

Archaeological investigations at  
City Learning Quarter  
Bilston Street  
Wolverhampton

Worcestershire Archaeology  
*for City of Wolverhampton Council*

June 2023



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# CITY LEARNING QUARTER BILSTON STREET WOLVERHAMPTON

Archaeological excavation report

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## SITE INFORMATION

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Site name:	City Learning Quarter, Bilston Street, Wolverhampton
Site code:	-
Local planning authority:	City of Wolverhampton Council
Planning reference:	19/00931/FUL
Central NGR:	SO 9168 9840
Commissioning client:	Turner and Townsend, on behalf of City of Wolverhampton Council
Client project reference:	-
WA project number:	P5807
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HER reference:	EBL1009
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## Archaeological investigations at City Learning Quarter, Bilston Street, Wolverhampton

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Illustrations by Laura Templeton and Abbie Horton

### Summary

An archaeological excavation was undertaken by Worcestershire Archaeology from September 2020 to November 2021 at two sites within the City Learning Quarter off Bilston Street (NGR SO 9168 9840) following on from evaluation trenching. The project was commissioned by Turner and Townsend on behalf of their client, City of Wolverhampton Council, in advance of a proposed redevelopment of the site, comprising the demolition and refurbishment of various buildings on the site, plus the construction of new buildings, for a public education quarter.

The site was formerly the location of the Great Hall, a moated manor house known to be in existence by the 16th century and that became one of the major enamelling factories in Wolverhampton in the late-18th to 19th centuries. It had been the focus of previous archaeological work from 2000 to 2007, which revealed parts of the manor house and moat, along with medieval ridge and furrow beneath the clay platform, which had been created with material from the excavation of the moat circuit.

Two areas were excavated, that is in the north-east and south-west corners of the site. The northern Area 1 revealed a previously unknown redesign of the moat circuit, suggesting that the eastern side of the moat had been backfilled and then extended around the turn of the 18th century. The dating of the original stretch of moat hinted at a possible medieval origin, though this was far from conclusive, and a 16th century date contemporary with the construction of the Tudor Hall remains its most likely date of origin. The excavation also showed how the extended moat section was not excavated as deep as the original, being less than 1m deep compared with the 2m, or more, of the earlier moat. Also revealed was the graduated backfilling of the moat in its final years. When only its north-east corner was extant, a retaining wall was inserted on the west side of the moat channel by way of a revetment.

In the southern Area 2, the footprint of part of the 19th century expansion of the enamelling works was evident. This included the remains of the furnace, showing at least three phases of flue construction, along with other adaptations to the design. The buildings identified here aligned well with those recorded on the 1840 *Health of Towns* map, which also described the function of the different buildings. Here, two earlier ditches were also identified, one of which was likely a land boundary between orchards as shown on Taylor's Map of 1750. The other was probably the outer edge of the south-western corner of the moat.

# Report

## 1 Introduction

### 1.1 Background to the project

An archaeological excavation was undertaken by Worcestershire Archaeology (WA) from September 2020 to November 2021 at two sites within the City Learning Quarter (CLQ) off Bilston Street (NGR SO 9168 9840). The main excavation ran from 7 September to 2 November 2020, with two further stages of work from 27 September to 1 October and 22-26 November 2021. Area 1 covered an area c. 670m<sup>2</sup> in size and Area 2 c. 425m<sup>2</sup>.

The project was commissioned by Turner and Townsend (2020) on behalf of their client, City of Wolverhampton Council, in response to a specification for archaeological excavation prepared by the Archaeology and Historic Environment Officer, Wolverhampton City Council. The project results from the submission of a planning application to City of Wolverhampton Council (reference 19/00931/FUL), which proposes redevelopment of the site, comprising the demolition and refurbishment of various buildings on the site, plus the construction of new buildings for a public education quarter.

Previous evaluation on the site had identified the remains of a moat and curtain wall associated with a manor house of presumed 16th century date, as well as 18th and 19th century industrial activity related to the processes of japanning and enamelling, and a Victorian school house (Lovett 2020).

The excavation conforms to the industry guidelines and standards set out by the Chartered Institute for Archaeologists in *Standard and guidance: for archaeological excavation* (CIfA 2014a).

### 1.2 Site location, topography and geology

The site is located on the south-eastern side of Wolverhampton city centre (Figure 1). It is bounded on the north by Bilston Street, on the east and south by St George's Parade, and, on the west, by Garrick Street. Area 1 was situated in the north-east corner of the development, and was covered in gravel and tarmac, having been in use as a carpark for some time, and it sloped slightly from a high point of 156.4m AOD in the west down to 155.1m AOD in the east. Area 2 was in the central south part of the site, and laid with tarmac as it was also a carpark, and this was flat, lying at about 156.6m AOD.

The underlying geology comprises bedrock of Clent Formation and Enville Formation (undifferentiated) – Mudstone and Sandstone (BGS 2022).

## 2 Archaeological and historical background

The site has been the subject of a desk-based assessment (DBA; Delta-Simons, 2018), and the following background summary is taken from the Birmingham Archaeology excavation report (Hewitson *et al* 2010):

The site was once the location of the Great Hall of the Levesons, built in the 16th century. The Levesons were a wealthy merchant family of local importance who first entered the historical record in the 13th century. Whilst the exact date of the construction of the Great Hall is unknown, 19th century drawings of it suggest a stylistic date of around 1570, with some sources suggesting as early as 1554 and others as late as the early 17th century. The first mention of the Hall comes in an itinerary from around 1540, which refers to the ancient house of the Luson (Leveson) family; this cannot refer to the 16th century Hall, and so suggests an earlier building may have stood on the site.

In 1563 John Leveson succeeded to the Leveson estate on the death of his brother Thomas, and he is regarded as the most likely candidate for commissioning the Hall. A descendant, also named Thomas, supported the king in the Civil War and was given command of Dudley Castle. In 1642

this Thomas garrisoned the Great Hall but it was given up the following year as indefensible due to being too low-lying and exposed. Thomas managed to get permission from Parliamentary forces to allow his wife Frances to live there. By 1646 Thomas was forced to surrender Dudley Castle to Parliamentary forces. He had his estates confiscated and was forced into exile, where he, eventually, died penniless in 1652.

Robert Leveson, Thomas's son, recovered his father's estates following the Restoration in 1660, though by 1665 it is likely that he was not living there. Robert eventually sold the estate to Francis, first Earl of Bradford in 1702 for £22,000. The Hall was rented to the Turton family, though it is unclear whether this was before or after the sale of the estate.

The Turton family were wealthy ironmongers, and, when they moved into the Hall, it was in a ruinous state and so they spent some of their considerable wealth renovating it. They removed the upper storey and inserted sash windows, sometime around 1702-1710. By now it was known locally as Turton's Hall, though it is likely that the Turtons had moved out by 1735. After this time, it is left empty for a prolonged period, such that coiners were rumoured to have used the Hall for their criminal enterprises.

Some sources suggest that the Hall was in commercial use by 1745, though it is not until 1767 that it becomes a japanning works. It is unclear who started the business at this time, but, in 1780, Taylor and Jones are listed as proprietors in the local trade directory.

The Taylor map of 1750 shows the Hall (named as The Great Hall) in detail, with the building three storeys high and aligned north to south in an H plan. The moat circuit surrounds the Hall, with two towers, one at the north-east corner and one at the south-east. By the 1788 map only a few additional buildings have been constructed to the south of the Hall and the moat circuit is still complete.

In 1805 Obadiah and William Ryton moved their japanning business into the Hall. In 1810 Obadiah dies and Benjamin Walcot joined as partner in the business. William Ryton retired in 1842 and Walcot became sole proprietor. The tithe map of this year shows further expansion, with new buildings to the south and west of the Hall, with the southern arm of the moat filled in and built over. The north-eastern corner is now the only bit remaining open.

Benjamin Walcot died in 1847 and his son Frederick took over, rejuvenating the business and extending construction further to the south of the Hall. By now the Hall was known simply as the Old Hall. The moat had completely gone and St George's School was built over it in the north-east corner. Sometime between 1874 and 1880 the business finally closed, and the Hall then lay empty until it was demolished in 1883.

## 2.1 Timeline of events

There follows a simplified timeline of events, based on Hewitson *et al* (2010):

<b>1530-1540</b>	John Leland's itinerary: this refers to the <i>ancient house of the Lusson family</i> (pronounced Leveson), though this can't mean the brick-built hall, as even if it was already built, this building could not be described as ancient. This suggests an earlier hall on the site.
<b>1500s</b>	Leveson family own the Hall from at least the 16th century.
<b>1553-1554</b>	Proposed date of construction for Hall by Mander and Tydesley (1960)
<b>1560-1600</b>	Proposed date of construction for Hall by Jones (1900) and Barford and Hewitt (1871)
<b>1570s</b>	Likely date of construction based on style
<b>1603-1625</b>	Proposed date of construction for Hall by Niven (1882)
<b>1563-1575</b>	John Leveson succeeded to the Leveson estate on the death of his brother Thomas, and he is the most likely candidate for building the Hall.

<b>1615-1652</b>	Thomas Leveson, a Catholic, supported the King in the Civil War, and was given control of Dudley Castle.
<b>1642</b>	Thomas Leveson garrisons the Hall
<b>1643</b>	The Hall is given up as a garrison as indefensible; too low-lying and exposed. Got permission from Parliamentary leaders for his wife, Frances, to live there.
<b>1646</b>	Leveson surrenders Dudley Castle, and has his property confiscated. He eventually dies penniless in exile in 1652.
<b>1660</b>	Robert Leveson, Thomas's son, recovers his father's lands in the Restoration, though, by 1665, he is almost certainly not living in it.
<b>1702</b>	The estate is sold to Francis, first Earl of Bradford, for £22,000. The Turton family are already resident in the house by now, though not sure exactly when this started. Apparently, the Hall was in a ruinous state when they moved in.
<b>1702-?1710</b>	Turtons renovate the Hall, removing the top storey and inserting sash windows.
<b>1735?</b>	The Turtons move out around this time, and the Hall is left empty for a prolonged period. Coiners possibly use the Hall.
<b>1745</b>	The Hall is possibly in commercial use.
<b>1750</b>	Taylor's Map.
<b>1767</b>	The Hall becomes a japanning works, though uncertainty as to who started the business.
<b>1780</b>	Taylor and Jones are listed in the trade directory as proprietors.
<b>1788</b>	Initial expansion of the Hall from that shown on 1750 map, with addition of buildings to south and south-west of the Hall. Moat still extant.
<b>1805</b>	Obadiah and William Ryton move their japanning business to the Hall.
<b>1810</b>	Obadiah dies and Benjamin Walcot joins as partner to William.
<b>1820</b>	Papier-mâché specialism possibly begins.
<b>1842</b>	William Ryton retires and Walcot becomes sole proprietor. Further expansion to south and west evident on tithe map. Moat only extant in NE corner.
<b>1847</b>	Benjamin Walcot dies and his son Frederick takes over.
<b>1852</b>	Further expansion as seen on <i>Health of Towns</i> map. Moat completely gone and St George's School now built in NE corner.
<b>1874-80</b>	Business closes down.
<b>1883</b>	The Hall is demolished.
<b>1899</b>	College of Education is built.

## 2.2 Previous archaeological work on the site

The site has been the subject of several investigations since Birmingham Archaeology undertook an evaluation in 2000 (Hewitson *et al* 2010), which comprised four trenches, with their Trench 3 located in the north-east corner of the site (within Area 1 of the present works). This revealed the upper fills of the moat and, thus, the northern arm of the circuit was securely located. A second stage of evaluation in 2002 allowed the full depth of the moat to be ascertained, with two trenches, one in the north of the site, and one in its north-western corner. An excavation area 8m by 26m was opened across the western wing of the Great Hall and the adjacent moat, revealing the footings of the Hall, cutting through a clay platform formed from the upcast created when the moat was dug. This platform sealed a medieval plough soil, although no evidence for an earlier hall from this period was identified.

A watching brief in the same year revealed the northern extent of the Hall building, as well as parts of the curtain wall, and the northern and eastern arms of the moat. A further stage of evaluation, in 2003, took place to the south of Old Hall Street, and demonstrated the survival of the southern arm of the moat circuit below modern deposits.

A final watching brief phase was undertaken in 2007, this time demonstrating the survival of deposits in the western arm of the moat, along with possible *ex situ* remnants of the curtain wall.

The evaluation by Worcestershire Archaeology in November 2019 comprised four trenches across the development site (Lovett 2020). The trenches in the north-western and south-eastern corners of the site revealed little of significance, but the trench in what is now Area 1 revealed part of the curtain wall and moat, as well as remains of the later St George's School. Another trench, in Area 2, revealed a brick-built furnace and associated walls of 19th century date.

### 3 Project aims

The aims of the work are:

- to mitigate the loss of heritage assets by providing a full archaeological record of deposits, structures, and features that will be impacted by the development,
- to further our understanding of the origin, history and development of the site,
- to disseminate the results by publication and archive,
- and to provide opportunities for public engagement

The objectives are:

- to identify, excavate, sample and record any archaeological features, deposits or structures that pre-date the construction of the Great Hall
- to excavate, sample, and record any archaeological features, structures or deposits relating to the construction, development, and occupation of the Great Hall.
- to excavate a section through the moat in Area 1, to identify and (if present) record and sample deposits that pre-date the late-19th century infilling, with a particular focus on waterlogged deposits with environmental potential and deposits at the base of the moat that may date its original construction.
- to excavate, sample and record any features, structures or deposits that relate to the japping factory phase of activity on site, including identification and analysis of industrial processes.
- to assess the significance of the results in context with previous archaeological work, and with reference to regional research objectives set out in the *West Midlands Regional Research Framework* (Watt 2011).

A post-excavation assessment was produced (Lovett 2022), which, in light of the discovery of the alterations to the moat, identified the following updated aims:

- to determine the date and sequence of changes to the moat circuit.
- with reference to the regional research objectives set out in the *West Midlands Regional Research Framework* (Watt 2011), to examine *the interconnecting themes of capitalism, industrialisation, consumption and globalisation*.

## 4 Project methodologies

### 4.1 Fieldwork methodology

A Written Scheme of Investigation (WSI) was prepared by Worcestershire Archaeology (WA 2020). Fieldwork was undertaken in a number of discrete stages, between 7 November 2020 and 26 November 2021. Two areas, amounting to 1095m<sup>2</sup> in area, were excavated. The location of the excavation areas is indicated in Figure 2, and Plates 1-2.

Deposits considered not to be significant were removed under constant archaeological supervision using a 360° tracked excavator, employing a toothless bucket. Subsequent excavation was undertaken by hand. Clean surfaces were inspected and selected deposits were excavated to retrieve artefactual material and environmental samples, as well as to determine their nature. Deposits were recorded according to standard Worcestershire Archaeology practice (WA 2012). Excavation area and feature locations were surveyed using a GNSS device with an accuracy limit set at <0.04m. On completion of excavation, the areas were reinstated by replacing the excavated material.

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

The project archive is currently held at the offices of Worcestershire Archaeology. Subject to the agreement of the landowner, it is anticipated that this will be deposited with Wolverhampton City Archives.

## 5 Archaeological results

### 5.1 Introduction

Two excavation areas were opened up: Area 1 (Plate 1) in the north-east of the site, and Area 2 (Plate 2) to the south.

Area 1 was excavated to investigate the moat and curtain wall associated with the manor house (here five slots, A–E, were excavated, for which see Figs 3a-b). St George's primary school was on top of the backfilled moat from the mid-19th century, until its demolition in the mid-20th century. The remains of the school were given only cursory recording and have not been discussed in detail in this analysis. Area 2 (Fig 4) was investigated to further understand the nature of the industrial activity identified during the evaluation in 2019 (Lovett 2020). The impacts of the development in Area 2 were limited to landscaping and small services, with the majority of the archaeological features to be left *in situ*, and so investigations here were also limited in extent.

For the features recorded in the excavation areas, see Figures 3-12 and Plates 1-24.

### 5.2 Results

Context Group	Feature type	Cut number	Fill/deposit number	Phase
1	Ditch	3158 3113 3115	3159 3114 3116	1
2	Moat (Moat 1)	4029	4028, 4027, 4026, 4025, 4024, 4023, 4022, 4021, 4020, 4019	2 and 3

		3118	3156, 3157, 3155, 3154, 3153, 3152, 3151, 3150, 3149, 3148, 3147, 3146, 3145, 3144, 3143, 3142, 3141, 3140, 3139, 3138	
3	Moat extension (Moat 2) curtain wall, timber, and moat cleaning	4055 3055 4015	4031, 4052 3135, 3054 4033	3
4	Moat extension (Moat 2)	3103  3072  3120	3104, 3105, 3106, 3107, 3108, 3109, 3110  3093, 3073, 3074, 3075, 3076, 3077, 3094, 3078, 3079, 3097  3132, 3131, 3130, 3128, 3129, 3127, 3126, 3125, 3133, 3134	3, 4 and 5
5	Deposits behind timber beam		4034, 4048, 4047, 4046	3
6	Red brick wall in secondary original ditch and subsequent backfilling	4042	4032, 4014, 4017, 4016, 4013, 4012, 4011, 4010, 4009, 4008, 4007, 4045, 4041, 4044, 4043, 4039, 4038	4 and 5
7	Possible platform/subsoil	-	3160, 3161, 3162, 3111	1
8	Levelling layer covering moat		3167, 4002	5
9	Early ditch	2176	2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2194	2

10	Pit	2168	2173, 2172, 2171, 2170, 2169	4
11	Furnace workshop wall	2085	2195, 2086, 2005, 2109	4
12	Flue 1	2030  2147  2149  2152	2123, 2031, 2032, 2033  2148, 2146  2150, 2151  2154, 2153	4
13	Flue 2	2136 2133 2035  2162	2135, 2134 2132, 2144 2118, 2119, 2120, 2036, 2037, 2038, 2139, 2158, 2159,  2105	4
14	Coal room	2102	2028, 2128, 2129, 2130, 2131, 2047, 2124, 2041, 2115, 2127, 2116, 2117, 2048, 2029, 2008	4
15	Flue 3	2104  2125	2108, 2006, 2007  2101	4
16	St George's School	Not listed	Not listed	5
17	20 <sup>th</sup> -century features	Not listed	Not listed	6
18	Garden soils in Area 2		2192, 2193, 2072, 2156	4
19	Early ditch, possible moat cut	2196	2197, 2198	2
20	Furnace works building	2064, 2058	2066, 2067, 2056, 2057	4

Table 1: Context groups

### 5.2.1 Natural deposits

The same natural ground was encountered in both excavated areas, this being a compact yellow orange sandy clay.

### 5.2.2 Phase 1: Pre-moat activity

Only a handful of features (CG1) were identified that are considered to predate the moat ditch (Fig 3b; Plate 3). A small gully terminus (3158) was cut by the eastern edge of the moat (3118; Moat 1); 0.45m wide and 0.16m deep; it cut the natural ground, and contained no dateable material.

Two parallel ditches, 3113 and 3115, lay further to the east. No relationship between them could be discerned, due to the homogenous nature of the fills. Whilst it is not possible to date them in relation to the original moat cut, the later curtain wall extension does overlie them, and so they have been assigned an early phase.

A possible relict subsoil (3160/3111, CG7; Fig 3b) was seen in the area between the eastern edge of Moat 1 and the inner side of the later curtain wall. It was investigated via a number of small sondages, and was cut by ditches 3113 and 3115. It was a greyish yellow, gleyed material, heavily rooted, and contained pottery dating to 1200-1400 AD.

### 5.2.3 Phase 2: Original moat and ditches

The earliest moat (Moat 1; CG2) was identified in the south-west corner of Area 1 (Figs 3a-b, Trench C; and Fig 5, Sections 25 and 49; Plates 3-7). A full profile across it was not possible to achieve due to accessibility, and so it was excavated in two halves a year apart, but the full depth was excavated. It was c 3m deep and at least 13m wide, probably as wide as 16m, though this was the corner of the moat, and so it may have been wider here than elsewhere. It was lined with a stony clay (4028) at its base and, at least, the lower part of its western edge (Fig 5, Plate 6); no lining was identified on the eastern edge. The lower fills were a mixture of blue clays and grey sands, laminating and lensing, showing the changes in depositional energy. The very lowest deposit, 3156, returned a radiocarbon date of cal AD 1300–1410 (95.4% probability; SUERC-106955). A number of timbers were recovered from these deposits (a timber in fill 3150, Plate 7; plank 3117 in fill 3154, Plate 8), with 15th-17th century pottery also recovered from two fills (3150 and 3152; Fig 5). One of these timbers (3117) had been converted to a 25mm thick plank, with 28 boreholes (25mm in diameter) drilled through it in four rows (Plate 8). The function of this timber remains unclear, but the holes suggest ventilation may have been important.

In Area 2, to the south, two ditches running roughly east to west were present, seen only in a machine-dug sondage through 19<sup>th</sup>-century garden soils. The larger of the two, ditch 2176, contained sixteen fills (CG9; Figs 4 and 6, Plate 10). One of the lower fills, 2179, returned a radiocarbon date of cal AD 1506-1645 (95.4% probability; SUERC-106679), making this probably contemporary with the Hall construction in c 1570. It may be a field boundary between orchard plots that is shown on the Taylor 1750 map. The environmental evidence, particularly from fill 2182, tended to corroborate this.

A second ditch, 2196 (CG19), was seen below wall construction cut 2147 (CG12), parallel with ditch 2176 (Figs 4 and 7; Plate 11). It cut the clay natural ground and was filled with a sterile and homogeneous clay, and is dated to this phase by stratigraphic sequence rather than any artefactual evidence. It lay on the edge of where the moat is projected to run, and though it was only 0.7m deep at this point, this marries well with the depth recorded in the slot through the moat 11m to the east in previous excavations by Birmingham Archaeology in 2003. That part of the moat was backfilled with a series of redeposited natural clays and topsoil deposits, supposedly as part of a rapid closure in advance of extending the industrial capacity of the enamelling works. The redeposited natural clay filling (2196) further reinforces the argument that this is indeed the southern edge of the original moat.

### 5.2.4 Phase 3: Moat 2

At some point prior to 1750 (date of the earliest surviving map showing the final moat iteration), the eastern arm of the original moat (Moat 1) had been backfilled and its circuit extended eastwards (Moat 2), with the curtain wall (3054/4031; CG3) also being extended (Figs 3b and 10). The two towers that are shown in maps and drawings of the Hall are presumed to have been constructed in this same phase, and the north-eastern of the two was located in Area 1, though only as a handful of foundation stones as part of curtain wall 3054. There is the possibility that the towers were already present as structures external to the original moat circuit and were just incorporated into the new curtain wall, though this seems unlikely, and there is no archaeological evidence to suggest it was the case. The new curtain wall was constructed of a mixture of dressed yellow sandstone blocks, sandstone rubble and various red brick sections.

A clear horizon was visible between the slowly accumulated lower fills of the original moat (Moat 1) and the rapid backfilling of the upper deposits (fills 3138-3144 and 4019-4022, see Fig 5). The latter were yellow clays tipped in, with occasional brick fragments and pottery, with tip lines apparent in the sections. It was not possible to discern whether the curtain wall extension was built before the backfilling of the moat or after it, or even at the same time. The original stretch of curtain wall, as with the western edge of the moat itself, could not be examined due to site restrictions.

Where the curtain wall passed through the now cut-off section of original moat (Moat 1), it followed the profile of the moat cut, and so was 2m high at its greatest extent (CG3; Trench A, Fig 3b; Fig 8, and Plate 13), but when it was beyond the original moat to the east, it sat directly on the natural ground (Plate 12, where this is visible on the far left-hand side of the wall). On its northern, that is faced side, the wall was dressed and even, though not built to formal courses. In contrast, its south side was roughly built, obviously never intended to be seen (Plate 14). It was predominantly stone in the lower half (where it was 2m high), with red brick of various dimensions forming the majority of the upper half.

A square buttress supported the curtain wall, and this feature was repeated along its length, as shown in historic drawings of the site. It mirrored the rest of the wall in being stone in the lower half and brick on top, while the brick section survived to seven courses, with bricks 9" long by 4½" wide by 2½" deep. The highest surviving part of the wall was constructed of bricks measuring 9¾" x 4" x 2¼" and surviving to seven courses in an English bond. Elsewhere in the wall bricks ranged from 9" x 4¼" x 1½" to 9½" x 5" x 3", suggesting re-use of bricks, potentially from various phases of the hall building itself. Notably, one of the large stone blocks (0.85 x 0.44m) had (medieval) trefoil tracery decoration on it, and this had been placed upside down in the lower part of the wall (Fig 8; Plate 15). Further re-used stone was noted, though there was no more architectural stonework.

The moat itself had, therefore, been extended (Moat 2), not dug to the same depth as the original (Moat 1; CG2). Instead, it was only 1.1m deep, with a shallow profile (Plate 16; Trenches D and E, CG4), and this could suggest that it was designed as a purely ornamental feature (i.e. it did not need the depth of the original which would have been more defensive by design).

#### *Late modification to moat – c 1700*

A timber beam was revealed near the bottom of the moat in Trench A (Fig 3b; Plate 17; CG5). Lying parallel to (and 0.5m from) the curtain wall extension on its northern side, and within a stretch of the original moat (Moat 1), this timber 4033 was probably used as a temporary revetment or other works (?scaffold) for some modification of the moat following its re-excitation, and then abandoned in place. Due to site restrictions, it was not possible to fully reveal the extent of it, but it was a reused timber with mortice holes and tool marks visible. It was retaining material that had been deposited in the moat since the circuit had been extended, with 18th-century pottery recovered from that deposit.

## 5.2.5 Phase 4: Furnace works and associated works – early to mid-19th century

### *Establishment of new pond*

Above timber 4033 (i.e. still within the moat) there was red-brick wall, 4032 (Trench A; CG6), which ran diagonally away from the north face of the curtain wall, with its southern end nestled into the western side of the buttress and the curtain wall, heading north-west (Fig 8; Plate 18). This was a two-brick thick wall surviving to nine courses, with at least one course truncated off the top, based on the presence of mortar on the top course, with the bricks being 9½" x 4½" x 3". The wall continued beyond the limit of the trench but must have either ended or changed course, as it was not picked up in Trench B to the north (Fig 3B; Plate 19). This wall was built over timber 4033, straddling it. A clear cut (4042) through earlier deposits was visible in section, showing the level of backfilling that had occurred prior to this latest alteration to the moat.

### *Furnace works flues 1 and 2*

In the southern half of the site, in Area 2, a series of brick structures and pit features was excavated (Figs 4 and 9). The majority of the structures aligned well with the cartographic evidence available from the *Health of Towns* map of 1852 (Fig 11 and 12), but which were not present a decade earlier when the tithe map was drawn. One wall, 2064 (CG20), was probably the western property boundary wall that does appear on the 1842 tithe map, and against which later structures abutted. Abutting the western side of the wall was brick and mortar floor surface 2067, which was heavily truncated. In the middle of the site, external to the buildings, was a rubbish pit containing waste from the japanning or enamelling process (2168; CG10).

Wall 2005 (CG11) formed the main structure, in which was housed the furnace room (Plates 20-21). This wall ran north-east to south-west and was the southern side of the building. It was formed of machine-made red bricks and survived to four courses high. It abutted wall 2064 at its western end. An initial flue (2036; CG13) was built from its northern face at the western end. This was constructed of several parts; large sandstone blocks (2144) sat in a clay that was heavily discoloured by heat. These provided a solid and insulating packing wall against which a single skin wall of yellow fire-brick was built, with a similar wall opposite, creating a flue passage some 0.45m wide. A heavily vitrified material was concreted to the sides of the flue. Sat atop the brick wall, at an angle, were more yellow fire-bricks that had formed an arch over the top of the flue, of which only one small portion survived. On the eastern side of flue 2036 was a small brick structure formed by wall 2162, with heat-affected deposit 2105 within it. This probably served a similar function to 2144, but later truncation, and limited excavation, made it impossible to determine. A probable firebox at the north-west side of flue 2036 (2128; CG14) was likely associated with this phase of construction, but subsequent truncation has removed any relationships.

A second flue (2031; CG12; Fig 9), was constructed at the north-eastern end of the building. This was of similar construction to 2036, with a flue constructed of yellow fire-bricks, abutting a wide brick wall (2146) presumably designed to insulate and provide a solid superstructure. This wide brick structure abutted wall 2153, one of the outer walls of the larger building.

### *Flue 3 and coal room*

The western end of flue 2031 was truncated by the construction of building 2028 (CG14; Fig 9), which was a rectangular structure of red brick, measuring 2 x 1.8m and to a depth of 1.16m. It had a brick floor set within it, and a set of brick and stone steps on its south-western side. These survived to their full height, so the entrance level to the room is known. These stairs (2041) were built over a loose rubble deposit in a somewhat *ad hoc* fashion. In the south-east corner of the room, a wall (part of 2028) lay at a diagonal to the rest of the structure, and presumably formed part of an opening into firebox 2115. This was constructed of the same yellow fire-bricks as the flues. These features were all part of CG14.

Both of the two earlier flues were truncated by third flue 2006 (CG15; Fig 9), which ran at a north-east to south-west diagonal to connect them together. It was again built of yellow firebricks. Firebox 2115 lay underneath the middle of flue 2006, providing a heat source.

### *Closing off the flue*

The firebox 2115 was closed off by a small wall (2101; CG15) in the south-east corner of the building, which abutted wall 2028. It was not certain whether this also put flue 2006 out of commission, certainly there were no further flues within the trench.

The structures were all razed and backfilled by 1888 when the 1st Ed OS map is drawn, presumably as part of the general demolition of the Great Hall in 1883.

