Excavation Report

Ramsey Abbey: Excavations at Ramsey Abbey School, Cambridgeshire, 1998-2002

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Client: Cambridgeshire County Council

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Ramsey Abbey: Excavations at Ramsey Abbey School, Cambridgeshire, 1998-2002

Full Report

Rob Atkins and Stephen Macaulay, with Paul Spoerry and Elizabeth Shepherd Popescu

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Site Code: RAS AB 98 and 02
CHER Event Numbers: ECB 735 (1998) and 3007 (2002)
Date of works: 14th April to 1st June 1998 and 25th September to 19th October 2002
Grid Ref: TL 2931 8512 and TL 2932 8515

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OA East OASIS Report Form **OASIS Number: Cambridg1-45502**

PROJECT DETAILS				
Project name	Ramsey Abbey School			
Short description	Excavations at Ramsey Abbey in 1998 and 2002 were conducted by OA East (formerly Cambridgeshire County Council's CAM ARC). The excavated area covered part of the former abbey precinct, with a new school building being built in 1998 and a related extension in 2002. Four main phases of Late Saxon to medieval activity were revealed, the earliest being two or three small timber buildings of possible domestic origin in the extreme south of the site, with an adjacent field boundary ditch. The buildings were replaced by a short-lived large enclosure containing an internal watering hole. During the 12th century the house was captured, looted and fortified by Geoffrey de Mandeville. Perhaps dating to this time was a large defensive ditch and associated bank. A trackway may have led towards a large building possibly used as a storehouse well as two other structures. A lode was later constructed and presumably connected to other lodes within and around Ramsey, permitting goods to be brought to and from the abbey. A possible crane may have been used to off-load goods. At the dissolution the lode was backfilled with domestic rubbish from the abbey and demolition rubble was strewn across the site. The area reverted to agricultural land until it recently became part of the land held by Ramsey Abbey School.			
Project dates	Start	1998	End	2002
Previous work	CHER ECB 347 (1996), 2221 (geophysics),		Future work	Unknown
Associated project reference codes	RAS AB 98 and 02 (ECB 735 and 3007)			
Type of project	Excavation			
Site status	SAM Cambridgeshire 14			
Current land use (list all that apply)	School			
Planned development				
Monument types / period (list all that apply)	Remains associated with medieval and later Benedictine monastery Should use thesaurus of monument types			
Significant finds: Artefact type / period (list all that apply)	Relief decorated tiles Should use MDA object thesaurus			
PROJECT LOCATION				
County	Cambridgeshire	Parish	Ramsey	
HER for region	Cambridgeshire			
Site address (including postcode)	Ramsey Abbey School			
Study area (sq.m or ha)				
National grid reference	TL 2931 8512			
Height OD	Min OD	5m OD	Max OD	6m OD
PROJECT ORIGINATORS				
Organisation	OA East			
Project brief originator				
Project design originator	Stephen Macaulay			
Director/supervisor	Stephen Macaulay			
Project manager	Paul Spoerry/Elizabeth Popescu			
Sponsor or funding body	Cambridgeshire County Council			
ARCHIVES	**Location and accession number**		**Content (e.g. pottery, animal bone, database, context sheets etc)**	
Physical	OA East Bar Hill		Metalwork, slags, pottery, cbm, architectural stonework, faunal remains, plant macrofossils	
Paper	OA East Bar Hill		Site records, specialist reports, other archive reports	
Digital	OA East Bar Hill		Specialist reports, other archive reports, site databases, records and drawings	
BIBLIOGRAPHY				
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Summary

Excavations at Ramsey Abbey in 1998 and 2002 were conducted by OA East (formerly Cambridgeshire County Council's Archaeological Field Unit – CAM ARC). The excavated area covered part of the former Benedictine abbey precinct, with a new school building being built in 1998 and a related extension in 2002.

Four main phases of Late Saxon/Saxo-Norman to medieval activity were revealed. The earliest remains included two or three small timber buildings of possible domestic origin in the extreme south of the site, with an adjacent field boundary ditch. These features may represent the early settlement focus of the abbey which later moved further north. The buildings were replaced by a short-lived large enclosure containing an internal watering hole. Secondary evidence for ironworking nearby was present. Boundary ditches were dug in the centre of the excavation area, with another building to the north.

During Stephen's reign the house suffered severely when it was captured, looted and fortified by Geoffrey de Mandeville. Perhaps dating to this time was a large defensive ditch (more than 4.6m wide and surviving nearly 2m deep) and associated bank. A trackway may have led towards a large building possibly used as a storehouse. Other structures lay adjacent to the north and east of this structure. A lode was later constructed and ran for more than 45m, with a butt end to the south; further north it presumably connected to other lodes within and around Ramsey, permitting goods to be brought to and from the abbey. The lode was up to 8m wide and 1.45m deep, with a flat base and was fed by drainage ditches. A possible crane may have been used to off-load goods on the western side of the lode. At the dissolution the lode was backfilled with domestic rubbish from the abbey and demolition rubble was strewn across the site. The area reverted to agricultural use until it recently became part of the land held by Ramsey Abbey School.

Artefacts of interest include a lead token which has a letter R on one face and a design of a bird pecking at a fish on the other – this probably refers to Ramsey Abbey itself. Of national importance is a collection of late medieval floor tiles (to be published separately), resonating with the documentary evidence for the production and selling of medieval and later tiles at Ramsey.

This archival document supplements an article in the *Medieval Archaeology* series (Spoerry *et al* in press), which should be referred to for more detailed discussion. In cases of inconsistency between the two reports, the article should be taken as the definitive document.

1 Introduction

Archaeological excavations were carried out by OA East (formerly CAM ARC) within the precinct of Ramsey Abbey (TL 2931 8512) in 1998 and 2002 (Fig. 1, Plate 1). The initial excavation took place before the development of a new school building by the Education Property Department of Cambridgeshire County Council: the second excavation took place on land immediately adjacent to the north prior to an extension to this building. Cambridgeshire County Council funded both stages of archaeological work.

The site lies adjacent to the surviving remains of Ramsey Abbey (Scheduled Ancient Monument Cambridgeshire 14 and conservation area). The 1998 investigation followed two assessments carried out within the grounds of the Abbey School in 1996 and 1997 (Macaulay 1996; Last 1997). Following the results of the 1996 investigation, the proposed building was moved to an area of presumed lower archaeological value (Last 1997). A Project Specification was produced for the 1998 excavation (Macaulay and Spoerry 1998) and the work resulted in a Post-Excavation Assessment and Updated Project Design (Macaulay 1999). The 2002 excavation was carried out in accordance to a specification by OA East, which proposed that there was a need to incorporate the results of the 2002 excavation with the larger 1998 investigation (Macaulay 2002).

The aims of the excavation as recorded in the 2002 specification were to recover a sample record of medieval activity on the site. The site-specific objectives were to:

- date structures and activities in order to place the archaeological evidence within its monastic context, including documentary records;
- elucidate in detail the activities and processes that provided the economic support for Ramsey Abbey;
- understand the development of the site over the span of occupation and record, if possible, changes in function;
- discover the evidence for industrial and agricultural processing, comparing the assemblages with similarly dated sites in the fens and towns;
- understand the contribution of fenland resources to diet and material culture and consider this data with regards to Ramsey Abbey's known fisheries and holdings throughout the fenland basin.

2 Geology and Topography

The site lies on the boundary of March gravels (marine deposits of the Hoxnian age) and sandy/clay/silt downwash of the Devensian age (BGS 1995). Where natural was observed during the archaeological excavation it was a yellow (light brown) clay/silt, which overlay a fen peat layer extending into the fens to the east of the site. The abbey and its precinct were built on a very slight rise in ground level compared to the present town with the abbey lying between 5m and 6m OD and the town between 4m and 5m OD. Within the 1998 and 2002 excavation area the ground level of the site sloped down significantly towards the east, with a high point of 6m OD.

Ramsey lies on what was effectively an island surrounded by Bury Fen to the south and Stocking Fen to the north and was approached, as the chroniclers note, by a causeway on one side (Fig. 2; Page *et al* 1932, 188). The lines of the streets have changed little since the town was originally laid out. No doubt the approach to the abbey and town has always been via the present road from St Ives and along the High Street to the market place (Page *et al* 1932, 189). Jonas Moore's 1684 Map of Ramsey (Fig. 2) shows the presence of a number of lodes in this part of the fens. A stream ran from Wistow and Bury to become the High Lode north of the Great Whyte lode – the High Street passed over this stream by the Great Bridge or the Old High Bridge.

3 Archaeological and Historical Background

3.1 Archaeological background (Figs. 3, 4 and 5)

3.1.1 Ramsey Abbey

The 1998 and 2002 excavations took place within the precinct of the important Benedictine monastery of Ramsey Abbey, representing the first significant archaeological work conducted in the area. Considerable investigative work has centred on the historical documentation of the abbey.

The prelude to the 1998 excavation consisted of an evaluation where ten test pits were opened up within the original proposed development area (CHER ECB 347; Macaulay 1996; Fig. 3, no. 6). These revealed the presence of archaeological remains dating to the Late Saxon and medieval periods. The test pits exposed the foundations of walls, perhaps relating to the abbey, which were sealed by a 16th-century demolition layer. As a result of these findings the proposed school

building was moved. A second evaluation programme was undertaken in September 1997 (Last 1997). Two trenches revealed the foundations of a clunch-built wall, deep layers of soil that overlay medieval features, medieval ditches/foundation and a rubble demolition layer. All of the finds recovered dated to the 13th to 14th centuries. Medieval remains were present but to a lesser extent than those recorded in the original evaluation. The results were supplemented by a geophysical survey in 1999 (CHER ECB 2221; Fig. 3, No. 9 and Appendix 4).

Present understanding of the archaeology of Ramsey Abbey is very poor. Following its dissolution in 1539, most of the buildings were demolished. The accurate location of the monastic buildings, including the cloisters, abbey church and inner/outer court boundaries are not known, such was the scale of the demolition. Various theories persist, based upon the interpretation of these surviving buildings. These include the present day parish church of St Thomas a Becket (thought to have originated either as the original infirmary built in 1180-90 (Fig. 3, No.1), or the guest house/hospital); the 16th-century gate house, 13th-century chapel, buildings incorporated into the cellars of the present school building and surviving boundary walls (Fig. 3, Nos. 2-5). The 1998, the 2002 excavations and the 1996 test pitting appear on Fig.3 as Nos. 6, 7 and 8.

A medieval tile kiln was discovered in the grounds of the Ailwyn School in 1966 and excavated by Elizabeth Eames, John Cherry and the master and pupils of the school (Eames 1980). The precise location of the kiln is not known but it probably lies close to the small copse along Hollow Lane to the south-east of the school buildings. The Royal Commission for Historic Monuments of England (RCHME) recorded the most obvious earthworks within the abbey environs in the 1920s, a plan of which appears in the Victoria County History (RCHME 1926, 210) and the relevant earthworks are illustrated in Fig. 4.

In 2004 and 2006, prior to the erection of a school building complex at Ailwyn School and related road services, further archaeological work took place (Cooper 2004; Mortimer 2006; Howe 2006; Fig. 4, A). An archaeological evaluation, subsequent excavation and watching brief found the probable enclosure ditches of the abbey precinct as well as a few small quarry pits.

3.1.2 Ramsey Town and Island

Although a Palaeolithic axe was discovered in Victoria Road, Ramsey this was probably a chance glacial find and no other significant prehistoric finds have been recorded on Ramsey island (Hall 1992). No Early or Middle Saxon activity is known from Ramsey or its vicinity.

The historic town owes its existence to Ramsey Abbey which was founded in AD 969. Edward The Confessor seems to have given *banlieu* rights to the abbey for a distance of a league around it, meaning that the abbey was able to control this area with court rights (Page *et al* 1932, 187).

Very little archaeological work had been carried out within Ramsey town until the 1990s and all of these recent investigations lay to the north-west and west of the abbey (Fig. 5). Saxo-Norman occupation was found at No. 52 High Street (Archaeological Solutions forthcoming). Medieval occupation was found on several sites, all of which suggest that the ground was made useable by levelling up the land and thereby reclaiming wet, low-lying areas (Atkins 2004a and 2004b; Cooper 2003 and 2005; Hickling 2006; O'Brien and Crank 2002; Membery and Hatton 1996; Pearson and McDonald 2000). Remains of medieval structures have been found above some of these levelling layers (Atkins 2004b). Despite this, archaeological work has demonstrated that the town continued to flood in the medieval period, with late peat formation. The post-medieval period saw further ground levelling (Atkins 2004a).

The present ground levels within the relevant excavation areas are between 4m and 5m OD with natural deposits generally encountered between 2.5m and 3m OD. There is a slight drop in level towards the north-western and western edges of the medieval town. Most of the extensive fenland in the parish is near to sea level (Hall 1992, 41).

Between 300 and 500m to the north of the abbey, medieval material was recovered from a field (Hall 1992 site 17, 42; fig. 25). When surveyed in March 1978 the field was ploughed but showed soilmarks and remains of earthworks. The precise nature was vague, there being two gravel terraces, a pond and finds of building material. The pottery was mainly 13th century. Evidence from court rolls implies that this was general waste from the abbey and not the direct result of occupation (Hall 1992, 42). The relevant field has since been levelled.

The presence of low lying land on the town's periphery and the surrounding fen may explain why the town did not expand during the medieval period. Furthermore, Ramsey was not on a major traffic route. As a consequence – despite the presence of a powerful monastic institution – it never rose above the position of a small market town serving the needs of its immediate neighbourhood. A broad range of crafts are documented as having been carried out in the town, being dominated by leatherworking until the 15th century when the cloth trade took precedence.

3.2 Historical Background

3.2.1 Documentary Evidence

Ramsey Abbey was primarily the creation of two men, Oswald who was bishop of Worcester from 960 and Aethelwine, the aeldorman of East Anglia. At Oswald's suggestion, Aethelwine founded a small wooden chapel for three hermits, reputedly after a vision of St Benedict appeared to his fisherman in Ramsey Mere – the position of the church was to be indicated by a bull (DeWindt and DeWindt 2006, 11). Being suitably impressed by the story, Oswald sent twelve monks and a prior from the Benedictine house at Westbury – he made the journey to inspect Ramsey and described it as an island 'surrounded by marsh and bogs; with meadow, woods, and ponds; with all kinds of fish and a wide variety of birds; and cut off from the outside world' (quoted from DeWindt and DeWindt 2006, 12). The foundation of the site by Ailwyn, foster brother of King Edgar, occurred in 969 with Edgar giving the initial grant of land. Ailwyn the founder left most of his estates to the abbey after his death in 986. It was the substantial endowments made at the death of Aethelstan Mannsonne that made the house one of the richest in the fens – Ramsey the Golden. The wealth of the house enabled it to build up an extensive library and the abbey rapidly developed a reputation for learning which remained with it until the dissolution. The abbey weathered the change to Norman rule without difficulty.

The estates were reorganised *c*. 1100 with certain manors providing supplies to the cellarer whilst others, usually the more distant estates, provided money instead. Many of the detailed estate records have survived and the published records are extensive. The monastic economy of this house, like Peterborough and Ely, has been studied in detail showing how the house not only supported almost 80 monks, a number that remained constant during the 13th century, but was also able to support the daughter house, at Slepe (St Ives). In the 11th century Ramsey bought a stone quarry from Peterborough Abbey and presumably they used this stone to rebuild the monastic buildings and the church rebuilt during the 11th and 12th century. In Stephen's reign the house suffered severely. Geoffrey de Mandeville seized and fortified the house, the monks being expelled. The abbey was badly damaged and impoverished.

The late 13th and 14th centuries saw a succession of wealthy and worldly abbots (John of Sawtry, Simon of Eye, William of Godmanchester), each of whom embarked on a series of costly building programmes. The Black Death added to these problems and by 1349 the house owed 2500 marks (£1666/13/4d). The visitation returns at the end of the 14th century suggest that the house was both

financially and morally decayed, but by 1431 all was restored. In 1535 Thomas Bedyll visited the house and reported to Thomas Cromwell that the monks would acknowledge the supremacy and in 1538 they surrendered without complaint receiving high pensions as a reward. The house was valued in 1535 at £1,715/12/3d which included the abbey and the cells at Modney and St Ives. The house at Chatteris was assessed separately.

The abbey continued to flourish until its dissolution in 1539, when its land, titles and buildings were bought by the Cromwell family who saw to its destruction. Much of the abbey stone is known to have been used to build several Cambridge Colleges (Kings, Trinity, Gonville & Caius) as well as the gatehouse at Hinchingbrooke House.

3.2.2 Payment to Ramsey Abbey Employees

Surviving records of payment to Ramsey Abbey employees give some idea of the character of trade and the abbey's economy (DeWindt and Dewindt 2006, appendix 8). These evidently relied heavily on the local network of watercourses; for instance, four employees were paid to repair boats between 1471 and 1500. There are also records indicating the repair of waterways and related features.

There are several records for boats being hired to carry a variety of goods especially in the period 1350 to 1365. In 1361 John Fincham was paid 24d for buying and sending two tuns of wine and 40d for hire of his boat. John Legge was paid 180d for the hire of his boat in 1361. Thomas Mariner is recorded as stipend, mariner for the abbot at 24d between 1350 and 1363 and in 1351 was reimbursed 30 for buying a small boat. He was recorded in 1350 as carting fodder, as well as for buying hay for the abbey and expenses for hiring a boat to seek wine. William Sperhaulk was paid 32d for hiring his boat for carrying fodder in 1351 and in 1332 for buying fish including salmon. Thomas Toppyng was paid 8d in 1436 for carting lumber by boat from Peterborough to Ramsey.

It is likely that commodities such as stone were also being brought into the abbey via the network of lodes, which also took goods downstream for sale elsewhere. In 1332 there are records for William Bakhouse being paid 12d on two different occasions for carrying stone. In 1359 John Limbote, mason was paid 127d for carting stone although the records do not say if this was by boat or road.

There are many records of tiles being produced by Ramsey Abbey employees from the mid 14th century to the mid 16th century and bricks in the early 16th century. Many records also exist for the digging and carting of clay, implying that at least some of the raw materials were being brought from nearby. There is evidence for the

sale of Ramsey Abbey tiles – in 1352 and 1354, for example, Simon Nightingale was employed to sell tiles for the abbey.

3.2.3 Cartographic Evidence

The earliest map of the Ramsey area is the very small scale 1646 county map of Huntingdonshire by Blaeu. It shows a stylised church representing Ramsey; some of the surrounding fenland and main rivers around Ramsey are drawn but there is no indication of the abbey. The 1684 Jonas Moore map of Ramsey is the first map which shows Ramsey to any scale (Fig. 2). The map is still very stylised although it shows the general shape of Ramsey town built along two main roads. This map records the Great Whyte but does not show the Little Whyte nor any other lodes which perhaps suggests that they may all have been backfilled by this time. The map shows the town linked to Ramsey Mere via two lodes. The abbey is marked but is only as a stylised church.

The first detailed map of Ramsey Abbey itself is the Silius Titus estate survey *c.* 1704-9 which is a wonderfully eccentric depiction (Fig. 6; HRO 1737 RB 2/1). It shows within the former abbey area the parish church surviving as well as a few other buildings, probable ponds and numerous small fields within which are trees, suggesting that at least some may have been orchards. The 1998 and 2002 excavations have been approximately located within the map. The excavations were partly within the eastern limits of the map within three fields or orchards. Two buildings lay directly to the west of the 2002 excavation area.

The 1" 1824 Ordnance Survey map indicates that the small fields recorded in the Silius Titus map had by now been largely amalgamated and the two excavation areas fell within two fields (Fig. 7). The 1887 1st edition Ordnance Survey map shows that both the excavation sites now lay within a single large empty field (Fig. 8).

4 Methodology

The 1998 investigation covered an area of approximately 2000m² (35m x 55m) and was broadly 'L'-shaped, lying to the east of the school and abbey buildings (Fig. 3, No.7). In 2002 a further area of approximately 525m² was opened up immediately to the north of the earlier trench (Fig. 3, No. 8). The sites were mechanically stripped using a 360° tracked excavator to a depth of at least 0.30m, however subsequent investigation necessitated additional machine stripping to allow examination of earlier archaeological deposits that lay beneath both medieval archaeology and post-medieval dumping. Throughout the investigation ground water occurred at *c*.0.7m below ground level,

necessitating pumping out of all deeper archaeological features investigated.

After machine stripping the area was cleaned by hand with a base plan compiled (Fig. 9). Archaeological features were recorded by hand and using a Zeiss RecElta 15 Total Station. Metal finds in the spoil and near the surface were located by metal detector, and removed from spoil heaps. Archaeological features were excavated and recorded using the OA East single context recording system and pro-forma recording sheets. Features were hand excavated and planned at a scale of 1:20. Sections and profiles across excavated features were drawn at a scale of 1:10. A written record of all excavated features was made on single context recording sheets. The archive was supplemented by monochrome and colour photographs. Environmental samples were taken from a variety of features under the supervision of the then English Heritage Regional Advisor (Dr Peter Murphy).

5 The Archaeological Sequence

5.1 Introduction

Five main phases of Late Saxon or Saxo-Norman to post-medieval activity have been identified. This phasing is largely based on the stratigraphic matrix since the pottery has broad date ranges, hampering precise phasing. The finds suggest that occupation commenced in the 10th or 11th century and the area was occupied until the Dissolution in *c.* 1539 when it became fields. This use continued until in the 20th century when the land became part of Ramsey Abbey School's playing fields.

The upper layers were turf, overlying a uniform subsoil layer, thicker in places due to landscaping and the presence of buried garden soils and demolition layers. A general overview of the archaeology indicated that all features visible on the ground surface were cut through cultural deposits, with no natural layers initially evident.

Sections across selected features are illustrated in Figs 10-13.

5.2 Phase 1: Late Saxon to Saxo-Norman (10th to mid 12th centuries) (Figs 14-16)

5.2.1 Phase Summary

The earliest activity lay in the southern half of the 1998 excavation site and consisted of at least two timber earthfast buildings with associated pits and postholes. All of these structures lay to the south of a boundary ditch which crossed the site from east to west. This ditch was on an alignment which persisted as a boundary through all periods until the 18th century. Remains assigned to the earliest phase were sealed beneath a later post-medieval garden soil/dumping layer and had been heavily truncated, leaving only limited evidence of the original structures.

5.2.2 Building 1 (Group 1.1)

At the extreme south-east of the site the 1998 excavation encountered the remains of a building consisting of beam slots and numerous (x 20) postholes/stakeholes (Figs 14 and 15). Only part of the structure was observed with the remainder lying to the east of the investigation area. The remains had been heavily truncated by later activities and the slots were only 0.07m-0.10m deep, with widths varying from 0.33-0.7m. Given the fragmentary evidence, the layout described below is tentative.

The structure seems to have been about 11m long (western wall) and at least 5m wide (northern wall) with internal sub-divisions. The western wall comprised postholes (1098, 1208, 1230, 1232, 1234 and 1260) as well as posts within beam slots. An entranceway *c*.0.7m wide may have existed along the western wall. This may have been porched, as is suggested by the position of various postholes (1057/1059, 1183, 1186, 1208 and 1228). Again these features survived as very shallow depressions only 0.05m-0.10m deep. The putative entrance led into an internal corridor, with northern (1205, 1203 and 1210) and southern walls (1182 and 1175). The northern wall of the building itself was at least 5m long and comprised four posts (1098, 1124, 1126, and 1130). Two other postholes (1120 and 1128) may have provided internal support. The southern wall comprised three postholes (1253/1255, 1234 and 1248), while others again appeared to form internal support (1188, 1247 and 1250).

Pottery recovered from the fills of these features is dominated by Thetford and Thetford type wares (AD 900-1150) with a few sherds of Medieval Ely Ware probably being intrusive. A very small quantity of slag was recovered from seven features (233g). A small quantity of

tile (154g) was also present. Very little animal bone was found (37g), but included a hare bone gnawed by dogs.

5.2.3 Building 2 (Group 1.2)

Adjacent to the west of Building 1 were the remains of a small sub-rectangular structure with external dimensions of c.7m long (east to west) and c.5m wide (north to south). It consisted of a mixture of beam slots and postholes, which again had been heavily truncated by the later activity.

The northern wall comprised a beam slot (1271) and two postholes (1145 and 1143). This beam slot was 1.03m long, 0.81m wide and 0.1 deep. The c. 5m long eastern wall comprised another slot 1122 (3.6m long x 0.6m wide x 0.1m deep) and associated postholes (1141 and 1201). External postholes 1145 and 1269, appeared to form part of the structure. A soil sample from slot 1271 (Sample 8) produced a single charred grain.

A large pit (1166; Fig. 10, S 42) lay within the presumed structure (and measured 1.2m long, 1.25m wide and 0.34m deep). It was filled with three distinct deposits although finds (animal bone and slag) were only recovered from the uppermost fill.

Finds recovered from the possible building included Saxo-Norman pottery c. AD 900-1150, dominated by bowls and dishes. Tile (786g) including peg tile was recovered. Small amounts of smithing waste (45g), shell (123g) and animal bone (322g) were also found.

5.2.4 Building 3? (Group 1.3)

Lying to the south and south-west of Buildings 1 and 2 were further postholes, perhaps indicating the presence of a third building. These comprised three double postholes (1179/1281, 1283/1285 and 1287/1289) and two single postholes (1222 and 1275). Postholes 1333 and 1335 lay near a large later watering hole which may have removed part of the structure. Two other postholes may also have been associated with the building.

A very small background scatter of slag was recovered from postholes 1179, 1333 and 1335 (totalling 6 pieces, weighing 0.131kg).

5.2.5 Boundary Ditch (Group 1.4)

A linear ditch (1350) ran from east to west across the site, presumably forming a boundary (Fig. 10, S 82). This significant boundary was maintained throughout every subsequent phase and is recorded in the 1707 map of the estate (Fig. 6). The initial phase of the ditch lay

beneath a much larger, possibly defensive ditch (1312, Group 3.2) which had heavily truncated it (it survived to *c.*0.75m+ wide x 0.62m+ deep). It had a V-shaped profile with a rounded base and contained two undated fills (1368 and 1369). The final and most substantial infilling deposit (1368) indicates deliberate backfilling utilising the adjacent bank (no other trace of which survived). A soil sample from the basal fill 1369 (Sample 24) produced only five charred cereal grains.

5.3 Phase 2: early to mid 12th century (Figs 17-18)

5.3.1 Phase Summary

Replanning of the site appears to have occurred after the Conquest, when the position of buildings shifted to the north. Features attributable to the first half of the 12th century were again only found in the 1998 excavation area. They included a timber building to the north (Building 4), an enclosure and related watering hole and boundary ditches.

5.3.2 Enclosure and Associated Watering Hole (Group 2.1)

The north-eastern corner of an enclosure (1195) was found in the extreme south of the 1998 site. It enclosed land to the west close to the fen edge.

The enclosure ditch ran from the south baulk for 28.5m in a north to south direction before turning at *c.*90° to the west. The ditch was 2.2m wide and 0.55m deep with a steeper side to the east and was flat bottomed (Fig. 10, S. 42). It was filled with up to three deposits containing St Neots-type ware (*c.*900-1150), animal bone and smithing slag. The slag came from the section excavated across the ditch and earlier pit 1166 and included a bloom fragment and a smithy hearth bottom.

Within the enclosure was a large pit which may have served as a livestock watering hole (1310/1354). This measured 7.4m by more than 6.4m and was only partially excavated. At a depth of 0.54m the base was not reached and the steep eastern edge showed no sign of bottoming (Fig. 12, S 74). The pit was backfilled with at least six layers, tipped in from the east. A relatively large quantity of slag was recovered (1.955kg), considering that only a small amount of the feature was excavated. This included parts of two smithy hearth bottoms as well as some hearth lining. Two soil samples (Samples 10 and 18) were taken from its fills although both only produced a single charred grain.

A layer of dark grey brown silty clay (1297) lay adjacent to the north of the possible watering hole while a similar deposit (1273) was found 4m to the west. These layers covered an area of 3m by 1m (1273) and 2.5m by 1.4m (1297) and were 0.20m and 0.15m thick respectively (not illustrated). Layer 1273 contained frequent sub-rounded and sub-angular flints (up to 40mm by 40mm in size) making up more than 10% of the deposit. These stones may have been laid to stabilize the land surface. Although the deposits did not contain pottery, layer 1297 yielded a large amount of slag (7.513kg) including ten smithy hearth bottoms. Layer 1273 was sampled (Sample 9) and produced only three charred grains.

5.3.3 Building 4 (Group 2.2)

Three walls of a sub-rectangular building were partially revealed in the north-western corner of the 1998 excavation site (Fig. 18). Its southern wall (1054) consisted of a beamslot, butt-ended to the east, with two internal oval or linear post/timber settings. A 2m long east to west ditch or foundation trench (1064/1082/1189) continued the alignment of wall 1054 to the east. It was 0.56m wide and 0.29m deep and contained medieval pottery. A soil sample (Sample 2) yielded more than 100 charred grains including flax.

The beamslot forming the eastern wall of the building (1091) had a large post set at its southern end (1093), this and the gap between the two walls of the building perhaps indicating the position of an entrance. Within the building, at approximate right angles to the south wall, was an irregular beamslot (1115) with integral post/slot settings. It was *c.*2m long and 0.46m wide and 0.30m deep with irregular posts on its south side. A small posthole (1106) lay at the centre of the gully. Just to the north-west was a large post-pit or the end of another post-in-slot trench (1072).

Pottery (Thetford ware, St Neots ware, Stamford ware, MEL and Rockingham Forest shelly wares – shelly wares henceforth), animal bone, shell and iron nails were recovered from these features. A residual single-pointed pinbeater came from fills of the eastern wall beamslot (Fig. 31, SF 18). All of the finds suggest a general domestic function for the building.

To the south of the building were two further slots or drainage ditches (1242 and 1077) that may have been associated with it.

5.3.4 Possible Boundary or Trackway Ditch (Group 2.3)

Some 7m to the north of the enclosure was a shallow ditch (1062/1063) aligned east to west (*c.*0.65m wide and 0.25m deep), running parallel to the enclosure marker and possibly indicating the

presence of a trackway between the two. It turned abruptly north at its eastern end, perhaps to enclose Building 4. Its main fill of olive grey clay silt contained charcoal and a relatively large amount of pottery (92 sherds; 0.727 kg) including Late Saxon and medieval fabrics, some of which may be residual: the group is dominated by Early Medieval ware/Medieval Ely-type ware (68 sherds; *c.*1050 – *c.*1350) and Shelly wares (15 sherds, *c.*1150 – *c.*1350). Although a date of 11th to 12th century is possible, infilling after *c.* 1150 is perhaps most likely.

5.4 Phase 3: mid 12th to 13th centuries (Figs 19-21)

5.4.1 Phase Summary

This phase saw a new timber structure(s), probably a storehouse, linked by a trackway to a ?defensive ditch and bank. These defensive features may link to the abbey's fortification during the Anarchy period of the 1140s and their presence may suggest that the abbey's lode (most clearly evident in the following phase) was already in place. On the southern side of the ditch was a new trackway or path.

5.4.2 Trackway or Path (Group 3.1)

In the southern part of the 1998 excavation area were two probably related ditches. The southernmost formed an L-shaped boundary (1220/1235/1292) with the other ditch running parallel to the north (1257/1280). The 2.2m wide area between the ditches may have served as a track or pathway. The northern ditch (1280) was 1.46m wide and 0.40m deep with a broad flat profile. The southern ditch was steeper and narrower (measuring 1.06m wide and 0.44m deep). Pottery recovered from its fills comprised Thetford, St Neots, Shelly, Medieval Ely and Grimston wares. Animal bone and slag were also recovered. The ditch was deliberately backfilled with what appeared to be the remains of a bank (e.g. fills 1245 and 1294). A lead pencil was recovered from the fill of ditch 1257 (Fig. 29, SF 56).

5.4.3 Possible Defensive Ditch (Group 3.2)

Running east to west across the centre of the 1998 excavations was a large steep-sided ditch with a u-shaped profile (1312), enlarging or replacing earlier ditches. It was *c*. 4.6m+ wide and survived to 1.87m deep. There would presumably have been a *c.* 6m wide bank to the north of the ditch since no contemporary features were found here.

The basal ditch fill (1331) was 0.80m thick and consisted of black grey clay with frequent charcoal and moderate finds (Fig. 10, S 82). The moderate number of finds included fifteen pottery sherds, amongst which was an intrusive post-medieval sherd. Tile and animal bone were also recovered. A sample from this fill produced the remains of a

range of crops and plants (Sample 23). The lack of weathering deposits beneath this layer implies that the ditch has been deliberately backfilled soon after it went out of use.

The four upper fills (1311 and 1365-7) contrasted with the lower fill and were mostly olive or olive brown in colour. Layers 1365 and 1366 were undated, while fill 1367 produced a single sherd of medieval pottery and fill 1311 contained mid 12th to mid 14th century pottery (as well as two intrusive post-medieval sherds), along with an iron joiner's dog, part of a possible chisel blade and a nail. All four layers were sampled (Samples 19, 20, 21 and 22) but produced only 13 charred grains in total. The small amount of intrusive material probably derived from the insertion of a later wall which cut across the ditch.

5.4.4 Possible Trackway (Group 3.3)

Two parallel ditches (1375 and 1038), spaced 2.1m apart, ran northwards for 12m from the possible fortification ditch (above), perhaps representing a trackway (with external drainage ditches).
The ditches were both *c*.0.70m wide and 0.33m deep. Their fills contained residual Late Saxon wares, along with small quantities of contemporary fabrics comprising Shelly wares (1150-1350), Grimston (1200-1350) and Lyveden-Stanion wares (1200-1350).

5.4.5 Building 5 (Group 3.4)

Overlying the northern part of the possible track were the remnants of the south-east corner of a large structure (recorded over an area of 8.5m by 4.5m, Building 5, Fig. 20), on a slightly different alignment to the earlier building which it overlay. This may have formed a store or other ancillary building associated with the abbey and again the pottery recovered dates to the mid 12th to mid 14th centuries.

The beamslot forming the eastern and southern walls (1078) was *c.*0.50 m wide by 0.13 m deep. Just inside the line of the wall were two postholes (1373 and 1176) which may relate to it; these were 0.25 and 0.45m in diameter and 0.08 and 0.13m deep respectively. Another, more substantial post-pit lay outside the building to the north-east (1159). This was 1.06m in diameter with a post pipe and packing measuring 0.3m in diameter and 0.46m deep.

5.4.6 Possible Beam Slots & Postholes (Group 3.5)

To the east lay a series of features, some of which may represent further elements of Building 5 (Fig. 20). This complex of possible beamslots and postholes had been very disturbed. Running parallel to the south wall of the building was another possible beamslot (1363), adjoined at its eastern end by two further slots. In turn, these ran

northwards to link to another complex of features, including an east to west aligned slot, which had been recut at least once (1276, recut 1322). To the north lay another fragment of slot (1240) and associated post. The beam slots were between 0.3m and 0.5m wide and 0.08m and 0.27m deep. Taken alongside the evidence for Building 5, these features could suggest the presence of a corridor on the outer side of the building or perhaps indicate a feature associated with an early phase of the lode (which is otherwise first seen in Phase 4). Various timber structures might be envisaged in this context, such as platforms and jetties.

5.4.7 Isolated Pits (Group 3.6)

Several pits lay in the middle of the 1998 excavation area in a distinct cluster covering an area of *c.*5m², with an isolated pit to the south (1393), which may also date to this phase. All were steep-sided and about 0.3m deep.

Pit 1117 lay to the east adjacent of the early trackway (Fig. 20) and was oval (measuring 1.3m by 1m by 0.30m deep) with steep sides. It contained a single fill (1102) of very dark greyish brown silty clay with a high charcoal content. The pit was backfilled with a relatively large quantity of refuse including building waste. The pottery (62 sherds, 0.630 kg) is dominated by Medieval Ely type ware (*c* 1150 – *c* 1350). Roof tile included several peg holes (372g) and animal bone (371g). Frequent large angular limestone fragments (up to 0.19m in length) were present, which may represent unwanted building stone.

Three inter-cutting shallow rubbish pits (1139, 1163 and 1164) lay just to the south-east (Fig. 12, S 31). Again, these were up to 0.30m deep with near vertical sides. The fills varied: pit 1164 contained a dark greyish sandy clay silt, pit 1139 a mixed deposit consisting largely of dark greyish brown silty clay including 10% charcoal and pit 1163 contained three deposits including redeposited debris from a hearth or oven in the form of a 0.12m thick scorched dark red/dark olive grey silty clay deposit. A few sherds of medieval pottery were recovered. Pit 1393 (5m to the south) was of similar dimensions to the other pits. It remained unexcavated but measured 1.4m long and more than 1.06m wide in plan.

5.4.8 ?Building 6 (Group 3.7)

To the north-east of Building 5 was a cluster of postholes and slots, perhaps forming a small rectangular structure (?Building 6, Fig. 24) that was set end-on to Building 5 (Figs 19 and 23). Its small size (at only 2.5m north to south by *c.*3m east to west) may suggest a specialised function.

The possible slots (1612 and 1624) ran east to west and survived for less than 1m in length, being 0.12m wide and between 0.03m and 0.1m deep. The postholes (1542, 1608, 1616, 1618, 1620, 1622 and 1626) were between 0.32 and 0.75m in diameter and between 0.09m and 0.35m deep. They invariably contained a single fill of mid greyish brown silty clay.

5.5 Phase 4: 13th century to *c.* 1539 (Figs 22-24)

5.5.1 Phase Summary

Features belonging to this phase were only found in the northern half of the 1998 excavations and in the 2002 site. This phase is marked by the construction of a large lode (initially interpreted as a fish or eel pond), which may have brought in supplies to the abbey by boat. A small possible crane lay adjacent to the east of the lode and presumably functioned to off-load the goods.

The timber building (Building 4) on the western side of the lode may have continued in use, as may the bank and ditch to the south. Their presence may indicate that the lode was infact an earlier creation.

5.5.2 Lode (Group 4.1)

A lode running north to south was found within both the 1998 and 2002 excavations. It ran for 45m from the northern baulk of the 2002 excavations before butt ending in the 1998 excavation area. The feature was sectioned completely in four places, with several partial slots being cut across it, and was up to 8.7m wide and 1.45m deep (Fig. 11, S 108). The profile of the lode was constant in all observations – it was moderate to steep sided at *c.*45-50º with a flat base. The excavated sections generally contained at least five fills.

The slot dug across the lode in 1998 (1211) recorded the widest part of the feature (8.7m wide and 1.45m deep); although it was backfilled with at least three deposits (a slump of redeposited and two fairly sterile fills) only a single medieval pottery sherd was recovered. A partial slot (1096 and 1300) was excavated to the south on either side of the lode, near to the butt-end and had been infilled with between three and five fills. In slot 1300 there was evidence for silting (0.25m thick), sealing a layer of redeposited natural slumping from the edge of the feature, suggesting that the lode had been open for some time after its final cleaning episode.

Only twelve and eleven sherds of Late Saxon and medieval pottery respectively were recovered from slots 1096 and 1300. The basal fill of slot 1300 (1301) contained numerous horse bones (1.709kg) from two

animals; these were large (over 13 and 14 hands respectively) and some bones displayed butchery marks. Two samples were taken from fills of both slots, but produced little material (Samples 3 and 13).

Three further slots were dug across the lode during the 2002 excavation (1580, 1570/1572 and 1584). Here, the feature was up to 6.5m wide and 1.04m deep. Slot 1570/1572 was the only slot not bottomed to natural. In all three slots a small amount of Saxon and medieval pottery was recovered with intrusive post-medieval pottery recovered from a single section. A small collection of iron objects was recovered comprising a horseshoe fragment, a scale-tang knife of late medieval date at the earliest, three wallhooks (including Fig. 28, SF 80) and three nails. A probable bone skate was also found (Fig. 31, SF 62).

Five environmental samples were taken from the 2002 slots (Samples 106-110). The plant remains recovered point to shallow, low velocity water conditions with little or no overgrowth on the banks. Waterlogged wetland/aquatic plant macrofossil seeds as well as marsh and freshwater mollusc shells were found in most of the samples.

5.5.3 Crane and Related Features (Group 4.2)

On the north-east side of the lode was a cluster of features which may relate to its use (Fig. 23). Their relationship to a number of trample layers/colluvium in this area remains uncertain; some were sealed by them and some cut through them. Furthest to the north was a line of pits, the westernmost of which a large rectangular feature (1553; Fig. 13, S 105; Plate 2) measuring 1.7 m long by 1.2 m wide and 0.75 m deep, with near vertical sides and a flat base.

