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4 CROWN STREET, BURY ST EDMUNDS, SUFFOLK

CONTINUOUS ARCHAEOLOGICAL MONITORING/RECORDING & STRIP, MAP & SAMPLE RESEARCH ARCHIVE REPORT

Authors: Andrew A. S. Newton and Stephen Quinn	
NGR: TL 8557 6405	Report No: 5520
District: St Edmundsbury	Site Code: BSE 438
Approved: Claire Halpin MCIfA	Project No: P5559
	Date: 15 March 2018 Revised 20 July 2018

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Project details			
Project name	*4 Crown Street, Bury St Edmunds*		
Archaeological investigation conducted at 4 Crown Street examined two areas located immediately either side of the line of the precinct wall of the Abbey of St Edmund, the line of which runs through the house, forming the original rear wall. Work on one side of this wall revealed twenty-four graves containing nineteen burials. One grave appeared to be empty while a further four contained disarticulated human remains representing several individuals; these are considered to represent charnel pits containing the remains of individuals disturbed during the digging of later graves. Dating evidence was minimal but the graves are considered to be of medieval date due to their position within the 'Great Churchyard' of the Abbey, a location in which members of the lay community were buried. This was closed as a burial site in the mid 19th century, but the area is shown as a garden on Hodskinson's 18th century map and it is probable that encroachment of buildings/properties over the line of the precinct wall happened in the post-dissolution period. *The area outside of the precinct wall contained evidence for structures and domestic occupation. Medieval rentals indicate that there were properties and tenements lining the eastern side of Crown Street, beneath the wall. It is possible that the earliest features in this area (a possible cellar, unexcavated) represent structures present prior to the construction of the precinct wall. An oven, which cuts a layer which contained 14th century pottery, represents food preparation activities and therefore suggests domestic occupation. Later activity in this area appears to represent post-dissolution redevelopment and incorporates the re-use of building materials that were probably taken from nearby monastic buildings. The full sequence did not need to be excavated for the works that were undertaken so is not fully dated or characterised, but it would not be unreasonable to suggest that the activity relates to buildings against the precinct wall.*		
Project dates (fieldwork)	*Feb-March 2014*		
Previous work (Y/N/?)	*N*	Future work (Y/N/?)	*N*
P. number	*5559*	Site code	*BSE 438*
Type of project	*Archaeological `strip, map and sample' investigation*		
Site status	*-*		
Current land use	*Domestic dwelling*		
Planned development	*Replacement kitchen extension*		
Main features (+dates)	*Medieval burials, oven, structural features*		
Significant finds (dates)	*Inhumations, medieval finds including pottery, bone, CBM, worked stone*		
Project location			
County/ District/ Parish	*Suffolk*	*St Edmundsbury*	*Bury St Edmunds*
HER/ SMR for area	*Suffolk HER*		
Post code (if known)	*-*		
Area of site	*<1ha.*		
NGR	*TL 8557 6405*		
Height AOD (max/ min)	*c.39m AOD*		
Project creators			
Brief issued by	*Abby Antrobus, Suffolk County Council Archaeological Service Conservation Team*		
Project supervisor (PO)	*Archaeological Solutions Ltd*		
Funded by	*Mr & Mrs Michael Watson*		
Full title	*Archaeological `Strip, Map and Sample' Investigation*		
Authors	*Andrew A. S. Newton and Stephen Quinn*		
Report no.	*5520*		
Date (of report)	*March 2018; revised July 2018*		

4 CROWN STREET, BURY ST EDMUNDS, SUFFOLK

CONTINUOUS ARCHAEOLOGICAL MONITORING/RECORDING & STRIP, MAP & SAMPLE RESEARCH ARCHIVE REPORT

SUMMARY

Archaeological investigation conducted at 4 Crown Street examined two areas located immediately either side of the line of the precinct wall of the Abbey of St Edmund, the line of which runs through the house, forming the original rear wall. Work on one side of this wall revealed twenty-four graves containing nineteen burials. One grave appeared to be empty while a further four contained disarticulated human remains representing several individuals; these are considered to represent charnel pits containing the remains of individuals disturbed during the digging of later graves. Dating evidence was minimal but the graves are considered to be of medieval date due to their position within the 'Great Churchyard' of the Abbey, a location in which members of the lay community were buried. This was closed as a burial site in the mid 19th century, but the area is shown as a garden on Hodskinson's 18th century map and it is probable that encroachment of buildings/properties over the line of the precinct wall happened in the post-dissolution period.

The area outside of the precinct wall contained evidence for structures and domestic occupation. Medieval rentals indicate that there were properties and tenements lining the eastern side of Crown Street, beneath the wall. It is possible that the earliest features in this area (a possible cellar, unexcavated) represent structures present prior to the construction of the precinct wall. An oven, which cuts a layer which contained 14th century pottery, represents food preparation activities and therefore suggests domestic occupation. Later activity in this area appears to represent post-dissolution redevelopment and incorporates the re-use of building materials that were probably taken from nearby monastic buildings. The full sequence did not need to be excavated for the works that were undertaken so is not fully dated or characterised, but it would not be unreasonable to suggest that the activity relates to buildings against the precinct wall.

1. INTRODUCTION

1.1 This document comprises the Research Archive for continuous archaeological monitoring and an archaeological strip, map and sample investigation of land at 4 Crown Street, Bury St Edmunds, Suffolk (NGR TL 8557 6405) (Figs.1 - 2). The investigation was commissioned by Mr & Mrs Michael Watson in advance of the construction of a rear extension. It was undertaken to comply with a planning condition (Bury St Edmunds Borough Council Ref. SE/13/0999 and 0100), based on the advice of Suffolk County Council Archaeological Service Conservation Team (SCC AS-CT).

2 SITE NARRATIVE

2.1 Overview

The investigation was conducted in accordance with advice issued by Suffolk County Council Archaeological Service Conservation Team (SCC AS-CT, Abby Antrobus, dated 20 September 2013), and a specification prepared by Archaeological Solutions in consultation with the client (dated 20 November 2013), and approved by SCC AS-CT. It complied with Gurney, D. 2003 '*Standards for Field Archaeology in the East of England', EAA Occasional Paper 14, and CIfA, Standard and Guidance for Archaeological Excavation*.

Planning policy context

The National Planning Policy Framework (NPPF 2012) states that those parts of the historic environment that have significance because of their historic, archaeological, architectural or artistic interest are heritage assets. The NPPF aims to deliver sustainable development by ensuring that policies and decisions that concern the historic environment recognise that heritage assets are a non-renewable resource, take account of the wider social, cultural, economic and environmental benefits of heritage conservation, and recognise that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. The NPPF requires applications to describe the significance of any heritage asset, including its setting that may be affected in proportion to the asset's importance and the potential impact of the proposal.

The NPPF aims to conserve England's heritage assets in a manner appropriate to their significance, with substantial harm to designated heritage assets (i.e. listed buildings, scheduled monuments) only permitted in exceptional circumstances when the public benefit of a proposal outweighs the conservation of the asset. The effect of proposals on non-designated heritage assets must be balanced against the scale of loss and significance of the asset, but non-designated heritage assets of demonstrably equivalent significance may be considered subject to the same policies as those that are designated. The NPPF states that opportunities to capture evidence from the historic environment, to record and advance the understanding of heritage assets and to make this publicly available is a requirement of development management. This opportunity should be taken in a manner proportionate to the significance of a heritage asset and to impact of the proposal, particularly where a heritage asset is to be lost.

2.2 Description of the site

2.2.1 The site at number 4, Crown Street, Bury St Edmunds lies on the eastern side of Crown Street, a thoroughfare which is aligned north-north-west to south-south-east, connecting Angel Hill with the broadly east to west aligned Westgate Street, and which runs along the western margin of the complex of the Abbey of St Edmund. The property straddles the line of the former 12th century precinct wall of the Abbey and therefore partially falls within the former Abbey grounds.

2.3 Background

2.3.1 Topography, geology and soils

Bury St Edmunds lies in an area of undulating countryside and is located within a shallow river valley. The River Lark merges with the River Linnett in the south-east part of the town close to No Man's Meadow.

The site itself lies at 39m AOD. To the north and the south, the land remains relatively flat but rises gently to the west, reaching 44m AOD at the junction of Churchgate Street and Whiting Street, and falling gently to the east where the banks of the River Lark lie at 32m AOD.

The local soils have not been surveyed due to the urban setting. However, Bury St Edmunds is in a region dominated by typical argillic brown earths which are clay loams derived from chalky boulder clay. The presence of the nearby rivers Lark and Linnet, and the position of the site on the flood plain of the Lark, also suggests the presence of alluvial deposits. The soils of the wider area surrounding Bury St Edmunds are classified by the Soil Survey of England and Wales (SSEW 1983) as the deep, well drained fine loamy and coarse loamy over clayey fine loamy soils, with some calcareous clayey subsoils, of the Melford Association. To the east and west of the town are pockets of soils of the Newport 2 and Newport 4 Associations, which are associated with glaciofluvial drift. Immediately adjacent to the River Lark, alluvially derived soils of the Thames Association have been recorded (SSEW 1983).

Bury St Edmunds lies on a solid geology of upper Cretaceous Chalk of the White Chalk subgroup, the lithological description given by the British Geological Survey for which is chalk with flints, with discrete marl seams, nodular chalk, sponge-rich with flint seams throughout (www.bgs.ac.uk). However, it is known that the Abbey complex lies on superficial deposits of alluvium and gravel on the western side of the River Lark (Drewett and Stuart 1975, 242).

2.3.2 Archaeological and historical background

In the autumn of 869, an invading Danish army, which had spent the previous three years in Mercia, York and the north, descended on East Anglia, establishing their winter quarters at Thetford. Within three weeks of their arrival they met and defeated the army of the East Anglian King, Edmund, at Hoxne in Suffolk. Either in battle, or more probably as a captive, Edmund was killed (Stenton 2001, 248). The contemporary West Saxon author of the *Anglo-Saxon Chronicle* records his death without any sign of interest (Stenton 2001, 248) but Hindley (2006, 188) reports that certain literary sources document a brutal execution, in which he was first flayed, then bound to a tree and shot repeatedly with arrows. He was then decapitated and his head was discarded in neighbouring woodland. His subjects, discovering his body bound to the tree, interred his remains in a wooden chapel at Hoxne

In 903, Edmund's remains were transferred to, and enshrined at, the church of St Mary at *Beodricsworth*. Following the King's martyrdom, six priests devoted themselves to a monastic life under the patronage of the royal saint and founded a monastery in the

early 10th century (BSE 010 – MSF437, SAM35556). Edmund's shrine became the focus of reputed miracles, so attracting pilgrims and visitors. In 1014, the new Danish King Swein Forkbeard demanded tribute money with threats from the religious community, and his sudden death led to rumours that St Edmund had caused his demise.

In 1020, King Canute (Swein's son) was quick to grant the abbey at St Edmundsbury, as it was now known, a charter freeing it from episcopal control and giving it jurisdiction over much of the surrounding countryside. At this time Ælfwine, Bishop of Elmham, replaced the secular clergy with 20 Benedictine monks brought in from the abbey of St Benet of Hulme (Butler & Given-Wilson 1979). The first stone church in the abbey complex was consecrated by Æthelnoth, archbishop of Canterbury, on 18 October, 1032, and dedicated to the honour of Christ, St. Mary and St. Edmund (Page 1975). Edward the Confessor enriched the abbey further by creating the Liberty of St Edmund. In the 11th century, William the Conqueror increased the monastery's privileges and the number of monks increased to 50 in *c*.1081.

The church of St Mary (BSE 010 - MSF437) was demolished and re-built under Abbott Baldwin in the late 11th century. It was under Baldwin that the planning and construction of the Abbey complex and the town, on its irregular grid plan, as they are recognisable today, began (Carr and Gill 2007). Either Baldwin or his predecessor placed Edmund's remains in an elaborate stone rotunda, and his cult attracted even more tourists until he effectively became patron saint of England. The development brought about by Baldwin included two market places and the road from Northgate Street to Raingate Street doglegging around the front of the abbey at Angel Hill. In the 12th century Abbot Anselm (1121-1148) enlarged the town grid and by 1200 the Abbot of Bury St Edmunds was one of the most powerful lords in the Kingdom although arguably never reached the status of the 'Prince Bishops' of Durham, who ruled their County Palatine as virtually a separate state. Samson (1182 – 1211), the best documented prelate of his rank in the country, is recorded being present in full armour at the siege of Windsor Castle in 1193.

The medieval town of St Edmund's Bury (BSE 241) comprised the urban settlement including the Abbey complex with land to the east comprising agricultural land. Mid-12th to mid-13th century pottery and tiles were discovered in the southern part of the Abbey complex (BSE 291) during archaeological test pitting (ESF20343; Carr & Gill 2007). Archaeological excavation conducted at the New Shire Hall site revealed Saxo-Norman and medieval activity that may be associated with the use of this area as the Sacrist's Yard (Newton 2013). An archaeological evaluation (ESF20810) in the Abbey Gardens has revealed a flint bonded wall and a robbed wall trench (BSE 332) representing structural remnants of the Abbey buildings. Crown Street is located in the core of the historic town and was a medieval street understood to have been lined with tenements and properties. It also lies within the core of the Anglo-Saxon town that preceded the Norman grid street plan.

To the north of the Abbey (BSE 010), an archaeological evaluation to the rear of Thingoe House revealed ditches and pits dated from the 12th to 14th centuries. A layer of clay was discovered, possibly indicative of the presence of a building in this area. Also to the north of the Abbey precinct, a ditch has been recorded running beneath properties in this area and parallel to the precinct wall (BSE 172). The two early 13th century hospitals of St Nicholas (BSE 025) and St Stephen (BSE 134), to the north-

east, were possibly associated with the monastery. Archaeological investigations at East Close (ESF 16121) revealed a 12th to 14th century metalworking site (BSE 026 – MSF6727) with finds including pottery, jewellery, silver coins, bronze and iron tools, bone implements, stone architectural fragments (Anderson 1996).

Number 4, Crown Street, Bury St Edmunds is thought to have its origins in the 16th century. It was built up to the boundary of the 12th century abbey precinct wall but the overall property straddles this boundary. Over time, and following demolition of the wall, additional land was conveyed to the owners of the property and the building was subsequently extended. These extensions were, therefore, built on land which had previously been Abbey ground. According to A. B. Whittingham's (1952) conjectural plan of the medieval layout of Bury St Edmunds Abbey, the area to the immediate east of Number 4, Crown Street, beyond the precinct wall, was the Great Cemetery (or Great Churchyard), the medieval burial ground associated with the adjacent churches of St James and St Mary.

2.3.3 Previous Archaeological work

Prior to the onset of archaeological work associated with the construction of the new rear extension at Number 4, Crown Street no previous archaeological work has been recorded at this location. However, in 2000, archaeological recording was undertaken during the excavation of a new cellar under the living room floor of Norman Tower Cottage, which lies to the north of Number 4, Crown Street, adjacent to the Norman Tower, and which also straddles the line of the precinct wall. Within the 4 x 5m area that was investigated, a short length of the base of the precinct wall was observed but it had been cut into by a number of medieval burials. Two distinct layers of burials were observed but all were considered to have occurred within a fairly short timeframe from the late 15th century but prior to 1540 when the building preceding Norman Tower Cottage was extended and the precinct wall demolished. Twenty-seven sets of human remains were found and were considered to be townspeople, rather than members of the abbey's monastic community, as included in their number were several women and children. This work indicated that the medieval Great Churchyard/Cemetery extended further north than had previously been thought (Gaimster and Bradley 2000, 320).

2.4 Excavation Methodology and Deposit Model

2.4.1 Excavation methodology

The single storey kitchen which was attached to the rear of 4 Crown Street was in a poor state of repair and it was proposed by the property owners and agreed by St Edmundsbury Borough Council that the only viable option was to demolish it and rebuild it using the same footprint with new building foundations.

Due to the identification of human remains during the course of the investigation of the soil beneath the kitchen extension, St Edmundsbury Borough Council requested that Suffolk County Council Archaeological Service Conservation Team (SCC AS-CT) provide guidance to ensure that all archaeological aspects were dealt with in accordance with current legislation and good practice. Accordingly, SCC AS-CT

required the recovery of a record of archaeological deposits that may have been damaged or removed by development. The continuous monitoring of all groundworks (removal of existing foundations and floor levels) in order to provide a record of any archaeological deposits which might be damaged or removed by the development (such as burials, structural features, pits, postholes, hearths, surfaces). Any groundworks, and also the upcast soil, were closely monitored during and after removal in order to ensure that no damage occurred to any heritage assets. A programme of 'strip, map, and sample' was required once the overburden had been removed under close archaeological supervision in this area, and any archaeological remains were subject to excavation.

The development comprised two areas of excavation (Fig. 3.); one within the dining room of the existing building (the internal excavation area) and the other to the exterior of the building.

2.4.2 Deposit Model

Within the exterior excavation area a simple deposit model was observed (Fig. 4). The natural mid greyish yellow sand (L1001) was overlain in the northern part of this excavation area by L1012, a dark grey, very mixed, firm clayey silt which is considered to be the result of human activity and through which several archaeological features were cut. Further to the south, L1001 was overlain by L1016, a deposit covering an area of 2.4 x 1.6m and described as a mid orange-brown friable sandy silt. L1016 was interpreted as a 'grave soil' due to the presence of disarticulated human bone; a single sherd of pottery indicated a medieval date. L1016 sealed graves F1035, F1037, F1039 and F1041 and was cut by graves F1018, F1020 and F1022. In the south-western part of the exterior excavation area subsoil L1017 was observed overlying the natural L1001. L1017 was a mid brown-orange friable sand with very occasional flint gravel and it was cut by the foundation of the Abbey precinct wall. Overlying these deposits was modern made ground L1000, a mid grey-brown mixed clayey silt with frequent modern building materials.

Within the interior excavation, a more complex series of deposits was recorded (Figs. 5 and 6). This area, although lacking in burials, displayed a greater density of archaeological features and was, therefore, subject to greater levels of disturbance. In this part of the site, L1001 was directly overlain by L1080, a dark grey-brown sandy silt buried soil layer which was observed to overlie not just the natural substrate but also L1025, the fill of the construction cut (F1024) for the abbey precinct wall. Sealing L1080 was medieval floor surface L1079=1111, a compact mid orange-brown to orange-red clay. It is thought that this colouration was due to burning or scorching. Several features were cut into this deposit. Overlying L1079, and the features which cut it, was L1078, a dark brown to black friable silt with frequent charcoal and occasional chalk and flint gravel. This was considered to be the same deposit as L1110 which was observed in the northern part of this excavation area. Above L1078 lay L1066 which may have served as floor surface or levelling layer and which was dated as late medieval to post-medieval. It consisted of a compact mid yellow-grey clay with frequent chalk flecks and occasional gravel. It was recorded in the northern part of the excavation area as L1109 In the centre of this excavation area, L1066 was overlain by the localised deposit L1034, a compact light grey to white lime mortar overlying the area in which oven F1088, a feature which cut the medieval deposit L1079, was recorded. The uppermost deposit in this excavation area was L1033, a

mid brown-yellow friable silty sand which extended over the entire of the interior excavation area.

2.5 Phasing

Based on artefactual evidence and stratigraphic relationships, three phases of archaeological activity were identified. The earliest dateable activity can be assigned to the medieval period, pottery dates are suggestive of a date mostly in the 12th to 14th centuries. The second phase of activity has been dated, on the basis of artefactual evidence, to the 15th to 16th centuries or the late medieval to early post-medieval period. Activity later than this is considered to be of early modern or modern date.

Phase	Period	Date
Phase 1	Medieval	*c.* 12th-14th centuries
Phase 2	Late medieval to early post-medieval	15th-16th centuries
Phase 3	Modern	18th/19th-20th centuries

Table 1. The phases of activity represented

2.6 Phase 1. Medieval

The exterior excavation area

Running along the eastern edge of the exterior excavation area was F1024, the construction cut for M1026, the remains of the Abbey precinct wall. This was constructed of roughly coursed flint blocks (50-100mm diam.) bonded with yellow white mortar and laid on foundation material L1025, a mid orange-brown rammed, and therefore very compact, sandy gravel. The precinct wall is known to be of 12th century date, although parts of it were rebuilt in the 14th century following increased tension between the town's burgesses and the Abbey, which controlled much of the surrounding area, led to serious rioting and damage to Abbey buildings in 1327 (Greene 1992, 174). The position of the wall indicates that the majority of this excavation area was located within the bounds of the medieval Abbey precinct and, in accordance with Whittingham's (1952) plan of the Abbey, within the Great Cemetery/Churchyard (see Fig. 7).

As may have been expected based on the position of the site partly within the Great Cemetery/Churchyard, and as was demonstrated during work at the nearby Norman Tower Cottage (Gaimster and Bradley 2000, 320), the majority of the archaeology recorded in this area consisted of graves. Also recorded were two distinct layers or deposits resulting from human activity (L1012 and L1016), as opposed to being natural in origin, as was the case with subsoil L1017, which was cut by both the precinct wall and several graves.

Layer L1016 was dated as medieval on the basis of a single sherd of pottery and 209g of peg tile of 12th-13th century date. It sealed Graves F1035, F1037, F1039 and F1041 and was cut by Graves F1018, F1020 and F1022. Layer L1012 was tentatively dated as medieval as it occupied a similar stratigraphic position to L1016, sealing Grave

F1010 and being cut by Graves F1008, F1013, F1045 and F1047. The graves are described below in accordance with their stratigraphic relationships to these deposits. Five further graves, F1002, F1004, F1006, F1043 and F1084, were recorded cutting the natural deposits and with no direct stratigraphic relationships to L1012 or L1016; these are also described below.

