the inside of the precinct wall, around TP12. The underpinning is visible at ground level and extends to 0.25m BGL, and was probably constructed sometime in the 19th century.

Due to extensive tree roots little could be discerned about the abbey wall in trial pits TP08, TP09 and TP11.

Soft ground deposits on either side of the abbey precinct's western wall were modern or post-medieval in date. Pottery sherds from the trial pits on the outside of the precinct date the modern made ground layers to the 19th century or later. The only evidence of earlier activity was present in TP15; a brick surface was encountered at 0.75m BGL, and was likely to relate to the former dwellings that were present along this part of the wall up to the late 19th century. The only other evidence of these buildings found was demolition material within the made ground layers in trial pits TP13 and TP15. In the abbey precinct's interior the soft ground deposits were concerned with modern garden soils.

Within the south-western corner of the Museum Gardens, there is high potential for significant archaeological remains relating to the medieval Abbey precinct buildings and walls, as well earlier attempts at land build-up along the southern edge of the site. Evidence from the windowless sample boreholes have shown that the previous flood defence works have heavily disturbed and truncated archaeological remains, particularly in the area around WS04. However a small amount of medieval remains have been found within that locale, in boreholes WS04, BH02 and WS03 including potential structural remains. Furthermore archaeological records of the 1985 investigations state that the extant remains of the southern precinct walls were left in situ and not disturbed (YAT 1985. 10).

Analysis of the potential of any organic remains cannot be done at this time, as further work is required on the environmental samples taken from relevant contexts. It is recommended that a range of samples are tested across all the interventions from which they were recovered; namely CP boreholes BH02 and BH03, and WS borehole WS04. Four environmental samples in particular have been identified as candidates for processing and are as follows; SN.21 from context 2005, SN.6 from context 3005, SN.8 from context 3007 and SN.4 from context 408. Samples SN.6, SN.8 and SN.4 are from water logged, organic rich deposits beneath known medieval layers and therefore have the potential to provide information about this area of York, before St Mary's Abbey was established. SN.21 on the other hand is from an organic rich context, securely dated to the 12th–13th century, in an area of known Abbey activity. The deposit has the potential to provide further information about the nature of Abbey activity in this area, and the nature of any attempts at flood alleviation.

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ACKNOWLEDGEMENTS

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APPENDIX 1 – INDEX TO ARCHIVE

Item	Number of items
Borehole log sheets	13
Original drawings	1
Digital photographs	135
Written Scheme of Investigation	3
Report	1

Table 2 Index to archive

APPENDIX 2 – CONTEXT LIST

Context Number	Depth of deposit (AOD)	Description
BH01		
1000	9.77m	Topsoil and turf. Dark brown silty clay with rounded pebbles and roots
1001	9.53m	Demolition layer. Mid greyish brown silt with occasional fragments of CBM
1002	9.30m	Demolition layer. Dark brown, almost black silt with frequent whole and pieces of brick
1003	7.47m	Alluvial deposit. Mid brown fine sandy clay
1004	5.77m	Alluvial deposit. Mid blue grey sandy clay
1005	3.77m	Alluvial deposit. Mid blue grey mottled mid brown clay with rare fragmentary inclusions of animal bone at around 7.5m BGL
1006	0.27m	River sand and gravels. Very fine grey sand and gravels
1007	-3.63m	River sand. Mid grey fine sand with limestone cobbles present at c.14.80m BGL.
1008	-6.13m	River gravels. Loose and wet grey gravels
1009	-7.83m	Natural bedrock. Degraded sandstone
BH02		
2000	9.81m	Topsoil and turf. Dark brown silty clay
2001	9.61m	Made ground. Friable dark brown slightly silty clay with frequent CBM fragments and pebbles
2002	8.99m	Demolition/levelling layer. Mid grey brown friable to firm slightly silty clay with limestone fragments c.20mm in diameter, frequent mortar flecks, moderate CBM fragments, occasional medium sized sandstone fragments and occasional yellow clay inclusions. The deposit became increasingly friable and mortar rich to 1.02m BGL.
2003	8.79m	Wall? Limestone blocks, possibly the top of a mortar bonded wall. No indication of alignment and seems to be two courses high.
2004	8.41m	Made ground. Friable mid brown sand that turns increasingly clayey from c.2.45m BGL. Contains frequent mortar flecks, moderate small limestone fragments, occasional CBM fragments, moderate charcoal flecks and occasional animal bone inclusions
2005	6.81m	Made ground. Friable dark grey brown silt with fairly frequent small fibrous organics, green glazed pottery fragments, occasional CBM and limestone fragments
2006	4.41m	Alluvial deposit. Very wet and loose dark brown silt
2007	2.81m	Alluvial deposit. Firm mid brown grey clay with slightly lighter brown grey clay laminations
2008	-0.49m	River sand. Compact light grey sand
BH03		
3000	9.61m	Made ground. Friable brown sand with concrete and CBM
3001	9.21m	Demolition/levelling layer. Mid brown clay sand with limestone, CBM and mortar fragments

Context Number	Depth of deposit (AOD)	Description
3002	8.91m	Demolition/levelling layer. Friable mid grey brown clay silt with frequent CBM (plain tile), mortar and small limestone fragment inclusions.
3003	8.41m	Made ground. Firm light grey brown slightly sandy clay with mid orange brown sand patches. Deposit contained moderate limestone flecks, occasional small pebbles, moderate CBM fragments (plain tile). Deposit gradually grades through to deposit below
3004	7.96m	Alluvial deposit. Firm light to mid brown slightly sandy clay with frequent small stones
3005	7.46m	Alluvial deposit. Friable light to mid grey slightly sandy silt laminated with black organic lenses and flecked with organics throughout. Occasional mid orange brown sand lenses also present
3006	6.91m	Alluvial deposit. Firm laminated mid to dark grey brown slightly sandy silt with occasional light yellow brown sandy lenses. Occasional small stones and moderate plant remains including small wood fragments were present
3007	5.61m	Alluvial deposit. Same as 3006 but with greater organic content, turning increasingly black towards 5m BGL
3008	4.16m	Alluvial deposit. Dark grey brown slightly sandy silt turning increasingly dense and clay towards bottom of deposit with less organic content than 3006 & 3007. Occasional charcoal flecks and small stones were also present
3009	3.71m	River sand. Dense and clean light to mid grey sand.
BH04		
4000	11.21m	Topsoil and turf. Soft dark grey brown clay silt with occasional small CBM fragments and yellow mortar
4001	10.85m	Demolition/levelling layer. Friable creamy white crushed limestone and mortar with occasional medium CBM fragments
4002	10.75m	Made ground. Friable mid grey clayey silt with occasional limestone and CBM fragments and oyster shell
4003	10.65m	Made ground. Friable light grey clayey silt with occasional sub rounded stones and moderate limestone fragments
4004	10.41m	Made ground. Soft mid grey brown clayey silt with moderate CBM fragments (30mm x 30mm), limestone fragments, charcoal flecks, medieval green glazed pottery and animal bone
4005	9.41m	Alluvial deposit. Soft mid brown mottled light grey silty clay with occasional sandy patches
4006	7.71m	Alluvial deposit. Loose mid yellow brown slightly clayey sand
4007	4.91m	Alluvial deposit. Stiff mid brown clay with very occasional rounded pebbles
4008	-0.29m	Alluvial deposit. Mid brown fine sand
4009	-1.29m	Alluvial deposit. Stiff dark blue grey clay and silt
WS01		
100	10.92m	Topsoil and turf. Dark brown clay silt
101	10.62m	Bund clay. Mid brown stiff clay with fragments of mortar
102	8.92m	Made ground. Dark brown clay with CBM fragments and modern ceramic water pipe

Context Number	Depth of deposit (AOD)	Description
WS01A		
100A	10.92m	Topsoil and turf. Dark brown clay silt
101A	10.50m	Bund clay. Stiff brown clay
102A	9.22m	Made ground. Dark grey brown clay with fragments of CBM and mortar
WS02		
200	10.58m	Topsoil and turf. Dark brown clay silt
201	10.34m	Bund clay. Mid greyish brown stiff clay
202	7.77m	Made ground. Friable dark grey brown silty clay with CBM fragments and animal bone
203	7.52m	Made ground. Moderate mid brown clay
204	7.37m	Made ground. Friable black silt with modern glass present
WS03		
300	10.58m	Topsoil and turf. Dark brown clay silt
301	10.37m	Bund clay. Mid grey brown stiff clay
302	9.99m	Garden soil. Dark brown clay silt
303	9.90m	Made ground. Dark brown silty clay with rubble material inclusions
304	9.10m	Demolition/levelling layer. Light grey brown silt with frequent mortar and CBM fragments, sand lenses and occasional flecks of charcoal
305	8.28m	Wall foundation? Small to medium sized limestone and sandstone fragments with a hard lime mortar
WS04		
400	10.65	Topsoil and turf. Dark brown clay silt
401	10.35m	Bund clay. Mid grey brown mottled brown stiff clay
402	7.55m	Demolition/levelling. Mid grey brown clay containing frequent demolition material
403	7.35m	Brick surface? Brick and mortar, crushed by windowless sampler rig
404	7.23m	Bedding layer. Mid orange brown coarse sand
405	7.12m	Made ground. Soft mid to light grey sandy clay with occasional charcoal flecks
406	6.85m	Alluvial deposit. Mid orange brown loose fine sand
407	6.25m	Alluvial deposit. Soft blue grey clay
408	5.92m	Alluvial deposit. Almost black friable organic rich silt
409	5.45m	Alluvial deposit. Mid orange brown very wet sand
410	5.10m	Alluvial deposit. Dark grey brown, soft, organic rich silt
411	5.01m	River sand. Light to mid grey fine sand
412	7.75m	Demolition. Fragment of limestone
TP01A		
10	9.89m	Topsoil and turf. Friable black silt with pebble inclusions
11	9.61m	Garden soil. Dark grey brown silty clay –soft

Context Number	Depth of deposit (AOD)	Description
12	9.29m	Demolition layer. Light grey brown silt with creamy white mortar and frequent brick fragments
TP03		
30	8.99m	Topsoil and turf. Same as 10. Black friable silt with pebble inclusions
31	8.65m	Garden soil. Same as 11. Dark grey brown soft silty clay
32	7.89m	Old garden soil. Mid greyish brown silt
TP04		
40	8.97m	Topsoil and turf. Same as 10. Friable black silt with pebble inclusions
41	8.69m	Garden soil. Same as 11. Dark grey brown soft silty clay
42	8.31m	Made ground. Mid brown soft clay
43	8.11m	Made ground. Mid grey brown gritty clayey silt with occasional mortar and brick fragments
TP05		
50	8.64m	Topsoil and turf. Same as 10. Friable black silt with pebble inclusions
51	8.41m	Garden soil. Same as 11. Dark grey brown soft silty clay
52	8.10m	Made ground. Dark grey gritty clayey silt with occasional stone and CBM (brick) fragments
53	7.88m	Demolition. Light grey clay and creamy white mortar with small CBM fragments
54	7.74m	Made ground. Soft mid grey clay with occasional charcoal flecks
TP09		
90	8.52m	Topsoil and turf. Firm, dark brown root rich sandy silty clay
91	8.26m	Made ground. Friable mid grey brown silty sand with frequent pebbles and CBM (brick and plain tile). 1 large rough dressed limestone fragment
92	7.98m	Made ground. Firm mid orange brown silty clay with frequent CBM (brick and plain tile), mortar fragments and moderate small limestone fragments
93	7.64m	Made ground. Friable light to mid grey sand and mortar (c.20%) with frequent small limestone fragments and occasional pebble sand CBM (plain tile)
94	N/A	Medieval Abbey Precinct Wall. Limestone ashlar blocks with single chamfered course
TP11		
110	9.73m	Topsoil and turf. Firm dark brown silty sandy clay with abundant roots
111	9.48m	Made ground. Firm to friable dark brown sandy silt with frequent roots and pebbles, and moderate mortar and CBM (brick and plain tile)
112	9.20m	Made ground. Friable mid orange brown sand and gravel with frequent small to medium sized CBM (brick and tile), moderate pebbles and cobbles and occasional mortar flecks, oyster shell, glass and pottery
113	8.73m	Made ground. Same as 93. Friable light to mid grey sand and mortar with moderate pebbles and occasional CBM, plaster and pottery
114	N/A	Medieval Abbey Precinct Wall. Same as 114. Limestone ashlar blocks

Context Number	Depth of deposit (AOD)	Description
TP12		
120	9.31m	Wall footing. Limestone blocks and mortar
121	9.61m	Topsoil and mulch. Soft dark brown silty sandy clay with abundant roots
122	9.31m	Construction cut backfill. Limestone rounded pebbles
123	9.68m	Underpinning. Five courses of bricks with an English garden wall style bond. Bricks measure 200mm x 105mm x 65mm
TP13		
130	8.94m	Topsoil and turf. Firm dark brown sandy silty clay with frequent roots and pebbles
131	8.74m	Made ground. Friable dark brown silty sand with frequent pebbles and CBM (including bricks measuring 200mm x 105mm x 50mm)
132	8.56m	Made ground. Friable mid grey silty sand with frequent mortar and CBM (plain tile, pan tile and brick similar dimensions to above), and moderate limestone fragments
133	8.69m	Concretion. Mortar, limestone and tile fragments
134	N/A	Abbey Precinct Wall. Same as 114. Limestone ashlar blocks
TP14		
140	10.42m	Topsoil and mulch. Soft dark brown silty sandy clay with abundant roots
141	10.02m	Garden soil. Mid grey brown silt with very occasional bone, CBM, and coal
TP15		
150	10.08m	Topsoil and turf. Firm dark brown sandy silty clay with frequent roots
151	9.91m	Made ground. Firm to friable dark to mid brown sandy silt with moderate CBM, pebbles and mortar
152	9.58m	Made ground. Friable mid brown grey silty sand with frequent mortar and occasional limestone fragments
153	9.53m	Surface. Edge set bricks 245mm x 130mm x 45mm and 200 x 105mm x 60mm. Not bonded, clearly reused
154	9.18m	Made ground. Friable mid grey silty sand with frequent small to large CBM (brick and tile) and mortar fragments and occasional limestone fragments
155	N/A	Medieval Abbey Precinct wall. Same as 134. Limestone ashlar blocks with a double chamfered course. The change in angle of slope is similar to that seen in a section of wall further to the north east beyond St Olave's Church

Table 3 Context list

APPENDIX 3 – WRITTEN SCHEME OF INVESTIGATION

Water and Environment Management Framework

Lot 3 – Engineering and Related Services

YORK FMP

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL MONITORING MUSEUM GARDENS

FLOOD CELL B12, SCARBOROUGH BRIDGE TO LENDAL BRIDGE

Document overview

Capita AECOM were commissioned by the Environment Agency in June 2016 to undertake a Flood Management Plan for York. As part of this process a programme of Geotechnical Investigation (GI) for geotechnical purposes is to be carried out. This document is a written scheme of investigation (WSI) for archaeological monitoring of the GI works to be undertaken within the Museum Gardens. It has been produced to support an application for Scheduled Monument Consent for the GI works and to provide a framework and methodology for recording any archaeological remains that may be encountered during the GI works within the Museum Gardens.