Three postholes (up to 0.25 m in diameter and 0.15 m deep; 1555, 1557 and 1559) were set within it, apparently forming a tripod structure interpreted as a possible crane setting: the posts to the south were notably smaller than that to the north. The pit was infilled with greyish green silty clay, containing charcoal and other organic matter including decomposed wood. Its upper fill contained domestic refuse and building rubble. Most of the pottery recovered dates to the 13th to 14th centuries, although a brick fragment may imply that final backfilling took place in the 16th century. A sawn red deer antler beam and terminal tine fragment indicates discarded primary waste, although appears to be residual. There were also abundant fish bones, tile and animal bone.

5.5.4 Pits and Associated Features (Group 4.3)

Adjacent to the putative crane were several intercutting pits, set within a sub-rectangular area (1506, 1509, 1511, 1513, 1534, 1536 and

1538). They were generally sub-rounded in plan, although a few were sub-rectangular. They varied in size from 0.8m in diameter to 2.5m and their depths varied from 0.16m to 0.7m (Fig. 13, S 106; Fig. 11, S 100). Their sides varied from concave to near vertical.

Most had been infilled with domestic waste including animal bone, although their primary function remains unclear. The pottery generally predates 1400, but includes a few later sherds. The most productive pit (1506) contained a globular stone spindlewhorl (Fig. 30, SF 49), a copper alloy lace end (of Colchester Type 1, *c.*1375-1550/75), an iron strap fitting, three nails, a lead fishing weight (Fig. 29, SF 101) and a hone made from Norwegian ragstone (Fig. 30, SF 50). A soil sample from the same pit (Sample 101) produced possible sewage waste.

To the south-east of the cluster of pits lay another example (1500) more than 3.4m long, 1m wide and up to 0.4m deep. It was filled with a single fairly sterile deposit containing a single sherd of medieval pottery and a copper alloy strip.

5.5.5 Drainage Ditches and Possible Tanks (Group 4.4)

Three drainage ditches ran from east to west (running into the eastern limit of excavation), leading towards the lode. The northernmost examples (1502/1565/1599 and 1526/1597) appeared to be associated with two tank-like features (see below). These features were presumably intended to drain the land and help keep the lode filled up with water.

Furthest north, ditch 1502/1565/1599 (Fig. 11, S 101) ran east to west for 7m and was 1.35m wide and 0.55m deep with gently sloping sides and a flattish base. More than 100 sherds of pottery were recovered from the slot (1565) placed across the feature nearest the lode, while only 26 medieval sherds came from the other two slots - the pottery is of 13th to 14th century date. Slot 1502 produced a copper alloy/iron padlock and a copper alloy strip while slot 1565 contained a copper alloy dress pin, a piece of wire, an iron harness buckle (Fig. 28, SF 51) and three nails, along with a small quantity of animal bone. A soil sample from slot 1565 (Sample 103) produced a moderate amount of charred grain and other remains.

The second drainage ditch (1597/1526) lay *c.*6m to the south of the crane (Fig. 13, S 110). It was observed over a distance of more than 9m, was up to 0.8m wide and 0.23m deep. It contained a small quantity of pottery sherds dating before 1400 as well as a late medieval iron prick spur (Fig. 28, SF 46). Although a sample from ditch 1597 (Sample 112) produced few plant remains it did contain a moderate amount of molluscs comprising both open country and woodland/shade loving varieties.

At the western end of the ditches, between them and the lode, lay two elongated 'tanks' (1569 and 1547; Fig. 13, S 103) which measured up to 7.5m long by 2m wide and were 0.5m deep with steep sides (Fig. 23). An adjacent slot (1546) is of unknown function. The 'tanks' contained dark grey silty clay with more mixed upper fills – mollusc shells recovered from their fills were predominantly of marsh/freshwater slum species and freshwater obligate taxa, indicative of shallow water conditions. The humerus of a large horse of 15½ hands was found in the southernmost tank, with twenty-one bones from the skeleton of a horse of 13½ hands coming from the other, found in articulation. Most of the pottery recovered from the 'tanks' dates to the 13th to 14th centuries, although the presence of two sherds of post-medieval pottery and 16th-century brick may indicate a later infill date.

Near the southern butt-end of the lode, was a third east to west aligned drainage ditch (1172). It was more than 3m long, 1.3m wide and 0.40m deep with a U-shaped flat base. It contained 90 sherds of medieval pottery, a moderate amount peg tiles, an iron padlock (Fig 28, SF 22) and a lead offcut (Fig. 29, SF 57).

5.5.6 Pits and Gullies (Group 4.5)

Adjacent to the southern end of the lode were a few shallow features of uncertain use. These were not fully excavated and had been truncated by a modern pit and by general ground disturbance. A shallow undated gully/drain (1314) ran east to west for 4m and led towards two pits (1307 and 1337). The gully was 0.3m wide and 0.1m deep. Pit 1307 was 1.5m long and 0.5m wide and 0.14m deep and 1337 was 1m by 0.6m in size and not fully excavated. Both pits contained small amounts of medieval pottery.

5.5.7 Layer (Group 4.6)

At the extreme southern end of the 1998 excavation area was a layer of olive coloured silty clay (1272) measuring 10m by 10m and 0.11m thick (not illustrated). It sealed several features in this area. The layer was largely machined off at the start of the excavation but some finds were recovered including two smithy hearth bottoms and a single sherd of Thetford Ware. These finds are likely to be residual.

5.6 Phase 5: Post-Dissolution (Fig. 25)

5.6.1 Phase Summary

Field systems were established with stone boundary walls and ditches being used across both excavation areas. Some of these reflected the

major alignments of earlier phases. Two drains were dug in the post-medieval period, one of which (1213/1381) ran north to south through the former lode and the other (1298) ran east to west through the 1998 excavation area.

5.6.2 Stone Walls (Group 5.1)

A wall foundation (1357) ran east to west across the centre of the 1998 excavations along the same alignment and cutting into the former defensive ditch (Phase 3, Group 3.2). The wall survived as rubble foundations 0.7m wide, with reuse of Barnack stone from the abbey in evidence. A large number of architectural fragments were recovered from the wall as well as fragments of tile with mortar attached. Parallel and 16m to the north of this foundation was another wall (1003) which butt ended before it reached the position of the former lode. It was also c.0.7m wide and again contained reused abbey stone including the base of a possible sarcophagus or stone trough.

5.6.3 Drains (Group 5.2)

A ditch/drain was cut along the middle of the former lode along the centre of its complete length. At the former southern end of the lode the drain turned eastwards and ran into the baulk (1579/1583 and 1386). It was a slack V-shape in profile, up to 2.5m wide and 1.1m deep (Fig. 11, S 108). The drain had been backfilled with domestic waste in around the 17th century, with Post-Medieval Red ware being recovered. Metal objects recovered from ditch sections 1579 and 1583 consisted of a two copper alloy objects – a ring (Fig. 27, SF 42) and a ferrule (Fig. 27, SF 2) and ten iron objects - a wallhook (Fig. 28, SF 70), a snaffle bit (Fig. 28, SF 54), a strip, two wires, a possible stud (Fig. 28, SF 86) and four nails.

Two soil samples were taken in the 2002 excavation area, 20m apart (Samples 105 and 111). The northernmost (Sample 111) yielded moderately common freshwater obligate mollusc shell while terrestrial taxa were rare, possibly indicating that the ditch was at least semi-permanently water filled. The second sample contained charred cereal processing debris (including grains, chaff and weed seeds), charred wetland plant macrofossils and a large number of burnt mollusc shells, which may indicate that the material is derived from detritus which was burnt *in situ* within the ditch.

A stone drain (1213/1381) was then inserted in the top of the backfilled ditch/drain and followed the same alignment. The drain had in some places been totally robbed after it had gone out of use. Elsewhere the foundations survived and consisted of two lines of stone blocks laid end to end. The drain was approximately 0.70m wide (with stones averaging 0.4m x 0.3m x 0.3) leaving *c.* 0.10m wide drain.

A later drain (1169/1298) dating to the 17th or 18th century ran east to west across the centre of the 1998 excavation area. Abutting this drain was a further large north to south drain (unnumbered). The drain was 0.35m wide, 0.30m high with a stone base and top and two courses of handmade bricks forming the channel. The drain fed into a large pit *c*.2m in diameter (1339/1379): this may have acted as an overflow chamber or soakaway and fed two ditches running into the eastern baulk. Animal bone recovered from the backfill of the drain included butchered deer. Pottery recovered spanned the 16th to 18th centuries. Finds from the soakaway included a wide range of pottery including from residual early medieval wares to contemporary post-medieval fabrics. Other finds included tile and clay pipes.

5.6.4 Tree bowls? (Group 5.3)

A few largely undated and modern features were found across the excavation area. Several probably represent former tree bowls - the Silius Titus map (Fig. 6) indicates the presence of trees across the excavation area during this period.

5.6.5 Dumping and Post-Dissolution Landscaping

Dumping and landscaping of the site occurred during the post-medieval period (post-Dissolution). Most of these deposits were machined off but a representative sample was excavated (1004, 1005, 1006, 1007, 1008=1030=1342, 1034, 1035, 1041, 1066, 1069, 1080, 1095, 1103, 1315; not illustrated). The layers consisted largely of rubble, brick, tile and building debris as well as some metal objects including a copper alloy nail. Large quantities of pottery (4.361kg) and tile/brick (16.391kg) were recovered including some decorated tile fragments. The majority of the pottery was medieval in date and, although residual, is a clear indication that while the material was deposited in the post-dissolution era, it was largely derived originally from the medieval abbey.

6 The Finds

6.1 Small Finds

by Nina Crummy

The assemblage of 60 items ranges in date from Late Saxon to modern. The majority of the later post-medieval and modern objects are not included in this report but are catalogued in the site archive.

The earlier material is presented below by the functional categories defined in Crummy 1988, with the only coin recovered, an unstratified halfpenny of George II, shown separately. Within functional category, objects are listed as appropriate, generally by either material, phasing, date, or object type. Most of the metalwork is in good condition. Some of the iron objects are heavily encrusted with corrosion products but X-radiography revealed that original surfaces survived.

Table 1 presents the objects, other than iron nails, by phase and function. The numbers of items shown are the minimum present, as in a few cases one Small Find number covers several items. None of the objects were stratified in contexts earlier than Phase 4, though some may be predate Phase 4 and at least one, a single-ended pin beater, dates to Phase 1. Phase 4 contained most of the stratified items, and very few were recovered from Phase 5 contexts; over half are unstratified or unphased. Not all the functional categories represented on the site are also represented in Phase 4, though in most cases the unstratified items are of medieval or early post-medieval date.

Phase	**Coins**	**Category**													***Total***
		1	3	5	6	7	8	10	11	12	13	15	16	18	
4	-	2	1	1	-	-	4	2	7	1	-	-	1	3	**22**
5	-	1	-	-	-	-	1	-	1	-	-	-	-	3	**6**
U/s	1	5	1	-	2	3	-	-	11	2	2	3	-	2	**32**
Total	**1**	**8**	**2**	**1**	**2**	**3**	**5**	**2**	**19**	**3**	**2**	**3**	**1**	**8**	**60**

Table 1: Small Finds by phase and function

Category 1...dress accessories; 3...textile manufacturing equipment; 5...recreation; 6...weighing; 7...literacy; 8...transport; 10..tools; 11; fastenings and fittings; 12....animal husbandry; 13...military equipment; 15...metalworking; 16...antler-working; 18...miscellaneous

The best-represented category is that of general fittings (Table 1, Category 11), followed by dress accessories and miscellaneous items (Categories 1 and 18). There are also five objects connected with transport, but the other categories are only represented by between one and three items.

The dress accessories (Category 1) are mainly quite standard items, but they include a remarkable buckle-plate made from a piece of copper-alloy sheet on which a bronze smith had earlier practised cutting Lombardic letters, Roman numerals and crosses (Fig. 27, SF 12). The surface is covered with pairs of incised guide lines, between which have been cut different sizes of As, an A and B together, an A and partly finished B together, a V (five), and a IIII (four). There is a

faint incuse cross on one side, and what may be a relief cross close to the end of the other side. The recycling of this piece of metal suggests that both items, trial-piece and buckle-plate, were apprentice pieces. The ring from Phase 5 ditch 1579 is probably a finger-ring (Fig. 27, SF 42), though a very similar ring from Norwich was made from a strip secured by an iron rivet and was classed as a general fitting, and the use of rather plainer examples from London as dress accessories has also been questioned (Margeson 1993, fig 40, 450; Egan and Pritchard 1991, 332, fig 217, 1627, 1629). The type dates to the 15th century.

There are two items associated with textile manufacture (Category 3). One is an unstratified single-ended pinbeater of Late Saxon date, contemporary with the Phase 1 buildings on the site. These bone tools were used to push down the weft threads on a vertical two-beam loom, which probably began to be used in England in the early 10th century. Like the earlier warp-weighted loom, the two-beam loom is associated with home production, and was gradually replaced from the 11th century by the faster horizontal loom (Crummy 2002, 37). A mudstone spindlewhorl from Phase 4 pit 1506 may possibly be residual in that context and contemporary with the pinbeater, but is perhaps more likely to be later. It is similar to post-Conquest examples from King's Lynn and Northampton (Geddes and Dunning 1977, 315-17; Oakley and Hall 1979, 286-9). At a weight of 19.92 g it falls between the two weight ranges defined by both the Northampton and King's Lynn whorls. The size and weight of a whorl might be expected to have been dictated by the grade of yarn aimed for in spinning, but Walton Rogers has pointed out that more complex factors were involved, such as the method of manufacture for the whorls and the spinning technique used (Walton Rogers 1997, 1743-5). Though in the medieval period weaving became a male-dominated trade, the widespread of spindlewhorls in domestic contexts in towns such as Winchester shows that spinning remained a female domestic craft, carried out between other household activities (Woodland 1990). Both these tools therefore represent domestic occupation, and the spindlewhorl may indicate the presence of women at the abbey in Phase 4.

The only probable evidence found on the site for recreation (Category 5) was part of a bone skate made from a horse metacarpus (Fig. 31, SF 62). In the Late Saxon and medieval period ice-skating using bone skates was in many cases a leisure activity, but they could also have been of practical use when travel on frozen waterways during harsh winters was probably easier than over snow-covered land. They may also have been used as runners on sledges (Ambrosiani 1981, 138-9). Of the skates found at Coppergate, York, just over half were made from horse rather than cattle bones, though a greater preference for horse bones was found at Thetford and London (MacGregor *et al* 1999, 1987; Rogerson and Dallas 1984, 179; Pritchard 1991, 208).

Two lead weights (Category 6) were found during the evaluation. One is medieval and may have been used for the weighing of medicines or their ingredients, or of culinary spices (Fig. 29, SF 1). The other is coated with copper-alloy and may be post-medieval. The evidence for literacy (Category 7) is also sparse. There is a lead pencil and a strap-end that may come from a book-fastening (Fig. 29, SF 56 and Fig. 26, SF 58), and the buckle-plate described above under dress accessories is further evidence for literacy. In addition, a medieval lead token found during the evaluation has been placed in this category, though the allocation may not be the most appropriate. The token has a letter R on one face and a design of a bird pecking at a fish on the other (Fig. 29, SF 50). No heraldic parallel for this latter device has been found, and it probably, as the letter R suggests, refers to Ramsey Abbey itself. The token is more substantial than medieval pilgrim or secular badges, which are usually only decorated on one side. It may have been used as a symbol of authority for monks or abbey servants travelling outside the precinct on business.

The items associated with transport (Category 8) consist of a prick spur of late medieval form, part of a bit, a harness buckle and fragments of two horseshoes. Buckles with stout knobbed terminals on the bar similar to the Ramsey example have been found in contexts dating from the late 12th to early 14th century in Winchester and York (Goodall 1990, 526, 530, fig 138, 1303-4; Ottaway and Rogers 2002, fig 1469, 12692-3). The bit (Fig. 28, SF 54) is probably of late medieval or early post-medieval date but might be later; the type is useful on young horses as the long cheekpieces reinforce the pressure from the reins at a turn.

Only two tools were recovered (Category 10). A scale-tang knife from the Phase 4 ditch/lode (1580) is late medieval at the earliest, but a small hone fragment from Phase 4 pit 1506 (Fig. 30, SF 50) may be much earlier than its context. Hones made from this stone were imported into Britain in considerable numbers from the Late Saxon period onwards, perhaps continuing as late as the early post-medieval period (Crummy 2000, 121).

The general fittings (Category 11) include copper-alloy, lead and iron objects. Among the former are a probably drape or curtain ring (Fig. 27, SF 93) and a piece of copper-alloy sheet and two plaques that were probably used to patch sheet-metal vessels (Fig. 26, SFs 67, 55 and 28). The one lead item catalogued here is a shallow ferrule or lid probably of post-medieval or modern date. The ironwork includes many items stratified in features dated to Phase 4, among them a padlock, a padlock bolt (Fig. 28, SF 22), several wallhooks (*eg* Fig. 28, SFs 70 and 80), and two unparalleled fittings, both from Phase 4 pit 1509 (Fig. 28, SF 64-5). The recovery of both from a single context suggests that they may have been used as simple hinges on a small

box or similar container. The iron nails from the excavation are listed in Table 2. Those from the evaluation, many of which are probably late post-medieval or modern, are listed in the site archive. Table 2 shows that the number of the stratified nails is small, with most coming from the fill of just a few ditches and pits. Most are of standard form, with a moderately-sized flat or slightly convex round head. An unusual example came from Phase 5 ditch 1579; it has a large lozenge-shaped head and is clenched close to the top of the shank (Fig. 28, SF 86).

Fig. no	SF no	Context	Context description and phase	Identification	Length (mm)
-	73	1578	fill of ditch/lode 1580. Phase 4, Group 4.1	1 nail, clenched	38 (bent)
-	74	1578	fill of ditch/lode 1580. Phase 4, Group 4.1	1 nail	61
-	75	1578	fill of ditch/lode 1580. Phase 4, Group 4.1	1 nail	57
-	77	1505	fill of pit 1506. Phase 4, Group 4.3	2 nails; 1 shank fragment	38, 48; 41
-	66	1524	fill of pit 1509. Phase 4, Group 4.3	1 nail	52
-	78	1566	fill of ditch 1565. Phase 4	2 shank fragments, 1 bent	44, 38
-	63	1576	fill of ditch 1579. Phase 5, Group 5.2	1 nail with small head	41
Fig. 28	86	1576	fill of ditch 1579. Phase 5; Group 5.2	1 nail or stud with lozenge-shaped head, clenched at the top of the shank	112 (if straight)
-	88	1576	fill of ditch 1579. Phase 5; Group 5.2	1 shank fragment	55
-	89	1576	fill of ditch 1579. Phase 5; Group 5.2	1 nail	44
-	84	1588	fill of ditch 1583. Phase 5, Group 5.2	1 nail	39
-	68	1564	layer (= 1503), colluvium?	1 nail	34
-	69	1540	layer above Group 4.3. Phase 5	1 nail	44
-	71	1530	layer. Phase 5	1 nail	61
-	17	-	unstratified	1 nail, bent into U shape	38 (bent)
-	24	-	unstratified; metal-detected	1 shank fragment	42
-	43		unstratified	1 nail	20
-	44	-	unstratified	1 shank fragment	75

Table 2: Iron nails, listed by phase and context

Three fishing-weights are the only evidence for animal husbandry (Category 12); all are made from neatly rolled sheet lead and are of a consistent size. Fish formed an important part of the monastic diet, and most religious houses installed fish ponds to cater for this demand. Two pieces of lead shot, both unstratified, are catalogued here as military equipment (Category 13) but may instead have been used in hunting game; they may be of any date from late medieval to modern.

Lead-working, probably on a small scale, is represented by several unstratified lead spills, drips, and offcuts (Category 15). Some of these

pieces are catalogued below, but many more, mainly recovered by metal-detecting, are listed in the site archive. While some of this may represent post-medieval lead-working, perhaps during building works such as roofing and guttering, others may derive from the construction of and alterations to the abbey buildings, such as the offcut strips found during the evaluation that probably came from the installation of leaded windows (Fig. 29, SFs 5 and 7 below). Some fragments may come from the recycling of building materials after the Dissolution, when all the lead from monastic establishments was considered to be the property of the king and there is evidence for its removal and reuse by the crown (Dunning 1952, 200; Rahtz and Hirst 1976, 205; Hare 1985, 42; Coppack 1986, 103-11; 1990, 132-4; Brooks *et al* 2004, 137-8).

Antler was much utilised in the Late Saxon and early medieval periods in the manufacture a number of items, including combs, pins, counters and handles (Category 16). The single piece of discarded worked antler from Ramsey Abbey includes a considerable section of the beam, which was the major source of workable solid antler (Fig. 31, SF 56). It therefore represents discarded primary material, rather than waste debris generated during the later stage of carving specific items. The reason for its being rejected may be a crack which runs down the length of the beam, but this may also have formed during burial.

The miscellaneous items (Category 18) listed here mainly consist of fragments of strips or wire from Phase 4 and 5 contexts, but also included is a plano-convex lead disc with central perforation, which may be a fitting, weight, or small spindlewhorl.

Catalogue

NB: Small Find numbers were allocated from SF 1 for both the evaluation and excavation stages, resulting in duplication of numbers. Those from the evaluation are identified in the catalogue with the prefix ‘Eval’.

Coin

Eval SF 12. (1008). Evaluation. Worn halfpenny of George II. The precise date is illegible but the bust is of the older type and the legend reads GEORGIVS rather than GEORGIUS, providing a date range of 1740-54. Diameter 27 mm, weight 8.13 g.

Dress accessories

Fig. 27, Eval SF 12. Evaluation. Unstratified; metal-detected. Medieval copper-alloy folded buckle-plate with rectangular cut-out on the fold for the tongue. The plate was made from a trial-piece of sheet metal

used for practising the freehand cutting of letters, numbers, and symbols. Both sides have faint incised guide lines, within pairs of which are randomly cut several As, an A and B together, an A and partly finished B together, a V (five), and a IIII (four). There is a faint incuse cross on one side, and what may be a relief cross close to the end of the other side. Length 27 mm, width 17 mm.

Fig. 27, SF 39. Unstratified; metal-detected. Large medieval copper-alloy buckle-plate fragment, with long rectangular cut-out for the buckle tongue. There is a rivet hole in each surviving corner and the face of the plate is ornamented with a stemmed trefoil outlined in close-set rocker-arm work. There are also short slanting lines of rocker-arm work in places on the edge, and presumably others have worn away. Length 45 mm, width 34 mm.

Fig. 26, SF 16. Unstratified; metal-detected. Back-plate from a medieval or early post-medieval copper-alloy rectangular folded buckle-plate with the corners of the fold recessed. There is a rivet hole in each corner and a larger central one close to the fold. Length 42 mm, width 18 mm.

SF 8. Unstratified; metal-detected. Copper-alloy plate fragment with a rivet hole in each corner. Probably the back-plate from a buckle-plate or strap-end. Length 34 mm, width 19 mm.

Fig. 27, SF 42. (1576), fill of ditch 1579. Phase 5; Group 5.2. Copper-alloy ring, probably a finger-ring, with a broad central moulding and narrow marginal mouldings, made from a strip with soldered butt joint. There are rows of rouletting on the central moulding and in the flanking lodes. Internal diameter 19 mm, height 7 mm, thickness 1.5 mm.

SF 57/RF 101. (1505), fill of pit 1506. Phase 4; Group 4.3. Fragments of a copper-alloy lace-end with a rivet hole at the upper end; as Colchester Type 1, which dates from *c* 1375-1550/75 (Crummy 1988, 13). Length 9mm.

SF 94. (1568), fill of ditch 1565. Phase 4; Group 4.4. Shaft fragment from a small copper-alloy dress pin. Length 29 mm.

SF 14. Unstratified; metal-detected. Small copper-alloy dress or sewing pin with globular wound wire head; the tip is missing. The date range for these items runs from the medieval to modern period (Margeson 1993, 11). Length 22 mm.

Textile manufacture

Fig. 31, SF 18. (1090). Phase 2; Group 2.2. Evaluation. Bone single-pointed pinbeater of flat rectangular section at the upper end, thickening at the centre and tapering to round at the point. The tool is highly polished for most of its length, but with a rough patch at the centre of one face and another on the same face at the point; the very tip of the point is missing. Length 89 mm, maximum width 9 mm.

Fig. 30, SF 49. (1505), fill of pit 1506. Phase 4; Group 4.3. Globular stone spindlewhorl made from hard fine-grained limestone or calcite mudstone. The spindle-hole is straight-walled. Diameter 31 mm, length 18 mm; diameter of spindle-hole 8 mm. Weight 19.92 g.

Recreation

Fig 31, SF 62. (1572). Ditch/lode fill. Phase 4; Group 4.1. Fragment of a bone skate made from a horse metacarpus. The distal end has broken off, the proximal end has been trimmed to form a blunt terminal. The underside is polished from wear and the surface shows many fine scratches. The upperside is worn smooth in patches. Length 182 mm, maximum width 50 mm.

Weights

Fig. 29, Eval SF 1. (2000). Evaluation. Unstratified. Lead weight of gabled rectangular form, with a hole for suspension near the top. Height 33.5 mm, maximum size of section 21 by 13 mm. Weight 45.58 g.

Eval SF 29. (1273). Evaluation. Truncated conical lead weight coated with copper-alloy. The cross-section is irregularly oval rather than round. Height 30 mm, maximum diameter 20 mm. Possibly post-medieval.

Literacy

Fig. 26, Eval SF 58. (2000). Evaluation. Unstratified. Rectangular folded copper-alloy strap-end with a stemmed trefoil-shaped opening on the upper side. A shallow groove runs from the top of the central lobe of the trefoil around the fold. Rivets at the corners would have secured the fitting to a leather strap. Length 22 mm, width 26.5 mm. Probably later medieval or early post-medieval.

Fig. 29, Eval SF 56. (1256). Phase 3; Group 3.1. Evaluation. Lead pencil with narrowed upper shank and short point (Egan 1988, 270). Length 56.5 mm.

Fig. 29, Eval SF 50. (2000). Evaluation. Unstratified. Medieval lead token with beaded border on each side. On one face the border encloses a Lombardic capital R, on the other a design of a bird pecking at a fish held in its talons. Diameter 27.5 mm.

Transport

Fig. 28, SF 46. (1525), fill of ditch 1526. Phase 4; Group 4.4. Three fragments of an iron prick spur with elongated biconical goad. The one surviving terminal has a round lobe with a rivet to attach the spur to the boot. Length excluding goad approximately 80 mm; length of goad 36 mm. Date range: late medieval.

Fig. 28, SF 51. (1566), fill of ditch 1565. Phase 4; Group 4.3. Large rectangular iron harness buckle with the ends of the loop rolled over to hold a revolving bar with knobbed terminals. The tongue is a simple strip of metal wrapped around the opposite side the bar. Length 49 mm, width 61 mm.

Fig. 28, SF 54. (1588), fill of ditch 1583. Phase 5; Group 5.2. Part of an iron jointed snaffle bit, with long cheekpiece and small ring. The link is slightly curved. The ring is an integral part of the cheekpiece, which rotates within a stout knob at the end of the link. Length 86 mm; length of cheekpiece 96 mm; maximum internal diameter of ring 20 mm. A similar bit came from a post-medieval context at York and the general type is still in use today (Ottaway and Rogers 2002, fig 1524, 12741; Green 1977, 41).

SF 90. (1594), fill of ditch/lode 1584. Phase 4, Group 4.1. Iron horseshoe in three fragments; one branch is twisted. Four nail holes are visible in the undamaged branch and it has a calkin on the tip. Length approximately 120 mm, width 144 mm.

SF 79. (1548), fill of pit 1547. Phase 4; Group 4.4. Fragment from the end of one branch of an iron horseshoe with a calkin on the tip. One nail remains in place near the broken end. Length 74 mm.

Tools

SF 76. (1578), fill of ditch/lode 1580. Phase 4; Group 4.1. The handle of an iron scale-tang knife, severely encrusted with corrosion products. The plates of an organic (wooden?) handle, attached by three copper-alloy rivets, are preserved within the corrosion. Handles of this type first appeared within the late medieval period (Cowgill *et al* 1987, 26-7). Length 81 mm, maximum diameter 17.5 mm.

Fig. 30, SF 50. (1504), fill of pit 1506. Phase 4; Group 4.3. Fragment of a large rectangular-section Norwegian Ragstone hone. One face is badly spalled; a deep tapering groove has been worn into the centre of the other. Length 40 mm, width 39 mm.

General fittings

Fig. 27, Eval SF 2. (1002). Evaluation. Phase 5. Tapering copper-alloy ferrule made from rolled sheeting with an overlapping join. The narrow end is circular, the wide one is more or less triangular (possibly deliberate, possibly damage) and its edges are damaged. A complete rivet hole close to this end lies more or less opposite the join, but has no matching hole on that side. The triangular section and single rivet hole suggest that this is a crude chape from the end of a knife or dagger scabbard, probably a replacement for a better-made original. Length 49 mm, maximum width 15 mm.

Fig. 26, Eval SF 67. (2000). Evaluation. Unstratified. Trapezoidal copper-alloy sheet fitting, bent across the width close to the wide end. There are rivet hole or slots at each corner and a blundered third near the centre of the wide end. Probably a patch from a sheet-metal vessel (Egan 1998, 176-7). Length 48 mm, maximum width 44 mm.

Fig. 26, SF 55. Unstratified; metal-detected. Square copper-alloy plaque with a crudely-made rivet fitting through a central slot (see also SF 28 below); probably used to patch a sheet-metal vessel. 18 by 17 mm. For a similar rivet see a patched vessel fragment from Aldgate, London, found in a context dated to before 1660-80 (Grew 1984, 116, fig 58, 98).

Fig. 26, SF 28. Unstratified; metal-detected. Square copper-alloy plaque similar to SF 55 above. 20 by 18 mm.

Fig. 27, SF 93. Unstratified; metal-detected. Copper-alloy ring of facetted section, probably a drape or curtain ring (Egan 1998, 62-4). Internal diameter 27 mm, thickness 4 mm (worn in places), height 3 mm.

Eval SF 17. (1080). Evaluation. Phase 5. Small copper-alloy nail with biconical head and clenched shank; probably from upholstered furniture. Length (bent) 15 mm.

SF 9. Unstratified; metal-detected. Lead lid or ferrule with a shallow rim. A slight straight groove set just off-centre defines a zone of minor damage on one side, possibly caused by compression of the soil in that area during deposition. Diameter 73 mm, height 11.5 mm. The date of this object is uncertain, but it is most likely to be post-medieval or modern.

SF 47. (1520), fill of ditch 1502. Phase 4; sub-phase 4.3. Copper-alloy plated rectangular iron padlock case with ribs at each corner and an applied strip along the centre of each face. There is a slight rebate at one end for the insertion of the bolt (*cf* Margeson 1993, fig 115, 1240). Length 62 mm, diameter 28 mm. The rectangular form is unusual, but the copper-alloy finish and the applied strips are both features found on contemporary iron cylindrical padlocks (Egan 1998, 94-9; Ottaway and Rogers 2002, 2861-6).

Fig. 28, Eval SF 22. (1171). Evaluation. Phase 4; sub-phase 4.4. Iron U-shaped bolt from a cylindrical padlock, with the two leaf-springs still intact. Flanking the spring are two tabs with perforated terminals, similar to those on a lock from London (Egan 1998, fig 67). Length 77 mm.

Fig. 28, SF 64. (1524), fill of pit 1509. Phase 4; Group 4.3. Small iron hinged fitting consisting of a hooked spike, with the hook passing through a loop at the top of a lobate mount with small rivets in the upper and lower lobes, set flush with the upper surface. Length of hooked spike 49 mm (the tip is missing), length of lobate mount 47 mm. The hooked spike presumably fitted into a wooden board, while the small rivets on the mount would have been attached to a leather strap. This fitting probably served as a simple hinge mechanism, and the recovery of a second damaged example from the same context supports this identification. No direct parallel has been found for these objects, but a fairly similar piece with a plate (with two perforated rectangular expansions) suspended from a hooked fitting was found in a context dating from the 12th to 13th century at Coppergate, York (Ottaway and Rogers 2002, 2850, 3055, no12469). Another related item may be a small hooked mount from London which dates to the late 12th century (Brenan 1998, 70-1, no 139).

Fig. 28, SF 65. (1524), fill of pit 1509. Phase 4; Group 4.3. Fitting similar to SF 64 above, but with most of the spike missing. There is a small washer on the burred end of the lower rivet. Length of lobate mount 46 mm.

Fig. 28, SF 80. (1591), fill of ditch/lode 1584. Phase 4, Group 4.1. Iron wallhook with straight flat spike and backward curving hook. The outer end of the spike is slightly thicker than the rest to allow it to be hammered into the wall (Ottaway and Rogers 2002, 28360). Length 90 mm.

SF 81. (1591), fill of ditch/lode 1584. Phase 4, Group 4.1. Iron wallhook as SF 80 above. Length 109 mm.

SF 82. (1591), fill of ditch/lode 1584. Phase 4, Group 4.1. Iron wallhook as SF 80 above. Length 98 mm.

Fig. 28, SF 70. (1571), ditch fill. Phase 5.; group 5.2. Iron wallhook as SF 80. Length 94 mm.

Eval SF 31. (1321). Evaluation. Curved iron strip fragment, possibly a hook. Length 71 mm.

SF 83. (1504), fill of pit 1506. Group 4.3; Phase 4. Tongue-ended terminal from an iron strap-fitting with attachment nail still in place. Length 37 mm, maximum width 20 mm, length of nail shank 20 mm.

Eval SF 65. (1311), fill of ditch 1312. Evaluation. Phase 3. 1) U-shaped iron joiner's dog with the tip of one arm clenched and the other broken. Length 73 mm. 2) Strip fragment, possibly part of a chisel blade. Length 56 mm. 3) Iron nail with only a slight increase in diameter at the head. Length 97 mm. Probably post-medieval or modern.

Eval SF 87/RF 13. (1040). Phase 2; Group 2.3. Evaluation. Iron lozenge-shaped plate with one terminal rolled over to form a loop. Attached to this and lying partly across the plate is either a coiled piece of wire or a second fitting of some kind. Length 41 mm. Date uncertain, possibly post-medieval or modern.

Animal husbandry

Fig.29, SF 101. (1505), fill of pit 1506. Group 4.3; Phase 4. Fishing weight made from rolled sheet lead. Length 20.5 mm, diameter 7 mm.

SF 7. Unstratified; metal-detected. Fishing weight made from rolled sheet lead. Length 22 mm, diameter 7 mm.

SF 22. Unstratified; metal-detected. Fishing weight made from rolled sheet lead. Length 22 mm, diameter 7 mm.

Military equipment

Eval SF 4. (1005). Evaluation. Phase 5. Lead shot, deformed on one side by impact. Diameter 18 mm.

SF 23. Unstratified; metal-detected. Lead shot. Diameter 18 mm.

Metal-working

Fig. 29, Eval SF 57. (1171). Evaluation. Phase 4. Lead offcut or large spill. Most of one surface is slightly textured with close-set parallel ridges, perhaps from being worked flat with a narrow batten. Maximum dimensions 148 by 102.5 mm, 4 mm thick.

Fig. 29, Eval SF 5. (1006). Evaluation. Phase 5. Lead offcut, split at one end, probably waste from cutting lead window cames. Length 54 mm, maximum section size 6 by 5 mm.

Fig. 29, Eval SF 7. (1008). Phase 5. Evaluation. Lead folded tapering offcut strip, probably waste from cutting lead window cames. Length (folded) 39 mm, maximum width 9 mm, maximum thickness 4 mm.

Antler-working

Fig. 31, SF 56. (1552), fill of crane pit 1553. Group 4.3; Phase 4. Fragment of an antler beam with the lower end and the trez tine sawn off. The upper end of the beam is broken. Length 261 mm.

Miscellaneous

SF 48. (1519), fill of pit 1500. Group 4.3; Phase 4. Copper-alloy strip with one end straight and the other slightly rounded. There is a punched notch close to the latter, probably a secondary feature as the edges are burred on the reverse. Length 37 mm, width 9 mm.

SF 96. (1501); ditch cut. Group 4.3, Phase 4. Copper-alloy strip. Length 36 mm, width 9.5 mm.

SF 52. (1566), fill of ditch 1565. Group 4.3; Phase 4. Three fragments of copper-alloy wire. The two longest are bent and twisted. Lengths 60, 250 and 420 mm.

Eval SF 55. (1173). Evaluation. Plano-convex lead fitting, weight, or small spindlewhorl with large central hole. Diameter 26 mm, height 6 mm; diameter of hole 10 mm.

SF 67. (1577), fill of ditch 1579. Phase 5; Group 5.2. Fragment of an iron folded strip or bar. Length 72 mm, maximum width 20 mm.

SF 87. (1576), fill of ditch 1579. Phase 5; Group 5.2. Long fragment of iron wire, bent in the centre. Length 178 mm.

SF 85. (1588), fill of ditch 1583. Phase 5; Group 5.2. Fragment of iron wire. Length 50 mm.

Eval SF 61. (2000). Evaluation. Unstratified. Iron ring of round section, possibly used as a handle. Diameter 51 mm.

6.2 Slags and metalworking residue

by Tom Eley

6.2.1 Introduction

During the 1998 excavation 11.666kg of iron slag was found in 30 discrete contexts and cleaning layers (Appendix 1). The spatial distribution of the slag was concentrated with 89% (10.382kg) coming from contexts within the final southern 15m of the 1998 excavation. Most of the remainder came from Phase 5 deposits. From the Late Saxon and medieval contexts (Phases 1, 2, 3 and 4) 10.466kg of slag was recovered with 99% of this deriving from contexts in the southernmost 15m of the 1998 excavation. This suggests that the slag from these three phases may have come from a nearby smithy (and/or it could have been used as hardcore). This is further emphasised as the 2002 excavation to the north found less than 0.1kg of slag.

A visual assessment of the assemblage was undertaken categorizing the slag according to morphological characteristics. The main slag types looked for were taps slag, indicating iron smelting and plano-convex bottoms indicating smithing. Other slag forms included undiagnostic slag, which could not be assigned to a process, smithing slag that has a rough texture and vitrified ceramic indicative of hearth/furnace lining.

6.2.2 Results

Type	**Mass (kg)**
Smithing Hearth Bottom	9.857
Smithing Slag	1.175
Lining	0.247
Bloom	0.048
Undiagnostic	0.339
Total	11.666

Table 3: Metalworking slag categorization

Phase	**%**
1	3.34
2	83.06
3	3.05
4	0.25
5	10.3

Table 4: Percentage of metalworking slag by phase

6.2.3 Discussion

The results show that 94.6% of the slag derives from the smithing process with only a small amount (2.9%) of undiagnostic slag. No tap slag was found indicating that iron smelting was not occurring on this site nor were any non-ferrous slags identified. The main activity occurring seems to have been iron smithing with some evidence indicating primary bloom smithing. This raises the question of where the bloom came from. Was it brought in or was smelting occurring in the local vicinity that was not detected during excavation? On current evidence it seems likely that the bloom was brought from another location because of the total lack of other smelting slags.

Smithing hearth bottoms constitute 84.5% of the assemblage. Eighteent examples were identified on the basis of their plano-convex shape with four weighing between 1.4kg and 2.2kg. Smithing hearth bottoms formed in a smithing hearth either during primary bloom smithing, or iron working. Smithing hearth bottoms consist of charcoal, fuel ash, hearth lining, slag, flux, and iron agglomerating together at the base of the smithing hearth in hot oxidising conditions.

A small fragment of bloom was potentially identified from Phase 2 (1149), representing 0.4% of the assemblage. Blooms are the product of the bloomery iron smelting furnace which converted iron from ore under reducing conditions. The bloomery furnace did not create pure iron but a heterogenous mass of slag and iron of varying carbon content, that required skilful smithing to expel the entrapped slag. Although the bloom fragment found was small they are rare finds on archaeological sites. The small fragment found is not evidence for *in-situ* smelting but it does raise the possibility of bloom smithing occurring on a small scale.

