YORK ARCHAEOLOGICAL TRUST

Archaeological Investigations at City Walls, Micklegate Bar, Chainage 0690-0700

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YAT Watching Brief Report YA/2022/133, December 2022

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CONTENTS

Plates

Tables

Figures

NON-TECHNICAL SUMMARY

Between the 22nd August and the 22nd September 2022, York Archaeology conducted an archaeological watching brief at York City Walls, Chainage 0690-0700 (SE 59753 51467).

The work was undertaken for the City of York Council to observe structural repairs to the city wall to the immediate north of Micklegate Bar (Figure 1). The work was based on a Written Scheme of Investigation produced by YA (Savine 2022), and involved photogrammetric recording prior to the commencement of work, as well as the monitoring and recording of two trenches to view the foundations of the city walls, and the removal and reinstatement of some of the stones of the façade.

The two excavated trenches showed that the foundations of the city walls extend only one or two courses below the current ground and walkway levels, with the foundations themselves being inconsistent. This is probably all due to the numerous periods of rebuilding of the wall in the 19th century. The removal of the stones from both sides of the wall showed that the core of the wall had become unstable, meaning that the two faces of the wall were moving away from each other, causing the cracks seen in the rampart wall.

KEY PROJECT INFORMATION

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1 INTRODUCTION

Between the 22nd of August and the 22nd of September 2022 York Archaeology carried out a watching brief at York City Walls, Chainage 0690-0700 (SE 59753 51467) (Figure 1), a stretch of the city walls adjacent to Micklegate Bar which were showing signs of cracking and weakening. The site lies within the Area of Archaeological Importance (AAI; CYC 2023) and the Central Historic Core Conservation Area (CYC 2021), and is a Grade I listed building (List entry 1259262) and Scheduled Monument (Nos. 1004910 [York City Walls)] and MYO2196 [Micklegate Bar]).

The work was undertaken on behalf of the City of York Council (CYC) City Walls Manager, Stephen Gandolfi, as part of repair work to the city walls. The work was based on a Written Scheme of Investigation produced by YA (Savine 2022).

Micklegate Bar is the historic primary entrance into the City of York on the western side of the River Ouse. Its origins date back to the 12th century alongside the construction of the city walls, but it has undergone several rebuilds over the years with additions in the 14th century, as well as removals including the Barbican (Dean 2008, 60).

The works that took place as part of this project involved the photogrammetric recording of the wall prior to the commencement of remedial work. Stones were removed on one face of the wall by York City Walls masons which was observed by YA archaeologists. Two trenches were also excavated to understand the foundations of this part of the walls and the composition of the rampart.

2 METHODOLOGY

The work was undertaken in accordance with the approved Written Scheme of Investigation (WSI) (Savine 2022).

Work began in August 2022. It was decided to carry out the removal of a section of stonework in order to remove damaged stones and reinforce the wall core with metal ties. This work was carried out by City of York stonemasons with York Archaeology staff observing. Additionally, two trenches were hand excavated by York Archaeology staff. The purpose of these trenches was to identify the wall foundations, as well as a general objective of gaining new information about the history and building of the city walls.

The aims and objectives of this project were:

- Determine the extent of the cracking in the walls.
- Determine the nature of the wall foundations.
- Understand the construction of this section of wall.
- Assess the sequence of deposits in the trenches.
- Identify how best to approach the wall repair.

Prior to the commencement of work photogrammetric recording took place on the section of the rampart and parapet walls immediately to the north-west of Micklegate Bar. This was to aid in the reconstruction work.

Stonemasons removed a section of stones and metal ties were inserted into the core to strengthen the stonework. The planned remedial works comprised a deep rake-out and repoint

of the external face of the rampart wall, parapet wall and part of the inner face of the lower walkway using a lime-rich mortar in accordance with the conservation plan (Mason Clark Associates 2022). Stones were taken down in order of courses from top to bottom, labelled with their row and position within the row and placed to one side until all were taken down. Stones were checked for mason marks or other notes of interest. Once the metal ties were added, stones were put back into place and, where possible, original stones were reused.

The works also required the removal and reinstatement of paving in the walkway area. Trench 1 was located in the walkway at the base of a crack in the parapet wall face. The trench was located in the area where the wall turns, creating a curved excavation area, measuring 1.35m x 1.37m and 0.80m wide at its narrowest end. The trench was excavated by hand by York Archaeology staff. Flagstones were removed and deposits initially excavated to 0.40m below ground level (BGL). After photographs and drawings were completed, a SW/NE aligned sondage was placed through the area measuring approximately 0.60m x 0.60m to a further depth of 0.50m. The aim of the sondage was to further explore the deposits below the walkway.

Trench 2 was located on the rampart, against the wall and buttress. Measuring 1.00m x 1.02m the aim of the trench was to identify any wall foundations and rampart deposits. The trench was hand excavated to a depth of 0.80m BGL.

Once excavated the trenches were photographed, recorded, context numbers were assigned, and photogrammetry images were taken.

3 LOCATION, GEOLOGY & TOPOGRAPHY

The site is located on the southwestern side of York City Centre. Micklegate Bar straddles Micklegate, at its junction with Nunnery Lane and Blossom Street. The city walls in this area extend to the northwest and southeast, with the section of the walls under investigation then wrapping around to the northeast towards Toft Green. The site is located 460m southwest of the River Ouse and 250m southeast of York train station.

The bedrock in the area is sandstone of the Sherwood Sandstone Group. This is a sedimentary bedrock formed approximately 237 to 272 million years ago in the Permian and Triassic Periods (BGS 2023). The superficial geological deposits are York Moraine Member- clay, sandy, gravelly. These sedimentary superficial deposits formed between 116 and 11.8 thousand years ago during the Quaternary period (BGS 2023).

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

4.1 Roman

The earliest known activity in the area surrounding Micklegate Bar is from the Roman period. *Eboracum* was established with the arrival of the Ninth Legion in AD71 and the construction of the Roman fortress on the northeastern bank of the River Ouse. During the second century *Eboracum* became the site of a major urban settlement, and by the third century had achieved *colonia* status (Ottoway 1993, 11).

No structural evidence has yet been found for the defensive walls of the *colonia*, but it is likely that they ran along the lines of the later Medieval city walls- this is generally agreed upon due

to the distinction between areas of settlement and cemetery which have been found on the inside and outside of the city walls respectively (RCHME 1962). It is therefore speculated that the circuit of the present walls overlies the Roman fortifications. A substantial Roman cemetery was excavated at Trentholme Drive (RCHME 1962, 101) half a mile south west of Micklegate Bar, whilst evidence for Roman occupation and buildings has been identified within the city walls at Micklegate.

Micklegate Bar is flanked by two Roman roads and streets. A street has been found immediately to the inside of Micklegate Bar and another nearby at Barker Lane, presumably running on or close to the current line of Micklegate. To the north-west of Micklegate Bar the main road to *Calcaria* (Tadcaster) runs roughly along the line of Tanner Row and Toft Green, crossing the line of the city walls about 130ft north-west of Micklegate Bar, before running parallel to Blossom Street (RCHME Road 10). There is the suggestion that the principal gate to the *colonia* was on or close to the site of medieval Micklegate Bar (Wilson and Mee 2005, 9), whilst Micklegate Bar itself incorporates re-used Roman stone and sarcophagi in the outer archway and side walls.

The area around Micklegate has a wealth of evidence for civilian occupation. Many discoveries were made in the 18th and 19th centuries such as a Mithraic relief discovered in 1747 (Ottoway 1993, 14). A mosaic was identified 60 yards north west of Micklegate Bar in 1814, partly under the bank of the Medieval defences (RCHME 1962). In the Toft Green area two Roman apsidal buildings and mosaic paving (MYO3601-2) were identified in 1840 2m below ground level. A Roman wall was identified 1.8m BGL in 2011 during sewer repairs on Toft Green Road.

4.2 Anglo-Scandinavian

Evidence for Anglo-Scandinavian occupation in York generally is much more sparse than Roman or Medieval evidence. It is likely some of the Roman stone buildings would have been standing during this period and may have been reused. The origins of the name 'Micklegate' also derive from this period, with the Old Norse words 'mykill' meaning great and 'gata' meaning street. The area around Micklegate has evidence for Anglo-Scandinavian occupation with an emphasis on riverside occupation seen in waterlogged deposits (McComish 1999), and timber structures (Moulden and Tweddle 1986, 39) on Skeldergate as well as possible Anglo-Scandinavian structures noted during a watching brief at 21 Micklegate in 2000 (MAP 2000). The Holy Trinity Priory (MYO3520) also has possible Anglo-Scandinavian origins.

4.3 Medieval

In the Medieval period Micklegate Bar, known as 'Mickleith', was the most westerly entrance, acting as an important gateway in to the city. The area between the Bar and Ouse Bridge was of importance as it was an integral part of the old main route from London to Scotland (RCHME 1962, 68). The area remained an important religious area with the re-founding of Trinity Priory (MYO3520) into a Benedictine Priory in the 1080s. From the mid-13th century until the 19th century the mixed character of this throughfare continued with mansions of the nobility stood next to the houses of the merchants (RCHME 1962, 68).

York's city walls extend two and a half miles and are among the most complete city walls in the country (Wilson and Mee 2005, 1). Within the walls are four of its original gates and thirty-four internal towers, possibly located over earlier Roman defenses. With the construction of the city walls, Micklegate became not only an important throughfare, but also an important defensive location. Micklegate is mentioned by name in the 12th century when it was probably no more

than a strong gate, possibly of stone, through earth ramparts (Pugh 1961, 513). The defensive stone walls around York were constructed in the 13th and 14th centuries (Pugh 1961, 513) with the earliest masonry at Micklegate Bar likely to date from this period; the stone walls are built almost entirely out of magnesian limestone from the Tadcaster region (Wilson and Mee 2005, 2). The Bar underwent numerous changes, including the heightening of the bar with a three storied structure above the gate to allow for the addition of a portcullis in the 14th century (Dean 2008, 152). The barbican was also added around this time.

4.4 Post-Medieval

The Bar survived the siege of York in 1644. After this the Bar was renovated with the reconstruction of the outer arch of the barbican undertaken in 1670. The Bar was again renovated in 1737, and again between 1826 and 1829; the three archways also date to this period, constructed between 1754 and 1826 (Pugh 1961, 513). At this time the barbican was removed for reasons of public safety (Pugh 1961, 512).