Limitations

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The methodology adopted and the sources of information used by AECOM in providing its services are outlined in this Report. The work described in this Report was undertaken between June and September 2016 and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances.

Where assessments of works or costs identified in this Report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

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1. Introduction

The York Flood Management Plan (FMP) is being undertaken in response to the severe flooding experienced between the 26th and 28th December 2015. As part of the FMP, the risk of flooding and the performance of the existing flood defences through York have been reviewed.

For the purposes of the York FMP, ten communities have been identified across York and these communities are further sub-divided on the basis of 'flood cells'. A flood cell is defined as an area where the flood risk can be addressed independently of the areas up- and downstream. The Environment Agency is exploring a range of potential flood management options for each cell. As part of the options assessment process GI will be carried out within each cell.

This WSI has been prepared to support a Scheduled Monument Consent application for GI within flood cell B12, which encompasses the Museum Gardens, a Scheduled Monument and Registered Park and Garden (Figure 1).

GI works shall be undertaken by a Geotechnical Contractor ('the GI Contractor') who will supply suitable plant, equipment and personnel. An Archaeological Contractor ('the Archaeological Contractor') shall be appointed to undertake archaeological monitoring of GI works alongside the GI Contractor, including the supervision of plant operations and reporting on any findings and results.

The WSI for archaeological monitoring of the GI has been prepared by AECOM ('the Consultant') on behalf of the Environment Agency in accordance with the Chartered Institute for Archaeologist Code of Conduct (CIfA, 2014), Standard and Guidance for an Archaeological Watching Brief (CIfA, 2014) and standards and guidance published by Historic England (Appendix 1). The WSI will be agreed with Keith Emerick, Inspector of Ancient Monuments for Historic England. Andy Hammon, Regional Science Advisor for Historic England has been consulted on the approach and methodology set out in this WSI.

1.1 Site location and description

Flood cell B12 is located on the left bank of the Ouse. It is bounded to the west by Marygate, to the north by Bootham and High Petergate, to the east by Museum Street and Duncombe Place and to the south by the River Ouse. The WSI relates to all GI work to be carried out within St Mary's Abbey and St Mary's Abbey Precinct Walls Scheduled Monuments (Figure 2).

Current information indicates that the geology of the site comprises made ground (expected to variously comprise deposits from the landscaping of the Museum Gardens and archaeological deposits of medieval date and potentially earlier) to 2 m below ground level (bgl) underlain by soft alluvium in the western part of site to between 12 m and16 m bgl and glacial till in the eastern part of the site to 16 m bgl. The solid geology of the site comprises Weathered Sherwood Sandstone bedrock. The complex nature of archaeological deposits within the centre of York means that localised variation of these deposits can be expected at the site.

1.2 Designations

The site comprises two Scheduled Monuments:

- St Mary's Abbey (National Heritage List Entry (NHLE) 1004919); and
- St Mary's Abbey precinct walls (NHLE 1004920).

The site lies within the Museum Gardens, a Grade II Registered Park and Garden (NHLE 1000117). The SI will take place in close proximity to the Hospitium, a Grade II* listed building (NHLE 1257129).

1.3 Archaeological and Historical Background

The following summarises the background provided in the Historic England monument listing.

St Mary's Abbey was founded in 1086 when Count Alan Rufus granted St Olave's Church to a community of Benedictine monks. William II made a further grant of land in 1088 during his visit to York, personally laying the foundation stone for the abbey. This second grant established the extent of the Abbey and is thought to mirror the area of a defended annex to the Roman legionary fortress that lay immediately west of the city's defences. The area has also been postulated as the location of the pre-Conquest Earlsburh, the seat of the English Earls that governed York from 954.

Finds of mid- to late 12th century stonework within the abbey grounds suggests that the abbey saw significant building work a short while after this time, although it is unknown whether this was related to damage caused by the fire of 1137. Stonework finds recovered from the abbey grounds include a group of life-sized statues excavated in 1827 that are thought to be the earliest life-sized statues dating to the medieval period in England. These appeared to have been deliberately buried during the rebuilding programme between 1271 and 1294 when the abbey church was constructed.

The earliest sections of the abbey precinct wall are thought to have been constructed around 1266, shortly after the murder of some of the abbey's tenants by people of the city. The wall was extended and fortified following the grant of a licence to crenellate in 1318. It was following this grant that the section of wall, which will be subject to trial pit investigations as

part of the SI, was constructed together with the Water Tower on the bank of the Ouse. This extended the circuit of the walls from the gates of the abbey adjacent to St Olave's Church down to the river.

On 26th November 1539 the abbey was one of the last to surrender to the Crown during the Dissolution. Following this it was retained by the King, being known as Kings Manor. In the latter 16th century the choir and transepts of the abbey church were demolished along with the nave roof. The aisles were retained as two ranges of chambers. By the early 17th century the cloistral buildings were in poor repair and so the former late 15th century abbot's lodging was expanded to form the complex of buildings now known as Kings Manor. During the English Civil War the abbey precinct walls were used as part of the city's defences and in 1644 withstood a 12 week siege by Parliamentarian forces. The walls were breached and unsuccessfully assaulted on 16th June, York surrendering after the Royalist defeat at the Battle of Marston Moor. In the 1660s a commercial plant nursery was established in the ruins of the abbey and supplied plants to many country house estates, developing into somewhat of a tourist attraction of exotic plants and romantic ruins.

The Yorkshire Philosophical Society (YPS) purchased part of the nursery in 1827 together with some of the abbey ruins. They conducted archaeological excavations between 1827 and 1829, and constructed the museum, which opened in 1830. The museum contains the in situ remains of the monastic warming house within its basement. The gardens were developed and expanded through the 19th century intended as a private pleasure ground for members of the YPS. They were designed by Sir John Nasmyth as a scientific and antiquarian garden displaying botanical specimens and the abbey ruins, together with architectural fragments and geological specimens gathered by members of the society. The YPS made significant repairs to the Hospitium in 1828; the Grade II* listed Hospitium was probably built to house lower status guests of the abbey. The floor of the Hospitium dates to the 1300s. In 1961 the YPS gave the museum gardens in trust to the citizens of York. Management of the grounds passed to Askham Bryan College of Agriculture. The museum grounds passed to York City Council in 1996 who leased it to the Yorkshire Museums Trust in 2002.

An area in the south west corner of the gardens was formerly occupied by a swimming pool and a 20th century flood embankment runs between the Hospitium and the southern boundary of the gardens. The presence of the remains of the medieval monastic warming house in the basement of the museum suggests that medieval levels may be some depth below ground level. Contrary to this is the still extant 13th century floor of the Hospitium at present ground level. Given the extensive landscaping that occurred during the creation of the museum gardens during the 19th century it is difficult to infer at what depth medieval and potentially earlier deposits may occur.

Full monument descriptions for St Mary's Abbey (National Heritage List Entry Number 1004919) and St Mary's Abbey precinct walls (National Heritage List Entry Number 1004920) are provided in Appendix 2.

1.4 Scope of work

The GI interventions to be carried out and subject to archaeological monitoring detailed in this WSI are shown on Figure 2 and listed below:

- 8 hand dug trial pits immediately adjacent to St Mary's Abbey precinct wall
- 3 percussion boreholes to the east of St Mary's Abbey Precinct Wall
- 4 hand dug trial pits between the base of the flood embankment and the southern boundary of the Museum Gardens
- 3 window samples within the flood embankment
- 1 percussion borehole within the flood embankment

A standpipe will be inserted into borehole number B12-BH03 in order to facilitate ground water level monitoring.

Some flexibility will need to be maintained in the location of individual GI interventions. If significant archaeological remains are encountered, or in the event that burials are identified in the first instance, the option to move the GI intervention will be considered. It may also be necessary to move GI interventions depending on local ground conditions at the time of the works.

1.5 Aims and Objectives

The aim of the GI is to investigate ground conditions and structural foundations relating to flood defence features within each flood cell, in order to inform the selection of the preferred flood defence option for each cell. The GI interventions also offer the opportunity to investigate the deposit sequence in the southwest corner of the Museum Gardens. The aim of the archaeological monitoring will be to provide an interpretive deposit model for this area of the museum gardens based on information obtained through observation of the GI. Particular objectives of the archaeological monitoring will be as far as is practicable:

- To record the character and foundations of St Mary's Abbey precinct wall.
- To record the character and sequence of the deposits within each GI intervention.
- To assess the potential for deposits to preserve organic remains and palaeo-environmental evidence.
- To retrieve dating evidence for deposits where possible.
- To minimise disturbance to significant archaeological remains if encountered or if this is unavoidable to ensure that the remains are investigated and recorded in a controlled archaeological manner.
- To assess the extent to which construction of the present flood embankment may have affected deposits in the immediate area.
- To assess the extent to which landscaping associated with the setting out of the gardens has affected the preservation and relative depths of earlier archaeological evidence.

2. Methodology

2.1 Fieldwork procedures

All access to the site will be arranged through the GI Contractor. The Archaeological Contractor will adhere to the health and safety requirements of the GI Contractor, undertaking any specific induction required. The Archaeological Contractor will also prepare a risk

assessment and method statement to be submitted to the Archaeological Consultant and the GI Contractor prior to attending the site.

Trial pits will be hand dug by the GI Contractor and typically be 1 x 1 m in plan area and excavated to a maximum depth of 1.2 m bgl. The Archaeological Contractor shall ensure that disturbance to archaeological deposits/features is minimised and that the location of any deposits/features is recorded. Starter pits for the window samples and boreholes will be hand excavated by the GI Contractor. The GI contractor will be responsible for identifying the presence of services and ensuring it is safe to excavate.

The GI Contractor will allow the Archaeological Contractor sufficient time to inspect and record the window sample and borehole cores and arisings on site. The depth of the strata identified in the borehole and window sample cores will be recorded as accurately as is practicable.

The GI Contractor shall provide a suitable and safe position from which the Archaeological Contractor can effectively view the excavation of the trial pits. If archaeological remains are encountered excavation will cease to allow the remains to be assessed and described. It is not proposed that the Archaeological Contractor will enter deep holes. The Archaeological Contractor shall at all times obey the site rules of the GI Contractor.

The Archaeological Contractor will make every reasonable effort to complete any essential hand investigation and recording works without impacting upon the GI programme.

The Archaeological Contractor will not investigate any area beyond GI interventions.

Archaeological recording, where significant archaeological deposits are not present, will consist of:

- limited hand cleaning of archaeological sections and surfaces sufficient to establish the stratigraphic sequence exposed;
- the collection of dating evidence from in situ deposits and visual scanning of spoil heaps for dateable artefacts;
- a scaled drawn record of representative exposed sections and surfaces;
- photographs of exposed deposits within the trial pits, with an appropriate scale, and sufficient further photographs to establish the setting of the groundworks undertaken; and
- a record of the datum (either AOD or m bgl) levels of the archaeological deposits.

The GI Contractor shall provide information regarding the level (above Ordnance Datum) of the top of the ground surface at each hole where archaeological monitoring is required.

The upcast resulting from the investigation of any archaeological remains shall be stored at a safe distance from the trial pit. Where required, appropriate barrier fencing will be supplied by the GI Contractor to secure the worksite, and at the end of the investigation, the GI Contractor shall be responsible for the backfilling and reinstatement of the hole.

The Archaeological Contractor shall record the date, time and duration of all archaeological monitoring site visits until the work is completed.

The Archaeological Contractor shall ensure that all site records and finds are kept secure at all times, conserved and archived to the required standards.

Where no archaeological remains are encountered, a photographic record will be taken of the trial pit and a written description with sketch section will be produced.

If in the professional judgement of the on-site archaeologist significant archaeological deposits are encountered work will cease and the Consultant will be contacted immediately. The Consultant will liaise with the Environment Agency and the Historic England Inspector of Ancient Monuments in order to agree whether the GI intervention will be moved, or where this is not practicable, excavation of the deposits in a controlled archaeological manner (Section 2.2). The decision will be based on the need for geotechnical information from the location of the GI intervention balanced against the apparent significance and complexity of the archaeological remains that would be removed. The Consultant will instruct the GI Contractor to relocate the GI intervention.

2.2 Archaeological excavation and recording of significant archaeological deposits

All archaeological deposits will be excavated and recorded using single context recording and planning.

Plans, sections and elevations will be drawn as appropriate and a comprehensive photographic record will be made where archaeological features are encountered.

Archaeological deposits will be hand drawn at a scale of 1:20. Cross-section of features or trial pits will be drawn to a basic scale of 1:10. All drawings will be related to Ordnance Datum.

Where it aids interpretation, structural remains will also be recorded in elevation.

Each context will be described in full on a pro forma context record sheet in accordance with the accepted context record conventions. Each context will be given a unique number. These field records will be checked and indexes compiled.

Photographs of work in progress and post-excavation of individual and groups of features will be taken. This will include general views of entire features and of details such as sections as considered necessary. The primary photographic archive register will comprise 35mm format black and white prints. Digital photography of not less than 10 megapixels will be used in addition to illustrate the report, but will not form the primary site archive. All site photography will adhere to accepted photographic record guidelines.

Areas which do not contain any archaeological deposits will be photographed and recorded as being archaeologically sterile. The natural stratigraphic sequence within these areas will be recorded.

All finds will be collected and handled following the guidance set out in the CIfA guidance for archaeological materials. Finds of particular interest or fragility will be retrieved as Small Finds, and located on plans. Other finds, finds within the topsoil, and dense/discrete deposits of finds will be collected as Bulk Finds, from discrete contexts, bagged by material type. Any dense/discrete deposits will have their limits defined on the appropriate plan.

All artefacts and ecofacts will be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication First Aid for Finds, and recording systems must be compatible with the recipient museum. All finds that fall within the purview of the Treasure Act (1996) will be reported to HM Coroner according to the procedures outlined in the Act, after discussion with the client and the local authority.

Sampling will be carried out in consultation with the Archaeological Consultant and the Historic England Regional Science Advisor, as appropriate (e.g. dendrochronology, soil micromorphology, monolith samples, C14, etc.).

Sampling for environmental and biological material will take place in accordance with the recommendations contained in the papers Environmental Archaeology and Archaeological Evaluations, Association for Environmental Archaeology (1995) and Environmental Archaeology: A Guide to the Theory and Practice of Methods from Sampling and Recovery to Post -Excavation 2nd Edition (English Heritage 2011).