Graves sealed by L1016

Grave F1035 L1036 Skeletons 10 & 11

Age	Sk 10 : >50 Sk11 : 4-5
Sex	Sk 10: Male
Stature	Sk 10: 1.690m
Grave Dimensions	Length: 1.0+m; Width 0.34+m; Depth 0.10m
Orientation	E-W
Shape of Grave	Linear (full extent not visible) with moderately steep sloping sides and a flat base.
Fill	L1036. A mid greyish brown firm sandy silt with occasional moderate sub-angular flints and occasional small stones.
Skeletal Position	Sk10: Supine extended. Skull to west of body. Sk11: Supine extended. Skull to west of body, arms extended by side of body, legs extended west of body.
Bones Present	Sk10: Only parts of skull, ribcage and spine present. Sk11: Upper torso, spine, pelvis, leg bones and partial skull present. Lower arms, hands and feet and frontal skull missing.
Grave Goods	None
Finds	Flint nodules (possible pillow stones) found.
Notes	Two skeletons within one grave cut. The latter was cut by many graves. The juvenile (Sk11) was directly beneath the adult (Sk10). Sk10 poorly preserved.

Table 2. Grave F1035 L1036 Skeletons 10 & 11

Grave F1037 L1038 Skeleton 12

Age	*c.* 35-55
Sex	Male
Stature	1.686m
Grave Dimensions	Length: 1.82m; Width 0.50m; Depth 0.13m
Orientation	E/W
Shape of Grave	Linear (rectangular) with moderately steep sides and a flat base.
Fill	L1038. A mid greyish brown firm sandy silt with occasional small angular flints and stones.
Skeletal Position	Supine extended. Skull to W of body. Arms extended by side. Right leg extended east of body.
Bones Present	Partial skull, spine, left arm, torso, upper right arm, pelvis, legs and partial foot bones present. Hands, lower right arm, frontal skull and toe bones missing.
Grave Goods	None
Finds	Flint nodules (possible pillow stones) found.
Notes	Cut Grave F1035, cut by Grave F1022.

Table 3. Grave F1037 L1038 Skeleton 12

Grave F1039 L1040 Skeleton 13

Age	>35 years
Sex	Female
Stature	1.632m
Grave Dimensions	Length: 1.80m; Width 0.38m; Depth 0.14m
Orientation	E/W
Shape of Grave	Linear (rectangular) with moderately steep sides and a flattish base.
Fill	L1040. A mid greyish brown firm sandy clayey silt with frequent small angular flints.
Skeletal Position	Supine extended. Skull to W of body. Left arm extended by side under pelvis. Legs extended east of body.
Bones Present	Poor preservation, partial skull, partial spine and torso, full pelvis and upper legs and partial left arm present. Frontal skull, lower legs, feet, hands and right arm missing
Grave Goods	None
Finds	Animal bone 70g.
Notes	Cut Graves F1035 and F1041. Cut by Grave F1022.

Table 4. Grave F1039 L1040 Skeleton 13

Grave F1041 L1042 Skeleton 14

Age	*c.* 18-20 years
Sex	Male
Stature	1.722m
Grave Dimensions	Length: 2.20m; Width 0.52m; Depth 0.18m
Orientation	E/W
Shape of Grave	Linear (rectangular) with moderately steep sides and a flat base.
Fill	L1042. A light greyish brown loose/friable sandy silt with very occasional small angular stones and flints.
Skeletal Position	Supine extended. Skull towards W. Both arms extended by side of body. Both legs extended east of body.
Bones Present	Well preserved. All bones recorded as present apart from patellas
Grave Goods	None
Finds	None
Notes	Cut Wall Foundation F1024.

Table 5. Grave F1041 L1042 Skeleton 14

Grave F1049 L1050 Disarticulated Bone

Age	-
Sex	-
Stature	-
Grave Dimensions	Length: 0.80+m; Width: 0.40m; Depth: 0.18m

Orientation	E/W
Shape of Grave	Square? (Only top exposed) with moderately steep sides and a flattish base.
Fill	L1050. A dark greyish brown firm sandy, clayey silt.
Skeletal Position	Unknown
Bones Present	Disarticulated
Grave Goods	None
Finds	None
Notes	Possibly disturbed by modern activity.

Table 6. Grave F1049 L1050 Disarticulated Bone

Grave F1051 L1052 Skeleton 15

Age	>35 years
Sex	Female
Stature	1.701
Grave Dimensions	Length: 1.80m; Width: 0.50m; Depth: 0.15m
Orientation	E/W
Shape of Grave	Linear (rectangular) with moderately steep sides and a flat base.
Fill	L1052. A mid greyish brown firm sandy silt with occasional small angular flints.
Skeletal Position	Supine extended. Skull towards west of body. Both arms extended by side of body.
Bones Present	Well preserved though some missing. Rib cage, pelvis, skull, spine, clavicles, right fibula, right arm (partial right hand) and upper left arm present. Scapula, lower left arm and hand, feet and legs missing.
Grave Goods	None
Finds	None
Notes	Lower level grave. Cut by F1022.

Table 7. Grave F1051 L1052 Skeleton 15

Grave F1057 L1058 Skeleton 18

Age	*c.* 25-28 years
Sex	Male
Stature	1.847m
Grave Dimensions	Length: 1.60+m; Width: 0.75m; Depth: 0.18m
Orientation	E/W
Shape of Grave	Rectangular with vertical sides and a flat base.
Fill	L1058. A mid orangey brown friable sandy silt with occasional small sub angular to sub rounded flint gravel.
Skeletal Position	Supine extended. Skull towards west of body. Right arm flexed resting on left arm. Left arm extended by side of body. Both legs extended east of body.
Bones Present	Good preservation but skull fragmented. Skull, torso, arms, upper legs, pelvis, hands and spine survived. Lower legs, feet and right side of skull missing.
Grave Goods	None
Finds	Nails
Notes	Coffin burial

Table 8. Grave F1057 L1058 Skeleton 18

Grave F1059, L1060, L1061 Skeleton 19

Age	*c.* 18-19 years
Sex	Female
Stature	1.598m
Grave Dimensions	Length: 1.05+m; Width: 0.45m; Depth: 0.20m
Orientation	E/W
Shape of Grave	Rectangular with vertical sides and a flat base.
Fill	L1060. Lining of grave: dressed, weathered limestone blocks which are random and uncoursed with light yellowish sandy mortar. L1061. A mid orangey brown friable sandy silt with occasional small sub angular to sub rounded flint gravel.
Skeletal Position	Supine extended. Skull towards west of body. Both arms extended by side of body.
Bones Present	Good preservation but some missing. Skull, torso, upper arms, upper legs, pelvis and spine survived. Lower legs, feet, hands and lower arms missing.
Grave Goods	None
Finds	None
Notes	Mortar and cut limestone lined grave. Limestone around head, mortar underneath and either side of body. Cut abbey precinct wall F1026, cut by Grave F1057.

Table 9. Grave F1059, L1060, L1061 Skeleton 19

Graves cut into L1016

Grave F1018 L1019 Skeleton 7

Age	*c.* 25-35 years
Sex	Female
Stature	1.578m
Grave Dimensions	Length: 1.60m; Width 0.30+m; Depth 0.16-20m
Orientation	E/W
Shape of Grave	Linear with moderately steep sides and a flat base.
Fill	L1019. A mid greyish brown firm sandy silt with occasional small angular flints and chalk nodules.
Skeletal Position	Supine extended. Right side of body and skull missing apart from leg and foot bones. Left arm down by side. Both legs extended, right foot extended, left foot missing.
Bones Present	Partially articulated. Left side of torso, pelvis, arm and lower leg present. Only lower leg and foot present on right side. Skull, right side torso, pelvis, upper leg and left side upper leg, foot and entire spine missing.
Grave Goods	None
Finds	None
Notes	Narrow grave cut, cut by F1020.

Table 10. Grave F1018 L1019 Skeleton 7

Grave F1020 L1021 Skeleton 8

Age	>50 years
Sex	Male
Stature	1.714m
Grave Dimensions	Length: 1.74m; Width 0.48m; Depth 0.15m
Orientation	E/W
Shape of Grave	Linear (sub-rectangular) with moderately steep sides and a flat base.
Fill	L1021. A dark greyish brown firm sandy silt with occasional small angular flints and stones.
Skeletal Position	Supine extended. Skull towards W of body. Right arm/hand down by side. Both legs extended east of body.
Bones Present	Fragmentary articulated skeleton. Base of skull, incomplete torso, right lower arm, pelvis, left leg, partial right leg and both feet survive. Missing elements of spine, torso, skull, right leg and right arm. Missing completely both hands and left arm.
Grave Goods	None
Finds	Animal bone (6g)
Notes	Modern disturbance damage. Narrow cut.

Table 11. Grave F1020 L1021 Skeleton 8

Grave F1022 L1023 Skeleton 9

Age	*c.* 35-50 years
Sex	Male
Stature	1.699m
Grave Dimensions	Length: 1.40+m; Width 0.48m; Depth 0.20-0.22m
Orientation	E/W
Shape of Grave	Linear (rectangular) with moderately steep sides and a flat base.
Fill	L1023. A mid greyish brown firm sandy silt with moderate small-medium angular flints.
Skeletal Position	Supine extended facing south. Skull towards W of body. Right arm/hand and left arm/hand down by sides. Both legs extended east of body.
Bones Present	Right side and base skull, both arms, pelvis and upper legs present. Torso, both hands and spine incomplete. Lower legs from just above knee missing.
Grave Goods	None
Finds	Nails. CBM (60g).
Notes	Coffin nails present

Table 12. Grave F1022 L1023 Skeleton 9

Grave F1053 L1054 Skeleton 16

Age	*c*. 25-35m
Sex	Female
Stature	1.630m
Grave Dimensions	Length: 1+m; Width: 0.50m; Depth: 0.13m
Orientation	E/W
Shape of Grave	Rectangular with vertical sides and a flat base.
Fill	L1054. A mid orangey brown friable sandy silt with occasional small sub angular to sub rounded flint gravel.
Skeletal Position	Supine extended. Skull towards west of body. Both arms extended by side of body.
Bones Present	Good preservation, only missing at truncation. Skull, torso , right arm and spine survived. Lower body, legs, feet, hands and left arm missing.
Grave Goods	None
Finds	Nails
Notes	Possible coffin burial. Severely truncated by modern wall footings, cut Graves F1055 and F1057.

Table 13. Grave F1053 L1054 Skeleton 16

Grave F1055 L1056 Skeleton 17

Age	*c*. 22-25 years
Sex	Male
Stature	1.721m
Grave Dimensions	Length: 1m; Width: 0.45m; Depth: 0.10m
Orientation	E/W
Shape of Grave	Sub-rectangular with vertical sides and a flat base.
Fill	L1056. A mid orangey brown friable sandy silt with occasional small sub angular to sub rounded flint gravel.
Skeletal Position	Supine extended. Skull towards west of body. Both arms resting on pelvis. Right leg extended to east of body.
Bones Present	Poor, fragile, disturbed and damaged. Spine, ribcage, pelvis, parts of right arm, left lower arm and hand and upper right leg recovered. Skull, shoulders, upper left arm, left leg, lower right leg, feet and right hand missing.
Grave Goods	None
Finds	None
Notes	Heavily truncated by Graves F1057 and F1053 and a modern disturbance

Table 14. Grave F1055 L1056 Skeleton 17

Graves sealed by L1012

Grave F1010 L1011 Skeleton 4

Age	>50 years
Sex	Female
Stature	-
Grave Dimensions	Length: 0.24+m; Width 0.28+m; Depth 0.50m
Orientation	E/W
Shape of Grave	Rectangular (remains continue beyond trench)
Fill	L1011. A mid greyish brown firm clayey silt with very occasional small angular stones and flints
Skeletal Position	Unknown
Bones Present	Only skull and shoulder present within in trench. Skull toward west of body.
Grave Goods	None
Finds	Animal bone (22g)
Notes	Significantly lower than other grave cuts. No evidence of coffin.

Table 15. Grave F1010 L1011 Skeleton 4

Graves cutting L1012

Grave F1008 L1009 Skeleton 3

Age	*c*. 10-11 years
Sex	-
Stature	-
Grave Dimensions	Length: 0.72m; Width 0.50m; Depth 0.18m
Orientation	E/W
Shape of Grave	Rectangular (Truncated to south by pipe)
Fill	L1009. A mid greyish brown firm clayey silt. Contained occasional small angular stones and flints with very occasional CBM flecks.
Skeletal Position	Supine extended. Skull towards W. Left arm down by side.
Bones Present	Skeleton badly damaged and truncated. Skull, upper spine, left shoulder, left arm and upper ribcage present. Lower body, right arm and hands absent.
Grave Goods	None
Finds	Animal bone (34g)
Notes	Disturbed by modern truncation to south and due to shallow depth from surface. Cuts Graves F1010, F1045, F1047

Table 16. Grave F1008 L1009 Skeleton 3

Grave F1013 L1014 Disarticulated Bone

Age	-
Sex	-
Stature	-
Grave Dimensions	Length: 0.70m; Width 0.48m; Depth 0.35m
Orientation	E/W
Shape of Grave	Linear with moderately steep sides and a flat base.
Fill	L1014. A mid greyish brown firm sandy silt with occasional small angular flints.
Skeletal Position	N/A
Bones Present	Disarticulated
Grave Goods	None
Finds	Animal bone (133g)
Notes	Cut by Graves F1045 and F1047 and modern drain runs.

Table 17. Grave F1013 L1014 Disarticulated Bone

Grave F1045 L1046 Skeleton 5

Age	>35 years
Sex	Male
Stature	-
Grave Dimensions	Length: 0.62+m; Width: 0.40m; Depth: 0.14m
Orientation	E/W
Shape of Grave	Linear (heavily truncated) with moderately steep sloping sides and a flat base.
Fill	L1046. A mid greyish brown firm sandy silt with moderate small flint stones and occasional chalk flecks.
Skeletal Position	Supine, extended. Skull positioned to west of body.
Bones Present	Good bone preservation. Skull and left shoulder found with elements of spine and rib cage.
Grave Goods	None
Finds	None
Notes	Cut by Graves F1047 and F1008. Presumably extends passed trench limit.

Table 18. Grave F1045 L1046 Skeleton 5

Grave F1047 L1048 Skeleton 6

Age	*c*. 3-5 years
Sex	-
Stature	-
Grave Dimensions	Length: 0.80+m; Width: 0.40m; Depth: 0.18m
Orientation	E/W
Shape of Grave	Linear (rectangular/heavily truncated) with moderately steep sides and

	a flat base.
Fill	L1048. A mid greyish brown firm sandy silt with occasional small angular flints and occasional chalk flecks.
Skeletal Position	Supine, extended. Skull positioned to west of body. Right arm extended by side of body.
Bones Present	Skull present but fragmented. Shoulders, upper arms, lower right arm, upper spine, rib cage and coccyx found. Legs, feet, pelvis, hands, lower left arm and lower spine missing.
Grave Goods	None
Finds	None
Notes	Possibly damaged by modern disturbance. Cut by Grave F1008.

Table 19. Grave F1047 L1048 Skeleton 6

Other graves

Grave F1002 L1003 Disarticulated Bone

Age	-
Sex	-
Stature	-
Grave Dimensions	Length: 0.75m+; Width: 0.25m+; Depth: 0.37m+
Orientation	E/W
Shape of Grave	Rectangular with steep, near vertical sides and a flat base
Fill	L1003. A mid greyish brown, firm clayey silt.
Skeletal Position	N/A
Bones Present	Disarticulated
Grave Goods	None
Finds	Animal bone (23g)
Notes	Some of the bones are degraded and broken

Table 20. Grave F1002 L1003 Disarticulated Bone

Grave F1004 L1005 Disarticulated Bone

Age	-
Sex	-
Stature	-
Grave Dimensions	Length: 0.70m; Width 0.48m; Depth 0.35m
Orientation	E/W
Shape of Grave	Rectangular with near vertical sides and a flat base.
Fill	L1005. A mid greyish brown firm clayey silt.
Skeletal Position	N/A
Bones Present	Disarticulated
Grave Goods	None
Finds	None
Notes	Possibly multiple graves

Table 21. Grave F1004 L1005 Disarticulated Bone

Grave F1006 L1007 Skeleton 1

Age	>35 years
Sex	Female
Stature	1.634m
Grave Dimensions	Length: 0.75m; Width 0.74m; Depth 0.33m
Orientation	E/W
Shape of Grave	Linear, full extent not visible
Fill	L1007. A mid greyish brown firm clayey silt.

Skeletal Position	Presumed supine extended.
Bones Present	Only legs and partial pelvis present.
Grave Goods	None
Finds	Animal bone (57g)
Notes	Contained one articulated burial of leg bones and pelvis but third femur present. Truncated by modern pipe and F1043.

Table 22. Grave F1006 L1007 Skeleton 1

Grave F1043 L1044 Skeleton 2

Age	*c.* 35-55 years
Sex	Female
Stature	-
Grave Dimensions	Length: 0.44m; Width 0.34m; Depth 0.42m
Orientation	E/W
Shape of Grave	Linear (rectangular?) with moderately steep sides and a flat base.
Fill	L1044. A mid greyish brown firm sandy, clayey silt with occasional small angular stones and sub angular flints.
Skeletal Position	Supine extended. Skull towards W facing N.
Bones Present	Only skull, shoulder and some vertebrae present in trench. Presumably extends beyond trench
Grave Goods	None
Finds	None
Notes	Cut by modern sewer pipe and cut Grave F1006.

Table 23. Grave F1043 L1044 Skeleton 2

Grave F1084 L1085

Age	-
Sex	-
Stature	-
Grave Dimensions	Length: 0.75+m; Width: 0.55m; Depth: 0.38m
Orientation	E/W
Shape of Grave	Rectangular (truncated) with steep sides and a flat base.
Fill	L1085. A mid orangey brown friable sandy silt with occasional small sub angular to sub rounded flint gravel.
Skeletal Position	N/A
Bones Present	None
Grave Goods	None
Finds	None
Notes	No skeleton present in grave. Cut by Grave F1002

Table 24. Grave F1084 L1085

The interior excavation area

Running the length of the western edge of the interior excavation area was F1024, the construction cut for M1026, the abbey precinct wall. As in the exterior excavation area, this was unexcavated but its position indicated that the majority of this area of excavation represented activity outside of the abbey precinct. F1024 was amongst the stratigraphically earliest features recorded in this area. Immediately adjacent to it, and almost abutting it, was stakehole F1100 (0.10 x 0.10 x 0.08m), a circular feature with

steep sides and a pointed base which, like F1024, cut the natural substrate L1001. No finds were recovered from its dark grey brown sandy silt fill, L1101, but its location suggested a possible medieval date and it cannot have been later than this as it was overlain by L1080 which itself was sealed by layers of slightly later medieval date.

L1080 was a dark brown-grey sandy silt. No artefactual material was recovered from it but it overlay L1025, the fill/packing material present in F1024, the construction cut for the abbey precinct wall, as well as stakehole F1100. No features were cut directly into it, although several were cut through it from higher up in the stratigraphic sequence. It was overlain by L1079, a compact clay surface thought, on the basis of its red colouration to have been extensively burnt or scorched. Several features were observed to cut directly into this layer (Table 25).

Feature	Type	Plan/ profile (dimensions)	Fill	Relationships	Finds
F1076	Posthole	Sub-circular, steep sides, base not observed (0.35 x0.20 x 0.3+m)	L1077- Mid grey-brown firable clay silt with occasional chalk flecks	Cut L1079, sealed by L1078. Cut by F1062	CBM (36g), A.bone (6g), B.flint (105g), shell (1g)
F1091	Stakehole	Circular, near vertical sides, pointed base (0.11 x 0.10 x 0.12m)	L1092- Dark brown grey friable clay silt	Cut L1079, sealed by L1078.	-
F1093	Stakehole	Circular, near vertical sides, pointed base (0.07 x 0.07 x 0.11m)	L1094- Light yellow to white friable chalk	Cut L1079, sealed by L1078.	-
F1097	Posthole	Sub-circular, steep sides, moderately flat base (0.28 x 0.27 x 0.18m)	L1098- mid grey-yellow compact silt clay with occasional chalk flecks (L1107)	Cut L1079, sealed by L1078.	-
			L1107 (fill of postpipe void) Mid grey brown friable clayey silt with occasional charcoal and chalk flecks		CBM (118g)
F1102	Posthole	Circular, steep sides, base not recorded (0.22 x 0.18 x 0.15m)	L1105- Dark orange brown friable sandy silt	Cut L1079, sealed by L1078. Cut by F1062	-
			L1103- Light yellow-grey compact silty clay with frequent chalk		-

Table 25. Postholes and stakeholes cut directly into L1079

In addition to these various postholes and stakeholes, L1079 (which was recorded as L1111 towards the northern end of the excavation area) was cut by F1029=1088 (2.28 x 0.90m), a feature which was identified as an oven. It was lined with a compact mid brown-yellow clay (L1096=1030). Its basal fill (L1090=L1031) was a mid orange/yellow-brown friable clay silt with occasional chalk flecks and flint gravel which contained medieval pottery (1; 9g), CBM (31g) and animal bone (4g). The upper fill, L1089, was a mid brown-yellow compact silty clay with occasional chalk flecks. It contained no finds but was tentatively suggested as representing the collapsed superstructure of the oven.

The very northern end of Oven F1029=1088 cut layer L1027, a dark grey-brown friable sandy silt from which two sherds (11g) of medieval pottery were recovered. L1027 was the fill of F1108, a large rectangular feature (2.28+ x 2.00+m) which was not subject to full excavation but which appeared to represent a backfilled cellar (or similar) abutting the abbey precinct wall. L1027 was cut by three postholes, F1112, F1114, and F1116, which remained unexcavated. Oven F1029=1088 and F1108 also cut layer L1028, a mid orange brown friable sandy silt which contained CBM suggestive of a 14th century date and which occupied a similar stratigraphic position to L1079.

Overlying L1079, and sealing the features cut into it, was L1078. This was a dark brown to black friable sandy silt. The frequent charcoal flecks that it contained gave the impression that it was a burnt deposit. A small quantity of CBM recovered from this deposit was suggestive of a medieval date. This was the stratigraphically most recent deposit to be assigned such a date in the interior excavation area.