The city walls remained an important feature of the landscape of York throughout their existence, though their use and appearance changed and adapted. Soon after 1800 the proportion of professional premises and shops increased as the residential aspect declined (RCHME 1972, 68), with 19th century workshops built in the back gardens on the north side of the street on Tanner Row and Toft Green. The area was further adapted with the newly built railway station resulting in the creation of George Hudson Street in 1843.

By the 18th century the city walls were no longer in use as military fortifications and instead were beginning to be appreciated for their use as a pleasure walk. Between 1950 and 1955 Micklegate Bar, alongside Bootham and Monk Bars, were restored.

5 RESULTS

The works conducted at Micklegate Bar revealed insights into the defenses and their rebuilds and reconstructions. The primary aim to repair wall sections involved the stone removal, assessment of the wall core and subsequent wall rebuild. To understand the wall foundations and deposits making up this area two trenches were excavated by hand to depths ranging between 0.40m BGL and 0.90m BGL.

5.1 Trench 1- Plates 1,2,3,4,5:

The parapet wall (Plate 1) is constructed of medium to large-sized rectangular and sub rectangular limestone pieces. Visually, the corner section of the wall appears to be of a later construction, the stones here being less weathered, more regular in shape and size and more closely bonded together. Visible within this section is a large crack leading up the wall between the bonding material (Plate 2). Trench 1 was placed directly below this crack. Rectangular in shape, the trench was placed in the area where the walls turn to investigate the extent of the wall crack and the strength of the wall foundations here, measuring 1.30m x 1.37m and 0.80m at its shortest end (Plate 3).

The trench was excavated in two stages. The first stage removed the flagstones and excavated to a depth of 0.50m below ground level (BGL), followed by the excavation of a deeper sondage measuring 0.50m x 0.60m x 0.50m deep (Plate 4).

The earliest deposit seen within the sondage was rampart deposit 1010. This was a friable, mid greyish brown silty clay with orange clay patches, interpreted as a levelling deposit within the rampart. This was found at a depth of 0.54m extending to the LOE at 0.90m. Above rampart 1010 was structure 1005 (Plate 3). This was a north-east/south-west aligned wall under the present walkway located 0.50m from the south-eastern edge of the trench. A construction deposit 1004 was associated and built against the wall and consisted of a cream white lime mortar. Overlying the construction deposit was redeposited rampart material 1003, which was 0.30m in thickness. This was a compact to friable, mid orange-brown, clayey silt with occasional large angular sub rounded limestone fragments. A stone post-pad 1008, was found above redeposited rampart material 1003 (Plate 5). This was 0.006m in thickness. This may have been a support for the city walls 1009, when they were rebuilt in the 19th century. Overlying 1003 and built against 1009 was 1002, a bedding for the walkway slabs. This was 0.10m in thickness. Cut through the bedding deposit 1002 was drain base 1007 and drain 1006. Sealing the whole sequence was the present walkway flagstone 1001.

5.2 Trench 2- Plates 6,7:

Trench 2 was a square trench measuring 1.00m x 1.02m excavated to a depth of 0.80m BGL (Plate 6). The trench was located on the city wall rampart, immediately against the city wall and buttress. The intention was to investigate whether the foundations of the city wall were visible and whether the rampart material was from the original medieval rampart or a later addition.

The wall in this section was composed of medium to large-sized, rectangular, sub rectangular and square limestone blocks. It had a total of 17 courses, 15 of which were visible above ground. The lowest four courses appear to be visually different to those above it being smaller, more rectangular and more weathered in places. Abutting this section was a buttress, composed of consistently-sized and shaped square and rectangular stones, closely bonded together with mortar.

Within Trench 2 the earliest deposit seen was deposit 2002. This was a friable, greyish orangey brown clayey silt, interpreted as a foundation deposit for the walls above it. Immediately above this was the city walls 2003 (Plate 7). Built up against wall 2003 was deposit 2001, which was a loose, greyish brown, silty sand that made up the rampart in this area but is unlikely to be medieval in date due to its loose consistency and the high level of disturbance. Above this was layer 2000, similar to Context 2001 but containing modern inclusions such as glass fragments. This deposit formed the topsoil. Concrete support 2005 was added in the 19th century to support buttress 2004; the deposits around this area had been disturbed during this repair work and the area was subsequently backfilled with deposit 2006, which was likely to consist of redeposited material from layer 2000.

This section of wall appears to be a modern reconstruction, beginning with a probable 18th century repair. The earliest deposit is the orangey-brown clayey silt, which may represent earlier rampart material, forming the foundation for this part of the wall. This section of the walls has undergone numerous changes, including the addition of walkways, the creation of an extra arch and the cutting of the rampart to create access to Queen Street. As a result of this, the deposit on the rampart, which is loose and contains a mix of Roman, medieval and modern finds, is not

the original rampart and may instead be made ground comprising redeposited material from the medieval earthwork.

5.3 Stone removal section-Plate 8:

As part of the investigations and repair of the walls a series of stones were removed from the section of wall north-west of Micklegate Bar. This allowed damaged stones to be removed, an assessment of the stability of the wall core to be undertaken, and the subsequent rebuild and repair of the wall. The stones were removed course by course and marked with their row number and position in the row on the photogrammetry image.

The stones were removed by hand by City of York stonemasons over a period of several weeks. Once removed, they were inspected to identify any markers marks or tool marks, however none were observed.

The stones in this section were relatively regular in shape and size, being medium to large-sized, rectangular or square limestone blocks. The mortar was a greyish-yellow lime mortar with gritty inclusions. There appeared to be one phase of construction, most likely associated with 18th and 19th century repairs to the wall in this area.

Once the wall face was removed, this section of wall revealed a disintegrating wall core. This was causing the two wall façades to separate, causing the cracks seen in the rampart wall (Plate 8). The core was composed of angular, sub angular and broken fragments of small and medium sized limestone, packed together in a disorganized manner and reinforced with modern concrete from 20th century works. As a result of this large gaps were visible through both faces of the wall. Once the stones were removed the wall core was strengthened by the city wall masons using metal ties.

The phases of construction in this area suggest that the wall in this area required repair and reconstruction in the 18th-20th centuries.

6 THE BUILDING MATERIALS

By J. M. McComish

INTRODUCTION

This assessment relates to a small quantity of ceramic building material (CBM), opus signinum and stone recovered from archaeological investigations at York City Walls, Micklegate Bar, Chainage 690-700. The collection was recorded to a standard YAT methodology (McComish 2022a and 2022b).

RESULTS

The CBM comprised five fragments of Roman date, none of which was sufficiently diagnostic to determine the original form; they are therefore simply classified as Roman brick. They collectively weighed 380g and were recovered from Context 1003 (three sherds), Context 2000 (one sherd) and Context 2001 (one sherd). Four were in fabric R10 and one in fabric R9, the latter sherd having a reduced core. These are two of the most commonly occurring fabrics seen in Roman CBM in York.

A single sherd of 13-16th century roof tile was present (1010) which weighed 5g and was 13mm thick. This was in fabric M1, the most common fabric within medieval York. There were five adjoining sherds of pan tile in Context 1004 which weighed 500g and were 13 mm thick with a reduced core. These were in fabric P1 which has been recorded on numerous other sites within York.

Two fragments of opus signinum were present, both from Context 1010, which collectively weighed 95g. No original surfaces were present. This is a form of mortar mixed with crushed ceramics that was used for flooring in the Roman period.

Four small fragments of building stone were present: two of micaceous sandstone and two of oolitic limestone; none of the original surfaces survived on these fragments. Collectively they weighed just 16g. the micaceous sandstone originated from Roman flooring or roofing slabs, and the oolitic limestone is also of Roman date (this stone was not quarried or used for building purposes in the medieval period).

SUMMARY AND RECOMMENDATIONS

The small collection of building materials is all of Roman date and it is typical of Roman material recovered on excavations in York.

The collection offers little, if any, potential for further research, and none of the material was worthy of museum display. It is only of use for dating the contexts in question.

For excavations within York, YAT routinely adopts a record and discard policy, whereby building materials are only retained if they are a particularly well-preserved item or a highly unusual item. In the case of this site the stone and opus signinum fragments were too small to merit retention and the CBM was insufficiently diagnostic to merit retention. All of the material was therefore discarded.

7 ANIMAL BONE

By Dr Kris Poole

A total of 82 fragments of animal bone were recovered from this site, all by hand collection. The identifications by context are shown in Table 1. It is understood that, although artefacts from earlier periods are present in some of the same contexts as the bone, the deposits encountered were probably deposited during the 19th century rebuilding of the wall. In view of the dating, the mixed nature of the deposits and the small size of the bone assemblage, this assemblage was of little to no interpretative value and discard is recommended.

Species	1003	1004	1010	2001	TOTAL
Cattle	6	2	2	5	15
Sheep/Goat	3		1		4
Pig			1	2	3
Chicken	1				1
Large mammal	17	2	6	6	31
Medium mammal	2		3	1	6
Unidentifiable	17		4	1	22
TOTAL	46	4	17	15	82

Table 1 Animal bone quantification by context

8 SHELL

By Alison Wilson

One largely complete Native Oyster (*Ostrea edulis*) shell and 9 fragments collectively weighing 49g were recovered from three contexts.

This type of oyster has been widely consumed throughout most periods of British history and is likely to be a residual representative of domestic waste. Discard is recommended.

Context	Species	Count	Weight (g)	Context	Species
1003	Complete oyster shell with 3 fragments	4	35g	1003	Complete oyster shell with 3 fragments
1004	3 oyster shell fragments	3	10g	1004	3 oyster shell fragments
2001	3 oyster shell fragments	3	4g	2001	3 oyster shell fragments

Table 2 Shell quantification by context

9 THE SLAG

INTRODUCTION

This assessment report describes the material classified as slag recovered from Micklegate Bar, York. The report presents a description and quantification of the material recovered. The significance of the material is discussed, and recommendations made for further work. The assessment report follows the guidelines issued by Historic England (Dungworth 2015, 13-14).