The sampling programme for significant archaeological deposits shall assess the potential for palaeo-environmental remains across the site in support of the aims of the mitigation. Samples shall be taken as routine from securely stratified deposits irrespective of their apparent 'organic' content as judged in the field or the presence of datable material.

The sampling regime will include samples of the four types of deposit sample described below:

- Bulk-sieved Sample (BS). Sample size will depend upon the context/feature size, but should be up to 40- 60 litres in size (if the context size allows). They are taken for the recovery of charcoal, burnt seeds, bone and artefacts. The samples will be processed (flotation) on site where possible with 1mm and 500micron sieves on a rack to collect the carbonised washover. The retents and flots will then be dried, sorted and assessed to advise the potential for further analysis.
- General Biological Sample (GBA): These are only taken if a deposit is waterlogged. A 10 litre sample size will be used (if the context size allows). These samples will be processed in the laboratory, to recover macrofossils and microscopic remains such as pollen and insects.
- Column monolith: Kubiena tin samples may be taken for soils and pollen analysis and to determine soil accumulation processes.
- Spot samples: these samples are taken as required. they may be contexts or material not suited to sieving, such as caches of seeds, pieces of eggshell or any specific finds of organic material. They may also be specialist samples (e.g. charcoal for radiocarbon dating).

Samples will be taken for scientific dating where necessary for the development of subsequent mitigation strategies. Material removed from site will be stored in appropriate controlled environments.

If industrial activity of any scale is detected, industrial samples and process residues will also be collected. Separate samples (c. 10ml) will be collected for micro-slags (hammer-scale and spherical droplets) (English Heritage 2001).

2.3 Specific Considerations for borehole B12_BH03

The borehole core will be examined in the field by an archaeologist suitably experienced in the deep stratigraphic nature of York's archaeological deposits. If organic deposits are reached environmental samples will be taken where practicable for General Biological Samples and stored for analysis should the flood management option relating to this area of museum gardens be taken forward as the preferred option. Samples will be taken from the borehole cores, a 100mm diameter Shelby Tube will be inserted to recover 2 300mm long Class 1 undisturbed samples in the event that further specialist assessment is required.

A standpipe will be inserted into the borehole, surrounded by gravel and Bentonite surrounds and capped with a lockable cover to facilitate dip-well monitoring in the event that the flood protection in this area becomes the preferred option to take forward. In the event of this flood protection option being taken forward dip-well monitoring will commence 3 months prior to any planning and consent application and be maintained weekly up to three months following completion of the flood defence works.

3. Human Remains

In the event of the discovery of human remains work will cease and the Archaeological Contractor will notify the Archaeological Consultant immediately. The Consultant will liaise with the Environment Agency and City of York Archaeologist in order to agree whether the GI intervention will be moved. In the first instance it should be assumed that in the event that human remains are discovered the GI intervention will be moved to avoid disturbing the remains. In this instance, the remains will be left in situ and the GI intervention backfilled. The Consultant will instruct the GI Contractor to relocate the GI intervention.

The Archaeological Contractor shall provide a detailed methodology for excavation and recording of human remains in the event that this becomes unavoidable.

In the event that excavation of human remains is to proceed the Consultant will arrange to contact H.M. Coroner. The removal of human remains will only take place in accordance with a licence obtained from the Ministry of Justice and under the appropriate Environmental Health regulations and the Burial Act 1857.

4. Treasure

1.1.1 Any artefacts which are recovered that fall within the scope of the Treasure Act 1996 and Treasure (Designation) Order 2002 will be reported to the Archaeological Consultant immediately. The Archaeological Consultant will contact H.M. Coroner, and will ensure that the Treasure regulations are enforced and that all the relevant parties are kept informed. A list of finds that have been collected that fall under the Treasure Act and related legislation will be included in the fieldwork report.

5. Completion of Fieldwork

1.1.2 The Archaeological Contractor shall prepare and submit a Completion Statement to the Consultant within one working day of completing the survey.

1.1.3 The survey areas will be left in a tidy and workman-like condition and the Archaeological Contractor will ensure that all materials brought onto site are removed.

1.1.4 An OASIS entry shall be completed at the end of the fieldwork, irrespective of whether a formal report is required. The Archaeological Contractor will complete the online form at

http://ads.ahds.ac.uk/project/oasis/ within one month following completion of the fieldwork. Archaeological contractors are advised to contact OASIS (oasis@ads.ahds.ac.uk) for technical advice.

6. Reporting

6.1 General

The GI Contractor will submit copies of their exploratory hole logs to the Archaeological Contractor at the earliest opportunity, who will prepare their fieldwork report within four weeks of the completion of GI monitoring. The report will contain:

- a non-technical summary;
- a site location drawing;
- the archaeological and historical background;
- the methodology employed;
- the aims and objectives of the investigations;
- the results of the monitoring and a statement of potential for archaeological remains to exist within the proposed development site;
- a location plan of the GI interventions, including original and relocated Intervention positions, accurately positioned on an Ordnance Survey base map (at an appropriate and recognised scale);
- plans and sections of all trial pits and deposit sequence for each borehole and window sample, illustrating the stratigraphic sequence of deposits and any noted archaeological features or remains (at an appropriate and recognised scale);
- an interpretive deposit model of the site
- where appropriate, a list of all finds recovered and recorded, along with the appropriate trial pit number, context and date;
- where appropriate, a complete list of all finds as submitted as Treasure, if applicable;
- where appropriate, an appendix containing specialist assessment /analysis reports (artefacts; palaeoenvironmental / geoarchaeological data) or their equivalent;
- where appropriate, an appendix illustrating specific finds and portraits of specific features or structures, as appropriate;
- a stratigraphic matrix for each trial pit, if appropriate;
- an assessment /conclusion and a statement of potential with recommendations for post- excavation analysis and publication, if appropriate;
- where appropriate, a statement of the significance of the results in their local, regional and national context cross-referenced, if appropriate, to research frameworks;
- the current and proposed arrangements for long term conservation and archive storage (including details of the accredited repository), if appropriate;
- digital photographs illustrating the site setting, work in progress and archaeological discoveries.

The report will be submitted to the Archaeological Consultant for review. Any comments from the Archaeological Consultant will be addressed and taken into account within a revised final

version. The report will then be submitted to the Inspector for Ancient Monuments for Historic England and the Archaeologist for City of York Council. A digital copy of the report will be provided to the York HER and Historic England.

The copyright of the report and associated images belongs to the Environment Agency

Material copied or cited in reports will be duly acknowledged; all copyright conditions (such as those for Ordnance Survey maps or the National Grid) will be observed.

The Archaeological Contractor will submit a digital version of the finalised report within 2 weeks of the receipt of comments on the draft report.

6.2 Specific Considerations for Borehole B12-BH03

Samples from borehole B12-BH03 will be stored until such time as it is determined whether the flood management option to which this SI intervention relates is to be taken forward as the preferred option. In the event that it will be taken forward as the preferred option then the samples will be processed to establish baseline conditions regarding preservation of organic remains and the quality and condition of the waterlogged remains.

In additional to processing and analysis for general biological material the samples will be assessed using the following techniques:

- Triaxial permeability testing
- Porosity/bulk density/moisture content testing
- Particle size distribution analysis
- Chemical redox potential testing

Samples will only be processed in this way if the flood management option for which that GI intervention relates is to be taken forward as the preferred option unless otherwise instructed by the consultant.

7. Archiving

The Archaeological Contractor will, prior to the start of fieldwork, liaise with the Yorkshire Museum to obtain agreement in principle to accept the documentary, digital and photographic archive for long-term storage. The Archaeological Contractor will be responsible for identifying at the initial project set-up stage any specific requirements or policies of the museum in respect of the archive (for example, the discard policy for retained finds), and for adhering to those requirements.

Any charges levied by the repository for the long term storage of the archive will be met by the Archaeological Contractor.

All finds and coarse-sieved and flotation samples will have been processed and stored under appropriate conditions. The archive will also contain a site matrix, a summary of key findings and descriptions of artefactual and environmental assemblages. Arrangements should be made for the proper cataloguing and storage of the archive during the project life-cycle.

The archive of finds and records generated during the fieldwork will be removed from site at the end of each day and kept secure at all stages of the project until it is deposited in the agreed repository. The archive will be produced to current national standards (refer to Appendix 1).

Prior to deposition of the archive a retention and discard policy for each category of find or sample will be developed in consultation with appropriate specialists. The Archaeological Contractor will agree the retention and discard policy for the archive with the Consultant and the Yorkshire Museum.

The deposition of the archive forms the final stage of this project. The Archaeological Contractor shall provide Consultant with copies of communication with the accredited repository and written confirmation of the deposition of the archive. The Consultant will deal with the transfer of ownership and copyright issues and will inform York City Council once the archive has been transferred to the recipient repository.

8. Health and Safety

1.1.5 The works shall be carried out under The Construction (Design & Management) (CDM) Regulations 2015 with the Archaeological Contractor being part of a wider team under the GI Contractor (whilst on-site). Consequently, the GI Contractor's Health & Safety Plan, Health & Safety Policies and Risk Assessments will be adhered to at all times.

1.1.6 The Archaeological Contractor will have their own Health & Safety Policy as required under the Health and Safety at Work etc. Act 1974. A copy of the Archaeological Contractor's Health & Safety Policy will be submitted to the Archaeological Consultant, who will forward it on to the Employer and the GI Contractor.

1.1.7 The Archaeological Contractor shall prepare a Risk Assessment and Method Statement (RAMS), and a project-specific Health & Safety Plan and submit these to the Archaeological Consultant for approval prior to starting on site. If appropriate, the Method Statement shall be prepared in association with the GI Contractor, taking account of their Environmental Management Procedures and Health & Safety Plan(s).

1.1.8 The Archaeological Contractor will not be permitted to start on site until the GI Contractor has confirmed that the Plan is acceptable for the proposed works. If amendments are required to these reports during the works, the Archaeological Consultant and any other interested party must be provided with the revised document at the earliest opportunity.

1.1.9 The Archaeological Contractor shall follow the instructions of the GI Contractor and will liaise closely with the GI Contractor and comply with their site rules.

1.1.10 All site personnel will familiarise themselves with the following:

- site emergency and evacuation procedures;
- the site's health and safety coordinator;
- the first aider; and
- the location of the nearest hospital and doctor's surgery.

1.1.11 All equipment that is used in the course of the fieldwork must be 'fit for purpose' and be maintained in a sound working condition that complies with all relevant Health and Safety regulations and recommendations.

1.1.12 The RAMS shall include, as appropriate:

- the safe method of working whilst undertaking the archaeological monitoring;

- a resource plan, programme and CVs;
- the Health & Safety Plan and Site-Specific Risk Assessment;
- the Quality Assurance Plan; and
- the procedures for on- and off-site security and Emergency Response Plan (including environmental incidents).

1.1.13 The Archaeological Contractor shall liaise with the GI Contractor and the Consultant to ensure that the archaeological work is undertaken in an organised and professional manner.

1.1.14 All parties shall have full regard for the safety of all personnel on site, including measures to ensure the safety of all.

1.1.15 The GI Contractor shall supply welfare facilities for the archaeologist(s) to make use of as needed.

9. Fieldwork Resources and Limitations

9.1 Resources and timetable

9.1.1 The GI Contractor shall provide the Archaeological Contractor with a timetable for the ground investigations prior to the start of the investigations, and shall provide sufficient notification of the start of each trial pit to allow the Archaeological Contractor time to mobilise.

9.1.2 The on-site archaeologist will be a suitably qualified and experienced in the deep stratigraphic nature of York's archaeological deposits.

9.1.3 The appointed GI contractor will provide all machinery necessary for the boreholes and window samples.

9.1.4 The GI Contractor will be required to facilitate the Archaeological Contractor to carry out the programme of archaeological surveillance during the investigation period by:

- programming the Ground Investigation to include the Archaeological Contractor's requirements for carrying out the programme of archaeological surveillance;
- protecting revealed or discovered archaeological remains to be left in situ to the satisfaction of the Archaeological Contractor. The GI Contractor shall be responsible for providing any protective covering (such as geotextile) as specified by the Archaeological Contractor. The GI Contractor shall be responsible for placing / covering any archaeological features under the direction of the Archaeological Contractor.

9.1.5 The GI Contractor will agree the following with the Consultant and the Archaeological Contractor:

- a programme to ensure that the GI works are carried out under the supervision of the Archaeological Contractor;
- a Method Statement describing how the GI works will be undertaken;
- arrangements to allow the Archaeological Contractor sufficient time to examine, record and remove, if necessary, the revealed and discovered archaeological remains; and
- arrangements to protect archaeological remains to be left in situ.

10. Confidentiality and Publicity

10.1.1 The archaeological works may attract the interest of the public and the press. All communication regarding this project is to be directed through the Consultant. The Archaeological Contractor will refer all inquiries to the Consultant without making any unauthorised statements or comments.

10.1.2 The Archaeological Contractor will not disseminate information or images associated with the project for publicity or information purposes without the prior written consent of the Consultant and the Environment Agency.

11. Access Arrangements

11.1.1 Access to the site is restricted to authorised personnel only.

11.1.2 Access for the archaeological monitoring will be arranged and organised through the GI Contractor.

11.1.3 The location of welfare facilities, site offices and first aiders, will be communicated to the on-site archaeologist by the GI Contractor on first arrival on site, through site induction procedures.

12. General Provisions

12.1.1 The Archaeological Contractor will undertake the works according to this WSI and any subsequent written variations. No variation from or changes to the WSI will otherwise occur.

12.1.2 All communications on archaeological matters will be directed through the Archaeological Consultant.

12.1.3 The Archaeological Contractor shall make the minimum of disturbance during the survey and will avoid any unnecessary damage.