## **5.2.6 Phase 5: Moat backfilling and St George's School – mid to late-19th century**

The moat appeared to have been regularly cleaned out, even when it had been reduced to a pond in the north-east corner of the site, as the deposits in slot 3072 (Moat 2; CG4; Figs 3b and 7) were indicative of rapid backfilling from top to bottom, with the artefacts recovered dating no earlier than the 19th century. Similar deposition was evident in the other slots excavated through the moat, even in Trench A where the full depth of the original moat was recorded. The timber revetment and the diagonal wall 4032 (Fig 3B; CG 6; Plate 13) are testament to the regular maintenance of the moat in this period ).

With the moat finally backfilled in Area 1, St George's School was eventually constructed (CG16). This was built of red brick on stone foundations, following a levelling of the site with made ground. It is possible that the stone involved in this construction had been robbed from the curtain wall, as this had all but disappeared in the north-east corner.

## **5.2.7 Phase 6: 20th-century deposits**

St George's School survived until the middle of the 20th century, when it was demolished and the site levelled and turned into a roughly surfaced carpark.

A 20th century wall (2093) truncated the northern edge of the furnace structures following their destruction – it appears on the 1919 OS map but not the 1902 edition. A number of brick-filled postholes were present in two parallel lines running roughly north to south, suggesting that a temporary structure was present. Several smaller postholes (2050, 2052, 2054), and circular brick structure 2009, were also identified. The latter looked at first like a well, except for it was only one course of bricks deep. Immediately adjacent to it was elongated pit 2014, which was equally shallow and suggested to be some sort of drainage/soakaway. A roughly laid brick surface was present directly beneath the tarmac and early to mid-20th century motor signage recovered from brick rubble in the southern area, indicates the likely commercial use of the site at that time.

# **6 Artefactual evidence (by Samantha Elwell)**

## **6.1 Introduction**

The artefact report conforms to standards and guidance issued by the Chartered Institute for Archaeologists (CIfA 2014b), as well as further guidance on pottery analysis, archive creation and museum deposition created by various pottery study groups (PCRG/SGRP/MPRG 2016), the Archaeological Archives Forum (AAF 2011), and the Society of Museum Archaeologists (SMA 1993).

## **6.2 Aims**

This assessment/analysis aimed to identify, sort, date, and quantify all artefacts and describe the range of artefacts present. The information has been used to provide an analysis of the significance of the artefacts.

## 6.3 Methodology

### 6.3.1 Recovery policy

Artefacts were recovered according to standard Worcestershire Archaeology practice (WA 2012). The majority of artefacts collected in the field were recovered by hand, but a small quantity of further material was retrieved from environmental samples.

### 6.3.2 Method of analysis

All hand-retrieved finds were examined, and were identified, quantified and dated to period. A worked board was recovered and included in analysis; due to its size, its weight has not been recorded in the tables below but is noted separately to avoid distorting average weights.

A *terminus post quem* (TPQ) date was produced for each stratified context. This date was used for determining the broad date of phases defined for the site. All information was recorded on a Microsoft Access database, with tables generated using Microsoft Excel.

The pottery was examined under x20 magnification and referenced as appropriate by fabric type and form according to the fabric reference series maintained by Worcestershire Archaeology (Hurst and Rees 1992; WAAS 2017). Where possible fabrics have been cross referenced to the previous report undertaken by Birmingham Archaeology (Ratkai 2010). Where possible, forms were categorised and dated using the appropriate published typology for the specific fabric type.

One leather shoe was recorded by Quita Mould, noting all the diagnostic features present, measurement of relevant dimensions and species identification where possible. (+ indicates an incomplete measurement). The leather was wet when examined. No allowance has been made for any shrinkage. Leather species were identified by hair follicle pattern using a low-powered magnification (where the grain surface of the leather was heavily worn identification is not always possible). The term bovine has been used when uncertainty arose between mature cattle hide and immature calfskin. Shoe bottom components are assumed to be of cattle hide, unless stated otherwise. The terms employed are those in common use in the archaeological literature, while the seams, constructions and drawing conventions are fully described by Goubitz (1984) and Volken (2014).

Artefacts from environmental samples were examined and those worthy of comment are included below.

Initial quantification and identification during assessment was undertaken by Rob Hedge (Lovett 2022), and the analysis and final reporting was undertaken by Samantha Elwell.

### 6.3.3 Discard policy

Artefacts from topsoil and subsoil and unstratified contexts will normally be noted but not retained, unless they are of intrinsic interest (e.g. worked flint or flint debitage, featured pottery sherds, and other potential 'registered artefacts'). Large assemblages of post-medieval or modern material, unless there is some special reason to retain (such as local production), may be noted and not retained, or, if appropriate, a representative sample will be retained. Discard of finds from post-medieval and earlier deposits will only be instituted with reference to museum collection policy and/or with agreement of the local museum.

## 6.4 Results

The assemblage totalled 2537 artefactual finds weighing c. 154kg, the results are summarised in Table 2. These came from 60 stratified contexts; 37% (by count) of the assemblage was dated to the post-medieval period, with small quantities being of medieval and transitional material (13%). Modern material constituted 50% of the assemblage, the majority of which was represented by pottery (see Diagram 1).

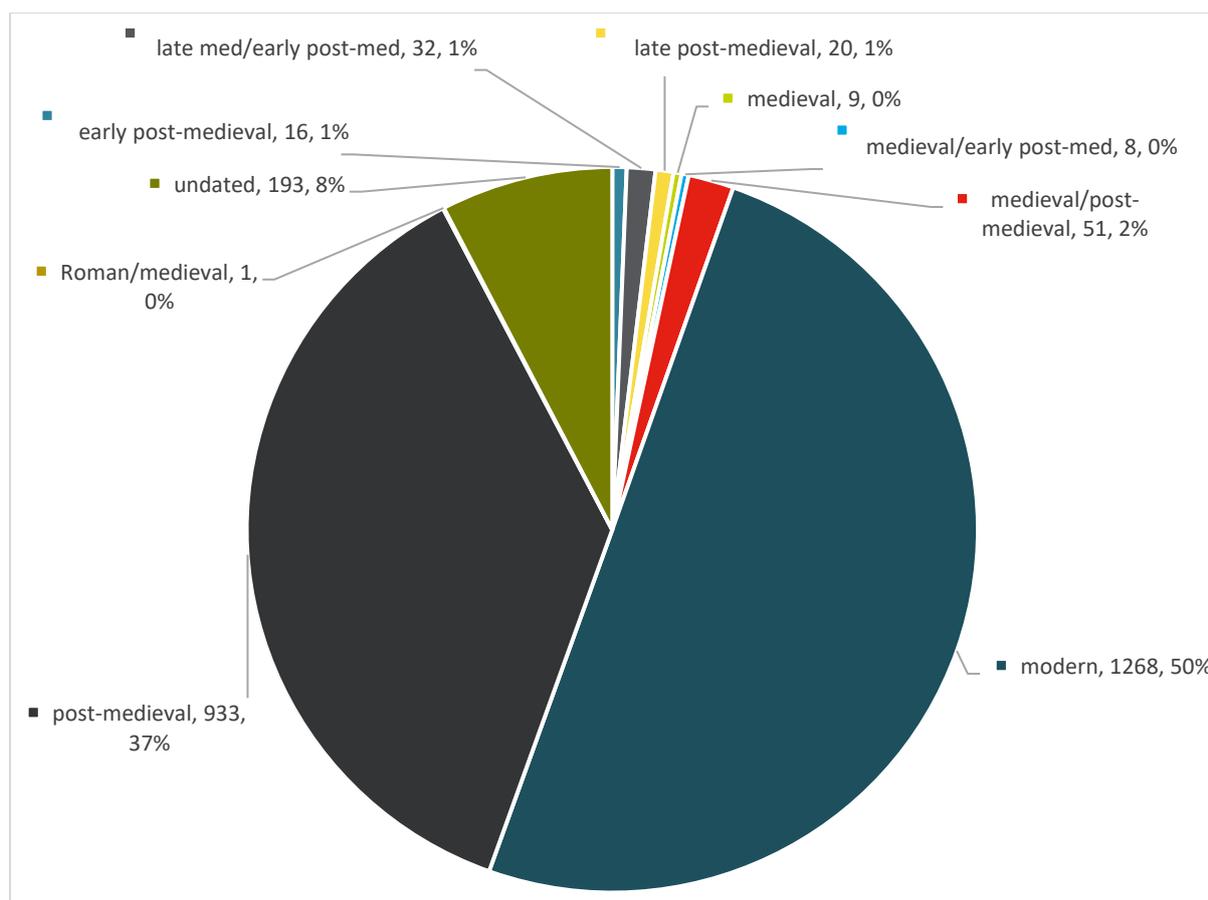


Diagram 1: Percentage of artefactual assemblage by period.

The level of preservation was variable with medieval pottery showing high levels of abrasion and a small average sherd size of 7.6g, therefore being likely to be residual. The post-medieval pottery was generally in good condition with low levels of surface abrasion and a notably larger than average sherd size of 53.3g. The large sherd size is due to the presence of near-complete vessels with robust fabrics, this degree of survival likely representing primary deposition.

The assemblage represents both domestic and industrial activity, which reflects the changing use of the site over time.

Period	Material class	Object specific type	Count	Weight(g)
Roman/medieval	slag	slag	1	13
medieval	ceramic	pot	8	61
medieval	ceramic	roof tile	1	73
late med/early post-med	ceramic	flat roof tile	14	2367
late med/early post-med	ceramic	pot	1	10
late med/early post-med	ceramic	tile	13	1531
late med/early post-med	leather	shoe	4	56
medieval/early post-med	ceramic	roof tile	8	606

medieval/post-medieval	ceramic	brick/tile	40	1276
medieval/post-medieval	ceramic	tile	11	2043
early post-medieval	ceramic	pot	16	1075
post-medieval		coal/coke	3	16
post-medieval		plaster	3	51
post-medieval	ceramic	brick	15	12,618
post-medieval	ceramic	clay pipe	171	599
post-medieval	ceramic	crucible	30	13,766
post-medieval	ceramic	drain	2	818
post-medieval	ceramic	flat roof tile	2	89
post-medieval	ceramic	brick	3	2500
post-medieval	ceramic	insulator	1	147
post-medieval	ceramic	pot	597	52,049
post-medieval	ceramic	roof tile	1	76
post-medieval	ceramic	tile	24	4367
post-medieval	ceramic	vessel	1	83
post-medieval	glass	bottle	10	918
post-medieval	glass	burnt glass	1	6
post-medieval	glass	glass	3	68
post-medieval	glass	vessel	37	1513
post-medieval	metal	door knob	1	986
post-medieval	metal	iron fragments	1	4000
post-medieval	metal	iron sheet	3	1347
post-medieval	metal	medallion	1	30
post-medieval	metal	penny coin	1	10
post-medieval	metal	pot lid	1	135
post-medieval	metal	sign	2	2800
post-medieval	metal	tinplate offcuts	11	256
post-medieval	metal	unident	4	91

post-medieval	organic	worked wood	3	670
post-medieval	slag	glass slag	1	3
post-medieval	slag	unident	2	300
post-medieval	stone	roof slate	1	61
late post-medieval	ceramic	pot	20	486
modern	ceramic	pot	1267	35,699
modern	glass	vessel	1	37
undated		coal	26	6
undated		fuel ash slag	1	2
undated		lime mortar	1	2
undated		unident	1	1
undated	ceramic	mortar	37	129
undated	ceramic	unident	4	2
undated	glass	glass	5	8
undated	leather	fitting	1	7
undated	leather	fragment	5	7
undated	leather	leather	6	32
undated	leather	shoe	29	1561
undated	leather	strap	1	30
undated	metal	hammer scale	15	0.1
undated	metal	handle	1	34
undated	metal	iron object	1	195
undated	metal	lead fragment	1	45
undated	metal	unident	18	1229.5
undated	organic	snail shell	1	268
undated	organic	worked wood	1	-
undated	slag	fuel ash slag	3	2
undated	slag	misc slag	2	18
undated	slag	slag	20	1082

undated	stone	building stone	2	390
undated	stone	burnt stone	3	167
undated	stone	chert	1	0.1
undated	stone	unident	4	2754
undated	wood	wood	6	128
<b>Totals</b>			<b>2537</b>	<b>153,805.7</b>

Table 2: Quantification of site artefactual assemblage (excluding weight of large wooden object 4013)

### 6.4.1 Artefacts by period

The *terminus post quem* (*tpq*) dating of individual contexts is presented in Table 7.

#### Medieval

##### *Pottery*

A small quantity of medieval pottery was present within five contexts (3150, 3152, 3160, 4026, 4028). This consisted of one sherd of a fine sandy ware with green glaze, and three very small sherds of sandy oxidised cooking pot (context 3160). The remainder was residual within four lower fills of the Phase 2 moat: 3150, 3152, 4026, and 4028. All were somewhat abraded body sherds in a range of regional sandy whitewares and oxidised (e.g. red) wares.

Overall, these sherds were abraded, small, and degraded, and so were all potentially, residual.

##### *Ceramic building material*

One fragment of ?medieval ceramic roof tile was also recovered from moat fill 4028.

#### Late medieval/early post-medieval

This relatively small group comprises material from the lower fills of the original moat and associated features.

##### *Pottery*

The pottery from this period comprised early redwares and coarsewares of late-16th–17th century date, including small forms with a metallic glaze and a fine red fabric (fabric 78), mugs or tygs, from context 4026.

Larger (kitchen) vessels were represented by eleven sherds of an early redware with a treacly glaze and in a flared pancheon form (context 3150). Initially, this fabric is comparable to coarseware type 2 in Ratkai (2010), being poorly mixed and a pinkish-orange colour (see Table 3 for local variations in coarseware fabric, as identified by Ratkai 1987; 2010). The sherds from context 3150 are also of a markedly different fabric to the later-17th and 18th century redwares observed in the later post-medieval deposits – see Figure 13, no. 1 for an example. A date no later than the mid-17th century, and potentially considerably earlier, is likely. Local kiln sites are known in Wednesbury (c. 5 miles to the south-east of Wolverhampton) where some excavation of kiln sites has occurred, but these remain largely unpublished; such kilns are very likely to be the production site for these wares. Reference is made to the pottery of Wednesbury by Robert Plot (1686, 122), who states that ‘they make divers sorts of vessels at Wednesbury, which they paint with Slip, made of a reddish sort of Earth gotten at Tipton’.

A sherd of midlands purple (fabric 108) was additionally recovered from context 4010.

	Coarseware 1	Coarseware 2	Coarseware 3	Coarseware 4
<b>Fabric colour</b>	light orange	pink	red	buff
<b>Fabric body</b>	lighter streaks	-	occasional white streaks	red and white wisps
<b>Inclusions</b>	frequent Iron ore	frequent Iron ore	moderate Iron ore	sandy fabric
	sparse Quartz	sparse Quartz	sparse Quartz	
	rounded off-white inclusions	rounded off-white inclusions	rare red sandstone	

Table 3: Classification of local coarsewares (CW) as previously excavated on the adjacent Old Hall site (Ratkai 2010)

#### *Ceramic building material*

A range of building material was not closely diagnostic, but some of the flat roof tile is typical of a late-15th to 17th century date range.

#### *Worked wood*

A board of worked oak was recovered from context 3153 with drilled perforations and marks which appear to suggest hand sawing. The function of the item is unknown and appears to have been broken before deposition due to one edge retaining a series of incomplete and worn holes. It is likely the item was discarded. Although not datable as an object in itself, the finds in the fill above (3152) have a date range of 1550-1700, so it can be assumed to be of equal or earlier date. It measures 810 x 180mm, narrowing at one end to 160mm, and is 30mm thick with holes of 20mm (see Fig 19, no. 16).

#### *Leather shoe (by Quita Mould)*

The partial remains of a shoe of welted construction were recovered from the original infilling of the medieval moat (4024). What remains is the insole, now broken into two pieces, and two fragments broken from the shoe upper (see Fig 17, no. 14). The insole has an oval toe, a distinctly narrow waist and rounded seat. The small piece broken from the toe area of the upper is pleated and appears to have been more square in shape suggesting that it overhung the sole, while the larger surviving fragment of the upper is decorated. The decoration comprises a series of lozenge motifs made up of 4 rows of small, stabbed marks, cutting into the surface of the leather; such perforated decoration is known as pinking. The shape of the insole, the overhanging toe of the upper and pinked decoration all indicate that the shoe dates to the early years of the 17th century (see for example Swann 1982, figs 5 and 7). The insole is of small adult size and suggests the shoe was for a woman.

#### *Catalogue description*

Context 4024 Leather shoe, welted construction, incomplete.

Shoe bottom: Insole with edge/flesh seam, stitch length 9mm. Now in two pieces, the forepart broken across the narrow waist and the remains of a rounded seat which appears to join. The insole has an oval toe, relatively narrow petal-shaped tread, very narrow waist and medium rounded seat, the end of the seat is torn off and missing. Made virtually straight, slightly favouring a left foot. Surviving length 205+mm, tread width 61mm, waist width 15mm, seat width 44mm.

Shoe upper: The lasting margin from the toe area of the vamp, pleated and shaped for a square toe, suggesting that it overhung the sole originally. The stitch length of the lasting margin varies due to the pleating. Broken directly above the lasting margin on the left side, extending to a height of c. 40+mm

on the right. Leather worn bovine (cattle hide) c. 2.5mm thick. Second fragment of upper, probably torn from the vamp throat. The tapering fragment has a long, straight edge, much of which is broken and delaminating with a butted edge/flesh seam surviving for 35mm at the narrower end and five stitches visible at the opposite end. Below the five stitches on the flesh side is a row of whip stitching for a lapped seam. The grain side is decorated with a series of at least 15 lozenge motifs, each 10 x 6mm and comprising of four rows of four shallow stabbed lozenge-shaped holes that do not penetrate to the flesh side. Leather bovine 2.29mm thick. Surviving length 180+mm, width 60+mm.

### Post-medieval

The finds of post-medieval date formed the bulk of the assemblage, consisting of pottery, clay pipe, glass, crucibles, slag, and metalwork.

#### *Pottery*

A total of 615 sherds of post-medieval pottery weighing 52.4kg was retrieved, accounting for 32% of the pottery assemblage. This pottery was largely domestic and was represented by a range of fabric types commonly associated with 17th-19th century assemblages.

The fabrics included large quantities of post-medieval red wares (fabric 78) accounting for 52% (by count) of the post-medieval fabrics. These account for the largest sherd sizes in the site assemblage with utilitarian forms reflecting vessels such as pancheons, bowls, and large storage jars. Almost complete jars and bowls were present, the jars featuring thick runs of black glaze on their exterior surfaces (see Fig 14, no. 4). Most redware sherds were glazed on their interior with a red slip showing on their exterior. Variations in redwares were present in speckled brown glazed redware (fabric 78.4, comparable to Ratkai 2010 CW2) and Cistercian ware (fabric 78.5).

Stoneware fabrics were present which were not clearly provenanced, with identifiable types including Nottingham (fabric 81.3) and white salt-glazed (fabric 81.5). Several intact and stamped ink bottles were identified (see example in Fig 14, no. 6), and larger storage vessels which frequently retained their cork bung.

Small quantities of tin-glazed ware (fabric 82) and creamware (fabric 84) were mainly flat wares. Derivatives of fabric 85 were identified such as pearlwares (85.11), which commenced production in the later 18th century. The majority were decorated edge-moulded vessels both coloured and plain. Three sherds of Agate ware (fabric 89), a fabric produced in Staffordshire 1740-1775, was identified in context 4008 and 4010. Edge-moulded wares, creamwares and Agate wares were relatively fancy wares suggestive of middle-class consumption at table in the mid-18th century.

Utilitarian wares were post-medieval orange ware (fabric 90) and buff wares (fabric 91), constituting 38 sherds, including Staffordshire type combed slipware dish with pie-crust rim; see Figure 14, no. 5 for an example. The latter, in variations, additionally included manganese-mottled and brown-glazed buff wares.

Fabric	Fabric common name	Count	Weight (g)
0	Unidentified	15	1236
77	Midlands yellow ware	2	45
78	Post-medieval red ware	317	40961
78.4 (CW2)	Speckled brown glazed red ware	9	712
78.5	Cistercian ware	1	12
81	Miscellaneous undated stonewares	77	3974

81.3	Nottingham stoneware	25	1416
81.5	White salt-glazed stoneware	6	71
82	Tin-glazed ware	6	127
83	Porcelain	57	557
84	Creamware	20	486
85.11	Pearlware	34	778
89	Agate ware	3	20
90	Post-medieval orange ware	2	48
91	Post-medieval buff wares	38	1893
100	Miscellaneous post-medieval wares	3	67

Table 4: Quantification of post-medieval pottery assemblage by fabric

#### *Ceramic building material*

Varying forms of ceramic building material were identified including three pieces of plaster weighing 51g. Brick of post-medieval date was largely fragmentary with some pieces identified as half bricks enabling their measurements to be recorded. Six pieces were measured at 4.5 inches wide and 2.5 inches thick, one piece measuring 2 inches thick. A partial maker's stamp was visible but unidentified on a half brick of yellow fabric from context 3078. Three heavily vitrified bricks were additionally identified, likely related to the furnace works on site. Post-medieval tile consisted of 27 pieces weighing 4.5kg, mostly fragmentary flat roof tile with some entire tiles measuring approx. 17cm square with a nib.

#### *Clay pipe*

Clay pipes constituted 171 pieces weighing 599g (see Table 5 for bowls), 147 plain pipe stems being recovered with various plain bowls. Broseley-type 4 and 7a bowls were identified which could be dated to the 17th and into the 18th centuries.

Bowl type (Broseley)	Number of examples	Date range		Stamp	Context group	Context
	1	1655	1679	'John'	19	2198
	1	1600	1910	Berries and foliage decorated bowl	4	3104
9	1	1850+		-	6	4008
9	1	1850+		-		
	1			-		
8b	1	1800	1840	-		
	4	1800+		2 x WS shield.	6	4010
7a	4	1720	1740	-		
5c	1	1680	1730	Partial 'W'		

	2	1810	1850	-	6	4012
	1	1800	1875	WS shield		
8a	1	1770	1800	-	6	4013
	1	1650	1730	-	5	4048
4	1	1690	1720	-		
7a	1	1720	1740	-		

Table 5: Quantification and dating of clay pipe bowl forms (based on Oswald (1975) typology for Broseley, fig 7)

#### *Industrial materials*

Additional ceramic artefacts identified were 30 pieces of crucible weighing 13.7kg with varying evidence for use. Two intact crucibles have holes in their bases, presumably an alteration made after their original use had ended, possibly converting them into flowerpots (see Fig 20, nos 18-19).

#### *Metal and Slag*

Items of metal included iron fragments, iron sheet, and tinsplate off-cuts. Notable items were a heavily corroded doorknob, a William VI commemorative medal dated 1831, a penny coin dated 1870, a japanned pot lid, and a painted sign advertising 'Agent for Diabolo cream separators' dating to 1880-1930 (this Swedish company made machinery used in dairies and farms to separate cream and milk).

#### *Glass*

Glass artefacts consisted largely of bottle necks and bases, both mould-formed, and hand-blown, and a decorative pedestal base.

#### **Modern (19th-20th century)**

Modern finds represented 50% of the total assemblage and was entirely represented by pottery and glass.

#### *Pottery*

Of the large quantity of china (fabric 85), totalling 705 sherds, the majority was of 19th century date with a small quantity stretching into the early 20th century such as various refined white wares. Vessels of this type were generally of white body and decorated with various colours and patterns, the majority being transfer-printed rather than painted. Decorative features were noted, and, where ceramic makers marks were identifiable, the sherds were definitively dated and gave evidence for their origins, such as Adams of Staffordshire (1804-1840) and Thomas Dimmock & Co (1844-1859). A small quantity of sponged wares was also present (fabric 85.7). One espresso-sized cup (can) was identified as 'Gaudy Welsh' pottery with grape design, dating 1820-1860 (see Fig 15, no.8); items of this type were generally not stamped, and reproductions of this Welsh pottery style were made throughout Britain into the early 1900s, including Staffordshire and Bristol (Lewis 2011).

A portrait on a sherd of transfer ware (see Fig 15, no 10), was identified as depicting Joseph Rayner Stephens. Stephens was a 19th century Methodist minister based in Manchester then Ashton-under-Lyne, who later campaigned for factory reforms. He was a suspected chartist and became a champion of the poor, and a lithograph at the National Portrait Gallery (2023) depicts him as 'the peoples friend'.

Miscellaneous late stonewares (fabric 81.4) were dated to the 19th-20th century (103 sherds, 12.7kg), one sherd being decorated with hunting dogs in relief. A large storage vessel (4013) had an unusual red slip coating on its interior.

Miscellaneous modern wares (fabric 101; 423 sherds) constituted a large proportion of the modern pottery including plant pots, some late production slipwares and plain wares. Yellow wares of 'Mocha' type decoration (fabric 101.1) were also present.

Fabric	Fabric common name	Count	Weight (g)
81.4	Miscellaneous late stoneware	103	12,740
85	Modern china	705	12,450
85.7	Sponged whiteware	5	85
101	Miscellaneous modern wares	423	9286
101.1	Yellow ware 'mocha' type	31	1138

Table 6: Quantification of the modern pottery

#### Glass

An 'Odo-ro-no' bottle dating to between 1914 and 1940 was of particular interest, as the brand was an early pioneer of Aluminium Chloride-based underarm antiperspirants (see more below; Fig 16, no 13).

#### Ceramic building material

Modern material consisted of a small quantity of ceramic drainage tile.

#### Clay pipe

Two decorated bowls and one partial bowl with a shield design and W.H. initials were identified in contexts 4010 and 4012. Bowls with a similar design were identified at Horseley Fields-Walsall Street, Wolverhampton (Malam 1984, 80-82) and could be dated to early-to mid-19th century and were assumed to be associated with public houses (see Fig 16, nos 11 and 12).

#### Industrial materials

Broken ceramic insulators and unrecognisable ceramic pieces were recovered, likely wasters.

#### Undated

A number of finds could not be intrinsically dated (see Table 2), notably the large quantities of coal, mortar, slag, hammerscale, and smaller amounts of glass, wood, and stone, together with the following artefacts.

#### Stone

One piece of stone resembling a cobble with a channel across its centre was found in context 4008.

#### Leather

Waterlogged leather items were recovered from contexts (3073, 3074, 3077, 3104, and 4013) consisting of various fragments and shoes in varying condition. The most intact shoe measures 160mm in length (not allowing for shrinkage) which equates to a child's size 9. The toe is worn through suggesting thorough wear (Fig 18, no. 15).

#### Organic

An unusual find, a large mollusc shell (unstratified), is possibly associated with both the jpanning works and the school (see Fig 14, no. 5). The shell is an imported item likely *Cittarium pica*, the West Indian top shell or magpie shell typically used as raw material for mother of pearl. Jpanned ware was often inlaid with mother of pearl (Lukas Large, pers comm), the find would be consistent with the known industry of jpanning at the site during the 18th and 19th centuries. It was found in later deposits associated with the school and may have been used as an exhibit.