Two contexts from Phase 2 contained the majority of the slag. In Phase 2, layer 1297 contained 7.513kg of slag representing 64.4% of the total assemblage; whilst 1.955kg of slag was found in the adjacent watering hole (1308 and 1328) representing 16.8% of the total. Together these two contexts contained 81.2% of the assemblage and included all the large smithing hearth bottoms. The remaining 19.3% of the assemblage was distributed over 28 contexts from Phases 1, 2, 3, 4 and 5. The potential bloom fragment comes from Phase 2. The slags were not found in *in-situ* features but re-deposited, potentially many times, and could have been brought from elsewhere. However the concentration of slag at the southern end of the 1998 excavation indicates there could have been a smithy somewhere nearby.

The assemblage as a whole was not large and does not represent an *in-situ* smithy. However the large size of some of the smithing hearth bottoms are of interest because they indicate intensive periods of

smithing; the bloom fragment could provide information on the carbon content of iron made in the bloomery furnace prior to AD 1150.

6.3 Hammerscale from Environmental Samples

by Rachel Fosberry

6.3.1 Introduction and Method

Twenty-three bulk samples were processed using the standard OA East processing technique of the time. This entailed tank flotation using a 1.0mm residue mesh and a 0.5mm mesh to collect the flot. The residues had previously been sorted for finds and then discarded. The flots were sent to Alan Clapham for analysis of the charred plant remains and then stored at OA East.

Recent examination of the substantial metalworking waste that was recovered during excavation has raised the question of whether any hammerscale was evident in the environmental samples. There is no record of the residues being checked for hammerscale and the only material available for examination was the flots. A magnet was passed slowly and repeatedly through each flot and any magnetic retent was examined under a binocular microscope at x16 magnification.

6.3.2 Results

Seven flots contain microscopic flake hammerscale and two flots contain single spheroids of hammerslag. Of these seven flots all but one (Sample 22) were in the extreme southern part of the site.

Sample 5	(1138)	Phase 1	3 flakes hammerscale
Sample 8	(1270)	Phase 1	½ spheroidal hammerslag
Sample 9	(1273)	Phase 2	*c.* 30 flakes hammerscale + 1 spheroid
Sample 10	(1309)	Phase 2	5 flakes hammerscale
Sample 11	(1328)	Phase 2	1 flake hammerscale
Sample 17	(1334)	Phase 1	1 flake hammerscale
Sample 22	(1367)	Phase 3	4 flakes hammerscale

6.3.3 Conclusion

Considering the substantial quantity of smithing slag recovered from this site, it would be expected that hammerscale would occur frequently in the flots, however, the only sample that contains a significant quantity of hammerscale is Sample 9 (1273, Phase 2).

These results cannot be truly representative of the amount of hammerscale present in the deposits sampled. Usually, the majority of hammerscale remains in the residue after flotation. Spheroidal hammerslag is most likely to float due to it being hollow however, the

size of the spheroids generally ranges from 2mm up to about 6mm and it is probable that some would have passed through the flot mesh and been lost. The spheroid in Sample 9 is only 3mm in diameter.

6.4 Medieval Pottery

by Carole Fletcher, with Paul Spoerry

6.4.1 Introduction and Background

The excavations at Ramsey Abbey School in 1998 produced an assemblage of 1018 sherds of pottery (10.991 kg), recovered from 85 contexts. The second phase of excavation in 2002 produced an assemblage of 1257 sherds (14.180 kg) from a total of 1010 contexts, of which 54 produced pottery. Though smaller in area, this second phase of excavation doubled the amount of material available for study.

The material found unstratified (1000) and that from cleaning (1008) in 1998 is included in the above calculations but have been excluded from the ceramic phasing. The unstratified material recorded as context (99999) and various unphased contexts from both phases of work are also included in the above calculations but are excluded from the ceramic phasing and that of the phase or group calculations.

The information for each phase of excavation was recorded in separate databases, which were then reintegrated. The stratigraphic phasing for both excavations has been brought together; the statistical illustrations are for the combined excavations. The one major difference between the two stages of excavation is that the material excavated in 2002 almost exclusively falls into the later stratigraphic phases of the site, Phases 4 and 5. Only 11 sherds (0.111kg) are identified as coming from Phase 3 in the 2002 excavations, compared with 560 sherds (5.985kg) from the 1998 excavations, making up over half of the assemblage at that time. This difference is due to spatial considerations as the 2002 excavations were located away from the main areas of early activity as defined during the 1998 excavations.

The major fabric types identified in the 1998 assemblage are Thetford (THET) and Thetford type (THETT) fabrics, early medieval ware (EMW), Shelly ware (SHW) and Medieval Ely ware (MEL). The excavations in 2002 produced similar results, but a greater knowledge of the material led to the identification of a Medieval Ely type ware (MELT), which though possibly still produced in Ely or its surrounding area, is suitably different. Time and funding constraints prevent the author from a complete re-examination of the fabrics from the 1998 excavation to confirm that this was also the case with the earlier

material. To prevent the fragmentation of the results between both phases of excavation, the material identified as MEL from the 1998 excavations, and the material from the 2002 excavations subsequently sub-divided as Medieval Ely ware (MEL) and Medieval Ely type ware (MELT) is combined as a single group (MEL/MELT) in the fabric tables.

The 2002 excavations also produced fabric types not previously recognised on the site, or misidentified as unknown sandy wares or similar. These are Lincolnshire medieval sandy Ware (LMS), medieval Essex micaceous sandy ware (MEMS), medieval Essex micaceous sandy ware (EMEMS) and Fen Sandy Wares (FSW). In addition late Lyveden-Stanion (LLYST) was also recognised; and eleven sherds of Bourne D or Bourn D type ware (BOND/BONDT) were identified. A single sherd of Middle Saxon pottery weighing 10g was also recovered from the site during the 2002 excavations, although this forms part of the residual element present in Phase 5.

Specialist vessels not seen in the 1998 material were identified in the 2002 assemblage including a partial base from a mortar, a single sherd from a Surrey White ware money box and sherds from two possible curfews. In the post-Dissolution phase, the assemblage includes utilitarian wares such as BOND/BONDT bowls and pitchers from Lincolnshire and post-medieval redwares (PMR) and Bichromes (BICR) whose forms include bowls, pitchers and pipkins. The assemblage is not large and the small size of some of the phase assemblages mean that the group is too small to warrant detailed analysis of any phase except Phase 4. A consideration of change in the assemblage over time has been attempted on a phase level with a comparison of significant groups of features, where it is felt that this can add information to help build up a picture of activity on the site.

6.4.2 The Phase Assemblage

a) Phase 1: Late Saxon to Saxo-Norman (10th to mid 12th century)

Excluding intrusive material, the small pottery assemblage attributed to this phase (39 sherds, 0.283 kg) consists of St Neots type ware (*c* 850 – *c* 1150), Grimston Thetford ware (*c* 1000 – *c* 1200) and East Anglian Early Medieval ware (Early Medieval ware henceforth; *c* 1050 – *c* 1200), suggesting that the features fell from use during the Saxo-Norman period.

b) Phase 2: early to mid 12th century

Amongst the pottery attributed to this phase (207 sherds, 1.679 kg) the contemporary fabrics are dominated by Early Medieval ware dating to

c 1050 – *c* 1200 (37% by weight) followed by Shelly wares of the mid 12th to mid 13th centuries (30% by weight). Medieval Ely type wares are strongly represented (21% by weight) and are of comparable date. Jars for both cooking and storage predominate in Phases 2-4, which is consistent with many rural assemblages in this period. Phase 2 demonstrates this dominance most clearly with over 70% of the identifiable forms being jars.

c) Phase 3: mid 12th to 13th centuries

The pottery from deposits assigned to Phase 3 (325 sherds, 3.456 kg) shows an increase in the number of jugs, which mainly results from the predominance of Medieval Ely type wares and an increase in the amount of Grimston ware (*c* 1250 – *c* 1500). A slight decline in the number of jars (cooking and storage vessels) can also be observed. The increased use of large jugs for the serving of liquids is a feature of pottery assemblages in England from the later 12th century onwards and this trend is reflected in the Ramsey assemblage. The change may be associated with the growth of the wine trade, a factor which has particular relevance here, at a site in close proximity to the loading and storage facilities of a major monastic institution.

d) Phase 4: 13th century to c.1539

The pottery from Phase 4 (983 sherds, 11.676 kg) is dominated by Medieval Ely type wares of the mid 12th to mid 14th centuries. The wide date range of the phase (13th century to *c* 1539) is reflected in the extensive range of ceramics represented. Its start date is supported by the marked reduction in the presence of Early Medieval ware, which is thought to finish around AD 1200 as other fabrics developed. Medieval Ely type wares now comprise 50% of the assemblage; Shelly wares are still an important element but now other medieval types, both glazed and unglazed, begin to appear in more significant numbers than in earlier phases, making up more than 10% of the assemblage.

This phase assemblage is almost identical to that of the preceding phase in terms of vessel types present, although the fabric types present change. For example, while the number of bowls remains similar, in Phase 3 these are exclusively Medieval Ely type and Shelly wares, whereas by Phase 4 some 52% of the bowl sherds are in post-medieval fabrics. The majority of the fabrics represented in this phase assemblage are, however, medieval suggesting that any conclusions drawn about this phase may be distorted by its longevity.

e) Phase 5: Post-Dissolution

A total of 218 sherds (3.484kg) of pottery was recovered from this phase. The main context yielding pottery was cleaning layer 1008; this

has an exceedingly high degree of residuality and indicates that the material was cleared from areas medieval activity and redeposited.

This phase sees the introduction of ceramic drinking vessels, represented by fragments of Ely Babylon ware (16th to 17th centuries), 17th-century post-medieval black ware vessels most likely to be tygs or mugs, and a Bichrome vessel (16th to 17th centuries). Bowls are now the major vessel type at 71% of the total, and 90% of these are post-medieval redwares. The presence of these often large bowls or pancheons may indicate processes associated with dairying.

f) Discussion by Phase

The relative lack of stratigraphic sequence and the overlapping nature of the site phasing make an assessment of the ceramic material within these phases difficult, particularly in terms of assessing residuality and intrusiveness. In addition, the phases and groups are in many cases too small to provide any statistically valid figures for comparison.

As a result the following discussion relates mainly to the overarching stratigraphic phases of the site with discussion of subgroups only where they are large enough to add to the understanding of the pottery usage and deposition on the site.

Phase	No. Sherds	Weight (kg)	Ave. sherd weight (kg)
1: 10th to mid 12th century	39	0.283	0.007
2: early to mid 12th century	207	1.679	0.008
3: mid 12th to 13th centuries	325	3.456	0.011
4: 13th century to c.1539	983	11.676	0.012
5: Post-Dissolution	218	3.484	0.016

Table 5: Ceramic assemblage by phase (for 1998 & 2002)

Table 5 shows the assemblage when examined by phase. The average sherd weight of Phases 1-4 is not large and suggests a degree of reworking and re-deposition of material. The larger sherd weight in Phase 5 may indicate less reworking. Phase 1 is too small a group to be statistically valid and is therefore not be considered in the discussion beyond this point.

The results of a broad assessment of residuality and intrusiveness are shown in Fig. 32. Comparisons have been made by sherd count rather than weight due to the often large un-abraded nature of intrusive early post-medieval sherds from fabrics such as BOND which can make the level of intrusiveness seem disproportionately large.

No intrusive material was evident in Phases 2 and 5 and only low levels in Phases 3 and 4. Residuality is more obvious and the

percentage of residuality is greatest in contexts in Phase 5 where approximately 33% of the assemblage is residual. This is not unexpected as Phase 5 covers the widest date range and includes material obviously redeposited from the medieval abbey.

Phase 4 is the largest group and represents more than a half of the total phase assemblage by count and weight. This phase has a low percentage of residuality, which reflects again broad dating from the 13th to the mid 16th century. The large size of the group may reflect longevity rather than intensity of occupation. Some of the groups within this phase have a much narrower of date range than the broad date of the phase suggests and most contexts are dated to the mid 12th to mid 14th century. The high levels of residuality in Phase 5 demonstrate the amount of reworking of material that occurs after the mid 16th century.

6.4.3 Fabrics

Pottery	Phase 2	Phase 3	Phase 4	Phase 5
Middle Saxon pottery				0.3
STAM	4.5	3.3	2.1	0
THET/THETT	6.0	8.3	1.4	2.2
EMW	36.9	3.0	0.7	0.1
NEOT/SHW	30.6	33.4	18.3	1.9
MEL/MELT	20.8	42.6	50.5	13.2
DEST/LMS/GRIM/ MEMS/LYST	0.9	5.8	19	3.8
CREA/PMR/BOND/BCHIN	0	0.4	6.3	67.2
UNK/IMPORTS	0.3	3.2	1.7	11.3

Table 6: Percentages of broad pottery types (by weight)

Phase 2, is dominated by EMW wares followed by Shelly fabrics, which will include a small number of NEOT sherds. MEL/MELT wares are also strongly represented. There are few non–local glazed wares indicating that local production was providing both kitchen and table vessels.

Phases 3 and 4 show dominance by MEL/MELT, with Shelly wares also well represented being more numerous in Phase 3. A mid 12th to early 13th century date for the beginning of this phase is supported by the marked reduction in the presence of EMW, which is thought to finish around the beginning of the 13th century, as other fabrics develop. Phase 3 is similar to Phase 2 in having few non–local glazed wares

The wide date range of Phase 4 (13th to mid 16th century) increases the range of ceramics represented. Again, there is a marked reduction in the presence of EMW. MEL/MELT now comprises 50% of the assemblage and Shelly ware fabrics are still an important element. However other non–local medieval glazed wares and unglazed wares such as MEMS are beginning to appear in more significant numbers, now making up 19% of the assemblage. This may indicate a different range of activities on site during this phase although the longevity of the phase makes it difficult to draw conclusions. Post-medieval and post-Dissolution fabrics are present in Phase 4 and it is unclear with such a broad date range when these can be considered contemporary or intrusive.

Phase 5 is completely dominated by BOND/BONDT, PMR and other later fabrics, which make up more than 67% of the assemblage. It is likely that the later fabrics (e.g. cream ware) are intrusive but the assemblage is very mixed.

Figure 33 compares the pre-1150/1200 fabrics and the later medieval types to indicate how much early pottery is present in the all groups this gives a slightly clearer picture of the ceramic composition of the assemblage.

It can be seen from these results that pre- 1150-1200 fabrics are well represented in Phase 2 with the rapid fall by Phase 3. In Phase 2 the medieval fabrics are at similar levels to the earlier fabrics and by Phase 3 medieval fabrics are dominant.

6.4.3 Forms

Figure 34 shows the percentages by weight of each group assemblage that can be attributed to broad vessel functional types. This data excludes from the calculations those sherds for which no form or function identification could be made. It should be remembered that some of these phases are already small and that these calculations include both the intrusive and residual material for which a form was identified, hence these results must be treated with caution.

It is obvious from Fig. 34 that there is a dominance of jars in three of the phases (Phase 2, 3 and 4), a small percentage of bowls and jugs also being present. In Phase 2 the bowl represented consists of two sherds of SHW and the jugs by nine sherds of STAM, one of GRIM one sherd of DEST and four sherds of MEL.

Phase 3 shows increase in the number jugs and includes an unglazed SHW vessel and an expanded number of medieval glazed jugs sherds

including GRIM, MEL and LYST. A slight decline in the number of jars can also be observed. The small increase in the percentage of jugs implies that consumption of liquids in such vessels was a feature of activity associated with this phase. The small number of such vessels is, however, more in keeping with a rural assemblage rather than that expected of a major medieval monastery.

The assemblage from Phase 4 is very similar to that of Phase 3 in terms of vessel types present with the exception of the presence of six curfew sherds (from contexts 1505 and 1515) and sherds from a MGC mortar and a Surrey White ware money box. Although the vessel types remain the same the fabric types change. For example while the number of bowls remains similar in Phase 3 these are exclusively medieval fabrics (MEL and SHW) by Phase 4 both medieval and post-medieval fabrics are present.

This phase sees a dramatic fall in the number of jars and jugs (by weight) with this material now being manly residual. The dominance of bowls in Phase 5 is consistent with a late medieval/early post-medieval date for the phase. PMR bowl sherds form the majority of the vessel assemblage by weight at more than 1kg. The presence of these large bowls or pancheons may indicate processes associated with dairying. This phase also sees the introduction of drinking vessels, represented here by fragments of Ely Babylon ware (BABL) and post-medieval black glazed ware (PMBL), these vessels are most likely to have served as tygs or mugs.

6.4.4 Fabric and form within Phase 4

Phase 4 contains the largest number of sherds and the broadest dating range, providing the opportunity for slightly more detailed study than the smaller assemblages from other phases. Of the groups within Phase 4, Group 4.0 has not been examined as it relates to layers and dumps not directly associated with features in the remaining groups (4.1 to 4.5). Of these, two are too small for statistical examination (Group 4.2 and 4.5). The remaining groups have been examined in the same way as the main assemblage (by form and fabric) to recover more detail about site usage and patterns of deposition.

Pottery	Group 4.1 (lode)	Group 4.3 (pits)	Group 4.4 (ditches & tanks)
STAM	1.1	3.1	1.4
THET/THETT	1.0	0.9	1.5
EMW	0.8	0.9	0
NEOT/SHW	3.6	21.0	8.9
MEL/MELT	51.0	45.5	64.7
DEST/LMS/GRIM/ MEMS/LYST	12.8	25.2	6.4

CREA/PMR/BOND/ BCHIN	28.9	0.4	16.1
UNK/IMPORTS	0.8	3.0	1.0

Table 7: Percentages of broad pottery types in group assemblages (by weight) for Phase 4

Table 7 indicates that in the group assemblages MEL/MELT is the largest component.

Fills of the lode (Group 4.1) include the largest amount of intrusive post-medieval pottery. The pottery recovered from the lode is generally fairly uninformative in terms of defining the dates of infilling (105 sherds, 1.262 kg): this is not surprising since the feature almost certainly underwent scouring episodes and most fills relate to its disuse rather than its use. The basal fills were undated with secondary fills containing fabrics spanning *c* 1150 – *c* 1350, dominated by Medieval Ely type wares. Some of the uppermost fills include a few sherds of post-medieval fabrics.

The pits assigned to Group 4.3 contain almost no post-medieval pottery and, while MEL/MELT still dominates the group, it also has a much greater proportion of non-local glazed wares making up more than a quarter of the group assemblage. It is probable that at least some of these pits are medieval in date and might be given a narrower date range than that assigned to Phase 4 as a whole. Only a single sherd of post-medieval pottery was recovered, comprising a fragment of Surrey white ware money box which dates to the 16th century.

The drainage ditches and tanks associated with the lode (Group 4.4) are similar in terms of their ceramic assemblages to the material from fills of the lode, although they contain more MEL/MELT and SHW/NEOT and fewer non-local glazed sherds.

Figure 35 shows a dominance of jars in Groups 4.3 and 4.4, which is in keeping with many rural assemblages and is also a reflection of the larger site assemblage. In the fills of the lode, jugs are the dominant form (26% of the assemblage), jars and bowls accounting for 24% and 21% respectively. The mixed mature of this assemblage perhaps indicates that material was dumped from both kitchen and table assemblages.

Two of fills of pit 1506 produced curfew sherds (1505 and 1515) and a large fragment of mortar, most likely an Essex product, was recovered from another fill of the same pit (1504). One further fragment of mortar was recovered from the fill of a post-medieval drain (1573, Phase 5); this fragment is mentioned here since it may come from the same vessel.

Though an examination of the material from Phase 4 has indicated some differences in pottery distribution the broad dating of the phase makes it difficult to draw conclusions about the various group assemblages. The exception to this is pit 1506 (Group 4.3), which appears to have gone out of use before the Dissolution. This feature contained a range of medieval kitchen vessels.

6.4.5 Conclusions

The pottery assemblage is dominated by East Anglian Late Saxon and Saxo-Norman types in Phases 1 and 2, alongside increasing quantities of Shelly wares originating from Northamptonshire and perhaps Lincolnshire. Ely type wares, made locally in the Fenland, then become the most common product and these dominate with Shelly wares until the later medieval period. It is likely that from the later 14th century onwards, once Shelly pottery ceases to be produced and distributed in quantity, Ely type wares dominate the assemblage, but these decline in the face of increasing supply of Bourne D ware from south Lincolnshire from the mid-15th century onwards[i].

It is important to recognise that the broad classification Medieval Ely type ware, as described in this assemblage, is likely to be a conflation of sandy and calcareous pottery made at Ely and similar, but not identical, fabrics and types made closer to Ramsey around the Huntingdonshire Fenland. Since recent Inductively Coupled Plasma Spectroscopy (Vince 2008) suggests that Ely type wares excavated at Ramsey may not be actual Ely products, it is tempting to associate this Huntingdonshire pottery variant with the estates, patronage and interests of Ramsey Abbey – in contrast to the Ely pottery industry which was quite clearly facilitated, if not encouraged and initiated, through the interests of the monastic and ecclesiastical authorities at that centre.

The Ramsey pottery assemblage is similar to groups from domestic and lay communities in the town and surrounding countryside, insofar as it includes pottery made in the Cambridgeshire fenland, alongside vessels from further west in Northamptonshire and a small amount of material that was transported across the fens from Norfolk. The group may contain slightly more vessels from further afield, and there could also be an elevated level glazed jugs represented here in the high medieval period. These differences are, however, only slight and in no way striking or fundamental to the nature of the assemblage which remains mostly parochial and seemingly domestic.

6.4.6 Addendum

Recent excavations in Ely by the Cambridge Archaeological Unit (at Broad Street) have also led to the identification of a post medieval red ware industry in Ely (David Hall, pers. comm.) the products of which appear in Ramsey. These Ely products were previously identified simply as Post-Medieval Red Wares, thought to originate in Essex. Norfolk Bichrome vessels previously believed to come from Norfolk production sites also appear to have been produced in Ely. These form part of the post-medieval pottery range now known to have been produced in the town. The result of this new information is that the dominance of Ely products can now be seen to continue into the post-medieval period.

To further complicate matters, in 2007 the Ramsey material for illustration was re-examined as part of the Cambridgeshire Medieval Pottery Project (Spoerry 2007) to find corpus examples for the medieval type series for the county. In doing so it was observed that the material previously described as MELT is the fabric now recognised as Huntingdonshire Fen Sandy ware (HUN FSW), which is a separate fabric from MEL or MELT. Though still a Cambridgeshire product its production centre has not yet been identified. This has resulted in a new fabric description for the pottery previously called MELT in the catalogue for the illustrated pottery. It has not been possible to look at all the MEL and MELT material from the 1998 and 2002 excavations to determine what is HUN FSW and therefore the original discussion and conclusions must stand until such time as a full re-examination of the pottery from the 1998 and 2002 excavations can take place.

Catalogue of Illustrated Pottery

Fig. 36, no.1. A large sherd from a small sooted jar with an everted, rounded slightly internally bevelled rim from a Huntingdon EMW rounded jar. Fabric: Early medieval wares have in the past principally been characterised in Essex and Norfolk, and are seen generally as an East Anglian tradition. An EMW type particular to Huntingdon has recently been recognised. This has a clay matrix, macroscopically very similar to HUN FSW, although it typically contains fewer calcareous inclusions and less, perhaps finer quartz, although a more coarsely sanded variant is also known. 1239, fill of slot 1238, Phase 3

Fig. 36, no.2. An everted, rounded slightly externally thickened rim sherd from a HUN FSW rounded jar. Fabric: oxidised sandy ware, the quartz and grains being mostly less that 05mm across, hence rendering it a finer quality than many regional sandy wares. 1171, fill of ditch 1172/1272, Phase 4

Fig. 36, no.3. An everted externally bevelled rim from a HUN FSW shouldered jar with heavy external sooting. 1171, fill of ditch 1172/1272, Phase 4

Fig. 36, no.4. A knife trimmed base sherd from a hand built mortar a rare ceramic form. Fine fabric buff coloured surfaces and margins with mid grey core with fine

quartz and mica inclusions with occasional flint, Mill Green coarse ware. 1504, fill of pit 1506, Phase 4

Fig. 37, no.5. A HUNFSW short socketed handle. 1504, fill of pit 1506, Phase 4

Fig. 37, no.6. A large section from a small or miniature shouldered LMEL jug with a strap handler scar and flat base. Poor quality glaze or under fired glaze is present on neck and shoulders of the vessel. 1374, fill of posthole 1373, Phase 3

Fig. 37, no.7. An everted flattened externally bevelled rim sherd with a pulled or pinched spout from a HUNFSW rounded jug. 1102, fill of pit 1117, Phase 3

Fig. 38, no.8. A Large sherd from a decorated bowl with an internally thickened slightly externally bevelled rim. HUNFSW. 1537, fill of pit 1538, Phase 4

Fig. 38, no.9. Complete profile from a large shallow dish with a rounded slightly internally thickened rim and slightly sagging base. South Cambridgeshire EMW (SCAM EMW) with dull red brown surfaces with external paler red-brown margins and mid grey core and internal margins. Common sub-rounded quartz and occasional angular flint. 1029, ditch cut, unphased.

6.5 Ceramic building material

by Dr Paul Spoerry, with a contribution by Alan Vince

6.5.1 Introduction

The excavations in 1998 and 2002 produced 34.682 kg and 23.023 kg of ceramic building material respectively, providing 57.705 kg in total. The material can be divided into 47.364 kg of roof tile, 2.147 kg of floor tile, 6.623 kg of brick and 1.571 kg unclassified.

As with many excavations retention of brick fragments and brick samples was subject to a different process than for other ceramic finds, so these relative totals should not be taken to entirely indicative of presence within context; many further brick fragments were identified, particularly in contexts where building materials were re-used, and those examples retained and included here are therefore just a selection. A short discussion of three examples of bricks from the site is included in the site analysis (see Section 6.6, Ryan this volume).

In contrast, as far as possible all tile and other ceramic building material revealed during the excavations was retained. It is that assemblage that has been analysed and is discussed here.

6.5.2 Ceramic Building Material Fabrics

All of the ceramic building material (CBM) recovered from the excavation was assigned a ceramic fabric code on the basis of macroscopic description. Initially seven fabric groups were identified, but in some cases further variation was recognised within these groups

and some sub-fabrics were therefore also assigned. The fabrics and sub-fabrics, and the types of product they were commonly used for, are given in Table 8.

Fabric Group	Sub-fabrics	Types present	Petrological group (after Vince)
A	AA, A2	Roof tiles, floor tiles and some brick	2
B		Probably Romano-British CBM only	1
D	DR, DW, DR2, DW2	Roof tiles, decorated floor tiles and some brick	DR, DR2=2 DW=3
E		Roof tiles	3
F		Roof tiles and one brick	2
G	GW, G2, GW2	Roof tiles, floor tiles and brick	3
H		Fire bricks	

Table 8: Ceramic building material fabric types

Although not fully published, it has been reported that staff of the British Museum and students from Ailwyn School carried out an excavation of a late medieval brick kiln close to the site of Ramsey Abbey in 1967, which also produced much evidence for roof tile and possibly floor tile manufacture (e.g. Eames 1980, 123). With this knowledge of local manufacture in mind, twelve samples from most of the common CBM fabrics were selected for Thin Section analysis, to attempt to characterise local and non-local products. In addition a sample of clay was recovered from an exposure close to Ramsey Abbey and this was also studied in thin section following the firing of a briquette.

6.5.3 Summary of Results of Petrological Analysis

(see Vince, Appendix 2)

Ignoring those inclusions which may have been deliberately added as tempering, the fabrics were grouped into three types:

Fabric B (two samples; Romano-British).Non-calcareous, few inclusions visible to the naked eye. Quartz and muscovite silt present in the groundmass.

Fabrics A, AA, A2, DR, DR2 and F (six samples, including decorated floor tile). Calcareous body in which the calcareous matter is probably formed from microfossils, with abundant ostracod? or thin-walled bivalve shell sand. In some cases the shell has been altered, either before or after burial. The groundmass also contains variable amounts of dark brown/opaque iron, either of bacterial or faecal origin. Such matter is a distinctive feature of some Jurassic clays but cannot be tied down to a specific strata or period within the Jurassic.

Fabrics E, DW and G (four samples) Calcareous body with no fossils visible. In this case the calcareous matter in the groundmass is much more abundant and finer-

textured. Similar clays were used to make Cambridgeshire yellow bricks in the 19th century.

It is likely that groups 2 and 3 were both produced from Jurassic clays, either the Oxford Clay or the Kimmeridge clay. The most common group (Group 2) may actually have been produced at Ramsey, since it includes the decorated floor tile sample thought on other grounds to be made at Ramsey. Group 3 is perhaps more likely to have been imported to Ramsey from south Cambridgeshire, but a more local source cannot be discounted without sampling of the local clay sources. The Group 1 clay contains no distinctive features to indicate its likely origin and it may well not be locally produced. Study of the deliberately added inclusions tends to support, or at least not contradict, the general provenance implied from study of the groundmass.

A sample of local clay was also submitted for study.

The clay was blue-grey in colour with black mottling and moderate decayed roots. Mixed with this clay was a light brown, very sandy clay. A sub-sample of the clay was made into a briquette, with the minimum of working to preserve the original texture, and fired at c.1000 degrees C by Andrew Macdonald. The fired clay has a variable dark red colour (Munsell 2.5YR 3/6) with black mottling.

Study of the resultant thin section suggests that it is likely that the blue-grey clay is, ultimately, of Jurassic origin, based on the low silt content. The quartzose sand contains grains derived from Triassic sands and the Upper Cretaceous chalk and is presumably a Quaternary cover sand. Such sands occur widely in the east Midlands, and all contain mostly Triassic material.

The clay sample is most similar to the Group 1 CBM, which was used only in the Roman period, but these samples contain more silt in their groundmass that the clay. However, the quartz sand found sparsely in this fabric is similar to that in the clay sample, and black-stained clay pellets are present, as in the Ramsey clay. Groups 2 and 3 are clearly different from the clay sample in that they contain either bioclastic inclusions (Group 2) or authigenic calcareous inclusions (Group 3).

In conclusion the local clay sample cannot be associated with known medieval brick and tile on the site production, but it may alternatively suggest that Romano-British CBM was made locally as well.

6.5.4 Floor Tiles

a) Decorated Floor Tiles (Figs. 39-40)

Eight relief decorated floor tile fragments were recovered during the 1998 excavation and a further fragment, found in adjacent flower beds,

was added to the site archive in 2002. All of the decorated tiles found in 1998 were in Fabric DR, with the 2002 addition being in Fabric G. The former fabric is certainly local in origin, although there is the possibility that the latter is not from Ramsey. Stylistically this tile is somewhat distinct from the others represented here, although this degree of variation should not be over-emphasised as a similar generic product seems to have been intended.

1 Corner fragment in orange fabric, 19mm thick with vertical sides and a sanded base with mortar adhering. The background around the stamped relief design is infilled with buff slip, in parts covered with a green lead glaze The upper surface is heavily worn and slip and/or glaze may have originally covered the whole tile, although this is by no means certain. The design is made up of a simple stylised grapes on vine or trefoil border around an unknown central panel. 1035, layer, Phase 5

2. Fragment in orange-buff/buff mixed fabric, 25mm thick with vertical sides and a sanded base. The upper surface is covered with a buff slip, with a green mottled glaze (possibly with copper added) surviving over part. The upper parts of the relief design, which was originally up to 5mm deep, are partially worn. The design is made up of a simple stylised grapes on vine or trefoil border, made with a different die to No.1, around an unknown central panel. 1007

3 Corner fragment in orange-pink fabric, 28mm thick with vertical sides and a sanded base. The upper surface is covered with an orange-brown slip and does not appear worn. The corner/border design is perhaps a complex stylised bunch of grapes. 1356, structure, Phase 5

4 Fragment in orange-pink fabric, 28mm thick with vertical sides and a sanded base with mortar adhering. The upper surface is probably covered with an orange-brown slip and is slightly worn. The design is made up of a simple stylised grapes on vine or trefoil border around an unknown central panel showing a sinuous foliate design. 1356, structure, Phase 5

5 Fragment in orange-pink fabric, 26mm thick with a sanded base with mortar adhering to both it and the upper surface, perhaps indicating re-use in a wall. . The upper surface is probably covered with an orange-brown slip and is slightly worn. The design is made up of a three-petalled flower or trefoil border around an unknown central panel showing a sinuous concentric design. 1356, structure, Phase 5

6 Corner fragment in Fabric G, orange throughout with a sanded base. The majority of the upper surface, which is moderately worn, is covered in a buff slip that is associated with degraded or under-fired lead glaze. The design has a border frieze around a central panel, the former showing a triple wavy line and repeated single dot, the latter represented by a quartered trefoil. 1035, layer, Phase 5

7 Spalled surface fragment in buff-pink fabric. The upper surface, which is moderately worn, is covered with a red slip and areas of degraded or under-fired lead glaze. The fragment shows part of the central panel of the design, with sinuous foliage with round fruit either side of a straight upright which may have formed a mirror image point for the design. Unstratified

This group of relief-decorated tiles is important as it represents the first published examples of medieval decorated floor tiles probably made at Ramsey Abbey. The comparatively high relief (up to 5mm) and generally intricate complexity of the designs when compared to the more usual inlaid tiles found in contemporary monastic contexts, makes the group unusual.

b) Undecorated Floor Tiles (Fig. 40)

Six undecorated floor tile fragments were recovered and these were identified as being in Fabrics A and GW. Two examples have been illustrated.

8 Fabric A; orange throughout, 23mmm thick with vertical sides and mortar on the sanded base. It has a clear lead glaze, showing signs of wear, coloured orange-brown over the fabric, but with small areas showing as a buff yellow over randomly distributed smears of cream clay under the glazed surface. Despite this it was probably intended to be one-colour, and is a small mosaic tile of perhaps the 13th century or later. Petrological study suggests this fabric is probably local to Ramsey. 1529, layer, Phase 5

9 Fabric GW; yellow-cream surfaces over pink fabric, 29mm thick and complete at 70mm x 70mm with slightly bevelled sides and a heavily sanded base. It has a thick green lead glaze, showing signs of wear and is also a one-colour small mosaic tile of perhaps the 13th century or later. Petrological study suggests this fabric may not be local to Ramsey. 1603, fill of pit 1603, Phase 5

6.5.5 Roof Tile (Fig. 40)

From the two excavations a total of 738 fragments (47.364kg) of roof tile were recovered and recorded. Where the form of the tile was identifiable these were all peg tile fragments, except for two pieces of ridge tile, both in Fabric A, one of which can be interpreted as having a bird finial (No. 10).

10 Fragment of rounded ridge tile in soft, low-fired, micaceous Fabric A, buff with grey core. The probably zoomorphic finial has broken off leaving just the base/body section. 1151, fill of ditch 1150, Phase 2

The peg tiles varied in thickness from c. 8mm to 30mm, but with most around 15mm thick. There were no obvious correlations between thickness and fabric. Where nail holes were present these were always round and usually about 15-18mm across in Fabric A, but were quite often smaller in other Fabric types. Square-sectioned nail holes were evident in Fabrics from Groups D and G, although they also showed round-sectioned holes. A very small number of tile fragments showed evidence for partial lead glazing, this being present in five fragments of Fabric A, three of Fabric E and one of Fabric GW. In addition one fragment in Fabric G showed combing.

The roof tile was classified according to general fabric group and where necessary this was subdivided further into fabric types. Statistics for the fabric types, presented as percentages of the whole assemblage by weight, are provided in Table 9. From this table it is evident that Fabric A is by far the most common, providing over 61% of the tile, with no other individual fabric occurring more than G at over 11%, followed by DR and F, both at between 6% and 7% by weight. When fabric groups are considered, after Group A (64.1%), Groups G (16.6%), and D (10.8%) are the next most common, with no other group represented in double figures. The significance of these statistics, in terms of provenance, is discussed in below.

Fabric	Weight (kg)	Percentage
A	29.181	61.6
AA	0.311	0.6
A2	0.839	1.8
A2X	0.060	0.1

B	0.411	0.9
D	0.396	0.8
DR	2.895	6.1
DW	1.130	2.4
DR2	0.041	0.1
DW2	0.642	1.4
E	0.340	0.7
F	3.243	6.8
G	5.306	11.2
G2	0.598	1.3
GW	1.861	3.9
GW2	0.110	0.2
Total	47.364	99.9%

Table 9: Summary of roof tile quantification by fabric

6.5.6 Discussion, Dating, Technology and Provenance issues

a) Dating

From previous knowledge concerning the brick kiln and roof and floor tile waste excavated in 1967 (Eames 1980, 123) and from Vince's work here (Appendix 2) it seems likely that Ramsey Abbey commissioned and made its own ceramic building materials on more than one occasion. Eames dated the brick kiln to the 16th century and she seems to similarly date the floor tile manufacture by association. It is not clear, however, whether her assumptions about dating either were indeed correct. The technology of brick manufacture and style of these products did not change significantly in the later medieval period generally. It is also not certain that decorated floor tiles found in association with the brick production represent genuine evidence for contemporary production, rather than material left over from previous manufacture in the same area.

Relief tiles are known in England from the Late Saxon period onwards (van Lemmen 2000, 8). Nonetheless relief designs as complicated as those seen here are known from few locations. The well-known industry active at Bawsey in Norfolk from the later 14th century onwards, that supplied many locations into the Lincolnshire fenland, had simpler designs than those seen here, and in fact later in the life of this industry the quality of the replacement blocks, and so the tile designs declined significantly (Eames 1968, 28). The Bawsey tiles were, however, smaller and thinner than the Ramsey examples, owing more to tiles from the Penn industry than anywhere else (Green 2005). It is believed that economy of clay usage, avoidance of excessive shrinkage and warping during drying and firing, and lower transportation costs due to less weight were all reasons why the more successful 14th-century kilns adopted these smaller tiles. The Ramsey tiles do not fit this model and may thus be earlier or later. A few

examples of large relief tiles with distinctive characteristics have been found in the Swineshead/Boston area in Lincolnshire, and it is possible that they were actually manufactured at Swineshead Abbey in the 14th century. Designs include an example showing a Lamb and Flag on a field of crosses, c. 187 x 192mm, which appears as complicated as the Ramsey tiles, but the designs have little in common except for the border which is a little like No. 5 here (Healey n.d. and pers. comm.). More complex relief tiles are known from other regions, e.g. tiles surviving at Old Radnor parish church, Powys (van Lemmen, 2000, 9) which have been assigned a 15th or early 16th century date. In conclusion, the Ramsey tiles are unlikely to have been manufactured before the later 14th century, and might be as late as the early 16th century, but nothing more can be said with any certainty.

b) Provenance

It is not clear whether all of the floor tile fragments described here were used; at least one example appears not to be worn and so may be a discarded 'waster'. On balance, although direct evidence for their manufacture here is not present, as discussed above it can be assumed that they were indeed made locally, along with roof tiles and bricks, although possibly at different times. A mix of light firing Jurassic clays were used, tempered with sands of perhaps permo-triassic origin. Such raw material is common around Ramsey, although it is likely that quite specific and localised clay sources were utilised and chosen for the lightest coloured clays.

The results of thin section petrology suggest that the majority of roof tile found at the site has a local origin (Vince's Group 2), constituting over 71% of the roof tile assemblage. Vince's Group 3, perhaps originating in the southern Cambridgeshire fenland and here represented by tile in fabrics DW (possibly also DW2), E and G (probably all G sub-fabrics), constitutes 28% and is thus a sizeable contributor also. If it does indeed derive from further to the south, then most probable source of manufacture is on the Isle of Ely on the basis of petrology and from expectations derived from other historical and archaeological evidence (Spoerry 2007). This material was ordered and/or bought at distance and doubtless transported to Ramsey on boats through the fenland waterways.

c) Technology

In her British Museum catalogue Eames discusses the phenomenon of tiles apparently covered in a slip that appears to have been the carrier for an under-fired lead glaze (1980, 122-3). She explains that this problem came about where clay used for the tile body melted at too low a temperature for the glaze to have properly fused. Rather than destroy the tiles completely through over-firing, the tiler was forced to produce at least some tiles with unfired glazes, in kiln loads where

temperature variation was anyway quite great. Examples of this were cited for Burton Lazars in Leicestershire and Ramsey, Cambs, the latter observed by herself during the period when the brick kiln excavation took place in the 1960s. It is certain that the majority, if not all, of the tiles described in this report exhibit these traits. So far, no 'properly' fired glazes have come to light on relief decorated tiles from Ramsey, and the under-fired examples are mostly tiles which, from the wear they exhibit, were used in pavements despite their failings.

d) Addendum

In summer 2006, during relocation of the History Department of Ailwyn School as part of a merger with Ramsey Abbey School, several boxes of archaeological finds recovered on the school farm and during the 1960s brick kiln excavations, were rediscovered and loaned to OA East, for assessment. This material includes a group of more than fifty further fragments of Ramsey Abbey decorated floor tiles, including Star of David motifs and one whole tile showing a bull and prone figures alongside other decorative ceramic objects in similar fabrics. This collection – and that known to be held in other museum collections – is deemed to have national significance and funding is currently being sought for a full analysis and publication programme of this important group.