Appendix 1

Relevant Legislation, and Standards and Guidance

Ancient Monuments and Archaeological Areas Act (1979) (as amended). 1979 c. 46. http://www.legislation.gov.uk/ukpga/1979/46

Burial Act 1857. 1857 c. 81 http://www.legislation.gov.uk/ukpga/Vict/20-21/81/contents

Dealing with Cultural Objects (Offences) Act 2003. 2003 c. 27. http://www.legislation.gov.uk/ukpga/2003/27/contents

The Construction (Design and Management) Regulations 2015. 2015 No. 51. http://www.legislation.gov.uk/uksi/2015/51/contents/made

AAF 2007 Archaeological Archives. A guide to best practice in creation, compilation, transfer and curation. Archaeological Archives Forum

AEA, 1995, Environmental Archaeology and Archaeological Evaluations. Recommendations concerning the environmental archaeology component of archaeological evaluations in England. Working Papers of the Association for Environmental Archaeology No 2

AML 1994 A Strategy for the Care and Investigation of Finds. Ancient Monuments Laboratory, English Heritage

Brown, A and Perrin, K 2000 A Model for the Description of Archaeological Archives. Information Management & Collections. English Heritage Centre for Archaeology/Institute of Field Archaeologists, Reading http://www.eng-h.gov.uk/archives/archdesc.pdf

Brown, DH 2011 Safeguarding Archaeological Information. Procedures for minimising risk to undeposited archaeological archives. English Heritage https://www.historicengland.org.uk/images- books/publications/safeguarding-archaeological-information/

Brown, DH 2011 Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation. 2nd edition. Institute of Field Archaeologists/Archaeological Archives Forum (Reading) http://www.archaeologyuk.org/archives/aaf_archaeological_archives_2011.pdf

CIfA 2014 Code of Conduct. Chartered Institute for Archaeologists, Reading, December 2014 http://www.archaeologists.net/sites/default/files/node-files/CodesofConduct.pdf

CIfA 2014 Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives. Chartered Institute for Archaeologists, Reading, December 2014 http://www.archaeologists.net/sites/default/files/node-files/CIFAS&GArchives_0.pdf

CIfA 2014 Standard and guidance for the collection, documentation, conservation and research of archaeological materials. Chartered Institute for Archaeologists, Reading, December 2014 http://www.archaeologists.net/sites/default/files/node-files/CIfAS&GFinds.pdf

CIfA 2014 Standard and guidance for commissioning work on, or providing consultancy advice on, archaeology and the historic environment. Chartered Institute for Archaeologists, Reading, December 2014 http://www.archaeologists.net/sites/default/files/node-files/CIfAS&GCommissioning.pdf

CIfA 2014 Standard and guidance. Archaeological watching brief. Chartered Institute for Archaeologists, Reading, December 2014 http://www.archaeologists.net/sites/default/files/node- files/CIfAS&GWatchingbrief.pdf

CIfA 2014 Standard and guidance. Appendices. Chartered Institute for Archaeologists, Reading, December 2014 http://www.archaeologists.net/sites/default/files/node-files/CIfAS&GAppendices.pdf

DCMS 2008 Treasure Act 1996 Code of Practice (2nd Revision) England and Wales. https://www.gov.uk/government/publications/treasure-act-1996-code-of-practice-2nd-revision-england- and-wales

English Heritage 1995 A Strategy for the Care and Investigation of Finds. English Heritage Ancient Monuments Laboratory, London

English Heritage 2011 Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation. Second edition. English Heritage

Centre for Archaeology Guidelines, London https://www.historicengland.org.uk/images-books/publications/environmental- archaeology-2nd/

English Heritage 2012 MIDAS: the UK Historic Environment Data Standard Version 1.1. Best practice guidelines. Forum on Information Standards in Heritage (FISH) http://heritage-standards.org.uk/wp- content/uploads/2015/10/MIDAS_Heritage_2012_update-_v5.doc

FAME 2006 Health and Safety in Field Archaeology Manual. Federation of Archaeological Managers and Employers

Ferguson, L and Murray, D 1997 Archaeological Documentary Archives. IFA Professional Practice Paper 1, Institute of Field Archaeologists, Reading

Historic England 2015 Geoarchaeology. Using earth sciences to understand the archaeological record. English Heritage, London https://historicengland.org.uk/images-books/publications/geoarchaeology- earth-sciences-to-understand-archaeological-record/

Historic England 2016 Preserving Archaeological Remains: Decision-taking for sites under development. Historic England, London https://historicengland.org.uk/images-books/publications/gpa2-managing- significance-in-decision-taking/

Owen, J 1995 Towards an Accessible Archaeological Archive. The Transfer of archaeological archives to museums. Guidelines for use in England, Northern Ireland, Scotland and Wales. Society of Museum Archaeologists http://www.socmusarch.org.uk/docs/towardsaccessiblearchive.pdf

SMA 1997 Selection, Retention, Dispersal of Archaeological Finds. Guidelines for use in England, Wales and Northern Ireland (Revised). Society of Museum Archaeologists http://www.socmusarch.org.uk/docs/selectionretentiondispersalofcollections1.pdf

UKIC 1983 Packaging and Storage of Freshly Excavated Artefacts from Archaeological Sites. (United Kingdom Institute for Conservation, Conservation Guidelines No 2)

UKIC 1984 Environmental Standards for Permanent Storage of Excavated material from Archaeological Sites. (United Kingdom Institute for Conservation, Conservation Guidelines No 3)

UKIC 1990 Guidance for Conservation Practice. United Kingdom Institute for Conservation

UKIC 1990 Guidelines for the Preparation of Excavation Archives for Long-term Storage. United Kingdom Institute for Conservation Archaeology Section

UKIC 2001 Excavated Artefacts and Conservation. (United Kingdom Institute for Conservation, Conservation Guidelines No 1, revised)

Watkinson, DE and Neal, V 2001 First Aid for Finds. RESCUE/United Kingdom Institute for Conservation

Appendix 2 Scheduled Monument listing descriptions

Historic England

St Mary's Abbey

List Entry Summary

This monument is scheduled under the Ancient Monuments and Archaeological Areas Act 1979 as amended as it appears to the Secretary of State to be of national importance. This entry is a copy, the original is held by the Department for Culture, Media and Sport.

Name: St Mary's Abbey

List entry Number: 1004919

Location

Yorkshire Museum, Museum Gardens, Museum Street, York, YO1 7FR The monument may lie within the boundary of more than one authority.

County:

District: York

District Type: Unitary Authority

Parish: Non Civil Parish

National Park: Not applicable to this List entry.

Grade: Not applicable to this List entry.

Date first scheduled: 19-Apr-1915

Date of most recent amendment: 18-Dec-2014

Legacy System Information

The contents of this record have been generated from a legacy data system. Legacy System: RSM - OCN

UID: YO 12

Asset Groupings

This list entry does not comprise part of an Asset Grouping. Asset Groupings are not part of the official record but are added later for information.

List entry Description

Summary of Monument

Benedictine monastery founded in 1086 which was surrendered to the Crown to form the Kings Manor in 1539, being the seat of government for northern England for the next 200 years. Developed as an early tourist attraction in the C18, the abbey formed the basis of a pioneering museum established in the early C19 by the Yorkshire Philosophical Society: managed by the Yorkshire Museums Trust since 2002 as a public park.

Reasons for Designation

St Mary's Abbey is scheduled for the following principal reasons:

* Architectural: the ruins of the abbey and other structures such as gateways and the Hospitium represent very significant survivals of medieval monastic architecture;

* Historical: from its foundation in the eleventh century St Mary's Abbey remained one of the most prominent and wealthy monasteries in England until its Dissolution in 1539;

* Archaeological potential: the site retains buried remains which have the potential to increase our knowledge and understanding of the abbey, its precinct, and of other sites of this type.

History

St Mary's Abbey was founded in circa 1086 when Count Alan Rufus granted St Olave's Church (adjacent to the abbey church, Grade I Listed, but not included in the scheduling) to a community of Benedictine monks which had been trying to re-establish the monastery at Lastingham on the North York Moors. In 1088 William II visited York and made a further grant of land adjacent to St Olave's, personally laying the foundation stone for a new abbey church. This royal grant established the extent of the monastic precinct which is thought to fossilise the extent of a defended annex to the Roman legionary fortress lying immediately outside the western defences of the city. It is suggested that this was the pre-Conquest Earlsburh: the seat of the English earls who governed York from 954, and that by strengthening the foundation of a Norman monastery, William tightened his control over the city in the second year of his reign, at a time when he faced widespread unrest. St Mary's Abbey prospered under royal patronage, expanding rapidly through the C12, establishing a number of dependant cells across Cumbria, Yorkshire and Lincolnshire, even with some property as far away as East Anglia. It was also involved in the origin of Fountains Abbey. A community of 13 monks broke away from St Mary's to establish a new foundation at what is now known as Fountains Abbey, Ripon, in the hope of living a poorer and stricter rule. It is not known if St Mary's escaped the fire that swept through York in 1137, although finds of large quantities of mid to late C12 sculptural stonework suggests that the abbey did see significant building work soon after the fire. This stonework includes a remarkable group of life-sized statues which were excavated in 1827 and are thought to be the earliest examples of life-sized statues dating to the medieval period in England. These were deliberately buried, perhaps during the course of an ambitious rebuilding programme in the late C13 when the church was completely reconstructed. The new abbey church was built between 1271 and 1294 to the design of Simon of Pabenham who is thought to have been a relative of the assistant architect of the same name who oversaw the construction of the Angel Choir at Lincoln Cathedral in the 1260s. The earliest sections of the precinct wall are thought to date to 1266 (built shortly after the murder of some of the abbey's tenants by people from the city), but the circuit was extended and fortified after the grant of a licence to crenellate in 1318. The precinct walls are scheduled as a separate item (see NHLE 1004920). Relationships between St Mary's and the city were not always cordial, for instance the abbey was blockaded in 1343 and 1350, but generally the abbey was a significant contributor to the medieval city, with the abbot also having a role in national affairs, regularly attending parliament in the later Middle Ages with a seat in the House of Lords. By the time of the Dissolution, St Mary’s was the richest abbey in the north with an annual income in excess

of £2000 a year. The abbey was one of the last in the country to be dissolved with the last abbot, William Thornton surrendering St Mary's to the Crown on 26 November 1539.

Following the Dissolution, St Mary's Abbey was retained by the King, being known as the Kings Manor, becoming the headquarters of the "Kings Council of the Northern Parts" governing northern England. When Henry VIII visited York in 1541 he stayed in the hastily converted buildings around the cloister. Later in the C16, the choir and transepts of the abbey church were demolished along with the nave roof; the side aisles being retained as two ranges of chambers. By the early C17, the cloistral buildings were in poor repair and so the former late C15 abbot's lodging was greatly expanded to form the complex of buildings that are now called the Kings Manor (which lie mainly outside the area of the scheduling, being Listed Grade I). The Kings Manor remained a seat of government and occasional royal residence up until the English Civil War when the precinct walls were re-used as part of the city's defences. These withstood a 12-week siege by Parliamentarian forces in 1644, the precinct being breached, but unsuccessfully assaulted, on 16 June, York only surrendering after the Royalist defeat at the Battle of Marston Moor on 2 July.

In the 1660s a commercial plant nursery was established amongst the ruins of the medieval abbey. Flourishing through into the C19, this nursery supplied plants to many country house estates but also developed into a tourist attraction of exotic plants and romantic ruins. In 1827 the Yorkshire Philosophical Society (YPS) purchased part of the nursery and some of the abbey ruins, conducting archaeological excavations in 1827-29 and constructing a museum which opened in 1830. This Grade I-listed neo- classical building by William Wilkins was one of the country's first purpose-built museums and contains the in situ remains of the monastic warming house in its basement. The museum and gardens were developed and expanded through the C19. The gardens, designed in 1844 by Sir John Nasmyth (Registered Grade II), were originally intended as private pleasure grounds for the learned members of the YPS: designed as a scientific and antiquarian garden, along with displaying botanical specimens and the abbey ruins, they also included architectural fragments and geological specimens gathered by members of the society. Along with reconstruction work of the Hospitium (included in the scheduling and Listed Grade II*), a number of new buildings were also constructed such as the Observatory of 1832, for many years housing the largest refracting telescope in the world (Listed Grade II). Excavations in the early C20 uncovered further remains including the ruins of the vestibule to the chapter house which were preserved in situ as a museum display in the basement of the Tempest Anderson Hall (part of the Grade I-listed museum) built in 1912.

In 1961 the YPS gave the museum and gardens in trust to the citizens of York. Management of the grounds passed to Askham Bryan College of Agriculture which oversaw a number of changes to the planting and restorations of various buildings. The museum and grounds passed to York City Council in 1996 who leased it to the Yorkshire Museums Trust in 2002.

Designation History: Around two thirds of the precinct of St Mary's Abbey was scheduled in 1915. This is thought to have been the area that was in the ownership of the YPS, including the ruins of the abbey church and the Hospitium which were Listed Grade I and II* respectively in 1954. St Mary's precinct walls were part of the original scheduling but this designation was confirmed in 1922 following a query from the Corporation of York who had taken over responsibility for the walls in 1918-19. These were listed Grade I in 1954 and are now

separately scheduled. Areas of the monastic precinct not part of either scheduling include: the Church of St Olave with its churchyard (listed Grade I); St Mary's Lodge (listed Grade I); a rectangular area in the south western corner formerly occupied by a C19 swimming baths (included in the Registered Garden); and the north-eastern quarter of the precinct partly occupied by the Grade I-listed Kings Manor, and the Grade II-listed City Art Gallery and Headmaster's House. Two abutting areas to the east were also designated in 1922 as part of the scheduling for York City Walls, this designation also including remains of St Leonard's Hospital. Within the area of the scheduling for St Mary's there are three additional listings, all at Grade II: the Observatory (in 1972); the Railings and gates forming south-west boundary of Museum Gardens (in 1973); and the Drinking Fountain (on Museum Street, in 1983). In 1984, Museum Gardens was added to the Register of Historic Parks and Gardens at Grade II.

Details

The monument forms the greater part of the public park (Museum Gardens) with the Yorkshire Museum to its centre. Like most of the medieval churches of York (with the exception of the Minster), St Mary's Abbey church is aligned north east-south west, apparently following the alignment of the Roman legionary fortress rather than being more conventionally east-west.

The ruins of the abbey church lie to the north west of the museum building which is built over the eastern cloistral range, with the vestibule to the chapter house and other standing remains being preserved in situ as museum displays in the basement. Almost the full footprint of the C13 abbey church is exposed, mainly as base courses; the higher standing remains being concentrated around the northern aisle of the nave. These remains include the north western pier of the central crossing (which stands up to the springing point of the vault); the eight bay northern aisle side wall standing to the crowns of its main windows; and the western front including the northern jambs to the west door and great west window above, with a lower fragment of the southern side of the west front also still standing. An arched opening through the aisle wall provides a view of the Grade II Listed table tomb of one of the founders of the museum: the artist William Etty, died 1849.

The medieval abbey originally had two main gateways into the precinct, ruins of which are included in the scheduling. The abbey's principal gateway faced away from the city and was at the west end of St Olave's Church, straddling the line of a Roman road which led to the bridge over the Ouse. The gateway arch survives spanning between fragments of the gatehouse attached to St Olave's Church and St Mary's Lodge. The lodge, circa 1470 and Listed Grade I, was built to house important guests to the abbey.