Context	Material class	Material subtype	Object specific type	Count	Weight(g)	Tpq start	Tpq end
u/s	organic		snail shell	1	268	-	-
2002	metal		sign	2	2800	1880	1930

2003	ceramic		clay pipe	1	2	1600	1910
2007	glass		vessel	1	10	1870	1930
2008	ceramic		pot	4	54	1795	1830
2013	ceramic		pot	1	8	1800	
2016	ceramic		clay pipe	3	6	1830	1900
	ceramic		pot	4	49		
	metal		unident	1	0.5		
2023	ceramic		pot	3	90	1800	1900
2026	ceramic		pot	1	8	1830	1900
2045	ceramic		brick	1	1017	-	-
	ceramic		tile	1	184		
2048	ceramic		pot	8	242	1840	1900
2048	metal		door knob	1	986	1840	1900
2086	ceramic		pot	3	404	1820	1850
	glass		vessel	3	228		
2096	ceramic		clay pipe	3	10	1800+	
	ceramic		pot	22	1240		
2137	metal		unident	3	46	-	-
2170	ceramic		brick	1	1795	-	-
	ceramic		tile	1	161		
2171	metal		iron fragments	1	4000	-	-
	metal		unident	1	1		
2172	ceramic		pot	2	12	-	-
2173	ceramic		brick	1	242	-	-
	ceramic		tile	4	464		
2179	slag		fuel ash slag	3	2	-	-
	stone		chert	1	0.1		
	stone		unident	1	233		
	wood		wood	1	27		

2182	stone		burnt stone	3	167	-	-
2185	ceramic		tile	2	314	-	-
2187	ceramic		brick	1	843	-	-
2189	ceramic		brick	1	1518	-	-
	ceramic		brick/tile	11	951		
2190	ceramic		tile	3	362	-	-
2191	ceramic		tile	2	61	-	-
2197	ceramic		unident	3	1	-	-
2198	ceramic		clay pipe	1	10	1655	1679
3005	metal		penny coin	1	10	1870	1870
3073			unident	1	1	1800	1900
	ceramic		brick/tile	29	325		
	ceramic		clay pipe	5	13		
	ceramic		flat roof tile	1	53		
	ceramic		mortar	28	85		
	ceramic		pot	11	1032		
	glass		glass	4	2		
	leather		leather	2	20		
	leather		shoe	5	227		
	metal		hammer scale	15	0.1		
	slag		slag	14	760		
	stone		unident	1	1636		
3074	ceramic		brick	1	131	1840	1940
	ceramic		clay pipe	1	5		
	ceramic		crucible	2	8000		
	ceramic		flat roof tile	1	158		
	ceramic		pot	55	4895		
	ceramic		roof tile	1	76		
	ceramic		vessel	1	83		

	glass		vessel	1	9		
	leather		fitting	1	7		
	leather		fragment	5	7		
	leather		leather	4	12		
	leather		shoe	12	484		
	leather		strap	1	30		
	metal		iron sheet	3	1347		
	metal		medallion	1	30		
	metal		pot lid	1	135		
	metal		tinplate offcuts	10	213		
	metal		unident	1	905		
	slag		slag	2	164		
	stone		roof slate	1	61	1840	1940
	stone		worked stone	1	59	1840	1940
3075	ceramic		drain	1	147	1800	1900
	ceramic		pot	17	640		
	glass		vessel	3	308		
3076	ceramic		pot	27	1396	1800	1900
3077	ceramic		clay pipe	2	10	1830	1880
	ceramic		crucible	1	261		
	ceramic		pot	59	2938		
	glass		burnt glass	1	6		
	leather		shoe	10	330		
	organic		cat mandible	1	2		
3078	ceramic		brick	1	1666	1830	1940
	ceramic		pot	10	182		
3079	ceramic		pot	37	1507	1830	1940
3080	ceramic		brick	5	3339	1400	1700
	ceramic		tile	11	1044		

3104	ceramic		clay pipe	1	10	1830	1900
	ceramic		flat roof tile	1	602		
	ceramic		mortar	9	44		
	ceramic		pot	32	1879		
	glass		glass	1	6		
	leather		shoe	1	400		
	metal		tinplate offcuts	1	43		
	slag		slag	2	15		
3105	ceramic		pot	1	412	1800	1900
3106	glass		vessel	1	148	1790	1820
3126	ceramic		flat roof tile	3	145	1800+	
	ceramic		pot	49	3036		
	glass		vessel	1	9		
3127	ceramic		crucible	3	908	1830	1940
	ceramic		pot	4	249	1830	1940
3128	ceramic		crucible	1	233	1680	1730
	ceramic		flat roof tile	2	780		
	ceramic		pot	5	49		
	ceramic		tile	3	71		
3134	ceramic		tile	3	2559	-	-
3150	ceramic		flat roof tile	8	718	1600	1670
	ceramic		pot	12	1049		
	organic		worked wood				
3151	organic		worked wood			-	-
3152	ceramic		pot	3	69	1550	1700
	ceramic		tile	5	452		
	organic		worked wood				
3153	organic		worked wood plank	1		-	-

3157	ceramic		unident	1	1	-	-
3160	ceramic		pot	4	9	1200	1400
3168	glass		vessel	1	37	-	-
3216	slag		smithing slag			-	-
4008			coal/coke	3	16	1850	1887
			plaster	2	13		
	ceramic		clay pipe	83	224		
	ceramic		crucible	7	1056		
	ceramic		insulator	1	147		
	ceramic		pot	600	15283		
	ceramic		tile	5	597		
	glass		bottle	3	470		
	glass		glass	3	68		
	glass		vessel	21	179		
	metal		unident	6	220		
	organic		bone	1	1		
	slag		glass slag	1	3		
	slag		slag	3	156		
	slag		unident	2	300		
	stone		unident	1	826		
	ceramic		clay pipe	43	168		
	ceramic		crucible	11	1412		
	ceramic		pot	448	15645		
	ceramic		tile	5	1208		
	glass		bottle	6	414		
	metal		handle	1	34		
	metal		iron object	1	195		
metal		unident	1	3			
organic		bone	1	5			

	slag		misc slag	2	18		
4012			plaster	1	38	1840	1950
	ceramic		clay pipe	24	104		
	ceramic		crucible	5	1896		
	ceramic		drain	1	671		
	ceramic		pot	308	17692		
	ceramic		tile	1	302		
	glass		vessel	5	102		
	metal		unident	3	79		
	organic		bone	4	72		
	wood		wood	5	101		
4013	ceramic		clay pipe	1	9	1830	1950
	ceramic		pot	155	17591		
	ceramic		tile	2	162		
	glass		bottle	1	34		
	glass		vessel	1	520		
	leather		shoe	1	120		
	metal		unident	6	66		
	organic		unident	1	54		
	organic		worked wood	3	670		
4022	ceramic		brick	1	1216	-	-
	ceramic		vitrified brick	3	2500		
4023	ceramic		brick	2	851	1550	1800
4024	organic		leather	4	56	1600	1625
4026	ceramic		pot	8	178	1550	1650
	ceramic		roof tile	8	606		
	metal		lead fragment	1	45		
4027			coal	6	1	-	-
4028			coal	20	5	1770	1850

			fuel ash slag	1	2		
			lime mortar	1	2		
	ceramic		pot	2	5		
	ceramic		roof tile	1	73		
	stone		building stone	2	390		
4034	ceramic		pot	7	1029	1700	1800
4048	ceramic		clay pipe	3	28	1720	1810
	ceramic		pot	7	508		

Table 7: Artefactual dating of contexts

## 6.5 Catalogue of illustrated finds (Figs 13-20)

1. Early coarseware fabric, comparable to Ratkai CW2. later 16th to mid-17th century ware; 3150, CG2, P2.
2. Bowl/pancheon form with moulded handle, unusually sandy fabric and reduced core. Speckled orange/brown glaze. Post-medieval fabric 78, redware; 4013, CG6,. P5.
3. Large piece of redware bowl/pancheon with black glazed interior. Post-medieval fabric 78, redware; 4010, CG6, P5.
4. Large jar, exterior dripped black glaze with fully glazed interior. Post-medieval fabric 78, redware; 4012, CG6, P5.
5. Staffordshire type combed slipware, press-moulded dish. Post-medieval fabric 91, buffware; 4048, CG5, P3.
6. Stamped stoneware blacking bottle. 19th century fabric 84.1; 4012, CG6, P5.
7. Blue-striped refined whiteware cup. Modern fabric 101; 4012, CG6, P5.
8. Espresso sized cup, 'Gaudy Welsh' pottery, grape design. 19th century fabric 85; 4013, CG6, P5.
9. Davenport cup with flowers, fish and a trailing 'moss fibre' style. Fabric 85. 1815-1850. C4012. CG6. P5.
10. Portrait plate depicting Joseph Rayner Stephens. 19th century fabric 85; 4012, CG6, P5.
11. Clay pipe with 'W.S' shield stamp. 19th century; 4012, CG6, P5.
12. Another example as no. 11. 19th century; 4010, CG6, P5.
13. Glass 'Odo-ro-no' bottle, 1910-1940; 3128, CG4, P5
14. Parts of leather shoe. Early 17th century; 4024, CG2, P2.
15. Leather child's shoe. 19th-20th century; 4013, CG6, P5.
16. Wooden plank with drilled holes; 3153, CG2, P2.
17. Mollusc shell. Undated. Unstratified.
18. Crucible, perforated base. 19th century; 3074, CG4, P5.
19. Crucible, perforated base. 19th century; 3074, CG4, P5.

## 6.6 Artefacts by site phase

### 6.6.1 Phase 1: Pre-moat activity

There were only four sherds of medieval pottery from the earliest site phase (3160), suggesting this deposit formed sometime in, or after, the 13th/14th century.

Phase number	Context Group	Context number	Material class	Object class	Object specific type	Count	Weight (g)
1	7	3160	ceramic	domestic	pot	3	4
1	7	3160	ceramic	domestic	pot	1	5

Table 8: Phase 1 artefacts

### 6.6.2 Phase 2: Original moat and ditch

The earliest stage of the moat (CG2) and an early ditch (CG9) infilling yielded building material and domestic pottery, with small quantities of leather, coal, and fuel ash slag.

#### *Original moat*

A small amount of medieval pottery was abraded and fragmentary making fabric identification difficult but again had a broad 13th to 16th century date range; its condition indicated residuality. More likely contemporary with the infilling of the moat is the early post-medieval pottery, represented entirely by early coarsewares (redwares; fabrics CW2 and CW3) which provided a 17th century date for this material. Building material comprised early post-medieval roof tile with a broad 13th-18th century date, and brick. Four pieces of shoe leather of early 17th century date were also recovered (see Fig 17, no 14). A small sherd of modern china in context 4028 (fabric 85;1g) was intrusive.

The previous stages of work undertaken by Birmingham Archaeology (Hewitson *et al* 2010) noted an absence of late medieval and early post-medieval pottery in the moat, citing this as evidence that the moat was kept clean. The results from this excavation would confirm that conclusion, as the eastern arm of the moat that was sealed prior to 1750 does show evidence that medieval and early post-medieval material was present within fills of the original moat (3153, 3152, 3150, 4028, 4026, 4024, 4023). The sections of the moat excavated by Birmingham Archaeology were part of the original circuit, and so would presumably have had a similar depositional sequence to the eastern arm. As they remained open, they would have been maintained up to their eventual closure in the 19th century.

Planks of worked wood were also present due to waterlogging in the lower fills. These included an unusual board with many drilled holes which gave the appearance of being a grille (3153) – possibly associated with a water feature (the moat itself perhaps), and so perhaps at an outfall (Fig 19, no 16).

#### *Ditch/leat*

Material from a ditch (CG9) is dated from the brick and tile giving a broad post-medieval date – this was compatible with a radiocarbon date for this feature (2179; cal AD 1506-1645, 2 sigma, SUERC-106679). The fill also contained pieces of burnt stone, wood and slag.

Phase number	Context Group	Context number	Material class	Object class	Object specific type	Count	Weight (g)
2	2	3150	ceramic	building material	flat roof tile	8	718
2			ceramic	domestic	pot	11	1038

2			ceramic	domestic	pot	1	11
2			organic		worked wood		
2		3151	organic		worked wood		
2		3152	ceramic	domestic	pot	2	41
2	ceramic		domestic	pot	1	28	
2	ceramic		building material	tile	5	452	
2	organic			worked wood			
2		3153	organic		worked wood		
2		3157	ceramic	unident	unident	1	1
2		4023	ceramic	building material	brick	2	851
2		4024	organic	domestic	leather	4	56
2		4026	ceramic	domestic	pot	5	37
2	metal		unident	lead fragment	1	45	
2	ceramic		domestic	pot	1	9	
2	ceramic		building material	roof tile	8	606	
2	ceramic		domestic	pot	2	132	
2		4027		production waste	coal	6	1
2		4028		building material	lime mortar	1	2
2				production waste	coal	20	5
2				production waste	fuel ash slag	1	2
2			ceramic	building material	roof tile	1	73
2			stone	building material	building stone	2	390
2			ceramic	domestic	pot	1	4
2			ceramic	domestic	pot	1	1
2	9		2179	stone	unident	chert	1
2		slag			fuel ash slag	3	2
2		wood		unident	wood	1	27
2		stone		unident	unident	1	233
2		2182	stone	unident	burnt stone	3	167

2		2185	ceramic	building material	tile	2	314
2		2187	ceramic	building material	brick	1	843
2		2189	ceramic	building material	brick/tile	11	951
2			ceramic	building material	brick	1	1518
2		2190	ceramic	building material	tile	3	362
2		2191	ceramic	building material	tile	2	61

Table 9: Phase 2 artefacts

Context Group	Context number	Object specific type	Fabric code	Count	Weight (g)	Pottery period
2	3150	pot	99	1	11	medieval
2	3150	pot	CW2	11	1038	early post-medieval
2	3152	pot	78.4	2	41	post-medieval
2	3152	pot	99	1	28	medieval
2	4026	pot	99	1	9	medieval
2	4026	pot	CW3	5	37	early post-medieval
2	4026	pot	CW3	2	132	post-medieval
2	4028	pot	85	1	1	modern
2	4028	pot	99	1	4	medieval

Table 10: Phase 2 pottery fabrics

### 6.6.3 Phase 3: Moat extension

This phase comprised two features: the rapid backfilling event of the moat extension (CG2); and the fills retained behind a large timber beam (CG5). The former contained building material including brick and vitrified brick, the finds are part of the backfilling event of the eastern arm of the original moat (4022), the brick being just broadly datable to the post-medieval period.

CG5 has two contexts with finds (4034, 4048) which are fills behind the timber beam uncovered at the north-east corner of the original moat circuit, likely used while alterations were made to extend the moat. Domestic, utilitarian pottery including buff wares (fabric 91) and redwares (fabric 78) were identified within 4034 and were predominantly larger forms such as bowls. Smaller vessels of domestic wares were present in 4048 such as cups, with redwares (fabric 78) stoneware fabrics (fabric 81.3, 81.5), tin glazed wares (fabric 82) and buff wares (fabric 91). The buff wares were represented by Staffordshire-type combed slipware and manganese-mottled ware. Also present were three pieces of clay pipe, two bowls being identified as Broseley type 4 and type 7a dated to the late 17th to early 18th century. Overall, CG5 had an early 18th to early 19th century *tpq* range.

Phase number	Context Group	Context number	Material class	Object class	Object specific type	Fabric code	Count	Weight (g)
3	2	4022	ceramic	building material	vitrified brick	0	3	2500
			ceramic	building material	brick	0	1	1216
	5	4034	ceramic	domestic	pot	78	2	696
			ceramic	domestic	pot	91	1	46
			ceramic	domestic	pot	91	1	16
			ceramic	domestic	pot	78	1	19
			ceramic	domestic	pot	78	2	252
		4048	ceramic	domestic	clay pipe	0	1	3
			ceramic	domestic	clay pipe	0	1	12
			ceramic	domestic	clay pipe	0	1	13
			ceramic	domestic	pot	81.5	1	14
			ceramic	domestic	pot	91	2	368
			ceramic	domestic	pot	82	1	11
			ceramic	domestic	pot	91	1	51
ceramic	domestic	pot	81.3	1	5			
ceramic	domestic	pot	78	1	59			

Table 11: Phase 3 artefacts

Phase number	Context Group	Context number	Object specific type	Fabric code	Count	Weight (g)	Pottery period
3	5	4034	pot	78	5	967	post-medieval
3	5	4034	pot	91	2	62	post-medieval
3	5	4048	pot	78	1	59	post-medieval
3	5	4048	pot	81.3	1	5	post-medieval
3	5	4048	pot	81.5	1	14	post-medieval
3	5	4048	pot	82	1	11	post-medieval
3	5	4048	pot	91	3	419	post-medieval

Table 12: Phase 3 pottery fabrics

### 6.6.4 Phase 4: Furnace works

Phase 4 comprises four context groups covering an area of the furnace works with associated features.

CG10 (pit 2168) contained dumped deposits of building material and metal fragments with two sherds of redware (fabric 78). The pottery gives the deposit a 17th–19th century date range, which is consistent with the late-18th century date of the furnace works and associated buildings.

CG11 had a small amount of pottery and glass relating to the backfill of a construction cut for the factory/furnace wall, the finds indicating a *tpq* date of 1820–1850 for this deposit.

CG14 (2008 and 2048) related to the coal room and a furnace, which contained small quantities of pearlware (fabric 85.11), porcelain (fabric 83) and modern china (fabric 85) giving a *tpq* date of 1840–1900. The deposit additionally contained an extremely corroded metal doorknob.

CG15 (2007, fill of flue 2006) contained a piece of codd bottle glass (10g) giving a 1870-1930 *tpq* date.

Phase No	Context Group	Context number	Material class	Object class	Object specific type	Count	Weight (g)
4		2045	ceramic	building material	brick	1	1017
4		2045	ceramic	building material	tile	1	184
4		2137	metal	unident	unident	3	46
4	10	2170	ceramic	building material	brick	1	1795
4	10	2170	ceramic	building material	tile	1	161
4	10	2171	metal	unident	iron fragments	1	4000
4	10	2171	metal	unident	unident	1	1
4	10	2172	ceramic	domestic	pot	2	12
4	10	2173	ceramic	building material	brick	1	242
4	10	2173	ceramic	building material	tile	4	464
4	11	2086	ceramic	domestic	pot	2	356
4	11	2086	ceramic	domestic	pot	1	48
4	11	2086	glass	domestic	vessel	3	228
4	14	2008	ceramic	domestic	pot	2	15
4	14	2008	ceramic	domestic	pot	2	39
4	14	2048	ceramic	domestic	pot	8	242
4	14	2048	metal	fitting	door knob	1	986
4	15	2007	glass	domestic	vessel	1	10

Table 13: Phase 4 artefacts

Phase	Context Group	Context number	Object specific type	Fabric code	Count	Weight (g)	Pottery Period
4	10	2172	pot	78	2	12	post-medieval
4	11	2086	pot	81.4	2	356	modern
4	11	2086	pot	85	1	48	modern
4	14	2008	pot	83	2	15	post-medieval
4	14	2008	pot	85.11	2	39	post-medieval
4	14	2048	pot	85	8	242	modern

Table 14: Phase 4 pottery fabrics

### 6.6.5 Phase 5: Moat backfilling and establishment of St George's School (1852)

This phase contained the largest proportion of finds and it represents the alterations to the moat in the 19th century and the beginnings of St George's School. The assemblage is of post-medieval to modern date, with residual late medieval/early post-medieval roof tile (Table 15).

CG4 contained fourteen contexts with datable material which predominantly represent the backfilling of the moat and demolition layers against the curtain wall (3054). The demolition layers (3126, 3127, 3128, 3134) contained domestic pottery and building material with four sherds of crucible. The crucible material had an iron-rich coating on the interior and is probably to be associated with the factory works of the late-18th century continuing into the 19th century. The pottery is a mix of post-medieval and modern fabrics (Table 16), the redwares constituting the largest sherds, with forms such as pancheons and other open vessels (i.e. kitchen wares) predominating. Late medieval/early post-medieval roof tile is likely residual from 18th century alteration works to the hall. The assemblage from the demolition layers has a broad date range due to the mix of material, with the domestic pottery spanning from the 17th to 20th centuries.

The moat fills (3073, 3074, 3075, 3076, 3077, 3078, 3079, 3104, 3105, 3106; CG4) comprised mixed material, including domestic pottery, production waste such as slag, and building material including brick and tile. Smaller quantities of shoe leather, glass and metal were also identified. Utilitarian pottery fabrics (i.e., heavier coarseware vessels) represented 44% of the pottery assemblage from the moat fills. Redwares (fabric 78) represented the largest proportion of pottery in weight from the moat fills, the sherds displayed low levels of surface abrasion with intact handles and glazes retaining a glossy finish. The sherds were frequently large, indicating that they had not been redeposited (i.e. degraded by disturbance). High quantities of stoneware bottles and bowls (fabric 81, 81.3, 81.4, 81.5) were also in large sherds, suggesting likewise. The remaining 56% of sherds are of domestic fabric types with much smaller average sherd sizes. As these sherds additionally show low levels of surface abrasion, it is again unlikely that they have been disturbed post-deposition (i.e. they were smaller due to the fragility of these wares). Overall, this group was compatible with its originating from a kitchen dump or midden, and possibly re-used as backfill during site clearance.

Rapid moat infilling associated with the construction of St George's school (4008, 4010, 4012, 4013; CG6) contained large amounts of material with a mixture of production waste, building material and pottery in domestic and utilitarian wares, and was probably a result of site clearance material being used for the moat infilling (the following are listed in stratigraphic order from lower to uppermost fills):

Fill 4013 has the smallest quantity of material from this group including a small amount of tile, shoe leather, metal, and glass. A clay pipe bowl of Broseley type 8a could be dated to 1770-

1800. The pottery was predominantly represented by redwares (fabric 78) and stonewares (fabric 81) with 47 sherds of modern china and variants. Over 10kg of redware sherds were present in this fill with an average sherd weight of 164.7g, these being predominantly pancheon forms and other large, open vessels. Modern miscellaneous fabrics (100) were largely represented by pieces of plant pots; for a summary of fabrics, see Table 16. The *tpq* range for this fill was 1830-1950.

Fill 4012 saw an increase in the quantity of finds which was predominantly pottery (17.6kg). A large proportion of the pottery assemblage was again represented by redwares (fabric 78) with a high average sherd weight of 202.8g suggesting very large sherds or near-complete open vessels. Stoneware bottles of various fabrics (fabric 81, etc) included blacking bottles and vessels with their corks remaining in place. Modern china and its variations (fabric 85, etc) had an average sherd weight of 24g, and these included various domestic styles and forms with two painted figurines. One small cup was produced by Davenport and could be dated 1815-1850, see Fig 15, no. 9. A small amount of porcelain (fabric 83), creamware (fabric 84) and buff wares (fabric 91) were also present. This fill additionally contained post-medieval tile, drain and plaster, crucible sherds, glass and small quantities of metal. Twenty-one clay pipe stems were recovered with three decorated bowls. One bowl was decorated with a shield stamp with 'W.S' inscribed within the shield (Fig 16, nos 11-12).

Fill 4010 saw a further increase in quantity of artefacts including small quantities of roof tile, glass bottles, metal and pieces of crucible. Clay pipes were represented by 43 stems and bowls. One Broseley type 5c bowl being datable to 1680-1730, one Broseley 7a of 1720-1740 date range and another decorated with a shield stamp with 'W.S' inscribed and likely of early-mid 19th century date. Utilitarian and domestic pottery types represent the bulk of the assemblage with large sherds of redwares (fabric 78; average sherd size again large at 124.5g), buff wares in Staffordshire slipware and manganese-mottled wares (fabric 91), and various stonewares of predominantly modern fabrics (fabric 81.3, 81.4, 81.5). The domestic wares were predominantly tablewares of refined whitewares and modern china (fabric 85), with a stamp from Adams of Staffordshire providing a date of 1804-1840. One small sherd of Midlands Purple was also recovered (fabric 108) but would be residual by this date.

Fill 4008 contained the largest proportion of material from this group, including residual late medieval to early post-medieval roof tile, production waste such as small quantities of slag and sherds of crucible, pieces of stone, metal, and glass (19.55kg total artefact weight). Seventy-nine clay pipe stems were also recovered, including three Broseley type bowls with an 1800-1850 date range. Typically, the redwares (fabric 78) and stonewares (fabric 81) were the largest sherds and the modern refined china fabrics very fragmentary (Table 16). This context has a *tpq* date range of 1850-1887.

A one-penny coin dated 1870 was recovered from context 3005.

One unstratified find worthy of note was a large snail shell found within a layer relating to the demolition of St George's school in the 1960s/70s (Fig 19, no. 17).

Phase No	Context Group	Context number	Material class	Object class	Object specific type	Count	Weight (g)
5		3005	metal	domestic	penny coin	1	10
5	4	3073		production waste	unident	1	1
5	4		ceramic	building material	brick/tile	29	325
5	4		ceramic	building material	flat roof tile	1	53

5	4		ceramic	building material	mortar	28	85
5	4		ceramic	domestic	clay pipe	5	13
5	4		ceramic	domestic	pot	1	1
5	4		ceramic	domestic	pot	4	195
5	4		ceramic	domestic	pot	1	78
5	4		ceramic	domestic	pot	1	38
5	4		ceramic	domestic	pot	4	720
5	4		glass	building material	glass	4	2
5	4		leather	personal ornament	leather	2	20
5	4		leather	personal ornament	shoe	5	227
5	4		metal	production waste	hammer scale	15	0.1
5	4		slag	production waste	slag	14	760
5	4		stone	unident	unident	1	1636
5	4	3074	ceramic	building material	brick	1	131
5	4		ceramic	building material	flat roof tile	1	158
5	4		ceramic	building material	roof tile	1	76
5	4		ceramic	domestic	clay pipe	1	5
5	4		ceramic	domestic	pot	1	17
5	4		ceramic	domestic	pot	3	23
5	4		ceramic	domestic	pot	1	27
5	4		ceramic	domestic	pot	8	1213
5	4		ceramic	domestic	pot	9	1861
5	4		ceramic	domestic	pot	2	237
5	4		ceramic	domestic	pot	6	318
5	4		ceramic	domestic	pot	2	39
5	4		ceramic	domestic	pot	5	98
5	4		ceramic	domestic	pot	6	76
5	4		ceramic	domestic	pot	1	4
5	4		ceramic	domestic	pot	5	110

5	4		ceramic	domestic	pot	1	11
5	4		ceramic	domestic	pot	2	48
5	4		ceramic	domestic	pot	1	108
5	4		ceramic	domestic	pot	2	705
5	4		ceramic	production waste	crucible	2	8000
5	4		ceramic	unident	vessel	1	83
5	4		glass	domestic	vessel	1	9
5	4		leather	domestic	fitting	1	7
5	4		leather	domestic	fragment	5	7
5	4		leather	domestic	shoe	4	149
5	4		leather	domestic	strap	1	30
5	4		leather	personal ornament	shoe	8	335
5	4		leather	unident	leather	4	12
5	4		metal	domestic	pot lid	1	135
5	4		metal	personal ornament	medallion	1	30
5	4		metal	production waste	iron sheet	1	734
5	4		metal	production waste	tinplate offcuts	10	213
5	4		metal	unident	iron sheet	2	613
5	4		metal	unident	unident	1	905
5	4		slag	production waste	slag	2	164
5	4		stone	building material	roof slate	1	61
5	4		stone	building material	worked stone	1	59
5	4	3075	ceramic	building material	drain	1	147
5	4		ceramic	domestic	pot	1	359
5	4		ceramic	domestic	pot	5	143
5	4		ceramic	domestic	pot	1	13
5	4		ceramic	domestic	pot	2	15
5	4		ceramic	domestic	pot	1	28
5	4		ceramic	domestic	pot	5	60

5	4		ceramic	domestic	pot	2	22	
5	4		glass	domestic	vessel	3	308	
5	4	3076	ceramic	domestic	pot	1	2	
5	4		ceramic	domestic	pot	7	452	
5	4		ceramic	domestic	pot	1	15	
5	4		ceramic	domestic	pot	5	564	
5	4		ceramic	domestic	pot	12	355	
5	4		ceramic	domestic	pot	1	8	
5	4		3077	ceramic	domestic	clay pipe	2	10
5	4			ceramic	domestic	pot	7	137
5	4	ceramic		domestic	pot	3	27	
5	4	ceramic		domestic	pot	3	434	
5	4	ceramic		domestic	pot	13	1811	
5	4	ceramic		domestic	pot	1	2	
5	4	ceramic		domestic	pot	2	22	
5	4	ceramic		domestic	pot	3	30	
5	4	ceramic		domestic	pot	1	1	
5	4	ceramic		domestic	pot	1	1	
5	4	ceramic		domestic	pot	9	174	
5	4	ceramic		domestic	pot	1	5	
5	4	ceramic		domestic	pot	1	23	
5	4	ceramic		domestic	pot	2	2	
5	4	ceramic		domestic	pot	1	31	
5	4	ceramic		domestic	pot	1	6	
5	4	ceramic		domestic	pot	1	15	
5	4	ceramic		domestic	pot	1	21	
5	4	ceramic		domestic	pot	2	20	
5	4	ceramic		domestic	pot	4	21	
5	4	ceramic	domestic	pot	2	155		

5	4		ceramic	production waste	crucible	1	261
5	4		glass	unident	burnt glass	1	6
5	4		leather	personal ornament	shoe	10	330
5	4		organic		cat mandible	1	2
5	4	3078	ceramic	building material	brick	1	1666
5	4		ceramic	domestic	pot	2	17
5	4		ceramic	domestic	pot	5	49
5	4		ceramic	domestic	pot	3	116
5	4	3079	ceramic	domestic	pot	2	24
5	4		ceramic	domestic	pot	1	9
5	4		ceramic	domestic	pot	1	82
5	4		ceramic	domestic	pot	3	678
5	4		ceramic	domestic	pot	1	102
5	4		ceramic	domestic	pot	6	480
5	4		ceramic	domestic	pot	1	10
5	4		ceramic	domestic	pot	12	41
5	4		ceramic	domestic	pot	8	11
5	4		ceramic	domestic	pot	2	70
5	4	3104	ceramic	building material	flat roof tile	1	602
5	4		ceramic	building material	mortar	9	44
5	4		ceramic	domestic	clay pipe	1	10
5	4		ceramic	domestic	pot	1	3
5	4		ceramic	domestic	pot	4	197
5	4		ceramic	domestic	pot	4	490
5	4		ceramic	domestic	pot	2	545
5	4		ceramic	domestic	pot	1	236
5	4		ceramic	domestic	pot	1	57
5	4		ceramic	domestic	pot	2	74
5	4		ceramic	domestic	pot	3	75

5	4		ceramic	domestic	pot	2	20
5	4		ceramic	domestic	pot	3	45
5	4		ceramic	domestic	pot	4	63
5	4		ceramic	domestic	pot	4	57
5	4		ceramic	domestic	pot	1	17
5	4		glass	unident	glass	1	6
5	4		leather	personal ornament	shoe	1	400
5	4		metal	production waste	tinplate offcuts	1	43
5	4		slag	production waste	slag	2	15
5	4	3105	ceramic	domestic	pot	1	412
5	4	3106	glass	domestic	vessel	1	148
5	4		ceramic	building material	flat roof tile	2	109
5	4		ceramic	building material	flat roof tile	1	36
5	4		ceramic	domestic	pot	14	1298
5	4		ceramic	domestic	pot	22	1507
5	4		ceramic	domestic	pot	1	102
5	4	3126	ceramic	domestic	pot	2	11
5	4		ceramic	domestic	pot	5	37
5	4		ceramic	domestic	pot	2	13
5	4		ceramic	domestic	pot	1	15
5	4		ceramic	domestic	pot	2	53
5	4		glass	domestic	vessel	1	9
5	4		ceramic	domestic	pot	2	73
5	4	3127	ceramic	domestic	pot	1	155
5	4		ceramic	domestic	pot	1	21
5	4		ceramic	production waste	crucible	3	908
5	4		ceramic	building material	flat roof tile	2	780
5	4	3128	ceramic	building material	tile	3	71
5	4		ceramic	domestic	pot	1	19