SLAG CLASSIFICATION

The slags were visually examined, and the classification is based solely on morphology. Additional data to improve the interpretation was obtained from a programme of Hand-Held X-Ray Fluorescence (HH-XRF). Details of the method are provided in Appendix 1. The debris associated with metalworking or submitted in the understanding that they are associated with metalworking, can be divided into two broad groups; residues diagnostic of a particular metallurgical process or non-diagnostic residues that may have derived from any pyrotechnological process (McDonnell 2001). The diagnostic ferrous debris can be attributed to a particular ironworking process; these comprise ores and the ironworking slags, i.e., the macro, hand recovered smelting and smithing slags and the micro-residues such as hammerscale and slag fragments recovered from sieving programmes. The second group are the diagnostic non-ferrous metalworking debris, e.g., crucibles and moulds. Thirdly, there are the non-diagnostic slags, which could have been generated by several different processes but show no diagnostic characteristic that can identify the process. In many cases the non-diagnostic residues, e.g., hearth or furnace lining, may be ascribed to a particular process through archaeological association. The residue classifications used in the report are defined below.

Diagnostic Ferrous Slags and Residues

Flowed Slag – slag displaying smooth flowed surfaces, often fine grained, but lacking the ropy flowed characteristics of classic tap slag. In most cases it is smelting slag, but in some cased it could be flowed smithing slag due to overheating.

DESCRIPTION

Table 1 lists the count and weight of the slag types present on the site, there were no micro-magnetic residues recovered from the site. The assemblage is small and comprises three fragments of flowed slag that in a rural setting would be interpreted as tapped iron smelting slag. The largest fragment from Context 1010 was washed and then analysed by HH-XRF to assess the presence of manganese in the slag. Elevated levels of manganese normally confirm the slag as a smelting slag, because if the element is present in the ore, during the smelting process it partitions to the slag and not the metal. However if the ore is manganese free then clearly no manganese will be present in the slag. The spectrum (Figure 1) clearly shows that no manganese is present and that other elements e.g. calcium (Ca) are in low concentration.

Context	Flowed Slag Count	Flowed Slag weight	Context Description*
1003	1	2	Redeposited rampart
1010	2	55	Post-rampart levelling
Total	3	57	

Table 3 Catalogue of the residues recovered from the excavation (weight in grams).

*** Information from Context sheets**

SIGNIFICANCE

The assemblage is small, and all three fragments are flowed slag. It is unlikely that they are smelting slags and probably are liquated smithing slags or derive from e.g. a foundry. The material may have derived from the construction of the rampart, which presumably would have involved collecting large volumes of material from the local area. When the phasing is available, the interpretation can be refined. The assemblage is not significant.

RECOMMENDATIONS

When the phasing is available, the interpretation can be refined, but no further analytical work is required on the assemblage.

10 DISCUSSION

PHASES OF CONSTRUCTION

Investigations on the stretch of wall adjacent to Micklegate Bar is unlikely to have revealed any evidence of medieval construction. This is because the area has been significantly adapted and repaired throughout its use into the modern day.

Both trenches revealed a series of deposits related to the wall construction and repair. The earliest deposits revealed in Trench 1 were silty clay/ clayey silt deposits interpreted as levelling deposits within the rampart. Other work that has been conducted on the city walls elsewhere in the city may help to shed light on the deposits seen here. At both Tower 32 and Tower 39 the earliest deposit seen was a layer of friable or firm, mid orangey brown, silty clay or clayey silt, representing the uppermost surviving layer of the rampart (Johnson 2017, 7). This may suggest that the deposits seen below the walls in Trenches 1 and 2 represent rampart material which was used as a foundation for the walls. Redeposited rampart material 1003 sits above the in-situ rampart 1010 and contains Roman pottery and CBM, and is therefore likely redeposited material.

The next phase of construction was the city walls themselves. Built on top of the rampart material, the walls underwent reconstruction in the 18th and 19th century. Across York much of the city wall underwent repair and reconstruction to the medieval defences at this time: at Nunnery Lane works revealed several phases of build with evidence of rebuilds possibly as a result of earlier collapse (YAT 1992, 1), with 19th century restoration to the parapet (Johnson 2001, 7) also visible. At Chainage 1919-1921 material excavated was contemporary with restoration work done in 1888-1889 which created the present wall walk (YAT 1994, 2) and at Chainage 822-906 the fabric of the city walls was found to be 19th century and all associated deposits were modern in date (Mason 2005). These examples are similar to what we see at Micklegate, with changes in the 19-20th century to the parapet wall to create the walkway, which is evident in the visual differences seen in this section of wall. Structure 1005 which is abutted by the section of parapet wall may represent an earlier phase of wall, acting as the foundation for where the wall would have originally ended. When the walkway and drain were added this is likely to have disturbed the earlier rampart material.

In Trench 2 the rampart material also appears to be modern in date. Unlike the orange silty clay seen in ramparts elsewhere in the city, the deposit here is a loose, greyish-brown silty sand, containing mixed finds from medieval pottery to modern glass. The clayey rampart material is often seen relatively high up, for instance at Tower 32 the rampart deposits were at around 0.22m BGL (Johnson 2017, 17), whilst Trench 2 was excavated to 0.80m BGL and did not reveal such material. The reason for this is likely to be modern works and made ground. The 20th century addition of concrete support to the wall is seen elsewhere in York, for instance at Tower 32 where a sloping concrete block was revealed at the base of the wall (Johnson 2017, 7), similar to the concrete below the buttress at Micklegate. It is relatively common for the city wall rampart to consist of modern material, with investigations in 1996 near Museum Gardens showing that deposits within the retaining wall were of recent date due to adjustments to the profile of the rampart (Marwood 1996, 2). Therefore, later works to restore the walls is likely to have disturbed any earlier rampart material.

WALL STABILITY

In recent years the walls across the city have required repair and adaptations. The investigations at Micklegate have shown that the wall in this location is constructed over a clayey-silt foundation. This is seen elsewhere on the walls, including at Tower 39 where a lack of foundation was evident with the walls built directly on top of a flattened rampart surface (Johnson 2017, 25). The defenses of York are unusual in that they were built on top of as opposed to through the ramparts (Dean 2008, 54), which may explain the weakening of the walls.

Furthermore, the 19th century reconstruction and adaptation of the walls may have resulted in the wall cracking and weakening. In the parapet wall a large crack was visible along the corner of the wall. In a similar example, in Trial Pit 2 at Tower 32 a crack was visible running down the face of the medieval tower wall, around the point that it is bonded to an 18th/19th century extension built to support a widened wall walk (Johnson 2017, 9). A weakness in the bond between new and old at Micklegate, combined with this section being built on a clayey-silt foundation, may therefore explain the crack appearing in this section.

11 CONCLUSION

In conclusion, the investigations on the walls next to Micklegate Bar revealed insights into 18th, 19th and 20th century wall repair and adaptations. The phases of the wall's construction highlight the changes in its use, from defensive to leisure, with the addition of walkways and adaptations to the walls to accommodate for this addition. Unfortunately, many of these changes resulted in the weakening of the wall and, combined with poor foundations, cracks began to appear in these areas. This project allowed the rare opportunity to further understand York's city walls and the rampart, revealing a history of reconstruction and repair.

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ACKNOWLEDGEMENTS

YA would like to thank Claire MacRae and the City Walls team at CYC for their assistance during the works.

Site work was undertaken by Marina Vatylioti. The report was compiled by Fran Birtle and Katherine Bradshaw, with edits undertaken by Geroge Loffman. Illustrations were compiled by Briannie Price and Marius Ilie. The project was managed by Ben Reeves, and post-excavation work and report editing was undertaken by Kate Smart.

APPENDIX 1 – INDEX TO ARCHIVE

Item	Number of items
Context sheets	12
Levels register	0
Photographic register	0
Sample register	0
Drawing register	1
Original drawings	6
B/W photographs (films/contact sheets)	0
Colour slides (films)	0
Digital photographs	239
Written Scheme of Investigation	1
Report	1

Table 4 Index to archive

APPENDIX 2 – CONTEXT LIST

Context number	Trench	Description
1001	1	Flagstones. Large, rectangular, flat.
1002	1	Bedding for paving slabs. Friable, dark greyish black, clayey silt.
1003	1	Redeposited rampart deposit. Compact, friable, mid orangey brown, clayey silt. Moderate small charcoal flecks, occasional large sub angular and subrounded stones.
1004	1	Construction backfill. Friable, creamy white, lime mortar, with small and medium angular limestones. Occasional small and medium CBM fragments.
1005	1	Limestone structure.
1006	1	Drain. Metal, drain cover.
1007	1	Concrete base for drain.
1008	1	Foundation block/post-pad. Sub rounded stone.
1009	1	City walls.
1010	1	Levelling deposit. Soft to firm, mid greyish brown, silty clay. Moderate chalk flecks and firm, mid orangey brown, clay patches.
1011	1	Rampart soil. Friable, mid orangey brown, clayey silt.
2000	2	Topsoil. Loose, greyish black, silty sand. Frequent rooting, small rounded rocks. Occasional CBM.
2001	2	Soil build up. Friable, greyish brown, silty sand. Frequent rooting, moderate small rounded rocks, occasional medium sized angular rocks.
2002	2	Foundation deposit. Friable, greyish orangey brown, clayey silt. Occasional small rounded stones.
2003	2	City walls. Limestone. Aligned E/W. 17 courses. White lime mortar.
2004	2	Buttress. Limestone. 14 courses. White lime mortar.
2005	2	Concrete foundation block.
2006	2	Soil build up. Loose, greyish black, silty sand. Frequent rooting, moderate small rounded rocks, moderate medium sized angular rocks.

Table 5 Context list

PLATES

Plate 1 Parapet Wall (2m scale).

Plate 2 Close up of crack in parapet wall.

Plate 4 Trench 1 (1m scale).

Plate 3 Trench 1 sondage (0.5m scale).

Plate 5 Post Pad 1008 below city walls.

Plate 6 Trench 2 (0.5m scale).

Plate 8 Trench 2 against wall (0.5m scale).

Plate 7 Wall core (0.5m scale).