Guests of lower status are thought to have been accommodated in the Hospitium which is sited next to the ruins of the abbey's secondary gate, the Watergate, which provided direct access to the river. The Hospitium (Grade II* Listed and included in the scheduling) is a large, two storey building with a stone built ground floor and timber framed upper floor, mainly dating to circa 1300, but altered by restorations in 1840 and the 1930s. In 1497 a third major gateway was constructed, known as Queen Margaret's Arch, this is close to Bootham Bar and is included in the scheduling for the precinct walls. The entrance to Museum Gardens from Museum Street is modern.

The ruins within the basement of the museum and those of the exposed northern side of the cloister show that the modern ground surface is generally higher than the medieval ground surface. However there has been extensive landscaping so that there is no clear relationship between the modern ground surface and underlying medieval surfaces. Buried remains of the southern and western cloistral buildings as well as those of the outer court (auxiliary buildings such as barns, bake and brew houses) are less well understood but are considered to survive beneath the lawns and other planting between the museum and the river. The scheduling extends beyond the abbey's riverside wall to the southern boundary of Museum Gardens. This area is expected to include buried remains of medieval and earlier waterfront structures and associated waterlogged deposits. The scheduling also extends beyond the line of the precinct wall on the eastern side to include the intramural ditch and the outer rampart of the City Wall to abut the separately scheduled area for the City Wall. The scheduling further includes the southern courtyard of what is now known as The Kings Manor. This area is not part of Museum Gardens, but includes the buried remains of the chapter house. The northern part of the Kings Manor is not included in the scheduling, nor is the northern quarter of the precinct. The use of this northern area in the medieval and early post-medieval periods is poorly understood.

Throughout Museum Gardens there are numerous fragments of medieval architectural stonework used as path and border edging or rockery stone. Although much originates from St Mary's, some is thought to have been collected from excavations of other sites across Yorkshire and beyond. Just south of the museum building there is a very good example of a prehistoric cup and ring marked rock which is also thought to have been an archaeological find from elsewhere. At least some items placed about the grounds, such as Roman stone coffins near to the Museum Street entrance, are more recent introductions.

Exclusions: Modern road and path surfaces, and items of street and park furniture such as fencing, gates, benches and litter bins are excluded from the scheduling, although the ground beneath is included. The Hospitium and all sections of ruined medieval walling, including that attached to roofed buildings and that within the basement of the Yorkshire Museum, are included within the scheduling. The roofed buildings of the Yorkshire Museum (including the Tempest Anderson Hall), the Observatory and that part of the Kings Manor which lies within the area of the monument, are excluded from the scheduling (but remain designated via Listing), although the ground beneath remains included in the scheduling.

Selected Sources

Books and journals

An Inventory of the City of York II Defences, (1972)

An Inventory of the City of York V Central, (1981)

Christopher Wilson, Janet Burton. St Mary's Abbey York, (1988)

National Grid Reference: SE 59917 52086

Historic England

St Mary's Abbey precinct walls

List Entry Summary

This monument is scheduled under the Ancient Monuments and Archaeological Areas Act 1979 as amended as it appears to the Secretary of State to be of national importance. This entry is a copy, the original is held by the Department for Culture, Media and Sport.

Name: St Mary's Abbey precinct walls List entry Number: 1004920

Location

Precinct walls and associated towers extending along Marygate and Bootham, York. The monument may lie within the boundary of more than one authority.

County:

District: York

District Type: Unitary Authority

Parish: Non Civil Parish

National Park: Not applicable to this List entry.

Grade: Not applicable to this List entry.

Date first scheduled: 19-Apr-1915

Date of most recent amendment: 18-Dec-2014

Legacy System Information

The contents of this record have been generated from a legacy data system. Legacy System: RSM - OCN

UID: YO 12 A

Asset Groupings

This list entry does not comprise part of an Asset Grouping. Asset Groupings are not part of the official record but are added later for information.

List entry Description

Summary of Monument

Medieval defences defining the precinct boundary to the north and west sides of St Mary's Abbey, York. See separate, abutting scheduling for St Mary's Abbey (NHLE 100419) which also includes other parts of the precinct boundary.

Reasons for Designation

The medieval defences defining the precinct boundary to the north and west sides of St Mary's Abbey, York, are scheduled for the following principal reasons:

* Architectural: the precinct walls represent a very significant survival of medieval monastic architecture;
* Historical: from its foundation in the eleventh century St Mary's Abbey remained one of the most prominent and wealthy monasteries in England until its Dissolution in 1539;
* Archaeological potential: the wall, towers and ground beneath them retain material which has the potential to increase our knowledge and understanding of the abbey, its precinct, and of other sites of this type.

History

St Mary's Abbey was founded in circa 1086 when Count Alan Rufus granted St Olave's Church (on the line of the defences, Grade I listed, but not included in the scheduling) to a community of Benedictine monks which had been trying to re-establish the monastery at Lastingham on the North York Moors. In 1088 William II visited York and made a further grant of land adjacent to St Olave's, personally laying the foundation stone for a new abbey church. This royal grant established the extent of the monastic precinct which is thought to fossilise the extent of a defended annex to the Roman legionary fortress lying immediately outside the western defences of the city. It is suggested that this was the pre-Conquest Earlsburh: the seat of the English earls who governed York from 954.

It is presumed that the abbey had some form of boundary marking the extent of the precinct soon after its establishment, but it is not known what form this took. The earliest sections of the surviving precinct walls are thought to date to 1266, being built following the murder of some of the abbey's tenants by people from the city in 1262. This took the form of a wall built of magnesian limestone ashlar rising to over 3m, providing a measure of security, but falling short of being fully defensive. This wall is thought to have only enclosed the north-eastern part of the precinct, extending northwards from St Olave's along Marygate and then eastwards along Bootham.

In 1318 (during a period of Scottish incursions following the English defeat at Bannockburn in 1314) the abbey was granted a licence to crenellate, resulting in extension and fortification of the walls to form a defensive circuit immediately outside the defences of the city. The earlier wall was heightened by a further 2m and crenellated, with half-round interval towers also being constructed. The circuit was also extended with a new wall linking the main gatehouse by St Olave's to the river. As part of this work, two large round towers were built in circa 1324, St Mary's Tower (at the corner of Bootham and Marygate) and the Water Tower at the southern end of the Marygate wall, on the Ouse riverbank. A wall was also constructed along the eastern side of the precinct, facing the higher city wall across an intramural ditch. A surviving section of this wall (Grade I listed, but not included in the scheduling) extends north-eastwards of the Kings Manor, on the eastern side of a driveway. Buried remains of the rest of the circuit are also not included, although parts are included within the scheduling of St Mary's Abbey.

In 1497 a postern gate defended by a rectangular tower was constructed in the north-eastern corner of the precinct to allow more direct access into the city via Bootham Bar. The pretext

for its construction was a proposed visit to the abbey by Henry VII, but it is named Queen Margaret's Arch after his eldest daughter who visited York en route north to become the bride of James IV of Scotland.

St Mary's Abbey was one of the last monasteries to be dissolved, being surrendered to the Crown on 26 November 1539. It was retained by Henry VIII, becoming the Kings Manor, used as the headquarters of the "King's Council of the Northern Parts" governing northern England. The Kings Manor remained a seat of government and occasional royal residence up until the English Civil War when the precinct walls were re-used as part of the city's defences. These withstood a 12-week siege by Parliamentarian forces in 1644, the precinct being breached, but unsuccessfully assaulted on the 16 June. This assault resulted in the partial destruction of St Mary's Tower which was subsequently repaired.

From 1827, much of the abbey precinct was purchased by the Yorkshire Philosophical Society and turned into a museum and pleasure grounds. The society undertook restoration work of the standing walls, including the demolition of a number of properties that had been built up along the outside face of the precinct walls. Pedestrian arches were also inserted (circa 1836) besides Queen Margaret's Arch and the Water Tower.

Designation History: The precinct walls and towers along Marygate and Bootham were included along with about two-thirds of St Mary's Abbey precinct as a single scheduled monument in 1915. The scheduling of the precinct walls was confirmed in 1922 following a query from the Corporation of York which had by this time taken over responsibility for the walls. This confirmation led to the precinct walls being treated as a separate, but related, scheduled monument. These scheduled walls were listed Grade I in 1954.

Details

The monument is divided into two scheduled areas: extending along the precinct boundary from Queen Margaret's Arch, via St Mary's Tower, as far as the north side of 29 Marygate; and secondly from St Mary's Lodge to the Water Tower. Both these scheduled areas abut the larger scheduled area for St Mary's Abbey, this latter scheduling including the gatehouse adjacent to St Olave's on Marygate.

Most of the walls and towers within the scheduling are thought to survive to about their full height, with C19 and later restoration and areas of rebuilding. The post-1318 heightening of the earlier wall is marked by a clear horizontal break internally because the later work is slightly thinner, with the off-set for the thicker, lower wall thought to have formed part of the support for a timber wall-walk. There is also a slight change in stonework, with the later walling generally employing larger blocks of a slightly lighter colour. Unrestored crenellations retain L-shaped slots in the reveals to the embrasures, indicating that these were originally closed by timber shutters. Arrow slits within towers and through some of the merlons of the battlements are generally cruciform, with widely splayed internal reveals.

The Postern Tower, built 1497, is rectangular, extending beyond the outer face of the wall. This is brick built, faced in ashlar, originally of two storeys but with the upper floor divided to provide a third storey probably in the C17. The hipped roof is also thought to be C17. Extending to its south east is a section of wall just over 9m long which stands to full height which is pierced by Queen Margaret's Arch and a much smaller C19 pedestrian entrance. The

broken eastern end of this wall is just short of where it is thought to have turned south-west (to be continued by the unscheduled but Grade I-listed length of wall north-east of Kings Manor). Between the Postern Tower and St Mary's Tower about 130m to the north-west, the wall also stands complete, topped by battlements and retaining two interval towers (Towers D and E).

However, for much of this length, the wall forms the rear of three terraces of C18 and C19 buildings. These buildings extend beyond the area of scheduling, but include two Grade II Listings (8 and 10 Bootham and 40 Bootham). The interval towers are of similar design and size, being half-round externally, semi-hexagonal internally, with an open back which projects beyond the inner face of the flanking wall.

St Mary's Tower is circular externally, hexagonal internally, of two storeys with a C19 conical roof. Much of the northern half of the building is a C17 rebuild following the partial demolition of the tower in the siege of 1644: the ragged boundary between the two builds being particularly clear on the side facing Bootham. The wall continues just over 140m between St Mary's Tower and 29 Marygate. About halfway along this length there is an open backed, rectangular interval tower (Tower C) which retains a possible door-jamb of a blocked postern doorway. Adjacent to this tower there is a C20 vehicle entrance that is cut through the wall. The southern end of this section of precinct wall (and the southern end of the first area of scheduling) forms part of 29 Marygate: an C18 house that is listed Grade II* and extends beyond the boundary of the monument, also incorporating further medieval remains.

The principal medieval entrance to St Mary's Abbey, the gatehouse immediately to the south-west of St Olave's Church, is not included in this scheduling but is included in the separately scheduled area for the rest of the Abbey. The adjacent Grade I-listed St Mary's Lodge is also not included. This monument's second area of scheduling includes the precinct wall which extends from St Mary's Lodge, south-west to end at the Water Tower on the Ouse riverbank. This section of wall was originally built after 1318, but various sections are C19 rebuilds or alterations. The wall includes two, small, semi-circular interval towers, the northern (Tower B) being a C19 rebuild of the original demolished in circa 1700, the wall to the north standing to full height, that to the south being lower with no crenellations. Just south of the southern interval tower (Tower A) there is a blocked postern doorway. The wall terminates to the south at the Water Tower. This is circular externally, hexagonal internally, now appearing to be single storied because of the embankment of the river. The parapet is much reduced, but was formally battlemented.

There is evidence that the tower was connected to a wall running eastwards along the river, possibly forming part of a quay. The medieval style archway through the wall north of the tower is C19, created as part of a riverside walk.

Selected Sources

Books and journals

An Inventory of the City of York II Defences, (1972), 160-173

National Grid Reference: SE 59994 52330

APPENDIX 4 – THE CERAMIC BUILDING MATERIAL

BY J. M. MCCOMISH

June 2018

INTRODUCTION

This assessment relates to 825g of ceramic building material (CBM) recovered from archaeological boreholes on flood defence works (York Archaeological Trust project code 6008). The CBM ranged in date from Roman to medieval.

METHODOLOGY

The collection was recorded to a standard YAT methodology (McComish 2014) whereby each sherd is individually recorded on a pro-forma sheet which details the project code, the context number, the weight in grams, the fabric type, the surviving complete dimensions (length, width, thickness, flange height) and any other relevant information (surface marks, glazes, unusual features etc.). A question mark is placed after the form name if the identification is uncertain, for example 'Imbrex?', while the form of non-standardised sherds is listed as 'Other'. The fabric is determined by comparing the sherd to a York fabric reference collection held by York Archaeological Trust (YAT). The data is stored on YATs internal computer system (IADB) under the project code 6008.

Because IADB does not allow entry of context numbers containing decimal points context 12.405 was entered as 12405 and 12.4004 was entered as 124004.

RESULTS

The various forms present are summarised in relation to context on Table 3. The material was all roofing tile of 13th-16th century date comprising three sherds of plain roof tile and one of ridge tile. All of the forms, fabrics and of dimensions recorded are typical for CBM in York as a whole.

SUMMARY AND RECOMMENDATIONS

The collection of CBM has no potential for further research, mainly being of use to provide dating evidence for the various contexts seen. No further work is recommended. None of the material was worthy of museum display or retention.

Context	Dating	Forms present
12.405	13-16th	Plain
12.4004	13-16th	Plain, Ridge

Table 4 CBM in relation to context

APPENDIX 5 – THE ANIMAL BONE

BY NIENKE VAN DOORN

INTRODUCTION

Bore holes on the York FRMP SI Works site have produced a small assemblage of hand collected animal bone. These animal bones were recovered from two contexts. This assemblage has been rapidly assessed focussing primarily on the range of animal taxa present.

METHODOLOGY

The faunal remains were examined and recorded with guidance from Dobney et al. (1999) and O'Connor (2008). Evidence of butchery, gnawing, burning or post depositional damage was recorded where present, with reference to Shipman et al. (1984) and Stiner et al. (1995).

Identification of species was completed using published identification guides (Pales & Lambert 1971). Wherever identification to species could not be achieved, bone fragments were classified using the following categories; unidentified mammal, unidentified bird, or unidentified fish. Mammalian fragments that retained characteristics that enabled estimation of the size of the animal were assigned to one or more of the following categories: large mammal (the size of horse/cow/large cervid [i.e. deer]), medium mammal 1 (the size of sheep/goat/pig/small cervid), medium mammal 2 (the size of dog/cat/hare), small mammal (the size of rodents, mustelidae (badger/otter/polecat family) etc). Very small bone scraps (usually smaller than 10mm) were recorded as unidentifiable and only counted approximately.