5	4		ceramic	domestic	pot	1	8
5	4		ceramic	domestic	pot	1	16
5	4		ceramic	domestic	pot	1	4
5	4		ceramic	domestic	pot	1	2
5	4		ceramic	production waste	crucible	1	233
5	4	3134	ceramic	building material	tile	3	2559
5	6			building material	plaster	2	13
5	6			production waste	coal/coke	3	16
5	6		ceramic	building material	tile	2	487
5	6		ceramic	building material	tile	1	58
5	6		ceramic	building material	tile	1	25
5	6		ceramic	domestic	clay pipe	80	197
5	6		ceramic	domestic	clay pipe	1	9
5	6		ceramic	domestic	clay pipe	2	18
5	6		ceramic	domestic	pot	159	1886
5	6		ceramic	domestic	pot	10	341
5	6		ceramic	domestic	pot	23	264
5	6	4008	ceramic	domestic	pot	43	988
5	6		ceramic	domestic	pot	1	26
5	6		ceramic	domestic	pot	65	4712
5	6		ceramic	domestic	pot	3	245
5	6		ceramic	domestic	pot	1	12
5	6		ceramic	domestic	pot	71	3457
5	6		ceramic	domestic	pot	1	554
5	6		ceramic	domestic	pot	2	38
5	6		ceramic	domestic	pot	2	50
5	6		ceramic	domestic	pot	9	111
5	6		ceramic	domestic	pot	1	34
5	6		ceramic	domestic	pot	1	3

5	6		ceramic	domestic	pot	178	2024
5	6		ceramic	domestic	pot	9	89
5	6		ceramic	domestic	pot	3	191
5	6		ceramic	domestic	pot	4	43
5	6		ceramic	domestic	pot	2	12
5	6		ceramic	domestic	pot	12	203
5	6		ceramic	domestic	tile	1	27
5	6		ceramic	fitting	insulator	1	147
5	6		ceramic	production waste	crucible	7	1056
5	6		glass	domestic	bottle	2	443
5	6		glass	domestic	bottle	1	27
5	6		glass	domestic	glass	3	68
5	6		glass	domestic	vessel	21	179
5	6		metal	unident	unident	1	12
5	6		metal	unident	unident	5	208
5	6		organic		bone	1	1
5	6		slag	production waste	glass slag	1	3
5	6		slag	production waste	slag	1	48
5	6		slag	production waste	unident	2	300
5	6		slag	unident	slag	1	13
5	6		slag	unident	slag	1	95
5	6		stone	unident	unident	1	826
5	6	4010	ceramic	building material	tile	1	915
5	6		ceramic	building material	tile	4	293
5	6		ceramic	domestic	clay pipe	43	168
5	6		ceramic	domestic	pot	11	1116
5	6		ceramic	domestic	pot	11	130
5	6		ceramic	domestic	pot	26	528
5	6		ceramic	domestic	pot	42	837

5	6		ceramic	domestic	pot	24	914
5	6		ceramic	domestic	pot	1	10
5	6		ceramic	domestic	pot	50	6226
5	6		ceramic	domestic	pot	1	53
5	6		ceramic	domestic	pot	22	1324
5	6		ceramic	domestic	pot	1	9
5	6		ceramic	domestic	pot	1	55
5	6		ceramic	domestic	pot	22	126
5	6		ceramic	domestic	pot	5	190
5	6		ceramic	domestic	pot	224	3971
5	6		ceramic	domestic	pot	1	39
5	6		ceramic	domestic	pot	2	52
5	6		ceramic	domestic	pot	1	8
5	6		ceramic	domestic	pot	1	35
5	6		ceramic	domestic	pot	2	22
5	6		ceramic	production waste	crucible	11	1412
5	6		glass	domestic	bottle	3	109
5	6		glass	domestic	bottle	3	305
5	6		metal	unident	handle	1	34
5	6		metal	unident	iron object	1	195
5	6		metal	unident	unident	1	3
5	6		organic		bone	1	5
5	6		slag	production waste	misc slag	2	18
5	6	4012		building material	plaster	1	38
5	6		ceramic		drain	1	671
5	6		ceramic	building material	tile	1	302
5	6		ceramic	domestic	clay pipe	22	93
5	6		ceramic	domestic	clay pipe	2	11
5	6		ceramic	domestic	pot	4	120

5	6		ceramic	domestic	pot	2	50
5	6		ceramic	domestic	pot	36	905
5	6		ceramic	domestic	pot	21	1024
5	6		ceramic	domestic	pot	43	8723
5	6		ceramic	domestic	pot	1	266
5	6		ceramic	domestic	pot	1	18
5	6		ceramic	domestic	pot	21	2471
5	6		ceramic	domestic	pot	2	9
5	6		ceramic	domestic	pot	11	147
5	6		ceramic	domestic	pot	1	2
5	6		ceramic	domestic	pot	142	3383
5	6		ceramic	domestic	pot	4	65
5	6		ceramic	domestic	pot	6	90
5	6		ceramic	domestic	pot	1	10
5	6		ceramic	domestic	pot	5	243
5	6		ceramic	domestic	pot	1	68
5	6		ceramic	domestic	pot	3	33
5	6		ceramic	domestic	pot	1	19
5	6		ceramic	domestic	pot	1	41
5	6		ceramic	domestic	pot	1	5
5	6		ceramic	production waste	crucible	5	1896
5	6		glass	domestic	vessel	5	102
5	6		metal	unident	unident	3	79
5	6		organic		bone	4	72
5	6		wood	unident	wood	5	101
5	6	4013	ceramic	building material	tile	2	162
5	6		ceramic	domestic	clay pipe	1	9
5	6		ceramic	domestic	pot	29	2025
5	6		ceramic	domestic	pot	1	70

5	6		ceramic	domestic	pot	40	6357
5	6		ceramic	domestic	pot	21	4091
5	6		ceramic	domestic	pot	1	42
5	6		ceramic	domestic	pot	15	3349
5	6		ceramic	domestic	pot	1	569
5	6		ceramic	domestic	pot	40	924
5	6		ceramic	domestic	pot	1	44
5	6		ceramic	domestic	pot	6	120
5	6		glass	domestic	bottle	1	34
5	6		glass	domestic	vessel	1	520
5	6		leather	personal ornament	shoe	1	120
5	6		metal	unident	unident	6	66
5	6		organic	fitting	worked wood	3	670
5	6		organic	unident	unident	1	54

Table 15: Phase 5 artefacts

Phase number	Context Group	Context number	Object specific type	Fabric code	Count	Weight (g)	Pottery period
5	4	3073	pot	78	5	273	post-medieval
5	4		pot	81	1	38	post-medieval
5	4		pot	81.4	4	720	modern
5	4		pot	100	1	1	post-medieval
5	4	3074	pot	78	19	3311	post-medieval
5	4		pot	81.4	6	318	modern
5	4		pot	81.5	2	39	post-medieval
5	4		pot	84	5	98	late post-medieval
5	4		pot	85	13	201	modern
5	4		pot	90	2	48	post-medieval
5	4		pot	91	3	813	post-medieval

5	4		pot	100	5	67	post-medieval
5	4	3075	pot	78	6	502	post-medieval
5	4		pot	81	1	13	post-medieval
5	4		pot	81.3	2	15	post-medieval
5	4		pot	84	6	88	late post-medieval
5	4		pot	85	2	22	modern
5	4		3076	pot	78	7	452
5	4	pot		81.3	1	15	post-medieval
5	4	pot		81.4	5	564	modern
5	4	pot		85	12	355	modern
5	4	pot		91	1	8	post-medieval
5	4	pot		100	1	2	post-medieval
5	4	3077	pot	78	3	434	post-medieval
5	4		pot	81.4	13	1811	modern
5	4		pot	83	6	54	post-medieval
5	4		pot	85	13	204	modern
5	4		pot	85.11	6	75	post-medieval
5	4		pot	91	8	196	post-medieval
5	4		pot	100	7	137	post-medieval
5	4		pot	101.1	3	27	modern
5	4	3078	pot	85	8	165	modern
5	4		pot	100	2	17	post-medieval
5	4	3079	pot	78	5	769	post-medieval
5	4		pot	81.3	1	102	post-medieval
5	4		pot	81.4	6	480	modern
5	4		pot	83	1	10	post-medieval
5	4		pot	85	20	52	modern
5	4		pot	85.11	2	70	post-medieval
5	4		pot	100	2	24	post-medieval

5	4	3104	pot	78	6	1035	post-medieval
5	4		pot	81.4	1	236	modern
5	4		pot	83	1	57	post-medieval
5	4		pot	84	2	74	late post-medieval
5	4		pot	85	8	140	modern
5	4		pot	85.11	8	120	post-medieval
5	4		pot	91	1	17	post-medieval
5	4		pot	100	1	3	post-medieval
5	4		pot	101.1	4	197	modern
5	4		3105	pot	81.4	1	412
5	4	3126	pot	78	36	2805	post-medieval
5	4		pot	78.4 (CW2)	1	102	post-medieval
5	4		pot	82	2	11	post-medieval
5	4		pot	83	5	37	post-medieval
5	4		pot	85	3	28	modern
5	4		pot	91	2	53	post-medieval
5	4	3127	pot	78	1	155	post-medieval
5	4		pot	85	1	21	modern
5	4		pot	100	2	73	post-medieval
5	4	3128	pot	77	1	19	post-medieval
5	4		pot	78	1	8	post-medieval
5	4		pot	78.4	1	16	post-medieval
5	4		pot	81.3	1	4	post-medieval
5	4		pot	81.4	1	2	modern
5	6	4008	pot	77	1	26	post-medieval
5	6		pot	78	64	4435	post-medieval
5	6		pot	78.4 (CW2)	4	522	post-medieval
5	6		pot	78.5	1	12	post-medieval
5	6		pot	81	71	3457	post-medieval

5	6		pot	81.3	1	554	post-medieval
5	6		pot	81.4	2	38	modern
5	6		pot	82	2	50	post-medieval
5	6		pot	83	9	111	post-medieval
5	6		pot	84	1	34	late post-medieval
5	6		pot	85	190	2304	modern
5	6		pot	85.11	4	43	post-medieval
5	6		pot	89	2	12	post-medieval
5	6		pot	91	12	203	post-medieval
5	6		pot	100	236	3482	post-medieval
5	6		pot	78	50	6226	post-medieval
5	6		pot	81.3	1	53	post-medieval
5	6		pot	81.4	22	1324	modern
5	6		pot	81.5	1	9	post-medieval
5	6		pot	82	1	55	post-medieval
5	6		pot	83	22	126	post-medieval
5	6		pot	84	5	190	late post-medieval
5	6	4010	pot	85	225	4010	modern
5	6		pot	85.7	2	52	modern
5	6		pot	89	1	8	post-medieval
5	6		pot	91	3	57	post-medieval
5	6		pot	100	90	2611	post-medieval
5	6		pot	101.1	10	292	modern
5	6		pot	101.2	14	622	modern
5	6		pot	108	1	10	late med/early post-medieval
5	6		pot	78	43	8723	post-medieval
5	6	4012	pot	78.4 (CW2)	1	266	post-medieval
5	6		pot	81	1	285	post-medieval
5	6		pot	81.3	1	18	post-medieval

5	6		pot	81.4	20	2186	modern
5	6		pot	81.5	2	9	post-medieval
5	6		pot	83	11	147	post-medieval
5	6		pot	84	1	2	late post-medieval
5	6		pot	85	153	3548	modern
5	6		pot	85.11	6	311	post-medieval
5	6		pot	85.7	3	33	modern
5	6		pot	91	3	65	post-medieval
5	6		pot	100	63	2099	post-medieval
5	6	4013	pot	78	61	10,049	post-medieval
5	6		pot	78.4	1	42	post-medieval
5	6		pot	81.4	16	3918	modern
5	6		pot	85	41	968	modern
5	6		pot	85.11	6	120	post-medieval
5	6		pot	101	30	2494	modern

Table 16: Phase 5 pottery fabrics

### 6.6.6 Phase 6: 20th-century deposits

Phase 6 was represented almost entirely by domestic material and a metal sign advertising 'Diabolo cream separators' dating 1880-1930. The pottery was all of 19th-20th century date and of domestic fabric types, including transfer-printed wares (fabric 85), Yellow wares and whitewares (fabric 101), and late stonewares (fabric 81.4). An 'Odo-ro-no' bottle dating to between 1914 and 1940 is of particular interest (3168; Fig 16, no. 13), as the brand was an early pioneer of aluminium chloride-based underarm antiperspirants; it was an American product manufactured in Cincinnati, Ohio, and had started out selling 'Odor-o-no' from c 1910-1914, after which it slightly amended the trade name.

Phase number	Context Group	Context number	Material class	Object class	Object specific type	Count	Weight (g)
6		2016	ceramic	domestic	clay pipe	3	6
6		2026	ceramic	domestic	pot	1	8
6		2023	ceramic	domestic	pot	3	90
6		2016	ceramic	domestic	pot	2	6
6		2016	ceramic	domestic	pot	2	43
6		2013	ceramic	domestic	pot	1	8
6		2002	metal	fitting	sign	2	2800

6		2016	metal	unident	unident	1	0.5
6		3168	glass	domestic	vessel	1	37

Table 17: Phase 6 artefacts

Phase number	Context Group	Context number	material class	object class	object specific type	fabric code	Count	weight (g)	period
6		2013	ceramic	domestic	pot	85	1	8	modern
6		2016	ceramic	domestic	pot	85	2	6	modern
6		2016	ceramic	domestic	pot	101	2	43	modern
6		2023	ceramic	domestic	pot	81.4	3	90	modern
6		2026	ceramic	domestic	pot	101	1	8	modern

## 6.7 Discussion

This is a large assemblage spanning approximately 700 years of the site's history, and charting its passage from the town's agricultural hinterland, through the construction of the moat and the residential occupation of the Old Hall between the later 16th and early 18th centuries, to its industrial uses in the later 18th and 19th centuries. There is little evidence for any more intensive activity/occupation on the site before the 16th century, the small amount of medieval pot being more compatible with arable agriculture (i.e. a manuring scatter). This is the same as the earliest part of the sequence as concluded by Hewitson *et al* (2010) from the adjacent excavation of the site. The relatively late date of the moat construction here seems, therefore, to be confirmed.

Finds evidence from the lower fills of the original moat suggests silting deposits started to form no earlier than the late-16th or early-17th century, which, given the above, is not long after its first being established. There is a relative paucity of material from the mid-18th century, which may represent something of a hiatus in activity at a time when the hall had fallen out of use. But a significant increase in the volume of material from c 1770 onwards – including a mix of domestic and industrial material – attests to the dual use of the Old Hall as both residence and factory, when historical sources reveal a succession of owners. Some of the domestic wares of the turn of the 19th century are of very fine quality, suggesting that the Old Hall, at that time, was home to a prosperous enterprise. Eventually the industrial activity went into decline and the large, earlier features were infilled with debris from clearing the site for other, more urban development, as Wolverhampton continued to expand its population, as part of the thriving 'Black Country' in this era.

## 6.8 Recommendations

### 6.8.1 Discard/retention

It is recommended that the medieval and local early coarsewares are retained, including the post-medieval complete and near-complete vessels such as the pancheons/bowls. It may additionally be useful, for teaching and handling collections, to retain a selection of near-complete modern vessels. The portrait plate of Joseph Rayner Stephens is of local interest due to his involvement in the Methodist church and workers reforms, and this should be retained.

Other items potentially worthy of retention are: the stamped clay pipes be retained due to the likelihood of their local production; the two intact crucibles representing industrial works at the site; the 'Odor-o-no' bottle; and the large snail shell.

The organic items such as wood and leather are not considered stable enough for long term curation and so have been recorded in depth with photography and illustration.

## 7 Environmental evidence

### 7.1 Plant macrofossils (by Elizabeth Pearson)

The environmental project conforms to guidance by ClfA (2014a) on archaeological excavation, further guidance by English Heritage (2011) and the Association for Environmental Archaeology (1995).

The underlying soils consist of slowly permeable seasonally wet slightly acid but-rich loamy clayey soils of moderate fertility (Cranfield and Agrifood Institute 2022; Soilscape 18). The geology comprises till – Diamicton bedrock overlying Millstone Grit Group – Mudstone, Siltstone and Sandstone (BGS 2022). It was noted also that very acid to slightly acid soils, all of low fertility are to be found in the surrounding area of Wolverhampton; Soilscape 15, 10 and 6.

#### 7.1.1 Methodology

#### 7.1.2 Sampling policy

Samples were taken according to standard Worcestershire Archaeology practice (2012). A total of 17 samples taken from the site (Table 18). These included bulk samples (each of up to 40 litres), columns of spit samples and timber samples.

#### 7.1.3 Processing and analysis

Initial assessment was undertaken on seventeen samples, which included wash-over processing of small sub-samples to examine waterlogged remains in optimum condition and further processing of material in greater quantities, by Siraf tank flotation, to scan for additional species and more robust plant remains. Following assessment, further processing and analysis was undertaken on three samples which demonstrated good survival and diversity, and were archaeologically significant. These included the clay lining and base of the moat (3118), and a fill of ditch 2179.

For spit samples taken through waterlogged moat deposits, a sub-sample of 1 litre was processed by the wash-over technique as follows. The sub-sample was broken up in a bowl of water to separate the light organic remains from the mineral fraction and heavier residue. The water, with the light organic fraction was decanted onto a 300µm sieve and the residue washed through a 1mm sieve. The remainder of the bulk sample was retained for further analysis.

A selection of remaining samples were processed by flotation using a Siraf tank. The flots were collected on a 300µm sieve and the residue retained on a 1mm mesh. This allows for the recovery of items such as small animal bones, molluscs and seeds.

The residues were scanned by eye and the abundance of each category of environmental remains estimated. A magnet was also used to test for the presence of hammer scale. The flots were scanned using a low power MEIJI stereo light microscope and plant remains identified using modern reference collections maintained by Worcestershire Archaeology, and a seed identification manual (Cappers *et al* 2012). Nomenclature for the plant remains follows Stace (2010).

The cell structure of a single waterlogged roundwood fragment was examined in three planes under a MEIJI dark illumination microscope and identifications were carried out using reference texts (Schweingruber 1978; Hather 2000) and reference slides housed at Worcestershire Archaeology.

Context	Sample	Spit/Sub-sample	Fill of	Description	Period (century)	Phase	Sample volume (L)	Volume processed (L)	Res assessed	flot assessed
2171	1		2168	Metal debris fill of pit 2168	Early to mid 19 <sup>th</sup> C	4	10	10	Yes	Yes
2179	2		2176	Fill of ditch [2176]	Late 16 <sup>th</sup> C	2	40	10	Yes	Yes
2182	3		2176	Fill of ditch [2176]	Late 16 <sup>th</sup> C	2	40	10	Yes	Yes
2197	4		2196	Fill of 2196	Late 16 <sup>th</sup> C	2	10	10	Yes	Yes
3104	5			Fill of moat [3103]	Early to mid 19 <sup>th</sup>	5	20	10	Yes	Yes
3111	7			Likely subsoil within curtain wall	?medieval	1	40	10	Yes	Yes
3154	16		3118	Thick clay fill in bottom of moat 3118	Late 16 <sup>th</sup> C	2	40	10	Yes	Yes
3073	6		3072	Fill of moat	Mid to late 19 <sup>th</sup> C	5	40	10	Yes	Yes
3157	17		3118	Very thin black basal fill of moat 3118	Late 16 <sup>th</sup> C	2	1	1	Yes	Yes
3145	15	0-0.04m	3118	Grey clay fill of moat 3118	16 <sup>th</sup> to 17 <sup>th</sup>	2	10	1	Yes	Yes
3156	15	1.12-1.17m	3118	Sandy basal fill on east side of moat 3118	16 <sup>th</sup> to 17 <sup>th</sup>	2	10	1	Yes	Yes
4027	19		4029	Lowest fill of moat silting	16 <sup>th</sup> to 17 <sup>th</sup>	2	40	10	Yes	Yes
4028	18		4029	Clay lining of moat	16 <sup>th</sup> to 17 <sup>th</sup>	2	80	40	Yes	Yes

Table 18: List of bulk samples

#### 7.1.4 Discard policy

Remaining soil sample and residues (post scanning) will be discarded after a period of three months following submission of this report unless there is a specific request to retain them.

Retention of the following material is recommended:

- Flots
- Sorted remains from scanned residues
- Hand-collected animal bone

## 7.1.5 Results

The results are summarised in Tables 19 to 21.

Assessment of a column of spit samples through lower deposits of the original moat 3118 (Fig 7) and of ditch 2176 (Fig 8) showed good preservation of waterlogged organic remains, indicative of mixed habitats from basal to upper deposits. Moat deposits (CG2) here were dated to cal AD 1300–1410, while those towards the base of the ditch (CG9) dated to cal AD 1500–1650 (see Table 22). The environmental remains appear to mainly provide information on conditions within the moat and the near vicinity, with a small number of cultivars which may represent domestic waste.

Species diversity was greater in sub-samples processed by the wash-over technique. Processing on a sieving tank tends to recover fewer light seed remains, but despite this nonetheless, processing larger volumes of soil in this way has provided some indication of species diversity. Occasional insect remains were identified in some spit samples, in association with low numbers of mollusc remains and small fragments of animal bone. No further analysis was carried out on these remains.

Results from assessment and further processing from moat fill 3156 and ditch fills 2182 and 4028 are discussed below. Results from assessment and further processing are tabulated separately.

### 7.1.1 Original moat

Seed remains from layers at the base of the moat (3156) and the clay lining (4028) were dominated by vegetation such as redshank (*Persicaria maculosallapathifolium*), common on disturbed or cultivated ground, and nettles (*Urtica dioica*) and bramble (*Rubus* sect *Glandulosus*) which would have grown in overgrown, neglected areas, probably close to the moat. Occasional seeds of weeds more associated with cereal crops included corn spurrey (*Spergula arvensis*), corncockle (*Agrostemma githago*), corn marigold (*Glebionis segetum*) and stinking chamomile (*Anthemis cotula*). Elderberry (*Sambucus nigra*), black nightshade (*Solanum nigrum*), common hemp-nettle (*Galeopsis tetrahit*), hemlock (*Conium maculatum*), violet (*Viola* sp), and self-heal (*Prunella vulgaris*) may have growing in low densities with the nettle and bramble as their seeds were present in low numbers. A single sloe/damson/plum/cherry kernel fragment (cf *Prunus* sp) may have also grown in this environment, and could have been a cultivated shrub.

Abundant tasteless/small water-pepper (*Persicaria mitis/minor*) suggests wet ground around and within the moat, and occasional pondweed (*Potamogeton* sp), that the moat held some water.

Remains from a layer immediately overlying the basal deposits (3154) suggested that the moat, at this stage, held more water as duckweed (*Lemna* sp; a free-floating aquatic) and fine-leave water-droplet (*Oenanthe aquatica*) was present, alongside crowfoot (*Ranunculus* subgen *Batrachium*), water-pepper (*Persicaria hydropiper*) and sedge (*Carex* sp 3-sided nutlets). As redshank was particularly abundant, there may have been more disturbance or cultivation at this time. Wild strawberry (*Fragaria vesca*) may have been cultivated, or been growing in woodland or scrub. Sloe was also noted in (4027).

### 7.1.2 Ditch 2176

A similar range of seeds of weeds of disturbed or cultivated ground and more neglected, overgrown areas, as described for moat 3103 were recorded.

In addition, a grape pip (*Vitis vinifera*) was recorded in ditch fill 2181, and a small number of other potential food remains included raspberry (*Fragaria vesca*), summer savory (*Satureja hortensis*) and wild strawberry were also recorded in this feature.

Context	Sample	Large mammal	Fish	Bird	Mollusc	Insect	Charcoal	Charred plant	Waterlogged plant	Hammerscale	Artefacts	Comments
2171	1								abt		abt Fe plate & scrap. occ coal, Fe with trace of Japanning	
2179	2	occ				occ			abt*		occ coal, clinker, chert flake	*= occ seeds
2182	3					occ	occ		abt		occ coal, burnt stone.	
2197	4	occ					occ		occ		occ coal, cbm.	
3073	6		occ	occ	occ			occ	occ*	occ	mod coal, occ pot, mortar, CBM, Worked stone (cobble?), basalt(?), Glass, glass slag, ochre(?)	*=includes seeds
3104	5	occ							abt		occ oyster shell, coal, lime mortar, pot, Fe slag(?), glass.	
3111	7						occ		occ		occ coal	
3145	15					occ			abt			occ mites
3154	16					occ		occ	v abt		occ coal, fuel ash	*=includes seeds
3156	15								v abt			
3157	17		occ					occ	v abt		occ coal, pot	*=includes seeds
4027	19						occ		v abt		occ coal	
4028	18						occ		v abt		occ coal, clinker, pot, lime mortar, building stone, chert	

Table 19: Summary of environmental remains; occ = occasional, mod = moderate, abt = abundant

Latin name	Family	Common name	Habitat	2182 ditch	3156 moat	4028 moat
<b>Waterlogged plant remains</b>						
<i>Ranunculus acris/repens/bulbosus</i>	Ranunculaceae	buttercup	CD	++		
<i>Ranunculus</i> sbgen <i>Batrachium</i>	Ranunculaceae	crowfoot	E	+		
<i>Vitis vinifera</i>	Vitaceae	grape-vine	F	+		
<i>Prunus spinosa</i>	Rosaceae	sloe	C		+	
<i>Rubus idaeus</i>	Rosaceae	raspberry	CD	+		
<i>Rubus</i> sect <i>Glandulosus</i>	Rosaceae	bramble	CD	++		
<i>Fragaria vesca</i>	Rosaceae	wild strawberry	C	+		
<i>Urtica dioica</i>	Urticaeae	common nettle	ABCD	++	+++	++
<i>Viola</i> sp	Violaceae	violet	DF	+		
<i>Persicaria maculosa/lapathifolium</i>	Polygonaceae	redshank/pale persicaria	AB	+	+++	+
<i>Persicaria mitis/minor</i>	Polygonaceae	tasteless/small water-pepper	E		+ / ++	
<i>Polygonum aviculare</i>	Polygonaceae	knotgrass	AB	+		
<i>Rumex acetosella</i>	Polygonaceae	sheep's sorrel	ABD	+		
<i>Rumex</i> sp	Polygonaceae	dock	ABCD	++		
<i>Spergula arvensis</i>	Caryophyllaceae	corn spurrey	AD		+	
<i>Agrostemma githago</i>	Caryophyllaceae	corn cockle	AB		+	
<i>Chenopodium album</i>	Amaranthaceae	fat hen	AB	+		
<i>Stachys sylvatica</i>	Lamiaceae	hedge woundwort	CD	+		
<i>Satureja hortensis</i>	Lamiaceae	summer savory	AF	+		
<i>Lycopus europaeus</i>	Lamiaceae	gypsywort	E	+		
<i>Cirsium</i> sp	Asteraceae	thistle	ABDE		+	
<i>Glebionis segetum</i>	Asteraceae	corn marigold	AB		+	

Latin name	Family	Common name	Habitat	2182 ditch	3156 moat	4028 moat
<i>Bidens</i> sp	Asteraceae	bur-marigold	ABE		+	
<i>Sambucus nigra</i>	Caprifoliaceae	elderberry	BC	++	+	
<i>Conium maculatum</i>	Apiaceae	hemlock	AB	+	+	
<i>Lemna</i> sp	Lemnaceae	duckweed	E	+		
<i>Carex</i> sp (3-sided) nutlets	Cyperaceae	sedge	CDE	+		
<i>Ranunculus</i> sbgen <i>Batrachium</i>	Ranunculaceae	crowfoot	E		+	
cf <i>Prunus</i> sp	Rosaceae	sloe/damson/plum/cherry etc	CF		+	
<i>Rubus</i> sect <i>Glandulosus</i>	Rosaceae	bramble	CD		++	
<i>Urtica urens</i>	Urticaceae	small nettle	AB	+		
<i>Viola</i> sp	Violaceae	violet	DF			+
<i>Solanum nigrum</i>	Solanaceae	black nightshade	AB		+	
<i>Stachys sylvatica</i>	Lamiaceae	hedge woundwort	CD		+	
<i>Galeopsis tetrahit</i>	Lamiaceae	common hemp-nettle	AB		+	
<i>Prunella vulgaris</i>	Lamiaceae	selfheal	D		+	
<i>Onopordum acanthium</i>	Asteraceae	cotton thistle	B		+	
<i>Anthemis cotula</i>	Asteraceae	stinking chamomile	AB		+	
<i>Apium nodiflorum</i>	Apiaceae	fool's watercress	E	+		
<i>Potamogeton</i> sp	Potamogetonaceae	pondweed	E		+	
Poaceae sp indet grain	Poaceae	grass	AF	+		
unidentified bud	unidentified				+	
unidentified twig/bud fragments	unidentified			++		
unidentified seed	unidentified			+		
unidentified bark fragments	unidentified				+	
unidentified wood fragments	unidentified				++	+/low

Latin name	Family	Common name	Habitat	2182 ditch	3156 moat	4028 moat
unidentified herbaceous fragments	unidentified					++
<b><i>Charred plant remains</i></b>						
unidentified cereal grain/seed fragment	unidentified					+/low

Table 20: Plant remains from selected samples

Context	Sample	Spit/Sub-sample	Preservation type	Species detail	Category remains	Quantity/diversity	Comment
2171	1		wa	<i>Salix</i> sp (fruit), unidentified root fragments (herbaceous)	misc	+/low	
2179	2		wa	<i>Ranunculus acris/repens/bulbosus</i> , <i>Ranunculus sardous</i> , <i>Ranunculus</i> sbgen <i>Batrachium</i> , <i>Rubus</i> sect <i>Glandulosus</i> , <i>Fragaria vesca</i> , <i>Urtica dioica</i> , <i>Persicaria maculosa</i> , <i>Persicaria hydropiper</i> , <i>Rumex</i> sp, <i>Silene</i> sp, <i>Chenopodium album</i> , <i>Hyoscyamus niger</i> , <i>Solanum nigrum</i> , <i>Sonchus asper</i> , <i>Sambucus nigra</i> , <i>Lemna</i> sp, <i>Carex</i> sp (3-sided) nutlets	misc	+++/high	<i>Polygonum hydropiper</i> and <i>Ranunculus</i> sect <i>Glandulosus</i> . Small crucifer
2197	4		wa	<i>Urtica dioica</i> , <i>Lemna</i> sp	seed	+/low	Mainly <i>Urtica dioica</i>
2197	4		wa	unidentified herbaceous fragments	misc	+/low	
2197	4		wa		beetles	+/low	
2197	4		ch	unidentified wood fragments	misc	+/low	
3073	6		wa		misc	+++/low	<i>Daphnia</i> sp eggs
3073	6		wa	<i>Ranunculus acris/repens/bulbosus</i> , <i>Ranunculus sceleratus</i> , <i>Ranunculus</i> sbgen <i>Batrachium</i> , <i>Polygonum aviculare</i>	seed	++/low	
3073	6		wa	unidentified stem fragments, unidentified root fragments (herbaceous), unidentified wood fragments, unidentified leaf scar, unidentified herbaceous fragments	misc	++++/low	
3104	5		wa	unidentified stem fragments, unidentified root fragments (herbaceous), unidentified wood fragments, unidentified catkin?, unidentified herbaceous fragments	misc	++++/low	