FIGURES

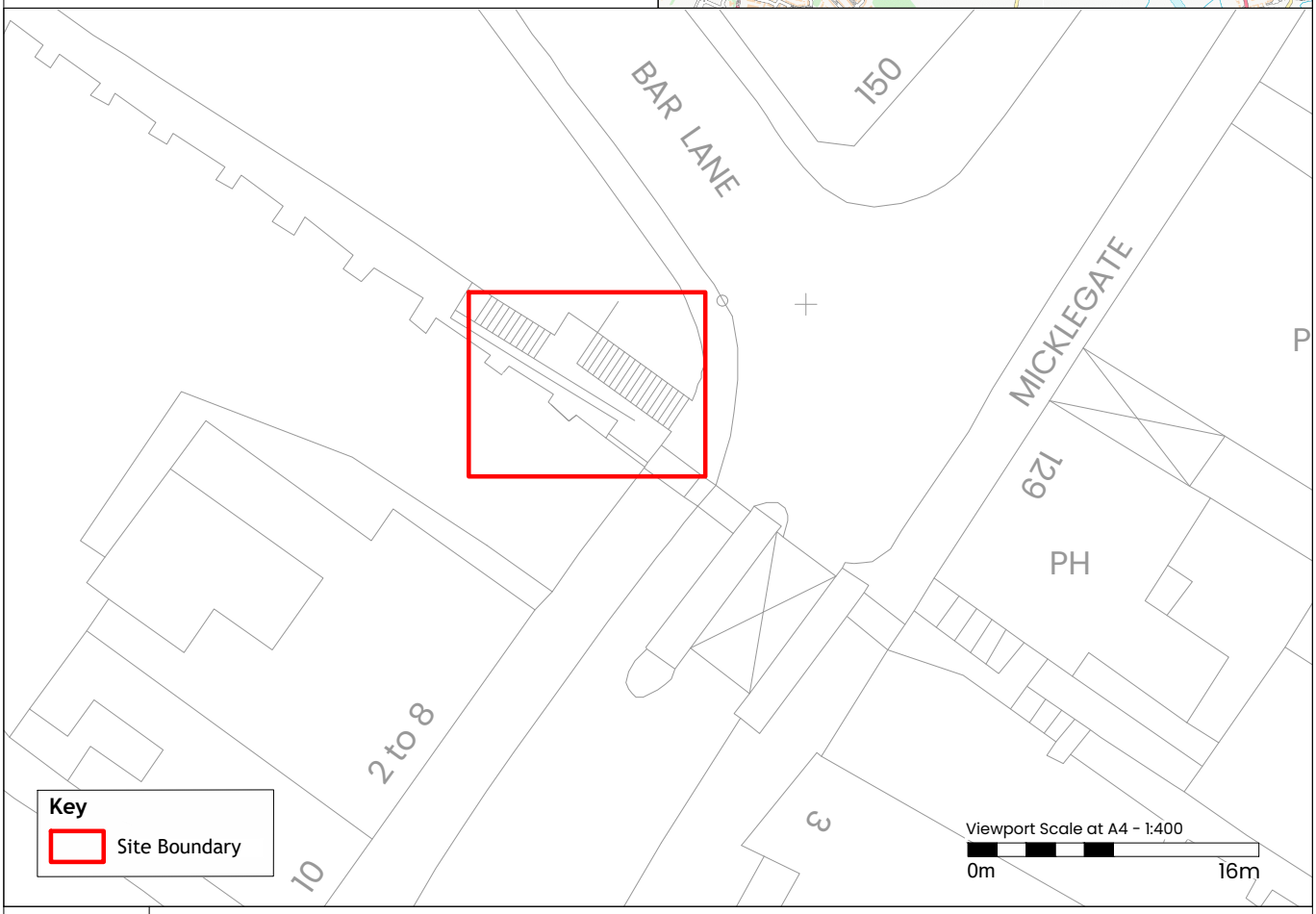


Figure 01 - Location Map
6323 - City Walls, Micklegate Bar, York

Scale at A4 - Varies
Drawn by BP

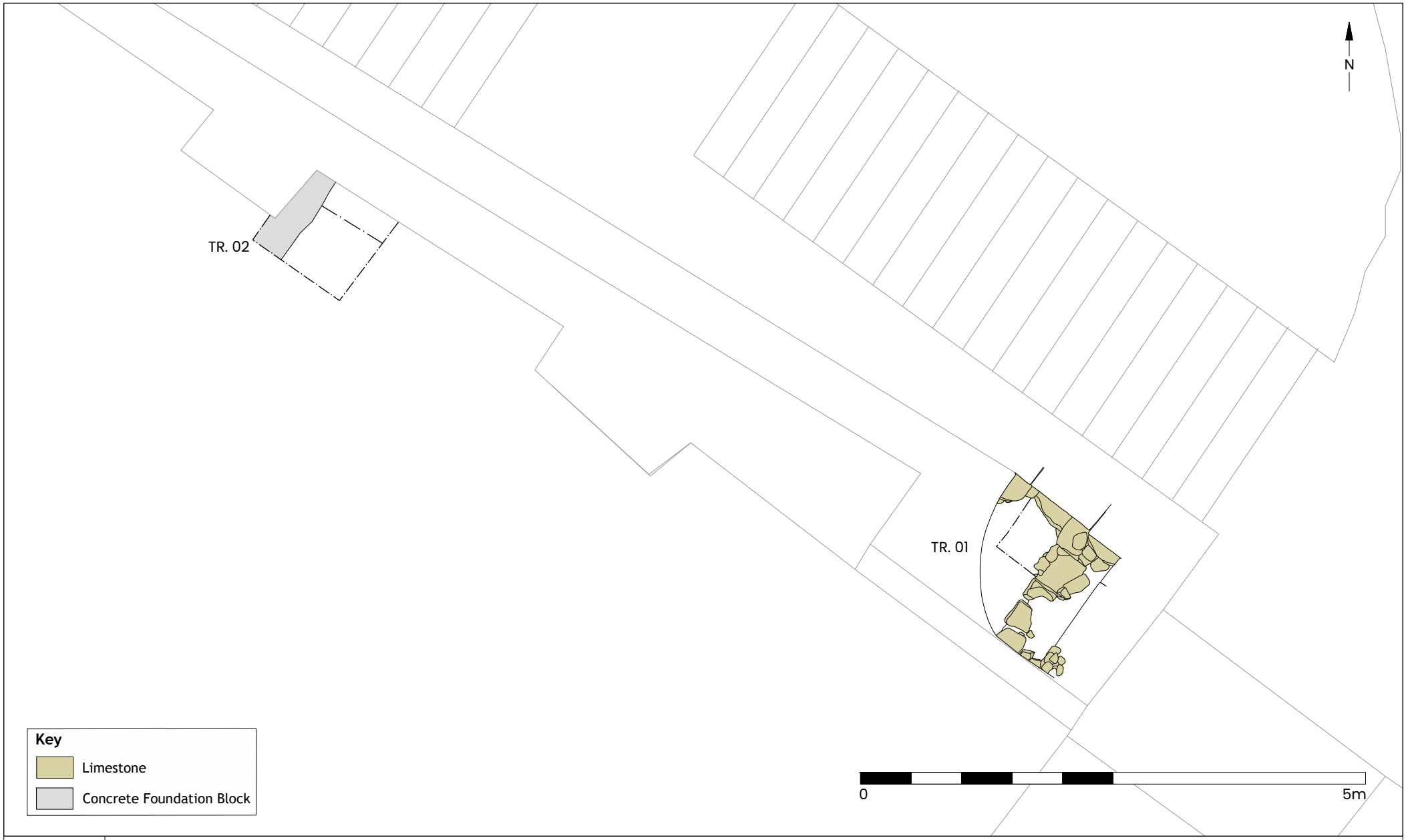


Figure 02 - Trench Location Plan
6323 - City Walls, Micklegate Bar, York

Scale at A4 - 1:50
Drawn by MH & BP

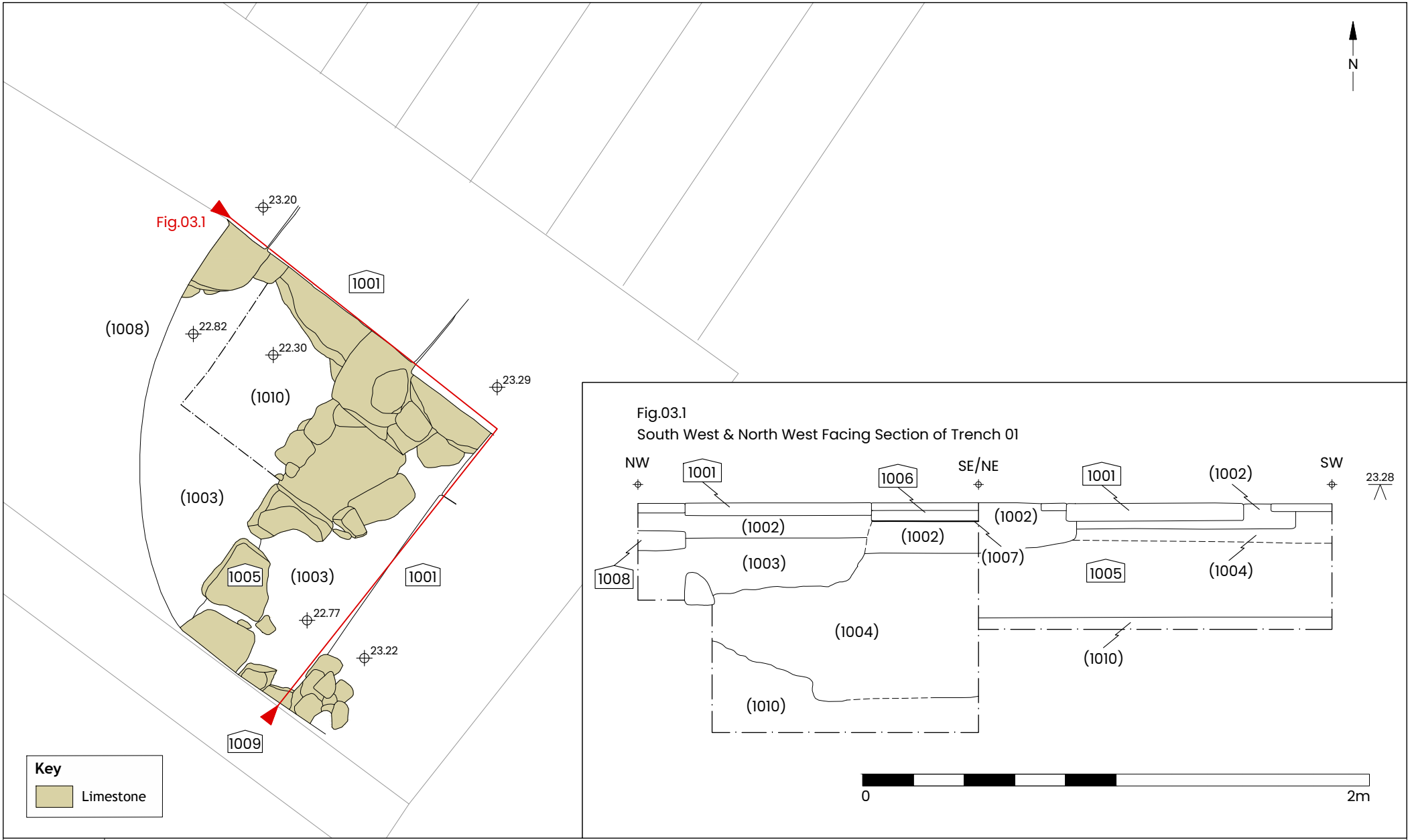


Figure 03 - Trench 01 Plan and Section Figure 03.1
6323 - City Walls, Micklegate Bar, York