6.6 Brick

by Pat Ryan

Three brick fragments were sent for identification:

1549	fill of tank 1547 (Phase 4)	1 fragment	38-40mm thick
1551	fill of crane pit 1553 (Phase 4)	1 fragment	43-45mm thick
1000	layer, unphased	1 part brick	135+ x115x43-45mm

All three pieces of brick are made from a similar clay; they are +approximately the same thickness, and have the same manufacturing characteristics. They were all made in a mould, which was lubricated with water only, and laid on their bases on a similar surface to dry. The slight differences in colour are due to variations in temperature in one part of a kiln to another during firing. They are therefore, all likely to be from the same type of brick.

The dimensions of the part brick indicate a one-handed brick and therefore made not earlier than the late-13th century. Reddish-coloured bricks were being made in England in the 15th century,

initially on high status sites *i.e.* royal sites, sites connected with members of the royal court and monastic sites. Red brick has been found in the excavations at Beeleigh Abbey near Maldon. Here, the open-hearth of a timber-framed house in the abbey precinct was replaced by a chimney of red brick about 1460. This house and other buildings were also underpinned with red brick.

It is therefore probable that a 15th or early 16th century date can be ascribed for these brick pieces. This would tie in with documentary records of brick moulds and bricks being produced in Ramsey Abbey in the early 16th century (DeWindt and DeWindt 2006, appendix 8).

6.7 Stonework & Masonry

by Tony Baggs

In general the worked stone is limestone containing oolites and shell fragments. Pronounced bedding is absent and it is characteristic of the good quality freestones of the Northamptonshire Jurassic belt which are often generically called 'Barnack' although not necessarily coming from quarries in that village.

There are 11 fragments (A-K) which are of particular interest, all of which derive from demolition/reuse episodes in Phase 5:

A Length of string of hood moulding with three exposed faces; the upper plain, the centre with an asymmetrical shallow tooth or chevron and the lower with a billet moulding. 12th century, probably second half. The face edge is slightly curved on a radius in excess of 5 metres which would make it an exceptionally wide semi-circular arch if it was a normal hood. Perhaps it was a segmental hood over a square-headed opening. (layer 1041, SF 23)

B Edge moulding on a large slab which appears to have been part of a plinth – perhaps for a monument or table tomb. Probably late medieval.

C Two fragments of a string or hood moulding, slightly curved. The upper face has a hollow, the lower step an ogee, a step and a hollow (which is probably not complete). Late medieval, probably 15th century.

D Small fragments of a roll moulding ending in a fillet and once forming part of a larger profile with, at least on one side, a hollow. Possibly a window mullion. Late 13th century or more likely first half of 14th century.

E Perhaps a string course with a plain chamfer on top and a convex moulding decorated with small non-standardised paterae beneath. Probably 14th century.

F-H Sections of window transom. F has the abutment of a mullion and G and H (layer 1356, SF 32) incorporate the reveal mouldings. F (layer 1356, SF 34) also has a drain hole from the inner gully and if that was central the interval between mullion centres would be about 360mm (14"). G has been cut away

on the upper side of the outer face. The author has not seen this moulding before but it looks late medieval. The window must have been substantial and it may have been in a domestic building for it is functional rather than decorative. (layer 1356, SF 33)

I A 70mm diameter half roll on a square quoin. Probably 12th century.

J Four fragments of column drum, diameter 130mm. Perhaps once part of detached shafts flanking a 12th century doorway.

K Fragments of an attached three-quarter shaft, diameter 210mm. probably 12th century (layer 1401, SF 23)

6.8 Other Finds

6.8.1 Daub

Burnt daub was found in cleaning and unstratified deposits, totalling only 59g. This material is of little significance, although buildings and structures excavated on the site were all timber constructions.

6.8.2 Clay Pipe

A small number of clay pipes were recorded, totalling 109g (N=30). There were 25 stem fragments, two bowl fragments and three bowls. The material derives from only seven contexts, these being cleaning or demolition/dumping layers associated with the post-medieval activity on the site. The material dates to the early-mid 17th century, which is consistent with the stratigraphic dating of the deposits.

6.8.3 Shell

In addition to the material recovered from environmental samples, oyster and mussel shells were retrieved from 19 contexts, totalling 804g. Feature types include; Layers/dumping (N=8 or 42%), Ditches (N=5 or 26%), Beam slots (N=6 or 32%). Significantly the material was recovered from either fills of occupation activities or in features where domestic rubbish would have been dumped.

6.8.4 Glass

A total of 148g of glass was recovered from the site from 8 contexts. The assemblage derives from post-medieval layers and cleaning deposits. The material was post-medieval in origin, the single largest fragment (99g) forming part of a 17th/18th century dimple bottle.

7 Zooarchaeological and Botanical Evidence

7.1 Animal, Fish and Bird Bone

by Ian L. Baxter, with fish and bird bones identified by S. Hamilton-Dyer

7.1.1 Introduction

A total of 640 “countable “ fragments of animal bone were hand collected from the 1998 and 2002 excavations (Table 11). A further 184 fragments were recovered from the 2002 excavation environmental sample residues (Table 12). Of the hand collected fragments, 510 were recovered from the 1998 excavations and 130 from the 2002 excavations.

Most of the bone from the 1998 site came from features in Phase 3 (mid 12th to 13th centuries), just over 40% of the 1998 total. A further 23% in 1998 came from Phase 4 making the medieval total over 63%. In contrast nearly 90% of the 2002 bone came from Phase 4 with the remainder from post-medieval deposits.

7.1.2 Methodology

The mammal bones were recorded on an Access database following a modified version of the method described in Davis (1992) and Albarella and Davis (1994). In brief, all teeth (lower and upper) and a restricted suite of parts of the postcranial skeleton were recorded and used in counts. These are: horncores with a complete transverse section, skull (zygomaticus), atlas, axis, scapula (glenoid articulation), distal humerus, distal radius, proximal ulna, carpal 2+3, distal metacarpal, pelvis (ischial part of acetabulum), distal femur, distal tibia, calcaneum (sustenaculum), astragalus (lateral side), centrotarsale, distal metatarsal, proximal parts of the 1st, 2nd and 3rd phalanges. At least 50% of a given part had to be present for it to be counted.

The presence of large (cattle/horse size) and medium (sheep/pig size) vertebrae and ribs was recorded for each context, although these were not counted. “Non-countable” elements of particular interest were recorded but not included in the counts. For birds the following were always recorded: scapula (articular end), proximal coracoid, distal humerus, proximal ulna, proximal carpometacarpus, distal femur, distal tibiotarsus, distal tarsometatarsus.

The separation of sheep and goat was attempted on the following elements: dP_3, dP_4, distal humerus, distal metapodials (both fused and

unfused), distal tibia and astragalus using the criteria described in Boessneck (1969), Kratochvil (1969), and Payne (1969 and 1985). The shape of the enamel folds (Davis 1980; Eisenmann 1981) was used for identifying equid teeth to species. Equid postcrania were checked against criteria summarised in Baxter (1998). Bone was identified by comparison with published descriptions (in particular Schmid 1972, Boessneck 1969, Sisson and Grossman 1953, Getty 1975, Cohen and Serjeantson 1986, Prummel 1987-9, Clutton-Brock *et al* 1990),

Wear stages were recorded for all P_4s and dP_4s as well as for the lower molars of cattle, sheep/goat and pig, both isolated and in mandibles. Tooth wear stages follow Grant (1982). Measurements are retained on the Access database. These in general follow von den Driesch (1976). All pig measurements follow Payne and Bull (1988). Humerus HTC and BT and tibia Bd measurements were taken for all species as suggested by Payne and Bull (1988) for pigs. Measurements taken on equid teeth follow Levine (1982).

Bone measurements have been recorded and kept in the archive. They are based on Jones *et al* (no date), von den Driesch 1976, Eisenmann 1986 and Harcourt 1974. Withers height estimations in Table 13 are based on multiplication factors given by Kiesewalter (Driesch and Boessneck 1974) and Teichert (in Weinstock 1993). The horse ages in Table 12 are based on incisor wear drawings in Barone (1980) and tooth wear curves in Levine (1982). In Table 13 the sex of the domestic animal remains is based on Sisson and Grossman (1953), Grigson (1982), Boessneck (1969), and Clutton-Brock *et al* (1990).

		Phase
Human	*Homo sapiens L.*	5
Horse	*Equus caballus L.*	2, 3, 4, 5,
Red Deer	*Cervus elaphus L.*	3, 4
Roe Deer	*Capreolus capreolus*	4,5
Fallow Deer	*Dama dama* L.	4, 5,
Cattle	*Bos* f. domestic	1, 3, 4, 5
Pig	*Sus* f. domestic	2, 3, 4, 5
Sheep/Goat	*Ovis*/*Capra* f. domestic	1, 2, 3, 4, 5
Dog	*Canis familiaris* L.	3, 4,
Fox	*Vulpes vulpes*	4
Cat	*Felis catus*	4, 5,

Hare	*Lepus europaeus* Pallas	2
Weasel	*Mustela nivalis*	4
Mouse/Vole	*Murid/Microtine*	4
Field Vole	*Microtus agrestis*	4
Goose	*Anser* f. domestic	3
Goose	*Anser Branta* sp.	4
Fowl	*Gallus* f. domestic	1, 2, 3, 4
Duck	*Anas platyrhynchos*	4
Cf. Tufted Duck	*Aythya foligula* (L.)	5
Cf. "Thrush"	*Turdus sp.*	4
Cf. Widgeon	*Anas Penelope*	4
Cf. Partridge	*Perdix perdix*	4
Crow	*Corvus corone/frugilegus* L.	5
Jackdaw	*Corvus monedula* L.	5
Frog/Toad	*Rana/Bufo sp.*	4
Eel	*Anguilla anguilla*	4
Herring	*Clupea harengus*	4
Pike	*Esox lucius*	4
Cyprinid	*Rutilus/Leuciscus* sp.	4
Haddock	*Melanogrammus aeglefinus*	4
Fish	*Gadus* sp.	4

Table 10: Faunal remains by phase

7.1.3 Frequency of species

Of the 640 hand collected bones, 40% were only identified to mammal status. Of the remainder the most common taxa at the site was sheep/ goat which provided 18% of the assemblage, cattle (12%) and pig (10.5%). Horse remains are next frequent at 9% and include partial skeletons. Domestic fowl are relatively frequent at 4%. Other bird species, the majority of which may also be domestic, comprise 3.5%. Considering the proximity of the recent site to that excavated in 1998 there are considerable differences in the relative frequencies of the domestic mammals (Table 10).

In particular, pig and horse remains are much more common at the 1998 site while the frequency of cattle and, to a lesser extent, sheep/goat is much reduced. For both sites the total sample sizes are small, however, and the differences are explicable by taking account of this constraint in combination with differences in feature type and the activities represented by their assemblages. In the 1998 site, nearly half the assemblage (48%) was recovered from ditch contexts compared with 22% from ditches and almost 50% from pits in the 2002 assemblage. In general, ditches are more peripheral to areas of human habitation and activity and serve as more convenient locations for the disposal of waste material from the carcasses of the larger domestic mammals (Wilson 1996).

The total countable bone are listed below by phase.

Taxon	Phase					Total
	1	2	3	4	5	
Horse	0	1	8	4 (19)	21 (3)	55
Red Deer	0	0	1	2 (1)	0	4
Roe Deer	0	0	0	(1)	0	1
Fallow Deer	0	0	0	3 (1)	2	6
Cattle	4	0	22	11 (8)	28 (2)	75
Pig	0	1	20	6 (26)	12 (2)	67
Sheep/Goat	2	4	37	17 (26)	27(2)	115
Large Mammal	2	1	50	38 (9)	39 (3)	142
Medium Mammal	1	10	54	19 (12)	19(2)	117
Dog	0	0	1	3	1	5
Fox				(1)		1
Cat	0	0	0	3	2	5
Hare	0	1	0	0	0	1
Goose	0	0	2	4 (1)	0	7
Fowl	1	1	7	5 (8)	0 (1)	23
Duck	0	0	0	(3)	0	3
Cf. Tufted Duck	0	0	0	0	1	1
Crow	0	0	0	0	1	1
Jackdaw	0	0	0	0	2	2
Cf. Widgeon	0	0	0	(1)	0	1
Cf. Partridge	0	0	0	(1)	0	1
Indet. Bird	0	0	3	2	1	6
Large Gadid	0	0	0	2	0	2
Indet. Fish	0	0	1	0	0	1
Total	**10**	**19**	**206**	**234**	**171**	**640**

Table 11: Total number of fragments per faunal species per phase (2002 in brackets)
(Number of Identifiable fragments of bones of each Species = NISP)

The bulk samples from Phase 4 contexts in the 2002 excavations yielded a moderate collection of bone (Table 12)

Taxon	Phase 4
Sheep/Goat (*Ovis/Capra* f. domestic)	1
Pig (*Sus* f. domestic)	1
Weasel (*Mustela nivalis*)	1
Mouse/Vole (Murid/Microtine)	3
Field Vole (*Microtus agrestis*)	(1)

Domestic Fowl (*Gallus* f. domestic)	1
Goose (*Anser anser*)	+
Duck (*Anas platyrhynchos*)	1
Cf. "Thrush" (*Turdus* sp.)	2[1]
Frog/Toad (*Rana/Bufo* sp.)	5
Eel (*Anguilla anguilla*)	94
Herring (*Clupea harengus*)	38
Pike (*Esox lucius*)	7
Cyprinid (*Rutilus/Leuciscus* sp.)	7
Haddock (*Melanogrammus aeglefinus*)	1
Fish sp. (*Pisces*)	22
Total	**184**

Table 12: Faunal remains - number of identified specimens (NISP) from the 2002 bulk samples

"Mouse/Vole" also includes the specimens identified to species. Numbers in parentheses are not included in the total of the period. "+" means that the taxon is present but no specimens could be "counted" (see text).
[1] eight and four bones from partial skeletons

7.1.4 Species Represented

a) Human

A human frontal fragment and a fragment of fibula were found in Phase 5 (layer 1008). These are probably redeposited from disturbed burials.

b) Cattle

Cattle remains are relatively infrequent at this site, occurring as scattered isolated elements in most features. An exception is Phase 4 pit 1506 where a humerus fragment was accompanied by three (uncounted) proximal tibia fragments. The proximal radius and ulna from a single individual representing a discarded joint were found in a Phase 4 pit (1534). The astragalus of a juvenile was recovered from a Phase 4 drain (1599). No suitable cattle bones from the 1998 excavations were complete enough to calculate withers heights. The limited information available from teeth and epiphyseal fusion data (Tables 13 and 14) suggests that most medieval cattle were adults or old adults at time of death. This is probably related to their usefulness as traction animals. A phalanx I from the same context has high ring bone indicative of a beast used for traction (Baker and Brothwell 1980, 120-2). Half of the cattle bones from Phase 1 have butchery marks. Although few bones from Phases 2 and 4 have butchery marks, the level of fragmentation and that of bone fragments only identifiable as large mammal is indicative of butchery. By Phase 5 cattle long bones

are being sawn through. Three bones from the carpus of a single individual were found in Phase 3 (1040, fill of ditch 1062).

	U	S/W	H/W
Cattle			
M1 5-6m			1
M2 15-18m			1
P2 24-30m		1	
P3 18-30m		2	
M3 24-30m			3
P4 28-36m	1	1	
Sheep/Goat			
M1 3-5m			3
M2 9-12m		2	1
P2 21-24m		1	
P3 21-24m		1	
M3 18-24m		2	2
P4 21-24m		3	
Pig			
M1 4-6m			
M2 7-13m		1	
P2 12-16m			
P3 12-16m		1	1
P4 12-16m		1	1
M3 17-22m			

Table 13: Phases 3 to 4 from 1998 excavation - teeth of main domesticates in approximate order of eruption (ages after Silver 1969)

Key: m = months U = Unerupted/Deciduous S/W = Slight Wear H/W = Heavy Wear

Proportions of unfused and fused epiphyses grouped in approximate sequence of fusion				
	Unfused	**Fused**	**Total**	**% Fused**
Cattle				
Early -18m	0	4	4	100
Intermediate 2-3yrs	0	0	0	
Late 3.5-4yrs	2	1	3	33
Sheep/Goat				
Early -1yr	1	5	6	83
Intermediate (a) 1-2yrs	0	0	0	
Intermediate (b) 2-3yrs	0	2	2	100
Late 3-3.5yrs	3	0	3	0
Pig				
Early -1yr	0	1	1	100
Intermediate 2-2.5yrs	3	2	5	40
Late 2.5+yrs	0	0	0	

Table 14: Phases 3 to 4 from 1998 excavation - epiphyseal fusion (based on Silver 1969)

Key: Cattle. Early: humerus distal, radius proximal, phalanges I & II proximal. Intermediate: Mc and Mt distal, tibia distal, calcaneum proximal. Late: humerus proximal, radius distal, ulna proximal, femur proximal and distal, tibia proximal
Sheep/Goat. Early: humerus distal, radius proximal. Intermediate (a): phalanges I & II proximal, Mc distal. Intermediate (b): Mt distal, tibia distal, ulna proximal, femur proximal, calcaneum proximal. Late: radius distal, humerus proximal, femur distal, tibia proximal.
Pig. Early: humerus distal, radius proximal, phalanx II proximal. Intermediate: Mc and Mt distal, tibia distal, fibula distal, calcaneum proximal, phalanx I proximal. Late: humerus proximal, radius distal, ulna proximal, femur distal & proximal, tibia proximal, fibula proximal.

c) Sheep

No bones or teeth attributable to goat were seen compared with 50% of the 2002 ovicaprid assemblage positively identified as sheep. An astragalus from a Phase 4 drain (1565) came from an animal approximately 67cm high at the shoulder based on the multiplication factors of Teichert (1975). No bones from the 1998 excavations suitable for estimating withers height were complete enough to be useful. However, most of the sheep were of a small size typical during the medieval period. An exception is provided by a scapula fragment from Phase 2 (1069) which came from a particularly large animal, perhaps a ram. The horn cores of a ram were found in context 1353 of Phase 2. Where sex can be established from the pelvis, over 66% of sheep in Phases 3 and 4 of the 1998 excavation are female (Table 15). Most sheep seem to have been slaughtered between one and three years but a number of older animals were also kept as breeding stock. For the 2002 excavations the sheep remains are skeletally mature with M_3 in wear.

Phase	Context	Horse Skeletal element	Sex	Comments
5	1339	maxilla	Male	canine

Phase	Context	Cattle rim height medial acetabular border	ilio-pubic ridge	Sex	Comments
1	1200	8.8 mm	Sharp	female	no dip

Phase	Context	Sheep Horncore basal circumference	Sex
3	1353	155.0	Male

Ph	Cont	ventral muscle ridge on ilium	ilio-pectineal eminence	depth of acetabular rim	ilio-pubic ridge	Sex
3	1040	not preserved	pad-shaped	6.1 mm	blunt	male
3	1171	yes	not preserved	not preserved	not preserved	?female
3	1331	not preserved	sharp	4.3 mm	sharp	female
4	1046	no	pad-shaped	11.0 mm	blunt	male
4	1102	yes	damaged	7.1 mm	blunt	?female
4	1133	yes	not preserved	not preserved	Not preserved	?female
5	1035	yes	not preserved	not preserved	Not preserved	?female

Innominate

Phase	Context	Sex	Criteria
3	1069	male	lower C
3	1094	female	lower C
3	1171	male	lower C alveolus
3	1236	male	lower C
5	1005	male	lower C
5	1008	male	upper C

Pig

Table 15: Sex of the main domesticates from the 1998 excavations

Key: Horse (based on Sisson and Grossman 1953)
Cattle Innominate (based on Grigson 1982)
Innominate (based on Boessneck 1969; Clutton-Brock et al 1990)
Pig (based on the form of the canine or canine alveolus)

d) Pig

As noted above, pig remains are particularly frequent at this site. Many religious houses kept pigs on a moderately large scale during the Middle Ages. The practice of pannage will have required an abundance of suitable woodland forage in the locality.

The remains of pig are particularly common in Phase 3, accounting for nearly 10% of identified bone. Although withers heights have been

calculated for the pigs from the site in Table 13, these should be treated with caution as the estimations based on Teichert's (1990) factors for the calcaneum and metapodials are unreliable (Weinstock 1993, 77). An astragalus from Phase 2 (1090) gives a withers height of 74.6 cm, which may be an underestimate (Weinstock *op. cit*.).

Out of four canines or canine alveoli available from 1998 site Phase 3 all but one are from male animals (Table 15). All three canines recovered are the 2002 excavations are from male animals. This suggests the culling of surplus boars not required for breeding purposes. The canines from Phase 5 are also from male animals. Most pigs were probably slaughtered before the age of two years (Tables 13 and 14). The only butchery recorded on pig bones is a scapula fragment from Phase 5 with the neck (collum scapulae) chopped through.

e) Horse

The remains of horse are relatively common, accounting for nearly 6½ % of identified fragments in the 1998 excavations and very common (17%) from the 2002 site (Table 11).

The horses would have stood between 13½ to 15½ hands high at the withers (Table 16; based on Kiesewalter 1888 and Vitt 1952). A small and poorly preserved distal humerus fragment found in Phase 4 lode can only be identified as equid. Of particular interest are two femora from different animals found in a fill of the lode (1301). The more complete specimen is from a horse approximately 13 hands high at the withers. The other less complete femur came from a somewhat larger animal over 14 hands high. As this was associated with a stirrup and armour it may represent a destrier or war-horse (Hyland 1994). In France during the high medieval period abbeys played a significant role in horse-trading (Hyland 1994, 83-5), but the author has not seen comparable data from England. After the Dissolution Henry VIII enacted legislation to improve the quality of English horses and increase their size and fitness for war (Chivers 1976, 7-8).

The humerus of a large animal of 15½ hands was found in a Phase 4 tank (1547) and the metatarsal of another individual 14 hands high in Phase 5 drain. Twenty-one bones from the skeleton of a horse of 13½ hands were found in another Phase 4 tank (1569) and six bones of a similarly sized animal in a Phase 5 drain (1583). The individual represented by the skeleton in tank 1569 has extensive (stage 4) exostoses on the distal first phalanx, a pathology typically found affecting the hind feet of draught animals (Bartosiewicz *et al.* 1997). Perhaps this horse was a *hercerarius*, which seems to have been an animal used for harrowing, as mentioned in the Domesday Book (Darby 1952, 311).

Phase	Context	Horse Skeletal element	Height (cm)				
2 to 3	1301	femur	130.6				
3 to 4	1180	Mt. III	141.8				
4	1095	Mt. III	153.0				
Phase	**Context**	**Pig Skeletal element**	**Height (cm)**	**Range**	**Number**	**Mean**	**S.D.**
1 to 2	1090	astragalus	74.6				
2	1270	Mc. III	61.6				
4	1066	calcaneum	68.6				
4	1095	calcaneum	57.0				
				57.0-74.6	4	65.5	6.705781

Table 16: Withers heights of horses from the 1998 excavations (Kiesewalter 1888) and pigs (Teichert 1990)

The approximate ages at death of horses from the site are given in Table 17, based on tooth wear. All the horse bones found at the site are skeletally mature and came from individuals aged from 7 years old to 13+ years.

Phase	Context	Teeth	Crown Height	Age
2	1090	Lower P2	42.8	7yrs
3	1080	Upper M1	38.0	13 yrs
3	1080	Lower M1	32.5	12yrs
3	1299	Upper M2	68.2	7yrs
4	1552	M1		13+
5	1339	Upper I1-3		7-10yrs
5	1180	Lower I3		7yrs
5	1095	Upper P4	45.7	10-11yrs
5	1095	Upper M3	59.3	8yrs
5	1095	Upper M3	57.6	8yrs
5	1095	Lower M3	38.0	13yrs

Table 17: Horse ages from both excavations (based on Barone 1980 and Levine 1982)

Several horse bones from the 1998 excavation had butchery marks although none of the horse bones from the 2002 site appears to have been butchered. An innominate fragment from Phase 3 (1323, fill of ditch 1322) has chop marks around the acetabulum and a second innominate from Phase 5 (1004, wall foundation 1003) has longitudinal cut marks on the inner and outer surface of the ilium body and transverse cut marks on the outer wing. The larger femur from Phase 4 (1301, fill of lode) has a longitudinal chop mark on the lateral epicondyle.

A third metatarsal from Phase 4 (destruction debris 1095) has the second metatarsal fused to it with pitting of the proximal articular surface. This is unlikely to be a case of spavin as the joint surface is affected. It may be a mild case of infective arthritis probably caused by *Brucella abortus* which also causes infectious abortion in cattle and severe undulant fever infection in man (Baker and Brothwell 1980). A much more severe case of infective arthritis from Market Harborough has been published by the author (Baxter 1996).

f) Deer

The remains of fallow deer are twice as common as red deer at the site and occur in Phases 4 and 5. A proximal radius fragment from context (1168) has two transverse cut marks on the proximal anterior surface below the articulation. These were probably caused during dismemberment. The proximal tibia of a fallow deer (*Dama dama*) was found in ditch 1578.

There were two worked antler fragments recovered from the 2002 excavations. There was a Roe Deer cast antler fragment from a Phase 5 layer (1540). The beam has been reduced in diameter and polished to form a tool, probably an awl. From the Phase 4 'crane' pit (1553) came a red deer antler beam and terminal tine fragment. The beam and anterior tine have been sawn. The posterior tine is broken (depositional/post-depositional damage). The antler from the 1998 excavations have no chop, cut or saw markings indicative of craft working and it is not possible to say if they were from shed antlers or the result of hunting. These antlers consisted of two red deer antler tines found in fill 1102 (pit 1117) of Phase 4. The only other possible red deer remains are a lower I1 from (1192, fill of ditch 1191) in Phase 3. A fallow deer antler tine accompanied those of red deer in pit fill 1102.

g) Dog

Canine teeth belonging to small dogs were found in Phase 3 (layer 1080) and Phase 5 (1180, posthole 1179). The remains of a much larger animal were found in layer 1100, Phase 4 comprising a distal humerus, most of a femur and a proximal tibia. Although none of the bones is complete enough to give an accurate withers height, this was a large hound similar in size and build to a modern Irish Wolfhound.

There is a transverse cut mark on the lateral midshaft of the humerus; a longitudinal cut mark on the proximal anterior shaft of the femur, which also has an old proximal break indicative of an impact fracture; and two longitudinal cut marks on the lateral shaft of the tibia, the medial proximal part of which has been crushed inwards while the

bone was still fresh. At least 6.5% of all identified medieval bone has been gnawed by dogs in the 1998 excavation.

h) Fox

A slim canid metatarsal diaphysis found in Phase 4 drain 1599 probably belongs to a fox (*Vulpes vulpes*).

i) Weasel

The mandible of a weasel (*Mustela nivalis*) was found in a sample from the Phase 4 lode (1580).

j) Cat

Cat remains occurred in Phase 5 (1303, 1311 and 1008). The bones from (1303) are associated hind leg elements from a sub-adult. The partial skeleton of a small adult cat was found in a sample from context (1311). There are possible cut marks on the mandibulae which would suggest skinning, but they are not as fine as other examples and may be of recent origin.

k) Hare

A proximal tibia fragment of hare was found in context (1138, pit 1139) of Phase 2. It bears a canine puncture caused by a dog.

l) Vole

Several bones and an M^3 of a field vole (*Microtus agrestis*) were found in a sample from a Phase 4 pit (1506).

m) Domestic birds

Bones of domestic fowl are relatively common with scattered elements found in most features in both the excavations off all phases. In general the chickens were small. Some juvenile bones were seen. The juvenile remains from Phases 3 and 4 recorded as indeterminate in Table 11 probably also derived from domestic fowl. Goose and duck bones were also found but it is largely uncertain if these are from wild or domestic birds. The goose distal tibiotarsus from Phase 4 pit 1506 is of domestic or wild greylag size. The goose remains from Phase 3 are all of greylag (*Anser anser*) size and probably represent domestic geese.

The duck humerus from Phase 4 drain 1599 and the paired radii and ulnae from Phase 4 pits (1506 and 1538) are long compared to those of female mallards in the author's collection and may be domestic. A single duck bone from ditch fill 1311 (ditch 1312) of Phase 5 probably came from a tufted duck (*Aythya fuligula*). Two fragments of bird

eggshell were found in a sample from the same context but the species cannot be identified.

n) Wild birds

Geese bones from ditch fill 1218 (ditch 1220) in Phase 4 are slightly smaller than a reference white-fronted goose (*Anser albifrons*) in the Leicester City Museums collections and may have originated from wild geese. The distal humerus fragment from this context has tooth punctures on the anterior surface, probably caused by a dog. A wild duck species is represented by a tibiotarsus found in a Phase 4 pit (1506). This probably belongs to a widgeon (*Anas penelope*). A femur found in the same context is comparable with partridge (*Perdix perdix*). Partial skeletons of thrush sized passerines (cf. *Turdus* sp.) were found in samples taken from Phase 4 pits (1506 and 1553). All these species are potential food items. A single bone of either carrion crow (*corvus corone*) or rook (*Corvus frugilegus*) was recovered from layer 1035 (Phase 5), and two bones of Jackdaw (*Corvus monedula*) from posthole 1179 (Phase 5).

o) Amphibians

Anuran amphibian bones were recovered from samples taken from Phase 4 features: pit 1506, 'crane' pit 1553, tank 1569 and lode 1580, but included no elements that could be identified to species.

p) Fish

Only two fish bones were hand collected; both these large fish vertebrae were found in pit fill 1102 (pit 1117), Phase 4. These belong to a large Gadid, probably cod (*Gadus morhua*).

7.1.5 Fish

by S. Hamilton-Dyer

A total of 174 fish remains were recovered from samples. Some 169 fish specimens came from four Phase 4 samples (pit 1506, 'crane' pit 1553, tank 1569 and drain 1565) with a further five from other samples (Table 12). The six species identified are eel, herring, pike, Cyprinidae (roach and chub/dace), and haddock. This last is represented by the second vertebra of a good-sized fish of about 40-50 cm. The majority of the remains are of herring and eel vertebrae. A few of these are crushed, indicative of human consumption (Jones 1986) and, probably, from cess deposits. Herring and haddock are obligate marine species and therefore must represent goods brought in, probably in a preserved state. All the other fish could have come from the local streams. The pike and cyprinid remains are all from small individuals

and could have been caught incidentally with the eels. Herring and eel are typical finds in sieved medieval material, their small size usually excluding them from hand collection. Cyprinids and pike are frequently found in some inland excavations, particularly those in the Cambridge area.

7.1.6 Summary and conclusion

Pig and horse remains are particularly frequent at this site. The increase in pig remains compared with the site excavated in 1998 seems largely due to a much higher proportion of the assemblage being recovered from pits as opposed to ditches at the 2002 site. High frequencies of pig are to be expected on medieval ecclesiastical sites. No doubt large piggeries were maintained by the abbey. Many cattle were probably used as traction animals before utilisation as food.

The abundance of horse remains requires other explanations, however, as these are not confined to the ditches. It is possible that, like many abbeys in France, Ramsey was involved in the horse trade. Horses of a size suitable as palfreys and destriers were found in the medieval deposits together with evidence of horse butchery. Whether horse meat was intended for the consumption of humans or dogs is unknown. Large hunting dogs were kept and butchered upon death, perhaps to feed other dogs. Such animals would have been useful in the pursuit of deer. Bird remains are also particularly abundant at this site. All are derived from potential food species and, while the majority would seem to be domestic birds, include wild species. Fish remains include marine species brought in from the coast and freshwater species, principally eels, obtained from local streams. There is evidence for the working of bone and antler.

7.2 Charred Plant Remains, 1998

by A.J. Clapham

7.2.1 Introduction

A total of twenty-three samples from the 1998 excavations were analysed for charred plant remains (see Table 18). Of the twenty-three samples, eight samples contained no remains (Samples 1, 6, 11, 12, 14, 15, 16 and 17). The rest did contain charred plant remains but only two (Samples 2 and 23) could be considered to be rich in plant remains. Twelve of the twenty-three samples were from ditches (Samples 2, 3, 12, 14, 15, 19, 20, 21, 22, 23 and 24), six were from pits (Samples 4, 5, 6, 10, 11 and 17), other samples were from buried soils (Sample 1), beam slots (Sample 8), layers (Sample 9), and post-

holes (Sample 16). There was no context or feature information for Sample 18.

In general, the samples were dominated by modern plant debris and roots, although the preservation of the charred material was good enough in order to allow species identifications in most cases.

7.2.2 Methodology

The samples were processed using the standard OA East flotation procedures and were sorted using a low-powered stereomicroscope (x 6.3-40 magnification). The critical plant taxa were identified using the modern plant reference collection housed in the Pitt-Rivers Laboratory, Department of Archaeology, University of Cambridge.

All nomenclature follows that of Stace 1997.

7.2.3 Results

As mentioned above and as can be seen in Table 18, twenty-three samples were analysed for charred plant remains, of which only two could be considered to be rich. These two samples (2 and 23) were from ditch fills (fill 1065, ditch 1064, Phase 4 and fill 1331, ditch 1312, Phase 3 respectively). It is these two samples that provide the main source of evidence for the economic activity of the site.

7.2.4 The Crops

In total, remains of six crop species were recovered from the samples. The commonest cereal recovered was that of bread wheat (*Triticum aestivum*), of which both grains and crop processing debris, in the form of rachis fragments, were identified (see Table 19) Other cereal remains identified from the site included the possibility of a free-threshing tetraploid wheat such as macaroni wheat (*Triticum durum*) which was tentatively identified from poorly preserved rachis fragments present in Sample 23. This is not an unusual find for a site of this date. Another cereal which is found from sites of this period is rye (*Secale cereale*) which was identified by the presence of both grains and rachis fragments, although this cereal was not very common (see Table 19). Hulled barley (*Hordeum vulgare*) was also recovered from the samples, although not many grains were identified.

Other crops present on the site were single finds of flax/linseed (*Linum usitatissimum*) and peas (*Pisum sativum*) (Samples 2 and 23, respectively).

In general, it can be assumed that the crops were grown locally, especially those represented by chaff remains, *i.e.* bread wheat. As

this wheat is a free-threshing cereal, (*i.e.* the grains fall easily from the ear, without the need to parch or pound), it may be suggested that the finds of these rachis fragments in ditch 1350 (Sample 24, Phase 1), may represent the remains of threshing or winnowing waste. The presence of culm nodes (parts of the grass stem), also lends support to this interpretation. The presence of the possible durum wheat rachis fragments may suggest a similar origin for these remains.

7.2.5 The Weed Seeds

The weed seeds recorded from the samples are in the majority of cases representative of the arable field, such as buttercup (*Ranunculus* subgenus *Ranunculus*), knotgrass (*Polygonum* sp.), goosefoot, (*Chenopodium* sp.), parsley-piert (*Aphanes arvensis*), vetches (*Vicia/Lathyrus* sp.), medick and clover (*Medicago* sp. and *Trifolium* sp.), small nettle (*Urtica urens*), cleavers (*Galium aparine*), stinking mayweed (*Anthemis cotula*) and nipplewort (*Lapsana communis*). The presence of low-growing weeds such as parsley-piert and scrambling weeds such as cleavers suggests that the crop was either harvested close to the soil or reaped by uprooting, but due to the paucity of weed seeds in any of the samples it is not possible to be totally sure. The presence of stinking mayweed suggests that heavy soils were being cultivated, although the presence of parsley-piert also suggests that lighter more sandy soils were also exploited.

Other habitats represented in the samples include a scrubby component as represented by the presence of a hawthorn (*Crataegus* sp.) thorn and a seed of apple (*Malus sylvestris*). This component could have been present at the edge of the field or have been incorporated into the sample from other sources (such as fuel). Grassland is represented by the presence of self-heal (*Prunella vulgaris*) but again this could have been growing at the edge of the field.

The other major component of the samples was of seeds of plants which are found in damp/waterlogged environments. These include; lesser spearwort (*Ranunculus flammula*), soft rush (*Juncus effusus*), woodrush (*Luzula* sp.), spike-rush (*Eleocharis* sp.), bulrush (*Schoenoplectus lacustris*), fen or saw sedge (*Cladium mariscus*) and the sedges (*Carex* sp.) including the star sedge (*Carex echinata*).

In many situations these species are considered to be obligate water or high water-table plants, but in this case the species are considered to represent weeds of the arable crops. As the area surrounding the site is on the fen edge, it can be assumed that at the time of deposition of the plant remains, the area possessed a very high water-table. It is entirely feasible that these wetland species were encroaching into the arable fields from the possible ditches surrounding the fields, as most

of these species spread via underground rhizomes it is possible that they could cover a large area of the fields, and the presence of the seeds of these species in the samples suggests that they were harvested along with the cereal crop.

7.2.6 Other remains

The only other notable remains recovered from the samples was that of two fragments of what appears to be charred bread. These fragments, one of which measured 2 x 1 x 1 cm, consisted of a uniform vesicular mass and were found in Sample 22 (ditch 1312, fill 1367, Phase 3). This probably represents the remains of a burnt loaf of bread which was discarded into the ditch.

7.2.7 Conclusions

In general, it can be seen from the tables that the major crop grown at the site was bread wheat, with smaller amounts of other cereals such as durum wheat, barley and rye being less well represented. The presence of oats (*Avena* sp.) may represent another crop, or in fact may be a weed of the arable fields. Other crops which were poorly represented include flax/linseed and peas.

The weed species identified from this site correspond to those usually associated with crops, the presence of two species (stinking mayweed and parsley-piert) suggest that both heavy and light soils were being cultivated. The high number of wetland indicators is taken to indicate that many of the fields had high water-tables which enabled these species to encroach into the fields, although other uses, such as roofing and flooring material can not be entirely ruled out. Saw-sedge, with the saw-like edges to its leaves, is unlikely to have been used as flooring but may have been utilised as a roofing material.

Context type	Ditch	Ditch	pit	pit	Beam slot	Layer	pit	Ditch
Cut no.	**1064**	**1096**	**1117**	**1139**	**1271**		**1354**	**1300**
Context	**1065**	**1086**	**1102**	**1138**	**1270**	**1273**	**1308**	**1299**
Phase	**4**	**3**	**3**	**3**	**1**	**2**	**2**	**4**
Sample no.	**2**	**3**	**4**	**5**	**8**	**9**	**10**	**13**
Sample size (l)	**10**	**20**	**10**	**20**	**10**	**20**	**20**	**20**
Flot size (ml)	**50**	**80**	**2**	**130**	**2**	**70**	**42**	**10**
Species								
Triticum aestivum grain	4		4	1				
*Triticum aestivum t*ail grain	6							
Triticum sp. grain	2f		1				1f	1
Hordeum vulgare grain	1f					1		
Avena sp.	20+8 f		1	2				
Linum usitatissimum	1							
Cerealia indet	46f	2f				1f		4
Ranunculus flammula	2							
Chenopodium sp.	3							
Rumex sp.	4							
Brassicaceae indet.			1					
Crataegus sp. thorn				1				
cf *Malus sylvestris*		1						
Vicia/Lathyrus sp.	4							
Medicago sp.	1							
Trifolium sp.	2							
Urtica urens	1							
Prunella vulgaris	1							
Anthemis cotula	5							
Lapsana commumis	1							
Luzula sp.	1							
Eleocharis sp.	21+8 f				1			
Schoenoplectus lacustris	1							
Cladium mariscus		1						
Carex cf *echinata*	1							
Carex sp. (trigonous)	1							
Small Poaceae	5					1		
?	2							
Parenchyma				1f				

Table 18: Environmental remains from the 1998 excavations

Context type	Pit	Ditch	Ditch	Ditch	Ditch	Ditch	Ditch
Cut no.	**1354**	**1312**	**1312**	**1312**	**1312**	**1312**	**1350**
Context	**1353**	**1365**	**1311**	**1366**	**1367**	**1331**	**1369**
Phase	**2**	**3**	**3**	**3**	**3**	**3**	**1**
Sample no.	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Sample size (l)	**20**	**20**	**20**	**20**	**20**	**20**	**20**
Flot size (ml)	**20**	**2**	**6**	**8**	**17**	**80**	**5**
Triticum aestivum grain				1		12	
Triticum aestivum rachis fragments						36	
Triticum sp. *tetraploid* free-threshing rachis frags						6	
Triticum sp. grain					1	4	
Triticum sp. basal rachis fragments						1	
Hordeum vulgare grain			1			1	
Hordeum vulgare tail grain						1	
Secale cereale grain						2	2
Secale sp. rachis fragments						1	
Avena sp.						8	
Pisum sativum						1	
Cerealia indet		1f	4f		2f	96f	3f
Sprouts						1	
Ranunculus subgenus *Ranunculus*				1			
Corylus avellana nutshell	1f			1f			
Polygonum sp.						1	
Rumex sp.				1		3	
Brassicaceae indet.						1	
Aphanes arvensis				1			
Vicia/Lathyrus sp.						8	
Medicago sp.						1	
Trifolium sp.						3	
Galium aparine						2+4f	
Anthemis cotula						3	
Juncus effusus fruit						1	
Cladium mariscus						1	
Carex sp. (biconvex)						1	
Poaceae culm nodes						11	
Buds						1	
Charred bread					2f		

Table 19: Environmental remains from the 1998 excavations

7.3 Charred Plant Remains, 2002

by Val Fryer

7.3.1 Introduction

Samples for the extraction of the plant macrofossil assemblages were taken from across the excavated area, and thirteen were submitted for examination. To differentiate from the 1998 excavation, samples started at 100 on the 2002 site.