3104	5		wa	<i>Fragaria vesca</i> , <i>Polygonum aviculare</i>	seed	+/low	
3111	7		wa	unidentified root fragments (herbaceous)	misc	+/low	
3145	15	0 - 0.04m	wa	unidentified moss fragments, unidentified wood fragments, unidentified herbaceous fragments	misc	+++/low	
3145	15	0 - 0.04m	wa	<i>Ranunculus acris/repens/bulbosus</i> , <i>Rubus</i> sect <i>Glandulosus</i> , <i>Urtica dioica</i> , cf <i>Barbarea vulgaris</i> , <i>Persicaria maculosa</i> , <i>Polygonum aviculare</i> , <i>Rumex</i> sp, <i>Chenopodium album</i> , <i>Hyoscyamus niger</i> , <i>Solanum nigrum</i> , <i>Sonchus oleraceus</i> , <i>Sonchus asper</i> , <i>Taraxacum</i> sp, <i>Anthemis cotula</i> , <i>Apium nodiflorum</i> , <i>Carex</i> sp (2-sided) nutlets, <i>Carex</i> sp (3-sided) nutlets, unidentified seed	seed	+++/low	
3154	16		wa	<i>Ranunculus acris/repens/bulbosus</i> , <i>Ranunculus</i> s/bgen <i>Batrachium</i> , <i>Rubus</i> sect <i>Glandulosus</i> , <i>Fragaria vesca</i> , <i>Urtica dioica</i> , <i>Viola</i> sp, <i>Persicaria maculosa</i> , <i>Persicaria hydropiper</i> , <i>Polygonum aviculare</i> , <i>Rumex</i> sp, <i>Chenopodium album</i> , <i>Carduus/Cirsium</i> sp, <i>Taraxacum</i> sp, <i>Sambucus nigra</i> , <i>Oenanthe aquatica</i> , <i>Conium maculatum</i> , <i>Lemna</i> sp, <i>Carex</i> sp (2-sided) nutlets, <i>Carex</i> sp (3-sided) nutlets	misc	++++/high	<i>Persicaria maculosa</i> dominant
3157	17		wa		misc	++++/low	
4027	19		unch*	unidentified leaf fragments, unidentified herbaceous fragments	misc	++++/low	
4027	19		ch	unidentified wood fragments, unidentified	misc	+/low	charcoal & charred residue ?
4027	19		unch*	<i>Prunus spinosa</i> , <i>Rubus idaeus</i> , <i>Urtica dioica</i> , <i>Persicaria mitis</i> , <i>Stellaria media</i> , <i>Stellaria graminea</i> , <i>Agrostemma githago</i> , <i>Sambucus nigra</i> , <i>Valerianella</i> cf <i>dentata</i> , <i>Oenanthe</i> sp, <i>Lemna</i> sp, <i>Carex</i> sp (2-sided) nutlets, <i>Carex</i> sp (3-sided) nutlets, unidentified seed	seed	++/medium	<i>Persicaria</i> and <i>Valeriana</i> IDs provisional

Table 21: Assessment of plant remains (preservation: ch = charred, wa = waterlogged; quantity: + = 1 – 10, ++ = 11- 50, +++ = 51 – 100, ++++ = 101+)

## 7.2 Palynology (by Emily Forster)

### 7.2.1 Introduction

Ten samples from the moat [3118] and one from a ditch [2176], associated with the Great Hall at Wolverhampton City Learning Quarter (CLQ) were processed for pollen analysis. Following a brief assessment of pollen preservation (Forster 2022) the sample from the ditch and three of the samples from the moat were analysed. A radiocarbon date of cal AD 1300-1410 (SUERC-106955) from near the base of the moat suggests the samples are medieval at the earliest, while a date of cal AD 1500-1650 (SUERC-106679) from the ditch suggests an early post-medieval date for context (2182). The results of the pollen analysis are discussed below.

### 7.2.2 Method

Samples were stored in a fridge until they could be processed, in order to prevent mould growth. Subsamples of 1ml volume were measured out by displacement and processed using standard procedures of potassium hydroxide digestion, microsieveing (180µm and 10µm) and acetolysis, followed by density separation using heavy liquid (Fastfloat, specific gravity 1.95, sodium polytungstates) (e.g. Nakagawa *et al* 2008). Two *Lycopodium* tablets (batch 938934) with an average of 10679 spores per tablet were added to each subsample at the start of the extraction process in order to facilitate pollen concentration calculations (after Stockmarr 1971). Samples were stained with safranin prior to mounting in silicone oil.

Pollen was counted up to a minimum sum of 300 land pollen grains using a Zeiss Axioskop transmitted light microscope at x400 magnification. Some types were examined – and when necessary measured – at x1000 magnification with oil immersion to aid identification. Wherever possible (i.e. when grains were not crushed or obscured by other material on the slide) Poaceae (grasses) with a diameter of 30µm or more were measured at x1000 magnification, then categorised as large grasses or cereals according to Andersen's criteria (Andersen 1979, see also Tweddle *et al* 2005). Rarer pollen types were identified using the key in Moore *et al* (1991), reference slides in the collection at the University of Sheffield's Department of Archaeology, and digital images on the Global Pollen Project website (last accessed December 2022). Nomenclature for pollen and spores follows Bennett (1994). Non-pollen palynomorphs (NPP) were relatively rare within the samples, but where present these were identified with reference to Van Geel (1998) and Van Geel and Aptroot (2006).

### 7.2.3 Results

Pollen and spores are generally well preserved within the samples, with pollen concentrations ranging from just under 90,000 in the earliest (deepest) moat sample to over half a million grains per mm<sup>3</sup> of sediment in the ditch (Fig 21 and supplementary data). All of the samples are dominated by herbaceous taxa, which make up over 80% of each assemblage. Poaceae (grasses) are dominant, constituting 41% of the pollen assemblage from (2182) and 49-53% of pollen in the moat samples. The most common trees and shrubs are *Quercus* (oak), *Betula* (birch), *Corylus avellana* type (most likely hazel in this setting) and *Alnus glutinosa* (alder). A wide range of probable arable, pastoral and/or ruderal weeds are present in all of the samples, together with *Hordeum* type (barley type, which includes wild and cultivated barley) in the moat, and *Secale cereale* (rye) and Cannabaceae (hemp or hops) in samples from both features (Fig 22). The pollen and spore data are displayed in Figs 21-22, with some additional information in the supplementary data, and are described below.

*Samples from the moat, [3118]: <13> (3156) at 1.03-4m and (3154) at 0.93-4 and 0.85-6m (approximate date AD 1300-1410 onwards)*

The three samples from the moat are from two contexts, (3156) at 1.03-4m depth, and (3154) at 0.93-4 and 0.85-6m depths respectively. The deepest, and therefore presumably oldest sample is that from (3156), which has a radiocarbon date of 1300-1410 cal AD. The rate of accumulation of sediment in the various contexts is not known, but the samples are arranged in the pollen diagrams by relative age, becoming more recent with decreasing depth (Figs 21-22). The three samples from the moat are

broadly similar to each other, which indicates little change in vegetation cover and suggests relatively constant land use in the surrounding area for the period over which the pollen was accumulating.

As mentioned above, herbaceous taxa dominate the assemblage throughout, with less than 20% of the pollen coming from trees or shrubs at any time. Arboreal pollen values are higher in the earliest sample (from (3156)) than in those from later contexts, but are still low enough to indicate a very open landscape. Poaceae (grasses) are the most common taxon and can represent a wide range of habitats. There is considerable overlap between herbaceous 'weeds' associated with arable, pastoral and ruderal contexts (e.g. see Turner 1964; Behre 1981), and, owing to the fact that pollen is rarely identifiable to species level, a pollen 'type' may include taxa that live in a variety of habitats. It is, however, possible to characterise taxa as broadly arable or pastoral, as in Figure 22. This reveals a diverse assemblage of types common in farmed/disturbed landscapes in all of the moat samples, including *Hordeum* type (wild and cultivated barley), *Secale cereale* (rye) and possible arable weeds such as Chenopodiaceae/Amaranthaceae (fat hen/goosefoot family), various taxa within the Asteraceae (daisy) family (e.g. *Achillea* type, *Arctium* type, *Artemisia* type, *Solidago virgaurea* type) and *Bupleurum* (hare's ears). Although species within some of these types and families are found in a range of habitats, the presence of cereals together with a diverse assemblage of potential arable weeds suggests crop farming (and/or processing) in the surrounding landscape. A possible (*cf*) example of *Solanum nigrum* (black nightshade), an annual weed that grows on waste/cultivated ground (Stace, 2019), was found in the most recent sample from the moat ((3154) at 0.85-6cm), which also contains Cannabaceae (hemp/hops). Only one grain of Cannabaceae pollen was seen, suggesting that this may represent hops growing in hedges rather than large-scale cultivation (see Greig in Hewitson *et al* 2010). It should be noted that while Brassicaceae (cabbage/mustard family) includes a variety of food plants together with arable weeds, it has been excluded from the arable group in Figure 22 as it is likely to represent watercress in this case, a taxon which was identified in previous analysis of waterlogged plant remains from the moat (Smith in Hewitson *et al* 2010). Taxa associated with grazing are very common in the moat samples, notably *Plantago* spp (plantains), *Rumex* spp (sorrels/docks) and *Trifolium* type (clovers), indicating the presence of pasture. NPP (non-pollen palynomorphs) are relatively rare and mostly consist of ascospores, which are present in all of the samples, but a single example of the coprophilous fungal spore *Sporormiella* was seen in the sample at 0.85-6m depth, (3154); *Sporormiella* is associated with dung and is, therefore, considered an indicator of livestock grazing/pasture, which is consistent with the strong presence of pastoral taxa in the pollen assemblage.

Trees and shrubs are dominated by typical mixed deciduous woodland taxa, namely *Quercus* (oak), *Corylus avellana* type (most likely hazel) and *Betula* (birch), with the wet woodland trees/shrubs *Alnus glutinosa* (alder) and *Salix* (willow) less common, and only rare occurrences of *Fraxinus excelsior* (ash), *Carpinus betulus* (hornbeam) and *Pinus sylvestris* (Scots pine). Ferns are relatively common, with the dominant types being Pteropsida (monolet) indet (indeterminate) – a very broad category of ferns, *Pteridium aquilinum* (bracken) and *Polypodium* (polypody). The latter grows as an epiphyte on oak trees, which is interesting as waterlogged plant macrofossil evidence for oak and birch suggested these might be growing in local stands (Smith in Hewitson *et al* 2010). Small percentages of Cyperaceae (sedge) and *Filipendula* (meadowsweet) indicate damp/wet conditions, though this could be very local to the moat and is not surprising. A single grain of *Vaccinium* type (bilberry/cranberry type) is present in the oldest sample, the only example of a heathland plant seen in any of the Wolverhampton CLQ assemblages. Small percentages of *Alisma* type (water plantains), *Nymphaea alba* (waterlily) and *Myriophyllum verticillatum* (whorled water-milfoil) indicate the presence of still or slow-moving water (Stace 2019; *Atlas of the British and Irish flora*), such as might be expected in a moat, which tallies with waterlogged plant remains from previous work on the moat deposits (Smith in Hewitson *et al* 2010 and see discussion).

As there are only three samples from the moat and these are so similar to each other, there is limited evidence for changing vegetation or land use. There is, however, a slight reduction in *Quercus* over time together with an increase in *Urtica dioica* (stinging nettle). Interestingly, some rare types are only

present in the uppermost sample ((3154) 0.85-6m); this includes some taxa already mentioned (Cannabaceae, cf. *Solanum nigrum* and the fungal spore *Sporormiella*) together with *Solanum dulcamara* (bittersweet), *Mercurialis perennis* (dog's mercury), *Potentilla* type (cinquefoils), cf *Rhinanthus* type (rattles) and *Nymphaea alba* (waterlily). There are also slightly higher percentages of Cyperaceae, *Alisma* type and *Sphagnum* moss in this sample, possibly suggesting wetter conditions around the moat at this time. However, it should be noted that the differences between the three moat samples are small and the overall indication is that there is little change. It is also possible that some differences relate to preservation conditions; the total concentration of pollen increases moving up the profile, being substantially higher in the uppermost sample. Interestingly, the percentage of identifiable pollen and spores that are broken or degraded is higher in this sample than in the older ones from the moat, together with the percentage of Lactuceae (lettuce/dandelion family); an increase in this taxon can be an indicator of poor preservation, as its pollen is both distinctive and robust, making it more likely to survive in a recognisable state than more fragile types when preservation is poor. However, the high concentration of pollen, together with the wide range of taxa present, suggests good preservation overall. One possibility is that some of the degraded and broken pollen in this sample is redeposited, for example eroded out of older sediments and washed into the moat, though, if this is the case, the overall effect on the composition of the assemblage appears to be minor, as it is broadly similar to the other moat samples.

#### *Sample from the ditch (2182)*

The ditch sample is at latest medieval/post-medieval in date, taken from a context overlying (2179) which is radiocarbon-dated to cal AD 1500-1650. Although the rate of accumulation of the sediment in the moat is uncertain, it seems very likely that the ditch sample post-dates the latest moat sample. In many ways the assemblage is similar to those from the moat; herbaceous taxa, particularly Poaceae, are dominant and a wide range of taxa related to agriculture and disturbance are present, including *Secale cereale*, Cannabaceae, and probable arable and pastoral weeds. *Hordeum* type is absent and *Secale cereale* is less common than in some of the moat samples, which might suggest a reduction in cultivation, though more data (i.e. from additional samples of a similar date) would be required to explore this further. The range of arboreal taxa is also very similar to that in the moat, though *Quercus* is noticeably less common; this supports the conclusion that one or more stands of oak were growing near to the moat. One notable difference is in the aquatic taxa; the three aquatics seen in the moat are absent from the ditch sample, while *Potamogeton natans*-type (pondweed) is present. Like the aquatics present in the moat, pondweeds may be found in still or slow-moving water, but this difference in flora might suggest shallower water in the ditch or a difference in nutrient content/contamination. However, it should be noted that although *P natans* type was not seen in the moat samples examined here, it was found in waterlogged deposits from elsewhere in the moat (Smith in Hewitson *et al* 2010).

There are no NPP other than unidentified ascospores in the ditch sample. Interestingly, the ditch has a higher concentration of pollen than any of the moat samples, but also a markedly higher percentage of damaged pollen and spores overall, both identified and unidentifiable (Fig 21). Lactuceae, *Cichorium intybus* type (chicory/dandelion type – a type of Lactuceae) and Asteraceae indet (daisy family) are all more common in the ditch than in the moat samples; these are all robust pollen types that are likely to survive in greater percentages than fragile grains where preservation is poor. As in the uppermost moat sample, the presence of redeposited pollen eroded from the surrounding landscape is a possibility in the ditch, and is perhaps more likely considering the larger quantities of damaged grains.

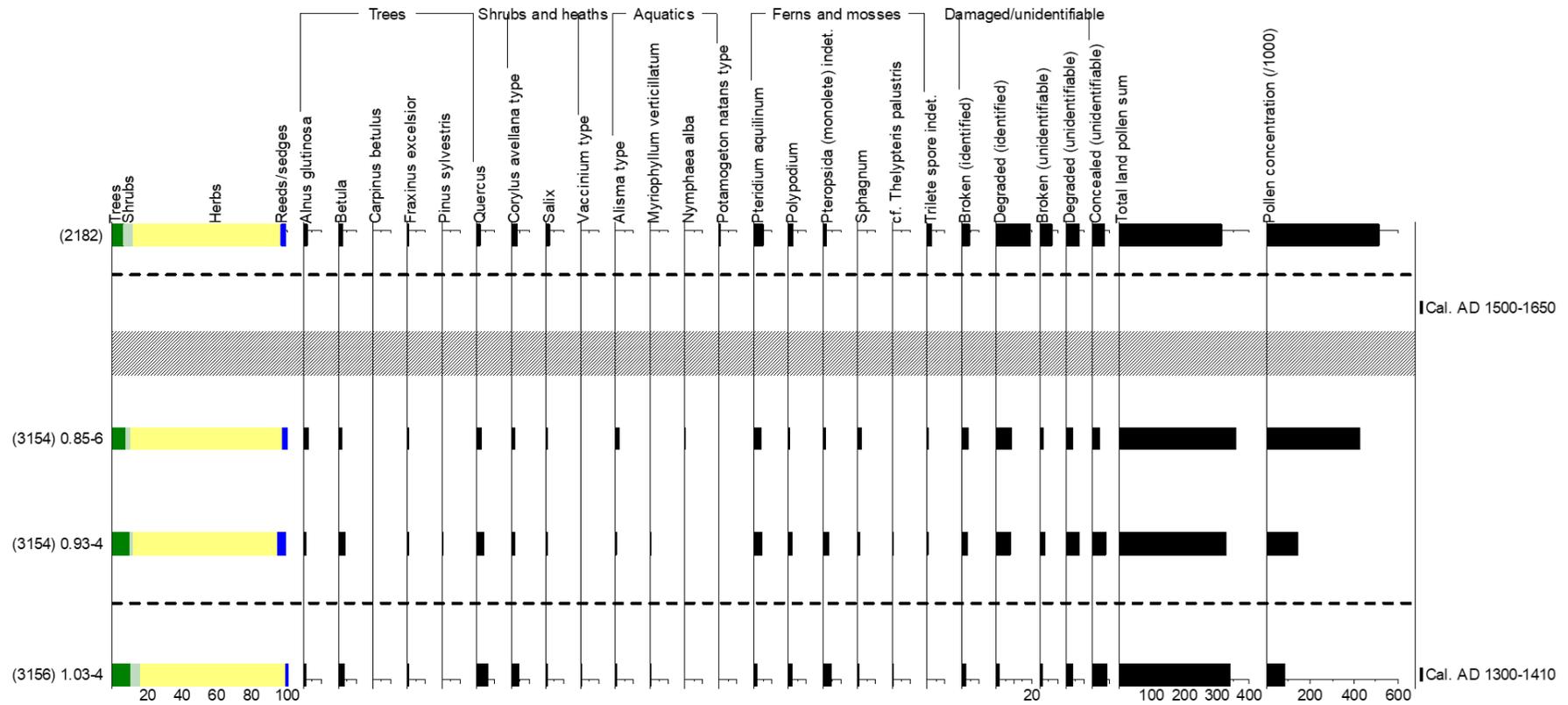


Fig 21: Pollen percentage diagram showing all non-herbaceous taxa, spores, pollen sums and pollen concentrations. Taxa that are never present as more than 1% of the assemblage are represented by presence markers. Contexts and sample depths (where appropriate) are indicated on the y axis. The dashed line indicates a change of context while the hashed area separates samples from the moat and ditch. Radiocarbon dates on the right relate to (a) (3156) in the moat, and (b) (2179) in the ditch, which was deeper (and therefore presumably older) than the analysed sample from (2182).

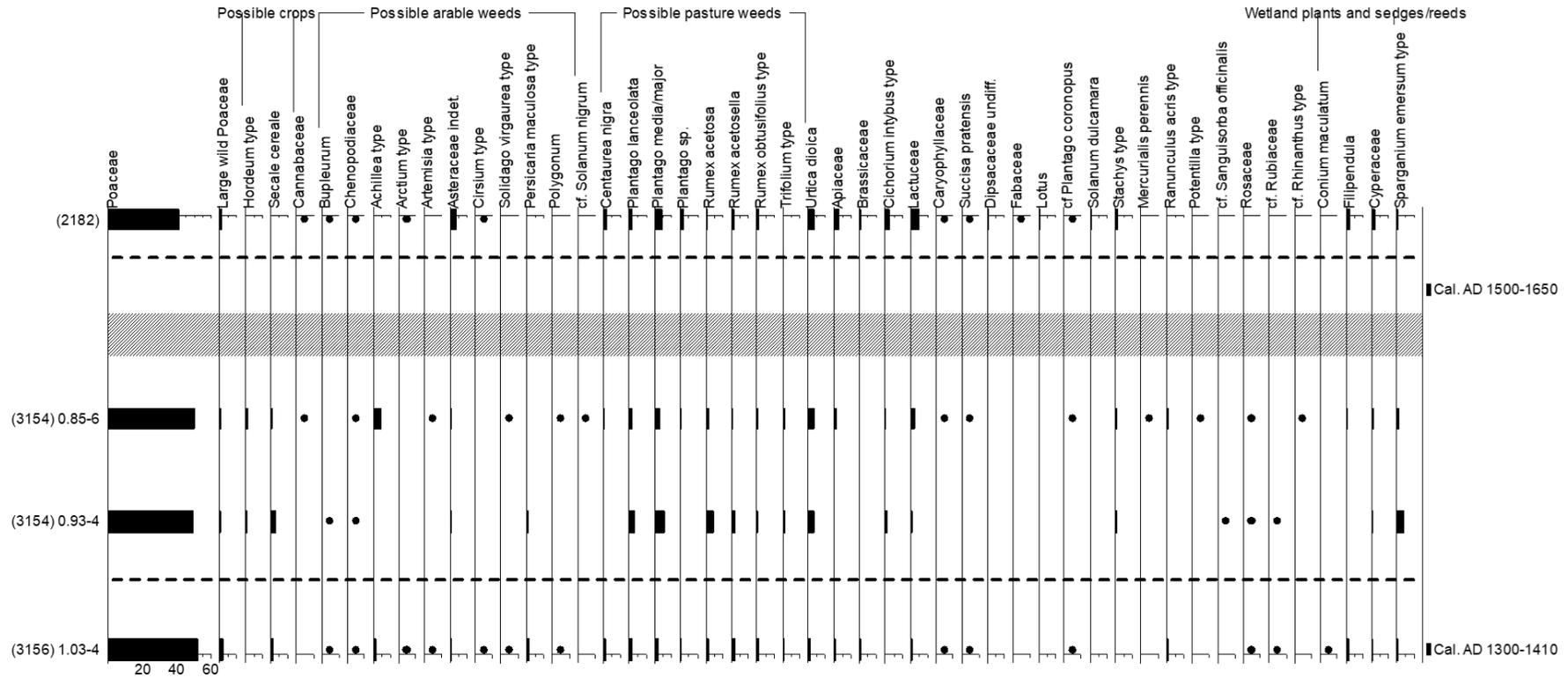


Fig 22: Pollen percentage diagram showing all herbaceous taxa. Taxa that are never present as more than 1% of the assemblage are represented by presence markers. Contexts and sample depths (where appropriate) are indicated on the y axis. The dashed line indicates a change of context while the hashed area separates samples from the moat and ditch. Radiocarbon dates on the right relate to (a) (3156) in the moat and (b) (2179) in the ditch, which was deeper (and therefore presumably older) than the analysed sample from (2182).

## 7.2.4 Discussion and conclusions

It is important to note that owing to the nature of the sampling sites, the pollen data are likely to represent relatively small catchment areas around the moat and ditch respectively, and may cover a short period of time depending on rates of accumulation. This limits the scope for gaining understanding the wider environment or change through time. However, there are some interesting patterns in the data, and, considering that few pollen studies focus on the later medieval and post-medieval periods, these results may provide some useful insights.

The pollen assemblages from the moat and ditch at Wolverhampton CLQ are strongly indicative of a broadly open landscape, with evidence for both arable and pastoral activity within the catchment. This is consistent with archaeological remains of plough soils, and the ridge and furrow identified in previous investigations of the area (Hewitson *et al* 2010), and is not unusual for the time period. Rye and hemp/hops are present in the moat and ditch, together with a wide variety of probable arable and pastoral weeds, in addition to possible barley in the moat. As *Hordeum* type includes wild and cultivated barley together with some other large wild grasses (Andersen 1979; Tweddle *et al* 2005), it is not possible to confirm this without supporting archaeobotanical evidence. The taxa seen in the ditch and moat samples are very similar to those recorded by Greig (in Hewitson *et al* 2010) at Old Hall Street, which had abundant cereal types and other herbs associated with agriculture. Hemp/hops were also found to be rare at Old Hall Street, as in the samples discussed here; as Greig states the rarity of Cannabaceae is perhaps more suggestive of hops growing in hedges rather than cultivation of hemp. Hemp-retting is very unlikely to have taken place on or near either of the Wolverhampton CLQ sites, as this usually produces very large quantities of *Cannabis sativa* pollen (e.g. Cox *et al* 2001). As mentioned previously, the presence, though rare, of the coprophilous fungus *Sporormiella* in the moat suggests livestock grazing, which agrees with the pollen evidence for pasture.

Interestingly, in contrast to Greig's (in Hewitson *et al* 2010) previous analysis, cereal pollen percentages are not unusually high in the Wolverhampton CLQ samples. The dominance of rye together with both pollen and plant macrofossil evidence for arable weeds is more suggestive of crops growing in the surrounding area than of large quantities of crop processing waste/hay being dumped in the moat or ditch. Cereals are generally poorly represented in pollen samples owing to their large size and low pollen productivity (as many are self-pollinating), but rye is wind-pollinated and, therefore, more likely to be seen in the palaeoenvironmental record. In addition, the macrofossil assessment contained little evidence for cereals in this part of the moat; if material was being dumped in a waterlogged context we might expect to find reasonable quantities of chaff and perhaps grain surviving, depending on the preservation conditions.

The assessment of plant macrofossils from the moat shows strong correlation with the agricultural weed assemblage in the pollen samples (e.g. *Anthemis cotula*, stinking mayweed, is represented by *Achillea* type pollen, while *Persicaria maculosa* and *Polygonum* spp. were also found in both pollen and plant macrofossil analyses) (Pearson 2022, and this report). There is no evidence for fruit trees in the pollen record, although fruit stones were found in the archaeobotanical remains; however, as fruit trees are usually insect-pollinated their pollen production is likely to be lower than that for trees that disperse their pollen by wind, meaning they are not so well represented in the pollen record.

Trees and shrubs make up less than 20% of the pollen assemblage at any time, yet the presence of reasonably high percentages of oak together with polypody, a fern that is epiphytic on oak trees, and a single find of dog's mercury (*Mercurialis perennis*), usually a woodland plant, supports earlier assertions (based on the waterlogged plant remains) that there may have been stands of oak (and other) trees growing near the moat (see Smith in Hewitson *et al* 2010).

Although it is important to note that the available pollen data are limited (as there are few data points) and probably represent a small catchment area, they suggest a very open landscape with substantial agricultural activity in the later medieval and post-medieval periods. Cultivation of rye and perhaps barley seems likely to have occurred together with livestock grazing. These results are consistent with

archaeological evidence for ridge and furrow plough soils in the area, and are not unusual for the later medieval/post-medieval period.

### 7.3 Waterlogged wood

A small sample of a plank bored with holes in four rows (3153) was examined and determined to be oak (*Quercus robur/petraea*).

### 7.4 Radiocarbon dating

Two radiocarbon determinations have been achieved from a lower fill of ditch 2176 and a basal fill of moat 3118. Samples were dated at SUERC, Glasgow by AMS.

The results are conventional radiocarbon ages (Stuiver and Polach 1977) and are listed in Table 22. The calibrated date ranges for the samples have been calculated using the maximum intercept method (Stuiver and Reimer 1986), and are quoted with end points rounded outwards to ten years. The probability distributions of the calibrated dates, calculated using the probability method (Stuiver and Reimer 1993) are shown in Appendix 2. They have been calculated using OxCal v4.2 (Bronk Ramsey 2009) and the current internationally-agreed atmospheric calibration dataset for the northern hemisphere, IntCal13 (Reimer *et al* 2013).

The material submitted from both samples consisted of a small quantity of seeds, so reliability will be limited. However, samples were submitted to rule out a date significantly different to artefactual dating, though, in the case of the basal fills of the original moat, there was hardly any associated dating.

Laboratory code	Context number	Material	$\delta^{13}\text{C}$ (‰)	Conventional Age	OxCal calibrated age (95.4% probability or 2 sigma)
SUERC-106679	2179	Plant – <i>Rubus</i> sect <i>Glandulosus</i>	-28.2	309 ± 18	1500–1650 cal AD
SUERC-106955	3156	Plant – <i>Prunus</i> sp, <i>Rubus</i> sect - <i>Glandulosus</i>	-27.0	590 ± 24	1300–1410 cal AD

Table 22: Radiocarbon dating results

### 7.5 Overall discussion of plant and pollen evidence (by Elizabeth Pearson)

Analysis has shown that plant and pollen remains were well preserved by waterlogging. The majority of remains reflect conditions within the moat or bankside habitat, with some infiltration of seeds and pollen from arable weeds, either from fields nearby, or as a result of straw and hay being dumped in the moat. There were limited indications of obvious change in local habitat or cultural waste from the base to upper layers of the moat, apart from the appearance of aquatic plants above basal layers. Potentially, therefore, this represents a relatively stable environment.