Scale at A4 - 1:20
Drawn by MH & BP

Fig.04.1
North East Facing Section of Trench 02

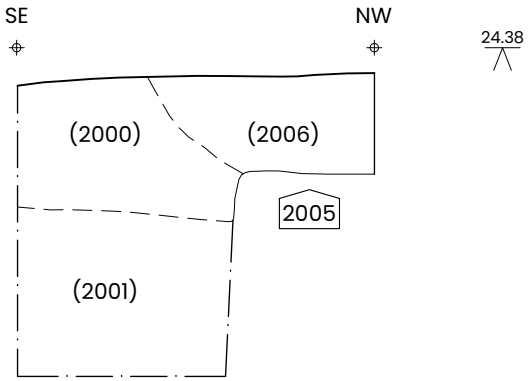
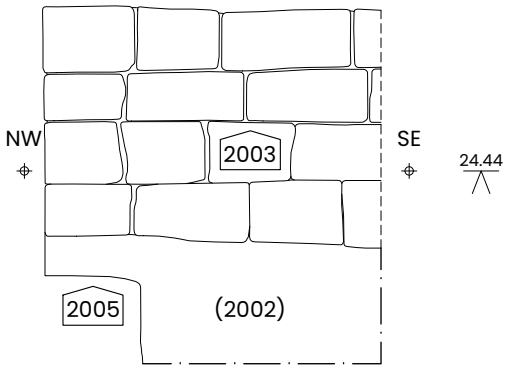


Fig.04.2
South West Facing Section of Trench 02



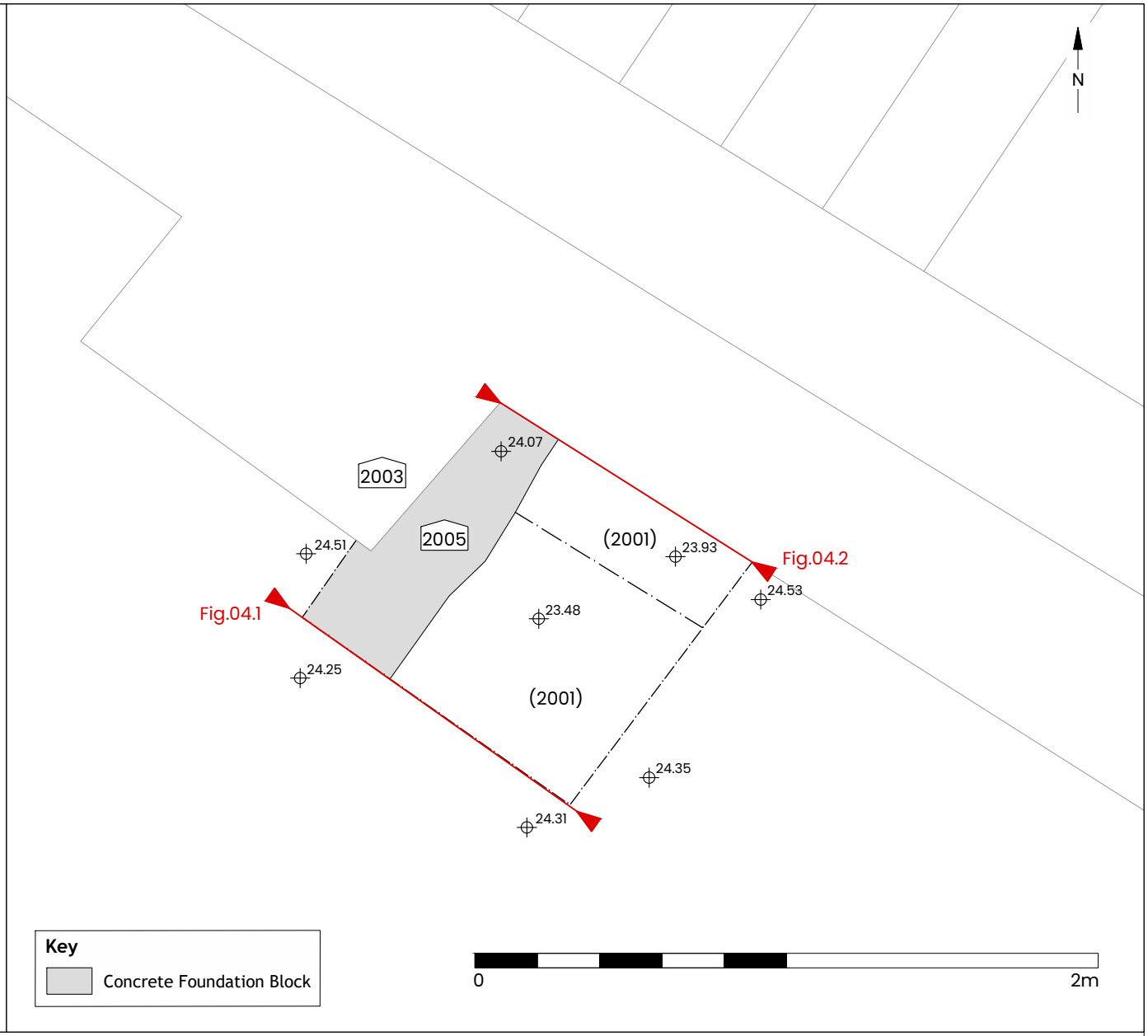
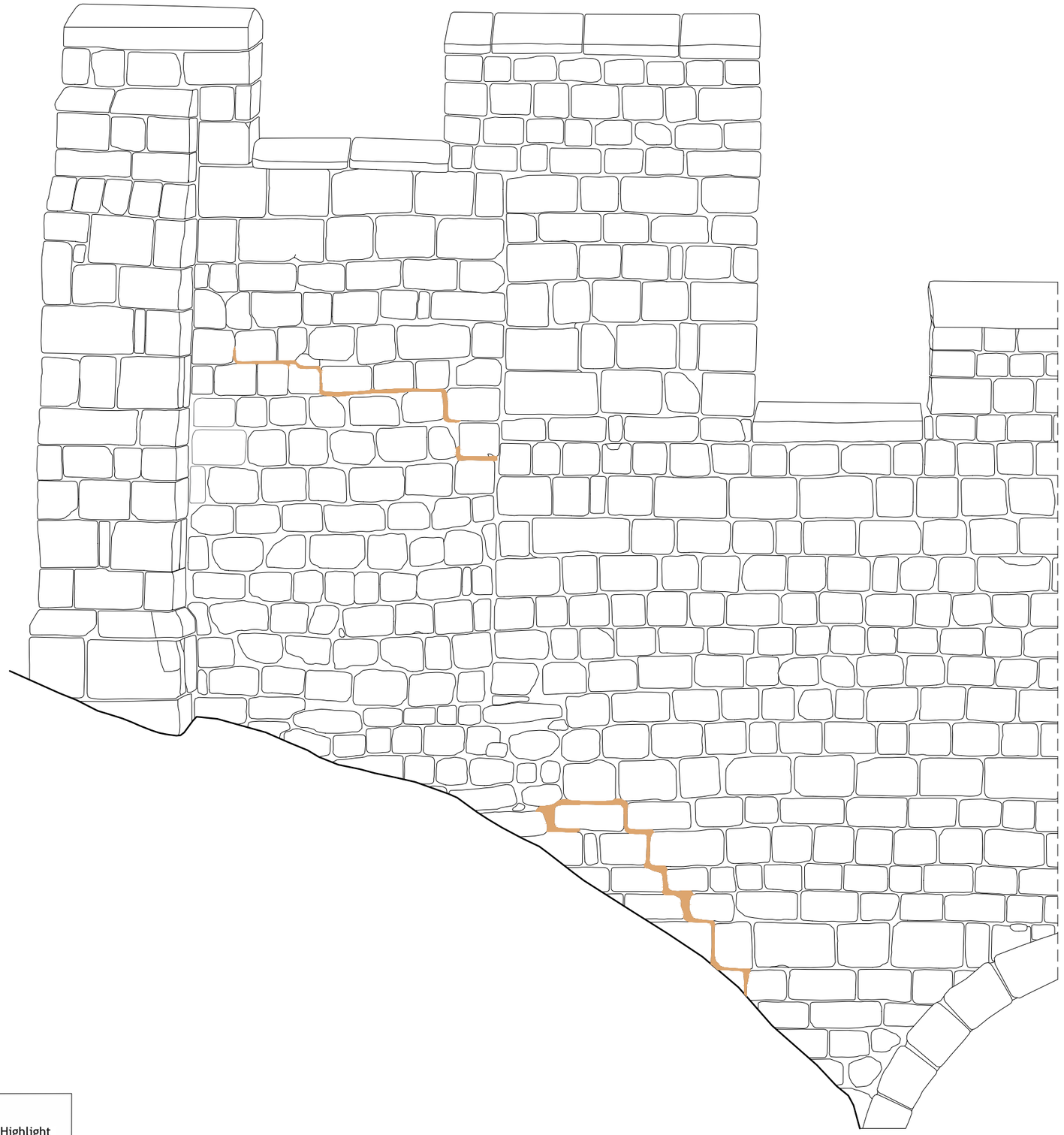
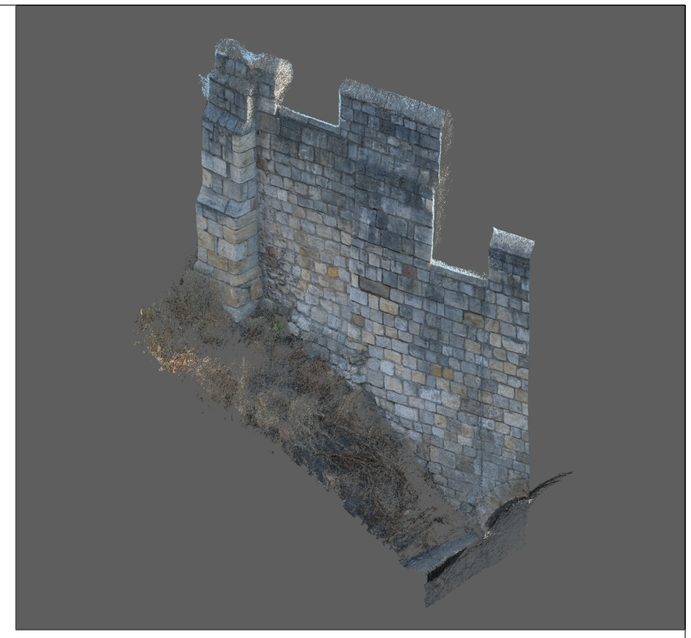