2.7 Phase 2. Late medieval to post-medieval

The exterior excavation area (Fig. 4)

No features or deposits that could be positively dated to Phase 2 were recorded within the exterior excavation area. L1000, the modern made ground present in this part of the site was observed to seal the fills of the medieval graves and/or the medieval layers recorded in this part of the site. However, due to their relationship with F1024 and M1026, the abbey precinct wall, some of the stratigraphically later graves may be of Phase 2 date.

The interior excavation area (Figs. 5 & 6)

Overlying L1078, the uppermost Phase 1 deposit, and where this was not present, L1079, was layer L1066, a possible floor surface or levelling layer. Finds from this layer consisted of pottery assigned a 14th to 16th century date (4; 28g), CBM of 14th to 15th century date (207g), a clay pipe stem (8g), glass (11g) and oyster shell (1g). L1066 was cut by Pits F1070 and F1081 (Fig. 5; Table 26).

Feature	Type	Plan/ profile (dimensions)	Fill	Relationships	Finds
F1070	Pit	Oval, steep to moderately steep sides, base not observed (1.15+ x 0.75+ x 0.45+m)	L1071- Mid grey-brown friable sandy silt with occasional chalk flecks and flint gravel	Cut L1066	-
			L1072- Mid yellow-grey compact silty clay with moderate chalk flecks		-
			L1073- Dark grey friable sandy silt with frequent chalk flecks		Calcine bone 3g
			L1074- Light yellow-grey compact silty clay with moderate		-

			chalk flecks		
			L1075- Mid orange-brown firm sandy clay with occasional chalk and charcoal flecks		-
F1081	Pit	Square, vertical sides, base not observed (0.46 x 0.45m)	L1082- Loosely packed broken peg tiles in a fine silty sand matrix	Cut L1066, F1088, and F1024/M1026	CBM (38618g), flint 860g

Table 26. Pits cutting L1066

F1068 (2.95 x 1.20 x 0.53m) was also observed to cut layer L1066. This was a rectangular construction cut with near vertical sides occupying the entirety of the southern end of the interior excavation area. Its eastern half contained masonry associated with M1067, which appears to have been a late medieval to post-medieval cellar. M1067 consisted of a 1.15m length (*c*. 0.3m in width) of walling, constructed of blocks of flint measuring 50-100m in diameter and bonded with a light yellow sandy mortar, and aligned north to south which then turned through 90° to the east and ran for another 1.40m at which point it was built up against and bonded to M1026, the remains of the Abbey precinct wall. The interior of this structure contained a single fill, L1083, which was a mid green-brown friable sandy silt with occasional flint gravel and from which were recovered 15055g of CBM, animal bone (430g), an Fe fragment (10g), and oyster shell (103g). In that part of F1068 not occupied by M1067, three distinct fills were observed (Table 27).

Fill	**Description**	**Finds**
L1099 (Basal)	Mid brown-grey friable sandy silt	CBM (645g), animal bone (15g)
L1069 (Middle)	Dark grey-brown friable sandy silt with moderate flint gravel	Pottery (4; 90g), CBM (2568g), animal bone (72g), Fe frag (1; 10g), Glass (25; 153g), oyster shell (38g)
L1087 (Upper)	Light brown-grey friable sandy silt with moderate charcoal flecks	-

Table 27.Fills of F1068

Cutting L1083, the fill of the interior of M1067, was Pit F1064 (0.6 x 0.56 x 0.25m). It was oval in plan, with steep sides and a moderately flat base. Its single fill, L1065, was light brown-yellow loose sand with frequent large to medium flint nodules and moderate flint gravel, which contained pottery (9; 96g), CBM (1806g), animal bone (22g), and worked bone (9g).

Overlying layer L1066 close to the approximate centre of the interior excavation area was a small (1.2 x 1.00 x 0.05m) spread of compact light grey to white lime mortar (L1034). It was observed during excavation that this could have been laid down as a levelling layer in the area above medieval Oven F1088, the presence of which could have caused a degree of subsidence in this area. Cutting L1034, and also L1066, was F1062, a sub-square posthole with with near vertical sides and a moderately flat base (0.3 x 0.3 x 0.16m). The basal fill (L1106) of this feature was a dark brown-grey friable silty sand. The upper fill (L1063) was a light yellow brown loose sand with very occasional flint gravel adn which contained CBM (70g), animal bone (5g), and a silver pin (1g; **SF1**).

2.8 Phase 3. Modern

Exterior excavation area (Fig. 4)

Medieval Grave F1013 and the Abbey precinct wall M1026, along with its construction cut F1204, were truncated by a modern water cistern constructed of 18th-19th century 'soft red' bricks, each with dimensions of *c.*220 x 105 x 65mm (Fig. 4). This itself was truncated by later modern brickwork. Sealing the archaeology within the exterior excavation area was L1000, a modern made ground containing pottery (1; 16g), CBM, modern glass and plastic.

Interior excavation area (Figs. 5 & 6)

The only modern deposit recorded within the interior excavation area was L1033, a mid brown-yellow friable silty sand with occasional small sub-angular to sub-rounded flints. This contained three sherds (154g) of residual medieval pottery, CBM (446g), animal bone (29g), charcoal (1g), copper alloy fragments (7g), and oyster shell (22g). This deposit was recorded immediately beneath the existing flagstone and mortar floor of the building and was present across the entire interior excavation area.

3 SPECIALIST REPORTS

3.1 The Pottery

Peter Thompson

Introduction

The archaeological investigations recovered 24 sherds weighing 488g from nine features and layers, and made ground L1000. Eleven sherds date from the medieval period and 13 are post-medieval. The assemblage can overall be described as moderately abraded.

Methodology

The sherds were examined under x35 binocular microscope and recorded according to the Medieval Pottery Research Group Guidelines (Slowikowski et al 2001). Fabric codes are those used for the Suffolk County Council pottery type series.

The Pottery

The grave soil L1016 and feature L1029 (L1031) each contained a single moderately abraded sherd of medieval coarse ware, and earth layer L1027, contained two similar examples including a Bury medieval coarseware with irregular stab decoration. The floor deposit L1079 of a medieval structure contained a Bury sandy fine ware cooking pot rim, and L1025 contained a body sherd of Grimston coarse ware.

Modern bedding layer L1033 contained three Bury coarse ware sherds which were only lightly abraded. They comprised two conjoining sherds of flat topped everted

neckless jar rim, and a large globular jug body sherd with a broken strap handle. The red core with smooth pale brown surfaces and slightly micaceous fabric containing moderate white and clear quartz grains and red iron ore indicates it is a Bury Fine Sandy ware. Chalky layer L1066 contained three probably residual sherds of glazed Hedingham fine ware, including a frilled jug base.

Cellar F1068 (L1069) contained 4 sherds in fairly good condition including a well-fired grey body sherd with red core in a fabric consistent with Bury medieval coarse ware. The remaining sherds were post-medieval red earthenwares, two containing glaze. Pit F1064 (L10165) contained 8 sherds of post-medieval glazed red earthenware including the rim of a chafing dish, and a fragment from a London-type stoneware drinking vessel rod handle.

KEY:
BSFW (3.31): Bury sandy fine ware late 12th-14th
BMCW (3.33): Bury medieval coarse ware late 12th-14th
GRCW (3.22) Grimston coarseware 11th-13th
MCW1 (3.20): Medieval coarse ware 2, 12th-14th common fine and occasionally medium sub-angular to sub-rounded quartz. Rare vey coarse black flint and rare black grog or slag. Occasional large voids. Dark grey surfaces with mid grey core
MCW2 (3.20): Medieval coarse ware 2, 12th-14th fabric similar to Grimston coarseware, dark grey surfaces, grey core with pale grey inner margins
MCW3 (3.20): Medieval coarse ware 3, 12th-14th same as MCW1 but no flint
PMRW (6.10): Post-medieval red earthenware 16th-18th
GRE (6.12): Glazed red earthenware 16th-18th
ESWL (8.21): London-type stoneware mid 17th-18th

Feature	Context	Quantity	Date	Comment
Made ground	1000	1x16g GRE	Mid 17th-19th	GRE: rim to small jar
Grave soil	1016	1x57g MCW1	Mid 12th-14th	
Foundation backfill	1025	1x32g GRCW	11th-13th	
Earth layer	1027	1x6g BMCW 1x3g MCW2	Late 12th-14th	BMCW: body sherd with irregular fine stab decoration
Feature 1029	1031	1x6g MCW3	Mid 12th-14th	MCW3: thumb impressed clay strip
Modern bedding layer	1033	3x150g BSFW	Late 12th-14th	BSFW: x2 conjoining F2 neckless jar rim; x1 jug body with broken strap handle 4.5cm wide
Pit 1064	1065	8x84g GRE 1x8g LONS	Mid 17th-18th	GRE: D2 type rim with vestigial stub handle from a chafing dish
Chalky layer	1066	1x25g HFW	13th-14th	HFW: residual frilled jug base
Fill of Cellar Construction Cut 1068	1069	1x10g BMCW 1x61g PMRW 2x15g GRE	16th-18th	PMRW: strap handle 4.6cm wide with deep central groove between two slighter, narrower grooves
Floor of medieval structure	1079	1x15g BSFW	Late 12th-14th	BSFW: A1 fairly upright jar rim with internal bevel, and soot patches on outer surface

Table 28: Quantification of pottery by context

3.2 The Ceramic Building Materials

Andrew Peachey

Excavations recovered a total of 777 fragments (74427g) of CBM predominantly medieval in date (Table 29) and including two well-preserved groups in a cellar and a pit. The former was probably deposited in the 14th-16th centuries but includes decorated and plain floor tile, brick, and peg tile of earlier date, potentially produced in the early to mid 14th centuries while the latter comprises a significant concentration of 14th- mid 16th century peg tile, probably a demolition deposit. Although fragmentary, presumable resulting from medieval demolition, the CBM is in an un-abraded and well-preserved condition.

Period	CBM type	Frequency	Weight (g)
Medieval	Brick	33	13851
	Floor Tile	29	5721
	Peg Tile 1 (13th-14th C)	26	1670
	Peg Tile 2 (14th- mid 16th C)	685	48621
	Ridge Tile	2	169
Post-medieval	Red Brick	2	4395
Total		*777*	*74427*

Table 29: Quantification of CBM

Methodology

The CBM was quantified by fragment count and weight with fabrics examined at x20 magnification, extant dimensions measured and manufacturing traits recorded in free text; with all data entered into a Microsoft Excel spreadsheet that will be deposited as part of the archive.

Distribution

The distribution of the CBM includes two significant medieval concentrations (Table 30), the former comprising 89 fragments (18183g) contained in Cellar M1067 (L1083), including Construction Cut F1068 (L1069 & L1099). This group included significant quantities and complete examples of medieval brick and floor tile, sparse fragments of earlier Peg Tile 1, associated with moderate quantities of 14th-mid 16th century Peg Tile 2. The latter concentration comprised 627 fragments (48332g) contained in Pit F1081 (L1082), almost entirely consisting of 14th-mid 16th century Peg Tile 2 with occasional fragments of earlier Peg Tile 1, brick, and floor tile also present which is consistent with the rapid accumulation of CBM typical of demolition deposits from a single event/structure. The remaining medieval CBM is very sparsely distributed, including notable small groups in Pit F1064 (L1065) and Layer L1033, containing a comparable mix of form and fabric types as recorded in Cellar F1068, with the near ubiquitous presence of 14th-mid 16th century Peg Tile 2 indicative of the chronology of deposition, albeit with potentially earlier medieval CBM mixed in resultant from former structures on the site or the re-use of brick and tile in subsequent structures.

Feature Group	14th-mid 16th C Peg Tile 1		Other brick, roof and floor tile	
	Frequency	Weight (g)	Frequency	Weight (g)

Cellar M1067 (inc. F1068)	31	2142	58	16041
Pit F1081	612	45108	15	3224
Pit F1064	6	150	9	1536
Layer L1033	22	346	1	79
Other medieval deposit	14	875	7	531
Cistern (modern)	0	0	2	4395
Total	*685*	*48621*	*92*	*25806*

Table 30: Distribution of medieval CBM in major feature groups (and modern CBM in Cistern)

Form types

The medieval CBM included a single type of brick, floor tile (plain and decorated with slight variations in size), two types of peg tile and ridge tile; each associated with slightly different fabric types and manufacturing characteristics, discussed below.

Brick

The technological traits of the medieval brick in the assemblage allowed for a precise form type to be identified, supported by a consistent fabric that suggests a single manufacturing source, probably representing local production for a specific purpose, such as a specific phase of building or renovation associated with part of the abbey.

Fabric 1: Mid red, sometimes with grey-brown core. Inclusions comprise common fine (natural) quartz sand with occasional mica, and sparse ill-sorted voids of burnt-out organic material including straw and chaff (linear 1-20mm long, 0.5-3mm thick)

The bricks include complete examples in Cellar M1067 (L1083), with further *c.*50-75% complete examples in Pits F1064 and F1081. A complete brick weighs *c.*1900g with dimensions of *c.*240x125x45/50mm. The bricks have a rough base, irregular arrises and a slightly lumpy upper surface that also exhibits sparse length-ways striations from where the brick was pressed into a mould. The bricks are superficially similar to the medium-size variant of Flemish-type, grass-marked bricks produced in the early 14th century, and are probably heavily influenced by their manufacture (Ryan 1996, 94), probably representing bricks manufactured in the latter half of the 14th and 15th centuries, prior to the introduction of improved firing techniques in the Tudor Period.

Floor Tile

The floor tile in the assemblage includes two size variants, and decorated or plain design schemes. They are united by being manufactured in a single fabric, but this fabric does contrast with the roof tile in the assemblage that has a high probability of having been produced locally, therefore it cannot be discounted it was imported from a kiln site within East Anglia, or produced by an itinerant craftsman associated with the construction of the abbey or associated buildings. The tiles are clearly within the tradition of medieval two-colour tiles, in particular 'Westminster-type' tiles produced in Norfolk and probably elsewhere in East Anglia (Betts 2002, 13), examples of which include an extant tile pavement at Clifton house, Kings Lynn (Eames 1985, 13). However; the limited designs present in this assemblage are not paralleled in the stylistic group of 'Westminster-type' tile, and appear to form part of a separate

'stencilled and line-impressed group' (Drury *forthcoming*: Group 65) with close associations to the abbey at Bury St. Edmunds, and an extensive area (mainly churches) in south Suffolk, north Essex and south-east Cambridgeshire that suggestion an unknown production 'centre' (if not itinerant) in the Stour Valley area.

Fabric 2: Dark red to orange-brown, with inclusions of common moderately-sorted quartz (0.1-0.25mm, occasionally larger), sparse red-iron rich grains, often de-graded (<5mm) and rounded flint/quartzite (2-8mm).

The bulk of the medieval floor tile was contained in Cellar M1067, in total 26 fragments (4433g), including complete examples decorated tile in L1083 and plain tile in L1069, with limited fragments of plain tile (3 fragments, 1288g) also contained in Pit F1081. Similar 'Westminster' tiles are typically relatively poorly executed and unevenly decorated (Crowley 1997, 196) and this trait is also evident in the tiles in this assemblage. The smaller variant has dimensions of *c*.105mm square with a thickness of 18-20mm, and was entirely plain (unglazed). Comparable 'small' plain tiles have previously been recorded at Campsea Ashe (Keen 1971, 147), but could not be dated more narrowly than the 13th-15th centuries though based on their size alone are most likely of 14th century date. The larger variant is *c*.120-130mm square with a thickness of 20-22mm (*c*.680g complete), and in a fragmentary condition difficult to differentiate from the smaller variant. The size of both types is more consistent with 'Westminster-type' tiles found in London and the south-east, than the slightly larger examples of the type recorded in Norfolk (Betts 2002, 21-22).

The larger floor tile in the assemblage exhibits two decorative designs, with the remainder preserving traces of dark green lead glaze. One complete tile exhibits a diagonally set fleur-de-lis floral design (Plate 1), with a white/cream slip applied under a green lead glaze, paralleled on tiles previously recorded at St. Mary's Church, Bury St. Edmunds and All Saints, Drinkstone; and Holy Trinity, Bradwell-juxta-Coggeshal (Sherlock 1980, 37: design 98; Drury *forthcoming*: design 866). The style of the fleur-de-lis is very close to some on 'Westminster-type' tiles from London and the south-east (i.e. Betts 2002: W82, W99 & W109), which lack the well-defined 'cross-bar' on many examples produced in Norfolk. The second design is preserved on a partial corner of a floor tile and comprises a 'lion rampant gourdant' (Plate 2), with the white slip applied to a composite impressed and line-stencilled design over a brown glaze, previously recorded at Bury St. Edmunds Abbey, Little Dunmow Priory, and churches at Rivenhall and Sible Hedingham (Sherlock 1980, 36: design 87; Drury *forthcoming*: design 208). Neither of the designs is particularly well-executed, with the application of the green lead glaze on the fleur-de-lis design comparable to that on a complete plain glazed tile also in L1083, which may have been utilised to form a narrow border between decorated panels (Eames 1985, 13). Furthermore, the brown glaze occurs only on the 'lion rampant gourdant' design. Comparable brown glaze was recorded on floor tiles with incised designs within a fire place at Orford Castle, potentially dating to the latter half of the 12th century (Drury & Norton 1985, 3), indicating that the manufacture of such building materials was occurring in significant quantities certainly by the 13th century in Suffolk. However, based on the occurrence of tiles with comparable designs, notably at Rivenhall and Bradwell (Rodwell & Rodwell 1983, 10-12; Rodwell 1998, 110-11), the limited firm dating evidence appears to favor a substantial production period in the early to mid 14th century (Drury *forthcoming*).

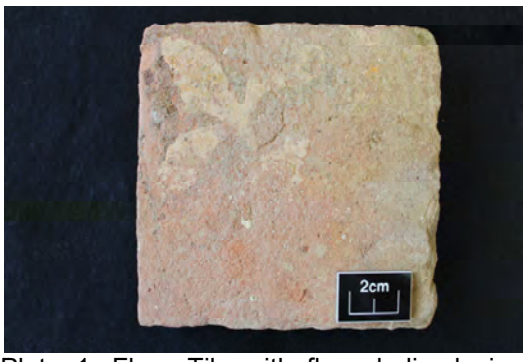


Plate 1: Floor Tile with fleur-de-lis design from Cellar M1067 (1083)

Plate 2: Floor Tile with lion rampant gourdant design from Cellar M1067 (1083)

Decorated floor tiles appear to have been a common component of medieval churches in Suffolk; foremost amongst them the abbey at Bury St. Edmunds with whose precinct the site is associated. It was probably one of the first places in the county to utilise methods of design that had more scope and were longer lasting than earlier relief-decorated types (Sherlock 1980, 8), such as line-impressed designs, including fleur-de-lis, lion and St. Edmunds Crown motifs. These designs have previously been recorded at Bury St. Edmunds and surrounding churches such as Campsea Ash, Little Dunmow, Coggeshall and Witham (Keen 1971, 147). It is intrinsically interesting that where the lion rampant gourdant design is present, the previously recorded examples, and that in this assemblage, consistently exhibit a pronounced ridge where the tile was impressed (paw) supplemented by the addition of line-impressions (body), over which the slip was brushed filling and over-running the area of the stencilled design. These consistent features of design and manufacture suggest a common source, either a kiln site or a craftsman, of a type that flourishes in the region in the early-mid 14th century (Drury *forthcoming*), similar to the tradition of line-impressed tiles recorded at a late 14th century kiln site at Bawsey, north-west Norfolk (Eames 1955). However, the contrasting designs and distribution suggests an alternative East Anglian source, either a large scale kiln comparable to Bawsey or an itinerant tiler whose chronology has yet to be established within the 13th-14th centuries (Keen 1971, 147), with a distribution that suggests a focal point of production in the Stour Valley area. These tiles continue to appear in churches into the 15th century, during which fashions appear to evolve to favour larger plain glazed tiles ('quarries') and stone pavements; but very few areas of original medieval tile associated with structural fabric dated by documented renovations or architectural style have been recorded extant, largely due to extensive 19th century renovations (and probably re-paving in the late medieval period).

Peg Tile

The Peg tile in the assemblage can be subdivided into two groups, distinct in fabric and dimensions: the former possibly representing the re-emergence of peg tile as a roofing material in the late 12th to 13th century, while the latter appear typical of the more common tiles that were standardised in the mid 15th century and common until the end of the medieval period, but probably developed in the 14th century (Drury 1981, 131). The earlier and later types: Peg Tile 1 and 2 could be reliably differentiated by their fabric where other traits were not present, with Peg Tile 1 occurring only in Fabric 3 and Peg Tile 2 entirely in fabric 4.

Fabric 3: Pale-mid orange, typically contrasting core/surfaces (sometimes with reduced core). Inclusions comprise poorly-sorted common quartz (<1mm), sparse red iron rich grains and chalk (<1.5mm, occasionally to 3mm). The fabric has a distinctly pimply feel.

Fabric 4: Orange red, with inclusions of common moderately-sorted quartz (0.1-0.5mm), sparse fine mica, sparse red-iron rich grains (<2.5mm) and rounded flint/quartzite (2-8mm).