7.3.2 Method

The samples were bulk floated by a member of the OA East team, collecting the flots in a 500 micron mesh sieve. The dried flots were scanned under a binocular microscope at magnifications up to x 16, and the plant macrofossils and other remains noted are listed on Tables 20 and 21. Nomenclature within the tables follows Stace (1997). Unless otherwise indicated, all tabulated plant remains were preserved by charring.

7.3.3 Plant Macrofossils

Cereal grains/chaff, seeds of common weed species and wetland/aquatic plants, and tree/shrub macrofossils were found at varying densities in all samples. Charred, mineral replaced and waterlogged remains were recovered. The charred remains were moderately well preserved although some grains had become puffed and distorted during charring. The mineral replaced seeds were again moderately well preserved, and most were easily identifiable. Waterlogged remains were rare, but were noted in Samples 106, 107, 109, 110 and 111. All were reasonably robust, and had survived drying after processing.

a) Cereals and other food plants

Oat (*Avena* sp.), barley (*Hordeum* sp.), rye (*Secale cereale*) and wheat (*Triticum* sp.) grains were recorded, with oats and wheat being predominant. Rachis nodes of both bread wheat (*T. aestivum*/ *compactum*) and rivet wheat (*T. turgidum*) types were noted in the medieval ditch fills. Other food plant remains were rare, but did include a plum (*Prunus* sp.) type fruit stone and grape (*Vitis vinifera*) seeds, both from Sample 102.

b) *Wild flora*

Weed seeds were present in all but five samples. Segetal taxa were predominant and included corn cockle (*Agrostemma githago*), stinking mayweed (*Anthemis cotula*), brome (*Bromus* sp.), goosegrass (*Galium aparine*), indeterminate grasses (Poaceae), dock (*Rumex* sp.) and vetch/vetchling (*Vicia*/ *Lathyrus* sp.).

c) *Wetland/aquatic plant macrofossils*

Seeds/fruits were noted at a low to moderate density in all but Sample 104. Taxa noted included sedge (*Carex* sp.), saw-sedge (*Cladium mariscus*), spike-rush (*Eleocharis* sp.), duckweed (*Lemna* sp.) and water crowfoot (*Ranunculus* subg. *Batrachium*).

d) *Tree/shrub macrofossils*

Tree/shrub macrofossils were extremely rare, and were only noted in three samples. A single possible hazel (*Corylus avellana*) nutshell fragment was found in Sample 101 and elderberry (*Sambucus nigra*) seeds were recorded from Samples 109 and 111.

e) *Other plant macrofossils*

Charcoal fragments and pieces of charred root or stem were common or abundant throughout. Other plant macrofossils included mineral replaced and waterlogged root/stem fragments and charred culm nodes.

f) *Molluscs*

Mollusc shells were present throughout at varying densities. Some specimens, which retained delicate surface structures and good pigmentation, were probably intrusive within the contexts, but the remainder, particularly the burnt shells, were probably contemporary with the contexts from which the samples were taken. All four of Evans' (1972) ecological groups of land snails were represented along with freshwater obligate species.

g) *Animal macrofossils*

Animal macrofossils including bone fragments, eggshell, fish bones and small mammal or amphibian bones were present in all but Sample 109. Mineralised faecal concretions were abundant in Sample 102.

h) *Other materials*

Other remains were very rare. The fragments of black porous 'cokey' material, black tarry material and the siliceous globules are probably

derived from the combustion of organic remains (including cereal grains and straw/grass) at extremely high temperatures.

7.3.4 Discussion

For the purposes of this discussion, the samples are dealt with by context type.

Sample No.	**100**	**103**	**112**	**101**	**102**	**111**
Context No.	**1544**	**1566**	**1596**	**1505**	**1552**	**1589**
Phase	**4**	**4**	**4**	**4**	**4**	**5**
Context type	**Ditch**	**Ditch**	**Ditch**	**Pit**	**Pit**	**Ditch**
Cereals and other food plants						
Avena sp. (grains)	xx	xx			x	
Cereal indet. (grains)	x	xx		x		
(sprout frag.)		x				
Hordeum sp. (rachis nodes)	xcf				x	
Hordeum/Secale cereale (rachis nodes)	x					
Prunus sp.					xcfm	
Secale cereale L. (grains)	xcf			xcf		
Triticum sp. (grains)	x	xxx		x	x xm	
T. aestivum/compactum type (rachis nodes)	xx	x	x			
T. turgidum type (rachis nodes)		x				
Vitis vinifera L.					xxm	
Herbs						
Agrostemma githago L.	x			xtfm	xcftfm	
Anthemis cotula L.	x	x				
Apiaceae indet.				xm	xm	x
Atriplex sp.		x				
Brassicaceae indet.	x	x				
Bromus sp.	x				x	
Chenopodium album L.				x		
Conium maculatum L.						xtfw
Fabaceae indet. (pod)					xm	
Galium sp.	x					
G. aparine L.	x	x				
Small Poaceae indet.	x				x	
Large Poaceae indet.	x	x	x			
Polygonum aviculare L.	x					
Polygonaceae indet.				xm	xm	
Rumex sp.	xx	x			x	
Stellaria graminea L.	x					
Tripleurospermum inodorum (L.)Scultz-Bip (capitula frag.)		x				
Vicia/Lathyrus sp.	xx	x		xm		
V. hirsuta (L.)Gray	x					
Wetland/aquatic plants						

Carex sp.					x	x
Cladium mariscus (L.)Pohl		x	x		x	
Eleocharis sp.	xx	x		x	x	
Lemna sp.						xw
Trees/shrubs						
Corylus avellana L.				xcf		
Sambucus nigra L.						xw
Other plant macrofossils						
Charred root/rhizome/stem	xx	x	x	x	x	
Mineral replaced root/rhizome/ stem				x		
Waterlogged root/rhizome/stem						xxx
Indet.culm nodes	xx					
Indet.inflorescence frags.	x					
Indet.seeds	x	x		x xm	xm	xw
Molluscs						
Woodland/shade loving species						
Aegopinella sp.			x			
Clausilia sp.	x					
Oxychilus sp.			x			
Punctum pygmaeum			x			
Retinella sp.				x		
Vitrea crystallina			x			
Open country species						
Helicidae indet.	x					
Pupilla muscorum		x	x		x	
Vallonia sp.	x	xx	x	x	x	
V. costata	x		x			
V. excentrica			xcf			
V. pulchella	x	x		x	x	
Catholic species						
Cepaea sp.					x	
Cochlicopa sp.	x	x	x		x	x
Helix sp.		x				
Nesovitrea hammonis					xcf	
Trichia hispida group	x	x	xx	x	x	x
Marsh/freshwater slum species						
Carychium sp.		x				x
Vertigo sp.	x	x	x	x	x	
Freshwater species						
Anisus leucostoma		x	x			xx
Armiger crista				x		x
Bithynia sp.		x		x		
Lymnaea sp.		x				
L. peregra						xx
Planorbis sp.		x			x	
Animal macrofossils						
Bone	x	xb	x	x		
Eggshell		x				

Fish bone		xx	x	xxx	xx	x
Marine mollusc shell frags.		x				
Mineralised/faecal concretions				x	xxx	
Mineral replaced arthropods				x	x	
Small mammal/amphibian bone	x			x		
Other materials						
Black porous 'cokey' material		x			x	
Black tarry material		x		x		
Mortar/plaster	x					
Siliceous globules	x					
Vitrified material					x	
Sample volume (litres)	**20**	**20**	**10**	**20**	**20**	**10**
Volume of flot (litres)	**1.3**	**0.1**	**<0.1**	**<0.1**	**0.1**	**0.2**
% flot sorted	**<12.5%**	**100%**	**100%**	**100%**	**100%**	**50%**

Table 20: Environmental remains from the 2002 excavations (pits and ditches)

a) Medieval ditch fills (Table 20)

Samples 100, 103 and 112 are from ditch fills. Cereal grains/chaff and segetal weed seeds are common in Samples 100 and 103, possibly indicating that that these assemblages are partly or wholly derived from deposits of cereal processing waste incorporated within the ditch fills. The presence of cereal sprout fragments in Sample 103 may suggest that some storage waste, in the form of spoiled grains, is also present. Dietary waste, including burnt bone fragments, eggshell, fish bone and marine mollusc shell fragments, is also present in Sample 103 along with a small assemblage of freshwater molluscs, the latter possibly indicating that ditch 1566 was occasionally flooded or water filled. Sample 112 contains insufficient material to be conclusively interpreted.

b) Medieval pit fills (Table 20)

Although Samples 101 and 102 produced extremely small assemblages, mineral replaced macrofossils including a fruit stone, a wheat grain, grape seeds and a fragment of leguminous pod, are recorded, along with abundant fish bones and faecal concretions. It appears most likely that this material is derived from small deposits of sewage waste, although the quantity is insufficient to suggest that the features functioned as cess pits.

c) The Lode (Table 21)

Sample No.	**105**	**106**	**104**	**108**	**107**	**109**	**110**
Context No.	**1576**	**1578**	**1563**	**1592**	**1570**	**1594**	**1595**
Context Type	**Ditch**	**Lode**	**Tank**	**Lode**	**Lode**	**Lode**	**lode**

Phase	**5**	**4**	**4**	**4**	**4**	**4**	**4**
Cereals							
Cereal indet. (grains)	x						
Hordeum sp. (grains)	xx			x			
Triticum sp. (grains)	x		x				
T. turgidum type (rachis node)	xcf						
Herbs							
Asteraceae indet.	x						
Brassica sp.				x			
Conium maculatum L.	x						
Malva sp.	x						
Medicago/Trifolium/Lotus sp.	xcf			xcf			
Small Poaceae indet.	x						
Large Poaceae indet.	x						
Rumex sp.	x			x			
Vicia/Lathyrus sp.	xcf						
Wetland/aquatic plants							
Alisma plantago-aquatica L.							xw
Carex sp.	x			x			
Cladium mariscus (L.)Pohl	x						
Eleocharis sp.		x					xw
Lemna sp.	x	xw			xw	xw	xxw
Ranunculus flammula L.	xcf						
R. subg. *Batrachium* (DC)A.Gray							xxw
Trees/shrubs							
Sambucus nigra L.						xw	
Other plant macrofossils							
Charcoal <2mm	xx	xx	x	xx		x	x
Charcoal >2mm	x			x	x	x	
Charred root/rhizome/stem	xxx		x	x		xx	
Waterlogged root/rhizome/stem				x	xxx		xx
Indet.culm node	x						
Indet.seeds	x						
Molluscs							
Woodland/shade loving species							
Acanthinula aculeata	xcfb	xcf			xcf		
Aegopinella sp.		xcf		x			
Clausilia sp.		x		x	x	x	
Discus rotundatus			x	x	x		
Oxychilus sp.				x		x	xcf
Punctum pygmaeum			x				
Retinella sp.			x				
Vitrea crystallina		x					
Zonitidae indet.							x
Open country species							
Pupilla muscorum		x		x	x	x	x
Vallonia sp.	xx	x	xxx	x		x	x
V. costata			xxx				
V. excentrica	x	x	xx				
V. pulchella	xx	x	xx		x		x
Catholic species							
Cochlicopa sp.	xx	x	xx	x	xx	xx	

Limacid plate					x		
Trichia hispida group	xxx	x	xxx	xx	xx	xx	x
Marsh/freshwater slum species							
Carychium sp.	xx xb	xx	xx	xx	xx	xx	
Vertigo sp.	x xb	x	xx	x	x	x	xx
Freshwater species							
Anisus leucostoma	x xb	xxx	xxx	xxx	xxx	xxx	x
Armiger crista	x xb	xx	x	x	x	x	xxx
Hippeutus complanata							x
Lymnaea sp.	xx xb	xx	x	xx	xxx		xx
L. glabra					xcf		xcf
L. palustris		x		x	x	x	
L. peregra	x	xx	x	xx	xx	xx	x
L. truncatula	x						
Pisidium sp.		x		x		x	
Planorbis sp.	xb		x	x		xx	xx
P. planorbis		xx	x	x	xxx	xx	xx
Succinea sp.		x					
Valvata cristata	xb	x			x		
Animal macrofossils							
Bone	xb						
Eggshell	xb		x				
Fishbone	x			x	x		
Ostracods				x			
Small mammal/amphibian bone		x		x			
Waterlogged arthropods							x
Other materials							
Black porous 'cokey' material	x		x		x	x	x
Black tarry material	x						
Burnt/fired clay	x						
Small coal frags.	x				x		
Sample volume (litres)	**20**	**20**	**20**	**20**	**20**	**20**	**10**
Volume of flot (litres)	**0.2**	**<0.1**	**<0.1**	**0.1**	**0.1**	**0.2**	**<0.1**
% flot sorted	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 21: Environmental remains from the 2002 excavations (medieval lode and tanks; post-medieval ditch)

Key to Tables
x = 1 – 10 specimens xx = 10 – 100 specimens xxx = 100+ specimens m = mineral replacedtf = testa fragments w = waterlogged b = burnt

Three samples (108, 109 and 110) were taken from sequential fills within the lode (1584). A further two samples were taken from equivalent fills elsewhere along the feature (i.e. (1563) = (1592) - upper fill and (1570) = (1594) - middle fill). In the post-use phase, a ditch was dug into the lode's upper fill; Sample 105 was from the fills of this later ditch.

Although charred plant remains are present within the upper fills of the lode (Sample 108) and tank (Sample 104), the density of material is

extremely low, and it appears most likely that the macrofossils were accidentally incorporated into the fills, possibly as wind-blown detritus. However, mollusc shells are abundant, with marsh/freshwater slum species and freshwater obligate taxa being predominant. Along with common shells of open country species, these appear to be indicative of shallow water conditions, with little or no overgrowth on the bank sides.

With the exception of charcoal fragments, charred plant macrofossils are absent from the middle fills of the cut (Samples 107 and 109). However, waterlogged duckweed seeds are recorded at a low density. Marsh and freshwater mollusc shells are again common, particularly those of species indicative of shallow, slightly stagnant freshwater conditions (i.e. *Anisus leucostoma*, *Lymnaea* sp., *L. peregra* and *Planorbis planorbis*).

Waterlogged wetland/aquatic plant macrofossils (including seeds/fruits of water plantain (*Alisma plantago-aquatica*), spike-rush, duckweed and water crowfoot) are moderately common in Sample 110 from the basal fill of the lode. Along with the mollusc shells, the entire assemblage appears to be indicative yet again of shallow, low velocity water.

The presence within Sample 105 (from the post-lode ditch) of charred cereal processing debris (including grains, chaff and weed seeds), charred wetland plant macrofossils and a large number of burnt mollusc shells, may indicate that the material is derived from detritus which was burnt *in situ* within the ditch. Perhaps not unsurprisingly, the assemblage from Sample 106 is closely paralleled by material from context 1592 (Sample 108), the layer into which the later ditch was cut.

d) Post-medieval drain (Table 21)

A single sample (111) was taken from the fill of drain 1589 (Phase 5). Although the plant macrofossil assemblage is too small to conclusively interpret, freshwater obligate mollusc shells are moderately common while terrestrial taxa are rare, possibly indicating that the ditch was at least semi-permanently water filled.

7.3.5 Conclusions

In summary, the assemblages from the medieval pit and ditch fills give little indication of specific on-site activities, with the possible exception of the disposal of refuse (including cereal waste and sewage) in available open features. Some of the ditches may have been sufficiently deep to contain water, although possibly only on a seasonal basis.

The lode appears to have been sited within open countryside, with only a minimum of shady overgrowth in the near vicinity. Although probably permanently water-filled, the water appears to have been quite shallow and slightly stagnant, as would be expected.

With rare exceptions, plant macrofossils were not recovered at a sufficient density to warrant quantitative analysis, and although mollusc shells were abundant, further analysis was not undertaken since it would add little to the data already recovered.

8 Discussion

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8.1 Overview

This discussion, which is developed further by the published article (Spoerry *et al* forthcoming), provides an overview of the excavation's primary research contribution – new information relating to the sequence of occupation and activity of the abbey, with its emphasis on trade and industry. In a wider context, it is possible to contextualise these remains in relation to both the landscape and economy of larger monastic houses of the period in general, and to the monasteries and communities of the fenland in particular. In the former case, the focus on water/waterways, drains and drainage in the works of the great religious houses and the special significance of cleansing and life-giving water under the medieval monastic codes is well-attested. In respect of the latter, the act of bringing waterways into the economic heart of a settlement through lodes and private 'spur lodes' leading to private hithes (wharves) or landing places is one that is beginning to appear again and again in both the monastic and lay settlements of the medieval fenland, a place which was wholly circumscribed, blessed and cursed through its wateriness.

8.2 The Early Abbey

The earliest remains found (Phase 1) may represent the first evidence for the pre-Conquest phases of Ramsey Abbey. The only Late Saxon deposits previously identified, which perhaps indicate the presence of further buildings, lay within very small test pits and evaluation trenches to the north of the Abbey School (Fig. 3, No. 6; Macaulay 1006).

The group of timber buildings found during the 1998 excavation perhaps formed part of an eastern and northern range arranged around a courtyard. These are almost certainly elements of the Saxon monastery founded in the later 10th century and, if so, it is important to consider what the initial phase would have looked like. Unfortunately surviving plan and structural evidence for English monasteries of this date is scant. The fact that so many of these institutions developed into well-known medieval abbeys and priories means that the rather more ephemeral and smaller-scale structures of their Saxon incarnations have either been obliterated, or have become hard to recover amongst the wealth of later standing buildings and excavated information. It is generally expected that institutions like Ramsey Abbey – newly created as part of the later 10th-century Benedictine

reform movement – would have represented the ideals of that movement in their plan, and they would not have looked like the monasteries of the previous Middle Saxon era as exemplified by Jarrow, Monkwearmouth and Whithorn (usefully summarised in Aston 1993). Instead Ramsey would have conformed in general terms to the idealised St Gall plan consisting of a single monastic church, with a cloister to the south and buildings arranged around it in familiar pattern. This model is exactly that used for the majority of stone-built monasteries in subsequent post-Conquest centuries. In the Late Saxon phases at Ramsey, however, these structures would have been predominantly timber. No full plans of 10th-century English monasteries exist; the 10th-century phase of the church at Deerhurst is understood (Coppack 1990, 37), whilst the southern part of an 11th-century cloister has been excavated at Eynsham, replacing an earlier phase of timber buildings, perhaps relating to the pre-existing Saxon minster (Hardy, Dodd and Keevil 2002). This earlier phase at Eynsham in size, arrangement and construction, is not unlike the remains present at Ramsey in Phase 1. A problem arises when comparing the Ramsey and Eynsham evidence, however, in that the structures clearly most comparable at the latter site are attributed to the final pre-monastic phase and not part of the reformed Benedictine monastery.

It is difficult to be more specific about the early buildings at Ramsey; certainly the size of Building 1 is impressive, and the other structures may be secondary to it. If Building 2 is indeed a latrine, then it implies residential accommodation, perhaps indicating proximity to either the monk's dormitory or the infirmary, or a private lodging of a senior official. All of these alternatives might suggest a location to the south and east of the main cloistral ranges.

Building 1 is also significant in that it has for the most part earthfast post foundations, which are more often Early or Middle Saxon in date when found in larger structures and, as far as can be determined from the exposed portion, it conforms in plan with the Early to Middle Saxon 'hall', particularly when the suggested square porch at its western end is taken into account (James *et al* 1984). Given its apparent date, the seemingly archaic attributes of this building are undeniable and it could conceivably be a 'special' structure conforming to a strongly held and traditional notion of what an important 'hall' should be like.

The ditch found to the north of the buildings can be interpreted either as providing evidence for their enclosure or indicating that they lay outside another complex.

In conclusion, it is clear that the remains that constitute Phase 1 are probably part of the Late Saxon conventual buildings, including at least one major domestic-type hall, and that they may have lain to the south and east of the main cloister of the 10th-century foundation.

8.3 Replanning The Abbey

The Phase 2 remains indicate a change in use for this part of the monastic landscape, domestic buildings being replaced by a possible stock enclosure and a watering hole. The latter subsequently had quantities of iron working waste dumped into it, whilst a new building lay further north beyond a newly-defined east to west trackway with which it was aligned. It is likely that these changes towards stock management and industrial processing are associated with the development of the monastery in the post-Conquest period, the nature of the activities being more appropriate for the outer court or the fringes of the inner court, and this seems to signal that the main monastic structures were moved further away at this time.

Phase 3 sees a further re-planning of the monastic landscape. The new alignments were placed slightly to the west of north and these persisted into subsequent phases and still do in the position of some boundaries in existence today. The main elements in this arrangement are the possible defensive ditch and putative bank on its northern side, running across the centre of the site, and the trackway to the south. The ditch is known to have continued some distance to the east, but whether it stopped at the point recorded by geophysical survey or continued eastwards is not clear. Functional explanations tend to preclude the former suggestion, particularly as it led into an area of low-lying land that may have been partially impassable. As a defensive work, the ditch and bank perhaps protected the lode and/or abbey buildings to the north from attack from the south, which was the direction from which assailants from the mainland would have arrived prior to the canalisation of the Bury Brook and the creation of a bridge on the High Street. As it is known that Ramsey was fortified by de Mandeville during 1143 (Page *et al* 1932, 191), it is reasonable to suggest this as a likely date for the creation of the ditch and bank; pottery dating is not sufficiently accurate to confirm this. Building 5 and the lode share their alignment with the ditch, the lode certainly being present from Phase 4, but possibly originating in Phase 3. All of these features are ordinal with the known standing medieval remains and geophysical anomalies previously detailed, that lie to the south and east, perhaps indicating a further re-planning of the alignment of the major monastic buildings during the well-documented major building programmes of the time (Page *et al* 1932, 191).

8.4 The Lode and Related Features

8.4.1 Lode

Watercourses were important to the fenland monasteries who had aspirations for their key estate centres: an important means of achieving economic success was to give nascent towns the best possible waterborne contracts, using them to supply their own major estates and their hinterlands (Spoerry 2005, 94). Ramsey Abbey, which owned substantial portions of Huntingdonshire, achieved economic success through manipulation of natural resources and the environment (Spoerry 2005, 105). It constructed many lodes, the earliest of which probably date from soon after the founding of the abbey in the 10th century, when Ramsey is known to have been served by Cnute's Dyke (Hall and Coles 1994, 137).

Documentary sources refer to trench-digging as one of the customary villein services – for example, four people at Upwood in 1339 were amerced because they did not go to the 'ditching' at Ramsey when summoned (quoted in Darby 1940, 148).

Ramsey's linkage to the main river network meant that stone and other commodities could be transported to the abbey and indeed river transport was clearly regarded as the main means by which building materials were delivered to sites in the region (Edwards and Hindle 1991). The Ramsey Cartulary notes an agreement that Ramsey should give 4,000 eels in Lent to Peterborough a year in return for building stone at Barnack (Ramsey Cartulary *i*, 192, 1052-65; quoted in Darby 1940, 31 and 105).

In 1192 an agreement was drawn up between the abbots of Ramsey and Sawtry in Cambridgeshire by which the monks of Sawtry were to close up all the lodes that they had made in the marsh of Whittlesey with the exception of the 'great lode which runs from Whittlesey Mere to Sawtry…for by it the monks of Sawtry bring stones and such necessities for the building of their monastery' (quoted in Darby 1940, 101).

Possibly related to such building schemes are the blocks of Barnack Stone found from Whittlesea Mere (Hutchinson 1994, 121; Jenkins 1993a and b) which probably indicate a sunken medieval barge. The evidence suggests the barge was a flat-bottomed double-ended vessel 9.0m long, with a beam of 3.0m and a draught of less than 1.0m that could carry over 7 tonnes (Cessford *et al* 2006, 28).

Lodes had the added benefit of taking away flood water. In 1230 it was recorded that Monkslode, at Sawtry, had been made 'to preserve

the lands, meadows and pastures of the men of Walton, Sawtry and Conington from the waters descending…and for navigation of corn, turves and other things to diverse places' (quoted in Hall and Coles 1994, 137).

Relatively little is known of how lodes were constructed. The surviving waterways, although undoubtedly reworked over time, do indicate that the lode sizes varied greatly, probably on the basis of the perceived size of the flow being diverted. On the southern Cambridgeshire fen edge the lodes have been studied in detail in four parishes and have been found to date before the end of the 13th century (Oosthuizen 2000, 32). These examples varied in width between 22 to 40 feet and appear to have been utilised for traffic, at least to serve local purposes. No locks were found along their course and in summer the water levels were often too low to permit waterborne transport. All the lodes were embanked and were fed by fen-edge catchments drains, which were also embanked.

The lode and associated features found at Ramsey Abbey may have continued in use until the Dissolution. The lode was at least 6m to 8.7m wide across its banks, with sides sloping to a 3m+ wide base. Its surviving depth of the varied being generally 1.04m, but slightly deeper near its butt-end at 1.45m. It would originally have been deeper and amply deep enough to take the draft of the kind of small craft that plied the medieval Fenland waterways, bring building stone from Barnack and all of the commodities necessary to provision a large and wealthy monastic community.

Similar lodes are known across Cambridgeshire and beyond. Excavations by OA East at Blackhorse Lane, Swavesey, found a short lode dating to the high medieval period, perhaps 8m wide and 1m deep with sloping sides (Cooper and Spoerry 1997). Three late 14th to 15th century lodes have been excavated in Ely between Broad Street and the Great Ouse (Cessford *et al* 2006). Here the lodes were narrower at 3.5 to 4.0m wide and their sides varied in profile, ranging from *c.*45-50º to *c.*60º+ although all were flat bottomed (Cessford *et al* 2006, 24-5). Oak revetments were found embedded in the lode sides, having been held in place by a wattle fence (Cessford *et al* 2006, 24). At Glastonbury a lode over 1km long was in use from the 10th to the 13th centuries was c.6m wide and 1m deep with a flat base (Hollinrake and Hollinrake 1993).

The base of the Ramsey lode lay at *c.*4.5m OD whereas the natural, often peaty material elsewhere in the town is recorded at between 2.5m and 3m OD. Such low-lying areas were deemed too wet for habitation and all the archaeological work across the town (Fig. 5) has found that the ground level was raised in the medieval and post-medieval periods with successive depositions of material derived at

least in part from the abbey. Examination of the court roles led the DeWindts to conclude that although Ramsey may have been a so-called fen island, it was itself quite fen-like, with meres, bogs, and other expanses of marshland that required constant drainage to prevent the inundation of the town (DeWindt and DeWindt 2006, 25).

The lode at Ramsey Abbey would have lain about 2-2.5m above the main lode at the Great Whyte and this discrepancy needs to be explained. Other monasteries in the region had the benefit of sluice gates or flash locks. The 14th- to 16th-century lode at Castle Acre Priory was built within the abbey precinct about 50m to the south of the abbey nave (Wilcox 2002, fig 3). Here, a large barn and granary were built parallel to and about 5m to the south of the lode, with a kilnhouse and bake/brewhouse were further away forming a courtyard. The remains of a wharf were found, alongside a probable bridge over the lode as well as the remains of a sluice gate which would probably have been used as a flash lock (Wilcox 2002, 32-5). This particular lode had been reveted in stone and in some places wood. The lock may have been operated when vessels were despatched down the canal to the river. A boat would have been positioned just to the east of the closed lock while the current along the canal from the east accumulated around it and, when sufficient water was present, the lock was opened.

At Byland Abbey, a channel has a recorded fall of nearly 3m down towards the Hollins Wood quarry, and if, as seems likely, this channel was built for navigation then some sort of flash-lock system must clearly be implied (Bond 1989, 98).

Documentary records show that sluices were common in the medieval fenland and many other monasteries in the region had benefit of sluice gates or flash-locks. Many related disputes arose: ‘presentment after presentment declared that certain “clowes” [a clow was a sluice or floodgate] had been stopped; that certain channels should be repaired, or cleaned, or made wide, or straightened; that certain banks ought to be restored and made higher; and that certain sluices must be constructed’(Darby 1940, 149).

At Ramsey the excavations suggest that this lode headed towards the northernmost point of the monastic enclosure, where earthworks were recorded (Fig. 4, C). At this point there is less than a metre height difference compared with the archaeological excavations. The earthworks here were both regular and extensive, covering an area of some 75m by 60m, and they were set on and below the 5m contours at the end of a lode that survived until recent times. Possible interpretations of the earthworks include fish ponds, locks, water tanks or docking areas. The lode may ultimately have led towards Ramsey Mere to the north-east, via the Little Whyte and the Great Whyte (Fig. 4; see further discussion below).

Environmental samples from the lode point to shallow, low velocity water conditions with little or no overgrowth on the banks, perhaps reflecting the presence of revetments similar to those found at both Ely and Castle Acre Priory.

8.4.2 Cranes

A typology of medieval cranes has been established (Ellmers 1989) and the excavated tripod base adjacent to the Ramsey lode may represent a 'wippe'crane (see-saw) or hoisting spar foundation, or could reasonably match a different means of supporting other types of crane. The 'wippe' crane type consists of a mast with a yard and originated from the requirement to lift cargo from deep-going vessels which could not reach a harbour (Ellmers 1989, 47).

Cranes may have been introduced to waterfronts from the second half of the 12th century (Hutchinson 1994, 113) and by about 1250 the town law of Bergen in Norway refers to a crane of this type (Ellmers 1989, 48). One 'wippe' crane survives in Bergen Museum; the mast is 12.85 m long, with the hook for the 15.05 m long yard positioned *c* 10 m above the ground. The Ramsey example would have been much smaller (about one third the size) although it does appear to have been more substantial than the late medieval lifting devices found adjacent to lodes at Ely, where remains of groups of between two and five shallow pits or postholes directly to the south of channels were interpreted as possible hoisting spars for small goods (Cessford *et al* 2006, fig. 10; 72). The absence of storage facilities here suggests that cargos may have been taken away immediately after unloading.

8.4.3 Possible storehouses

The buildings found adjacent to the Ramsey Abbey lode were probably some form of storehouses. Records of Ramsey Abbey employees mention a corn mill and a malt mill in the 14th century as well as the repair of a range of buildings including three storehouses and barns. Similar buildings have been found at other monastic sites, such as Castle Acre Priory (see above).

8.5 The Precinct of Ramsey Abbey

It is uncertain when the precinct of Ramsey Abbey was constructed although the boundary was probably formed in around the 12th century (see below) around an existing Late Saxon abbey and associated buildings.

Most previous interpretations have been based on supposition, as have hypotheses about the position and arrangement of the monastic

buildings. The exact location of the abbey church itself has yet to be pinpointed, although a multi-disciplinary project undertaken by OA East in 1999 provided sufficient new data for one of the previously published models, that of Dickinson (1967, 245-247), to be discounted in favour of one suggested by the late Tony Baggs (Spoerry and Cooper 2000). This places the abbey church's north wall along the surviving dog-legged south wall of the churchyard of St Thomas of Canterbury (where *in-situ* medieval fabric has now been identified) and implies that the extant 13th-century fabric in the basement of part of Ramsey Abbey School is more likely to be from the Chapter House or Refectory located on the south side of the cloister, rather than it being a lost Lady Chapel as indicated in some previous publications on the subject (Spencer and Cooper 2000).

The only other above-ground and *in-situ* elements from the medieval monastery are the surviving half of the late 15th-century gatehouse and the parish church itself, which was originally built as the abbey's hospital, infirmary or guest house in the 1180s, and was converted into the church for the new parish of Ramsey *c*.1222 (Haigh 1988). The relative position of these two pieces of surviving fabric and their function and date of creation and/or conversion require that a multi-phase model for the position of the monastic precinct boundary where it met the town be created.

The RCHME identified the more obvious earthworks within the abbey environs on a single plan (RCHME 1920, 210). They recorded Booth's Hill, the Anarchy fortification, at the extreme southern limit of the abbey precinct (Fig. 4, B), and at the extreme north a cluster of very large rectangular 'pits' or earthworks (C) one of which was still shown as a pond. These lay at the north-western terminus of a large ditch that curved around to the east and south and which forms the north-eastern part of the monastic enclosure (G). From these northerly ponds or earthworks to the end of the western side of the enclosure at New Road corner the enclosure ditch is replaced by the line of a ditch or channel (D) that runs below and parallel to the 5m contour (at approximately 3m OD) and has the effect of flattening off the enclosure's north-western side. This channel either feeds into, or out of the large pond-like earthwork complex.

As identified by the RCHME this large oval enclosure would appear to represent the abbey precinct boundary. It is unlikely that the boundary was incorporated in the Late Saxon period as the area enclosed is very large. The abbey was formed in the very late 10th century and other matters such as establishing the abbey buildings would probably have taken precedence. The possible Late Saxon occupation recorded in the 1998 excavation consisted of two or three primitive domestic structures on the eastern part of the medieval projected enclosed area of Ramsey.

The precinct itself measured approximately 800m north to south and 550m east to west, with the long axis aligned north-northwest to south-southeast, and would enclose an area of roughly 35 hectares. The area enclosed at Ramsey compares well with other abbey precincts, both Benedictine and Cistercian. The precinct of the Benedictine Abbey at Peterborough is 600 x 250m, and those at the Cistercian Abbeys of Fountains, Rievaulx, Furness and Byland are all comparable at between 800 - 1000m by 400 – 700m (Aston 1993, 92-95). All bar one of these also have their main gate at the centre of the western side of the precinct.

At Ramsey, Booth's Hill lies within this boundary at the south, and could either have been set within it (dating the enclosure to before the Anarchy period) or deliberately enclosed by it (dating after the Anarchy). Booth's Hill is usually interpreted as a defensive work dating to 1143 when de Mandeville's forces occupied and fortified the abbey. It was no doubt located to command the seasonally dry land to the south of the island on which the monastery was situated, and across which an ancient routeway, from Ramsey to its former mother parish church at Bury, is believed to have existed (D.Cozens pers. comm.). Unlike the crossing from the mainland to the west, this route would not involve a crossing of the Bury Brook. Parts of this route may be fossilised in the footpaths that still run to the east of the Bury Brook between Bury and Ramsey.

It is probable that the causeway to the mainland due west from the abbey was in place by the middle or end of the 12th century, as it was at that point that the settlement outside of the abbey gate was granted a market (Page *et al* 1932, 188); it is possible that until this route was constructed the main route onto the island was direct from Bury to the south. The causeway would not only have had to cross deep fen but also the course, or multiple courses, of the Bury Brook and it may be that the canalisation of the Bury Brook was begun at this time – a causeway would necessitate the closing off of all but one course of the stream, and also the construction of a bridge. The early bridge would have been of wood, but by the 13th century this had been replaced by a stone bridge.

The large earthworks at the northern tip of the enclosure might represent more ponds, or further docking facilities to add to those found on the lode-end to the south, or they might have been another defensive work protecting the waterway into the precinct, perhaps constructed along with Booth's Hill in 1143.

The precinct enclosure is almost certainly more complex than it appears at first glance. The eastern, central part of the circuit is unclear, the enclosure ditches are seen at the north-east and south-

east, where they cut across the high island ridge, but are not visible at the centre across the bay of low-lying fenland that separates them. To the south-east and north-east there is some evidence (stronger at the south-east) for the existence of a double boundary, or of different versions of the precinct; the information being recoverable from early edition OS maps, recent aerial photographs and an excavated section through a previously unknown boundary ditch (Mortimer 2006). It is possible that these alignments represent the line of, and ditched flood defences for, a trackway around the outside of the precinct.

The position of the western precinct boundary line is represented by surviving ditches running just below the 5m contour and positioned around 80m west of Hollow Lane, which itself roughly aligns with the late medieval gatehouse. These ditches link in with earthworks south of Hollow Lane shown on the RCHME plan, although exactly how these joined up with the eastern alignments is unclear.

The relationship between the precinct boundary and the growth and shape of the town of Ramsey itself is undoubtedly complicated. Whilst this subject cannot be fully explored here, it is important to note the following observations.

Surviving property boundaries visible to the north of Little Whyte and to the south of High Street, preserve the original precinct boundary line and give a position for the original western gateway and perhaps also for further defensive works from the Anarchy period.

Ramsey's plan was probably first formalised at, or soon after, the award of a market charter in 1200. This may have resulted in the market placed being established between the current High Street and Little Whyte, but it is also possible that an informal arrangement was already in existence here. Whatever the case, by 1222 when the infirmary was converted into a church for the parish, the precinct boundary would have been withdrawn to provide access to this church, which also offered the possibility of the infilling of the resultant space with further properties and allowed the market place to be extended eastwards to the current Church Green. The peculiar curving shape of properties infilling this space can be seen north of Little Whyte. South of the new parish church, the southern churchyard boundary became aligned on the north wall of the existing abbey church and a new gateway into the precinct was constructed where the existing 15th-century structure was later built (Spoerry and Cooper 2000).

8.6 Abbey Trade and Economy

It is likely that Ramsey Abbey was sending produce to King's Lynn which had an important corn and wool market. Transportation down

the River Nene was clearly important to this trade (Darby 1940, 98). The lodes and wharves found at Castle Acre Priory, Norfolk and Waltham Abbey, Essex were primarily related to the movement of agricultural produce (Wilcox 2002, 32-4; Huggins 1972, 81-9). Grain transport to Ramsey is well documented. Records show that tenants of the Ely and Ramsey manors, and of other fenland manors had to perform carriage by water whenever grain or other supplies needed to be taken to the monks (Darby 1940, 102).

Payments to Ramsey Abbey employees demonstrate that the abbey was paying for the transport of diverse other commodities such as fodder, lumber and wine by boat. The construction of stone buildings led to continued demand for raw materials. For example, in 1359 John Limbote was paid 127d for carting stone. A range of stone recovered from the excavations ranges in date from the 12th century until probably the 15th century. The use of architectural stone from the former abbey in the post-medieval drains and walls shows that such stone remained plentiful. Indeed, Ramsey stone was still being used locally and exported decades after the abbey was dissolved.

Ramsey Abbey was evidently making and selling tile from at least the middle of the 14th century and brick from the early 15th century (DeWindt and DeWindt 2006, appendix 8). A large amount of roof and floor tile was recovered from the site (more than 50kg) and both the documentary and archaeological evidence attests to significant trade in skilfully decorated tiles and bricks.

Both ferrous and non-ferrous metalworking was suggested by the excavation, the former focused in the southern part of the site and most of it occurring in Phase 2. Documented payments to smiths for ironwork are numerous and include a wide range of items such as horseshoes, iron wheels, the making of ‘diverse ironwork for the church’ and for ‘iron things, annually’ (DeWindt and DeWindt 2006, appendix 8).