Figure 04 - Trench 02 Plan and Section Figures 04.1 & 04.2
6323 - City Walls, Micklegate Bar, York

Scale at A4 - 1:20
Drawn by MH & BP



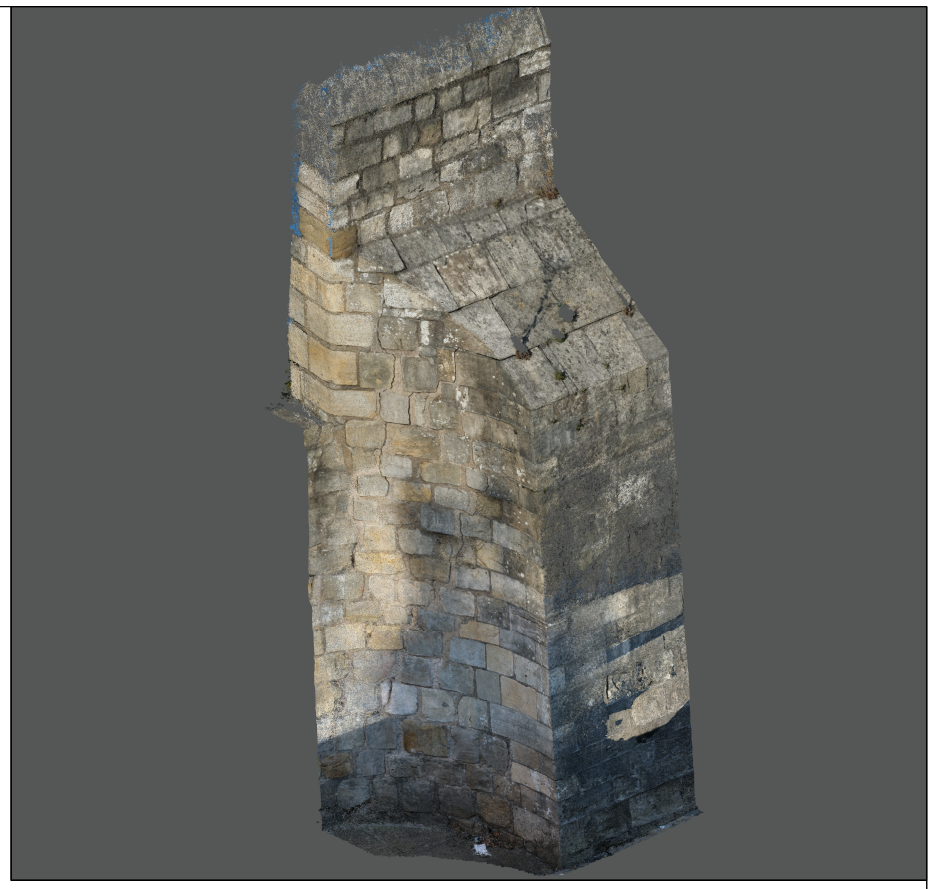


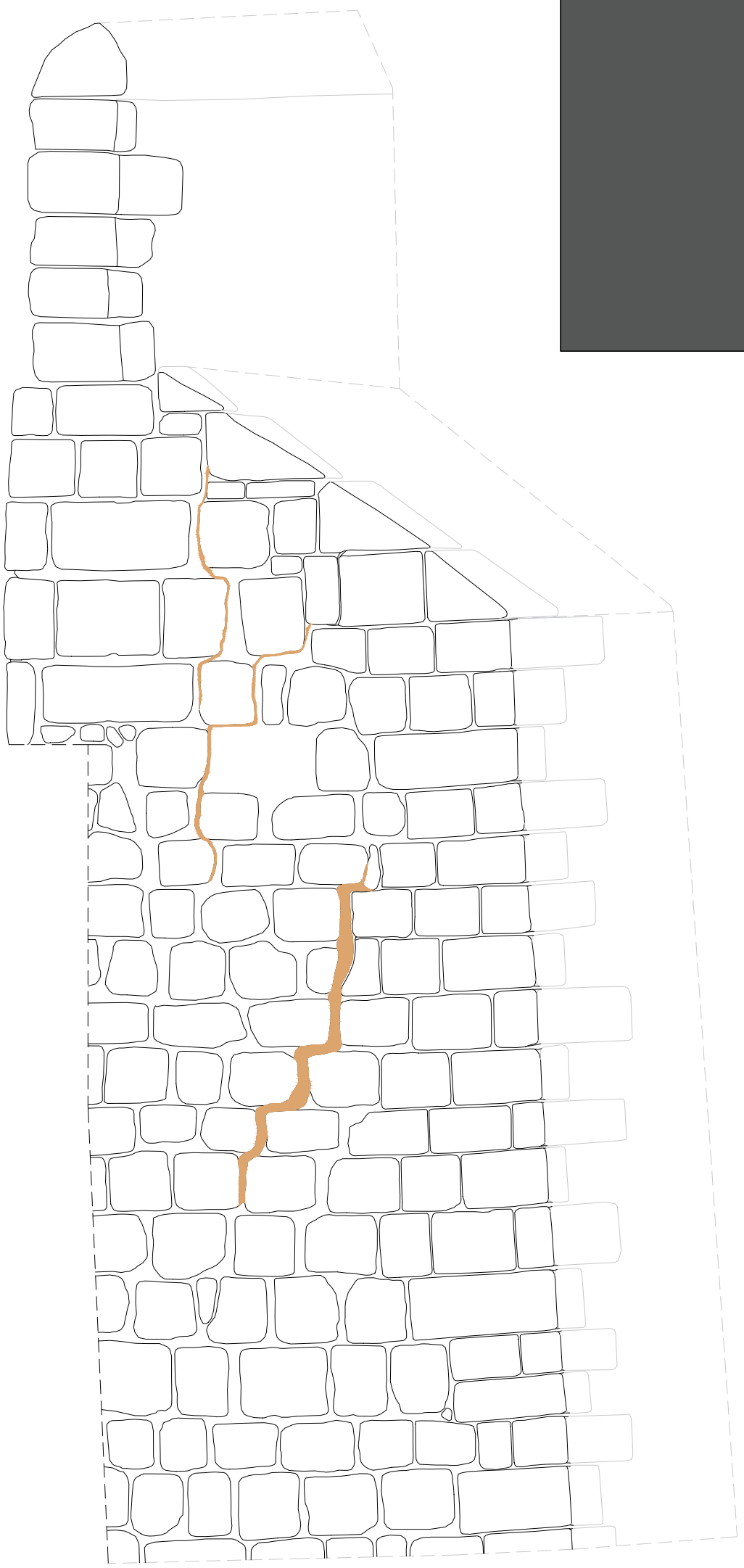
Key

Crack Highlight

Figure 05 - South West Facing (Outer) City Wall Elevation
6323 - City Walls, Micklegate Bar, York

Scale at A3 - 1:30
Drawn by MH





Key

Crack Highlight

0 — 2m

Figure 06 - North East Facing (Curved Part of Inner Walkway) City Wall Elevation
6323 - City Walls, Micklegate Bar, York

Scale at A3 - 1:20
Drawn by MH

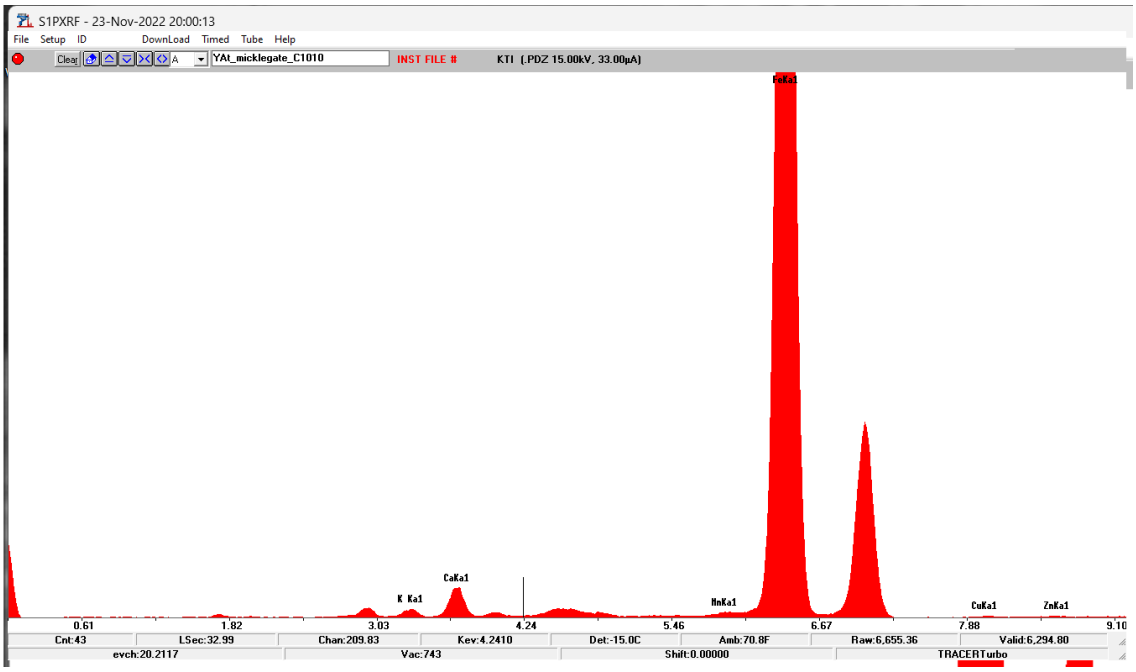


Figure 7 HH-XRF spectrum derived from the flowed slag sample from Context 1010, No manganese peak is present (to the left of the major iron peaks).