Peg Tile 1 was limited to 26 fragments (1670g) in the assemblage, of which 14 fragments (901g) were contained in Cellar M1067, including Construction Cut F1068, with the most intact example from the lower fill L1099. Sparse further fragments Peg Tile 1 were also contained in Layer L1016 and Pit F1081, with small fragments in Grave F1022, Posthole F1076, Layers L1033 and L1078. Peg Tile 1 has partial dimensions of 175mm wide and 12mm thick, with a rough underside, slightly uneven upper surface and a single circular peg hole located centrally at one end of the tile (25mm in from edge). The tile also exhibits irregular edges with common finger-impression from where the tile was handled prior to firing, while a single fragment in Layer L1016 exhibits splashes of lead glaze on the lower half of the tile. Although clearly a traditional peg tile, this is a relatively wide example and the single peg hole is unusual, both traits similar to shouldered and flanged peg tile that are superseded in the mid/late 12th century, probably reflecting the variability in the early production of peg tile, potentially between the mid 12th and mid 14th centuries. Roof tiles, including nibbed and peg tile in Fabric 3 were recorded in 13th-14th century deposits associated with the Sacrists Yard, Shire Hall, Bury St. Edmunds (Peachey 2013, 25) and included fragments with splashed lead glaze, but were generally more fragmentary and less diagnostic than the peg tile from Cellar M1067. Similarly large peg tiles with lead glaze, but two peg holes have been recorded at Orford Castle, potentially of 12th century date (Drury & Norton 1985, 3), supporting an earlier date. The width is an important characteristic as medieval peg tiles varied in size, but were regulated to conform to a minimum size in 1477 (Drury 1981, 131), including a width of 6 inches (or 150mm). Local standardisation may have been achieved (or practical) prior to this, and it is notable in deposits at Fore Hill, Ely, significant concentrations of peg tile demonstrated that width had been standardised to *c*.150/155mm by the 14th century (Alexander 2003, 161), consistent with the subsequent legislation and suggesting Peg Tile 1 may have been produced between the mid 12th and early 14th centuries.

Peg Tile 2 is near ubiquitous in the features that contained CBM, but the bulk: 612 fragments (45108g) was contained in Pit F1081 (L1082), with 31 fragments (2142g) in Cellar M1067 the only other limited group comprised of more than scarce, small fragments. Peg Tile 2 has partial dimensions of 150mm wide and 12-14mm thick, with a slightly abrasive sanded base and a relatively smooth upper surface that exhibits lengthways striations from where the tile was pressed into a mould. Two circular peg holes c.15mm wide, tapering to the base, are situated at one end of the tile with approximately 65mm between them (and 25mm in from the end of the tile). The edges tend to slightly irregular, and frequently exhibit finger impressions from where the tile was handled prior to firing. None of the Peg Tile 2 in the assemblage was glazed, and the form type appears typical of roof tile that developed in the 14th century, and continued to be the dominant method of constructing ceramic roof systems into the 16th century, after which the method continued but the quality of peg tile manufacture evolved to introduce more regular, higher-fired tiles in finer fabrics (such as contrasting 15th/16th century types recorded at Shire Hall (Peachey 2013,

26)). The Peg Tile 2 contained in Pit F1081 is moderately to highly fragmented with an average fragment weight of 73.7g, which does not allow for any complete tile to be reconstructed; neither is there any evidence of waster material or burning, therefore the significant concentration would appear to represent a demolition deposit associated with a building that would have been close to or adjacent to the former precinct wall of the abbey.

Ridge Tile

In addition to Peg Tile 2 in Fabric 4, Modern Made Ground L1000 contained two fragments (169g) of ridge tile of probably medieval date. The ridge tile was 12mm thick with a strongly curved profile and a thick dark brown to black glaze on the upper surface and edges only. The lateral edges of the tile were regular and smooth, but at either end the edges were uneven. These traits suggests the ridge tile is contemporary with Peg Tile 2, but without more complete examples or further technological traits such as an applied crest, a post-medieval date cannot be discounted.

Post-Medieval CBM

The brickwork of a Cistern was sampled, and produced two examples of 18th-19th century 'soft red' bricks, each with dimensions of *c*.220x105x65mm (individual weight *c*.2830g), a smooth base, regular faces and slightly rounded arrises. The fabric of the bricks equated with Fabric 2, used in the manufacture of late medieval Peg Tile 2, suggesting a relatively local source with a shared suite of inclusions.

Conclusion

The presence of Peg Tile 1 and decorated Floor Tiles that were probably produced in the early to mid 14th century, if not potentially slightly earlier, in association with medieval brick produced towards the end of this period, comprises significant evidence for early buildings that were probably associated with the abbey of Bury St. Edmunds. The fleur-de-lis and 'lion rampant gourdant' designs evident on the floor tile present a clear link with materials used in the construction of Bury St Edmunds Abbey (finished *c*.1135) and St. Mary's Church, Crown Street (built *c*.1125, renovated 1425-1435), also once part of the abbey. However, the principal note of caution assigned to this evidence is that these materials may have been re-used during the life of the abbey or following its dissolution, but the absence of any well-defined Tudor or post-medieval CBM suggests that the significant concentration of peg tile in Pit F1081, as well as the accumulation of CBM in Cellar M1067, may be associated with either the re-development of abbey buildings in the 14th-16th centuries (the Abbey Gate on Crown Street and many buildings had to be rebuilt in 1327 following the 'Great Riot'), or their demolition following the dissolution of the monasteries in 1539.

3.3 The worked stone

Tansy Collins

BSE 438. Cellar M1067.

Two pieces of worked stone were retrieved that are likely to have come from the same original structural feature, perhaps deposited as infill to create a levelling layer for the cellar floor. The fabric is a soft limestone, probably Totternhoe stone/clunch salvaged from the abbey. Both pieces are dressed and one preserves definite tooling marks.

Piece 1

This piece measures 8” x 8” x 5” (203mm x 203mm x 127mm), and although a portion has been sheared off, the full extent of the block was discernible. The block is generally square with a plain chamfer on one corner. The exposed faces are worn and pock marked, while little or no evidence for tooling marks is discernible.

Piece 2

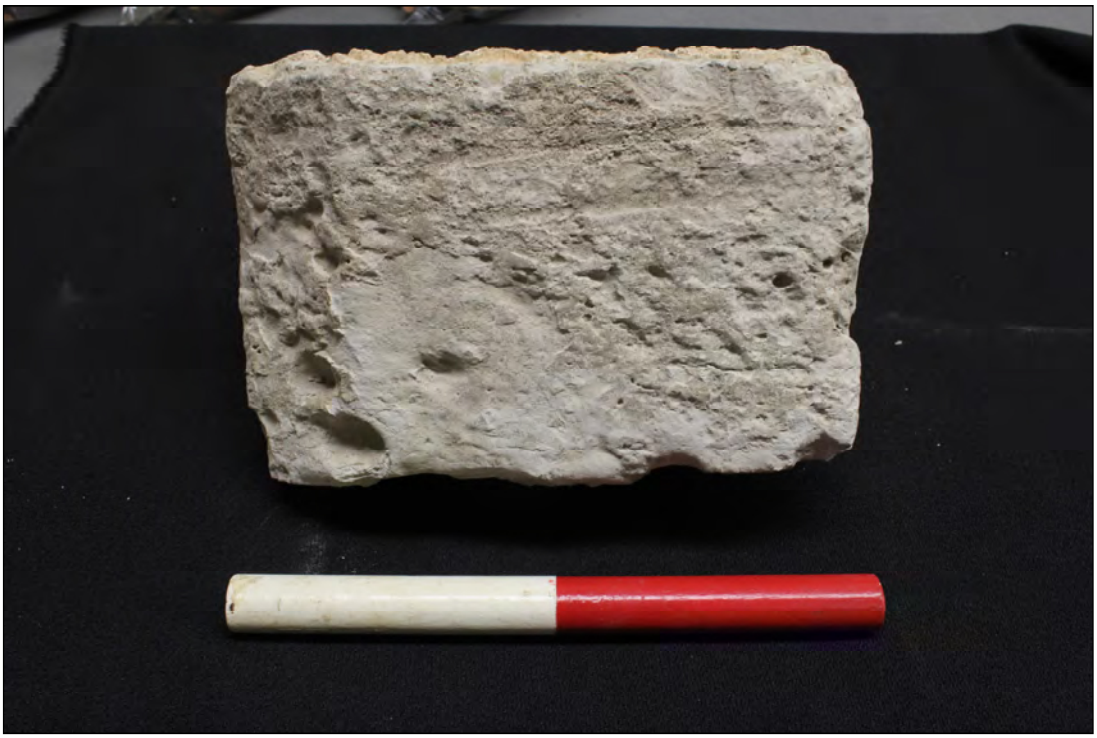
This piece measures 8¼” x 8¼” x 2½” – 4” (210mm x 210mm x 64mm – 102mm). Some damage has occurred but the extent of the piece is discernible. The chamfer is of the same plain form as the previous piece but differs in being of slightly different profile. The height of the block varies from 2½” – 4” (64mm – 102mm), and the chamfer does not rise vertically but instead at a slight angle from the flat soffit. As with the previous piece, there is much weathering, but one face retains tooling marks. These extend diagonally across the face of the stone in two directions creating V-shapes.

Conclusion

The two pieces of stone retrieved from Cellar 1067 appear to comprise blocks from an aperture, probably a doorway, one from the vertical side jamb and the second from higher level likely where an arch springs. The chamfers are very plain with no evidence of decoration or mouldings.

Plates

3 Upper face of worked stone piece 1 with plain chamfer in the bottom right corner



4 Side elevation of worked stone piece 1 with plain chamfer on the left

5 Soffit of worked stone piece 2 with plain chamfer in the bottom left corner

6 Side elevation of worked stone piece 2 with plain chamfer on the left rising at an angle from the flat soffit

7 Side elevation of worked stone piece 2 showing diagonal tooling marks.

3.4 Human remains

Sue Anderson

Introduction

Human remains were recovered as nineteen articulated skeletons, as disarticulated remains from grave fills associated with the articulated bodies, and as disarticulated remains from charnel pits, subsoil and modern features. A summary list of the articulated remains is provided in Table 32.

Skeleton	Sex	Age	Condition	Stature	Cranial Index	Pathology
1	Female	>35	Good	1.643m	-	minor DJD, periostitis
2	Female	c.35–55	Good	-	75.4	dental, sinusitis, DJD
3	-	c.10–11	Good	-	-	
4	Female	>50	Good	-	76.8	dental, palate infection
5	Male	>35	Good	-	-	DJD
6	-	c.3–5	Good	-	-	cribra orbitalia
7	Female	c.25–35	Good	1.578m	-	
8	Male	>50	Good	1.714m	-	DJD, osteochondritis
9	Male	c.35–50	Fair	1.699m	-	DJD, fractured clavicle, sinusitis
10	Male?	>50	Fair-poor	1.690m	74.5	DJD, osteoporosis
11	-	c.4–5	Good	-	-	
12	Male	c.35–55	Good	1.686m	-	DJD, SN, ischial bursitis, trauma
13	Female	>35	Good	1.632m	-	DJD, SN, SB, fractured toe
14	Male	c.18–20	V good	1.722m	72.7	cribra orbitalia, partial SB, SN
15	Female	>35	Good	1.701m	79.1	dental, DJD, ischial bursitis, trauma
16	Female	c.25–35	Good	1.630m	77.0	SN, trauma, cranial asymmetry
17	Male	c.22–25	Good	1.721m	-	SN, periostitis
18	Male	c.25–28	Good	1.847m	-	SN, minor DJD, sinusitis
19	Female	c.18–19	Good	1.598m	-	SN, rickets??

Table 32. Summary of graves and skeletons.
DJD – degenerative joint disease; SN – Schmorl's nodes; SB – spina bifida occulta

Method

Measurements were taken using the methods described by Brothwell (1981), together with a few from Bass (1971) and Krogman (1978). Non-metric dental traits were recorded based on figures published by Hillson (1996). Sexing and ageing techniques follow Brothwell (1981) and the Workshop of European Anthropologists (WEA 1980), with the exception of adult tooth wear scoring which follows Bouts and Pot (1989). Stature was estimated according to the regression formulae of Trotter and Gleser (Trotter 1970). All systematically scored non-metric traits are listed in Brothwell (1981), and grades of cribra orbitalia and osteoarthritis can also be found there. Pathological conditions were identified with the aid of Ortner and Putschar (1981) and Cotta (1978). Material from regional and national contemporary groups has been used for comparison (see below), but note that in some cases the figures used are not as published because they have been recalculated in order to make them directly comparable (for example, in terms of age group).

The large quantity of disarticulated material has been recorded in brief and a catalogue is included in Appendix 3. However, material from the larger groups was unwashed at the time of recording and only minimal information was recorded as a result. Bone from these groups was not measured and only major bones and evidence for pathological lesions were noted.

Comparative material

Only two contemporary groups from Bury St Edmunds have been analysed in recent years, but both are small and not really comparable with the Crown Street group. Both were from medieval hospitals, the group from St Saviour's (BSE 013) representing eight men (Anderson 1990) and that from St Peter's (BSE 392) being five children (Anderson 1990; 2012). Some of the largest contemporary groups in the region are from Ipswich and Norwich. A similar group from a churchyard excavation in Ipswich is the group from St Margaret's (IAS 7806), which also produced a large quantity of disarticulated material (Anderson 2006), although this group was largely post-medieval. Larger populations have been excavated at Wolsey Street (IAS 5003; Anderson 2009), and Ipswich Blackfriars (Mays 1991). A large secular churchyard group was excavated at St Margaret in Combusto, Norwich (Stirland 2009), a friary group at St Faith's Lane (Anderson, T., 2010), and a rural group at Ormesby St Margaret (Wallis and Anderson 2009). A large group from Rivenhall in Essex included medieval and later burials (O'Connor 1993) from a secular churchyard. Further afield, there are sizeable medieval churchyard groups from London (White 1988), Barton-upon-Humber (Waldron 2007) and York (Stroud 1993).

Number of individuals

The 19 graves contained a minimum of 19 articulated skeletons but, apart from Sk 14, all were substantially incomplete. Some had been cut by other graves and some by modern pipelines and footings. A few bones had been lost between excavation and analysis, including the skulls of Sk 8 and Sk 19.

It is much more difficult to determine a minimum number of individuals (MNI) for the disarticulated remains, due largely to the degree of fragmentation and dispersal of both bodies and bones. It was clear that many individuals were represented in the topsoil (1000) and cemetery soil (1016) groups, but the groups from possible charnel pits were also substantial and contained single bones of many individuals. Some of these bones may represent missing portions of the articulated group. In a few cases it was possible to pick out groups of bones which probably belonged to the same individual, for example grave fill 1052 contained part of a female skeleton (between the elbows and the knees), as well as the femora and one tibia from a child aged *c*.12–13 years. At least 34 skulls were present, but it is likely that many more individuals were represented by the disarticulated remains.

Condition

An assessment of the condition of the bone was made for each skeleton, although this is fairly subjective. The assessment of condition took into account the preservation of the bone, not the completeness or otherwise of the skeleton. One skeleton was 'very good', sixteen skeletons were considered to be in 'good' condition, one was 'fair', and one was 'fair–poor'. Generally there was a high degree of fragmentation, particularly of the torso of most skeletons, and a few had been affected by some surface erosion. The disarticulated material was also generally very well preserved.

Demographic analysis

A summary list of skeletons with age and sex is included in Table 1. Details of methods used for ageing and sexing individuals are recorded in the Appendix 3.

Juveniles

Three children below the age of 18 years were present in the articulated group, a proportion of 15.8%. Fragments of many more were represented in the disarticulated group, and an age could be estimated for some of these. Table 33 shows the distribution by age group. The disarticulated group provides only a rough quantification, but at least indicates the presence of children in all age groups. The totals suggest that mortality rates were similar in all age groups except the 16–18 year group.

Age group	Articulated	Disarticulated	Total	%
0-2		6	6	24.0
3-6	2	3	5	20.0
7-12	1	6	7	28.0
13-16		6	6	24.0
16-18		1	1	4.0

Table 33. Distribution of juvenile age at death.

The proportion of child burials in the articulated group was 15.7%, comparable with the priory population at Fishergate, York (15.5%) and higher than Ipswich Blackfriars (10%) but generally relatively low in comparison with other secular groups of the period. For example Ipswich St Margaret's articulated group contained 30% children, Wolsey Street medieval group 25.3%, Norwich St Faith's Lane 32.4%, St Margaret *in Combusto* 18.4%, London St Nicholas Shambles 17.5%, St Peter's Barton-upon-Humber 37.6% (under 15), Ormesby 27.4%, and as many as 50% in the medieval groups B and C at Rivenhall. Even amongst the disarticulated remains, the proportion of juvenile skeletal fragments appeared relatively low and was probably well below the 20–30% norm for the medieval period.

Adults

Sixteen individuals were over the age of 18 years at death. Seven were male, one was ?male and eight were female. The adult sex ratio is therefore 1:1.

Table 34 shows the distribution of adult age at death. Categories of age rather than actual age ranges are employed because estimation of adult age at death is difficult with currently available techniques. The data should be taken to represent *biological* rather than chronological age at death.

		Male		Female		Total	
Age group	**Approx age range**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Young	18–25	2	25.0	1	12.5	3	18.8
Young/Middle-aged	25–35	1	12.5	2	25.0	3	18.8
Middle-aged	35–45	1	12.5			1	6.3
Middle-aged/Old	45–55	2	25.0	4	50.0	6	37.5
Old	55+	2	25.0	1	12.5	3	18.8
Total		**8**		**8**		**16**	

Table 34. Distribution of adult age at death.

Three individuals in this group were categorised as 'old' and six were middle-aged or older. In urban populations of the medieval period, a high proportion of older individuals, particularly females, is often seen in high status cemeteries, for example at Wolsey Street in Ipswich (Group 2 medieval burials associated with a friary). In contrast, much higher proportion of the St Margaret *in Combusto* and St Nicholas Shambles groups were young adults, as were the small number of adults in the medieval groups at Rivenhall. Conversely, in the rural north Norfolk parish group from Ormesby, a relatively high proportion of the adult group reached old age. In terms of sex differences, older females are often more frequent in the monastic groups than the rural and urban secular groups, although the high proportion of young females in comparison with males at Barton-upon-Humber is suggested to be due to misdiagnosis of age, rather than to a genuine pattern of mortality (Waldron 2007, 36). Nevertheless, a high proportion of young females is often attributed to death in childbirth, and a low proportion of young women in a group may be indicative of a higher status population.

Metrical and morphological analysis

Tables of measurements and non-metric traits are provided in Appendix 3.

Stature

Estimated living stature could be calculated for thirteen of the adult skeletons. The mean of seven male estimates was 172.6cm (5' 8") and the range was 168.6cm to 184.7cm (5' 6" to 6' 1"). Five females produced an average of 163.0cm (5' 4") and a range of 157.8cm to 170.1cm (5' 2" to 5' 7). Both means are taller by 2–3cm than the contemporary groups at Ipswich Wolsey Street and Ormesby St Margaret, and by 3–5cm in comparison with the Norwich St Margaret *in Combusto* group, although the male mean is comparable with Ipswich Blackfriars (172.7cm). Seven males at St Saviour's, Bury St Edmunds, also had a mean stature of 172cm.

Cranial indices

Cranial indices could be calculated for six of the adult skulls, two male and four female. The average breadth/length index was 75.9, and the range was 72.7 to 79.1. The two male skulls had the lowest indices. The skulls were all dolichocranial (narrow) or mesocranial (medium width), which is unusual for a medieval group. The overall mean at Wolsey Street (Group 2) was 80.4, just within the brachycranial (broad) category, whilst at Ipswich Blackfriars it was 78.5, towards the higher end of mesocranial. Of nine skulls from St Saviour's Hospital, five were brachycranial and two were mesocranial. Broadness of the head has been linked with climate change (Beals *et al*. 1983) in different populations, with broader heads occurring more frequently in colder climates, but other factors, such as genetics, are also likely to play a part.

Non-metric traits

Non-metric traits are small asymptomatic deviations from the 'normal' skeletal anatomy and are scored on a present/absent basis. A number have been shown to be of genetic origin, and this may be the case for others. Tables of scores and percentages for each trait are included in the Appendix 3. Non-metric trait combinations in individuals may sometimes provide indications of family groups, but in this group there were no clear patterns.

Dental analysis

Thirty individuals, including disarticulated remains, had complete or partial dentitions. Of these, four were children. The adult individuals consisted of eight males, ten females and eight unsexed adults of various ages at death, but the group was too small for separation into sex or age categories.

If complete dentitions from all the adult individuals had been present, there would have been a total of 832 observable positions. However, 411 teeth/positions were missing and two were uncertain, leaving 419 observable positions. Ante-mortem loss was recorded in 39 positions; the ante-mortem tooth loss frequency for this group is therefore 9.3%. Eighteen abscesses were recorded, which gives a frequency of 4.3%. Post-mortem loss from assessable alveoli totalled 112. One tooth was

incompletely erupted, and five were congenitally absent. A total of 260 teeth were present. Eleven carious lesions in the surviving teeth gave a frequency of 4.2% for this dental pathology. These data is summarised in Table 35, along with prevalences from other medieval groups for which prevalences were available. This shows that rates for all three of the main dental diseases are highly variable. Generally the Crown Street group was at the low end of the range in comparison with contemporary groups, with ante-mortem loss showing the highest prevalence. This is probably related to the relatively high proportion of older individuals in the group.

Site	% caries	% abscesses	% A-M loss
Crown Street	4.2	4.3	9.3
Wolsey St Group 2	4.1	3.5	7.3
Ipswich Blackfriars	10.4	15.5	17.4
St Margaret *in Combusto*	9.1	4.0	-
Ormesby St Margaret	6.2	9.2	13.8
St Nicholas Shambles	5.5	-	7.6
Barton-upon-Humber	5.6	1.1	18.9

Table 35. Dental disease frequencies at Crown Street and contemporary sites.

Caries affected nine individual dentitions out of the thirty recorded, a prevalence of 30%. Only two individuals had more than one lesion, both with only two lesions affecting adjacent teeth. Seven individuals had abscesses, with three lesions present in one dentition, two lesions in two individuals, and the remainder with a single lesion each. At least five lesions were associated with carious teeth and two were below teeth which had been lost not long before the death of the individual. Several molar teeth had been partly lost before death, with partial closure of the alveolus. Twelve individuals had lost at least one tooth ante-mortem.

The carious lesions seen in this group all appear to have originated in cervical positions and some affected adjoining teeth as a result. This is typical of pre-modern groups.

The four juvenile dentitions added a further four deciduous teeth, and 12 erupted permanent teeth. No caries was present in any of these teeth, reducing the prevalence in erupted permanent teeth for the whole group to 4.0%.