There are also some edible cultivars which include possible plum from medieval deposits, and grape and summer savory from the Elizabethan ditch, which may derive from kitchen, cess waste, orchards and kitchen gardens. Wild strawberry and sloe from the medieval basal deposits of the moat, and raspberry from the Elizabethan ditch are possible edible cultivars. Hop/hemp pollen from the medieval phase could derive from wild hop growing in the vicinity, but it perhaps, more likely to have drifted into the site from hop or hemp cultivation. Hemp retting on the site has been ruled out, as this is likely to have left a stronger pollen signal than was recorded.

The presence of hemlock, self-heal and black nightshade at the base of the medieval moat could suggest a medicinal garden as though these grow wild, they are also well-known medicinal plants. Both hemlock and black nightshade can be toxic, but as with many medicinal herbs, used in appropriate amounts, they have healing properties.

Areas of sandy acidic soil that are of low fertility take up significant part of the area surrounding Wolverhampton, hence it is unsurprising that rye pollen was present. Rye competes well with wheat where soils are sandy and nutrient poor, and would have been an important part of the diet.

### 7.5.1 Comparison with other local sites

Waterlogged plant remains from the moat have also been reported on as part of excavations at Old Hall Street, indicating similar environments and also a small component of cultural waste (Smith 2010). Plant macrofossil remains at Old Hall Street were, however, more diverse than the remains from this site. Nevertheless, there were similarities in finds of edible cultivars which included plum/greengage/bullace/damson (*Prunus domestica*), wild/dwarf cherry (*Prunus avium*) and fig (*Ficus carica*). Pollen remains show the presence of possible hops, hay, straw and dung (Greig 2010), whilst insect remains (Smith and Tetlow 2010) suggested less wooded or shrubby vegetation and a more open grassy environment with open water in the moat and dung component in the fill.

## 7.6 Animal bone (by Alison Foster)

### 7.6.1 Methods

Subjective records were made of the state of preservation, and the bones were examined for evidence of dog gnawing, burning, butchery and fresh breaks, which was noted where applicable. Where pieces of the same bone could be refitted, the pieces were recorded as a single element.

Where possible, fragments were identified to species or species group using modern comparative reference material and published works (e.g. Schmid 1972). Remains that could not be identified to species were grouped into categories: large mammal (assumed to be cattle, horse or large deer (cervid)), medium-sized mammal 1 (assumed to be sheep/goat (caprine), pig or small deer), medium-sized mammal 2 (from a cat or hare-sized mammal) and completely unidentifiable. Ageing of mandibles and loose teeth was carried out using the tooth wear stages and age categories devised by Grant (1982) and O'Connor (2003) respectively. Closer identification of equid remains was made where possible following criteria described in Johnstone (2004) and Hanot and Bochaton (2018), while distinction of caprine bones has been made following Boessneck (1969) and Zeder and Lapham (2010). Withers heights for horses were calculated following von den Driesch and Boessneck (1974) and for dogs using Harcourt (1974).

### 7.6.2 Results

A total of 273 fragments representing 231 bones were recovered from 22 contexts. Cattle, caprine (some more closely identified as sheep) and pig bones were identified, together with a significant amount of dog, cat and horse/equid bones. Butchery evidence was mainly seen on the cattle bones and included sawing, a technique typical of late post-medieval assemblages, together with chop marks and cuts indicative of jointing and carving/filleting. Just four of the bones showed evidence of dog gnawing, suggesting that the bulk of the material had been inaccessible to scavengers. Notable characteristics of the assemblage are reported below, by phase and context group.

#### Phase 2

Bone from Phase 2 was recovered from two areas: the fill (4026) of the original moat [4029] and the waterlogged clay base and fill of a large ditch [2176], possibly a boundary between two plots.

##### *Original moat CG2*

Very little material was found in the fill (4026) of the original moat. Remains were sparse, consisting mostly of cattle bones (primarily head and foot elements, some with butchery marks); fragments of

sheep/goat pelvis, mandible and radius; and a tibiotarsus from an almost-mature chicken about the size of a modern bantam.

#### *Ditch CG9*

Bone from the anaerobic clay at the bottom of the ditch (2179) was well-preserved with occasional vivianite deposits while the larger quantity from subsequent backfilling (2189) showed more variable preservation. The majority of the remains from the ditch fill were recorded as equid and represented at least four individuals but there was no evidence of partial skeletons or articulated limbs. Teeth from two mandibles, more closely identified as horse, showed extreme wear and were clearly from very old animals. The age of the animals suggests the backfilling material was sourced from a horse disposal site, although no evidence for butchery or skinning could be seen on other elements. Several of the horse bones provided limited metrical data (Table 24) but were too fragmented or abraded to be useful for withers height estimates. The remainder of the bones were of cattle and included several loose teeth with recordable wear which probably derive from the same sub-adult mandible, and a piece of maxilla with teeth from a juvenile. Further unidentified large mammal fragments show fresh breakage, and are almost certainly parts of the equid and cattle bones recorded.

#### **Phase 4**

Features from the industrial phase produced very little animal bone. To summarise, a fragment of medium-sized mammal (probably pig) pelvis was found in the clay fill of Pit 2168 (CG10); a chicken tibiotarsus shaft from construction cut 2085 (CG11); a small piece of medium-sized mammal rib from coal deposit 2048 (CG14); and a caprine metatarsal with dog gnawing from the fill of Flue 2006 (CG15).

#### **Phase 5**

Context Groups 4 and 6 represent the backfills of the moat extension. A total of 115 bones were recovered, most of them from the fills of [4008] (CG6). The assemblage from this phase was characterised by an unusually high proportion of dog and cat bones.

#### *Moat 2 fill CG4*

The eighteen bones from the fills of [3072] were, on the whole, well-preserved with several complete, measurable elements. Species identified comprised cattle, sheep/goat, pig, equid, dog and cat. The four cattle bones all showed either butchery marks or, in the case of a sawn horn core tip from (3075), possible evidence for craftworking. A pig femur from (3074) displayed numerous shallow cut marks suggesting slices had been cut from a cooked joint. The sheep/goat remains included a mandible from a sub-adult individual. The equid bones comprised a measurable tibia from a large horse which gave an estimated withers height of almost 16hh (162cm) and a heavily butchered metatarsal from a pony-sized animal of approximately 13.1hh (134cm at the withers). The second metatarsal had fused to the third (main) metatarsal, a result of ossification of the interosseous ligaments which can occur through excessive concussive work or injury, but has been seen in feral populations and so would also seem to be associated with ageing (Bendrey 2007). Four heavy chops had been made to the posterior aspect of the proximal shaft and mid shaft of the metatarsal, and a further small cut to the anterior proximal shaft. The cut may have been inflicted during skinning, while the chops may have severed the suspensory ligaments and/or flexor tendons. Six dog bones were recovered, some of which were particularly well-preserved, including a complete femur from a fairly small dog approximately 39cm at the withers. All the dog bones were from skeletally mature animals, except for a radius with an unfused proximal end from a dog younger than 11-12 months (Silver 1969). A tibia from an adult cat (over 50 weeks old) was also present (Smith 1969).

#### *Moat 2 fill CG6*

This group represented more backfill in the moat extension. Preservation was generally good but more variable in (4008). The majority of the identified bones were from puppies and juvenile dogs (some very young), with rather fewer fused elements from adults. At least four dogs were represented, with variation in size and morphology indicating several different breeds or types present. Some of the skeletally mature elements were suitable for measuring: a femur and humerus

(both from 4012) gave withers heights of 36.3cm and 34.5cm respectively. Bones from other breeds comprised an immature ulna from a large, mastiff type, and a small, rounded cranium typical of a lapdog. A second, partial, skull showed the green staining which can occur as a result of contact with copper alloy, and suggests this dog may originally have been buried with a collar with metal fittings, a practice which has been noted in other pet dog burials of the period (Foster *et al* 2013). A smaller number of cat bones represented a minimum of three cats and a kitten. Fragments from larger taxa included seventeen cattle bones: almost all of these were from juvenile animals, among them elements from at least two very young calves. Butchery on the cattle bones included ribs chopped into short lengths for stock/soup and a fragment of sawn pelvis. The sheep/goat remains were mostly lower leg bones (with one almost complete metatarsal from (4012) sawn through just below the proximal end) suggesting removal and discard during primary butchery – a few ‘meatier’ bones including scapulae and tibiae indicated a component of kitchen waste. The pig bones were also mainly foot bones plus the mandible of a sub-adult from (4010) and a loose canine tooth of an adult male from (4012). Finally, a rabbit tibia and a duck radius were recovered from (4008) and (4012) respectively. No cuts or other butchery evidence were noted on these, but they are almost certainly kitchen waste rather than the remains of pets.

### Phase 6

Very little bone was found in contexts described as ‘modern’, none of it identifiable to species. The fill of pit [2017] contained a single scapula fragment from a medium-sized mammal, probably sheep/goat, while pit [2014] produced piece of vertebra from a large mammal and another unidentifiable fragment.

Species		Phase 2		Phase 4				Phase 5		Phase 6	Total
		CG2	CG9	CG10	CG11	CG14	CG15	CG4	CG6	-	
<i>Oryctolagus cuniculus</i> L.	rabbit	-	-	-	-	-	-	-	1	-	1
<i>Canis</i> f. domestic	dog	-	-	-	-	-	-	6	31	-	37
<i>Felis</i> f. domestic	cat	-	-	-	-	-	-	1	11	-	12
<i>Equus caballus</i>	horse	-	2	-	-	-	-	-	-	-	2
Equid	horse/donkey/ mule	-	16	-	-	-	-	2	-	-	18
cf. Equid	?horse/donkey/ mule	-	2	-	-	-	-	-	-	-	2
<i>Sus</i> f. domestic	pig	-	-	-	-	-	-	1	6	-	7
cf. <i>Sus</i> f. domestic	?pig	-	-	1	-	-	-	-	-	-	1
<i>Bos</i> f. domestic	cattle	6	7	-	-	-	-	4	17	-	34
<i>Ovis</i> f. domestic	sheep	-	-	-	-	-	-	-	2	-	2
Caprine	sheep/goat	3	=	-	-	-	1	2	7	-	13
Large mammal		3	66	-	-	-	-	2	3	1	75
Medium-sized mammal 1		1	-	-	-	1	-	-	11	1	14
<i>Anas</i> sp.	duck	-	-	-	-	-	-	-	1	-	1
<i>Gallus</i> f. domestic	chicken	1	-	-	1	-	-	-	-	-	2
Goose-sized bird		-	-	-	-	-	-	1	-	-	1

Species		Phase 2		Phase 4				Phase 5		Phase 6	Total
		CG2	CG9	CG10	CG11	CG14	CG15	CG4	CG6	-	
Unidentified		2	-	-	-	-	-	-	6	1	9
Total		16	208	1	1	1	1	18	97	3	231

Table 23: Hand-collected vertebrate remains (NISP – number of identified specimens) by phase.

Element	Species	Phase	Context	Bone ID									
<i>Scapula</i>					BG	LG	SLC	GLP	HS				
	Caprine	5	4010	117	26.6	28.8	25.1	38.8					
	Caprine	5	4012	139	25.0	29.5	23.4	37.4					
	Dog	5	3073	38			24.8		142.8				
<i>Humerus</i>					Bd	Dp	GL	SD	BT				
	Cattle	5	3073	37				34.3	69.5				
	Dog	5	4012	137	22.4	28.1	108.3	7.8					
<i>Radius</i>					Bd	GL	SD						
	Dog	5	4008	80	25.2		14.3						
	Duck	5	4012	138		88.5							
<i>Metacarpal</i>					Bd								
	Cattle	2	4026	145	52.4			53.3	59.2				

Element	Species	Phase	Context	Bone ID										
<i>Femur</i>					Bd	Bp	DC	GL	SD					
	Dog	5	3074	40	21.9	25.5	13.3	129	8.6					
	Dog	5	4012	136	22.8	25.6	12.5	119	9.8					
	Cat	5	4012	135	16.2	17.1	8.4	94.5	7.1					
<i>Tibia</i>					Bd	Dd	SD	LI						
	Equid	2	2179	8	61.2	38.4	33.3							
	Equid	2	2189	14		45.4	42.2							
	Equid	2	2189	17			38.4							
	Equid	2	2189	19			39.1							
	Equid	5	3074	39				371						
<i>Metatarsal</i>					Bd	Bp	GL	SD						
	Equid	2	2189	24				27.6						
	Equid	5	3128	53	46.2	46.5	255	29.9						
	Sheep	5	4042	141	25.9	21.4	125.9	12.4						

Table 24: Hand-collected vertebrate remains. Metrical data (following von den Driesch 1976) for domestic mammals, by element. All measurements are in mm.

### 7.6.3 Discussion

This animal bone assemblage is small in quantity, but its preservation is generally good and a large proportion of the material was identified to species. Species identified included the main domesticates – cattle, sheep/goat and pigs – but, as Table 23 indicates, the assemblage is notable for the relatively large amount of horse bones deposited in the Phase 2 ditch [2176] and the dog and cat remains incorporated into the backfills of the moat [3072] and [4042] during Phase 5. The dog bones represent the disarticulated remains of at least four individuals and include some measurable, skeletally mature elements as well as several from puppies and juveniles, the younger animals identified by the porous and unfused condition of most of the post-cranial elements and the presence of deciduous teeth in the mandibles. Of particular interest is a small, incomplete skull recovered from (4013) and an unfused ulna from (4008): the cranium shows the rounded profile characteristic of a lapdog similar to an ‘old type’ toy spaniel (pers comm, Katrina van Grouw) while the ulna suggests a juvenile dog of a robust, mastiff-type breed (pers comm, Denis Marcellin-Little). These deposits also contained the remains of at least three cats and a kitten. The disarticulation and mixing of the skeletons indicates that a significant amount of the material used for the deliberate backfilling of the moat was imported from areas used as burial grounds for dogs and cats, but it is not possible to say whether these bones are the remains of household pets or strays/unwanted puppies culled or otherwise discarded in a more casual manner. However, copper alloy staining was noted on a few of the bones from these deposits and may indicate the presence of buckles, studs and other possible evidence for dog collars, supporting an interpretation of more careful interment for at least some of the animals. The fills of the large Phase 2 ditch [2176] produced a small but significant assemblage of equid bones representing at least four individuals. Extremely worn teeth indicated two of these would have been very old animals: an additional just-erupted permanent third mandibular molar was from one younger than five years. As the bones are disarticulated and scattered, it is likely that these equid remains would also have been sourced from a nearby disposal site and incorporated into material imported to fill and level the ditches, rather than dumped directly into the feature as complete or partially dismembered carcasses.

The small amount of cattle, sheep and pig bones offers little scope for analysis. The dog remains, however, are well-preserved with many complete elements and are clear evidence for the breeding and keeping of various types in the locality.

### 7.6.4 Recommendations

The vertebrate remains should be retained as part of the physical archive of the site.

## 8 Overall site discussion

This excavation has continued archaeological investigations that began in 2000 with the evaluations in advance of the Metro One building (Hewitson *et al* 2010). This earlier work by Birmingham Archaeology revealed parts of the 16th century brick building known variously as the Great Hall, Turton’s Hall or Old Hall, as well as including excavation through various arms of the encircling moat. It demonstrated that the area had been under ridge and furrow from roughly the 13th to 15th centuries, and that the platform constructed of upcast moat material dated from the 15th to 16th century. The hall building erected on top of that platform saw various additions and alterations throughout its somewhat chequered life, until its demise in the late 19th century. The question of whether a previous building had existed on the site, as seemingly referenced in the historical record, could not be definitively answered from these results. Though what could be determined to a reasonable degree, was that, if such a building had existed on the site, it would probably have been 14th-15th century in date (see below), most likely of timber construction, and so would have left little trace. Two hand-dug slots and two machined slots through the moat circuit were also achieved in the north-east corner of the site, while, to the south, a minimally destructive excavation over parts of the 19th century enamelling works was conducted, revealing parts of furnaces.

## 8.1 Evidence for a medieval hall

There is only sparse evidence for a medieval hall on the site, with the main source being a reference in John Leland's mid-16th century itinerary, describing the 'ancient house' of the Luson (Leveson) family. As pointed out in Hewitson *et al* (2010), whilst this would correlate with the location of the Great Hall of the Leveson family on the edge of Wolverhampton, it could not refer to the Hall as excavated by Birmingham Archaeology, as it was very unlikely to have been built by that point and even if it was could not be described as 'ancient' (viz 'Thomas Luson of Uluorhampton at the townes end is the auntients house of the Lusons'; Smith 1908). No archaeological structural remains of medieval date have been identified to date, with the exception of a possible medieval plough soil found under the upcast moat material (see above). The pottery from this layer was heavily abraded, dating to the 13th-15th century (Hewitson *et al* 2010). This upcast moat material formed the platform within the newly created island, through which the later hall was cut. The upcast material contained pottery of 15th-16th century date. However, only a small sample of the platform was excavated, though these limited results do suggest that the surviving earliest moat is contemporary with the documented late-16th century construction of the main house.

To complicate matters, it is not entirely clear whether the earlier work on the moat, correctly identified the phases of moat they encountered, given that we can now be certain that at least two phases are present. It is tempting to interpret the apparent discrepancy in moat depths recorded for the north and south sides by Hewitson *et al* (2010) – c. 3m and c. 1.25m respectively – as evidence that both the original moat and moat 'extension' were encountered at the former, and only the (later) moat 'extension' at the latter location. If this were the case, it would require the south arm of the original moat to have been closer to the hall building – now effectively largely under Old Hall Street, and an area which has not been investigated. Also, unfortunately, levels are not available for the earlier work, which would have enabled much closer integration of the various moat profiles as part of this discussion.

The more recent excavation work has now found a small amount of ceramic building material that was recovered from the lining in the backfilled original stretch of moat, but this cannot be taken to be conclusive evidence for its construction date. However, once coupled with the radiocarbon date from the earliest silting deposit for the earliest moat (CG2), this does begin to suggest a 14th-century (or even earlier) origin might be possible. However, this would be contrary to the evidence of the stratigraphic relationships around the moat platform as recorded by Birmingham Archaeology, and it should be appreciated that the radiocarbon date came from a single charred grain which could also have been residual.

Most moated sites were constructed in the 12th to early-14th centuries, during which time some 3500 moats were dug (Wilson 1985). After this period, their numbers decline and, by the 16th century, they were going out of fashion. If the Leveson's moat is contemporary with their Tudor hall, then it is a rare, but not unheard of, construction for the time.

The reused masonry in the extended curtain wall (CG3) and the western annex of the Hall (F552 in Hewitson *et al* 2010), which are probably contemporary phases of construction, both have pieces of 14th-15th century tracery within them. This demonstrates that a medieval building had been robbed for building stone, though it seems unlikely that this stone could have come from an earlier hall on the site. This extended wall was built sometime after 1650, probably c. 1710, and it is doubtful that such masonry was lying around in the grounds of the new building for 100 years, especially considering that no evidence of medieval fabric was discovered during excavations of the Hall itself.

## 8.2 The Tudor hall

The construction of the Old Hall, as it is known today, dates from c. 1570, though a number of options for its exact construction date have been suggested by various writers (see Section 2.2 above), from the 1550s to the early-17th century. It is known that it was garrisoned in the early days of the Civil War but rapidly abandoned as indefensible. It was taken by the Parliamentarian forces, and it was

suggested that the bridge over the moat was broken. Certainly, the moat was silting up by this point, with 17th century pottery associated with its final natural infilling. The property was confiscated from its Royalist owner, before coming back to the family in the Restoration of 1660. It is uncertain whether this house had been occupied during the Interregnum.

### 8.3 The moat sequence

By the end of the 17th century the property was leased to the Turton Family, and it is likely that the Turtons, as part of their renovations of the dilapidated Hall, decided to extend the island and, therefore, pushed the eastern side of the moat out by 15m. To do this, they cut through the silting layers in the moat at its north-east corner and built a new stretch of curtain wall, backfilling behind it with the upcast material from the new stretch of moat. At each corner of this new extension a turret was built as part of the curtain walling. Historic drawings show these turrets, but they appear to be rather earlier in date, being of medieval or 16th century style (Hewitson *et al* 2010, 93). This anachronistic architecture could suggest that they had actually been part of the original moat circuit and then rebuilt when the moat was extended. Unfortunately, the excavation could not quite get to the western side of the original moat cut to discover what remains of the curtain wall survived.

The Turtons, in their renovations of the Hall, are thought to have removed the upper storey and replaced the windows with sashes, all very much in the modern style. It seems somewhat contradictory to build medieval-style turrets (or rebuild earlier ones) on a much later curtain wall, whilst bringing a 16th century house into a modern early-18th century vernacular. This removal of the upper storey no doubt provided a lot of bricks and it looks like these were re-used to construct the upper courses of the new curtain wall, which would then explain why 16th-century bricks formed an 18th century wall.

The new moat-like feature was shallower than the original digging, being only 1.1m deep compared to the c. 3m depth seen for the original moat (CG2; Fig 5) – and, also, during previous excavation, the moat had been recorded as up to 3m at its deepest. Certainly, the new section of moat could only have been an ornamental rather than defensive feature, though this may have also been the case when it was built in the 16th century. As concluded from the previous excavations, the moat seemed to have been well maintained and regularly cleaned out, and when backfilling came, this was rapid, as demonstrated by the pottery dates throughout the sequence of the fills.

A further question emerging from the new knowledge of the moat extension is whether the circuit was also extended to the south. The moat platform, as known from 1750 is c. 60m wide, as opposed to the original c. 36m from east to west. If the same latter dimension were still to be applied north to south, it would skirt very close to the southern edge of the house itself (see Fig 10).

The northern and southern arms of the *original* moat were taken to have been proven in the previous fieldwork (Hewitson *et al* 2010, 92), where they were described as displaying a similar profile in both slots, having ‘an asymmetrical profile that was shallower on the outer edge of the moat than the inner edge’, though with different depths being encountered. In contrast, the eastern extension, as recorded in the 2020-21 fieldwork, has a more symmetrical profile though is also noticeably shallow (Fig 7). On closer examination, this more shallow character seems to only be reflected in the south moat arm as excavated previously (Hewitson *et al* 2010). For further discussion of the possible implications of this for site interpretation, see above; though further fieldwork is clearly needed to finally determine the sequence in full.

During this period the alterations to the moat seem more in keeping with garden features, which would have sat well with the new house built in the 16th century. Since the earlier defensive function was no longer thought necessary, a shallower expanse of water could now be constructed. Such developments have been recorded elsewhere, such as at Gretton, Shropshire (Cardington parish; English Heritage Scheduled Monument 1020149; A Foster, pers comm).

It is known from cartographic evidence that the later moat (i.e. with extension) was backfilled piecemeal, with the north-eastern corner being the last to go. Evidence for the shoring up of the

western limit of the moat was identified, with a diagonal brick wall built out from the curtain wall on the western side of the excavation (Fig 8; Plate 13). Behind this wall were 18th century deposits. The 1842 tithe map shows the north-east corner of the moat delineated by property boundaries and it is almost certainly still open at this point, though not for long as St George's School has been built by 1852. The north-east corner of the moat may have been properly shored up to create a pond, allowing for a continued water source for the enamelling industry taking place within the old house at this point.

In the southern excavation area, the large east to west ditch (2176, CG9) is probably the boundary-cum-drainage ditch seen on Taylor's 1750 map, where it divides orchard plots. A radiocarbon date from a lower fill returned a date of cal AD 1506-1645 (Table 22), whilst a fill just above it contained grape, sloe, and plum seeds, which both fit well with this documentary evidence.

#### 8.4 Significance of finds from moat fills

The pottery assemblage has revealed the range of both utilitarian (kitchen) wares from the later 16th/17th century hall building, and of finer tablewares from its later occupation, the latter perhaps arising from clearance on a change of ownership. The former, in particular, provides a well stratified assemblage of Wednesbury ware, representing a local industry which exported its wares across the west Midlands at a time before Staffordshire came to dominate such production.

A number of other finds were also of unusual interest. A large, perforated timber board has so far proved impossible to assign a function to, though various possibilities have been proposed: a confessional screen, a sounding board for an organ, or a board for holding hazel rods during the manufacture of hurdles, none of which seem convincing. Perhaps the more general idea of a grille or ventilation panel is still to be favoured.

The recovery of various cat and dog bones from the moat backfill suggests a possible pet cemetery in the vicinity, with this then having been disturbed by site landscaping. Whether these were working animals to keep rodent populations down or pets of the domestic occupants of the Hall is of course impossible to say. One of the breeds identified was a toy spaniel, suggesting it had been kept as a pet, whilst the other identified bone was from a mastiff type, a breed more commonly used as a guard dog. Similarly, disarticulated remains of at least four horses were recovered from the large 17th-century ditch in Area 2. The disposal of dead animals quite locally must have been a widespread practice however, until industrial uses for bone emerged more generally in the 18th century, such as the use of calcined bone in pottery production.

#### 8.5 Furnace works

The enamelling industry followed the rapid backfilling of the moat and the structures revealed were broadly post-1842 in date, and had been built by 1852, when they are shown on the *Health of Towns* map. This map conveniently also names the function of most of the buildings, so that the excavated structures in Area 2 can be recognised as the eastern half of the 'Scouring Room' and parts of the 'Furnace for Enamelling' room. These buildings probably lasted up until the demolition of the whole property in 1883, though it was clear from the archaeological evidence that they underwent several phases of remodelling within that 30-year period.

There were at least three phases of flue construction, being variations of the original, with the fire box changing location also. The coal room 2028 also saw reconfiguration; it was in probably two iterations the stoking point for the fire boxes. Later this seems to have been bricked up, at which point, maybe, it became a storage space for fuel. Little research seems to have been done into enamelling works, but a photograph, taken in the early-20th century of an enamelling furnace at T. Sheldon & Company, Wolverhampton, shows a worker lifting the furnace door by a series of pulleys, whilst another worker prepares to slide an item into the furnace (Alamy 2022). The lack of any furnace structure in the part of the building marked on the 1852 map as the 'Furnace Room', suggests that it functioned in a similar way as that illustrated in the photograph; that is, it was an open space in which people worked, without any machinery or structure other than a pulley system and with a door to the furnace in the end wall.

The 'Scouring Room' would have been where the metal objects were prepared in advance of the enamel being applied prior to firing. The surface of the metal object would have needed to be scoured of organic material and loose oxide prior to being enamelled and fired (Ganoskin 2022). It is noted in Hewitson *et al* (2010, 95) that whilst this enamelling works may have gone bankrupt, the industry in Wolverhampton continued, and so most of the machinery would probably have been sold off rather than being allowed to be buried in the demolition of the buildings.

## 8.6 The end of the moat

The last part of the moat, which had helped define the landscape for over 250 years, was finally backfilled by the middle of the 19th century, for the construction of St George's School in the north-east corner of the site. The enamelling works that had been the catalyst for the demise of the moat in the western and southern stretches in particular, met its own end as the business failed in the latter half of the century, and the former Great Hall, and all the ancillary buildings that had sprung up around it as the industry had flourished, were next demolished. The majority of the site has now been redeveloped, with adult educational facilities and a library.

## 9 Conclusions

The date of the original moat foundation still remains uncertain, in that, while the 2020-21 fieldwork results hinted at its possible medieval origin, this was far from conclusive, and a 16th century date contemporary with the construction of the Tudor Hall remains the most likely. A previously unknown redesign of the original moat circuit was recorded, suggesting that the eastern side of the moat had been backfilled and then extended around the turn of the 18th century. The excavation also showed how the extended moat section was not excavated as deeply as the original, being less than 1m deep compared with the 2m or more of the original. This was compatible with a contemporary fashion for using previously defensive moats as later landscape gardening features.

Nineteenth century enamelling works were subsequently established, and these included the remains of a furnace, showing at least three phases of flue construction, along with other adaptations to the design revealing the experimentation that was very much part of the industrial era. The buildings identified here aligned well with those recorded on the 1840 *Health of Towns* map, which usefully described the building functions in some detail.

This site encapsulates many typical aspects of wider change in English society beginning with an elite building going through fashionable changes, followed by the rise of industry and its conversion to this purpose, and then the later realisation that an educated work force was needed for growth, with the consequent increase in educational facilities. At the same time Wolverhampton was expanding into a major centre for the west Midlands with all the advantages that a good communication network and local skills could bring to its prominent standing in the Black Country.

The methods adopted allow a high degree of confidence that the aims of the project have been achieved. Conditions were suitable in all of the trenches to identify the presence or absence of archaeological features. It is considered that the nature, density and distribution of archaeological features provides an accurate characterisation of the development site as a whole.

## 10 Project personnel

The fieldwork was led by Peter Lovett, ACIfA, assisted by Jamie Wilkins, ACIfA, Roland Tillyer, PCIfA, Jesse Wheeler, ACIfA, Chris Crump, Abbie Horton, Jon Jackson, Tim Cornah, ACIfA, Sophie Hobday, and Jo Losh.

The fieldwork project was managed by Tom Vaughan, MCIfA. The post-excavation project was managed by Derek Hurst, with the report being collated by Peter Lovett.