WRITTEN SCHEME OF INVESTIGATION

YORK ARCHAEOLOGICAL TRUST

WRITTEN SCHEME OF INVESTIGATION FOR

ARCHAEOLOGICAL INVESTIGATIONS, YORK CITY WALLS, MICKLEGATE BAR

Site Location: York City Walls, Micklegate Bar

NGR: SE 59753 51467

Proposal: **Building recording and watching brief**

Planning ref: **N/A**

Prepared for: City of York Council

Document Number: **2022/95**

Version	Produced by:		Edited by:		Approved by:	
	Initials	Date	Initials	Date	Initials	Date
1	BS	08/08/22	BR	11/08/22	BR	16/08/22

Version	Approved on behalf of Local Authority by:	
	Curator	Date
1	Claire MacRae	16/08/22

1) SUMMARY

City of York Council (CYC) has submitted proposals for stabilisation of parts of the city wall between Micklegate Bar and Toft Tower (Chainage 0690–0700) SE 59753 51467. The scheme comprises remedial structural repairs to both the rampart wall and the parapet wall close to the north side of Micklegate Bar, York (Figure 1, Site location).

The following archaeological works are required: photogrammetric recording prior to commencement of works and watching brief monitoring during the course of works.

This Written Scheme of Investigation (WSI) has been prepared at the request of Stephen Gandolfi, CYC city walls manager and approved by Claire MacRae, CYC principal archaeologist. The work will be carried out in accordance with this WSI, and according to the principles of the Institute for Archaeology (CIfA) Code of Conduct and all relevant standards and guidance.

Scheduled Monument Consent will be applied for by Stephen Gandolfi, CYC City Walls Manager.

2) SITE LOCATION & DESCRIPTION

The proposal site is located at Micklegate Bar, York City walls SE 59753 51467 (Figure 1). The site straddles Micklegate, at its junction with Nunnery Lane and Blossom Street, on the south-west side of York City centre.

Photogrammetric recording will take place on the section of the rampart and parapet walls immediately to the north-west of Micklegate Bar, prior to the erection of scaffolding.

A watching brief will be undertaken during remedial works to repair the rampart and parapet walls.

The planned remedial works comprise a deep rake-out and repoint of external face of the rampart wall, parapet wall and part of the inner face of the lower walkway north-west of Micklegate bar using a lime-rich mortar in accordance with the conservation management plan. The removal and reinstatement of a buttress facing stone in one location. Dismantling and rebuild of the parapet wall north-west of the Bar and removal and reinstatement of paving in this area. Further details of the methodology can be found int Mason Clark Associates report 18919-Y-RP-052-RO (Appendix 1)

3) DESIGNATIONS & CONSTRAINTS

Micklegate Bar is part of a Grade I Listed building, comprising part of the city walls from Baille Hill to Barker Tower, including Barker Tower and North Street Postern, Victoria Bar and Micklegate Bar (List entry 1259262). It is also part of the City Walls Scheduled Monument (List entry 1004910) (Laban 2018, 1)

The site is located within York's Area of Archaeological Importance (AAI). The site is also within characterisation zone 21 of the York Historic Core Conservation area.

CYC will apply for Scheduled Monument Consent and will liaise with relevant stakeholders regarding design and methodology. The AAI requirements will be fulfilled by YAT's attendance.

Access to the parapet walls either side of Micklegate Bar shall be controlled by CYC during the works. Works access for the watching brief shall be managed by CYC masons via scaffolding in

place for the remedial works. Standard YAT SHEQ protocols and PPE requirements will be adhered to.

4) ARCHAEOLOGICAL / HISTORICAL INTEREST

The settlement on the south-west bank of the river Ouse has its origins in the 2nd century. By the early 3rd Century, *Eboracum* was granted the official status of *colonia*, the most prestigious level of the urban hierarchy. It has been speculated that the circuit of the present walls directly overlay the Roman fortifications (Palliser 2014, 12–15). However little evidence has been found to support this assertion.

The presence of Roman burials in the area close to Victoria Bar, has led to suggestions that the south-eastern part of the city walls lies beyond the limits of the Roman civilian settlement (Whyman 2001, 391–3).

It is likely that the area had been enclosed by an earthen bank in the mid-10th century (RCHME 1972).

Following the Norman Conquest the city's defensive fortifications were improved. This included the replacement of the wooden palisade by stone walls over the course of the 13th and 14th century.

The outer arch and much of the passage walling of Micklegate Bar date to the early 12th century. The upper storeys date to the mid-14th century around which time a barbican was also added. In 1826 the barbican was removed and the following year the inner façade was rebuilt in stone and an arched passage was made to the south of the Bar. Also, in 1827 the battlements of the adjoining City walls were lowered and stairs made up to the wall walk on the north side of the Bar. The two arches to the north side of the Bar were added in 1863, replacing a single arched passage made through the rampart in 1753 (York HER accessed on 09/08/2022).

In July 2017 YAT conducted a building recording exercise at Micklegate Bar prior to renovation work to the 3rd floor roof (Laban 2018).

5) AIMS

The general aims of the building recording and watching brief are:

- To record the parapet walls before any works, including the installation of scaffolding, take place
- To examine and record and interpret the structure as it is exposed
- To record any alterations subsequently made as part of the remedial works
- To monitor and record during any investigations of the foundations which may be necessary to determine the causes of movement in the structures
- To archaeologically excavate should any important or complex remains be revealed during investigations

6) TECHNIQUES

The building recording will comprise the following elements

- Building recording to Historic England Level 1 standard using photogrammetry

- Reporting

7) METHODOLOGY

The investigation will/may comprise the following elements:

- Photogrammetric recording: **YAT**
- Dismantling of stonework: **CYC masons**
- Reinstatement of stonework and pointing
- Excavation: **CYC masons under archaeological observation/YAT archaeologists**
- SHEQ duty of care, access, engineering requirements: **CYC**
- Archaeological monitoring: **YAT**

Please note that further stages of work or other mitigation measures could be required by the local authority, depending upon the results of the investigations.

8) BUILDING RECORDING METHODOLOGY

The building recording will take place prior to, and during the remedial works.

The objective of this work is to provide a record of the fabric and features of the parapet walls and record any alterations made during the remedial works.

This survey will comprise a Level 1 survey and record in accordance with Historic England guidance "*Understanding Historic Buildings*" (2016).

Written record

A written description of the building will be made on site to aid in the understanding and interpretation of the building's history.

This will be informed by a systematic examination of building's exterior along with each principal room or space within the building, paying particular attention to the floors subject to alteration.

The notes taken on site will be compiled to provide a narrative description of the building and added to the final report.

Drawings

The survey will include location plans at scales of 1:25,000, and a larger plan showing the buildings and relevant structures and other ground features of a scale of at least 1:2,500.

The drawings used as a basis for the report, including photographic viewpoints, will be based upon existing plans supplied by the client at a scale of at least 1:100

All drawings will include metric scales, north signs or details of orientation. There will be clear labelling to signify the subject, the date of survey and the name/ initials of the surveyor.

Photography

Photographs of the building will include:

- General views of the building in its wider setting
- The buildings external appearance comprising a series of oblique views showing all external elevations and views at right angles to the plane of the elevation where appropriate
- The overall appearance of the principal rooms and circulation areas
- The appearance and composition of internal floors
- External and internal detail relevant to the building's design, development or use
- Any evidence for machinery or plant relating to the building's former function
- Any dates, inscriptions or graffiti which contribute to an understanding of the building or its fixtures or fittings
- Any building contents or ephemera which has a significant bearing on the building's history

Photographs will include graduated scales. Where necessary, the camera will be tripod-mounted for stability, and artificial lighting may be used.

The record will be made using a DSLR of at least 24-megapixel resolution. The photographs will be captured in RAW format and converted to TIFF for digital archiving with the Archaeology Data Service.

9) BUILDING RECORDING REPORTING

A full report will be provided within three weeks of the end of fieldwork, and copies provided to the client and the City of York Planning Department in PDF format along with indexed copies of all digital on-site photography.

The report will include:

- The date of the record, the name(s) of the recorder(s) and the location of the archive
- Ordnance Survey location map(s) showing the exact position of building at relevant scales and including the Ordnance Survey licensing number, if required
- the building's precise location, as a National Grid Reference and in address form.
- a summary of the archaeological context of the project including the purpose of the recording and any relevant background information
- annotated elevations based on the digital drawings produced by photogrammetric recording at a scale of either 1:20 or 1:50
- plates illustrating the nature of the building and pertinent points in the text
- plans showing the viewpoints of photographs
- a description of the results including drawings and photographs to illustrate the text
- a concise non-technical summary
- bibliographic references and acknowledgements, including references of any maps and documents used

A digital copy, in PDF format, will be provided for inclusion within the York Historic Environment Record.

10) BUILDING RECORDING ARCHIVING

The archive will be fully catalogued and prepared to recognised standards (Brown 2007). Where necessary the documentary archive will be sent to the NMR for copying.

The paper and digital archive generated by YAT will remain the property of YAT until deposited with the appropriate archive.

The client will be notified in writing on completion of fieldwork, with a proposed timetable for deposition of the archive. This should be confirmed in the project report.

The client will be informed in writing on final deposition of archive which will happen within 6 months of completion of the project.

The archive will be fully indexed and will include:

a) all field records

b) site notes

c) complete digital archive with catalogue and high-resolution images used in the report (.jpg or .tiff)

d) site drawings (plans and elevations)

e) printouts

The paper and digital archives will be deposited with Yorkshire Museum and ADS, as appropriate.

11) EXCAVATION RECORDING METHODOLOGY

Exploratory trenches may be dug by the CYC masons to determine the nature and depth of the foundations. A watching brief will be maintained by a YAT archaeologist during any such works. Should important or complex archaeological remains be revealed the work will be continued by archaeologists as a formal archaeological excavation. The recording methodology employed to record any archaeological deposits and features will be as follows:

All archaeological features will be recorded using standardised pro forma record sheets. Plans, sections and elevations will be drawn as appropriate and a comprehensive photographic record will be made where archaeological features are encountered.