The presence of calculus was recorded where possible, although this deposit is easily lost after burial. Four articulated individuals had slight deposits, three moderate and one considerable. The teeth in a fragment of adult ?male left maxilla in the disarticulated group (1014) were completely covered with a thick deposit of calculus. In general, thicker calculus was present where other dental pathology was evident, most likely due to pain and difficulties experienced by the individual when trying to chew on these teeth.

Alveolar resorption was noted as ‘slight’ in two cases, ‘moderate’ in two, and ‘considerable’ in three; it did not affect the two youngest adults or the juveniles. Again, the most notable examples were related to areas particularly affected by abscesses or dentitions with ante-mortem tooth loss. Pitting and new bone growth in at least one example indicated the presence of gingivitis or periodontal disease.

Enamel hypoplasia, a condition in which the growth of enamel is briefly interrupted due to illness or malnutrition, was not common in this group and only produced

shallow lines in the teeth of two individuals. Sk 14 and Sk 18 were both affected at *c*.3 years of age.

A congenital anomaly of the dentition, a supernumerary tooth, was noted in Sk 9. The individual had two normal-sized lateral incisors in the left maxilla (Plate 8).

Pathology

Congenital and developmental anomalies

Detached neural arch of the lumbar vertebra affected two individuals. Whilst this is often a congenital and/or developmental defect which occurs during the growth of the spine in childhood, sometimes the condition may be acquired through repetitive or acute trauma. Sk 9 was affected in the fifth lumbar vertebra and Sk 15 in the fourth and fifth (or possibly third and fourth as the fifth appeared to be fully sacralised; Plate 9). In the latter, degenerative joint disease was severe in the affected vertebrae, possibly partly related to the condition. Unfortunately it was not possible to determine whether the lesions were developmental or acquired, but it is interesting to note that Sk 9 was buried directly above Sk 15, perhaps suggesting a family plot. One other example of a detached neural arch was recovered from topsoil (1000).

A similar developmental condition in which the neural arch of the sacrum remains open, spina bifida occulta or cleft neural arch defect (Barnes 1994), affected two individuals (Sk 13 and 14) and a third (Sk 17) had a bifurcated neural spine of the first sacral segment. This condition is very likely to occur in families. Again, Sk 13 was buried directly above Sk 14. The condition itself would not have been noticeable in life.

One other minor congenital anomaly of the spine was noted in Sk 18, who had six sacral segments, instead of the usual five, and a full complement of spinal vertebrae.

Arthropathies and degenerative disease

Twelve individuals had changes which were related to degenerative joint disease (DJD), ranging from slight osteophytosis (OP) to Grade II/III osteoarthritis (OA). A systematic catalogue of osteophytosis and osteoarthritis of the spine is included in the archive, but generally the skeletons were too incomplete for statistical analysis. Individual cases are recorded in Table 36.

Sk	OP spine	OA spine	OP body	OA body	Other
1	not present		Slight OP R distal femoral condyle anterior, and inf edge of patella		
2	C1-4, C6, T3-4 bodies		Large OPs inf border L humerus head and all around scapula glenoid	OAII lateral clavicles and lesser tubercle of L humerus	New bone at muscle attachments both lateral clavicles and deltoid tuberosity of humerus
5	Rib lateral facets 4-5, 8 (large)				
8	T10, L3-5 bodies, one L rib with large OPs of facet		prox R ulna and hum trochlea posterior edge. L SIJ	V large OPs both with thickened new bone superiorly, sclerosis, prob OA	Enthesophytes linea aspera, gluteal tuberosity L femur, L patella, rear both calcaneums.
9	T8-9 bodies			OAII lateral R clavicle	
10	T11-L2 bodies			OAII lesser tubercle L humerus	
12	C6, T4-S1 bodies, v large on L2-L5 with new bone growth anterior bodies below the projecting OPs. OPs most rib facets		distal R radius joint with ulna (may not belong?)	OAII lat R clavicle and lesser tubercle humerus, also on L but humerus less affected	Cyst formation sup-lat edge R acetabulum and poss superior edge L with spiky new bone growth above it on L.
13	C5-T12, L3-S1, most rib heads/facets	OAII C6 sup body, C7-T1 bodies, L4-S1 bodies and R facets. OAIII L facets C4-5.	L scapula glenoid, L acetabulum rim, R slight	OAII L SIJ on ilium, OP of R SIJ. OAII and cysts L humerus lesser tubercle, partial destruction inf and sup edges. OAII sternum-manubrium joint	Slight new bone growth linea aspera. Large enthesophytes both calcaneums.
14	Small OPs T5?				
15	Large OPs and porosity on at least 2 mid T verts & T11-12	OAII C5-7 bodies. OAII L4-S1, large with reactive new bone growth anterior bodies		OAII lat R clavicle	
16	T4-5, T7-8, T10, T12 bodies				
18	some T vertebrae, generally small, larger on T11-12 with new bone growth anteriorly				Slight enthesophytes of patella

Table 36. Degenerative disease

Additionally, many stray vertebrae in the disarticulated group showed signs of DJD. One is of particular note: 1052 contained the partial remains (mainly the lower torso and upper legs) of an older female. The T4–7 vertebrae had small osteophytes, whilst those on the T12–L5 were larger and some of these vertebrae also had large Schmorl's nodes and possibly inflammatory changes. Unfortunately the section of spine from L3–S1 was in poor condition, but these vertebrae had ankylosed to form a solid mass of bone (Plate 10). The lack of fusion of the sacro-iliac joints and the remains of spaces between the vertebral bodies suggested that this was not caused by ankylosing spondylitis, and ankylosing hyperostosis was also unlikely as there were no profuse wax-like growths. Although the fifth lumbar and upper sacral area was in poor condition and mostly lost, it seems that there was a crush fracture of the fifth lumbar, which had fused to the sacrum, with complete fusion of the spinous processes and partial fusion of the vertebral bodies.

Sk 8 had very large ?enthesophytes or exostoses at the rear of the right ilium just above the acetabular rim, with cyst formation in both iliums towards the lateral sides (Plate 11). This is likely to be related to the arthritic changes in both hips (see Table 36).

Several individuals had large osteophytes of the lower vertebrae accompanied by new bone growth over the surfaces of the vertebral bodies, e.g. Sk 15 (Plate 12).

Osteoporosis was noted in old male Sk 10, who had very thin cortical bone throughout, but most noticeably in the ribs and spine. Some vertebrae were 'cod-shaped' with concave body surfaces, typical of the condition, and a crack in the twelfth thoracic vertebra was probably a pathological fracture related to the thinning of the bone (Plate 13).

Trauma and stress indicators

Twelve individuals amongst the articulated group could be assessed for Schmorl's nodes in one or more thoracic/lumbar vertebrae. Ten showed evidence for the condition, with particularly large lesions occurring in five. Those with the most severe examples were Sk 12 (male) and Sk 19 (female), both of whom were affected in the lower spine. Sk 19 had lesions from the fifth thoracic to the fifth lumbar, with some of the largest being between T11 and L4. Sk 12 was also most affected between T11 and L2, but the lower lumbar vertebrae of this individual were not assessable. Sk 18 also had lesions throughout the lumbar spine, and the fifth lumbar vertebra was wedged to one side. It is unusual to find such large lesions in the lumbar spine. The lesions are associated with physical stress on the spine, and often the same vertebrae are affected with DJD (see above).

Aseptic necrosis of the bone in the form of anterior epiphyseal dysplasia was noted in two individuals, Sk 14 (male) and Sk 17 (male), both affecting the eighth thoracic vertebra and accompanied by slight anterior wedging. Again this is likely to be related to physical stress on the spine. Osteochondritis dissecans is another aseptic necrosis of the bone which generally affected convex joint surfaces such as the femoral condyles (knee), and the humerus head (shoulder). In Sk 8 a small healed lesion was present on the lesser tubercle of the humerus.

Fractures were noted in five individuals. Sk 9 had a midshaft fracture of the left clavicle (Plate 14) which had healed with little distortion, although the shaft was thicker than the right. Sk 12 had a number of traumatic lesions affecting the torso: a fracture of the anterior end of one right rib, an exostosis on the superior edge of a mid right rib just anterior to the facet on the inner side, and a fracture across the body of the fourth sacral segment with fibre bone growth across the surface (Plate 15). A possible spiral fracture of the big toe was noted in Sk 13: the left proximal hallucial phalanx proximal facet had a deep Y-shaped crack running across whole facet, and the distal facet had a diagonal line running across it with small cyst formations (Plate 16). A hairline fracture across lower the lateral facet in the left acetabulum at the level of the superior edge of the ischial tuberosity was noted in Sk 15. As noted in association with DJD above, a fracture of the lower lumbar spine with subsequent ankylosis was noted in the disarticulated remains from 1052.

A first metacarpal found with Sk 16 (but which may not necessarily belong) was ankylosed to the greater multangular (Plate 17), although the latter was incomplete and the cause, although most likely to be traumatic, was uncertain and could be osteoarthritic.

Minor trauma in the form of a small exostosis on the superior edge, left side, of the first sacral segment body was noted in Sk 14, possibly caused by a torn muscle or ligament.

Deficiency disease

Cribra orbitalia, a porotic condition of the eye sockets which has been associated with iron deficiency anaemia, was noted in two individuals, Sk 6 (*c*.3–5) and Sk 14 (male, *c*.18–20), both with the minor 'porotic' stage of the condition. Six individuals could be assessed in the right orbit and seven in the left, giving a prevalence of 16.7% for the right and 28.6% for the left.

Possible evidence for rickets (Vitamin D deficiency) was found in Sk 19, who had lateral bowing of the distal portions of both humeri. This can be caused by early-onset rickets which affects the child before it can walk, when the weight is placed on the arms during crawling. A disarticulated femur shaft fragment from topsoil (L1000) was also severely bent and may be further evidence for the disease in this population.

Infections and inflammatory responses

Maxillary sinusitis was noted in three individuals, Sks 2 and 18 and a disarticulated fragment in 1005. In all three cases it was related to the presence of large abscesses. An inflammatory response in the form of pitting and new bone growth across the front of the palate of Sk 4 was probably also related to dental pathology, as this older female had lost most of her teeth ante-mortem. Conversely, the enlarged incisive fossa of palate noted in Sk 15 appeared to have been caused by a cyst or abscess in this position, but had not drained from any of the teeth in this area (Plate 18).

Sk 9 had sinusitis of the frontal sinuses, which were visible due to damage of the frontal bone in this area. There was new rounded bone growth and pitting in the right frontal sinus and partial on the left (Plate 19).

Periostitis of the lower leg bones is a relatively frequent finding in pre-modern populations. In this group it affected Sk 1 and Sk 7, and was also noted in disarticulated remains from L1014, 1019, 1038 and 1046. The anterior-lateral half of the left clavicle shaft of Sk 17 was slightly thickened with porosity, suggesting a periosteal inflammation in this area.

New bone formation on the inner surface of the ribs may be related to tuberculosis. In this group, Sk 5 had such small rounded warty new bone growth on the internal surface of the left 7th rib, but there was no other evidence for infection in this individual. A juvenile rib with fibre bone growth on the inner surface was a disarticulated find from L1014.

Three examples of ischial bursitis were found. Sk 12 (middle-aged male) was affected bilaterally with pitting and new bone formation on the right, and new bone on

the left. Sk 15 (middle-aged female) was only affected on the left, with rounded new bone and porosity. A fragment of right ischium with large osteophytes at the acetabular rim and small patches of porotic new bone growth on the tuberosity was recovered from grave fill L1021 but may belong to Sk 7. This condition is commonly known as 'weaver's bottom' and is an inflammatory response to repetitive movements whilst sitting on a hard seat.

Miscellaneous lesions

Three individuals had possible evidence for early fusion of the cranial sutures (craniosynostosis) or other cranial deformity, although none could be considered severe.

A ridge had formed along the endocranial surface of the sagittal suture of Sk 15 (middle-aged or older female), which may indicate that it had fused whilst growth of the parietal bones was ongoing. However, there was no distinctive keeling of the skull which might have suggested reduction in size or increased pressure on the brain.

The skull of Sk 11 (child, *c*.4-5) was very flat across the rear half of the parietals, which could be a result of post-mortem deformation but there was no sign of the cracking which would normally accompany this. Unfortunately the skull was incomplete so it is uncertain whether the deformity was pathological.

The cranial vault of Sk 16 (young/middle-aged female) was asymmetrical. There was a minor degree of post-mortem deformation in this case, but the left parietal was significantly rounded in comparison with the right, from the rear half onto the occipital bone, and there was asymmetry of the skull base (Plate 20). The cranial sutures were fully obliterated internally, although still patent externally.

Summary and discussion

The remains of nineteen articulated individuals and a large quantity of disarticulated bones were examined. The assemblage was generally in good condition but all skeletons except one had been truncated and were incomplete as a result. The articulated group consisted of three children under the age of 18 years, eight adult males and eight adult female. The male to female ratio was not statistically significant based on the adult skeletons. The excavated area represents only the edge of a much larger cemetery, but nevertheless the group appears to be a 'normal' population with no sex or age bias apparent.

The age ranges apparent amongst the articulated and disarticulated remains of children suggested that mortality rates were similar from birth to older adolescence. After this, the death rate seems to have reduced for the sub-adults and young adults, and increased again from middle age onwards.

Means of estimated living heights were above average for the period in both men and women, although groups from a medieval hospital in Bury St Edmunds and a friary in Ipswich were comparable for the male group. Cranial indices were on

average relatively narrow for a high medieval group and may suggest that the population was slightly earlier or later than this, or perhaps that this area was used by an extended family group. No particular evidence was found for family relationships in the non-metric trait distribution, although there was a suggestion of it based on congenital/developmental anomalies.

In general the dental health of this population seems to have been good in comparison with their contemporaries, with low rates of dental disease apparent. Where abscesses had formed in the upper jaws, these were often accompanied by infections in the maxillary sinus.

Pathological conditions noted in this group were most commonly those associated with older age and physical stress. There was limited evidence for metabolic disease in the form of iron deficiency anaemia and possibly vitamin D deficiency, and few cases of infectious or inflammatory disease.

Perhaps of most interest pathologically were the two older adult individuals, Sk 12 (male) and Sk 15 (female). Both had evidence for 'weaver's bottom' as well as signs of trauma in the pelvis – a fracture across the acetabulum in Sk 15 and a fracture and infection across the lower sacrum of Sk 12. Both had Schmorl's nodes of the spine, although most of the vertebrae of Sk 15 were too poor for assessment of this condition. However in both cases the condition was present in the lower lumbar vertebrae, which is relatively unusual in most populations. Sk 12 had degenerative joint disease in the neck, right shoulder, lower spine, wrist and hips, whilst in Sk 15 it affected the neck, right shoulder and lower spine. The chronic inflammatory condition of ischial bursitis has long been associated with weaving (e.g. Wells 1967; Kennedy 1989, 130) and other occupations which might involve prolonged sitting. The minor fractures in the pelves of these two individuals, accompanied by the bursitis and spinal conditions, may be indicative that they were involved in this type of work. Unfortunately a study of the few weavers identified amongst the post-medieval population at Spitalfields, London, did not provide any evidence for an association between osteoarthritis and occupation, although the report does not mention ischial bursitis (Waldron 1993).

The group as a whole shows some evidence for high status, in the form of taller than average stature and a high proportion of older individuals, particularly women. However, there is evidence of severe stress on the spine of some individuals, which is more indicative of manual labour. The large number of individuals represented by the disarticulated remains indicates that this part of the cemetery was well used over the centuries, and whilst there may be some indication of family plots amongst the latest incumbents represented by the less disturbed skeletons, it is likely that the area was used for burial of a broad cross-section of the population, as would be expected of a secular churchyard in the medieval period.

Plates Photos by C Van Selman

Plate 8. Additional lateral incisor in left maxilla of Sk 9.

Plate 9. Detached neural arches (spondylolysis) of the two lowest lumbar vertebrae of Sk 15.

Plate 10. Three views of the ankylosed sacrum and lumbar vertebrae from disarticulated 1052 (fill of Grave 19).

Plate 11. Fragments of pelvis showing osteophytes of acetabulums, exostoses of the right, and cyst formation in the broken fragment of the left ilium of Sk 8.

Plate 12. Lumbar vertebrae of Sk 15 with large osteophytes and new porotic bone growth on bodies.

Plate 13. Osteoporotic vertebrae of Sk 10, with crack in base of T12 to right, and large osteophytes with some new bone formation on the vertebral bodies.

Plate 14. Fractured right clavicle (bottom) of Sk 9, with left for comparison.

Plate 15. Fracture across fourth sacral segment of Sk 12, with fibrous new bone growth.

Plate 16. Healed fracture lines across proximal and distal ends of the proximal hallucial phalanx (big toe) of Sk 13.

Plate 17. First metacarpal with Sk 16, ankylosis to carpal (broken and largely missing).

Plate 18. Enlarged incisive foramen of Sk 15.

Plate 19. Rounded new bone in frontal sinus of Sk 9.

Plate 20. Rear, inferior and superior views of the skull of Sk 16 showing slight asymmetry.

3.5 The animal bone

Julia E.M. Cussans

Introduction

A small assemblage of animal bone is presented and discussed. The site lies on the western edge of the precinct of the Abbey of Bury St Edmunds and hence much of the material present may represents aspects of the monastic diet although, although features at the western side of the site are likely to be associated with properties of the lay community. Post-dissolution material is also likely to be present. In addition to the hand collected animal bone material, bone material collected from bulk sample residues (heavy fraction) and flots (light fraction) was also briefly examined and described. Bone material from flots all derived from grave fills and exclusively contained human bone.

Methods

The entire animal bone assemblage was scanned one context or context segment at a time and the results recorded on a bone scan pro-forma. The pro-forma took into account observations on bone condition including general preservation, colour, abrasion, fresh breaks and gnawing. Bone identifications were made using the in house reference collection at Archaeological Solutions and with the aid of reference manuals (e.g. Schmid 1972, Pales & Lambert 1971 a & b, Pales & Garcia 1981 a & b, Hillson 1992, Cohen & Serjeantson 1996). Mammal bones were quantified by species where possible or, where this was not possible, by size category, where large indicates cattle or horse sized, medium is sheep/goat, pig or large dog sized and small mammal is cat or hare sized. The presence of bird, fish and other small fauna could also be noted. For the identified mammal species the dominance of particular body parts was noted as was the presence of butchery, ageable mandibles and teeth, unfused epiphyses, measurable bones and those displaying pathologies. The presence of such features was noted in a semi-quantitative manner (none, few, some, many). Further to this, notes were made on any particular points of interest. The data were entered into an MS Excel spreadsheet along with context descriptions, spot dates and phasing to assist with data processing and analysis.

Following the original assessment domestic mammal assemblage was revisited to record further details on features of interest such as butchered, ageable or pathological elements. Butchery marks were recorded as knife cuts (KN) or heavy blade chops (CH) and their locations and possible functions described. Epiphysial fusion of long bones was assigned to age stages (Early, Intermediate, Late) following O'Connor (1989). No tooth eruption and wear data was available. Pathological lesions were located and described.

Results

<u>Taphonomy</u>

Bone preservation was rated as ok or good, with the majority of contexts being rated as ok. Bones were minimally abraded and fresh breakages were not particularly

common, attesting to the generally favourable state of preservation. A small quantity of gnawed bones was present (L1011, L1014, L1069) and were most likely gnawed by dogs. A single fragment of burnt bone was present (L1033), a large mammal rib fragment.

Feature	Context	Description	Spot Date	Preservation	Cattle	Sheep/ Goat	Pig	Cat	Large mammal	Medium mammal	Small mammal	Other Mam.	Bird	Fish	Total
1002	1003	Fiil of Grave		good		1		1		2					4
1006	1007	Fiil of Grave		ok	1		1			3			2		7
1008	1009	Fiil of Grave		ok			1			2					3
1010	1011	Fiil of Grave		good		1									1
1013	1014	Fiil of Grave		ok	1	1	2		5	3			1		13
1020	1021	Fiil of Grave		ok						2					2
1024	1025	Foundation Backfill	12th-14th C	ok						2			1		3
1029	1031	Fill of Cut	10th-12th C	ok		1									1
	1033	Modern Grey Bedding Layer	12th-14th C	ok					2	5	3	2	2		14
1039	1040	Fill if Grave		ok					1						1
1062	1063	Fill of Posthole		ok						1			1		2
1064	1065	Fill of Pit	15th-16th C	ok	1		1			5					7
	1066	Chalky Clay Layer	15th-16th C	ok					1						1
1067	1083	Fill of Cellar		good	4	8	2		14	11	1		3	1	44
1068	1069	Fill of Cellar Construction Cut	15th-16th C	good	2		1		4	5	2		1	1	16
1068	1099	Lower Fill of Cellar Construction Cut		good					1					1	2
1076	1077	Fill of Posthole		ok					1	1					2
				Total	9	12	8	1	29	42	6	2	11	3	123

Table 37. Quantification of hand collected animal bone from 4 Crown Street, Bury St Edmunds

Species present and quantification

In total 123 bone fragments were identified and recorded. The assemblage was largely dominated by domestic mammal bones, although bird bones were also fairly common; fish were also present. The assemblage was largely dominated by bones that could only be identified as medium or large mammal (Table 37). Identified domestic mammal taxa present, in order of abundance were sheep/ goat, cattle, pig and cat. A number of other small mammal bones were also present and largely determined to belong to rabbit and hence may have been intrusive. A selection of bird bones were present and will be described more fully below. A small number of fish bones were also present.

Cattle

Cattle were represented by a mix of elements. A single butchered bone was present – a nasal bone that had been transversely chopped through. Much of the cattle bone was noted as very young or neonate looking, an unfused distal radius (late fusing) was also present. No pathologies were noted on any of the cattle bones.