Supplementing the excavated remains, domestic livestock are frequently noted in the records, with cattle, pigs, sheep, horses and calves being pastured at nearby Muchwood. The Abbey records attest to the herding of swine (e.g. Adam Porcarious, 1353) and cows (e.g. John Prowde, 1523), the buying of beasts, the activities of butchers and the slaughterhouse. The records also note the employment of fishermen and those preparing fish, along with the supply of dried fish and eels.

Ramsey Abbey had hunting rights in the hundred of Hirstingstone (in which Ramsey lies) dating back to at least the time of Henry II, despite the probable proscription of such rights to the clergy (DeWindt and DeWindt 2006, 123). The abbots evidently employed huntsmen and

records note the hunting of deer and game (DeWindt and DeWindt 2006, 148). The monks were criticised in 1518 by church officials: 'Many of the monks give themselves over to hunting and games more than they should, and sometimes some of them shoot arrows in the fields without a decent habit on, to the scandal of the house' (Hamilton Thompson 1914, 85; quoted in DeWindt and DeWindt 2006, 148 and fn46). Travel expenses for 'seeking birds' were paid to Henry Cocus in 1356, while other records attest to swans, partridge and pheasant. Archaeological evidence for hunting and wildfowling is now provided by the faunal remains of deer and wild birds, as well as the presence of a probable large hunting dog.

8.7 The Dissolution and Afterwards

Activities attributable to this phase indicate that there was no occupation within the excavation area from the 16th century. The location of wall 1003 and drain 1213/1381 correspond with boundaries recorded in the 1704-9 Silius Titus map of Ramsey (Fig. 6). Ditch 1357 does not appear on the Titus plan, which may suggest that it had already gone out of use in the 17th century. Wall 1003 is not recorded on the 1824 1" map (Fig. 7) and had evidently fallen from use by this time since several of these boundaries enclosing small field boundaries had been amalgamated to form large fields. Drain 1213/1381 appears on this early 19th century map but not on the later 1st Edition Ordnance Survey map.

The use of architectural stone from the former abbey in the post-medieval drains, walls and in some of the dumping layers shows that stone was plentiful in this period. There are records of Ramsey stone being exported decades after the abbey was dissolved to Cambridge for the building of some colleges. When these post-medieval walls and drains went out of use in the 18th and 19th centuries, stone was again in demand and most of the stone was again robbed for reuse elsewhere, presumably within buildings in Ramsey town.

9 Conclusions

These comparatively small excavations have opened a significant window into the workings of the precinct at Ramsey Abbey during the medieval period. They have provided the opportunity to give wider and more accurate synthesis of the landscape and economy of the monastery, and have enabled the development of further research-based investigations into, for example, the arrangement of the inner court and the development of the town.

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[i] This progression is not clearly represented in the site phase statistics, due to reworking of deposits and mixing of differently-dated types, and due to the wide date range encompassed by Phase 4.

Appendix 1: Metalworking slag by Tom Eley

Context	Mass (kg)	Magnetic	Type	No. of fragments	Phase	Description
1008	0.896	yes	SHB	1	6	PCB shape 130mm by 105mm by 50mm. Charcoal impressions
1008	0.039	no	Undiagnostic	2	6	
1008	0.019	no	Lining	3	6	Vitrified lining
1008	0.031	no	Undiagnostic + Lining	1	6	
1008	0.057	yes	Smithing slag	2	6	
1030	0.007	no	Lining	1	6	Black, burnt reducing conditions.
1040	0.019	no	Lining	1	2	Vitrified
1040	0.005	no	Undiagnostic	1	2	
1055	0.008	no	Undiagnostic	1	2	
1056	0.008	no	Undiagnostic	2	1	
1073	0.005	no	Undiagnostic	2	3	
1095	0.088	no	SHB	1	6	PCB shape fragment. 60mm 40mm by 35mm. Charcoal fragments and porous
1103	0.06	no	Smithing slag	3	6	
1121	0.017	yes	Smithing slag	1	1	
1140	0.02	no	Undiagnostic	1	1	Porous vitrified
1149	0.094	no	SHB	1	2	PCB shape 60mm by 50mm by 20mm porous silica rich
1149	0.048	yes	Bloom fragment	1	2	Dense, strongly magnetic, dark grey 30mm by 30mm by 30mm. Creased appearance
1149	0.041	no	Undiagnostic	3	2	Stone inclusions, glassy
1174	0.01	no	Undiagnostic	1	1	PCB shape, vitrified with a blueish tinge
1180	0.019	no	Undiagnostic	1	1	Silica rich, porous
1181	0.015	no	Undiagnostic	2	1	
1200	0.076	yes	Lining + slag	2	1	
1202	0.005	no	SHB	1	1	PCB shape 42mm by 50mm by 30mm, porous.
1202	0.007	yes	Undiagnostic	1	1	

1209	0.01	no	Undiagnostic	2	1	
1209	0.03	no	Lining	1	1	
1218	0.029	no	Smithing slag	1	3	PCB shape, porous
1218	0.017	yes	Undiagnostic	1	3	Dense.
1218	0.003	no	Lining	1	3	
1223	0.004	no	Undiagnostic	1	1	
1229	0.008	no	Undiagnostic	1	1	
1256	0.019	no	Undiagnostic	2	3	
1266	0.002	no	Undiagnostic	2	2	
1272	0.131	no	SHB	1	3	PCB shape. 62mm 50mm by 53mm. Porous
1272	0.042	no	SHB	1	3	PCB shape fragment. 40mm by 40mm by 25mm
1272	0.037	no	Lining	4	3	Vitrified lining
1272	0.067	no	Smithing slag	3	3	porous.
1272	0.015	no	Undiagnostic	4	3	
1291	0.005	no	Undiagnostic	2	3	Porous, charcoal impressions
1297	0.146	yes	SHB	1	3	PCB shape 60mm by 65mm by 20mm
1297	0.132	no	SHB	1	3	PCB shape 80mm by 65mm 30mm. Little iron oxide staining
1297	0.105	no	SHB + Lining	1	3	PCB shape 70mm by 40mm by 35mm. Some Sandy lining attached
1297	0.356	yes	SHB	1	3	PCB shape 90mm by 85mm by 40mm
1297	0.304	yes	SHB	1	3	PCB shape 95mm by 55mm 41mm. Iron oxide staining and a possible tuyere blast depression.
1297	0.078	no	SHB	1	3	PCB shape 65mm by 43mm by 35mm. Some ceramic dark red in colour
1297	0.081	yes	Smithing slag	6	3	
1297	0.313	no	Smithing slag	20	3	
1297	0.409	yes	SHB	1	3	PCB shape 90mm by 65mm 59mm. Some charcoal impressions
1297	1.6	yes	SHB	1	3	PCB shape 130mm by 110mm by 85mm. A layer of slag and stones adhering to one side with charcoal impressions
1297	1.766	yes	SHB	1	3	PCB shape 130mm by 110mm by 70mm. An extra lump of slag fused to one side.
1297	2.223	yes	SHB	1	3	PCB shape elongated 160mm by 150mm by 150mm. Stony bases with charcoal impressions

1308	0.018	no	Lining	1	2	vitrified.
1308	0.044	no	SHB	1	2	PCB shape 50mm by 40mm 25mm. Dense layer on top surface.
1308	0.005	yes	Undiagnostic	1	2	
1328	1.438	yes	SHB	1	2	PCB shape 20mm by 12mm by 50mm
1328	0.274	no	Slag + Lining	3	2	Three pieces. Smithing slag with sandy burnt ceramic attached. Indicating reducing conditions, because it is dark reddish black with some green glass areas
1328	0.194	no	Smithing?	4	2	Contains some stone fragments and charcoal impressions
1331	0.019	yes	Smithing slag	1	3	
1332	0.024	no	Smithing slag	1	1	
1332	0.021	no	Lining	1	1	Micaceous dark grey.
1332	0.008	no	Undiagnostic	1	1	
1334	0.017	no	Lining	1	1	Vitrified
1334	0.038	no	Undiagnostic	1	1	
1334	0.04	no	Smithing slag	1	1	PCB shape.
Total	11.666					

SHB = smithing hearth bottom

PCB = plano-convex base

Appendix 2: Petrological Analysis of Ceramic Building Material and a Clay Sample, by Alan Vince

Twelve samples of ceramic building material were submitted for analysis in order to provide an objective description of their petrological characteristics and to try and establish the source of the raw materials used in their manufacture (Table A1). In addition one sample of clay from the vicinity of Ramsey Abbey was submitted for study.

The clay is blue-grey in colour with black mottling and moderate decayed roots. Mixed with this clay is a light brown, very sandy clay. A subsample of the clay was made into a briquette, with the minimum of working to preserve the original texture, and fired at c.1000 degrees C by Andrew Macdonald. The fired clay has a variable dark red colour (Munsell 2.5YR 3/6) with black mottling.

Petrological analysis

Fabric A (V2845)

One sample of Fabric A was submitted, a piece of flat roof tile. The tile has a light grey core and light brown margins and surfaces. At x20 magnification the fabric contains few large inclusions (lower cretaceous-derived polished quartz, sparse bivalve shell fragments and a single large angular black fragment, possibly fossil bone or clay/iron). Moulding sand on the base consists of abundant subangular quartz, mostly with a slight haematite coating, bivalve shell fragments, muscovite laths up to 0.2mm across, and sparse biotite.

In thin section the following inclusion types were noted:

- Quartz. Moderate angular quartz grains c.0.1mm to 0.2mm across. Sparse subangular and rounded grains up to 0.5mm across.
- Microfossils. Abundant ferroan calcite microfossils, consisting in the main of thin flat fragments some with a slight curvature, up to 1.0mm long. These are probably ostracods.
- Opaques. Sparse rounded fragments up to 0.5mm long.
- Voids. Sparse rounded and irregular voids. The rounded voids appear to have once held calcareous inclusions whilst the irregular ones appear to be pores.

The groundmass consists of optically anisotropic baked clay minerals, abundant dark brown/opaque grains, c.0.05mm across and ferroan calcite microfossils (probably broken pieces of the larger microfossils). Sparse quartz grains up to 0.05mm are also present.

Fabric AA (V2844)
One sample of Fabric AA was submitted, a fragment of flat roof tile. The tile has a light grey core and very pale brown margins and surfaces. At x20 magnification the fabric contains few large inclusions (two large fragments of oyster-like bivalve shell with a dark cement adhering to the broken edges; lower cretaceous-derived polished quartz). Moulding sand on the base consists of subangular quartz grains, bivalve shell fragments, red iron ore, muscovite and biotite.

In thin section the following inclusion types were noted:

- Quartz. As Fabric A
- Microfossils. As Fabric A
- Opaques. As Fabric A.

- Voids. As in Fabric A except that some contain ferroan calcite, which might be secondary, or concretionary limestone, and some contain non-ferroan calcite, partially replaced around the edges by ferroan calcite.
- Clay Pellets. Sparse rounded clay pellets with similar characteristics to the groundmass, but containing no microfossils

The groundmass is as Fabric A.

Fabric A2

One sample of Fabric A2 was submitted, a fragment of flat roof tile. The tile has a light grey core and light brown margins and surfaces. At x20 magnification, the fabric contains few large inclusions (rounded calcareous grains which are possibly heat-altered bivalve shell; a large tabular fragment of chert). Moulding sand on the base consists of subangular quartz, muscovite, bivalve shell fragments, red iron ore which may be from the body, and biotite.

In thin section the following inclusion types were noted:

- Microfossils. As Fabric A. Also, sparse rounded non-ferroan calcite microfossils.
- Opaques. As Fabric A.
- Voids. As Fabric AA.
- Clay PellQuartz. As Fabric A
- ets. As Fabric AA.
- Altered glauconite? Sparse red fragments up to 0.3mm across. These may be altered glauconite or phosphate. The colour, however is different from the secondary brown-stained phosphate found in some of the pores.

The groundmass is as Fabric A.

Fabric B (V2839, V2848)

Two samples of Fabric B were submitted, both of which appear to be Romano-British bricks or tegula fragments. The tiles have a light grey core and red margins and surfaces. At x20 magnification, At x20 magnification the fabric contains few large inclusions but is variegated with lenses of lighter-firing clay. Moulding sand, present on the bases of the tiles and folded into the fabric of one sample, is a fine quartzose sand composed of subangular quartz grains up to 0.1mm across, rounded quartz grains, rounded black iron ore, muscovite and biotite laths. Shell is absent.

In thin section the following inclusion types were noted:

- Quartz. Moderate sub-rounded and rounded grains up to 0.5mm across. A few of the grains are polycrystalline and strained whilst the majority are unstrained and monocrystalline.
- Finegrained Sandstone. Sparse rounded fragments composed of angular quartz grains c.0.05mm to 0.1mm across.
- Clay Pellets. Sparse dark brown to black-stained rounded pellets up to 1.0mm across.

The groundmass is composed of variegated clays differing in colour, texture and their quartz sand content (indicating that the quartz sand was not added to a pre-existing parent clay). The different lenses of clay vary in the amount and size of quartz and muscovite present but all contain moderate to abundant quartz inclusions with sparse muscovite.

Fabric DR (V2849)

One sample of Fabric DR was submitted, a relief-decorated floor tile. The tile is unglazed buy has a dark brown surface which appears to be a slip. At x20 magnification the fabric contains few large inclusions (sparse voids of grass or straw leaves) but is variegated, consisting of a light pink calcareous clay with lenses of lighter-firing and red clay. Fragments of red tabular iron ore occur alongside the red clay. Moulding sand on the base consists of subangular quartz up to 0.2mm across, sparse rounded quartz grains, muscovite and biotite.

In thin section the following inclusions were noted:

- Quartz. As Fabric A but sparse.
- Microfossils. As Fabric A but represented by voids and ?phosphate replacement.
- Opaques. One large rounded fragment 6.0mm long. Others as Fabric A.
- Voids. As Fabric AA.
- Bivalve shell. Sparse fragments of non-ferroan nacreous shell up to 3.0mm across

The groundmass is similar to Fabric A but is variegated with streaks varying in colour.

Fabric DR2 (V2840)

One sample of Fabric DR2 was submitted, a flat roof tile fragment. At x20 magnification, the variegated calcareous fabric contains moderate, iron-stained quartz grains, including polished grains of lower Cretaceous origin up to 1.0mm across. Moulding sand on the base consists of similar quartz sand with red iron ore, white angular flint and sparse shell.

In thin section the following inclusion types were noted:

- Quartz. As Fabric A
- Microfossils. As Fabric A
- Chert. Sparse rounded fragments up to 1.5mm across.
- Opaques. Sparse rounded fragments up to 2.0mm across.
- Micrite. Rounded fragments of non-ferroan calcite, up to 1.0mm across, with traces of microfossils. Probably chalk.

The groundmass is as Fabric A.

Fabric DW (V2841)

One sample of Fabric DW was submitted, a flat roof tile with a round peg hole. At x20 magnification, the variegated calcareous clay contains few inclusions. There is no moulding sand.

In thin section the following inclusion types were noted:

- Quartz. Sparse angular fragments up to 0.2mm across and rare rounded grains up to 0.4mm across, some with iron-stained veins.
- Voids. Sparse sub-rounded voids up to 1.0mm across.
- Clay pellets. Sparse rounded fragments, similar to the groundmass but redder.

The groundmass consists of optically isotropic, variegated calcareous clays, varying in colour (iron content). Sparse angular quartz up to 0.1mm across is present.

Fabric E (V2843, V2846)

Two samples of Fabric E were submitted, both from flat roof tiles, one of which has a partial lead glaze. The fabric has a dark grey core with light brown margins and surfaces. At x20 magnification, the fabric contains abundant rounded quartz grains, up to 1.0mm across, some of which are of lower Cretaceous origin and haematite-coated; sparse angular white flint fragments and rounded bivalve shell fragments.

In thin section the following inclusion types were noted.

- Quartz. Abundant rounded fragments up to 1.0mm across, including well-rounded, spherical grains (of Permo-Triassic origin).
- Chert. Sparse rounded fragments up to 1.0mm across.
- Flint. Sparse angular and subangular fragments up to 1.0mm long.
- Bivalve shell. Sparse rounded fragments of nacreous bivalve shell up to 1.0mm long.
- Opaques. Sparse rounded, heat-altered grains up to 1.0mm across.
- Baryte. A single possible identification of a banded fragment 1.0mm long.

The groundmass consists of optically isotropic variegated lenses and streaks of baked clay minerals with sparse angular quartz. Some of the clay lenses are light-coloured and possibly once calcareous.

Fabric F(V2842)

A single sample of Fabric F was submitted, a flat roof tile fragment. At x20 magnification, the fabric contains few large inclusions and has abundant iron-stained subangular quartz and unstained bivalve shell fragments up to 0.2mm and sparse muscovite and biotite laths of similar size.

In thin section the following inclusion types were noted:

- Quartz. As Fabric A but slightly more common.
- Microfossils. As Fabric A but also sparse non-ferroan echinoid spines and circular microfossils c.0.15mm across.
- Altered Glauconite. As Fabric A2. Some are brown rather than red and more definitely altered glauconite.
- Clay Pellets. As Fabric AA
- Bivalve shell. Some nacreous shell fragments up to 1.0mm long. In addition, probably some voids once contained bivalve shell, also up to 1.0mm long.

The groundmass is similar to Fabric A

Fabric G (V2850)

A single fragment of Fabric G was submitted, a flat roof tile fragment. At x20 magnification, the variegated, calcareous clay contains few inclusions (angular red clay/iron ore fragments up to 0.5mm across and voids whose original contents are unknown).

In thin section the following inclusion types were noted:

- Quartz. Rare rounded quartz up to 0.3mm across.
- Voids. Sparse voids, up to 1.0mm across.

The groundmass consists of optically isotropic variegated lenses and streaks of baked clay minerals, abundant quartz up to 0.05mm and sparse muscovite and biotite laths up to 0.1mm long. Some of the lenses are formed of light-firing heat-altered calcareous clay.

Clay Sample

The two clays present in the sample are clearly distinguishable in thin section, although there are quartzose grains which derived from the sandy clay scattered throughout the finer clay. Nevertheless, it is possible to reliably describe each clay separately.

The following inclusion types were present in the blue-grey clay:

(J) Clay pellets. Sparse rounded pellets, mainly c.0.5mm to 1.5mm across. The pellets have a similar groundmass to the rest of the clay but are mottled black.

(K) Voids. Sparse rounded voids, some elongated ovals in outline and others more spherical. These voids sometimes contain a lining of clay, similar in colour and texture to the groundmass.

The groundmass consists of partially isotropic, partially anisotropic baked clay minerals, moderate angular quartz, up to 0.05mm across and sparse muscovite laths, up to 0.05mm long.

The following inclusions were present in the sandy clay:

(L) Quartz. Abundant rounded grains, with several having a high sphericity, up to 0.5mm across.

(M) Chert. Moderate rounded grains, varying in texture and colour but all coarser than flint. Some have a high sphericity.

(N) Flint. Sparse subangular fragments up to 0.5mm across.

(O) Sandstone. Sparse rounded fine-grained sandstone fragments up to 0.5mm across with grains up to 0.2mm across and a colourless or brown-stained silicious matrix.

The clay groundmass between the quartzose inclusions is similar in colour and texture to that of the fired blue-grey clay.

Interpretation of clay sample petrology

It is likely that the blue-grey clay is, ultimately, of Jurassic origin, based on the low silt content. It may be that it had been redeposited by glacial action but there is no evidence to support this in the sample itself. The voids present in thin section can be equated with the decayed organic matter in the unfired clay and are probably rootlets rather than organic matter present in the clay from the Jurassic period, although Jurassic clays do often have a high organic content. The quartzose sand contains grains derived from Triassic sands and the Upper Cretaceous chalk and is presumably a Quaternary cover sand. Such sands occur widely in the east Midlands, and all contain mostly Triassic material.

Discussion

Ignoring those inclusions which may have been deliberately added as tempering, the fabrics can be grouped into three:

1. Fabric B. Non-calcareous, few inclusions visible to the naked eye. Quartz and muscovite silt present in the groundmass.
2. Fabrics A, AA, A2, DR, DR2 and F. Calcareous body in which the calcareous matter is probably formed from microfossils, with abundant ostracod? or thin-walled bivalve shell sand. In some cases the shell has been altered, either before or after burial. The groundmass also contains variable amounts of dark brown/opaque iron, either of bacterial or faecal origin. Such matter is a distinctive feature of some Jurassic clays but cannot be tied down to a specific strata or period within the Jurassic.
3. Fabrics E, DW and G. Calcareous body with no fossils visible. In this case the calcareous matter in the groundmass is much more abundant and finer-textured. Similar clays were used to make Cambridgeshire yellow bricks in the 19th century (for example, a sample from Cambridge collected by David Hall and thin-sectioned by the author). Similar clay was also collected by David Hall from a clay pit at Ely, apparently exploiting Kimmeridge Clay.
4. It is likely that groups 2 and 3 were both produced from Jurassic clays, either the Oxford Clay or the Kimmeridge clay. It is likely that the most common group, Group 2, was actually produced at Ramsey, since it includes the decorated floor tile sample thought on other grounds to be made at Ramsey. Group 3 is perhaps more likely to have been imported to Ramsey from south Cambridgeshire, but a more local source cannot be discounted without sampling of the local clay sources.

The group 1 clay contains no distinctive features to indicate its likely origin and it may well not be locally produced.

The deliberately added inclusions consist of several different quartzose sands, distinguished both by their size ranges and the accessory minerals present. Two main groups are present, however: a rounded quartz sand, varying in grain size, and included well-rounded, almost spherical quartz grains, fine-grained sandstones and rounded chert. These characteristics indicate a Permo-Triassic origin for the sand but sands of this type are so widespread throughout the east Midlands and East Anglia that they are of no use in characterisation in this case. This sand occurs in Fabrics B and E. The second main group consists of the fine angular quartz sand noted in Fabrics A, A2, DR, D2 and F. This may be naturally present in the Group A clay or may be added through contamination by the moulding sand.

The sand in Fabric DR2 includes rounded fragments of micrite, almost certainly chalk. These do not survive long in river sands and if these fragments were of riverine origin then they would indicate a source close to the chalk outcrop. However, chalky boulder clay also contains rounded chalk fragments and this is probably the immediate source of the Fabric DR2 micrite. Angular flint is also normally indicative of an origin close to the chalk, since detrital flint is brittle and is quite quickly rounded in detrital sands. The only fabric to contain flint is Fabric E but here the fragments have undergone some rounding (but not a large amount). Flint too occurs in Chalky boulder clay although in the case of Fabric E no micrite or rounded voids which might once have contained it were noted in either section.

Water-polished, well-rounded quartz grains are diagnostic of the Lower Cretaceous but these occur widely as detrital grains and are not a good indicator of source (except that they do not occur in sands from rivers whose catchment occurs only Jurassic and earlier strata). They occur widely in the fens as a result of fluvio-glacial transport from their outcrop on the west side of the Lincolnshire Wolds. Such grains are easier to identify in the hand specimen than in thin section and were noted in Fabrics A, AA, DR2 and E. This is consistent with the suggested origins of these fabrics.

The shell fragments visible to the naked eye are mostly nacreous bivalve shell, almost certainly naturally present in the clay (since it would serve no purpose to add them in such sparse quantities). They support the Jurassic origin of the parent clays in the fabrics in which they occur (Fabrics A, AA, A2, DR, E and F).It should be noted that these macroscopic shell inclusions occur in both Group 2 and 3 fabrics.

It would be possible to pursue the source of these Ramsey tile fabrics in two ways: firstly, to obtain samples of clays in the Ramsey area and to make briquettes, fire them and make thin sections of the fired briquettes and, secondly, to obtain chemical analyses of the Ramsey fabric samples, using Inductively Coupled Plasma Spectroscopy. This would provide a means to test the suggested fabric groups postulated here and would allow the Ramsey tiles to be compared with the Ely and Cambridge samples mentioned above.

Comparison of petrology of clay sample and CBM

Of these, Group 1, which was used only in the Roman period, is the most similar but contains more silt in the groundmass that the Ramsey clay. However, the quartz sand found sparsely in this fabric is similar to that in the clay sample, and black-stained clay pellets are present, as in the Ramsey clay. Groups 2 and 3 are clearly different from the clay sample in that they contain either bioclastic inclusions (Group 2) or authigenic calcareous inclusions (Group 3).

Table A1

TSNO	Context	REFNO	Action	class	Cname	Subfabric	Form	Part	Description
V2839	1244		TS	POTTERY	RTIL?	FABRIC B	BRICK / TEG	BS	
V2840	1000		TS	POTTERY	MTIL	FABRIC DR2	FLAT	BS	
V2841	1005		TS	POTTERY	MTIL	FABRIC DW	FLAT	BS	ROUND PEG HOLE
V2842	1000		TS	POTTERY	MTIL	FABRIC F	FLAT	BS	
V2843	1304		TS	POTTERY	MTIL	FABRIC E	FLAT	BS	ROUND PEG HOLE
V2844	1331		TS	POTTERY	MTIL	FABRIC AA	FLAT	BS	
V2845	1288		TS	POTTERY	MTIL	FABRIC A	FLAT	BS	
V2846	1323		TS	POTTERY	MTIL	FABRIC E	FLAT	BS	PARTIAL PLAIN GL
V2847	1331		TS	POTTERY	MTIL	FABRIC A2	FLAT	BS	
V2848	1299		TS	POTTERY	RTIL?	FABRIC B	BRICK	BS	

TSNO	Context	REFNO	Action	class	Cname	Subfabric	Form	Part	Description
V2849	1356	SF49	TS	POTTERY	MTIL	FABRIC DR	FLOOR	BS	RELIEF DECORATED
V2850	1005		TS	POTTERY	MTIL	FABRIC G	FLAT	BS	SQUARE PEG HOLE

Appendix 3: Context Summary

1998 excavation

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1000	0	layer				0.3	dk.yellowish brown	silty clay		0
1002	0	buried soil				0.2				0
1004	1003	wall							5	
1005	1003	wall							5	
1008	0	layer							5	
1009	0	layer		3.55		0.2	v.dk.greyish brown	sandy silt		0
1010	0	layer		2.5		0.14	dark olive brown	clayey silt		0
1011	0	layer		2.5		0.16	v.dk.greyish brown	clayey silt		0
1012	0	buried soil		10		0.2	v.dk.greyish brown	sandy silt		0
1013	0	destruction layer		2.5		0.1	dk.greyish brown	clayey silt		0
1014	1020	Ditch		2.2		0.2	dk.greyish brown	sandy silt		0
1015	1020	Ditch		1.7		0.3	dk.greyish brown	sandy silt		0
1016	1020	Ditch		2.4		0.13	dk.greyish brown	sandy silt		0
1017	1020	Ditch		0.7		0.5	dk.greyish brown	sandy silt		0
1018	1020	Ditch		1.6		0.18	greyish brown	sandy silt		0
1019	1020	Ditch		1.2		0.12	greyish brown	sandy silt		
1020	1020	Ditch	Wide U							0
1021	0	buried soil				0.2	lt.olive brown	clayey silt		0
1022	1023	Pit		1.8		0.22	light olive brown	clayey silt		0
1023	1023	Pit	flat based V							0
1024	0	Natural					yellow	clayey silt		0
1025	1027	Ditch			0.37	0.25	olive brown	clayey silt		0

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1026	1027	Ditch			0.32	0.17	light olive brown	clayey silt		0
1027	1027	Ditch	U-shaped		0.37	0.42				0
1028	0	layer		1.2		0.15	light olive brown	clayey silt		0
1029	1029	Ditch								0
1030	0	destruction layer			4.5	0.27	brown	clay	5	
1031	1031	Ditch								0
1032	1077	Slot		1	0.65	0.13	dk.greyish brown	silty clay	2	2.2
1033	1078	Slot		2	0.5	0.15	dk.greyish brown	silty clay	3	3.4
1034	0	layer				0.16	dk.yellowish brown	silty clay	5	
1035	0	layer				0.18	dk.greyish brown	silty sand	5	
1037	1038	Ditch		8	0.6	0.11	lt.olive brown	clayey silt	3	3.3
1038	1038	Ditch	U-shaped	8	0.6	0.33			3	3.3
1039	1038	Ditch		8	0.6	0.22	olive yellow	clayey silt	3	3.3
1040	1062	Ditch		2.7	0.55	0.2	olive grey	clayey silt	2	2.3
1041	0	destruction layer					dk.greyish brown	coarse sand	5	
1042	0	Gully					light olive brown	clay	5	
1043	1049	Slot		1	0.7	0.1	dk.grey	silty clay	2	2.2
1044	1050	Slot		1	0.4	0.1	dk.grey	silty clay	2	2.2
1045	1052	Slot		1	0.55	0.15	v.dk.greyish brown	silty clay	2	2.2
1046	1051	Slot		1	0.6	0.15	lt.olive brown	silty clay	2	2.2
1047	1053	Slot		1	0.3	0.15	v.dk.greyish brown	silty clay	?	?2.2
1048	1054	Slot		1	0.4	0.15	dk.grey	silty clay	?	?2.2
1049	1049	Slot	flat based U	1	0.7				2	2.2
1050	1050	Slot	flat based U	1	0.35	0.12			2	2.2
1051	1051	Slot	flat based U	1	1.3	0.1			2	2.2
1052	1052	Slot	U-shaped	1	0.55				2	2.2
1053	1053	Slot	U-shaped	1	0.3				?2	2.2
1054	1054	Slot	U-shaped	1	0.4				2	2.2
1055	1063	Gully			0.4	0.13	light olive brown	clayey silt	2	2.3
1056	1057	Post hole		0.72	0.67	0.25	dk.greyish brown	silty clay	1	1.1

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1057	1057	Post hole	Wide U	0.54	0.42	0.17			1	1.1
1058	1059	Post hole			0.27	0.12	brown/dk.brown	sandy silt	1	1.1
1059	1059	Post hole	vert side/flat base		0.27	0.12			1	1.1
1060	1061	Pit		1	0.53	0.53	dk.greyish brown	silty clay	5	
1061	1061	Pit	vert side/flat base	1	0.53	0.53			5	
1062	1062	Slot	complex	9	0.65	0.25			2	2.3
1063	1063	Gully	Wide U	3	0.57	0.15			2	2.3
1064	1064	Gully	flat based U		0.56	0.29			3	3.4
1065	1064	Gully			0.56	0.29	v.dk.grey	silty clay	3	3.4
1066	0	destruction layer				0.1	v.pale brown	silty clay	5	
1067	1062	Gully		0.9	0.6	0.6	light olive brown	clayey silt	2	2.3
1068	0	layer			0.22	0.9	olive yellow	clayey silt		0
1071	1072	Slot			0.5	0.18	v.dk.greyish brown	silty clay	2	2.2
1072	1072	Slot	U-shaped		0.5	0.18			2	2.2
1073	1074	Ditch			0.5	0.13	dk.yellowish brown	silty clay	3	3.4
1074	1074	Ditch	U-shaped		0.5	0.13			3	3.4
1075	1076	Ditch			0.5	0.06	dk.yellowish brown	silty clay	3	3.4
1076	1076	Slot	U-shaped		0.5	0.06			3	3.4
1077	1077	Slot	Wide U	1	0.65	0.13			2	2.2
1078	1078	Slot	U-shaped	2	0.5	0.15			3	3.4
1079	1079		Wide U	9	0.65	0.25			2	2.3
1080	0	layer		1.75	1.1	0.13	olive brown	sandy clay	2	2
1081	1096	Lode		7	1.6	0.17	lt.olive brown	clayey silt	4	4.1
1082	1082	Slot	U-shaped		0.18	0.22			3	3.4
1083	1082	Slot			0.18	0.21	olive brown	silty clay	3	3.4
1084	1084	Slot	U-shaped		0.42	0.23			2	2.2
1085	1084	Slot			0.42	0.23	v.dk.greyish brown	silty clay	2	2.2
1086	1096	Lode		0.88	1.4	0.19	dk.greyish brown	clayey silt	4	4.1
1087	1096	Lode		0.92	1.6	0.25	olive grey	clayey silt	4	4.1
1088	1089	Pit		0.61	0.67	0.26	dk.greyish brown	silty clay	?	?

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1089	1089	Pit	U-shaped	0.64	0.67	0.26			?	?
1090	1091	Slot		1	0.75	0.15	dk.grey	silty clay	2	2.2
1091	1091	Slot	Wide U	1	0.75	0.15			2	2.2
1092	1093	Pit			0.75	0.07	greyish brown	silty clay	2	2.2
1093	1093	Pit	flat based U		0.75	0.07			2	2.2
1095	1095	destruction layer				0.1	very dark grey	silty clay	5	
1096	1096	Lode	complex						4	4.1
1097	1098	Post hole		0.47	0.17	0.1	lt.olive brown	sandy clay	1	1.1
1098	1098	Post hole	flat based U	0.47	0.17	0.1			1	1.1
1099	1099	layer								0
1100	1100	layer								0
1101	1101	layer								0
1102	1117	Pit		1.3	1	0.3	v.dk.greyish brown	silty clay	3	3.6
1103	1103	Natural		1.31	0.97	0.38	v.dk.grey	silty clay	5	
1104	1104	Gully	Wide U		0.5	0.13			?	?2.2
1105	1104	Gully			0.5	0.13	olive brown	silty clay	?	?2.2
1106	1106	Post hole	flat based U		0.21	0.13			2	2.2
1107	1106	Post hole			0.21	0.13	dk.brown	silty clay	2	2.2
1108	1108	Gully	Wide U		0.25	0.13			2	2.2
1109	1108	Gully				0.13	olive brown	silty clay	2	2.2
1110	1111	Ditch		1	0.53		dk.yellowish brown	clayey silt	?	-
1111	1111	Ditch	complex	1	0.53				?	-
1112	1096	Lode		0.92	1.3	0.3	light olive brown	clayey silt	4	4.1
1113	1096	Lode		0.92	1.15	0.15	olive brown	clayey silt	4	4.1
1114	1114	Gully	U-shaped	1.15	0.7	0.4			4	4.1
1115	1115	Ditch	Wide U			0.12			2	2.2
1116	1115	Ditch				0.12	lt.olive brown	silty clay	2	2.2
1117	1117	Pit	Wide U	1.3	1	0.3			3	3.6
1118	1118	Natural								0
1118	1118	Natural								0

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1119	1120	Post hole		0.94	0.86	0.15	dk.greyish brown	silty clay	1	1.1
1120	1120	Post Hole		0.94	0.86	0.15			1	1.1
1121	1122	Slot		3.6	0.6	0.1	dk.grey	silty clay	1	1.2
1122	1122	Slot	Wide U	3.6	0.6	0.1			1	1.2
1123	1124	Post hole		0.4	0.26	0.85	olive brown	silty clay	1	1.1
1124	1124	Post hole		0.42	0.24	0.85			1	1.1
1125	1126	Post pipe		0.28	0.26	0.2	olive brown	silty clay	1	1.1
1126	1126	Post hole	U-shaped	0.28	0.26	0.2			1	1.1
1127	1128	Post hole		0.32	0.3	0.9	olive brown	silty clay	1	1.1
1128	1128	Post hole	U-shaped	0.32	0.3	0.9			1	1.1
1129	1130	Post hole		0.28	0.28	0.5	dk.greyish brown	silty clay	1	1.1
1130	1130	Post hole	Wide U	0.28	0.28	0.5			1	1.1
1131	1131	Ditch	round based V		0.6	0.15			2	2.2
1132	1051	Post hole			0.35	0.12	lt.olive brown	silty clay	2	2.2
1133	1133	layer		6	2	0.1	greyish brown	silty clay	5	
1134	1134	Ditch	Wide U		0.46	0.3			2	2.2
1135	1134	Ditch			0.46	0.3	lt.olive brown	silty clay	2	2.2
1136	1136	Slot	Wide U			0.1			3	3.4
1137	1136	Slot			0.24	0.1	olive brown	silty clay	3	3.4
1138	1139	Pit		0.8	0.84	0.28	dk.greyish brown	silty clay	3	3.6
1139	1139	Pit	flat based U	0.84	0.8	0.28			3	3.6
1140	1141	Post hole		0.71	0.65	0.14	dk.grey	silty clay	1	1.2
1141	1140	Post hole	U-shaped	0.71	0.65	0.14			1	1.2
1142	1143	Post hole		0.3	0.35	0.15	yellowish brown	silty clay	1	1.2
1143	1143	Post hole	U-shaped	0.3	0.35	0.15			1	1.2
1144	1145	Post hole		0.65	0.6	0.14	dk.grey	silty clay	1	1.2
1145	1145	Post hole	Wide U	0.65	0.6	0.14			1	1.2
1146	1164	Post hole		0.43	0.43	0.2	dk.greyish brown	clayey silt	3	3.6
1147	1163	Pit		0.72	0.3	0.13	lt.olive brown	sandy silt	3	3.6
1148	1163	Pit		0.26	0.2	0.22	lt.olive brown	clayey silt	3	3.6

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1149	1195	Ditch				0.16	dk.greyish brown	silty clay	2	2.1
1150	1150	Ditch	Wide U		0.38	0.1			2	2.2
1151	1150	Ditch			0.38	0.1	v.dk.greyish brown	silty clay	2	2.2
1152	1124	Post hole		0.22	0.26	0.5	lt.olive brown	silty clay	1	1.1
1153	1126	Post hole		0.28	0.26	0.2	olive yellow	silty clay	1	1.1
1154	1128	Post hole		0.32	0.3	0.9	olive yellow	silty clay	1	1.1
1155	1156	Pit			1.06	0.25	dk.yellowish brown	silty clay	3	3.4
1156	1156	Pit	flat based U	1.06		0.25			3	3.4
1157	1159	Post pipe			0.26	0.25	v.dk.brown	silty clay	3	3.4
1158	1159	Post hole			0.3	0.45	dk.yellowish brown	silty clay	3	3.4
1159	1159	Post hole	flat based U		0.3	0.23			3	3.4
1160	1163	Pit		0.25	0.25	0.12	dk.olive grey	clayey silt	3	3.6
1161	1161	layer		0.35	0.19	0.13	v.dk.greyish brown	sandy silt	3	3.6
1162	1162	layer				0.18	olive yellow	clayey silt	3	3.6
1163	1163	Pit	flat based U	1	0.9	0.3			3	3.6
1164	1164	Post hole	round based V	0.45	0.45	0.22			3	3.6
1165	1166	Pit				0.14	dk.greyish brown	silty clay	1	1.2
1166	1166	Pit	Wide U	1.2	1.25	0.34			1	1.2
1167	1169	drain			0.4	0.3			5	5.2
1168	1169	drain				0.2	greyish brown	silty clay	5	5.2
1169	1169	drain	vert side/flat base	5	0.7	0.35			5	5.2
1170	1170	layer					light olive brown	silty clay	4	4.2
1171	1172/1272	Ditch				0.35	Dark grey	silty clay	4	4.4
1172	1172	Ditch	flat based U		1.3	0.4			4	4.4
1173	1173	layer				0.28	greyish brown	silty clay	4	4.4
1174	1175	Post hole		0.58	0.5	0.25	olive brown	clayey silt	1	1.1
1175	1175	Post hole	vert side/flat base	0.58	0.5	0.25			1	1.1
1176	1176	Post hole	flat based U		0.45	0.13			3	3.4
1177	1176	Post hole			0.4	0.8	yellowish brown	silty clay	3	3.4
1178	1176	Post hole			0.41	0.13	dk.yellowish brown	silty clay	3	3.4