DISCUSSION

The results are outlined in table 4.

CONTEXT	QUANTITY AND DESCRIPTION	TAPHONOMY
B12 405	1 fragment of horse tibia (distal)	Light to medium colour, fair preservation
B12 4004	4 fragments of large mammalian bone, probably cattle shoulder and rib. 4 fragments of medium (1) mammalian bone, probably sheep rib. 2 fragments of medium (1) mammalian long bone.	Very light colour, fair condition

Table 5 Animal Bone

CONCLUSION

The animal bone recovered from York FRMP SI Works contained mostly mammalian bone, and consists of domestic taxa such as cattle and sheep.

Most of the assemblage seems to be consistent with undifferentiated domestic refuse. The preservation of the bones was overall fair, but no complete elements were present.

RECOMMENDATIONS FOR FURTHER RESEARCH

The collection of animal bone has limited potential for further research. The animal bone does not reflect any specific activity taking place on the site and while in a fair condition, all elements are incomplete or fragmented.

RECOMMENDATIONS FOR RETENTION/DISCARD

It is recommended that the animal bone collection is discarded after recording according to museum disposal guidelines.

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Stiner, M. C.; Kuhn,S. L.; Weiner, S.; Bar-Yosef, O. 1995. 'Differential burning, recrystallisation, and fragmentation of archaeological bone', *Journal of Archaeological Science* 22, pp.223-227.

APPENDIX 6 – THE POTTERY

BY ANNE JENNER

INTRODUCTION

Nine sherds of domestic pottery were retrieved from five contexts (see Table 6 below). While they represent activity in the medieval and later post medieval periods, they have been retrieved from areas next to the river Ouse where they are most likely to have been part of land management and dumping of refuse.

There are no late 14th/15th century Humber or Hambleton wares, no 16th century Cistercian wares and no 17th and early 18th century earthen wares, tin glazed, slipped or stone wares. Added to this, there are no foreign imports, such as medieval glazed wares from France, or any Dutch earthen wares or German stone wares that one finds in York from the late 14th century, peaking in the 16th century and continuing to be imported during the 17th and 18th centuries and beyond.

Although there appears to be a lack of any late 14th to 17th century pottery that one might expect to find at contemporary locations in York, the samples are too small to make really meaningful assumptions about the activity during the periods that they represent.

Despite this, the pottery sherds were taken from two distinct areas; within the St Mary's Abbey precinct and deposits built up against the exterior Abbey walls. The wares from each of these areas form two distinct period groups; medieval and late post medieval respectively. One would however, assume that each of these areas has been occupied or traversed regularly up to the present day and that it is merely the sample size which has led to these differences.

Further work in these areas may produce more evidence for activity during the Anglo Scandinavian, medieval and early post medieval periods.

METHODOLOGY

The pottery was quantified and recorded in the standard manner (see Orton, Tyers and Vince 1993, 166; Orton and Hughes 2013, 11). It was sorted into fabric and form groups, based on colour, firing, clay matrix, inclusions and glaze type. Where possible these groups are related to known types from the area. The number of sherds is noted in the Table below.

Although it is generally agreed that weight and number of sherds provide the most useful index of quantity (Brooks 1987, 116), we use only the sherd count for Assessment purposes.

DISCUSSION

Medieval

The medieval period is represented by 12th to early 14th century jugs from bore holes in the St Mary's Abbey area. Sherds include York white ware (C12.2005; see Mainman and Jenner 2013, 1224) and a reduced ware which may have its origin in the North-East (C12.4004). There is no evidence of jars or cooking pots. The hiatus during the later medieval and early post medieval periods has been noted above.

Post medieval

The post medieval period is mostly represented by late 18th, 19th and potentially later material, as mentioned above. There is also no evidence of Black glazed wares which are relatively common in 18th century contexts in York.

Post medieval material includes white wares and transfer printed wares which may have emanated from the Potteries in Staffordshire or Yorkshire. As there are no factory marks, it is not possible to ascertain their exact provenance. There would be little value in further researching these wares.

RECOMMENDATIONS FOR FURTHER WORK

Further intervention may reveal more information about the content and date of land reclamation in these three areas.

BIBLIOGRAPHY

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16 *The Pottery*

3 C. M. Brooks, 1987 *Medieval and Later Pottery from Aldwark and Other Sites*

6 A. J. Mainman 1993 *Pottery from 46-54 Fishergate*

9 A**.** Mainman and A. Jenner. 2013 *Medieval Pottery from York*

Orton, C., Tyers, P., and Vince, A. G. 1993 *Pottery in Archaeology.* Cambridge Manuals in Archaeology

Orton, C., and Hughes, M. 2013 *Pottery in Archaeology.* Cambridge Manuals in Archaeology (2nd Edition)

Context	Find	Quantity	Dating	Details
12.92	BF1	1	19TH CENTURY	1 white earthenware tea cup rim with brown decoration on white ground.
12.112	BF2	2	19TH CENTURY+	5 Dipped white ware breakfast cup/bowl, 1 transfer printed ware with blue and white decoration.
12.113	BF3	2	LATE 18TH/EARLY 19TH CENTURY	1 Cream coloured earthenware open form, 1 moderately gritted lightly oxidised post medieval earthenware with brown internal glaze.
12.2005	BF6	3	LATE 12TH/13TH CENTURY	2 York white ware jug body – fresh break, sherds join, with shiny glaze and applied strip, 1 lightly gritted lightly reduced green glazed ware.