Sheep/goat

Sheep/goat are represented almost entirely by limb bones, with the exception of two foot bones. Three sheep/ goat bones were noted as butchered. These were a pelvis that had been sawn through, a tibia with diagonal cuts up the lateral shaft and a proximal humerus that had cuts all around the circumference of the shaft. The sheep/goat assemblage from L1083 provided a number of ageable long bones: unfused proximal femur (intermediate fusing), fusing distal tibia (intermediate fusing), fused proximal ulna (intermediate fusing), fusing proximal humerus (late fusing) and fusing distal femur (late fusing). These data would tend to suggest that the majority of the animals represented were sub-adult at death and would probably have provided prime meat. The presence of a slightly younger animal is suggested by the unfused proximal femur. No pathological elements were noted in the sheep/ goat assemblage.

Pig

Pigs were represented by a mix of elements and a number of butchered elements were present. These included a humerus with a chop into the shaft and a proximal tibia with cuts into the lateral shaft. The pig assemblages included a number of unfused bones including distal humerus (early fusing), pelvis (early fusing), two distal metapodials (intermediate fusing) and a distal tibia (late fusing). The presence of unfused early fusing bones indicates that some of the animals were particularly young at death. No pathological bones were noted.

Cat

A single cat tibia was present that had some possible cuts on the upper shaft; these may have resulted from skinning. No pathologies were noted.

Large mammal

The large mammal assemblage was largely made up of rib and long bone fragments. A number of the rib fragments had been chopped through; a chopped scapula was also present.

Medium mammal

Bone fragments identified as medium mammal were largely rib and vertebrae fragments a number of which had been butchered. Ribs had been chopped through transversely and vertebrae had been longitudinally split or chopped down the side. One rib that was found in two pieces in two separate contexts (L1065 & L1069) appeared to have been broken and at least partially healed during life.

Birds

A relatively large high number of bird bones were present and several taxa were represented. Chicken, goose and pigeon were all identified. Goose was represented by a single coracoid bone. Pigeon was represented by a humerus and two tibio-tarsi both of which had cuts around the distal end. Chicken was represented by a number of bones including an ulna containing medullary bone, indicating the presence of an egg laying female bird. A further chicken sized bird long bone fragment also contained medullary bone.

Residues and Flots

Bone recovered from bulk sample residues was briefly examined. The majority of bone fragments were indeterminate mammal fragments, there were however a few fragments worthy of further mention. Burnt bone fragments were recovered from Sample 9 (Fill of posthole L1063, calcined) and Sample 12 (Fill of cellar L1083, charred). Pig teeth were present in Sample 8 (Fill of grave L1061) and Sample 24 (Fill of posthole L1077). A fragment of dog maxilla, including teeth, was recovered from Sample 3 (L1038). Sample 12 (Fill of cellar L1083) contained a variety of interesting material including the mandible of a young dog, a cat tibia, a couple of rabbit bones and a large selection of small fish bones. Small pieces of human bone including phalanges and teeth were found in Sample 1 (Grave Soil Layer L1016), Sample 2 (Fill of grave L1023) and Sample 3 (Fill of grave L1038).

In addition to the bone from the residues a relatively large quantity of human bone was recovered from the flots (light fractions) of many of the bulk samples taken from grave fills. Details of samples involved and bones present are given in Table 38.

Sample No.	Feature	Context	Description	Contents
1	1010	1011	Grave	2 x phalanges
2	1022	1023	Grave	Long bone frag
3	1037	1038	Grave	Phalange, metapodials, carpals/tarsals, rib frags
4	1041	1042	Grave	Long bone frag, phalanges, carpal/tarsal
5	1051	1052	Grave	Phalanges, carpals/tarsals, indeterminate frags
6	1053	1054	Grave	Carpal/tarsal
7	1057	1058	Grave	Carpal/tarsal, indeterminate frag.
8	1060	1061	Grave	Ulna frag, carpals/tarsals, phalanges, rib frags.

Table 38. Human bones recovered from bulk sample flots.

Summary and Discussion

A selection of domestic mammal taxa were present, with sheep/goat, cattle, pig, cat and dog all being identified; domestic bird were also exploited as were some fish. Many of the animals may well have been raised in the Abbey precincts as plans of the Abbey grounds (St Edmundsbury Chronicle 2016) indicate the presence of a cow shed, dovecote and fishponds.

The presence of young/neonate cattle may indicate that dairying was practiced within the Abbey; however, the plans of the Abbey mentioned above do not indicate the presence of a dairy. A further possibility is that veal was being consumed. However, Sykes (2006, 57) notes that at some monastic sites high frequencies of calf bones have been linked to vellum production, for example, Green Shiel, Lindisfarne (Scott 2000, cited in Dobney *et al*. 2007) and Flixbrough (Dobney *et al*. 2007, 234f).

Sheep/goat do not appear to be represented by whole carcasses but more likely by prime meat joint and so may well have been brought into the site. The young age of some of the pig bones may indicate the consumption of suckling pig. Geese may have provided eggs, meat and feathers for quills (Albarella 2005). Chickens appear to have certainly provided eggs and likely also meat. Pigeons were likely raised in the dovecote (Serjeantson 2006, 141) and butchery evidence suggests that they were eaten.

Although small this assemblage gives a brief insight into the diet and economy practiced by the inhabitants of the Abbey and, from the features at the western side of the site, that of a small part of the lay community. However, in order to confirm and expand on any of the tentative interpretations offered above a much larger data set would be required.

3.6 Shell

Julia E M Cussans

A very small assemblage of marine shell was recovered from excavations at Crown Street. These derived from a small number of contexts which are described in Table 37 along with spot dates, preservation and quantification information.

The hand collected assemblage was examined one context at a time and data recorded on a shell scan spreadsheet. The shell scan took account of the state of preservation (very poor, poor, ok, good, excellent) and the occurrence of shell abrasion and fresh breakages on a semi-quantitative basis (none, few, some, many). The scan also recorded the presence and quantity of marine mollusc taxa. Bivalve left and right valves (or lower and upper valves in the case of oysters) were quantified separately, with no valve pairing being carried out. In order for a valve to be counted the umbo (area where the hinge is located) must be present. Any valve where the umbo was missing could only be counted as a fragment. Likewise for gastropods, in order to be counted the apex of the shell had to be present; all other pieces were counted as fragments.

For each of the identified taxa the presence of human modifications, signs of parasites or disease and measurable shells was noted in a semi-quantitative manner (none, few, some, many). Notes were made on any further points of interest. Scan data were recorded directly into an MS Excel spreadsheet along with context descriptions, spot dates and phase data, to aid later manipulation.

Two methods of quantification were used. NISP is the number of identified specimens – the total number of shell pieces present. MNI is the minimum number of individual organisms represented. For bivalves this is the number of left or right countable valves, whichever is the greater.

Shell preservation ranged from poor through to good with very little shell abrasion apparent and very few fresh breakages. The majority of the assemblage was made up of oyster shells (*Ostrea edulis*), but a small quantity of mussels (*Mytilus edulis*) were also present. No human modifications were noted on any of the shells, nor were any parasitic infestations. One of the oyster lower valves was noted as being particularly misshapen, possibly as a result of overcrowding. Two of the oysters and all of the mussels were noted as being covered in an orange, metallic crust or concretion; the cause of this is unknown.

It seems likely that both oysters and mussels were being consumed in the vicinity of the site and that they made up at least a minor part of the diet of the Abbey inhabitants

					Oyster					Mussel					Total	
Feature	Context	Description	Spot Date	Preservation	Lower	Upper	Frags	NISP	MNI	Left	Right	Frags	NISP	MNI	NISP	MNI
	1033	Modern Grey Bedding Layer	Late 12th-14th C	good	1	2		3	2				0	0	3	2
1039	1040	Fill of Grave		ok		1		1	1				0	0	1	1
	1066	Chalky Clay Layer	13th-14th C	poor			1	1	1				0	0	1	1
1067	1083	Fill of Cellar		good	5	5		10	5				0	0	10	5
1068	1069	Fill of Cellar Construction Cut	16th-18th C	ok	3	4		7	4	1	3		4	3	11	7
1076	1077	Fill of Posthole		poor			1	1	1				0	0	1	1
				Total	9	12	2	23	12	1	3	0	4	3	27	15

Table 39. Quantification of marine molluscs from 4 Crown Street, Bury St Edmunds

3.7 The Environmental Samples

Dr John Summers

Introduction

During excavations at 4 Crown Street, Suffolk, a site which incorporates the Abbey precinct wall, a small area of the Great Cemetery of St. James' and St. Mary's and areas of occupation associated with the lay community outside of the Abbey precinct, a number of medieval features and inhumation burials were encountered, along with a number of later medieval/post-medieval features. A programme of bulk sample recovery was implemented in order to gather an assemblage of carbonised plant remains that could provide insights into medieval diet and economy at the Abbey.

Methods

Samples were processed at the Archaeological Solutions Ltd facilities in Bury St. Edmunds using standard flotation methods. The light fractions were washed onto a mesh of 500µm (microns), while the heavy fractions were sieved to 1mm. The dried light fractions were sorted under a low power stereomicroscope (x10-x30 magnification). Botanical and molluscan remains were identified and recorded using reference literature (Cappers *et al.* 2006; Jacomet 2006; Kerney and Cameron 1979; Kerney 1999) and a reference collection of modern seeds. Potential contaminants, such as modern roots, seeds and invertebrate fauna were also recorded in order to gain an insight into possible disturbance of the deposits.

Results

The data from the bulk sample light fractions are presented in Table 40. In general, carbonised plant remains were well represented within the deposits, with carbonised plant macrofossils recorded in thirteen of the 22 bulk sample light fractions (twelve of the fourteen samples not from grave fills).

<u>Medieval</u>

The Graves

The fills of eight graves were sampled, primarily for the recovery of small bones and artefactual remains. Carbonised plant remains were uncommon within these deposits, except for L1023 (F1022). This grave fill contained free-threshing type wheat grains (*Triticum aestivum/ turgidum* type) and oat (*Avena* sp.), accompanied by medium legume (Fabaceae) and knapweed (*Centaurea* sp.). This material will have been derived from background scatters of carbonised debris either on the surface or within deposits disturbed by the digging and backfilling of the grave.

Other features

Nine samples were recovered from other non-grave deposits dating to the medieval period, with carbonised macrofossils recorded from all nine. Two of these were from Oven F1088 (L1089 and L1090). These produced small concentrations of carbonised cereal, including grains of hulled barley (*Hordeum* sp.), free-threshing type wheat (*Triticum aestivum/ turgidum* type) and oat (*Avena* sp.). Also present were seeds of goosefoot (*Chenopodium* sp.), vetch/ wild pea (*Vicia/ Lathyrus* sp.) and brome grass (*Bromus* sp.). Charcoal was common, including oak (*Quercus* sp.) and non-oak ring-porous types, although not abundant. The low density of remains from the feature indicates that it is likely to have been cleaned out following its final use. It is difficult to be certain that the remains recovered relate directly to the role of the oven on the site, which may have been generated by food preparation type activities in the vicinity.

A sequence of deposits (L1078-L1080) contained a range of cereal and non-cereal remains at a density of between 0.4 and 2.3 items per litre. Cereal remains were dominated by carbonised grains, including hulled barley (*Hordeum* sp.), free-threshing type wheat (*Triticum aestivum/ turgidum* type), oat (*Avena* sp.) and rye (*Secale cereale*), along with occasional rachis remains. In addition was a single pea (*Pisum sativum*) in L1078. Non-cereal remains included probable arable weed taxa (*Chenopodium* sp., *Rumex* sp., Fabaceae, *Centaurea* sp. and *Anthemis cotula*). Other plants included elder (*Sambucus nigra*) and great fen sedge (*Cladium mariscus*). The former could have come from areas of scrub, while the latter is likely to have been imported, being a common plant for thatch, floor coverings and fuel (Rowell 1986). The density of remains is too low to suggest a discrete dump of carbonised remains, rather they are likely to represent scattered debris from nearby activity.

The material from post pipe fill L1107 (F1097) contained a similar range of cereal and non-cereal taxa to the other medieval deposits. The samples from posthole fill L1077 (F1076) and posthole packing L1098 (F1097) contained very little of archaeobotanical interest.

<u>Later medieval to post-medieval</u>

Five samples were recovered from later medieval to post-medieval deposits. Carbonised remains were recovered from three deposits, although in generally low density. The richest deposit was fill L1069 of cellar construction cut F1068. This contsined hulled barley (*Hordeum* sp.) and free-threshing type wheat (*Triticum aestivum/ turgidum* type), along with medium legume (Fabaceae) and great fen sedge (*Cladium mariscus*). However, the density of this material was relatively low (1.05 items per litre) and there is the possibility that it could represent remains disturbed from earlier deposits during the construction of the cellar.

Discussion

The bulk sample light fractions from 4 Crown Street are of interest within the framework of better understanding medieval activity at Bury St Edmunds. They show that carbonised remains spread into the area and were regularly incorporated into the fills of features and other deposits, although the site was away from the core areas of activity within the Abbey precinct it lay within and close to areas of possible domestic occupation outside of the precinct. Oven F1088 also indicates that there was contemporary activity in this location, perhaps including food preparation activities, although the remains from the feature itself were ambiguous.

None of the samples were sufficiently rich to indicate the specific dumping of carbonised material in features on the site. However, carbonised cereal and non-cereal remains were commonly encountered, suggesting the deposition of mixed carbonised debris from nearby activity.

Situated as it is partially within the Great Cemetery, the present site would not have been a focal point for crop handling or food preparation/consumption activities. The fact that carbonised cereals were relatively well represented within the deposits is a testament to the intensity of activity within the Abbey precinct, leading to the widespread distribution and deposition of carbonised debris. Being on the edge of the Abbey precinct means that carbonised plant material within the western part of the site are likely to be derived from medieval settlement along Crown Street, although the Abbey wall is likely to have been a barrier to such deposition within the eastern part of the excavated site.

It is unfortunate that a wider range of non-cereal arable weed taxa were not present, most likely because grain was imported in a predominantly processed condition. This means it is difficult to identify whether a range of growing conditions are represented, signifying a wide catchment for imported cereals. Stinking chamomile (*Anthemis cotula*) was present in L1079, which reflects heavy loam and clay soils, and might reflect cultivated areas on the clay further east of Bury St Edmunds (cf. Summers 2013), although this evidence is limited at best. No other particularly characteristic taxa were identified. The Abbey controlled large tracts of land (*demesne*), from which it could extract tithes in the form of produce. The crops making their way to the Abbey would have been gathered from across the Abbey's *demesne* lands, which would have been used to sustain the population of the Abbey and sold to create funds for the institution. The Abbey itself had large granaries, a mill, a bakery and a brewery serving the Abbey's population, primarily situated away from the present excavation site in the north of the precinct. These would have received processed cereal crops from the surrounding farmland, which to an extent explains the paucity of crop processing by-products within the assemblage.

The archaeobotanical assemblage from Shire Hall, thought to be on the site of the former Sacrists Yard, produced a similar range of cereals (Summers 2013), although these do represent a fairly typical medieval assemblage (e.g.

Moffett 2006; Fryer and Summers 2016; Ballantyne 2005; Straker *et al.* 2007). As with the present site, wheat was dominant, representing the highest quality cereal for bread (e.g. Stone 2006).

Remains from later medieval to post-medieval deposits were lower in density and may also have contained residual material from earlier medieval activity. This suggests that there was less carbonised debris being deposited and less activity involving the use and processing of cereals in the vicinity of the site. This may reflect the decline in activity within the Abbey precinct following the Reformation.

Great fen sedge (*Cladium mariscus*), was an important managed fenland resource during the post-medieval period (Rowell 1986) and probably long before. Its presence in both the medieval and later medieval to post-medieval deposits indicates that this plant was being imported to the site during both periods. Fen sedge is commonly used for thatch, as well as floor covering and fuel.

Conclusions

The archaeobotanical remains from 4 Crown Street have provided a limited but useful insight into the distribution of the carbonised by-products from the use of crop plants across parts of the Abbey precinct beyond the key areas of monastic activity. The range of cultivated taxa was quite typical for the period, being dominated by wheat, as would be expected within a higher status site such as this and corresponding with results from the nearby Shire Hall excavations (Summers 2013). Crops would have been imported as processed products from the Abbey *demesne* lands but there was insufficient data to make a detailed examination of the source of the crops identified.

Site code	Sample number	Context	Feature	Description	Volume (litres)	Cereals			Non-cereal taxa		Hazelnut shell	Charcoal		Molluscs		Contaminants					Other remains
						Cereal grains	Cereal chaff	Notes	Seeds	Notes		Charcoal>2mm	Notes	Molluscs	Notes	Roots	Molluscs	Modern seeds	Insects	Earthworm capsules	
Medieval																					
BSE438	1	1011	1010	Fill of Grave	10	-	-	-	-	-		X	-	-	-	X	X	-	-	-	Bone (XX)
BSE438	2	1023	1022	Fill of Grave	20	XX	-	FTW (2), Trit (2), Oat (2), NFI (4)	X	Medium Fabaceae (2), *Centaurea* sp. (2)	-	XX	Diffuse porous	-	-	X	-	-	-	-	Bone (X)
BSE438	3	1038	1037	Fill of Grave	20	-	-	-	-	-		X	-	-	-	X	-	-	-	-	Bone (XX)
BSE438	4	1042	1041	Fill of Grave	20	-	-	-	-	-		X	-	-	-	X	-	X	-	-	Bone (XX)
BSE438	5	1052	1051	Fill of Grave	20	-	-	-	-	-		-	-	-	-	X	-	-	-	-	Bone (XX)
BSE438	6	1054	1053	Fill of Grave	10	-	-	-	-	-		X	-	-	-	X	-	-	-	-	Bone (XX)
BSE438	7	1058	1057	Fill of Grave	10	-	-	-	-	-		-	-	-	-	X	-	X	-	-	Bone (XX)
BSE438	8	1061	1059	Fill of Grave	20	-	-	-	-	-		X	-	-	-	X	-	-	-	-	Bone (XX)
BSE438	16	1089	1088	Fill of Oven	10	X	-	HB (1), Hord (2)	-	-	-	X	-	X	*Pupilla muscorum, Vallonia* sp.	X	-	-	-	-	-

BSE438	17	1090	1088	Fill of Oven	10	X	-	FTW (1), Oat (2), NFI (4)	X	*Chenopodium* sp. (1), *Vicia/ Lathyrus* sp. (1), *Bromus* sp. (1)	-	XX	*Quercus* sp. incl. RW, Ring porous	X	*Pupilla muscorum*	X	-	X	-	-	Bone (X)
BSE438	18	1078	-	Burnt Deposit	20	XX	-	Hord (3), FTW (2), Trit (1), Oat (1), NFI (11)	XX	*Pisum sativum* (1), *Chenopodium* sp. (1), *Rumex* sp. (1), Medium Fabaceae (1), *Centaurea* sp. (1), *Cladium mariscus* (1)	-	XX	*Quercus* sp.	XX	*Pupilla muscorum, Vallonia* sp.	X	-	X	-	-	-
BSE438	19	1079	-	Scorched Floor of Med Structure	20	XX	X	HB (2), Hord (2), Rye (2), NFI (4), Indet. Rachis (1)	X	*Sambucus nigra*(1), *Anthemis cotula* (1)	-	XX	*Quercus* sp.	X	*Pupilla muscorum*	X	-	X	-	-	-
BSE438	20	1080	-	Buried Soil	10	XX	X	HB (1), Hord (3), FTW (3), Trit (6), Rye (1), NFI (8), FTW rachis (1)	-	-	-	-	-	-	-	X	-	X	-	-	-
BSE438	22	1107	1097	Post Pipe	10	XX	X	Hord (3), Trit (1), Oat (1), NFI (3), Culm (1)	X	Large Fabaceae (1), Medium Fabaceae (2), *Centaurea* sp. (1), *Carex* sp. (2), Small Poaceae (1), Large Poaceae (1)	-	XX	Diffuse porous	X	*Vallonia* sp.	X	-	X	-	-	-
BSE438	23	1079	-	Scorched Floor of Med Structure	10	X	X	HB germ (1), NFI (2), Culm (1)	-	-	-	X	-	-	-	X	-	X	-	-	-

BSE438	24	1077	1076	Fill of Posthole	10	X	-	NFI (1)	-	-	-	XX	Ring porous, Diffuse porous incl. RW	-	-	-	-	X	-	-	-
BSE438	25	1098	1097	Packing	10	X	-	NFI (1)	-	-	-	X	-	-	-	X	-	X	-	-	-
Later medieval to post-medieval																					
BSE438	9	1063	1062	Fill of Posthole	10	-	-	-	-	-	-	XXX	*Quercus* sp. incl. RW	-	-	X	-	-	-	-	-
BSE438	11	1082	1081	Fill of Pit	10	X	-	Hord (1)	-	-	-	XXX	*Quercus* sp. incl. RW, Diffuse porous incl. RW	XX	*Oxychilus* sp., *Vallonia* sp.	X	X	X	-	-	-
BSE438	12	1083	1067	Fill of Cellar	10	-	-	-	-	-	-	XX	Ring porous, Diffuse porous	-	-	X	-	-	-	-	Bone (XX), Fish bone (X), Fish scale (X)
BSE438	13	1069	1068	Fill of Cellar Construction Cut	20	XX	-	HB (1), Hord (3), FTW (2), NFI (13)	X	Medium Fabaceae (1), *Cladium mariscus* (1)	-	XX	*Quercus* sp.	-	-	X	-	-	-	-	Fish bone (X)
BSE438	14	1066	-	Chalky Clay Layer	20	XX	-	Hord (2), NFI (3)	-	-	-	XX	Diffuse porous incl. RW	XX	*Oxychilus* sp., *Pupilla muscorum, Vallonia* sp.	X	-	X	-	-	-

Table 40: Results from the bulk sample light fractions from 4 Crown St., Bury St. Edmunds. Abbreviations: HB = hulled barley (*Hordeum* sp.); Hord = barley (*Hordeum* sp.); FTW = free-threshing type wheat (*Triticum aestivum/ turgidum*); Trit = wheat (*Triticum* sp.); Oat (*Avena* sp.); Rye (*Secale cereale*); NFI = not formally identified (indeterminate cereal grain).