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1179	1179	Post hole	flat based V		0.44	0.06			1	1.3
1180	1179	Post hole			0.44	0.06	olive brown	silty clay	1	1.3
1181	1182	Slot		4.5	0.7	0.1	olive brown	clayey silt	1	1.1
1182	1182	Slot	Wide U	4.5	0.7	0.1			1	1.1
1183	1183	Post hole	U-shaped		0.65	0.11			1	1.1
1184	1184	Post hole			0.65	0.11	yellowish brown	silty clay	1	1.1
1185	1186	Post hole			0.55	0.24	dk.greyish brown	silty clay	1	1.1
1186	1186	Post hole	round based V		0.55	0.25			1	1.1
1187	1188	Post hole		0.9	0.32	0.1	lt.olive brown	clayey silt	1	1.1
1188	1188	Post hole	Wide U	0.9	0.32	0.1			1	1.1
1189	1189	Ditch	flat based U		0.54	0.25			3	3.4
1190	1189	Ditch			0.54	0.25	dk.yellowish brown	silty clay	3	3.4
1191	1191	Slot	flat based U		0.4	0.1			3	3.4
1192	1191	Ditch			0.4	0.1	dark brown	silty clay	3	3.4
1193	1194	Gully		0.76	0.33	0.07	lt.olive brown	clayey silt	1	1.1
1194	1194	Gully	round based V	0.76	0.33	0.07			1	1.1
1195	1195	Ditch	Wide U	10	2.2	0.55			2	2.1
1196	1195	Ditch				0.39	lt.olive brown	silty clay	2	2.1
1197	1195	Ditch				0.14	dk.greyish brown	silty clay	2	2.1
1198	1199	Post hole				0.28	dk.grey	clay	1	1.2
1199	1199	Post hole	U-shaped	0.43	0.4	0.3			1	1.2
1200	1201	Slot				0.07	olive brown	silty clay	1	1.2
1201	1201	Slot	complex		0.85	0.07			1	1.2
1202	1203	Slot		3.06	0.42	0.12	lt.olive brown	silty clay	1	1.1
1203	1203	Post holes	complex	3.06	0.42	0.13			1	1.1
1204	1205	Post hole		0.22	0.2	0.09	olive brown	silty clay	1	1.1
1205	1205	Post hole	U-shaped	0.22	0.2	0.09			1	1.1
1206	1208	Post hole		0.44	0.44	0.18	olive brown	silty clay	1	1.1
1207	1208	Post hole		0.44	0.44	0.11	lt.olive brown	silty clay	1	1.1
1208	1208	Post hole	flat based U	0.44	0.44	0.18			1	1.1

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1209	1210	Slot					lt.olive brown	silty clay	1	1.1
1210	1210	Slot	U-shaped						1	1.1
1211	1211	Lode	flat based U	20	8	1			4	4.1
1212	1211	Lode		20	3.5	0.4	greyish brown	clayey silt	4	4.1
1213	1213	Ditch	V-shaped	5	2.1	0.8			5	5.2
1214	1213	Ditch		5	0.6	0.2	black	peat	5	5.2
1215	1213	Ditch		5	2.1	0.36	dk.greyish brown	clayey silt	5	5.2
1216	1341	destruction layer			2.4	0.37	lt.grey	silty clay	5	
1218	1220	Ditch			1.05	0.33	dk.yellowish brown	silty clay	3	3.1
1219	1220	Ditch			0.61	0.12	lt. yellow brown	silty clay	3	3.1
1220	1220	Ditch	flat based U	5	1.06	0.44			3	3.1
1221	1222	Slot		1.53	0.4	0.16	lt.olive brown	silty clay	1	1.3
1222	1222	Slot	round based V	1.53	0.4	0.16			1	1.3
1223	1224	Post hole		0.46	0.24	0.6	olive brown	clayey silt	1	1.1
1224	1224	Post hole	Wide U	0.46	0.24	0.6			1	1.1
1225	1166	Pit				0.2			1	1.2
1226	1166	Pit				0.2	lt.olive brown	silty clay	1	1.2
1227	1228	Post hole		0.49	0.32	0.07		silty clay	1	1.1
1228	1228	Post hole	Wide U	0.49	0.32	0.07			1	1.1
1229	1230	Post hole		1	0.9	0.09	olive brown	clayey silt	1	1.1
1230	1230	Post hole	complex	1	0.9	0.09			1	1.1
1231	1232	Post hole		0.44	0.4	0.06	olive brown	clayey silt	1	1.1
1232	1232	Post hole	flat based U	0.44	0.4	0.06			1	1.1
1233	1234	Post hole		0.5	0.42	0.06	lt.olive brown	clayey silt	1	1.1
1234	1234	Post hole	U-shaped	0.5	0.42	0.06			1	1.1
1235	1235	Ditch	flat based U		1.4	0.37			3	3.1
1236	1235	Ditch			0.6	0.27	light olive brown	silty clay	3	3.1
1237	1235	Ditch			1.4	0.21	dk.yellowish brown	silty clay	3	3.1
1238	1238	Slot	U-shaped		0.37	0.11			3	3.6
1239	1238	Slot			0.37	0.11	olive brown	silty clay	3	3.6

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1240	1240	Slot	flat based U		0.3	0.08			3	3.5
1241	1240	Slot			0.3	0.08	olive brown	silty clay	3	3.5
1242	1242	?Ditch/Pit	round based V	10	0.6	0.25				?2
1242	1242	?Ditch/Pit	round based V	10	0.6	0.25				?2
1243	1242	?Ditch/Pit			0.35	0.05	brown	silty clay		?2
1244	1242	?Ditch/Pit			0.6	0.19	lt.olive brown	silty clay		?2
1245	1245	layer				0.4	olive brown	silty clay	3	3.2
1246	1247	construction		1.45	0.16	0.07	lt.olive brown	clayey silt	1	1.1
1247	1247	Gully	Wide U	0.83	0.28	0.07			1	1.1
1248	1248	Pit	complex	0.89	0.2	0.08			1	1.1
1249	1250	stakehole					lt.olive brown	clayey silt	1	1.1
1250	1250	stakehole	U-shaped	0.22	0.09	0.1			1	1.1
1251	1251	layer		8	14	0.16	olive brown	clayey silt	1	1.1
1252	1253	Post hole		0.38	0.27	0.05	olive brown	clayey silt	1	1.1
1253	1253	Post hole	Wide U	0.38	0.27	0.05			1	1.1
1254	1255	Post hole		0.64	0.36	0.05	lt.olive brown	clayey silt	1	1.1
1255	1255	Post hole		0.64	0.36	0.05			1	1.1
1256	1257	Ditch		4	1.46	0.3	dk.yellowish brown	silty clay	3	3.1
1257	1257	Ditch	flat based V	4	1.46	0.3			3	3.1
1258	1258	layer							5	
1259	1260	stakehole		0.15	0.1	0.06	lt.olive brown	clayey silt	1	1.1
1260	1260	stakehole	round based V	0.15	0.1	0.06			1	1.1
1261	1261	?Pit/Post hole	Wide U		0.35	0.07			3	3.5
1262	1261	?Pit/Post hole			0.25	0.07	v.dk.grey	silty clay	3	3.5
1263	1263	Slot	U-shaped		0.39	0.2			2	2.2
1264	1263	Ditch			0.39	0.2	dk.grey	silty clay	2	2.2
1265	1265	Slot	round based V			0.09			2	2.2
1266	1265	Ditch				0.09	olive brown	silty clay	2	2.2
1267	1261	Pit			0.5	0.6	olive brown	silty clay	3	3.6
1268	1269	Post hole				0.11	dk.greyish brown	clay	1	1.2

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1269	1269	Post hole	flat based U		0.35	0.1			1	1.2
1270	1271	Slot			0.81	0.1	lt.olive brown	clayey silt	1	1.2
1271	1271	Slot	Wide U	1.03	0.81	0.1			1	1.2
1272	1250	layer		10	10	0.11	olive	silty clay	4	4.6
1273	1273	layer		3	1	0.02	olive	silty clay	2	2.1
1274	1275	Post hole			0.4	0.09	brown grey	silty clay	1	1.3
1275	1275	Post hole	Wide U		0.4	0.09			1	1.3
1276	1276	Slot	flat based U	3	0.3	0.15			3	3.5
1277	1276	Slot			0.3	0.15		silty clay	3	3.5
1278	1278	Ditch	U-shaped	10	0.47	0.38			3	3.5
1279	1278	Ditch			0.47	0.38		silty clay	3	3.5
1280	1280	Ditch	Wide U	17	1.3	0.4			3	3.1
1281	1281	Post hole	flat based U		0.2	0.07			1	1.3
1282	1281	Post hole			0.2	0.07		silty clay	1	1.3
1283	1283	Post hole	round based V		0.8	0.07			1	1.3
1284	1283	Post hole					yellowish brown	silty clay	1	1.3
1285	1285	Post hole	Wide U		0.4	0.1			1	1.3
1286	1285	Post hole			0.4	0.1	dk.yellowish brown	silty clay	1	1.3
1287	1287	Post hole	flat based U		0.5	0.07			1	1.3
1288	1287	Post hole				0.07	lt.olive brown	silty clay	1	1.3
1289	1289	Post hole	Wide U		0.5	0.07			1	1.3
1290	1289	Post hole			0.5	0.05	yellowish brown	silty clay	1	1.3
1291	1292	Ditch		20	0.66	0.28	olive brown	clayey silt	3	3.1
1292	1292	Ditch	Wide U		0.65	0.28			3	3.1
1293	1293	destruction layer		3	1.75	0.03	lt.yellowish brown	silty clay	5	
1294	1294	layer		3	5	0.26	lt.olive brown	silty clay	5	
1295	1295	layer		2	2	0.21	olive brown	silty clay		0
1296	1296	layer		2		0.06	dk.greyish brown	silty clay		0
1297	1297	layer		1.4	2.5	0.15	dk.greyish brown	silty clay	2	2.1
1298	1298	Ditch	Wide U		1.4	0.25			5	5.2

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1299	1298	Ditch			1.7	0.25	dark grey	silty clay	5	5.2
1300	1300	Lode	flat based V	20	6.7	0.75			4	4.1
1301	1300	Lode			3.04	0.25	green grey	silty clay	4	4.1
1302	1300	Lode			1	0.1	greyish brown	silty clay	4	4.1
1303	1300	Lode			5.6	0.15			4	4.1
1304	1300	Lode			5.6	0.2	grey	silty clay	4	4.1
1305	1300	Lode			3	0.2	light olive brown	silty clay	4	4.1
1306	1307	Slot		1.5	0.53	0.14	olive brown	silty clay	4	4.5
1307	1307	Slot	Wide U	1.5	0.53	0.14			4	4.5
1308	1354	Pit		6.4	7.4	0.3	dark grey brown	silty clay	2	2.1
1309	1310	Pit					light olive brown	silty clay	2	2.1
1310	1310	Pit		6.4	7.4	0.35			2	2.1
1311	1312	Ditch		10	0.07		light olive brown	silty clay	3	3.2
1312	1312	Ditch	round based V	10	4.6	1.87			3	3.2
1313	1314	Gully		1.2	0.3	0.1	olive brown	silty clay	4	4.5
1314	1314	Slot	U-shaped	1.2	0.3	0.1			4	4.5
1315	1316	Ditch			1.8	0.4	olive brown	silty clay	5	5.3
1316	1316	Ditch	flat based V		1.8	0.4			5	5.3
1317	1318	Ditch		5	1.04	0.43	olive brown	silty clay	4	4.3
1318	1318	Ditch	flat based V	5	1.04	0.43			4	4.3
1319	1319	Ditch	round based V		0.4	0.25			2	2.2
1320	1319	Ditch			0.4	0.14	olive brown	sandy clay	?2	
1321	1319	Ditch				0.11	olive brown	silty clay	?2	
1322	1322	Ditch	complex		0.7	0.27			3	3.5
1323	1322	Ditch			0.7	0.27	v.dk.greyish brown	silty clay	3	3.5
1324	1324	Ditch	flat based U		0.63	0.2			3	3.5
1325	1324	Ditch			0.63	0.2	v.dk.greyish brown	silty clay	3	3.5
1328	1354	Pit		1	2.08	0.2	light yellowish brown	silty clay	2	2.1
1329	1329	Ditch	U-shaped		0.36	0.13			?	?
1330	1329	Ditch			0.36	0.13	dk.brown	silty clay	?	?

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1331	1312	Ditch			3.35		grey	silty clay	3	3.2
1332	1333	Post hole		0.8	0.6	0.1	olive brown	clayey silt	1	1.3
1333	1333	Post hole	Wide U	0.8	0.6	0.1			1	1.3
1334	1335	Post hole		0.8	0.4	0.05	olive brown	clayey silt	1	1.3
1335	1335	Post hole	Wide U	0.8	0.4	0.05			1	1.3
1336	1337	Structure					v. dk. greyish brown	silty clay	4	4.5
1337	1337	Structure	Wide U						4	4.5
1338	1339	Structure					olive brown	silty clay	5	5.2
1339	1339	Structure							5	5.2
1341	1341	Pit	Wide U		2.4	0.37			5	
1342	1341	layer		15	6	0.25	brown	clayey silt	5	
1343	1211	Lode		20	8	0.43	yellowish brown	clayey silt	4	4.1
1344	1211	Lode							4	4.1
1345	1346	Ditch			1.1	0.19	pale brown	silty clay	4	4.1
1347	1348	Gully			0.2	0.1		silty clay	2	2.3
1348	1348	Gully	Wide U		0.2	0.1			2	2.3
1349	1211	Lode					dk.greyish brown	clayey silt	4	4.1
1350	1350	Ditch	U-shaped		0.75	0.62			1	1.4
1351	1354	Pit			1.2	0.11	olive brown	clayey silt	2	2.1
1352	1354	Pit			1.3	0.09	yellow	silty clay	2	2.1
1353	1354	Pit			1.88	0.2	lt.yellowish brown	silty clay	2	2.1
1354	1354	Pit			1.65	0.53			2	2.1
1355	1310	Pit		1	1.28	0.25	light olive brown	silty clay	2	2.1
1356	1357	Structure							5	5.1
1357	1357	Structure							5	5.1
1358	1358	Floor layer							4	4.2
1359	1359	Ditch	U-shaped		0.42	0.13			3	3.4
1360	1359	Ditch			0.42	0.13		silty clay	3	3.4
1361	1361	Ditch	U-shaped		0.38	0.1			3	3.3
1362	1361	Ditch			0.38	0.1		silty clay	3	3.3

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1363	1363	Ditch	flat based U						3	3.3
1364	1363	Ditch			0.48	0.11		silty clay	3	3.3
1365	1312	Ditch		10	4.15	0.35	olive	silty clay	3	3.2
1366	1312	Ditch					olive	silty clay	3	3.2
1367	1312	Ditch			2.98	0.2	dk.grey	silty clay	3	3.2
1368	1350	Ditch			0.74	0.53	olive	silty clay	1	1.4
1369	1350	Ditch			0.58	0.08	olive grey	silty clay	1	1.4
1370	1371	Ditch			0.61	0.22	olive	silty clay	3	3.2
1371	1371	Ditch	complex		0.62	0.3			3	3.2
1372	1371	Ditch			0.47	0.08	grey	silty clay	3	3.2
1373	1373	Post hole	U-shaped	0.3	0.21				3	3.4
1374	1373	Post hole		0.3	0.21	0.08		silty clay	3	3.4
1375	1375	Ditch			0.19				3	3.3
1376	1375	Ditch							3	3.3
1377	1377	Ditch			0.13				3	3.3
1378	1377	Ditch			0.13				3	3.3
1379	1379	Post hole							4	4.2
1380	1379	Post hole							4	4.2
1381	1381	Ditch							5	5.3
1382	1381	Ditch							5	5.3
1383	1383	Slot							5	
1384	1383	Ditch							5	
1385	1385	destruction layer				0.4			5	
1386	1386	Structure							5	5.3
1387	1387	foundation	U-shaped		0.36	0.05			?	?
1388	1387	foundation			0.3	0.05	dk.greyish brown	silty clay	?	?
1389	1389	Post hole							?	?
1390	1389	Post hole							?	?
1391	1391	Pit							?	?
1392	1391	Pit							?	?

Context	Cut Number	Feature Type	profile	length	width	depth	colour	fine component	Group	subgroup
1393	1393	Pit							3	3.6
1394	1393	Pit							3	3.6
1395	1396	Pit							5	5.2
1396	1396	Pit							5	5.2
1400	1400	natural feature								0

2002 excavation

Context	Cut	Category	Type	Function	Sub-group	Phase
1500	1500	Cut	Pit		4.3	4
1501	1501	Cut	Ditch			4
1502	1502	Cut	Ditch	Drainage?	4.3	4
1503	-	Layer		Colluvium?		
1504	1506	Fill	Pit		4.3	4
1505	1506	Fill	Pit		4.3	4
1506	1506	Cut	Pit		4.3	4
1507	1509	Fill	Pit		4.3	4
1508	1509	Fill	Pit		4.3	4
1509	1509	Cut	Pit		4.3	4
1510	1511	Cut	Pit		4.3	4
1511	1511	Cut	Pit		4.3	4
1512	1513	Fill	Pit		4.3	4
1513	1513	Cut	Pit		4.3	4
1514	1506+	layer	Pit+		4.3	4
1515	1506	Fill	Pit		4.3	4
1516	-	Layer	Subsoil?			5
1517	-	Layer	Subsoil?			5
1518	1501	Fill	Ditch			4
1519	1500	Fill	Pit		4.3	4
1520	1502	Fill	Ditch	Drainage?	4.3	4
1521	1502	Fill	Ditch	Drainage?	4.3	4
1522	1502	Fill	Ditch	Drainage?	4.3	4
1523	1502	Fill	Ditch	Drainage?	4.3	4
1524	1509	Fill	Pit		4.3	4
1525	1526	Fill	Ditch		4.4	4
1526	1526	Cut	Ditch		4.4	4
1527	-	Layer				5

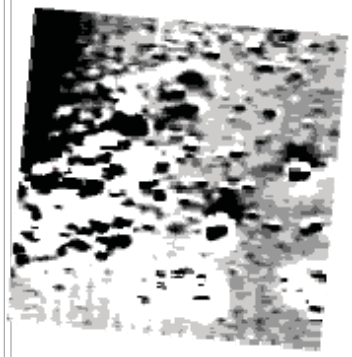
1528	1547	Fill	Pit	Tank?	4.4	4
1529	-	Layer				5
1530	-	Layer				5
1533	1534	Fill	Pit		4.3	4
1534	1534	Cut	Pit		4.3	4
1535	1536	Fill	Pit		4.3	4
1536	1536	Cut	Pit		4.3	4
1537	1538	Fill	Pit		4.3	4
1538	1538	Cut	Pit		4.3	4
1539	1511	Fill	Pit		4.3	4
1540	-	Layer		Over 4.3		5
1541	1542	Fill	Posthole	Structure	3.7	3
1542	1542	Cut	Posthole	Structure	3.7	3
1543	1546	Fill	Ditch	Drain	4.4	4
1544	1546	Fill	Ditch	Drain	4.4	4
1545	1546	Fill	Ditch	Drain	4.4	4
1546	1546	Cut	Ditch	Drain	4.4	4
1547	1547	Cut	Pit	Tank	4.4	4
1548	1547	Fill	Pit	Tank	4.4	4
1549	1547	Fill	Pit	Tank	4.4	4
1550	1547	Fill	Pit	Tank	4.4	4
1551	1553	Fill	Pit	Crane	4.3	4
1552	1553	Fill	Pit	Crane	4.3	4
1553	1553	Cut	Pit	Crane	4.3	4
1554	1555	Fill	Posthole	Crane	4.3	4
1555	1555	Cut	Posthole	Crane	4.3	4
1556	1557	Fill	Posthole	Crane	4.3	4
1557	1557	Cut	Posthole	Crane	4.3	4
1558	1559	Fill	Posthole	Crane	4.3	4
1559	1559	Cut	Posthole	Crane	4.3	4
1560	1561	Fill	Pit		4.3	4
1561	1561	Fill	Pit		4.3	4
1562	-	Layer-early		Colluvium?		
1563	1569	Fill	Pit	Tank	4.4	4
1564	-	Layer =1503		Colluvium?		
1565	1565	Cut	Ditch	Drain?	4.3	4
1566	1565	Fill	Ditch	Drain?	4.3	4
1567	1565	Fill	Ditch	Drain?	4.3	4
1568	1565	Fill	Ditch	Drain?	4.3	4
1569	1563	Cut	Pit	Tank	4.4	4
1570	-	Fill	Ditch	Lode	4.1	4

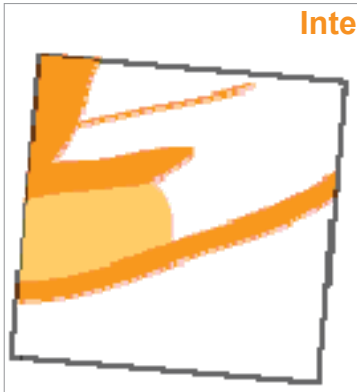
1571	-	Fill	Ditch	Drain		5
1572	-	Fill	Ditch	Lode	4.1	4
1573	-	Fill	Ditch	Drain		5
1574	1580	Fill	Ditch	Lode	4.1	4
1575	1579	Fill	Ditch	Drain	5.2	5
1576	1579	Fill	Ditch	Drain	5.2	5
1577	1579	Fill	Ditch	Drain	5.2	5
1578	1580	Fill	Ditch	Lode	4.1	4
1579	1579	Cut	Ditch	Drain	5.2	5
1580	1580	Cut	Ditch	Lode	4.1	4
1581	1582	Fill	Ditch	Lode	4.1	4
1582	1582	Cut	Ditch	Lode	4.1	4
1583	1583	Cut	Ditch	Drain	5.2	5
1584	1584	Cut	Ditch	Lode	4.1	4
1585	1583	Fill	Ditch	Drain	5.2	5
1586	1583	Fill	Ditch	Drain	5.2	5
1587	1583	Fill	Ditch	Drain	5.2	5
1588	1583	Fill	Ditch	Drain	5.2	5
1589	1583	Fill	Ditch	Drain	5.2	5
1590	1583	Fill	Ditch	Drain	5.2	5
1591	1584	Fill	Ditch	Lode	4.1	4
1592	1584	Fill	Ditch	Lode	4.1	4
1593	1584	Fill	Ditch	Lode	4.1	4
1594	1584	Fill	Ditch	Lode	4.1	4
1595	1584	Fill	Ditch	Lode	4.1	4
1596	1597	Fill	Ditch	Drain	4.4	4
1597	1597	Cut	Ditch	Drain	4.4	4
1598	1599	Fill	Ditch	Drain	4.3	4
1599	1599	Cut	Ditch	Drain	4.3	4
1600	1584	Fill	Ditch	Lode	4.1	4
1601	-	Fill	Pit?			3
1602	1584	Fill	Ditch	Lode	4.1	4
1603	1604	Fill	Pit			5
1604	1604	Cut	Pit			5
1605	1606	Fill	Pit			5
1606	1606	Cut	Pit			5
1607	1608	Fill	Posthole	Structure	3.7	3
1608	1608	Cut	Posthole	Structure	3.7	3
1609	1610	Fill	Posthole	Structure	3.7	3
1610	1610	Cut	Posthole	Structure	3.7	3
1611	1612	Fill	Beamslot	Structure	3.7	3
1612	1612	Cut	Beamslot	Structure	3.7	3
1613	1613	Cut	Beamslot	Structure	3.7	3

1614	1613	Fill	Beamslot	Structure	3.7	3
1615	1616	Fill	Posthole	Structure	3.7	3
1616	1616	Cut	Posthole	Structure	3.7	3
1617	1618	Fill	Posthole	Structure	3.7	3
1618	1618	Cut	Posthole	Structure	3.7	3
1619	1620	Fill	Posthole	Structure	3.7	3
1620	1620	Cut	Posthole	Structure	3.7	3
1621	1622	Fill	Posthole	Structure	3.7	3
1622	1622	Cut	Posthole	Structure	3.7	3
1623	1624	Fill	Posthole	Structure	3.7	3
1624	1624	Cut	Posthole	Structure	3.7	3
1625	1626	Fill	Posthole	Structure	3.7	3
1626	1626	Cut	posthole	Structure	3.7	3

Appendix 4: Geophysics survey

The following figure collates the results of three methods of geophysical surveying, the wall survey, excavation in 1998 and known standing structures.





This survey area was placed to see whether features continued to the east 1998 excavation. Possible magnetic anomalies relating to the major linear alignments seen during excavation (darker tone), plus an area of disturbed ground which may relate to the medieval occupation (including a smithy) and post-medieval demolition seen during excavation, being present here also (lighter tone).

Fig. App.4.1 Geophysics survey

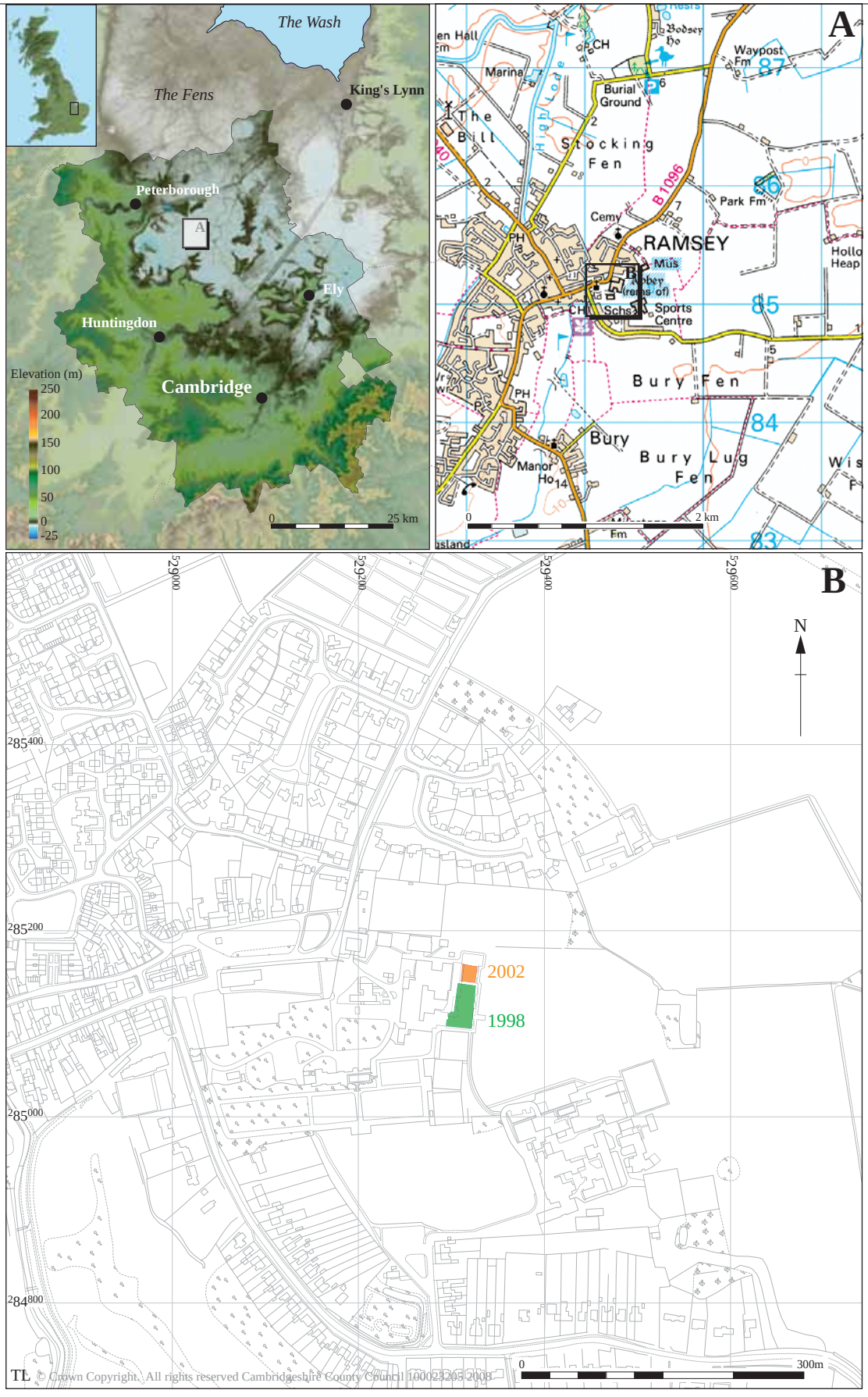


Figure 1 Site location, showing the 1998 and 2002 excavations areas

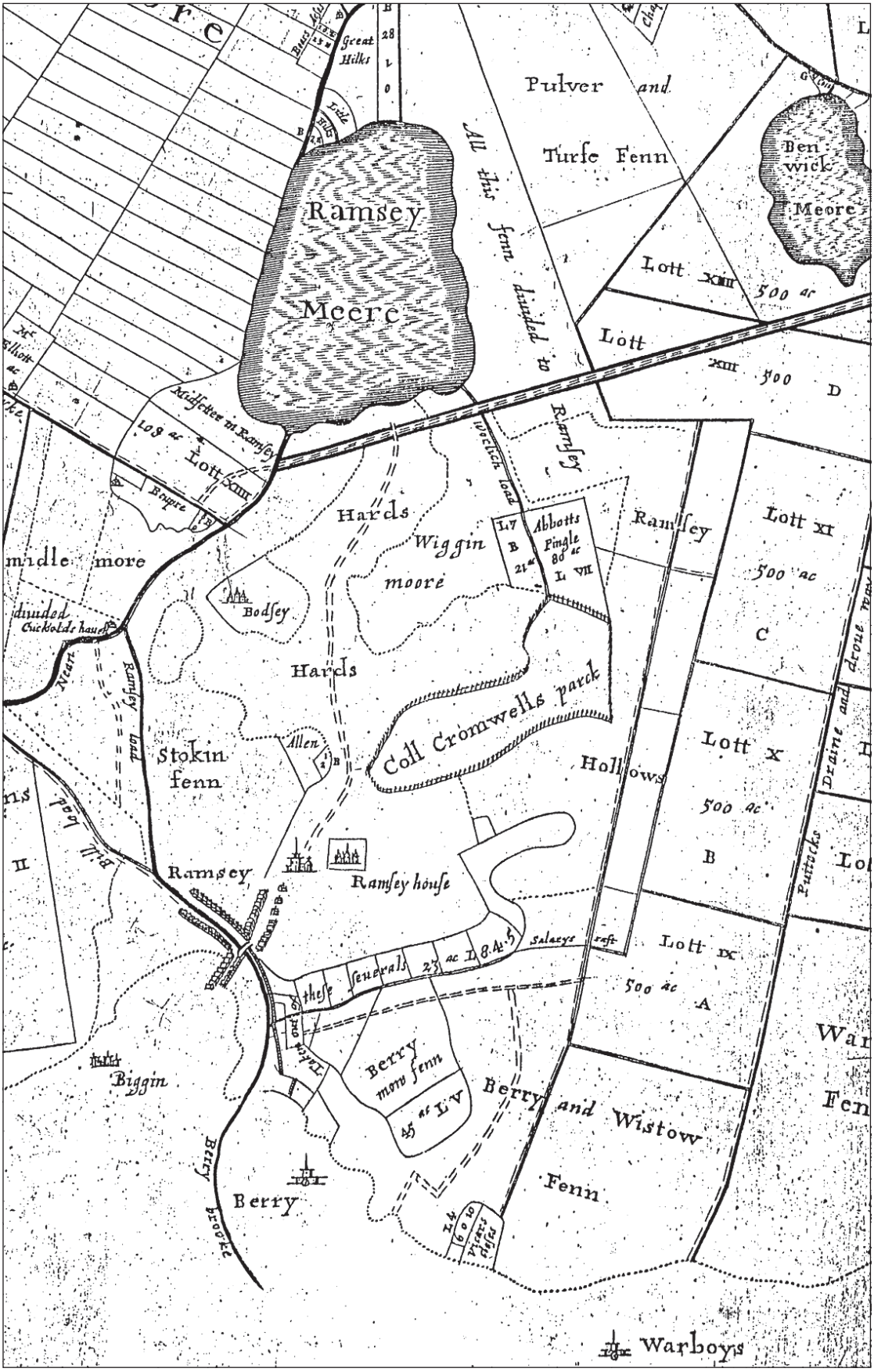


Figure 2 Detail of Jonas Moore's Map of Ramsey 1684

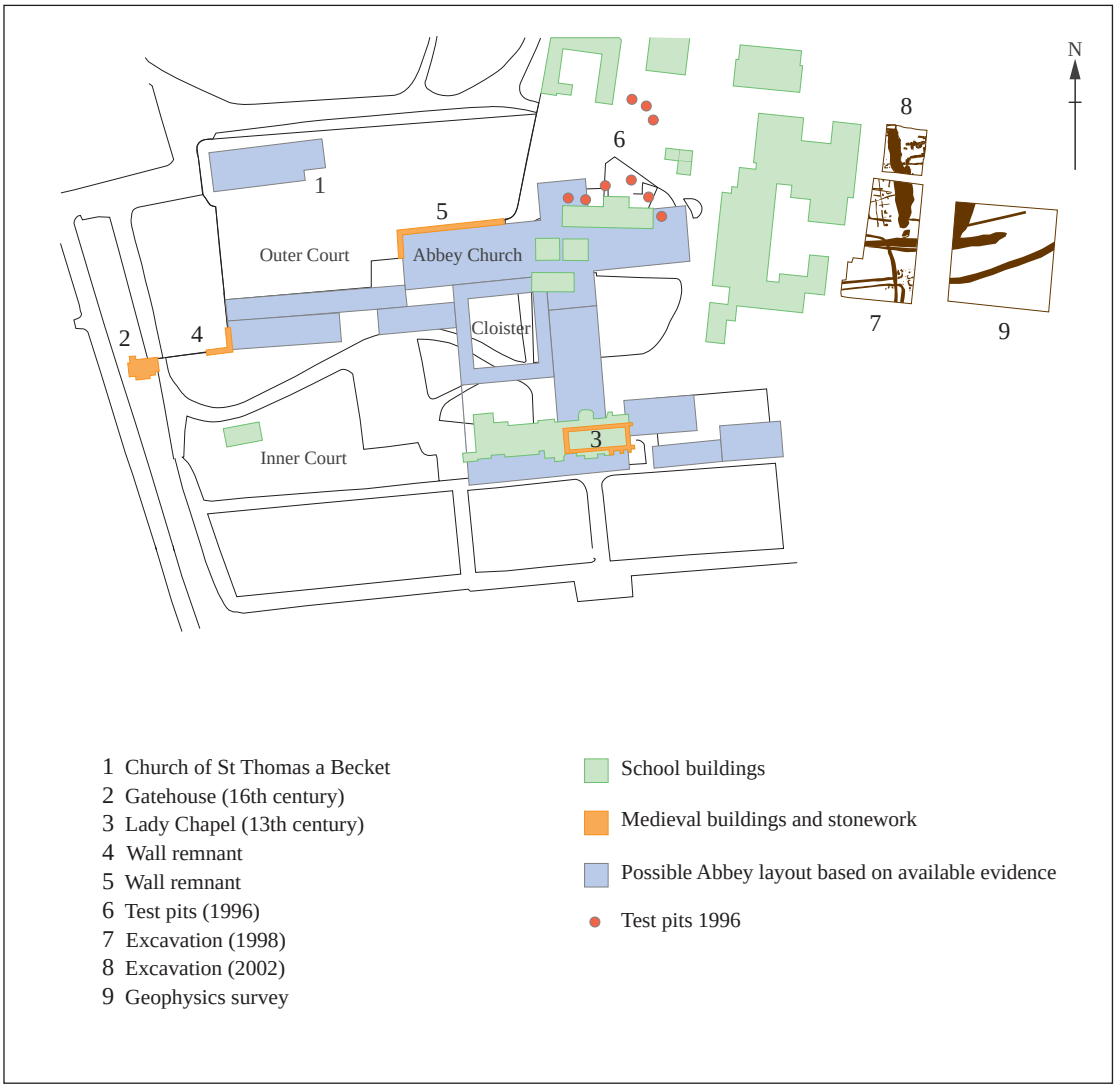


Figure 3 Plan of surviving and conjectured buildings of the medieval abbey, with the modern school buildings and recent archaeological work