12.4004	BF7	1	MEDIEVAL	1 reduced green glazed ware with applied strip decoration and flaked glaze.

Table 6 Pottery quantification

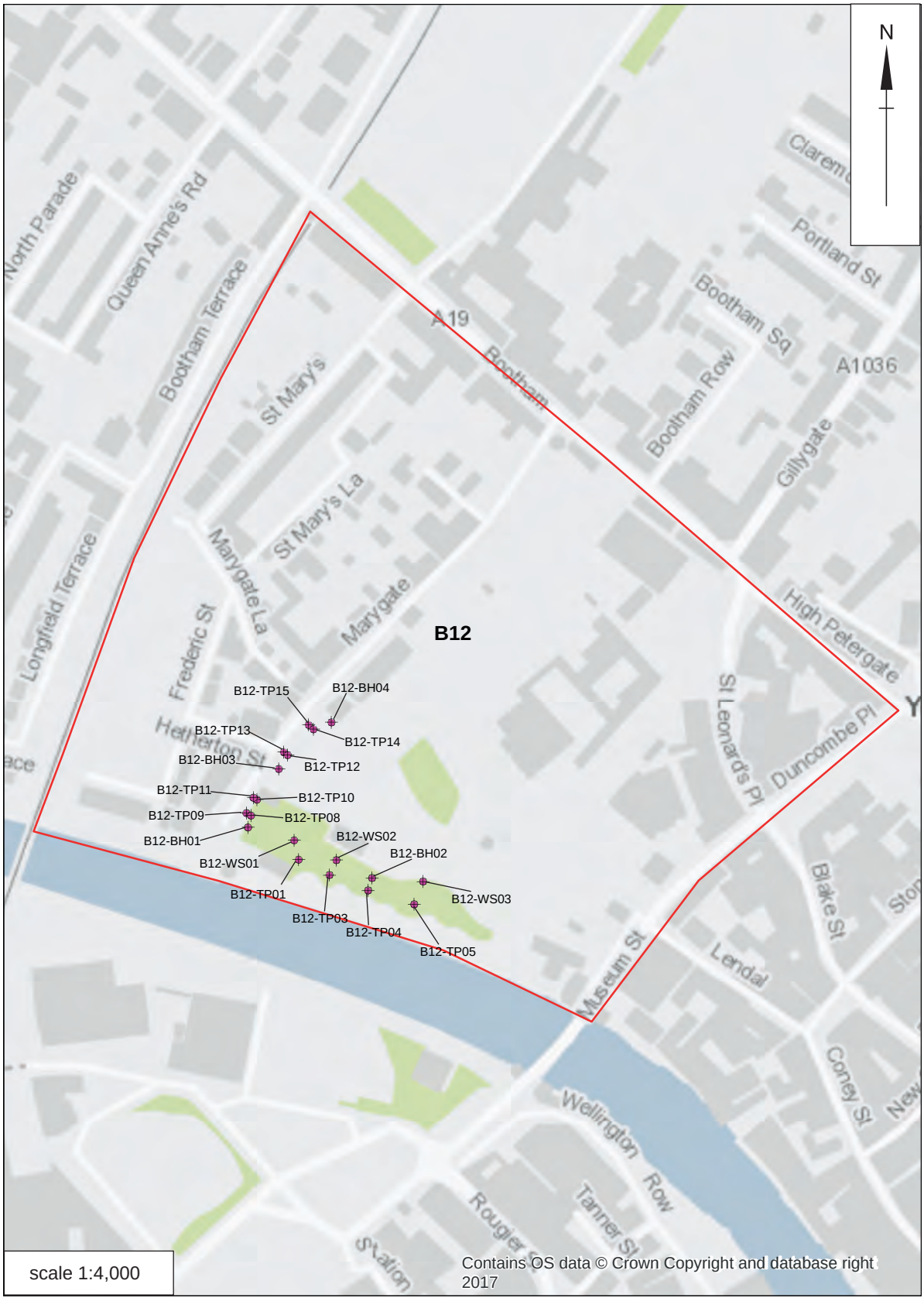


Fig. 1 Original Intervention Locations

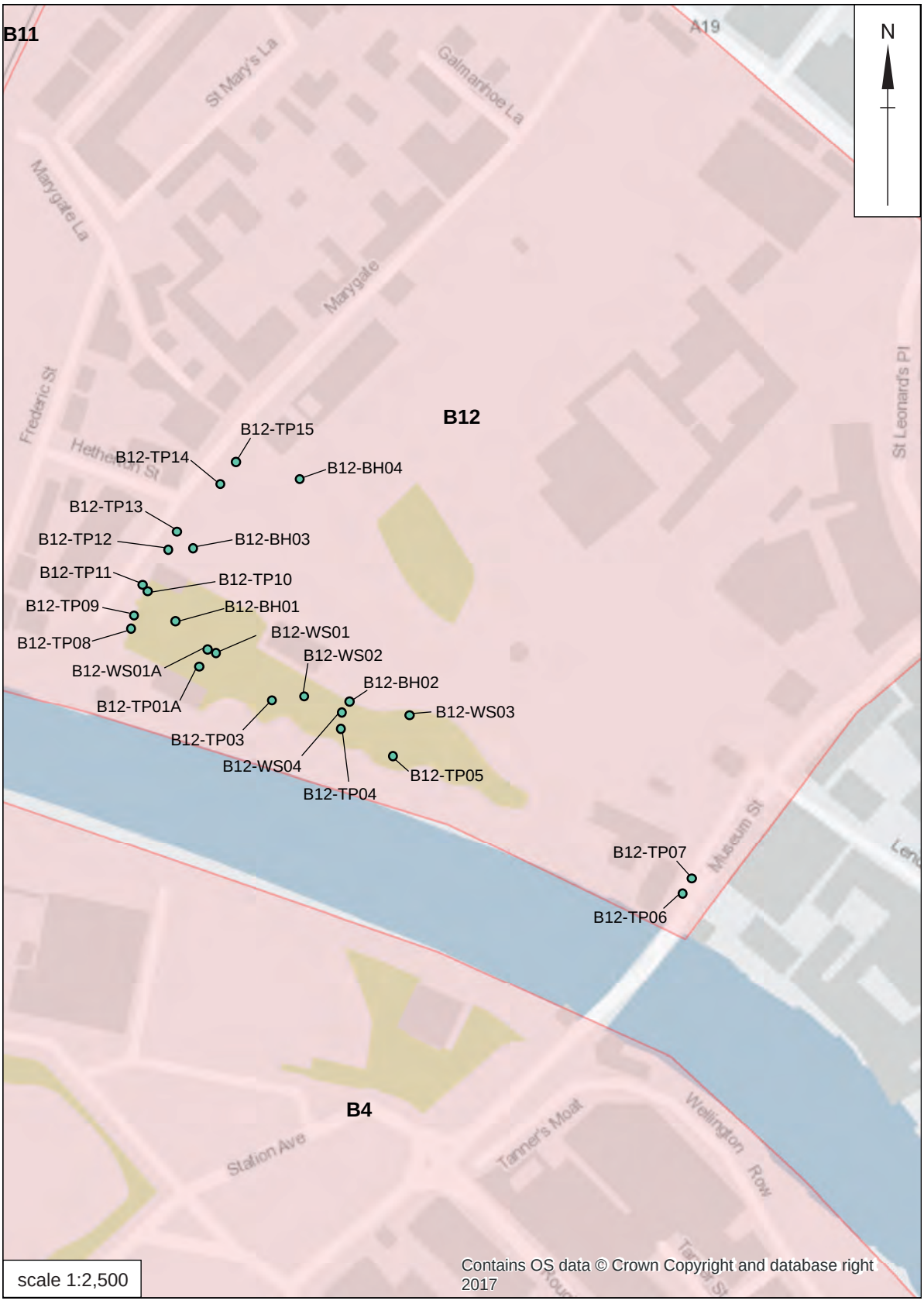


Fig. 2 Location of Interventions Monitored

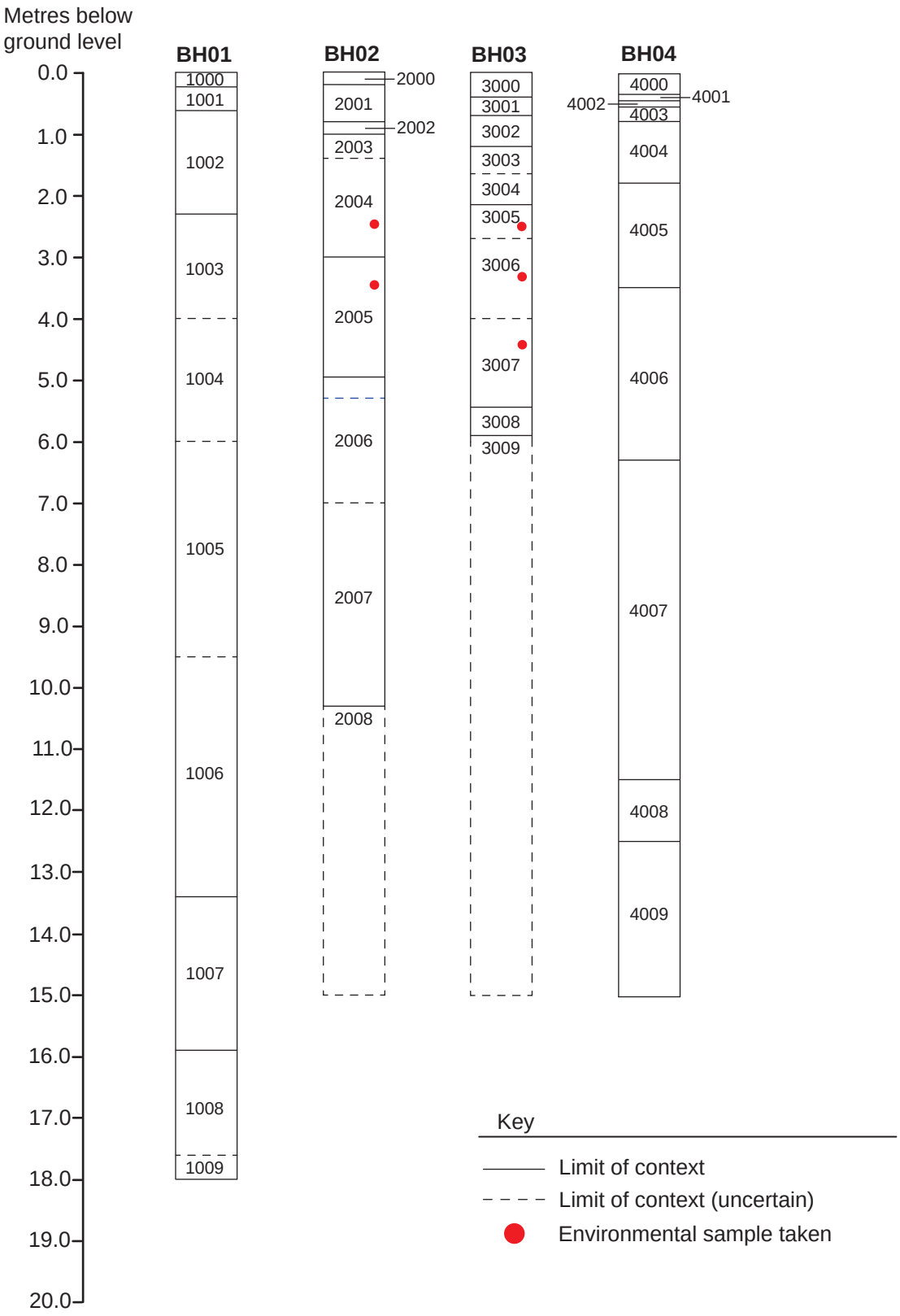


Fig.3 CP Borehole Profiles

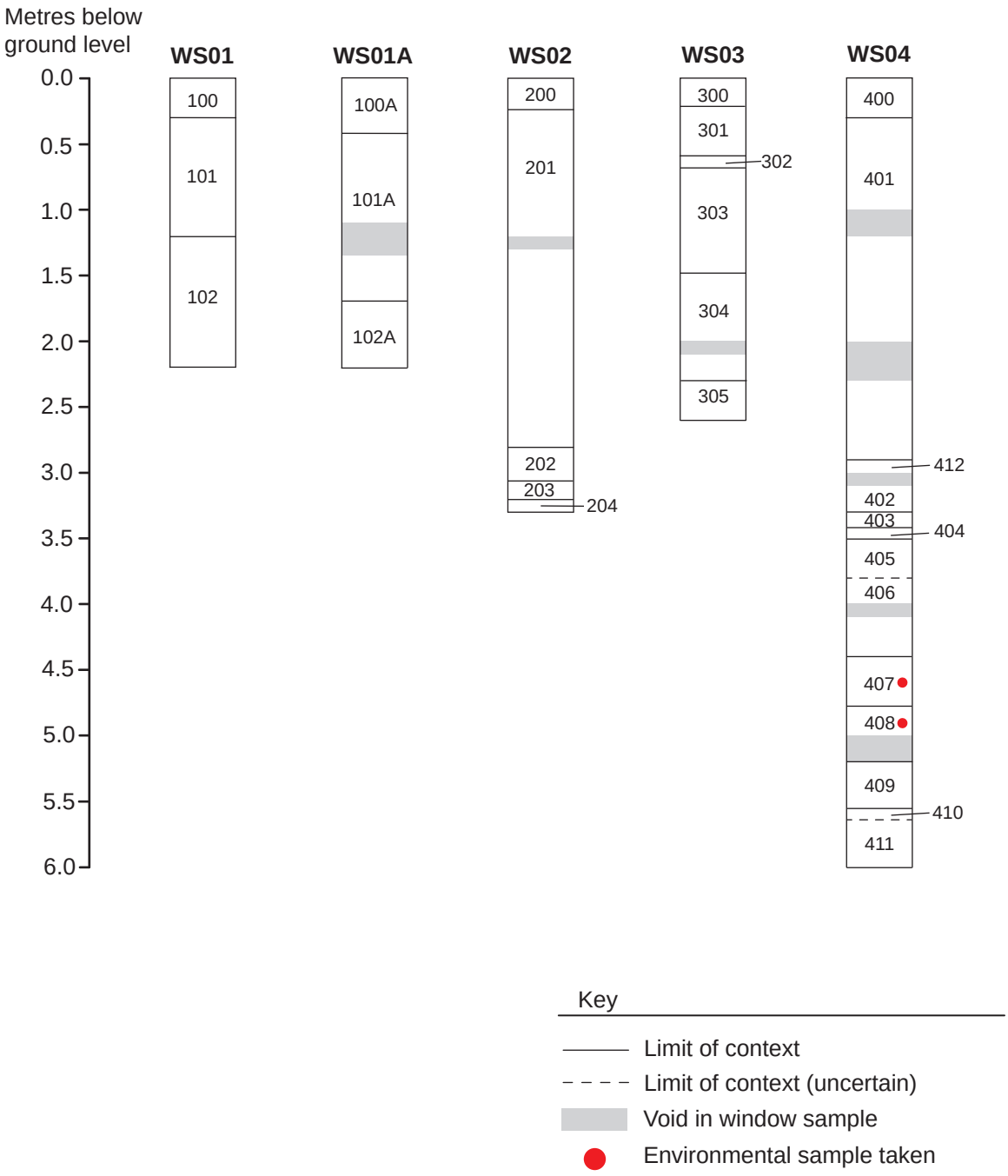
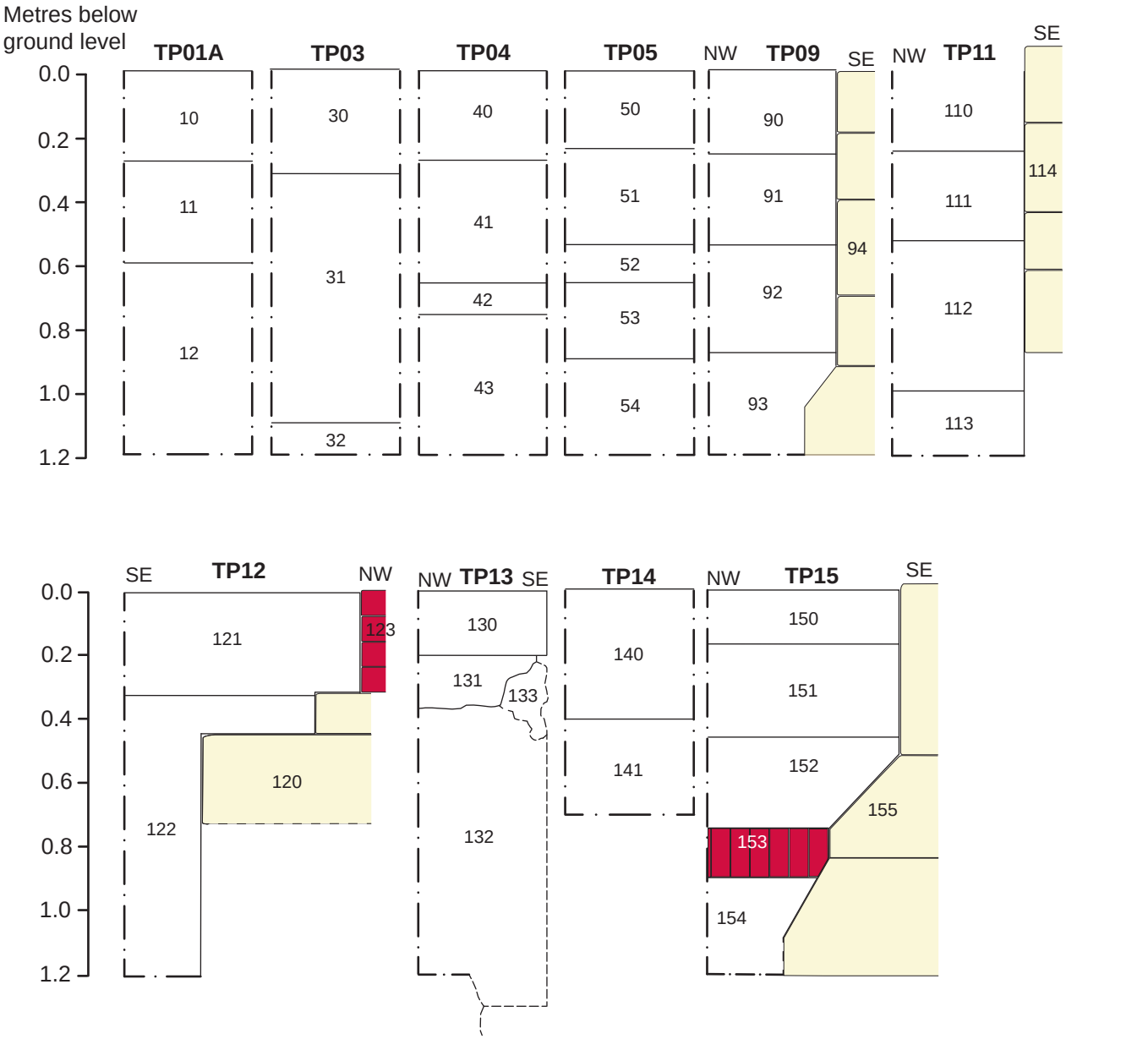