4 DISCUSSION

4.1 The medieval burials

Twenty-five medieval graves were recorded during the course of the archaeological investigations conducted at Number 4 Crown Street. The remains of nineteen articulated individuals were recorded while four graves (F1002, F1004, F1013 and F1049) contained only disarticulated bone and a further grave (F1084) contained no evidence for burial at all.

Much intercutting was observed between the graves and several had been further truncated by later features. All of the articulated skeletons except one had been truncated and were incomplete as a result although the assemblage was generally in good condition. Of the 19 articulated skeletons, three were children under the age of 18 years, eight were adult males and eight were adult females.

The excavated area was located within, but close to the outer edge of, the area identified as the Great Churchyard, the lay cemetery associated with the adjacent churches of St James and St Mary, on Whittingham's (1952; Fig. 7) conjectured plan of the layout of the medieval Abbey complex. The monastic cemetery was located to the east, between the eastern end of the main Abbey church and the infirmary. It is therefore unsurprising that the burials consist of both male and female burials and those of children, indeed Anderson (Ch. 3.4) notes that the group appears to be a 'normal' population with no sex or age bias apparent.

Work conducted slightly to the north, at Norman Tower Cottage, just to the south of the Abbey's Norman Tower, in 2000 also recorded burials (Gaimster and Bradley 2000, 320). The twenty-seven skeletons recorded during this work, like the nineteen recorded at 4 Crown Street, included males, females, and children and on this basis it was considered that they represented townspeople, rather than members of the monastic community. Their identification as members of the lay community demonstrated that the Great Churchyard extended further than had previously been thought. As at the current site, part of the base of the precinct wall was recorded. At both sites, some of the burials were observed to be cut into this feature, indicating that burial had taken place after the wall was no longer in use (Greene 1992, 174). The burials at Norman Tower Cottage were considered to have occurred after the deliberate build-up of soil in and around the Abbey precinct which occurred towards the end of the 15th century but prior to *c*. 1540 when the building pre-dating Norman Tower Cottage was extended and the precinct wall demolished (Gaimster and Bradley 2000, 320). The limited artefactual dating associated with the burials at 4 Crown Street is not wholly in accordance with the chronology suggested for the Norman Tower Cottage site, although the relationship between the burials and the precinct wall might indicate some degree of contemporaneity. It is possible, however, that the very slightly more peripheral location of the Norman Tower site, in terms of the extent of the Great Churchyard, might indicate a slightly later date, as more land was incorporated for use for burials.

All of the identifiable burials were placed on a broadly west to east alignment (with the head at the western end of the grave and the feet at the east). The very slight exceptions to this were F1057 (Sk 18) and F1053 (Sk 16), which cut the earlier grave, and which were both positioned on a slightly more west-north-west to east-south-east alignment than the other graves. Similarly, all of the identified burials were placed in the grave in a supine extended position. There was some variation in the position of the arms, although most were placed by the sides of the body, and there is necessarily any significance in this. Skulls were also observed tilted to face in a variety of directions; this may be the result of post-depositional movement in the grave due to taphonomic factors and is, therefore, also likely not to be of significance. In terms of burial positions and alignments, all of the graves containing articulated individuals appeared to conform to what may be expected of a medieval Christian cemetery.

Grave F1035 contained Skeletons 10 and 11, the former an adult male of more than 50 years of age and the latter a child of 4 to 5 years. In Anglo-Saxon contexts, multiple burials are regularly observed. Double burials tend to be found side by side, representing contemporaneous burial (Lucy 2000, 82). Consecutive multiple burial, representing the reopening of a grave, as is the case with F1035, where SK 11 (the child) appears to have been buried prior the interment of SK 10 (the adult) has been shown to be much less common (Stoodley 2002, 106). The most common combination in Anglo-Saxon multiple burials is an adult with a child and this is often interpreted as a mother and child but examples where this cannot be the case are known (Lucy 2000, 82). It is reasonable to suggest that similar practices may have occurred in some circumstances in medieval contexts such as this. However, this burial clearly did not consist of a mother and child (although potentially it could have been a father or grandfather and child) and as the burials appear to have been carried out consecutively, rather than contemporaneously, the notion of the child being placed into the care of the adult in the grave, as is suggested in Anglo-Saxon contexts, appears not to have been the reason behind this particular multiple burial. It is possible that the grave represents a family plot, with the consecutive burial of two people from the same family.

Three graves, F1022 (Sk 9), F1053 (Sk 16), and F1057 (Sk 18), contained evidence to indicate that these were coffined burials. No such evidence was recorded in association with the other graves but neither did these graves contain evidence for the use of shrouds. The use of coffins and the general absence of grave goods with the burials are normal features of medieval burial practice (Gilchrist and Sloane 2005, 111-116). Medieval beliefs about the afterlife were encapsulated not so much in the treatment of the corpse as in the resources devoted to supporting ongoing intercession on behalf of the soul in purgatory (O'Sullivan 2013, 274). This is why graves of this period, regardless of the social standing of the interred, are not furnished or endowed with grave goods.

Anderson (Ch. 3.4) notes that the burial group as a whole shows some evidence for high status, in the form of taller than average stature and a high proportion of older individuals, particularly women. Conversely though, the

evidence for severe stress on the spines of some individuals is more suggestive of manual labour and therefore a lower social standing. All respectable members of the parish community could reasonably expect to be buried within the churchyard, no matter what their position in society (O'Sullivan 2013, 274). This could explain why the burial group represented at 4 Crown Street displays evidence suggestive of both elevated status and hard working lives.

Graves in medieval churchyards were probably only temporarily marked to the extent that the buried corpse would have created a low mound. It is not clear how long burials were left undisturbed but preferential locations were often reused (O'Sullivan 2013, 274). This lack of marking and the reuse of particular areas may go some way to explaining the intercutting of the graves present at the current site. Bones disturbed by this practice were often left in the ground but could be collected together in an ossuary or, as often happened during building campaigns, in a charnel pit (O'Sullivan 2013, 274). Graves F1002, F1004, F1013, and F1049, which were observed to contain only disarticulated remains from numerous individuals (see Anderson Ch. 3.4), and the latter two of which are notably early in the stratigraphic sequence, would appear to represent such practices.

4.2 Other medieval activity within the Abbey precinct

Within that part of the site representing the confines of the abbey precinct (the exterior excavation area) features other than graves were not observed. Therefore, little information regarding this part of the abbey's grounds, beyond their use for burial, was apparent. The presence of small quantities of animal bone and charred plant remains in these graves, however, gives some indication of other activities that may have taken place within the abbey. This material must have derived from other process and represent accidental incorporation in to the grave fills but potentially represents food processing refuse associated with the running of the abbey and the households therein.

The only grave to contain significant carbonised plant remains was F1022. This grave fill contained free-threshing type wheat grains, oat legume and knapweed. Overall, the archaeobotanical assemblage was dominated by wheat which may be considered typical for a high status monastic site and which is similar to what was observed at the nearby Shire Hall site, which is considered to be the location of the Sacrist's yard (Summers 2013).

The small quantities of animal recovered from the graves represent cattle, sheep/goat, pig, cat, large mammal, medium mammal, and bird. With the exception of cat, all of these animals were potentially utilised for food and other resources and could be indicative of the diet of the inhabitants of the monastic complex.

4.3 Medieval activity beyond the precinct wall

The medieval archaeology recorded within the interior excavation area represents activity which occurred outside of the Abbey's precinct wall. While activity associated with the functioning of the Abbey, such as the Sacrist's yard, did occur outside of the precinct wall (Carr and Gill 2007, fig. 3; Newton 2013), Crown Street is understood to have been lined with properties tenements which suggests that this activity was associated with the lay community of Bury St Edmunds.

Amongst the stratigraphically earliest of these features was F1108, which was not subject to full excavation but which appeared to represent a backfilled cellar (or similar) abutting the Abbey precinct wall. This, along with the apparently isolated posthole F1093, might indicate that buildings were constructed against or right up to the precinct wall. Alternatively, this may have been a pre-existing feature representing a building demolished to make way for the precinct wall which was built in the 12th century. Gauthiez (1998, 93) suggests that because Crown Street, along with the southern part of Church Govel Street and the western side of Angel Hill, do not correspond to regular lines plotted from the Norman town axis they may represent traces of the earlier Saxon town. If this is the case, there is a potential for these stratigraphically early features to represent elements of the pre-Norman town. Indeed, the Norman enlargement of the abbey and the development of the Norman new town required the acquisition of the surrounding tenements and the destruction of large parts of the existing town to make way for the new developments (Gauthiez 1998, 94).

Several stratigraphically later features provide little information about the precise nature of the medieval activity that occurred in this area but the presence of oven F1029=1088 is suggestive of domestic occupation. Only a low density of archaeobotanical remains were recovered from this feature suggesting that it is likely to have been cleaned out following its final use. It is most likely that the oven was used for food preparation purposes but the precise nature of these activities, whether for parching grain, toasting malt, or baking, is not betrayed by the environmental evidence recovered from it. If it is assumed that any activity outside of the precinct wall represents the lay community of Bury St Edmunds, then the presence of domestic features here is of note as it suggests occupation immediately adjacent to the precinct wall, which may be considered to be supported by documentary evidence.

Eastgate Street and Angel Hill, the latter of which effectively forms the northern continuation of Crown Street, are considered to correspond to a *non aedificandi* area around the Abbey precinct, which may have been used for fairs (Gauthiez 1998, 93-94). It is possible that semi-permanent structures, and ovens associated with preparing hot food for sale at events of this type, may have been present at the margins of such an area. The prevention of development against or in close proximity to the walls of religious institutions like this is noted elsewhere. In Gloucester, for example, domestic plots in the vicinity of St Peter's Abbey appear to have backed on to a narrow lane running around the precinct walls (Baker and Holt 2004, 45). To the north of the Abbey of St Edmund, such development may have been prevented by the ditch that has

been noted running parallel to the precinct wall (BSE 172). However, it appears that such development may not have been prevented in the area of Crown Street. Gauthiez (1998, 94) suggests that it was less likely for an open space like this to have been established further south due to this part of the town being more densely occupied and therefore, domestic development may have occurred in direct proximity to the precinct wall; it is noted that many buildings on Crown Street had to be rebuilt following the during the townspeople's revolt of 1327 and it is known that an earlier building on the site of the nearby Norman Tower Cottage was extended around 1540 and therefore in the immediate wake of the dissolution of the abbey (Gaimster and Bradley 2000, 320).

Breen (2007), quoting a document dated to 1663, notes that a brewhouse, bakehouse, and kitchen, amongst other elements, formed part of 'the mansion for the sacrist's household without the wall' (i.e. the Sacrist's yard at the New Shire Hall site (Newton 2013)). It is, therefore, possible that kitchens or bakehouses belonging to the households of other offices of the monastic community could have been situated beyond the limits of the precinct wall. However, other documents, specifically the Sacrist's rentals from 1386 and 1433 (Cambridge University Library Mm FF ii 33 fols. 150r-154r and BM Harley 58), have entries under the heading '*Ad gabulum ecclesie Beatie Marie'* which are understood to relate to properties on the east side of Crown Street immediately south of the Norman Tower (Abby Antrobus *pers. comm.*). These documents variously describe the properties in this area as being 'under the wall of the cemetery', 'under the wall of the church', and 'under the wall of the church of St Mary', which suggests that they were constructed immediately adjacent, or in close proximity, to the precinct wall. The occupations of the individuals renting these properties are given as 'coteler' (cutler), 'smith'/'smyth', and 'glover', indicating that they were most likely to have been members of the lay community, although such trades could have been in the, perhaps indirect, employ of the monastic community.

The part of Crown Street within which the excavation site lies would have been prime land outside the Abbey precinct and it is likely that that tenements and properties were created here to maximise income from the frontage (Abby Antrobus *pers. comm.*).

4.4 Later activity beyond the precinct wall

Later activity recorded in the interior excavation area has been assigned a date, based on artefactual evidence, in the 14th to 16th centuries. The most significant aspects of this activity were floor surface or levelling layer L1066 and cellar M1067. Both the floor layer and the fill of M1067 were cut by later features.

Two large pieces of worked stone were recovered from M1067 and it is thought possible that they were used as part of the cellar floor or potentially elsewhere in its construction. They are of a soft form of limestone, probably Totternhoe stone/clunch, and appear to have come from the same orginal structural feature. Their most likely origin is the Abbey itself. Similarly, the floor tile bearing

fleur-de-lis and *lion rampant gourdant* designs that was recovered from M1067 is most likely to have come from Abbey buildings or from the nearby St Mary's Church. It is possible that all of this material became available for re-use following the rebuilding work that was required as a result of the 'Great Riot' of 1327, following the renovation of St Mary's between 1425 and 1435, or as a result of the dissolution of the Abbey which occurred in 1539 and pottery dates associated with this context would support an association with any of these events. From the available artefactual and stratigraphic evidence it is not possible to tie the Phase 2 activity definitively to any of these events. However, the building which preceded the extant Norman Tower Cottage, just to the north of Number 4 Crown Street, is understood to have been extended in or around the year 1540 (Gaimster and Bradley 2000, 320). This event is, therefore, broadly contemporary with the dissolution of the Abbey in 1539 and it is possible that this was not the only development which occurred in this area in the wake of this event. On this basis, it is suggested that the Phase 2 activity recorded at 4 Crown Street may relate to near-immediate-post-dissolution development at the margins of the abbey precinct.

5 CONCLUSION

Archaeological work at Number 4 Crown Street, Bury St Edmunds provided an opportunity to examine the area straddling the precinct wall of the former Abbey of St Edmund. The two distinct excavation areas represented an area at the immediate edge of the abbey's ground and an area immediately outside the confines of the abbey.

It is known that the area within the abbey represents part of the 'Great Churchyard' associated with the abbey and in which members of the town's lay community were buried. The archaeology recorded in this area, comprising male, female and child burials, demonstrates that this was indeed the case. Although the majority of these burials are considered to be medieval in date, stratigraphic differences between them and clear intercutting of graves suggest that they were buried over a significant enough period of time for the precise positions of earlier graves to have become obscured or forgotten. The fact that some graves were observed to partially cut features representing the abbey's precinct wall, which is understood to have been demolished *c*. 1540, at the same time that a property slightly further to the north on Crown Street was extended, and just after the abbey was dissolved, suggests that these may represent Tudor or post-medieval burials.

The archaeology represented on the outer side of the precinct wall is suggestive of domestic occupation in this area. There is nothing within the recorded archaeology to indicate whether or not the medieval features recorded in this area represent dwellings/structures belonging to Bury St Edmunds' lay community or if they represent activity directly associated with the monastic community, although documentary evidence may indicate the former. Later activity in this area is suggested to represent early post-dissolution redevelopment at this location, as is suggested by the re-use of building materials that are likely to have come from buildings forming part of the abbey.

This activity is likely to be broadly contemporary with the later burials recorded on the other side of the precinct wall.

ACKNOWLEDGEMENTS

Archaeological Solutions would like to thank Mr & Mrs Michael Watson for commissioning the work.

AS would also like to acknowledge the input and advice of Abby Antrobus of the Suffolk County Council Archaeological Service Conservation Team.

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9
Grave 1059 with Sk.19 looking west

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Fig. 1 Site location plan

Scale 1:25,000 at A4

Crown Street, Bury St Edmunds, Suffolk (P5559)

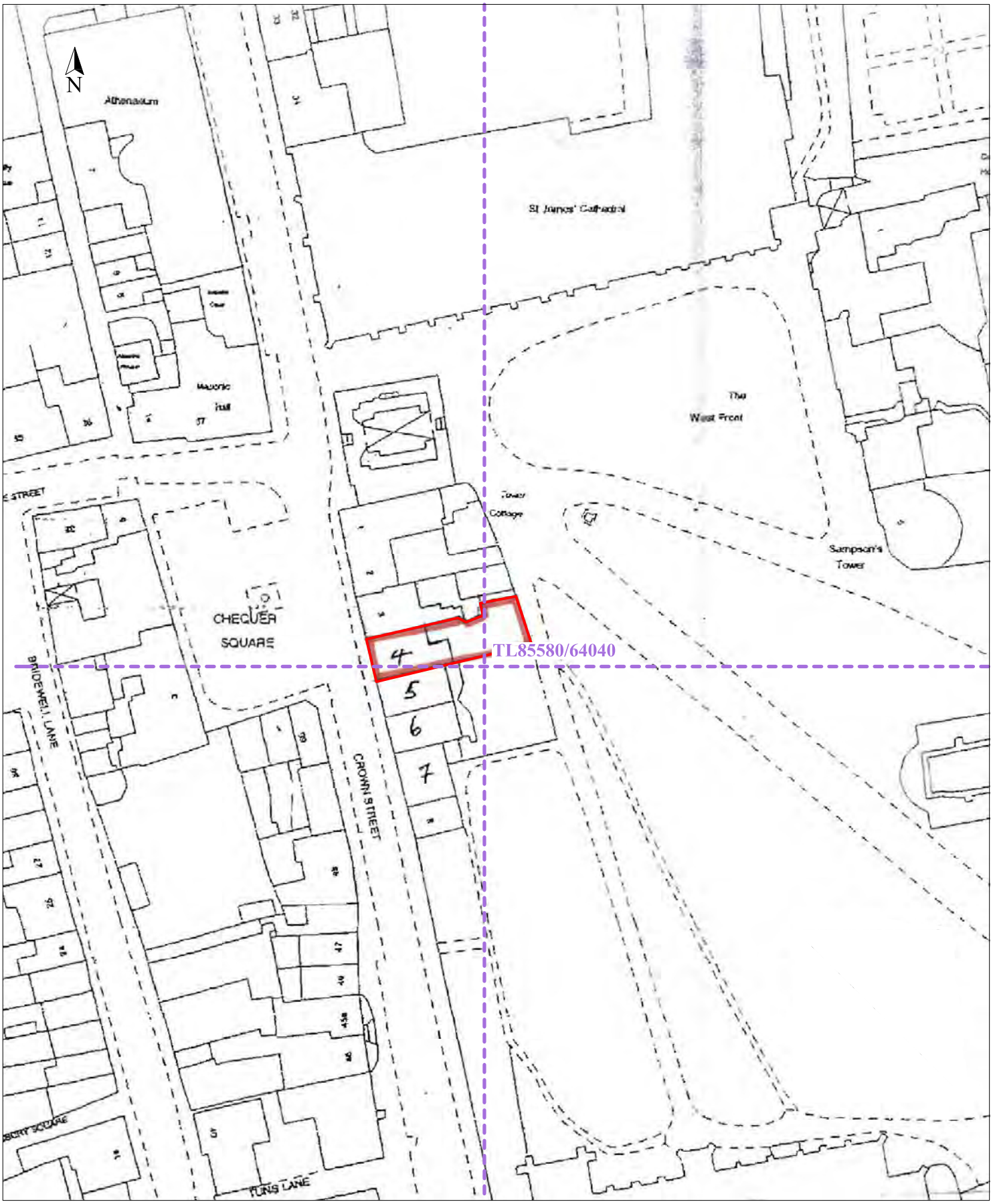

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Fig. 2 Detailed site location plan

Scale 1:750 at A4

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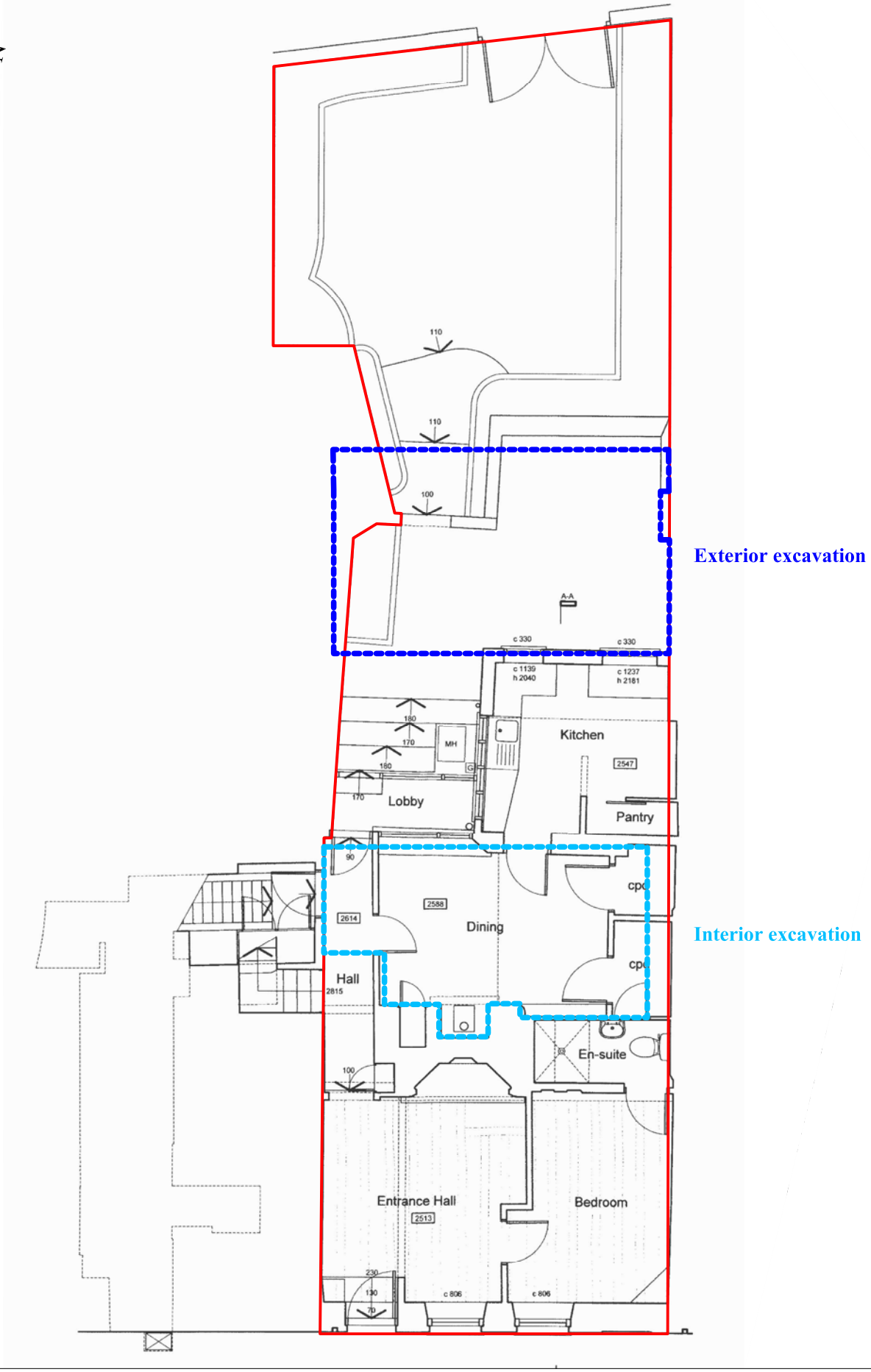