Archaeological contexts will be planned at a basic scale of 1:20. Larger scales will be utilised as appropriate. Sections drawings will be made at a basic scale of 1:10 or 1:20 depending on the size of the feature. All drawings will be related to Ordnance Datum. Where it aids interpretation, structural remains will also be recorded in elevation.

Archaeological contexts will be allocated unique numerical identifiers and described in full on a pro forma context record sheet in accordance with conventional archaeological record methods. All records will be checked and indexes of records compiled.

All site photography will follow accepted archaeological photography guidelines. Work in progress, general views, groups of contexts or features, individual contexts and sections will be digitally photographed.

Elevations will be recorded using photogrammetry and rectified drawings will be produced at 1:20 or 1:50, as appropriate, for reporting purposes.

Areas devoid of archaeological material 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. Unstratified material will not be kept unless it is of exceptional intrinsic interest. Material discarded as a consequence of this policy will be described and quantified in the field. 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.

Other samples will be taken, as appropriate, in consultation with York Archaeological Trust specialists and the Historic England Regional Science Advisor, as appropriate (e.g. dendrochronology, soil micromorphology, monolith samples, C14, etc.). 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.

It is very unlikely that human remains will be encountered. Any human remains discovered will be left in situ, covered and protected pending notification of the discovery to Claire MacRae, CYC Principal Archaeologist and the submission to the Ministry of Justice of an application for excavation. Exhumation of human remains will take place in compliance with environmental health regulations and only with a valid licence from the Ministry of Justice. An osteoarchaeologist will be available to give advice on site.

- Any **disarticulated** human remains discovered will be recovered and removed in appropriate packaging. If the excavations are to remain open for any length of time disarticulated remains will be removed and boxed, for reburial by the Church
- Any **articulated** human remains that are found will be excavated in accordance with recognised guidelines (see 7.10) and retained for assessment.
- Any grave goods or coffin furniture will be retained for further assessment.

Human remains will be removed in accordance with the Burial Act 1857 and the Ministry of Justice exhumation licence, and with the guidance of CIfA Technical Paper 13 (1993) and APABE (2017).

12) WATCHING BRIEF METHODOLOGY

This work comprises a continuous watching brief during the removal of stones, including those from the parapet walls and lifting of walkway paving slabs. The removal of these stones may reveal lower in situ medieval courses of the wall and show the relationship between Micklegate Bar and the adjacent City walls.

It is not intended that the archaeological monitoring should unduly delay site works. However, the archaeologist on site should be given the opportunity to observe, clean, assess and, where appropriate hand-excavate, sample and record any exposed features and finds. In order to fulfil the requirements of this WSI, it may be necessary to halt stone removal to enable the archaeology to be recorded properly.

The areas being monitored will be located using a base plan created by the excavation works and/or a GPS or EDM Total station. All measurements will be accurate to +/-10cm, and the trenches locatable on a 1:2500 Ordnance Survey map to ensure our interventions can be independently relocated in the future.

13) SPECIALIST ASSESSMENT

Any stratigraphic information, artefacts, soil samples, and residues will be assessed as to their potential and significance for further analysis and study. The material will be quantified (counted and weighted). Specialists will undertake a rapid scan of all excavated material. Ceramic spot dates will be given. Appropriately detailed specialist reports will be included in the report.

Materials considered vulnerable should be selected for stabilisation after specialist recording. Where intervention is necessary, consideration must be given to possible investigative procedures (e.g. glass composition studies, residues on or in pottery, and mineral-preserved organic material). Allowance will be made for preliminary conservation and stabilization of all objects and a written assessment of long-term conservation and storage needs will be produced. Once assessed, all material will be packed and stored in optimum conditions, in accordance with Watkinson and Neal (1998), CIfA (2014) and Museums and Galleries (1992).

All finds will be cleaned, marked and labelled as appropriate, prior to assessment. For ceramic assemblages, any recognised local pottery reference collections and relevant fabric Codes will be used.

Allowance will be made for the recovery of material suitable for scientific dating and contingency sums will be made available to undertake such dating, if necessary. This will be decided in consultation with Claire MacRae, CYC Principal Archaeologist.

14) WATCHING BRIEF/EXCAVATION REPORT & ARCHIVE PREPARATION

Upon completion of the site work, a report will be prepared to include the following:

a) A non-technical summary of the results of the work.

b) An introduction which will include the planning reference number, grid reference and dates when the fieldwork took place.

c) An account of the methodology and detailed results of the operation, describing structural data, archaeological features, associated finds and environmental data, and a conclusion and discussion.

d) A selection of photographs and drawings, including a detailed plan of the site accurately identifying the areas monitored, trench locations, selected feature drawings, and selected artefacts, and phased feature plans where appropriate.

e) Specialist artefact and environmental reports where undertaken, and a context list/index.

f) Details of archive location and destination (with accession number, where known), together with a context list and catalogue of what is contained in that archive.

g) A copy of the key OASIS form details

h) Copies of the Brief and WSI

i) Additional photographic images may be supplied in digital format for the HER.

The report will be submitted in digital format to the commissioning body as well as direct to Claire MacRae, CYC Principal Archaeologist for planning purposes and inclusion into the HER.

A field archive will be compiled consisting of all primary written documents, plans, sections and photographs. Catalogues of contexts, finds, soil samples, plans, sections and photographs will be produced. York Archaeological Trust will liaise with the Yorkshire Museum prior to the commencement of fieldwork to establish the detailed curatorial requirements of the museum and discuss archive transfer and to complete the relevant museum forms. The relevant museum curator would be afforded access to visit the site and discuss the project results.

The owner of the Intellectual Property Rights (IPR) in the information and documentation arising from the work, would grant a licence to the Local Authority and the museum accepting the archive to use such documentation for their statutory functions and provide copies to third parties as an incidental to such functions. Under the Environmental Information Regulations (EIR), such documentation is required to be made available to enquirers if it meets the test of public interest. Any information disclosure issues would be resolved between the client and the archaeological contractor before completion of the work. EIR requirements do not affect IPR.

Upon completion of the project an OASIS form will be completed at http://ads.ahds.ac.uk/project/oasis/.

15) POST-EXCAVATION ANALYSIS & PUBLICATION

The information contained in the assessment report may enable decisions to be taken regarding the future treatment of the monument remains and any material recovered during the excavation.

If further archaeological investigations take place, any further analyses (as recommended by the specialists, and following agreement with Claire MacRae, CYC Principal Archaeologist) may be incorporated into the post-excavation stage of the mitigation programme unless such analysis are required to provide information to enable a suitable mitigation strategy to be devised. Such analysis will form a new piece of work to be commissioned.

In the event that no further fieldwork takes place on the site, a full programme of post-excavation analysis and publication of artefactual and scientific material from the evaluation may be required by Claire MacRae, CYC Principal Archaeologist. Where this is required, this work will be a new piece of work to be commissioned.

If further site works do not take place, allowance will be made for the preparation and publication in a local and/or national journal of a short summary on the results of the evaluation and of the location and material held within the site archive.

The results of the work may be publicised locally e.g. by presenting a paper at the YAT annual archaeology in York conference and talking to local societies, as appropriate.

16) HEALTH AND SAFETY

Health and safety issues will take priority over archaeological matters and all archaeologists will comply with relevant Health and Safety Legislation and UK government Covid-19 control measures.

A YAT Risk Assessment/Method Statement (RAMS) will be prepared prior to the start of site works.

17) PRE-START REQUIREMENTS

The client will be responsible for ensuring site access has been secured prior to the commencement of site works, and that the perimeter of the site is secure.

The client will be responsible for providing all equipment for spoil management such as hoists, skips and scaffold working platforms.

The client will provide York Archaeological Trust with up to date service plans and will be responsible for ensuring services have been disconnected, where appropriate.

The client will be responsible for ensuring that any existing reports (e.g. ground investigation, borehole logs, contamination reports) are made available to York Archaeological Trust prior to the commencement of work on site.

18) REINSTATEMENT

Following excavation and recording the trenches will be backfilled by CYC. York Archaeological Trust are not responsible for backfilling or reinstating any deposits or surfaces, including compression of fill, unless specifically commissioned by the client who will provide a suitable specification for the work.

19) TIMETABLE & STAFFING

The timetable will be agreed with the client in advance of the works.

Specialist staff available for this work:

- Human Remains – Malin Holst, York Osteology Ltd
- Palaeoenvironmental remains – Kristine Krawiec, YAT
- Head of Curatorial Services – Christine McDonnell, YAT
- Finds Researcher – Nicky Rogers, Freelance
- Pottery Researcher – Anne Jenner, YAT
- Finds Officers – Kate Smart, YAT

- Archaeometallurgy & Industrial Residues – Dr Gerry McDonnell/Dr Rod Mackenzie, Freelance
- Conservation – Ian Panter, YAT

20) MONITORING OF ARCHAEOLOGICAL FIELDWORK

As a minimum requirement, Claire MacRae, CYC Principal Archaeologist will be given at least one week's notice of work commencing and will be informed prior to completion on site. Any changes to this WSI may only be made with the written approval of Claire MacRae, CYC Principal Archaeologist. Claire MacRae, CYC Principal Archaeologist will be afforded opportunity to visit the site during the works to inspect the site and the archaeological recording, and discuss the project and any further mitigation requirements. York Archaeological Trust will notify Claire MacRae, CYC Principal Archaeologist of any significant archaeological discoveries that are made during the course of the project.

With the client's agreement illustrated notices may be displayed on site to explain the nature of the works.

21) COPYRIGHT

22) BIBLIOGRAPHY

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For current Historic England guidance documents see:

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

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

HH-XRF METHODOLOGY

The instrument used was a Bruker S1 Turbosdr hand-held XRF instrument operating at 15kV. The technique is non-destructive. A beam of x-rays is generated in the instrument and focussed on a fresh fractured surface of the sample, the x-rays interact with the elements present in the sample resulting in the emission of secondary x-rays which are characteristic (in terms of their energy and wavelength) of the elements present in the sample. The energies of the secondary x-rays are measured, and a spectrum generated showing a level of background noise with peaks of the elements present superimposed on the background noise. Slag samples were analysed for 30 live seconds; the spectrum is stored. All elements heavier than magnesium (Mg, Z=12), can be detected.

York Archaeological Trust

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

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