Fig.4 WS Borehole Profiles



scale 1:20

Key

- Limit of context
- Limit of context (uncertain)
- Limestone blocks
- Brick

Fig. 5 Trial Pit Sections

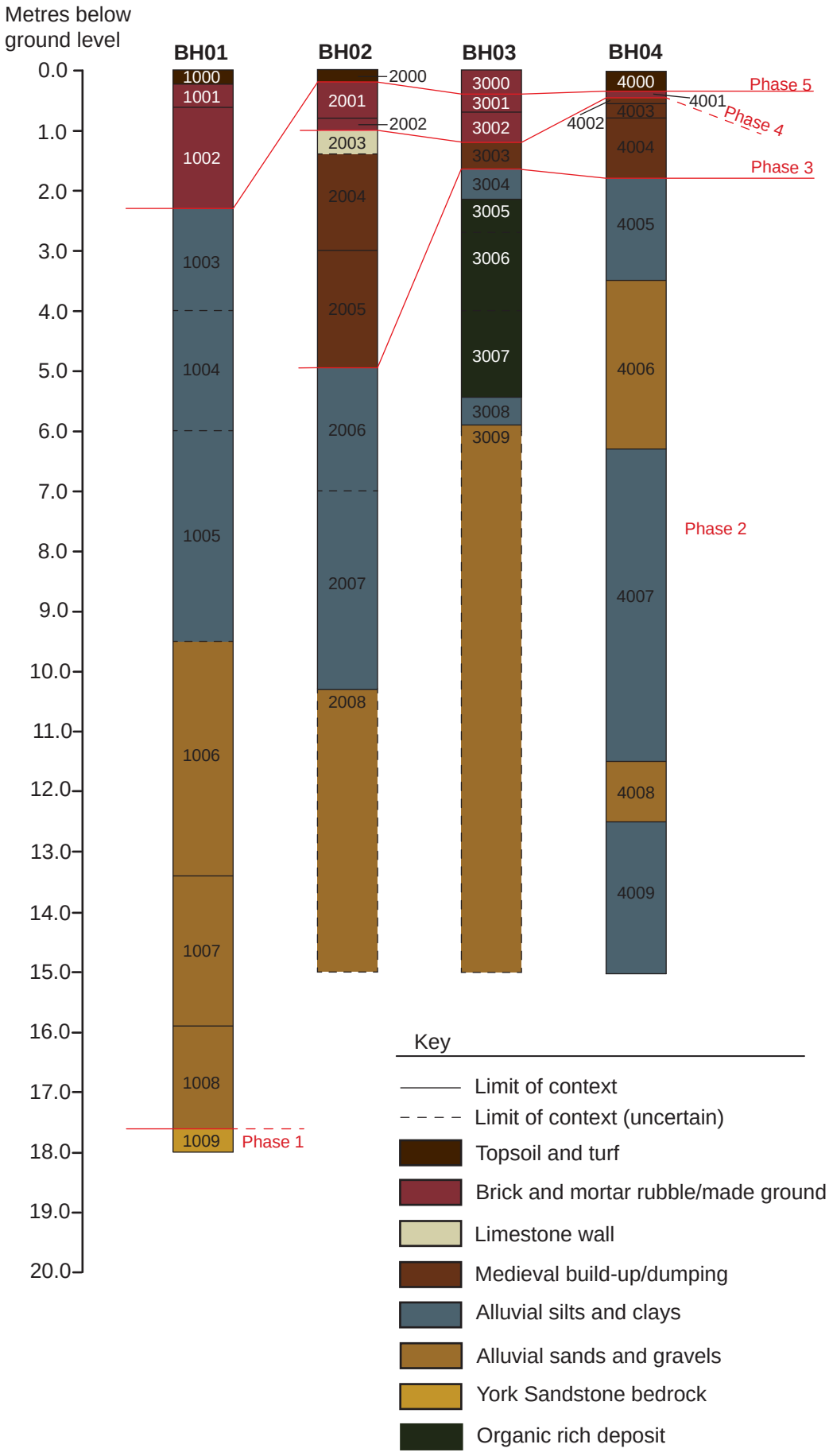


Fig. 6 CP Borehole Deposit Model

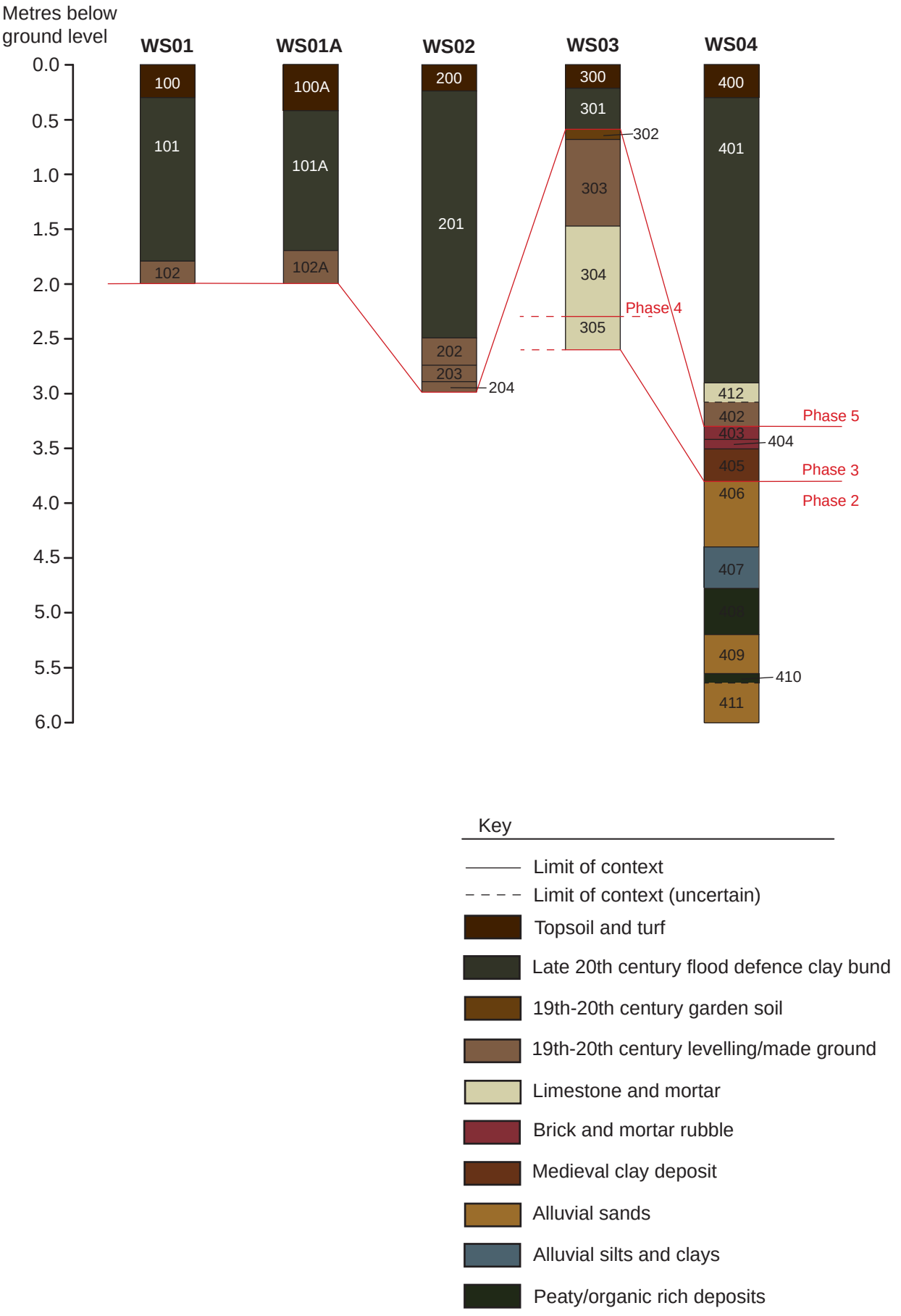


Fig. 7 WS Borehole Deposit Model

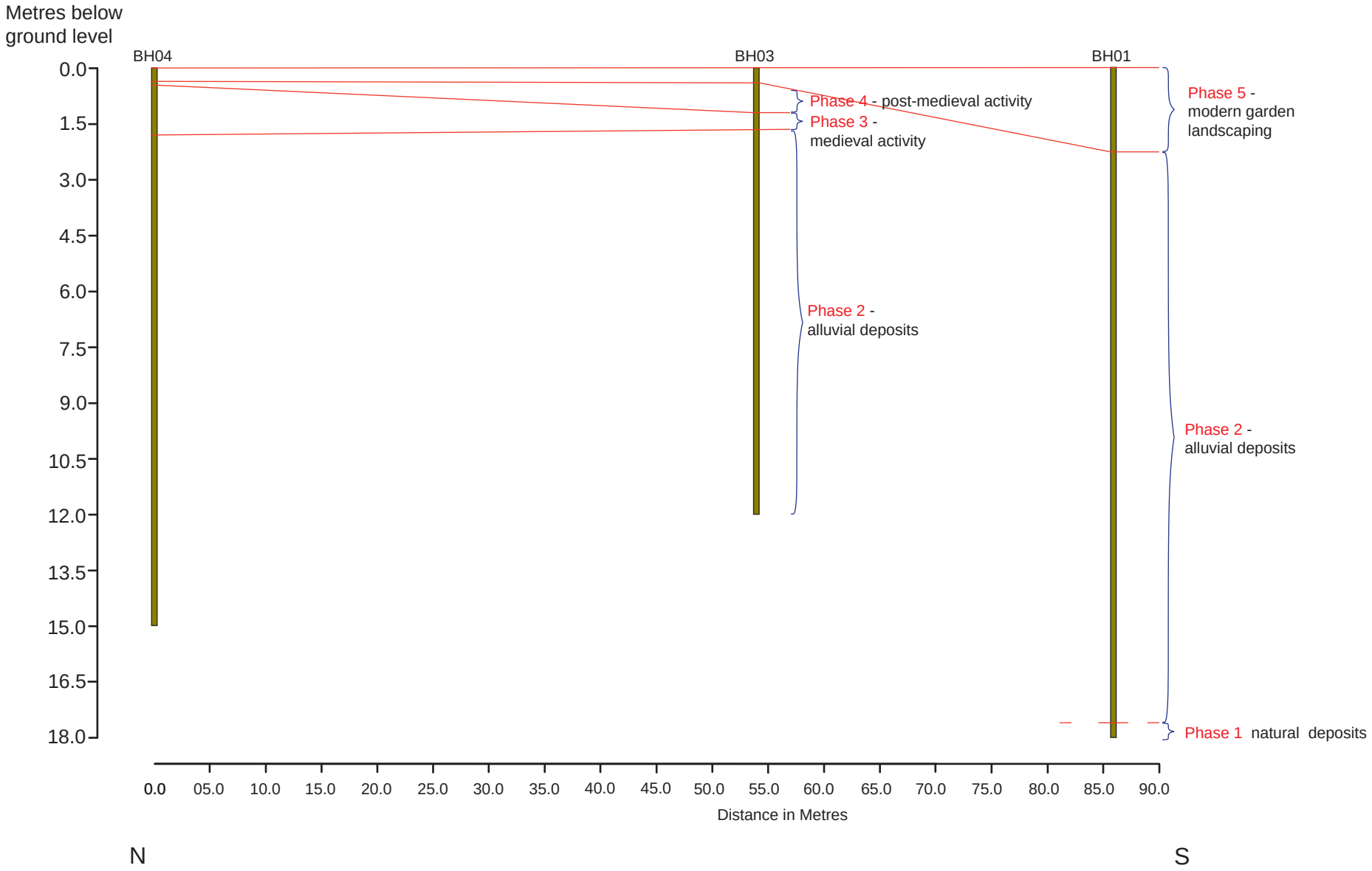


Fig. 8 CP Deposit model, north to south transect

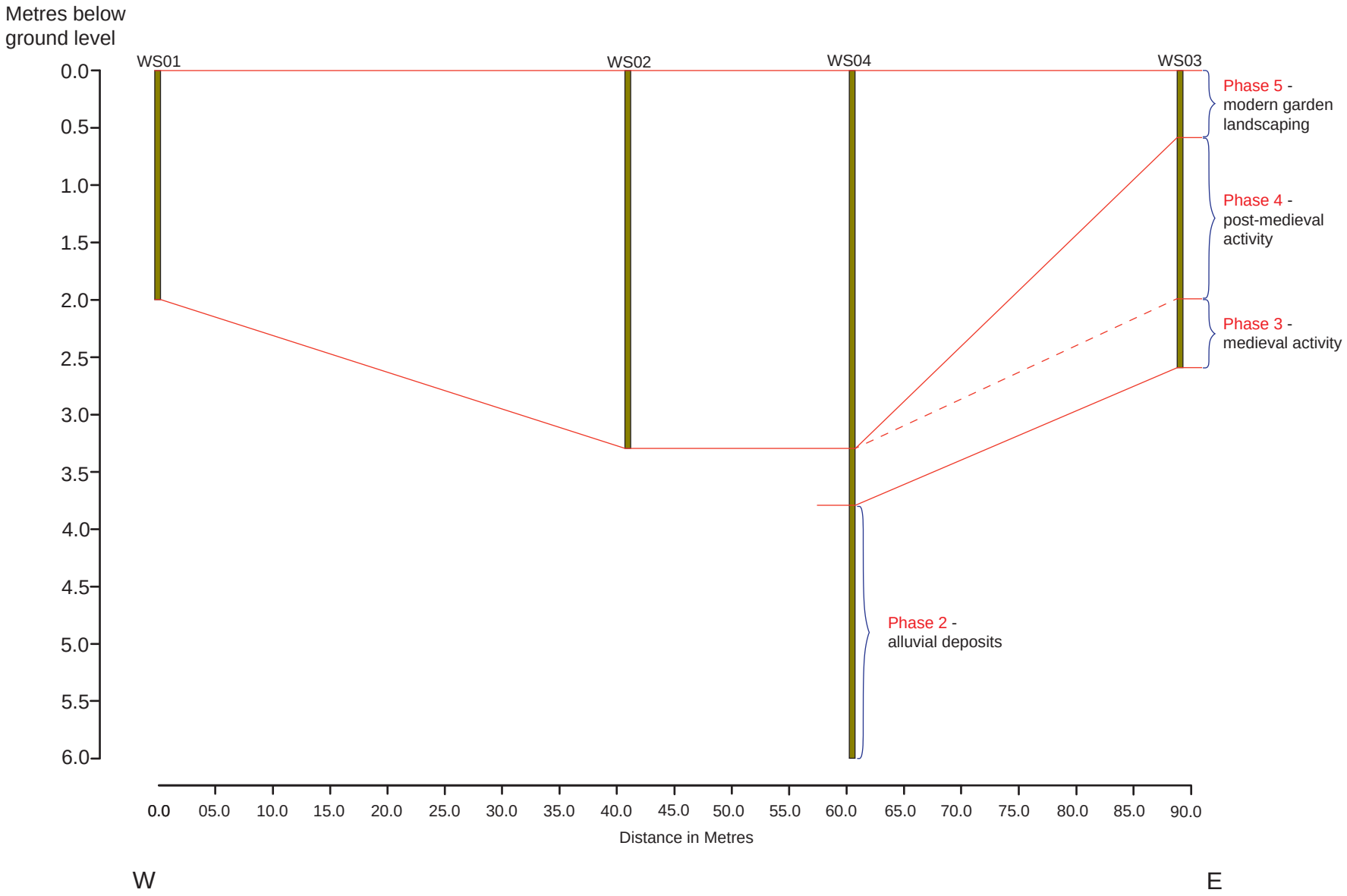


Fig. 9 WS Deposit model, west to east transect

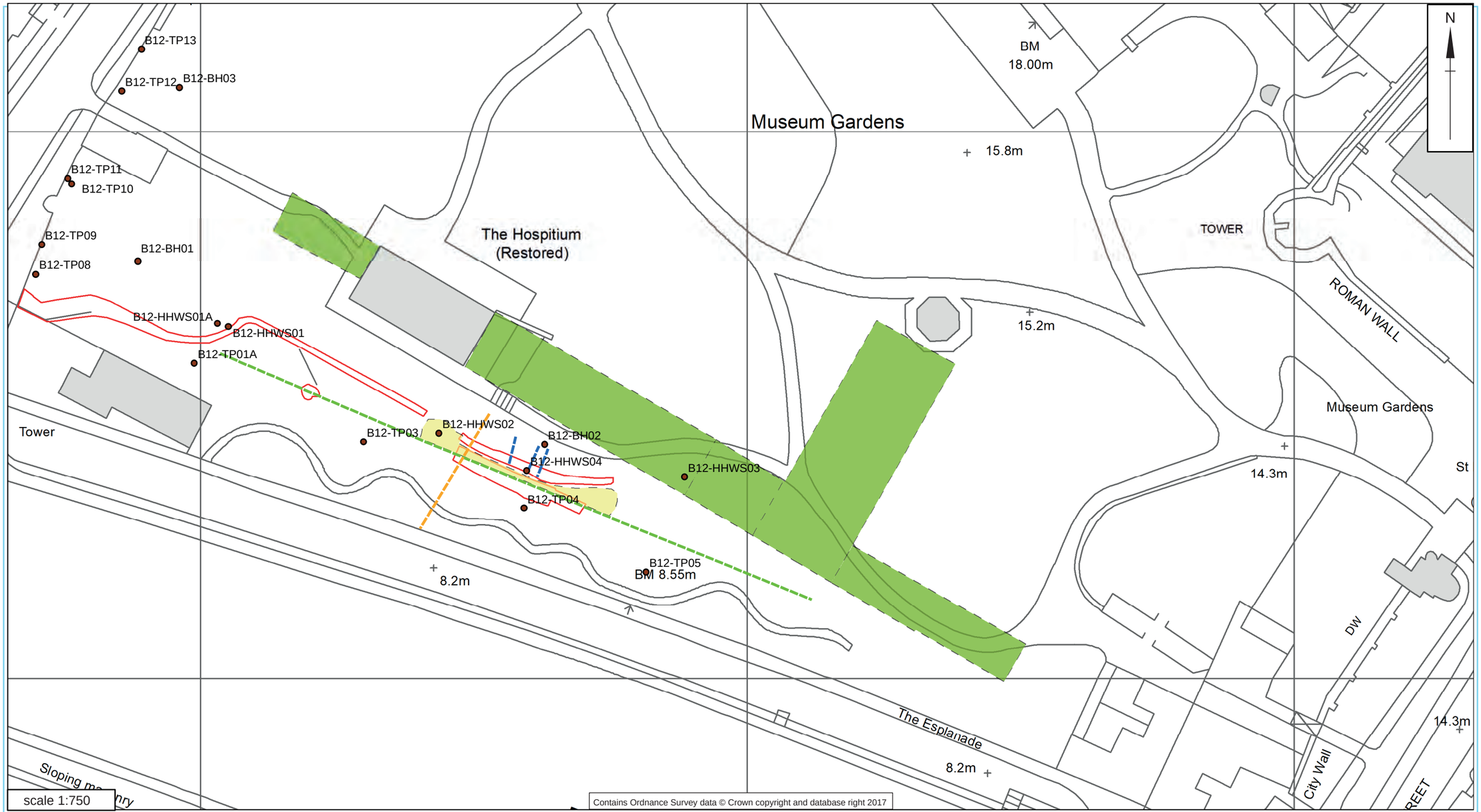


Fig. 10 Former archaeological works and location of demolished medieval buildings.
Taken from YAT DBA Report 1993. Museum Tree Planting Survey

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