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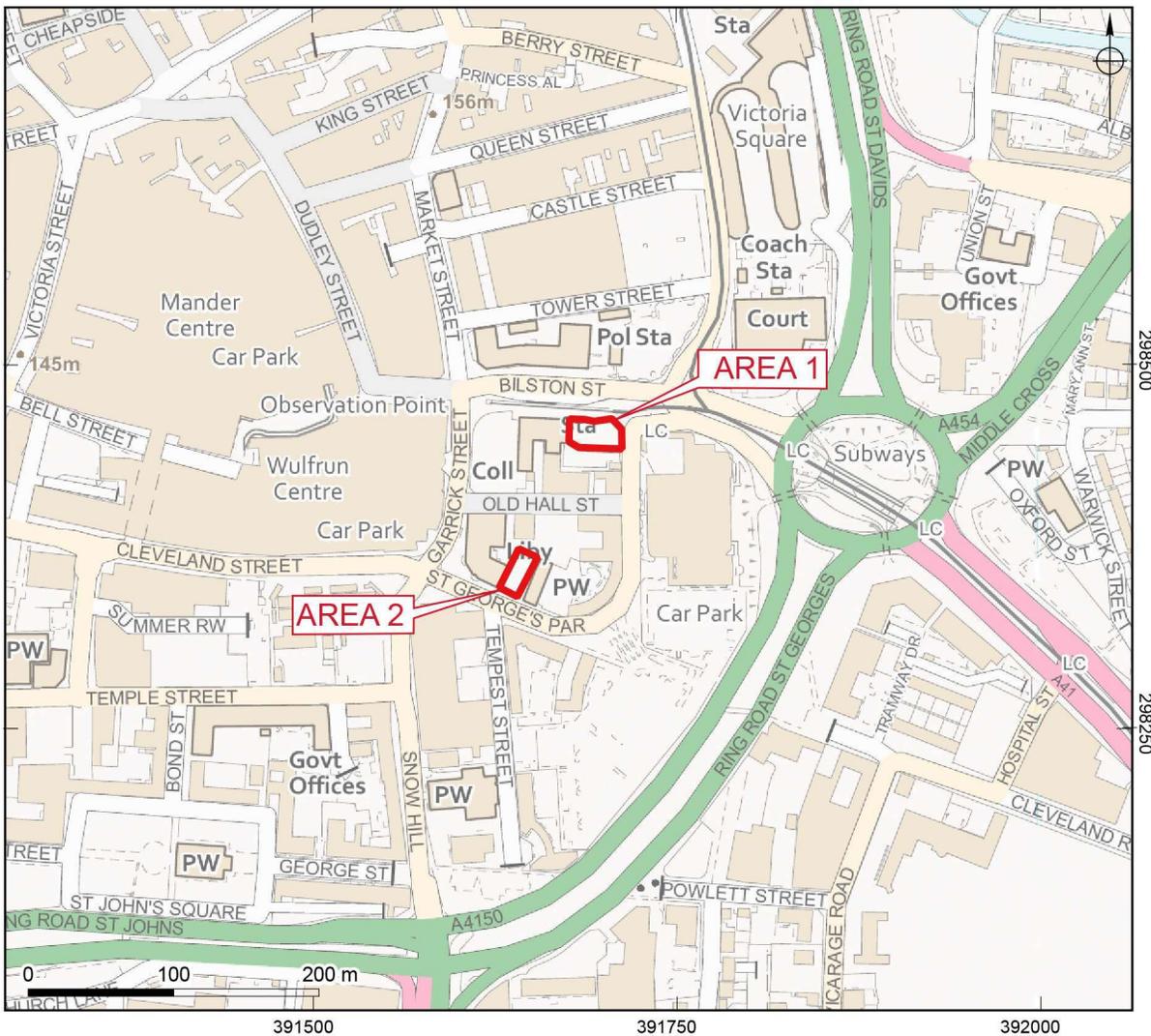
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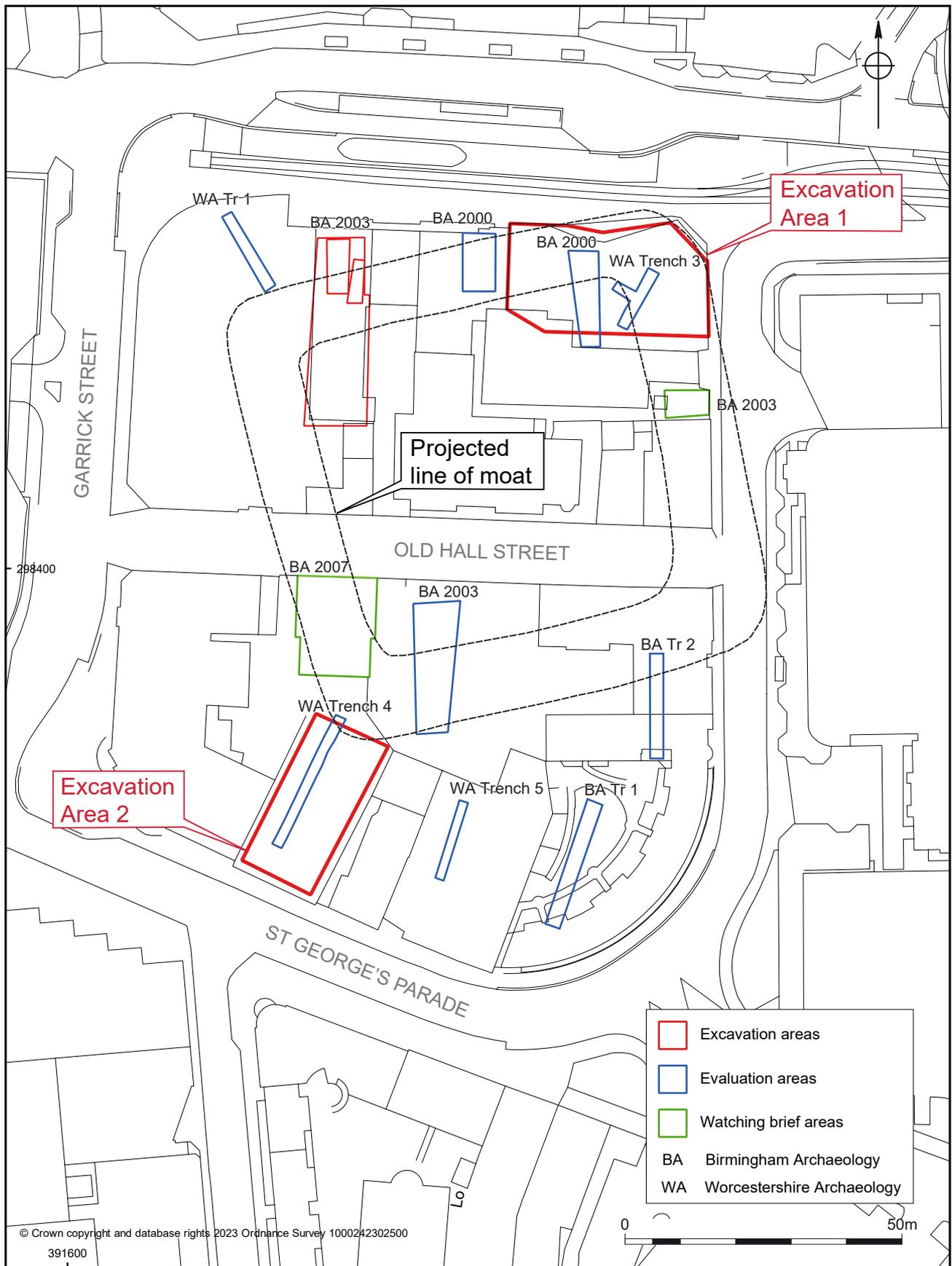
## Figures



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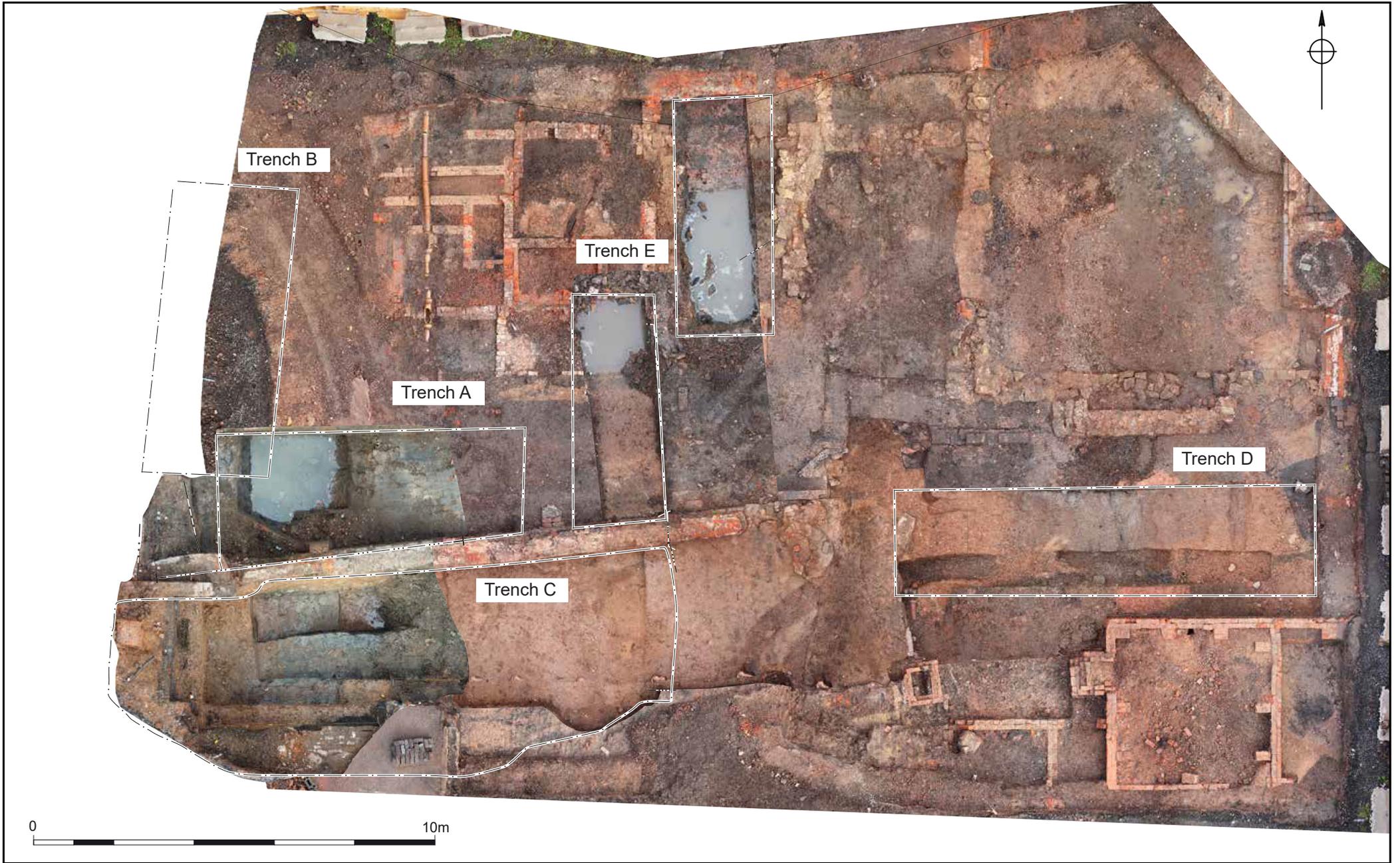
Location of the site

Figure 1



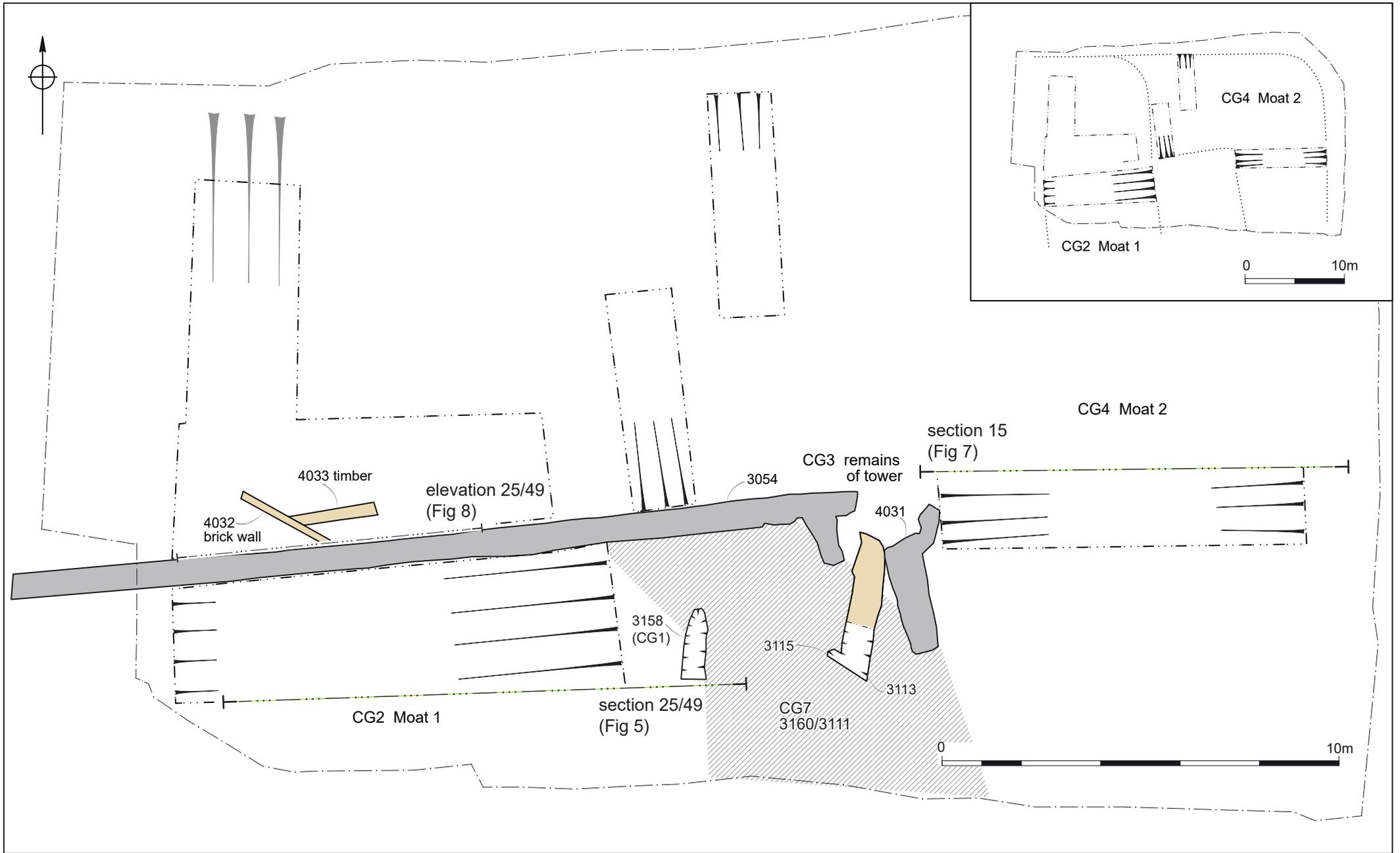
Investigation areas

Figure 2



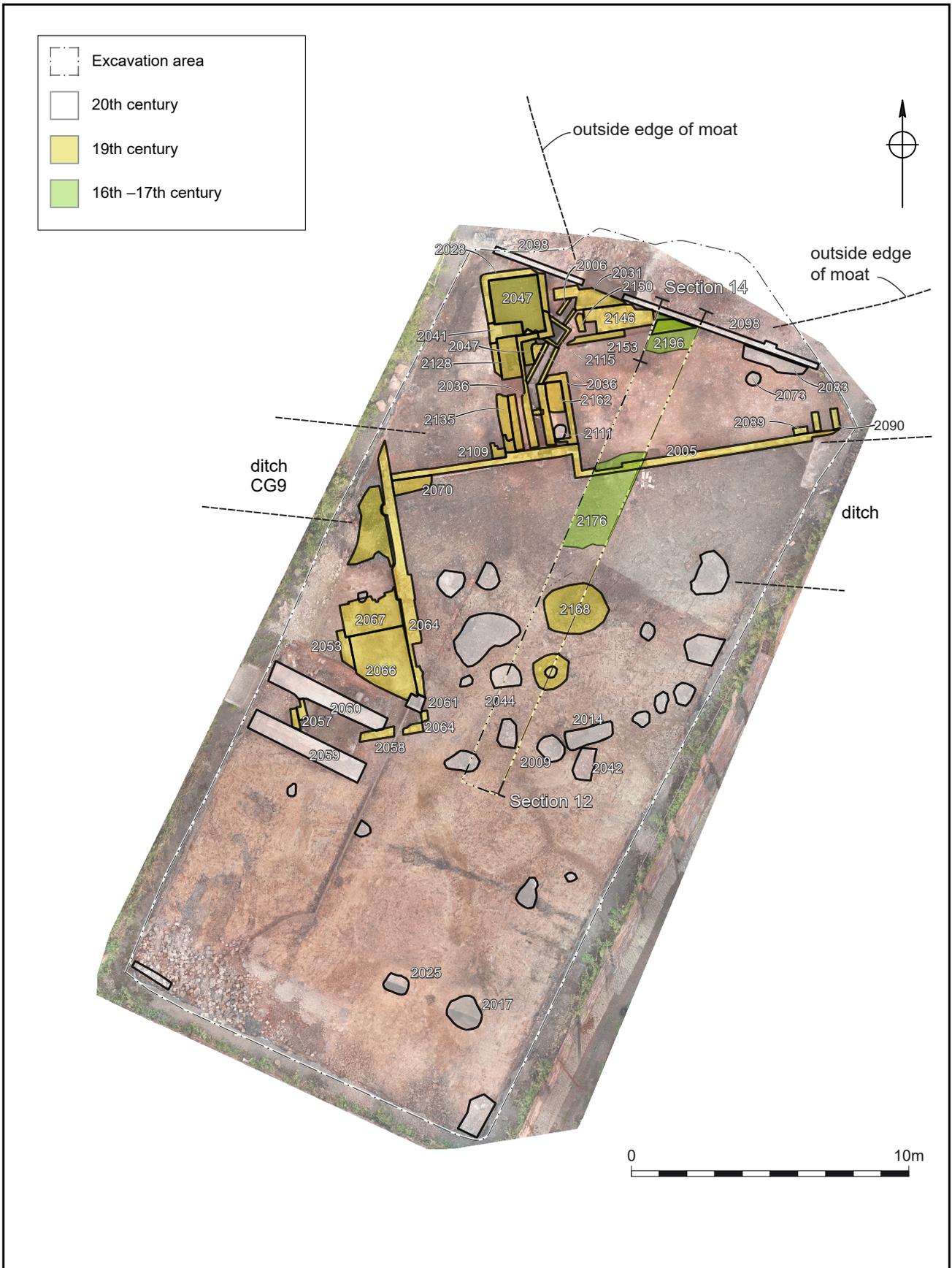
Area 1 moat investigations

Figure 3a



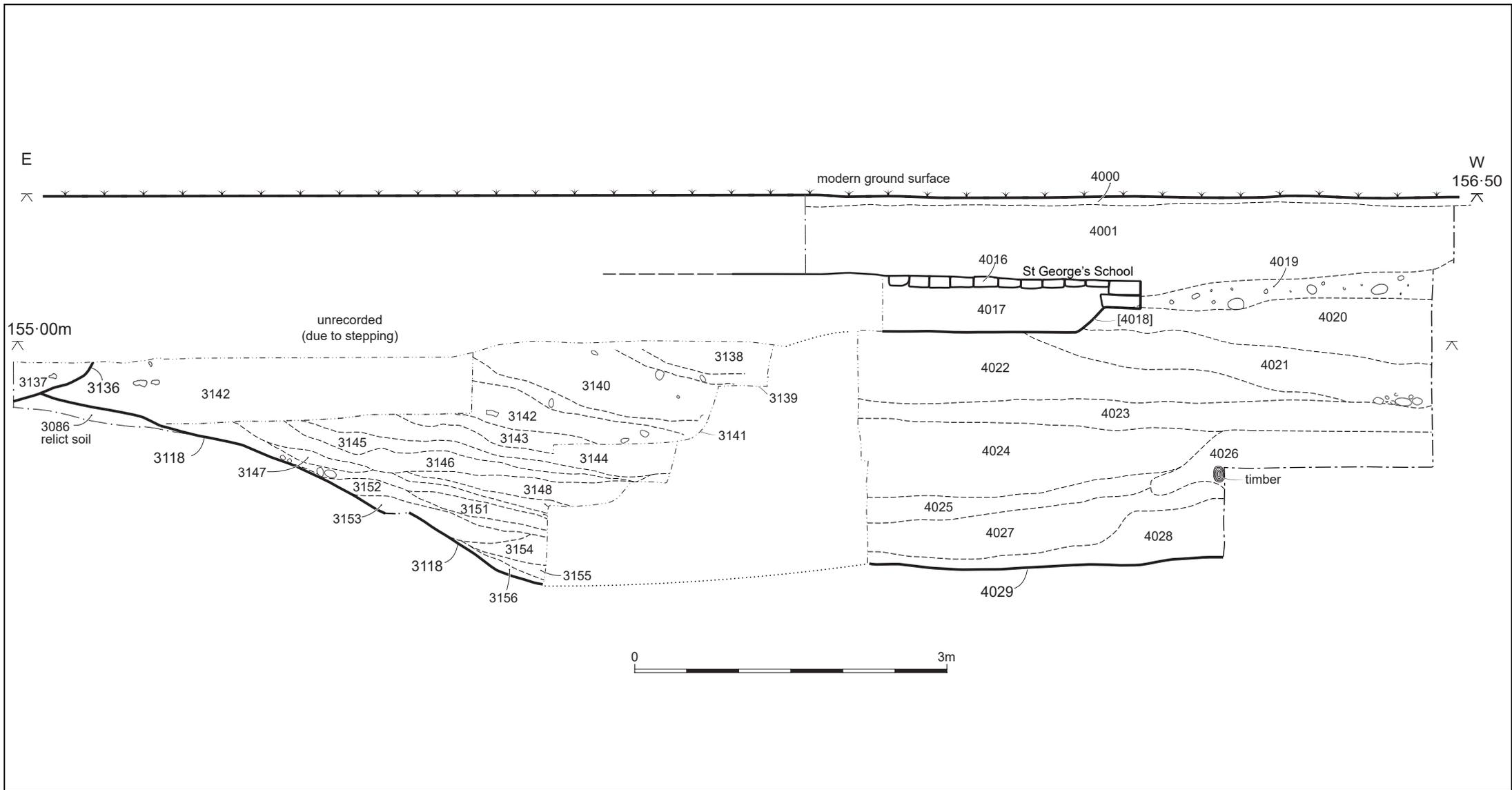
Key features in Area 1

Figure 3b



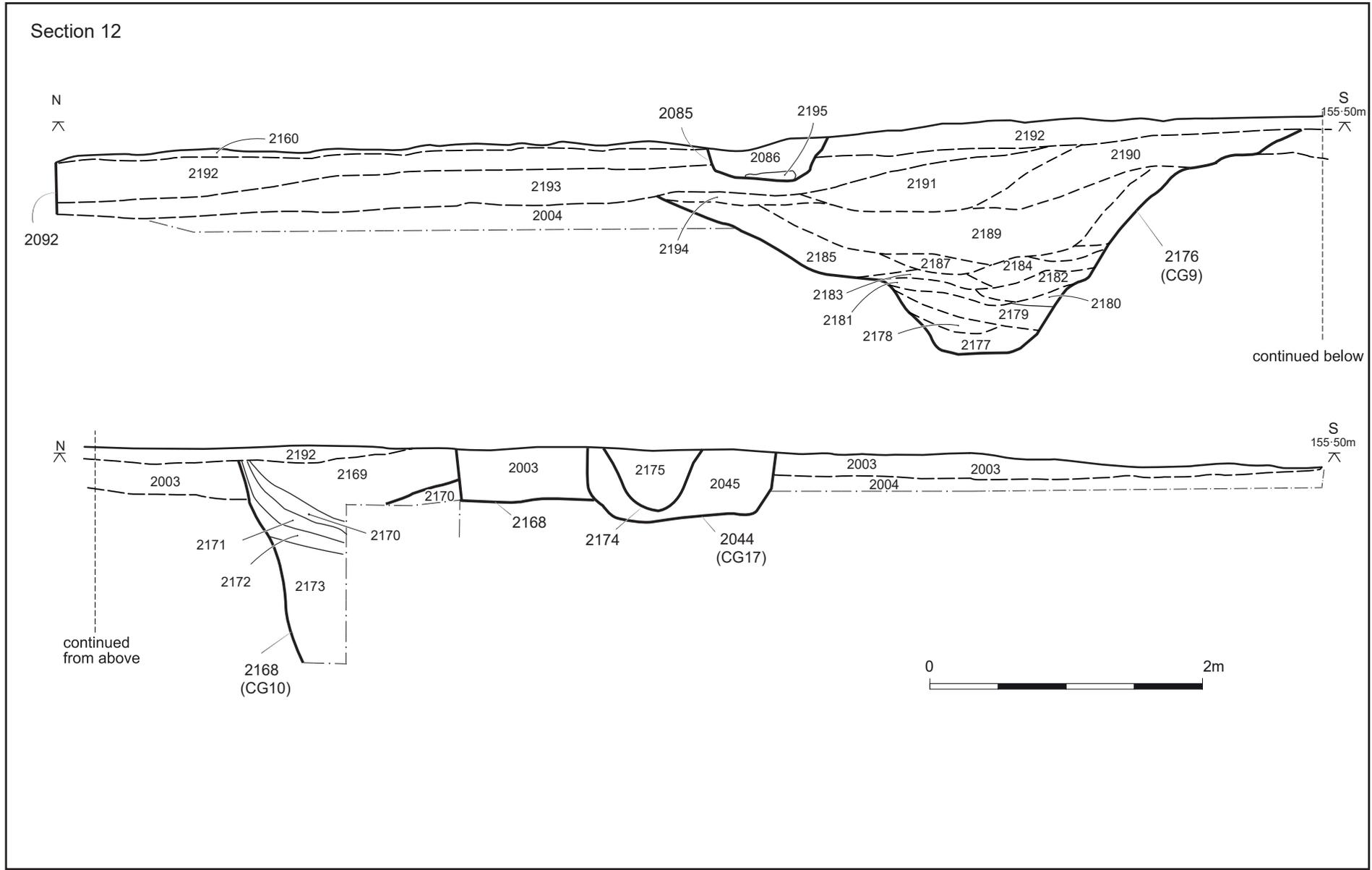
Area 2 phase plan (also showing WA Trench 4)

Figure 4



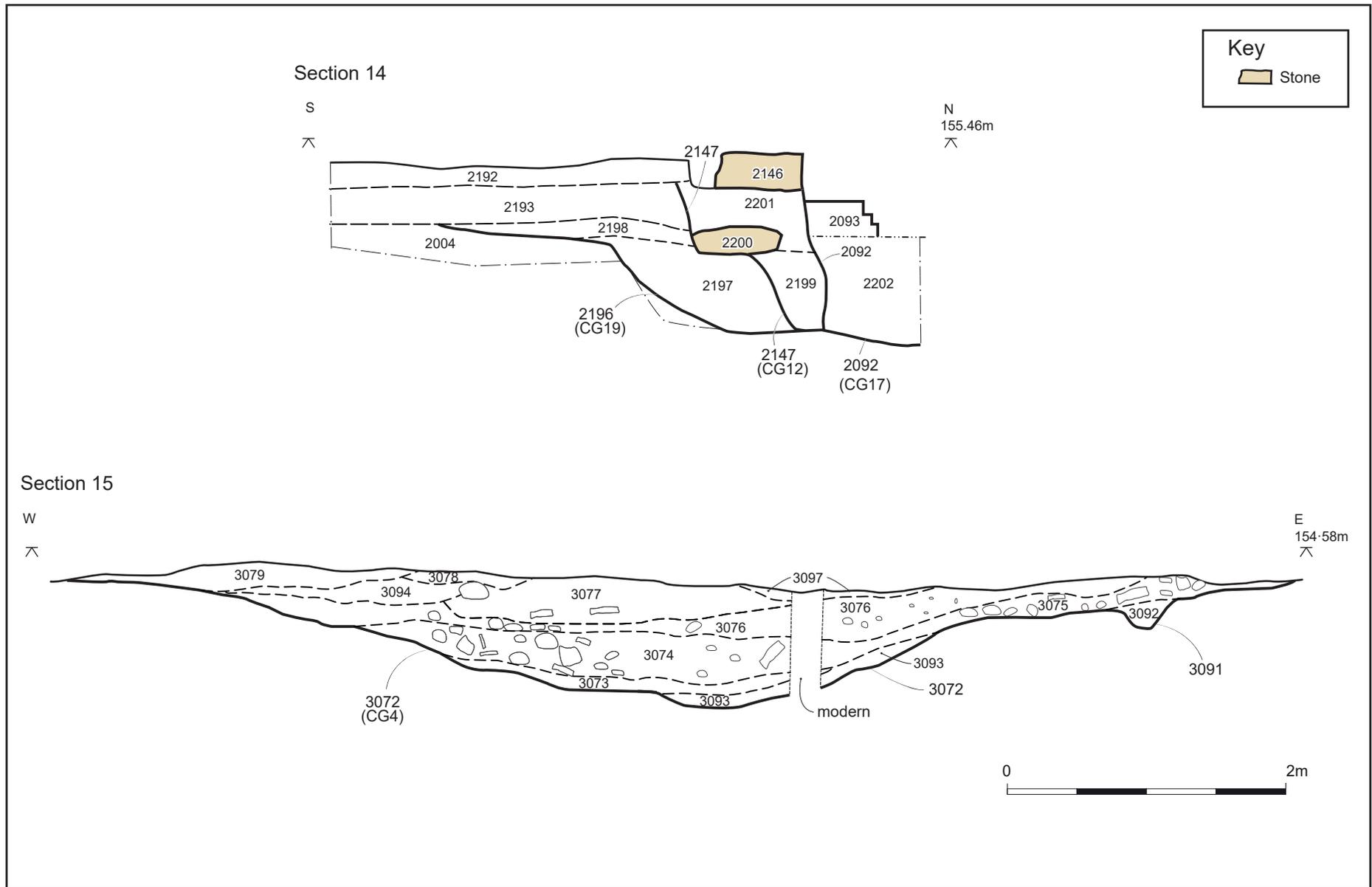
Sections 25 and 49 through moat; for their location see Figure #