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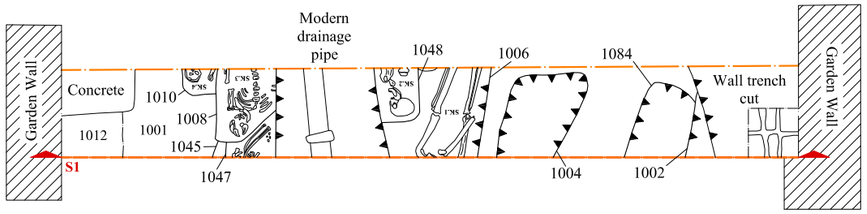
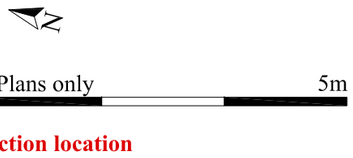
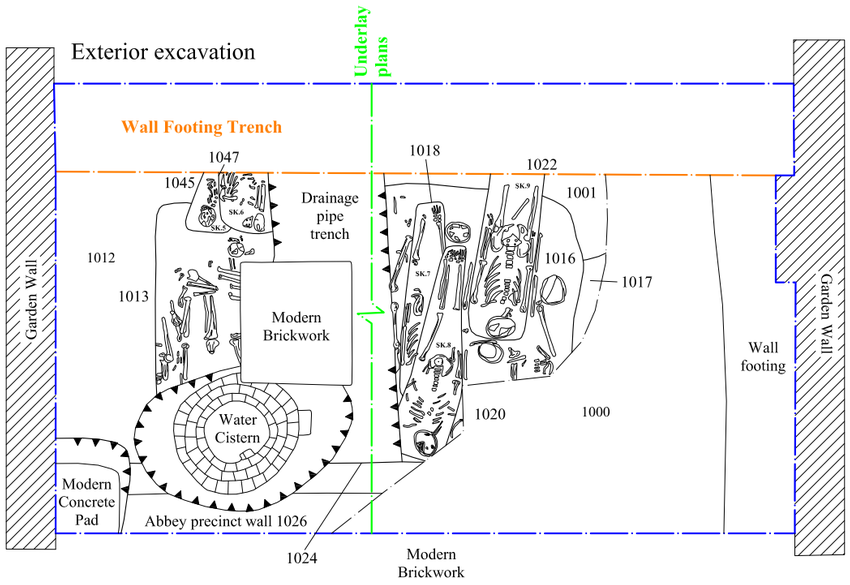
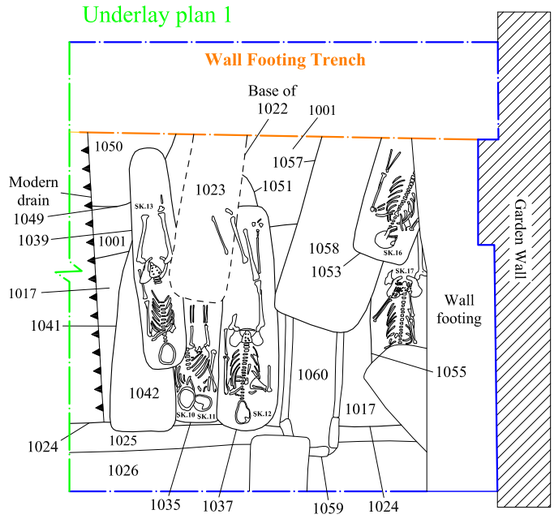
Fig. 3 Areas monitored plan
Scale 1:100 at A4
Crown Street, Bury St Edmunds, Suffolk (P5559)

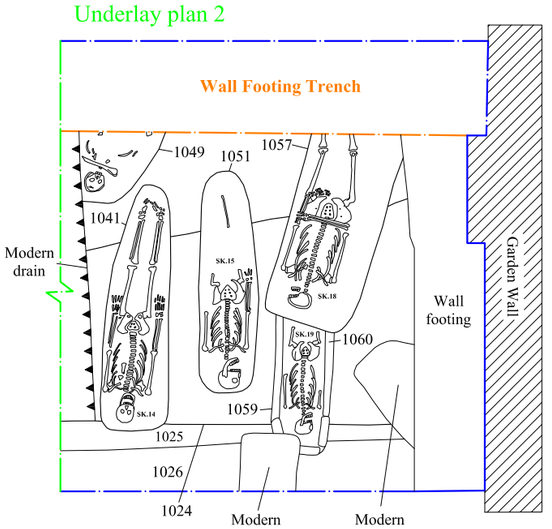
Wall Footing Trench plan











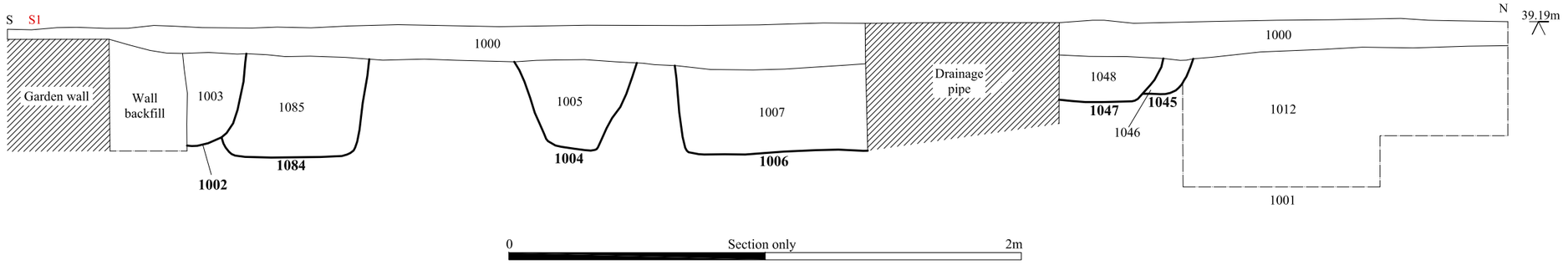


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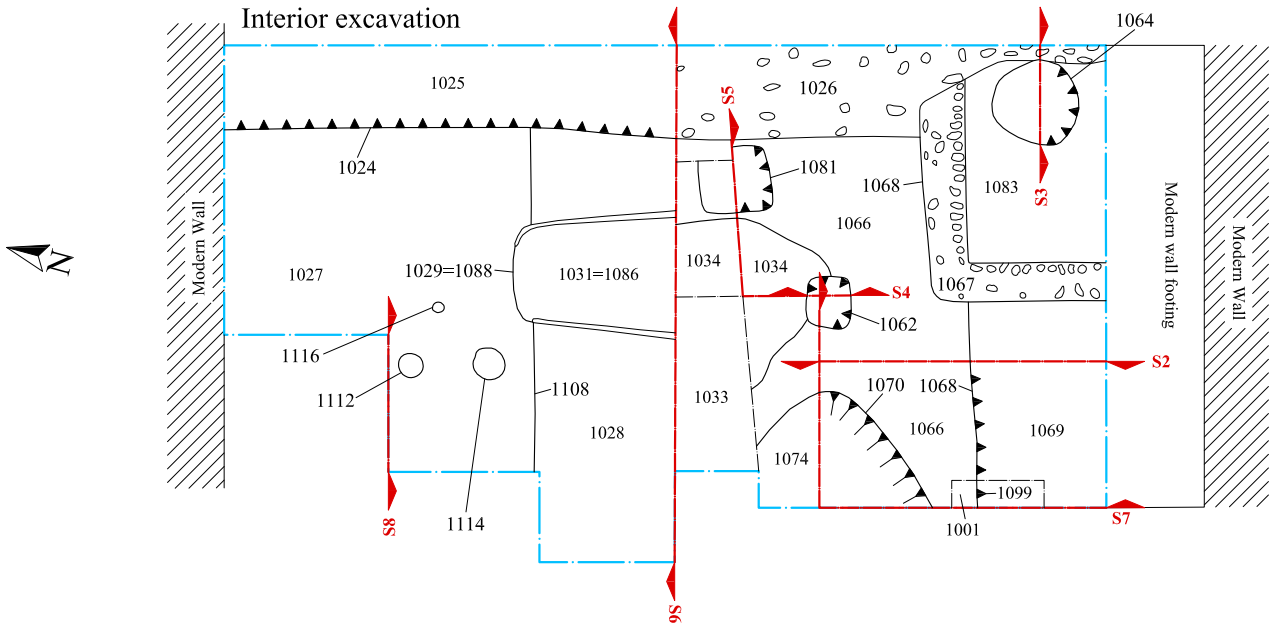
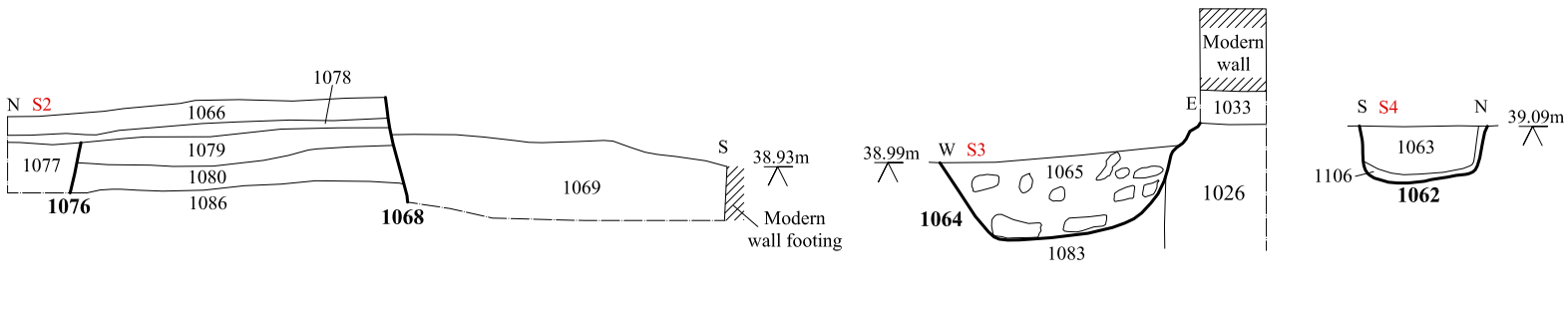
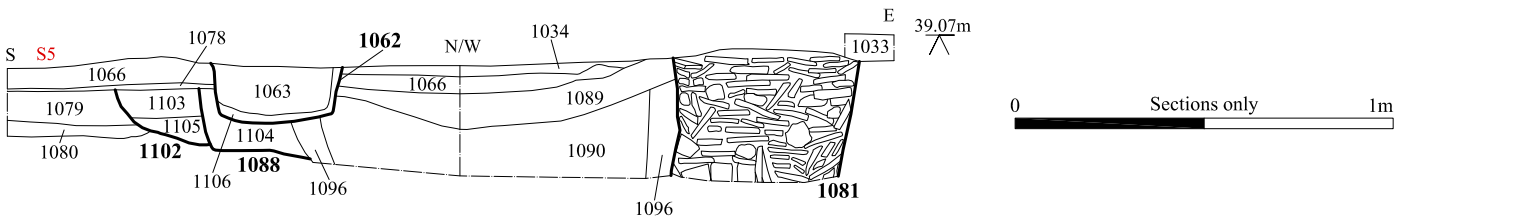
Fig. 4 Exterior excavation plans and section
Scale 1:50 and 1:20 at A3
Crown Street, Bury St Edmunds, Suffolk (P5559)



0 Plans only 5m

S= Section location





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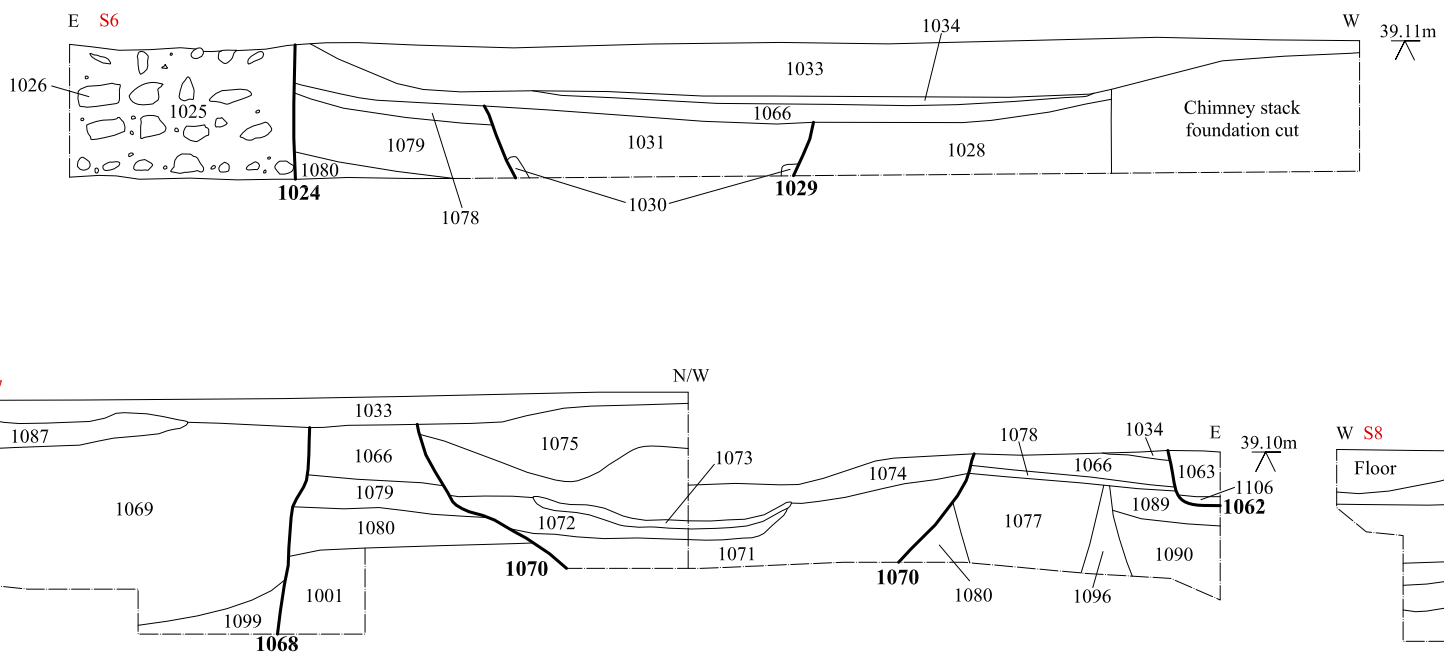
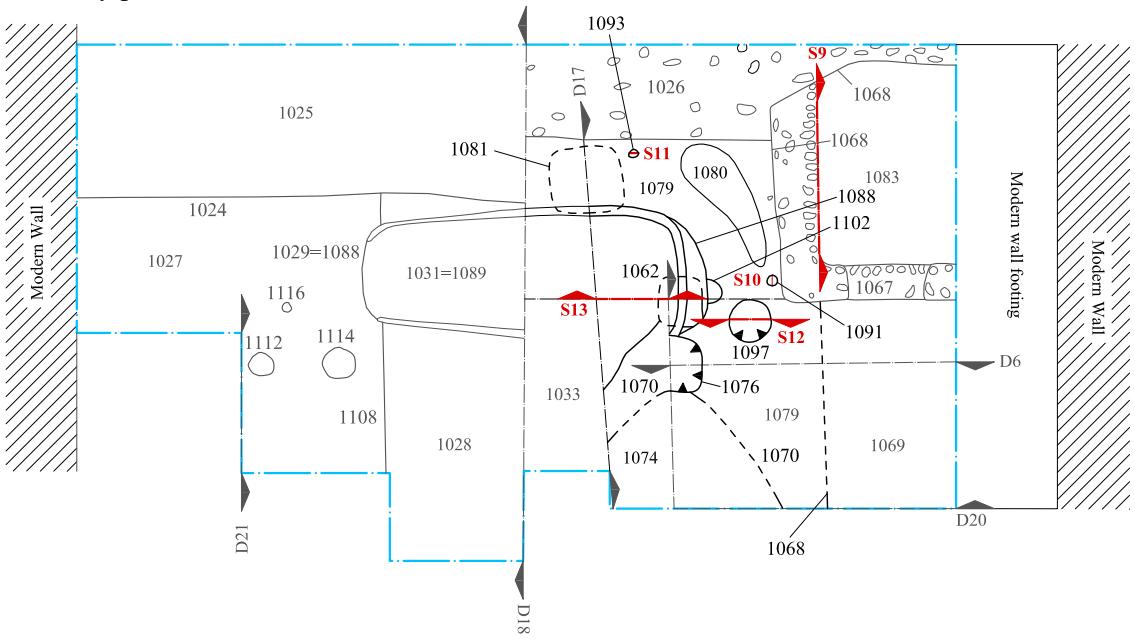
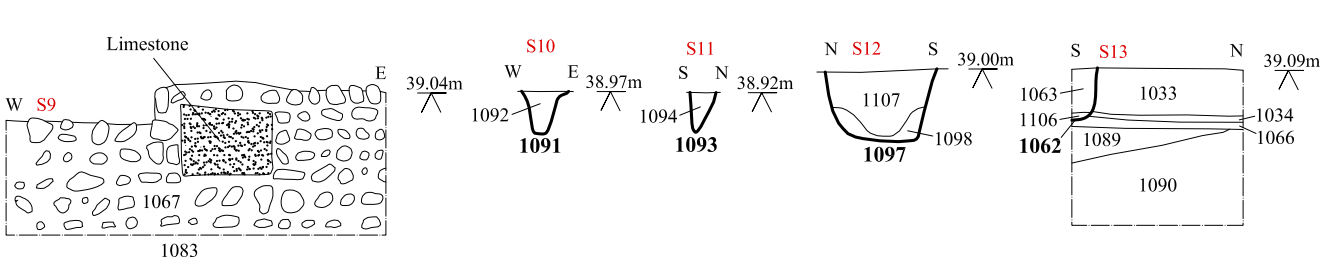


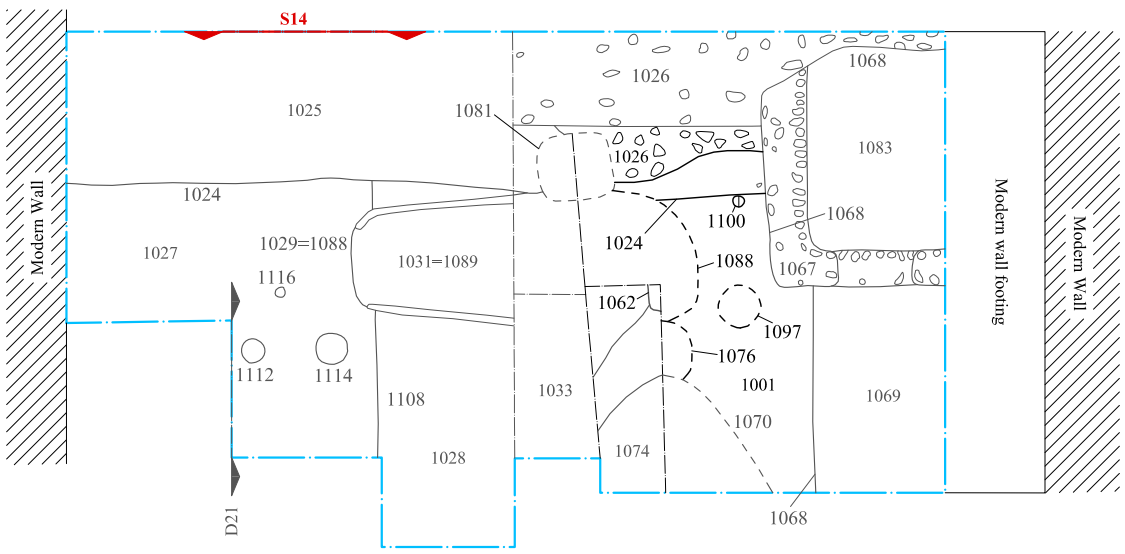
Archaeological Solutions Ltd
Fig. 5 Interior excavation plan and sections
Scale 1:50 and 1:20 at A3
Crown Street, Bury St Edmunds, Suffolk (P5559)

Underlay plan 1



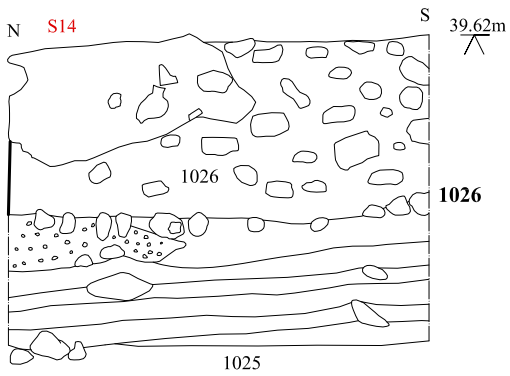


Underlay plan 2



0 Plans only 5m

S= Section location



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Archaeological Solutions Ltd

Fig. 6 Interior excavation plans and sections

Scale 1:50 and 1:20 at A3

Crown Street, Bury St Edmunds, Suffolk (P5559)