Figure 5



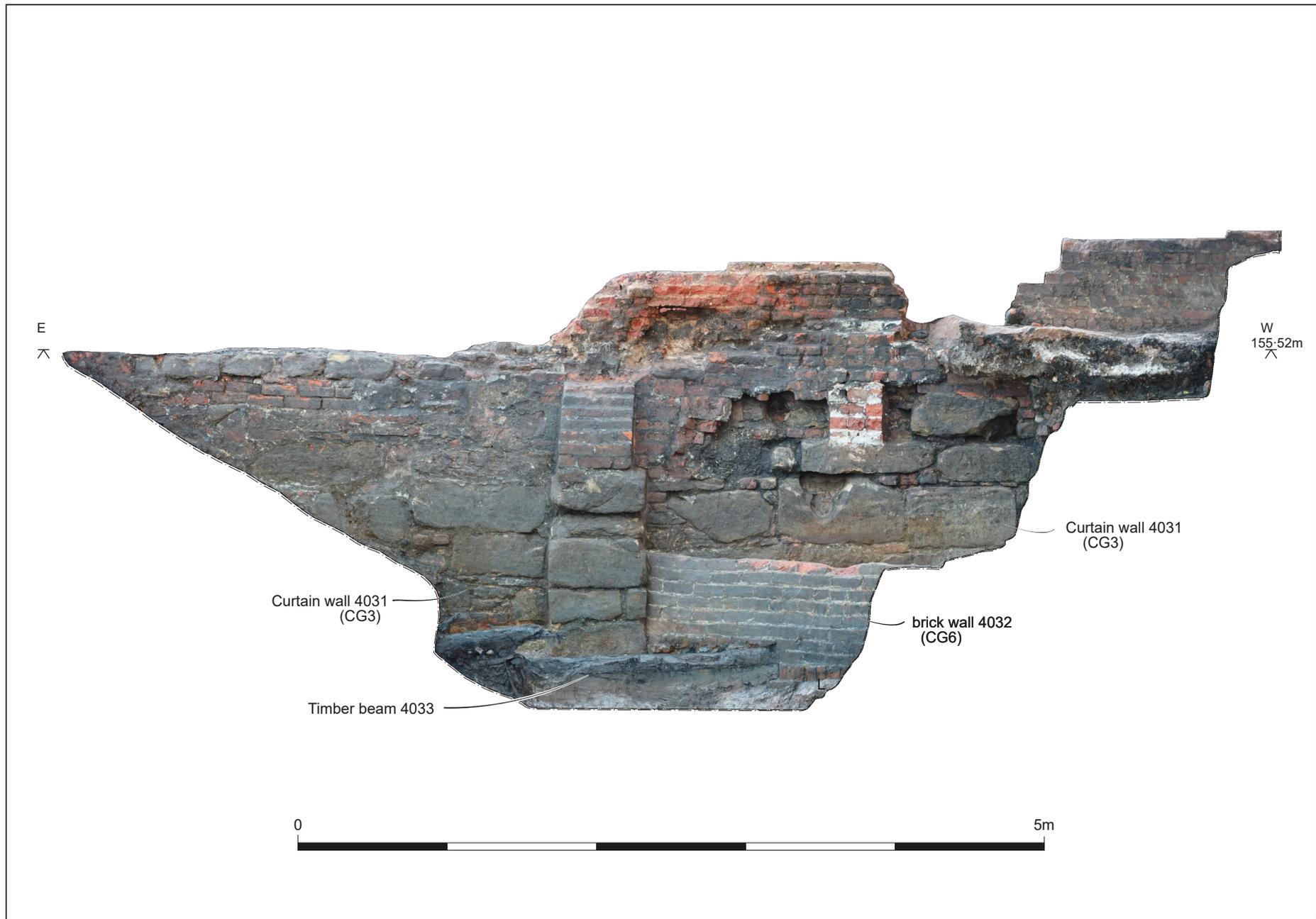
Section 12; for location see Figure 4

Figure 6



Sections 14 and 15; for locations see Figures 4 and 3b respectively

Figure 7



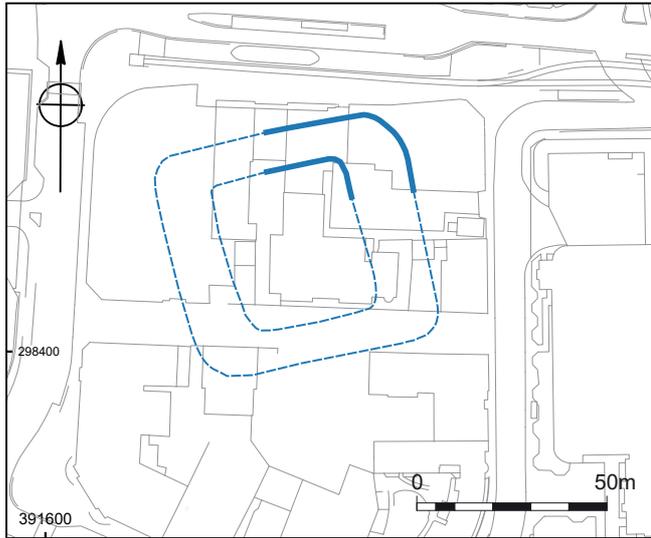
Photogrammetric elevation of post-medieval curtain wall and later brick revetment wall;  
for location see Figure 3b

Figure 8

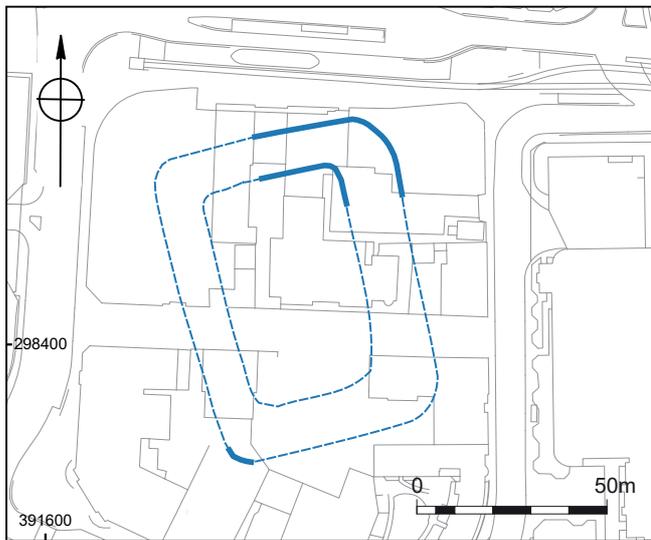


Area 2: 19th-century industrial features

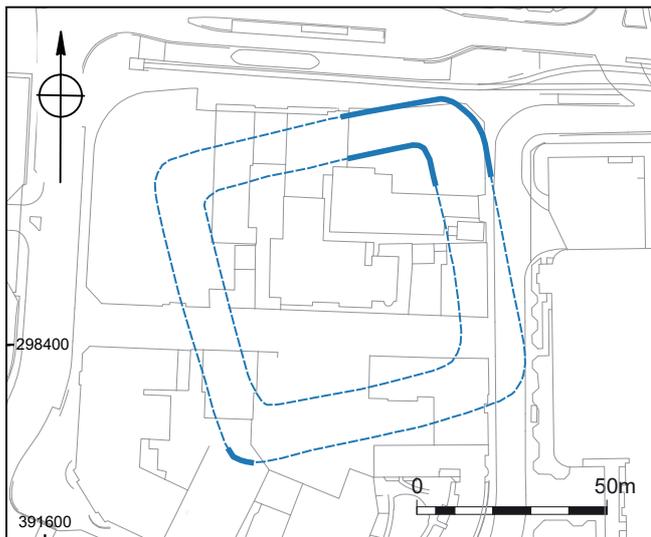
Figure 9



1: Projected moat 1 alignment before eastern extension

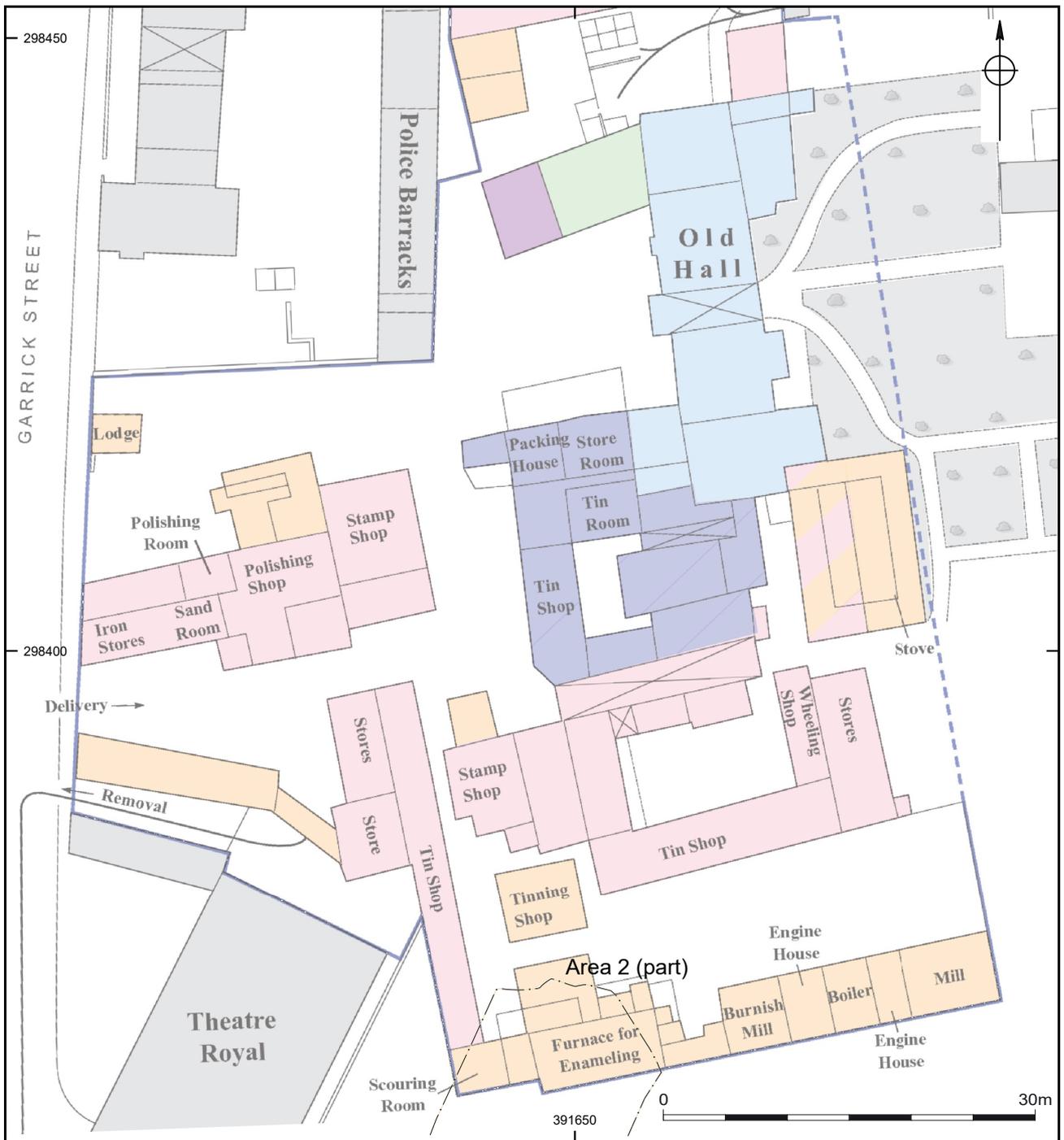


2: Projected moat 1 alignment if southern arm belongs to moat 1/2



3: Projected moat 2 based on Taylor, 1750

Figure 10



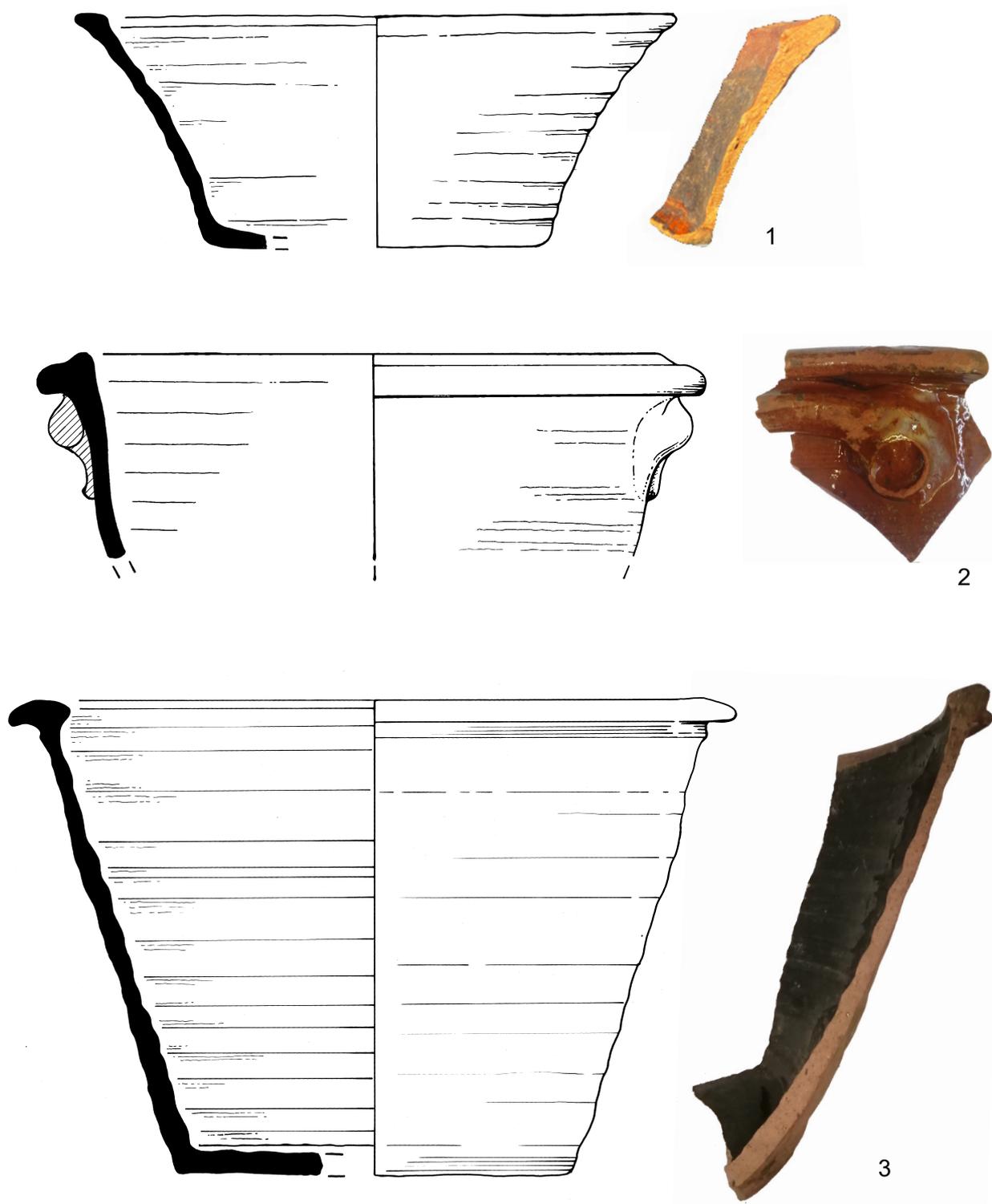
Location of Area 2 (part) and other mainly industrial buildings as shown on Health of Towns map 1852

Figure 11



*Extent of surviving features within excavation Area 2 and buildings as shown on Health of Towns map 1852*

*Figure 12*



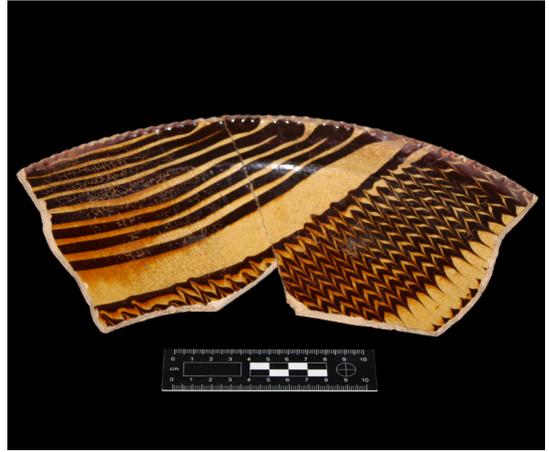
0 200mm

Pottery

Figure 13



4



5



6

Pottery

Figure 14



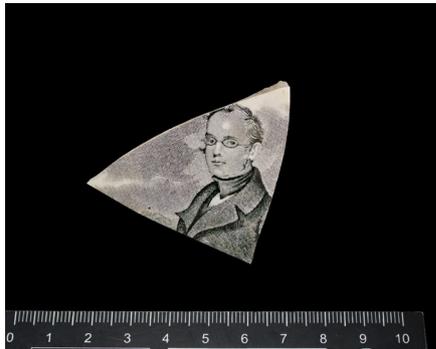
7



8



9



10

Pottery

Figure 15



11



12



Figure #

Clay pipes and glass vessel

Figure 16



Leather shoe

Figure 17



15

*Leather shoe*

*Figure 18*



16



17

Organic finds: wooden board (16) and shell (17).

Figure 19



Crucibles

Figure 20

## Plates



*Plate 1: Pre-excitation aerial photograph of Area 1, showing the remains of St George's School over the moat, with the curtain wall to the south.*



*Plate 2: Aerial photograph of Area 2, showing the southern wall of the enamelling works and the flues and chambers of the furnace in the north*



*Plate 3: Back of the extended curtain wall (CG3) built into fills of the original moat (CG2). Looking north-west, 1m scales*



*Plate 4: Eastern side of original moat 3118 (CG2) in section. Lower silting fills in grey with orange clay denoting rapid closure*



*Plate 5: Continuation of the section through original moat (CG2). Looking south-west, 1m scales*



*Plate 6: Base of original moat with clay lining 4028 (CG2) partially excavated. Looking south-west, 2m scale*



*Plate 7: Sampling the lower fills of the original moat (CG2)*



Plate 8: Timber in fill 3150 in original section of moat 3118 (Moat 1; CG2). Looking south-west, 1m and 0.4m scales



*Plate 9: Plank 3117 in fill 3154 in silting fill of moat 3118 (Moat 1; CG2). 0.5m scale*



*Plate 10: Ditch 2176 (CG9), probably a boundary feature seen on Young's 1750 map. Looking east*



*Plate 11: East-facing section of probable southern edge of the moat circuit 2196 (CG19). 1m scales*



*Plate 12: Outer face of the extended curtain wall CG3, looking south (1m scales)*



*Plate 13: The north side of the curtain wall (CG3) to extended moat, with later wall 4032 (CG6) and timber 4033 (under horizontal ranging pole). Looking south, 1m and 2m scales*



*Plate 14: Curtain wall (CG3)*



*Plate 15: Detail of the late medieval tracery stonework reused in the curtain wall extension. Looking south, 1m scale*



*Plate 16: A slot through the moat extension, 3072 (CG4), looking south (1m scales)*



*Plate 17: Reused timber 4033 under retaining wall 4032 (CG6) in the base of the moat. Looking south, 1m scale*



*Plate 18: Fills of the moat up to its complete closure around 1845, showing retaining wall 4032 (CG6) abutting the curtain wall*



*Plate 19: Slot through the moat close to where it would have originally returned south, showing rapid deposition of fills in 19th century*



*Plate 20: View of furnace room, looking north-west*



*Plate 21: View of the furnace room in Area 2, looking north*



*Plate 22 Reconfigurations of flues in Area 2. 1m scale, looking east*



*Plate 23 Partially intact flue chamber in Area 2. 0.3m scale, looking south*



Plate 24 View south along sondage in Area 2. Ditch 2176 (CG9) in mid-ground (1m scales)

## Appendix 1: Summary of project archive

TYPE	DETAILS*
Artefacts and Environmental	Animal bones, Ceramics, Environmental (plant macro remains, pollen, vertebrate remains, insect remains, bird remains), Glass, Industrial, Leather, Metal, Wood, Other
Paper	Context sheet, Diary (Field progress form), Drawing, Report, Section,
Digital	Database, GIS, Images raster/digital photography, Spreadsheets, Survey, Text

*\*OASIS terminology*

The project archive is currently held at the offices of Worcestershire Archaeology. Subject to the agreement of the landowner, it is anticipated that this will be deposited with Wolverhampton City Archives.

## Appendix 2 Radiocarbon dating

*RADIOCARBON DATING CERTIFICATE*

21 October 2022

**Laboratory Code** SUERC-106679 (GU61969)

**Submitter** Liz Pearson  
Worcestershire Archaeology  
The Hive  
Sawmill Walk  
The Butts  
Worcester WR1 3PD

**Site Reference** Wolverhampton City Learning Quarter

**Context Reference** 2179

**Sample Reference** P5807/2179/2

**Material** organic - seed : Rubus sect Glandulosus

**$\delta^{13}\text{C}$  relative to VPDB** -28.2 ‰

**Radiocarbon Age BP** 309  $\pm$  18

**N.B.** The above  $^{14}\text{C}$  age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Laboratory and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon* 58(1) pp.9-23.

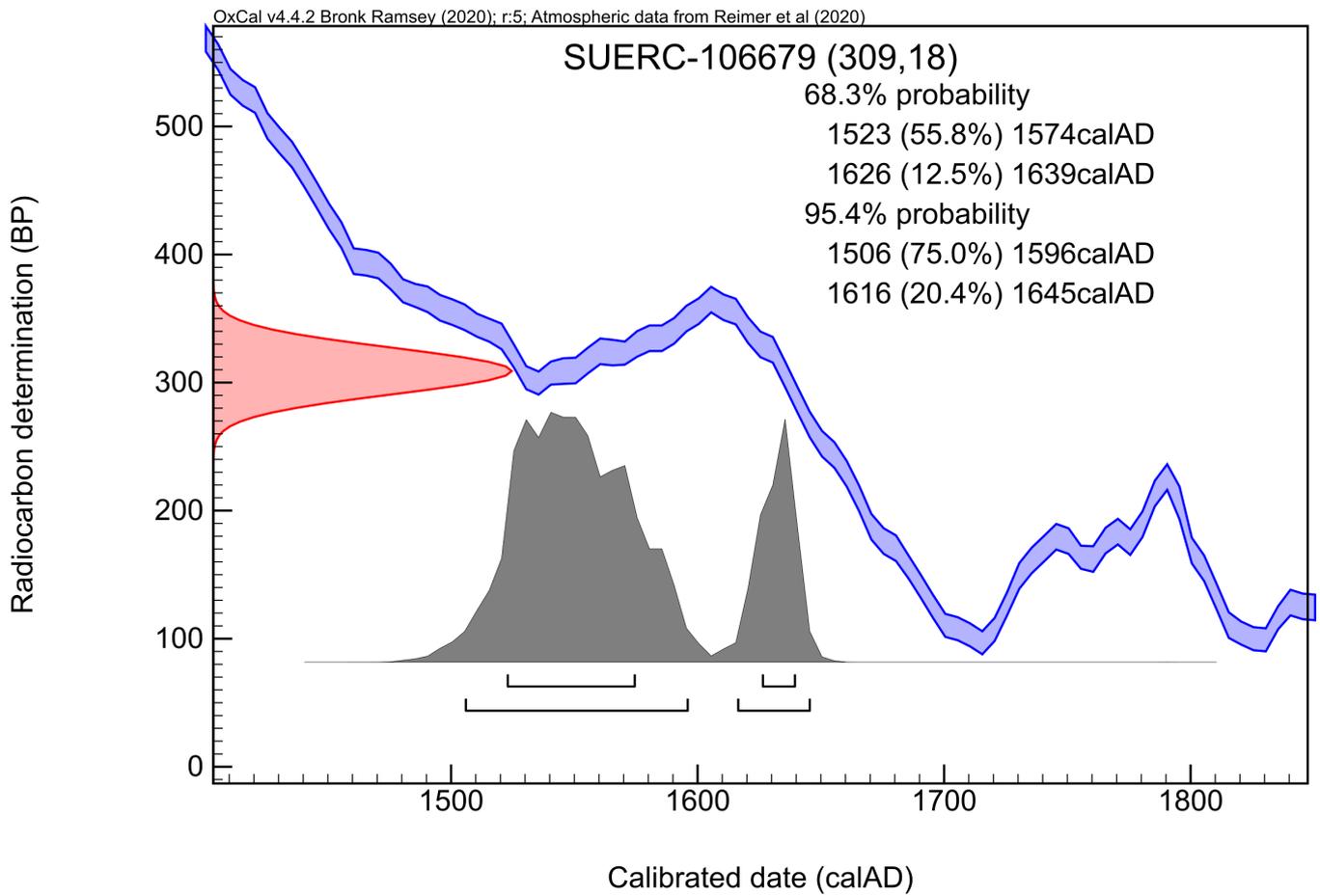
For any queries relating to this certificate, the laboratory can be contacted at [suerc-c14lab@glasgow.ac.uk](mailto:suerc-c14lab@glasgow.ac.uk).

Conventional age and calibration age ranges calculated by :

*E. Dunbar*

Checked and signed off by :

*P. Naynab*



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.\*

The above date ranges have been calibrated using the IntCal20 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

\* Bronk Ramsey (2009) *Radiocarbon* 51(1) pp.337-60

† Reimer et al. (2020) *Radiocarbon* 62(4) pp.725-57

*RADIOCARBON DATING CERTIFICATE*

31 October 2022

**Laboratory Code** SUERC-106955 (GU62127)

**Submitter** Liz Pearson  
Worcestershire Archaeology  
The Hive  
Sawmill Walk  
The Butts  
Worcester WR1 3PD

**Site Reference** Wolverhampton City Learning Quarter

**Context Reference** 3156

**Sample Reference** P5807/3156/15

**Material** Plant - seed

**$\delta^{13}\text{C}$  relative to VPDB** -27.0 ‰

**Radiocarbon Age BP** 590  $\pm$  24

**N.B.** The above  $^{14}\text{C}$  age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Laboratory and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon* 58(1) pp.9-23.

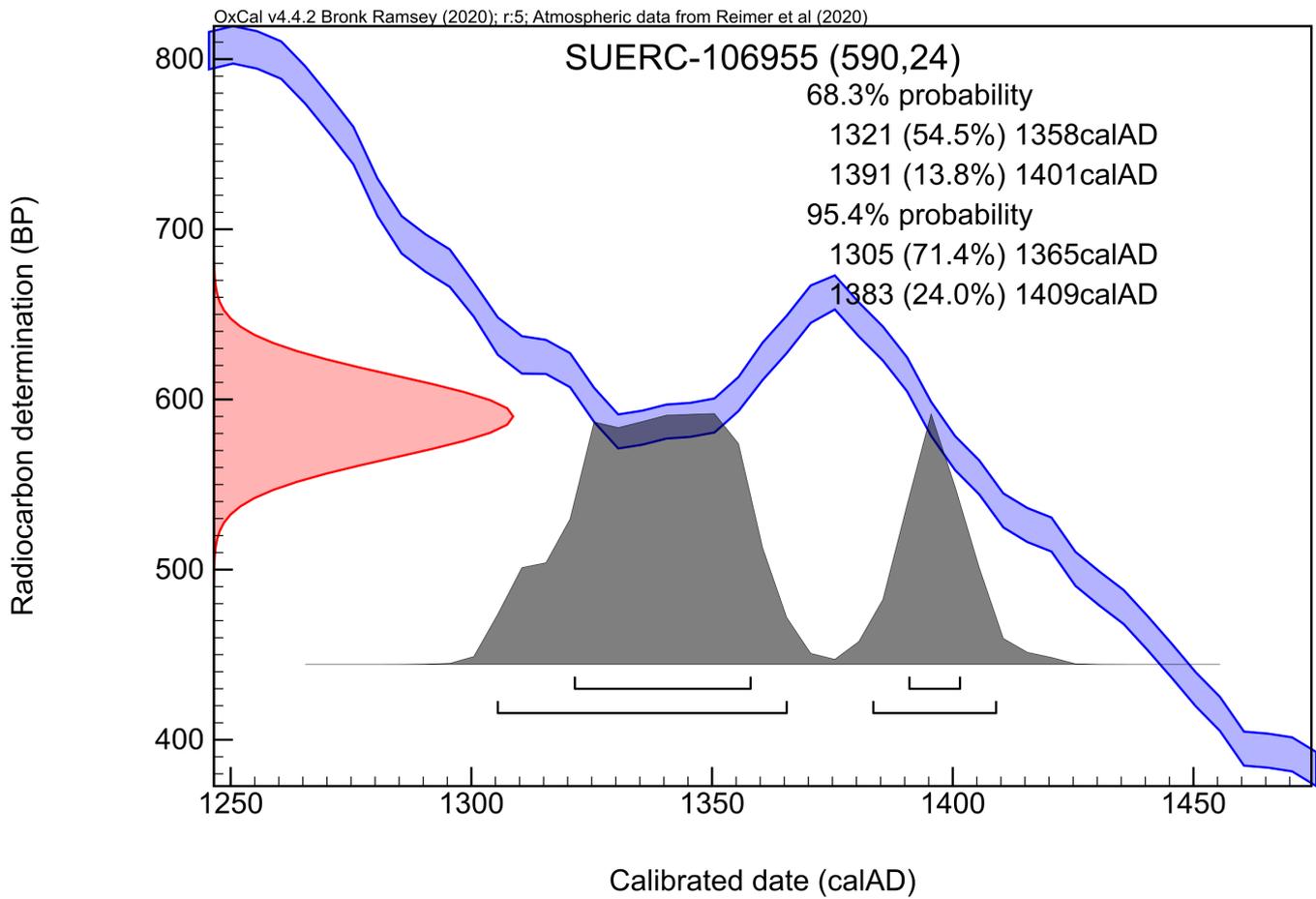
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Conventional age and calibration age ranges calculated by :

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Checked and signed off by :

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