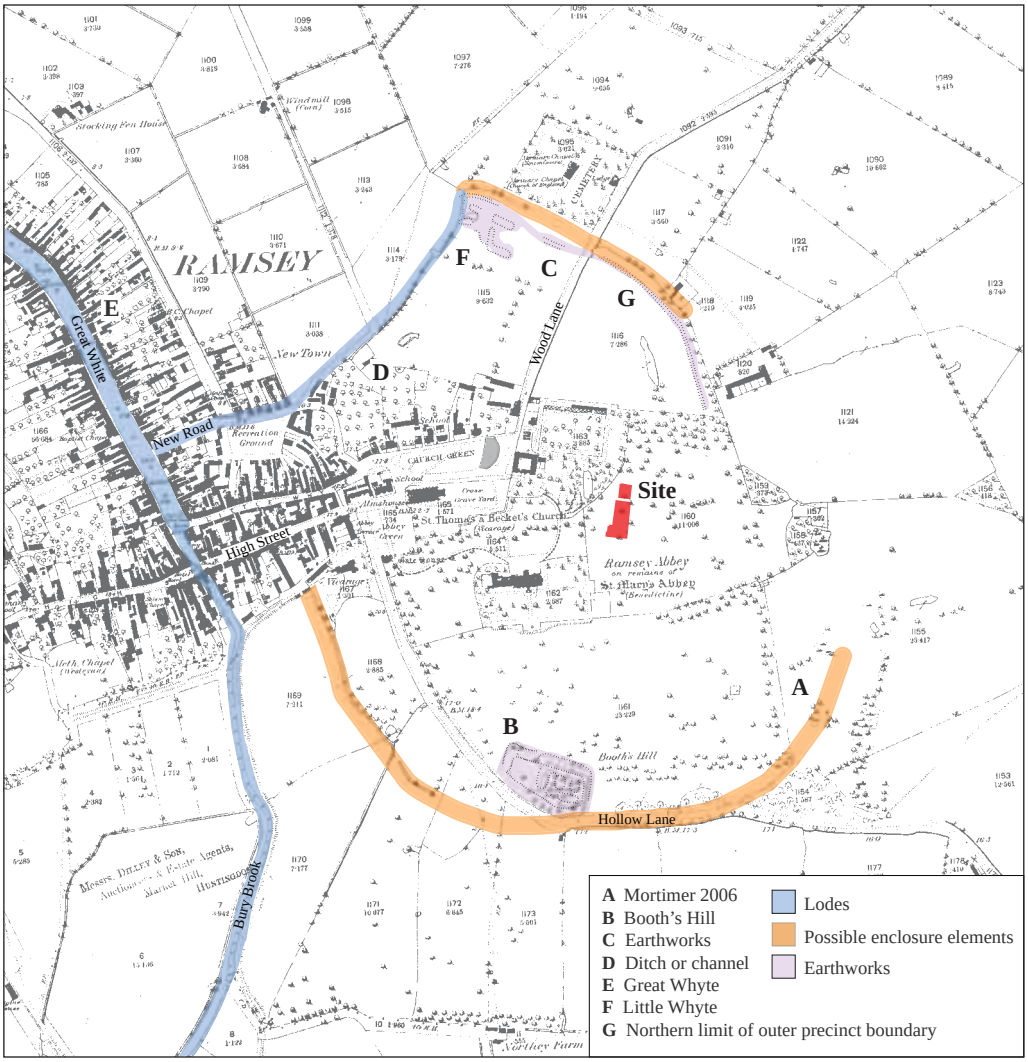


Figure 4 Interpretative map showing elements of the abbey precinct

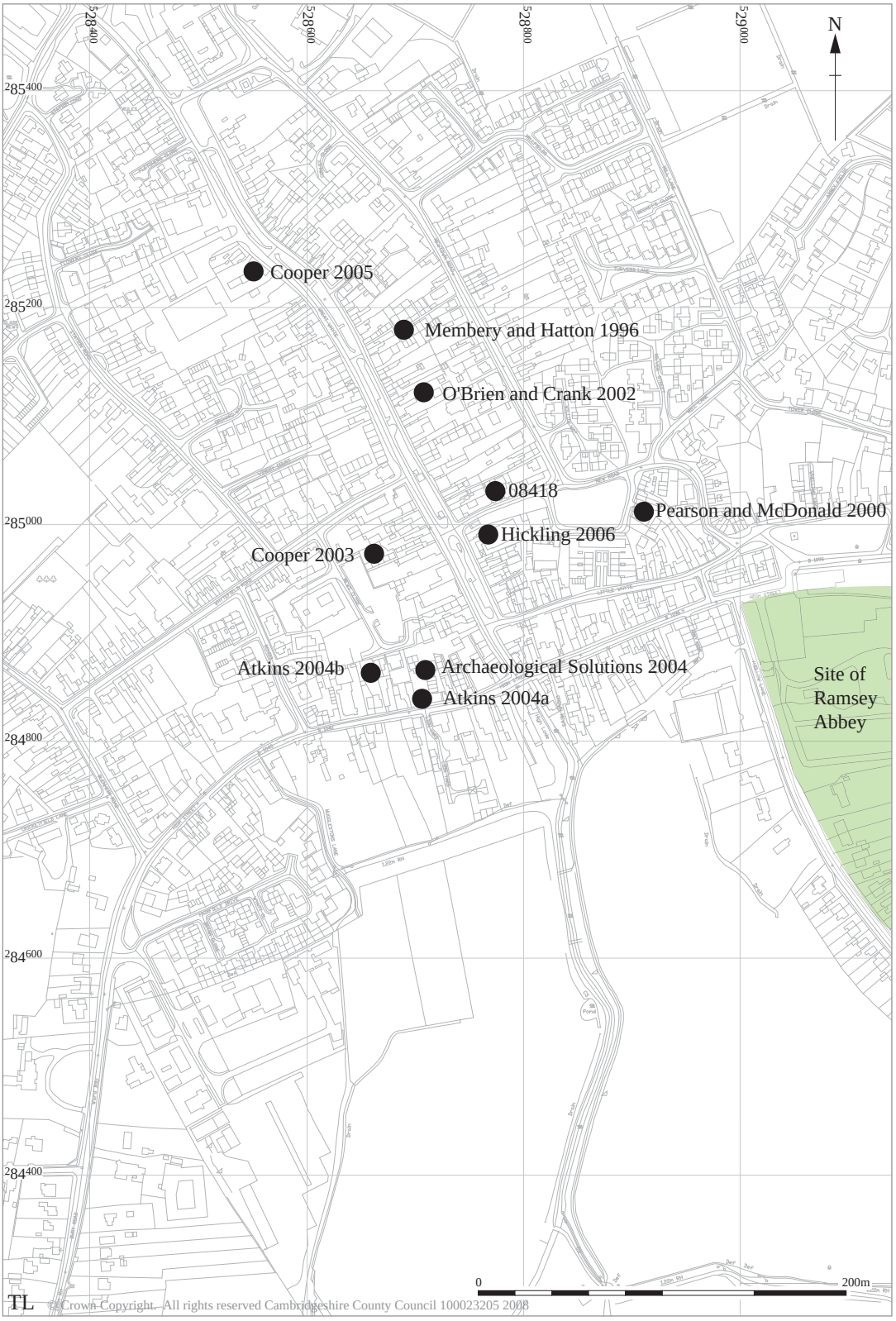


Figure 5 Plan showing archaeological work elsewhere in Ramsey

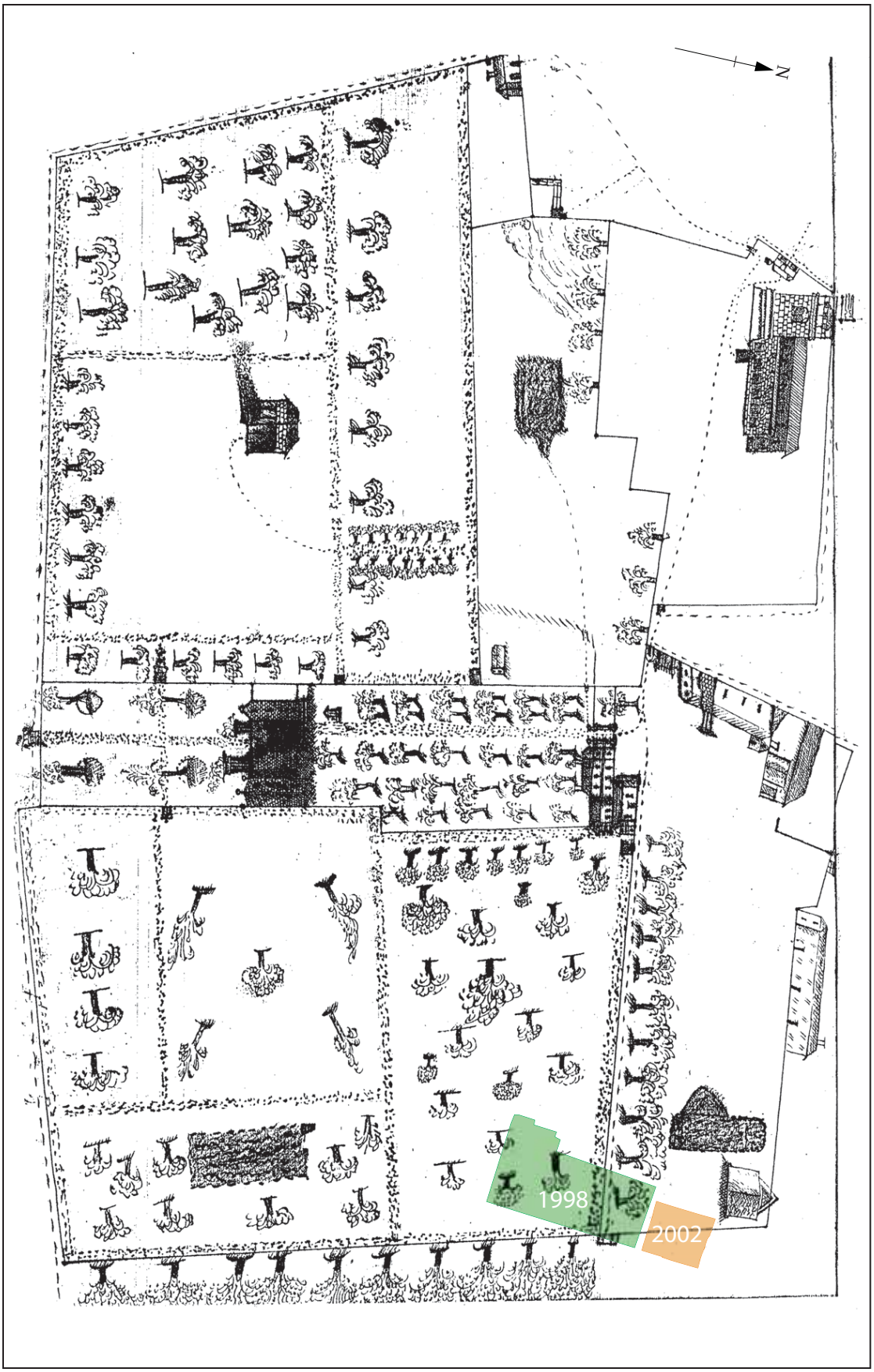


Figure 6 Detail of Silius Titus's Plan of Ramsey Abbey (1704-9), showing the excavated areas

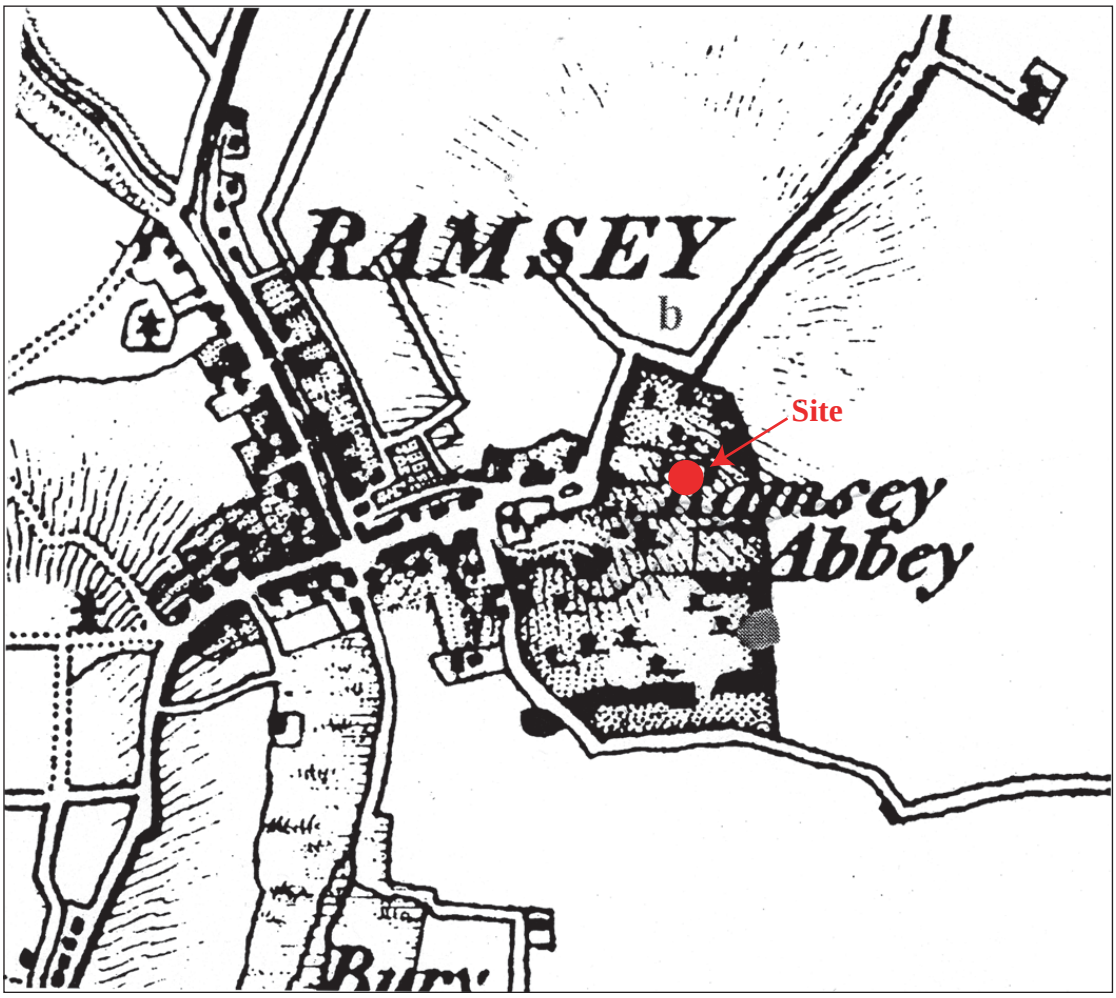


Figure 7 Detail of 1824 1" Ordnance Survey Map

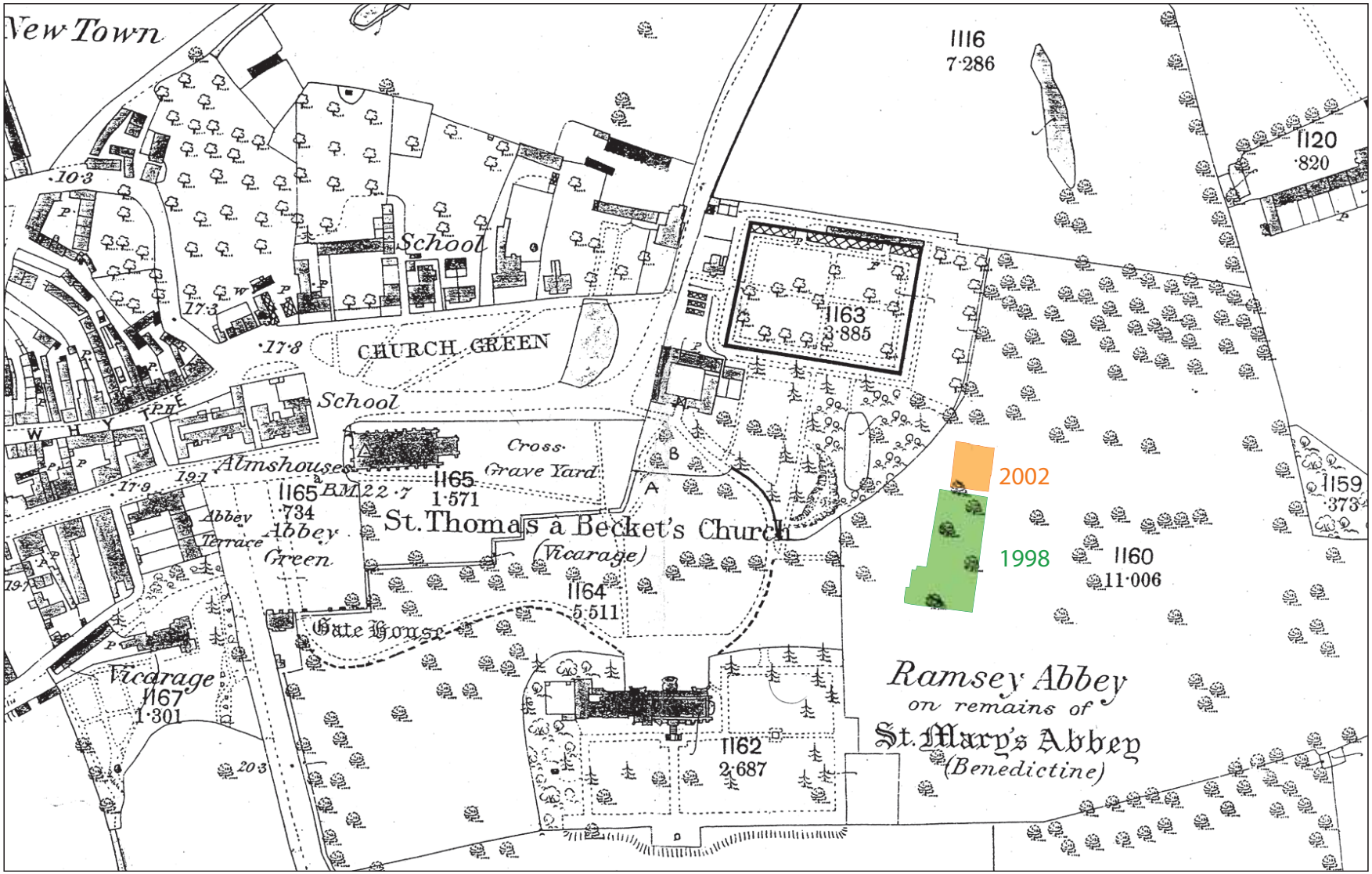


Figure 8 Detail of 1st Edition Ordnance Survey Map (1887)

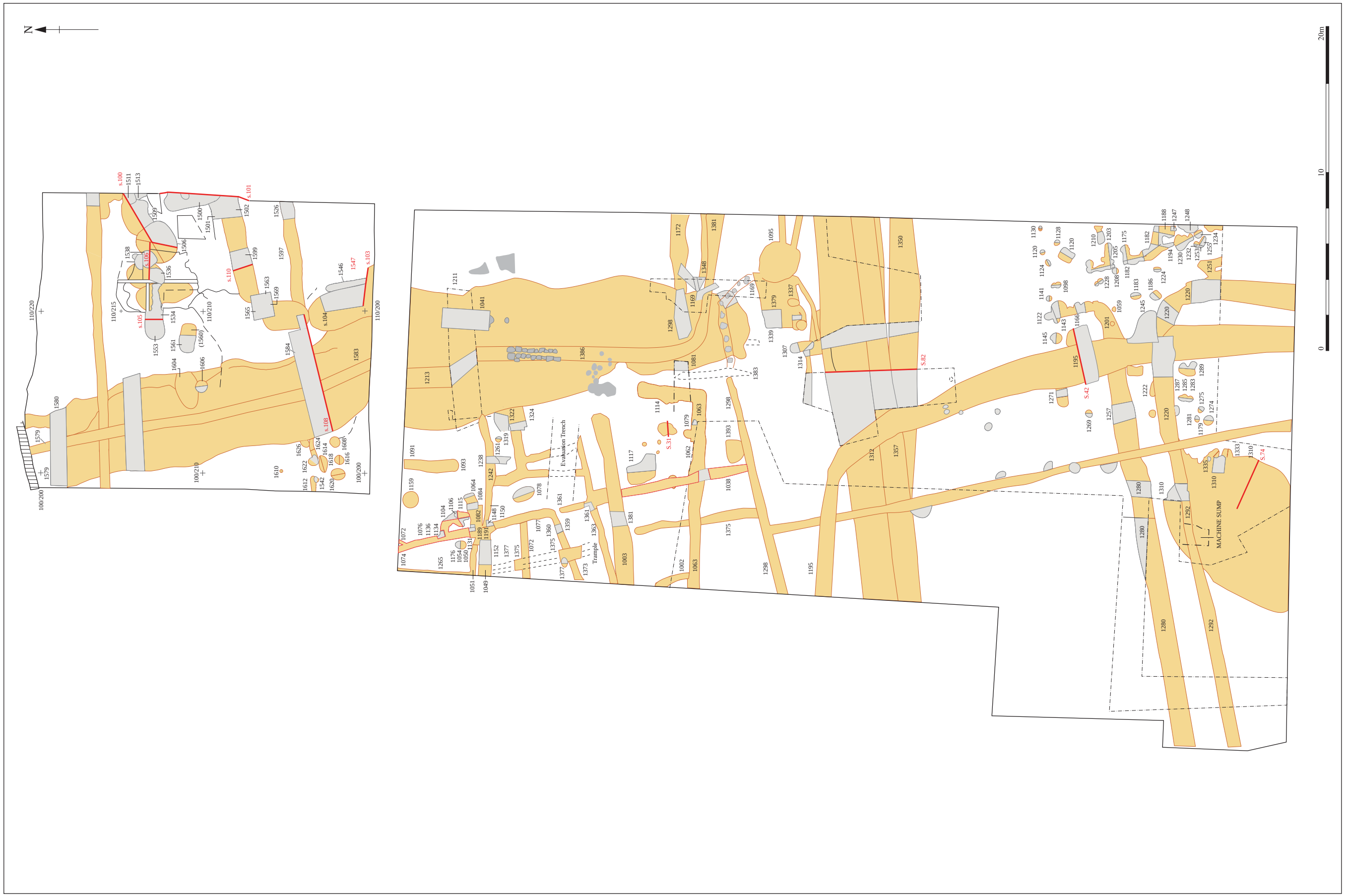


Figure 9 All feature plan of 1998 and 2002 excavations

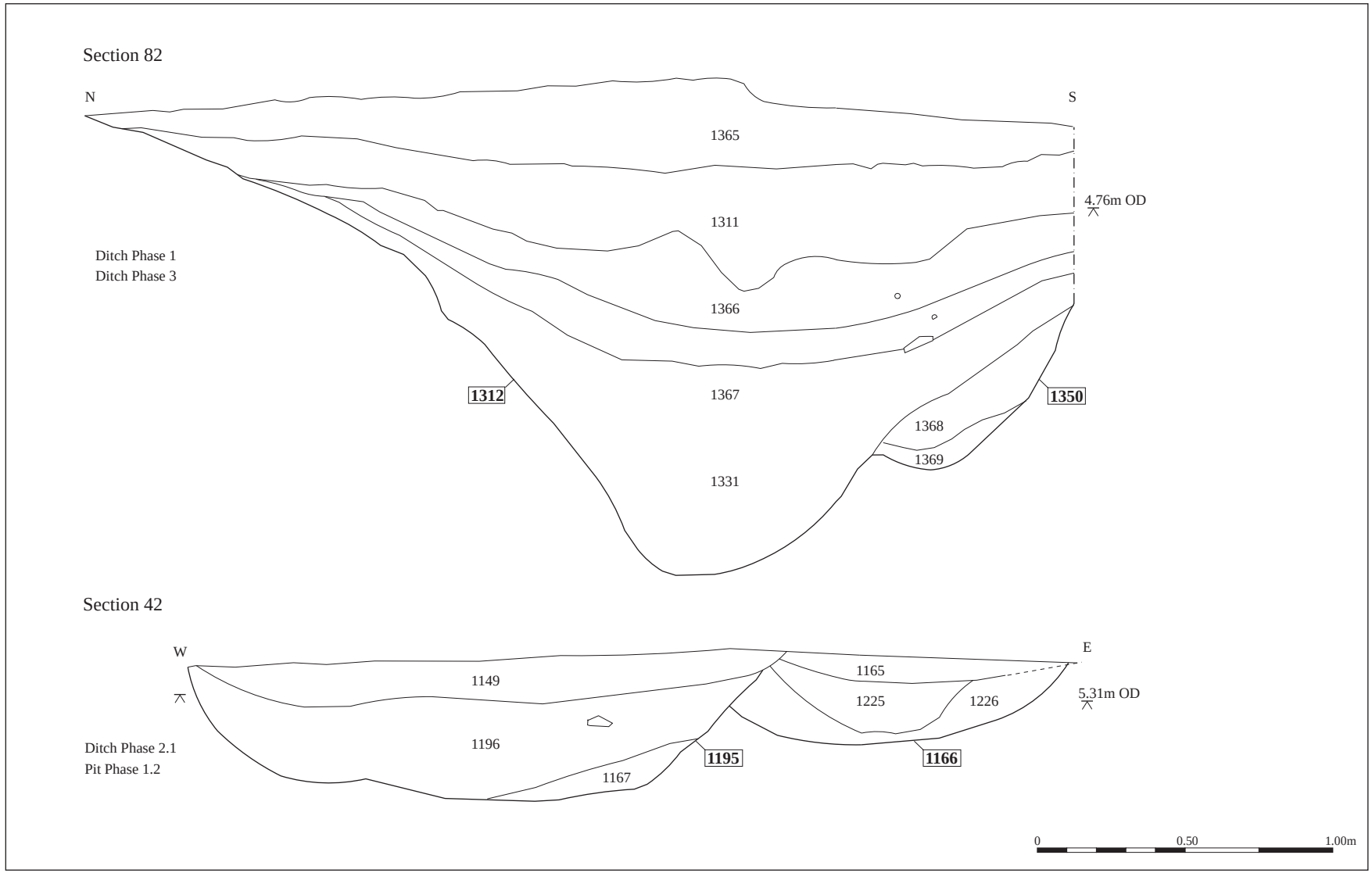


Figure 10 Selected section drawings

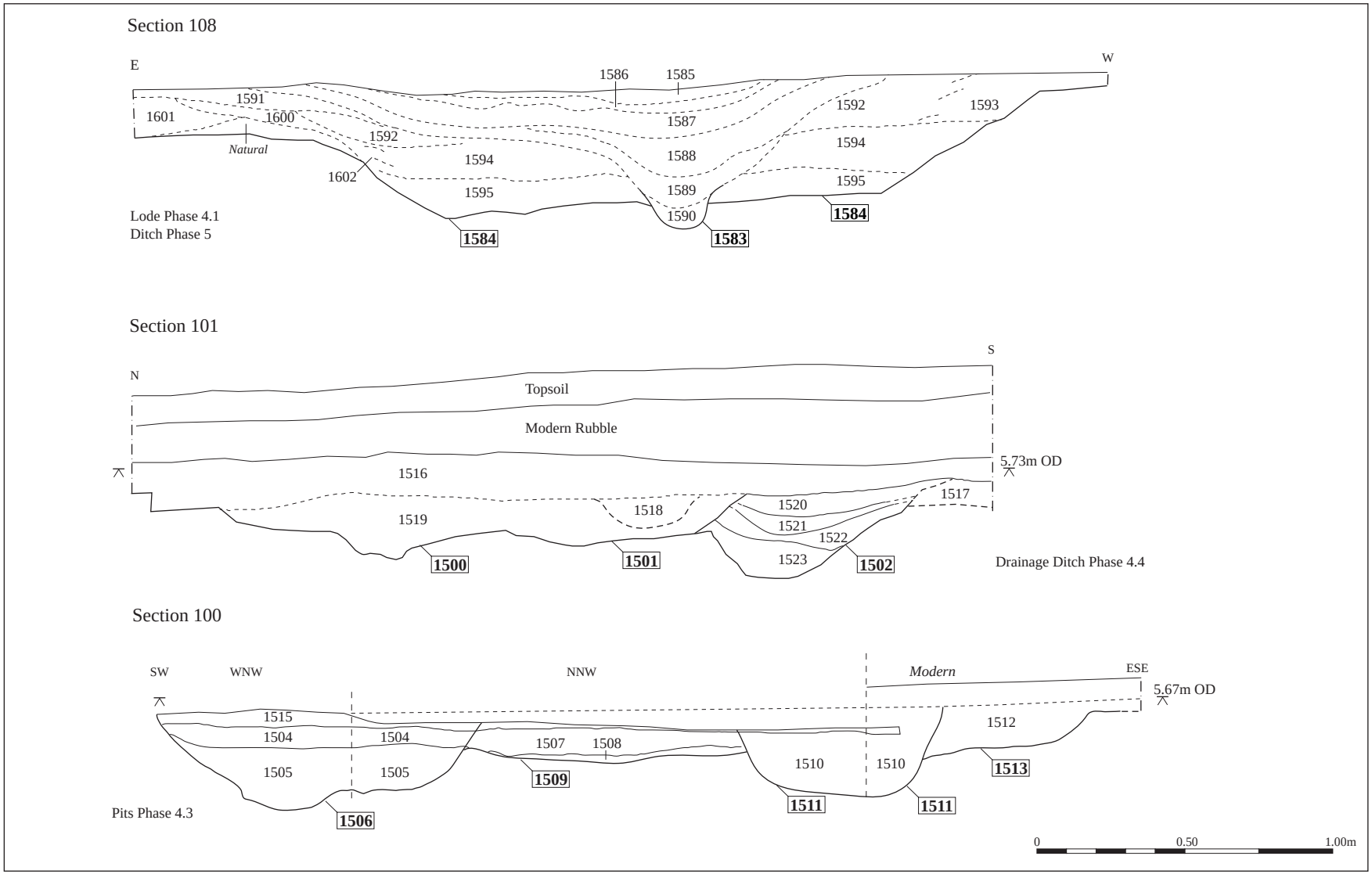


Figure 11 Selected section drawings

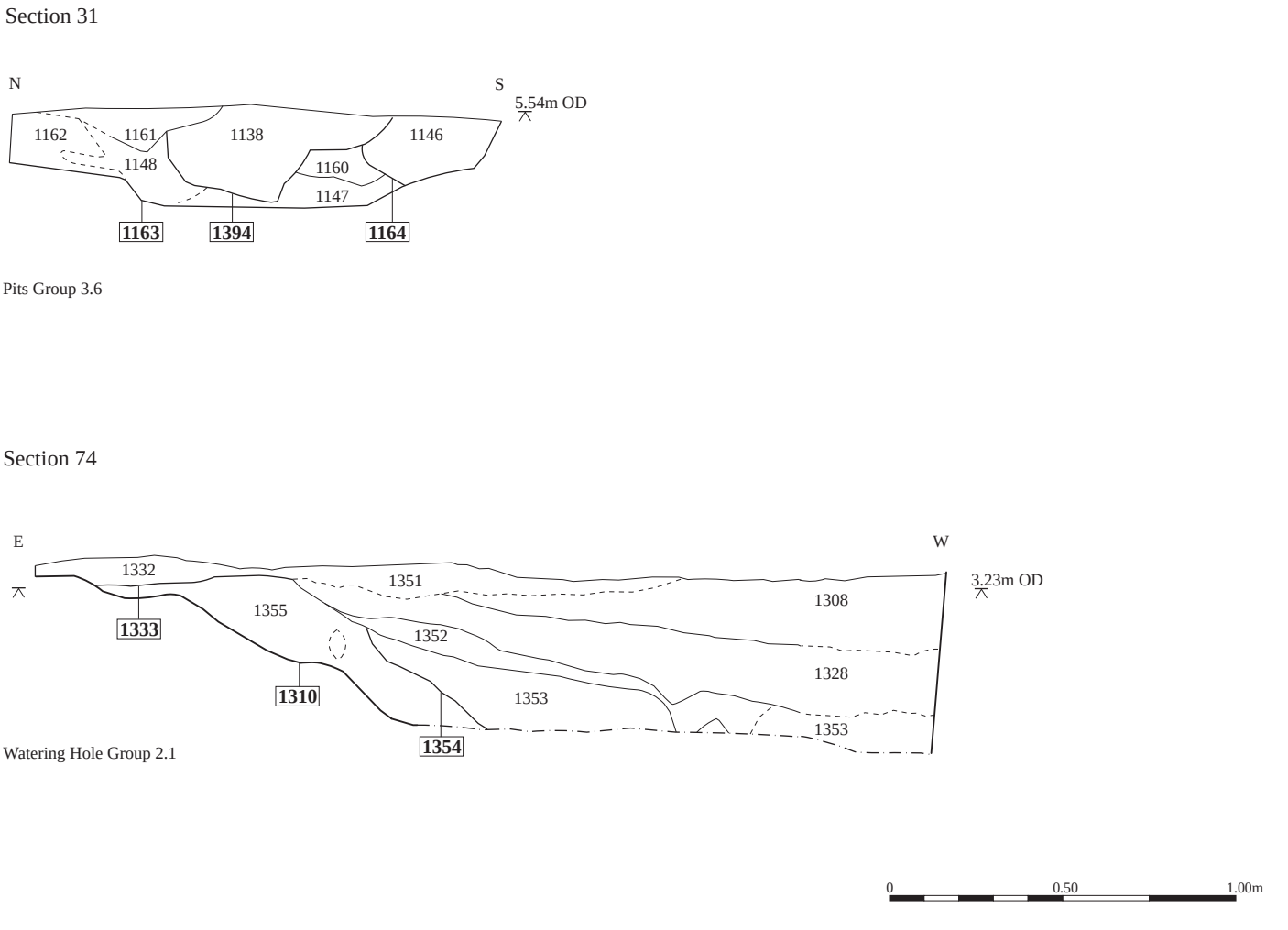


Figure 12 Selected section drawings

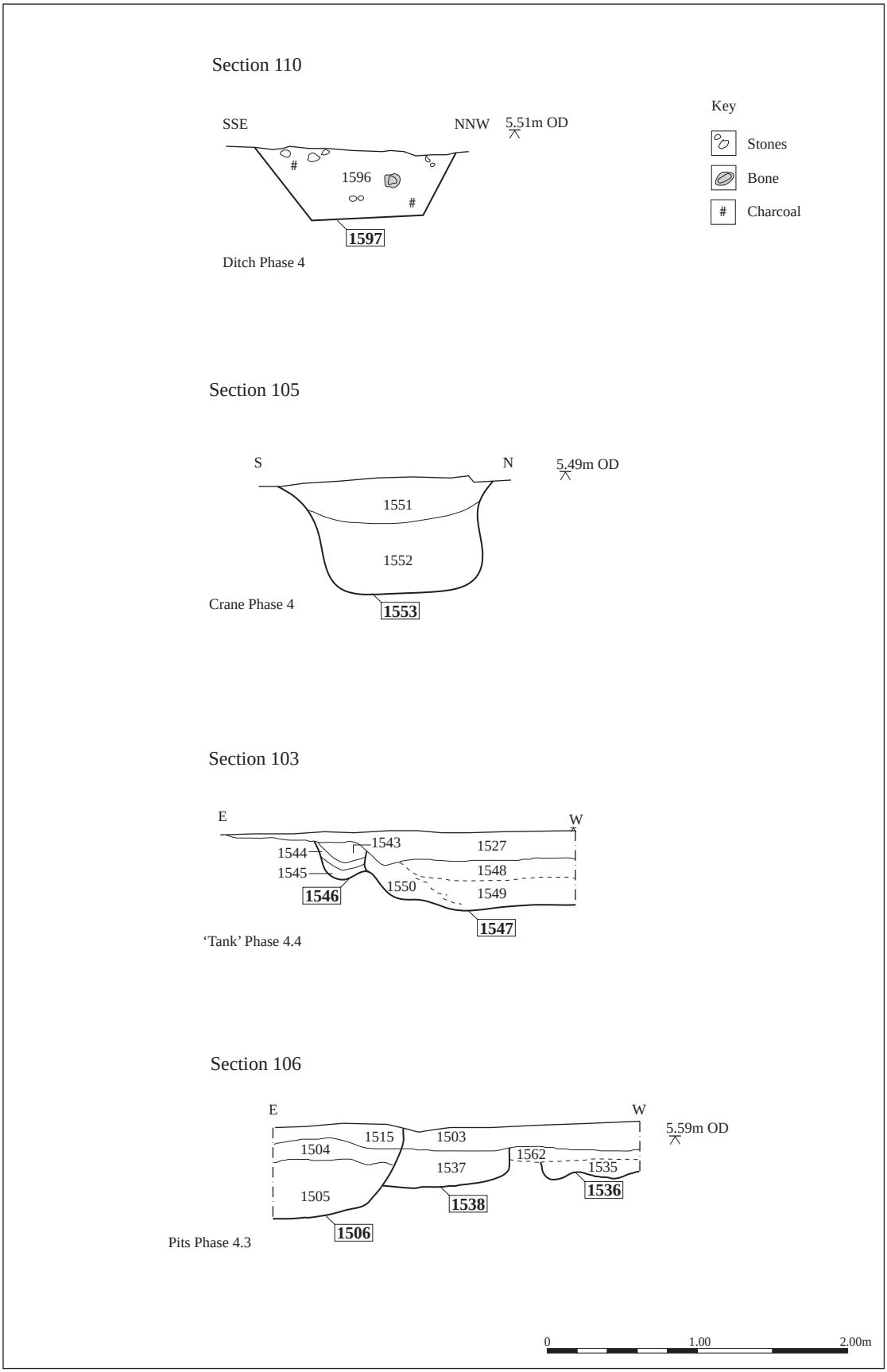


Figure 13 Selected section drawings

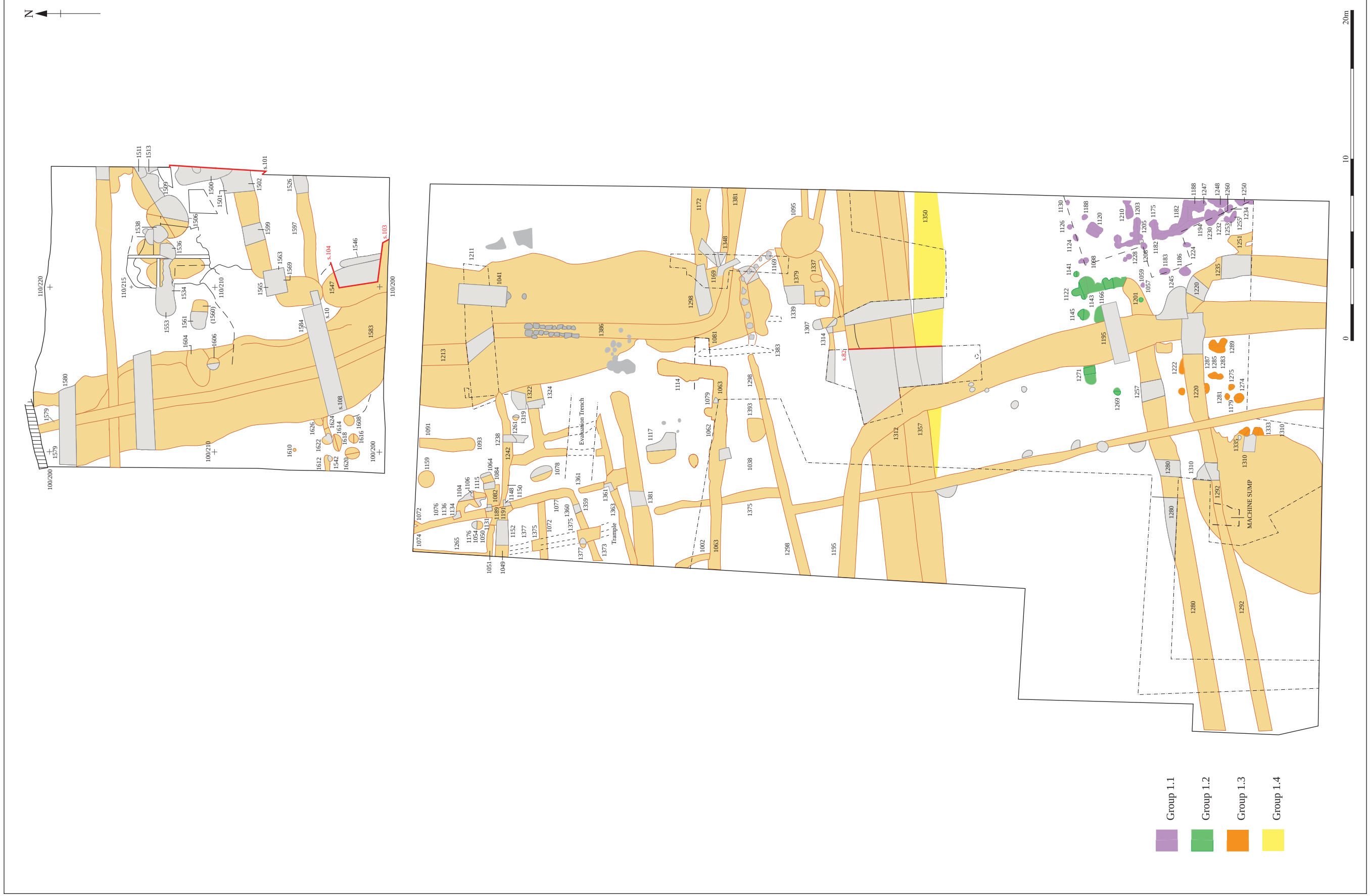


Figure 14 Plan of features attributed to Phase 1 (10th to mid 12th century)

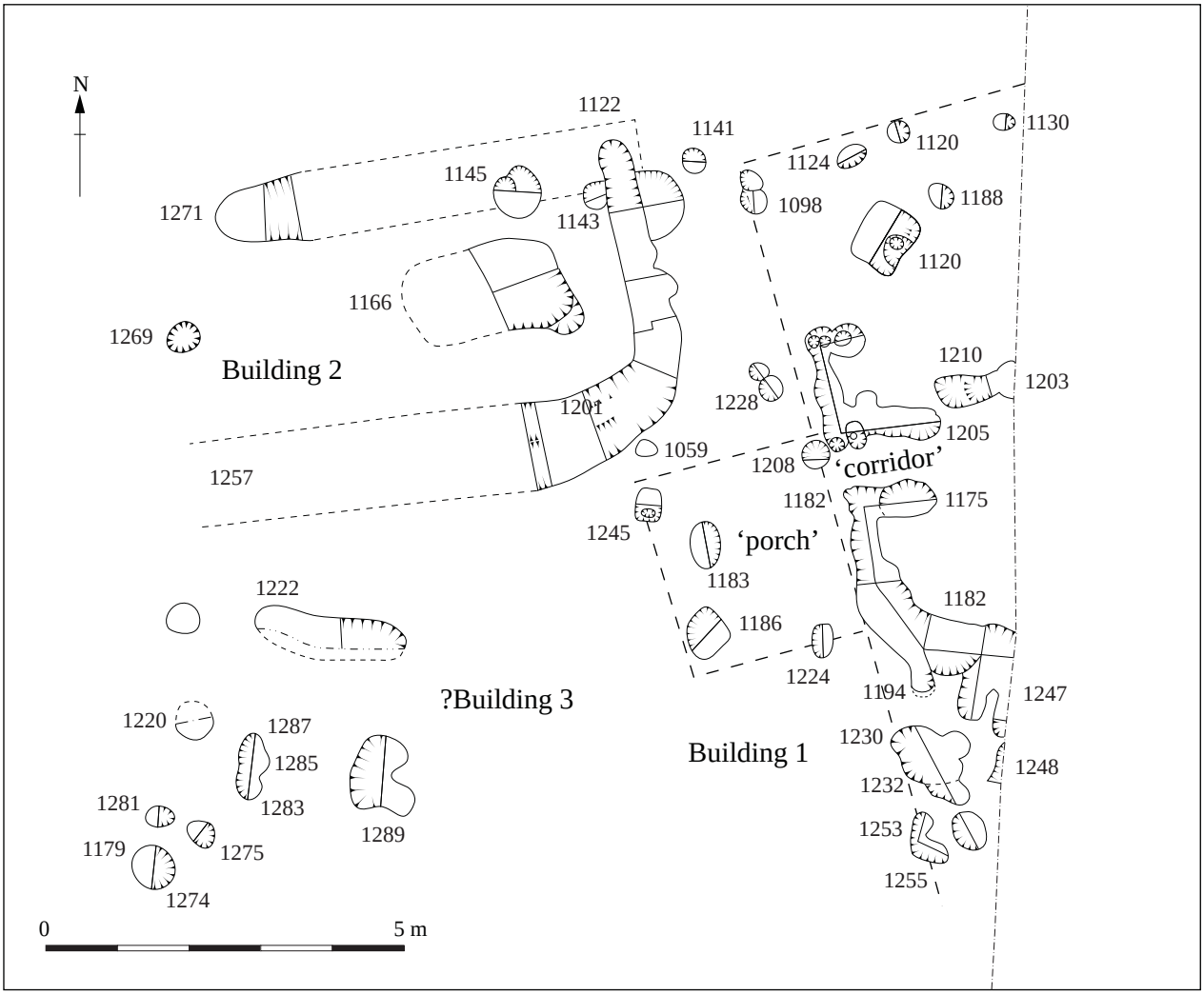


Figure 15 Detail of Buildings 1-3 (Phase 1)

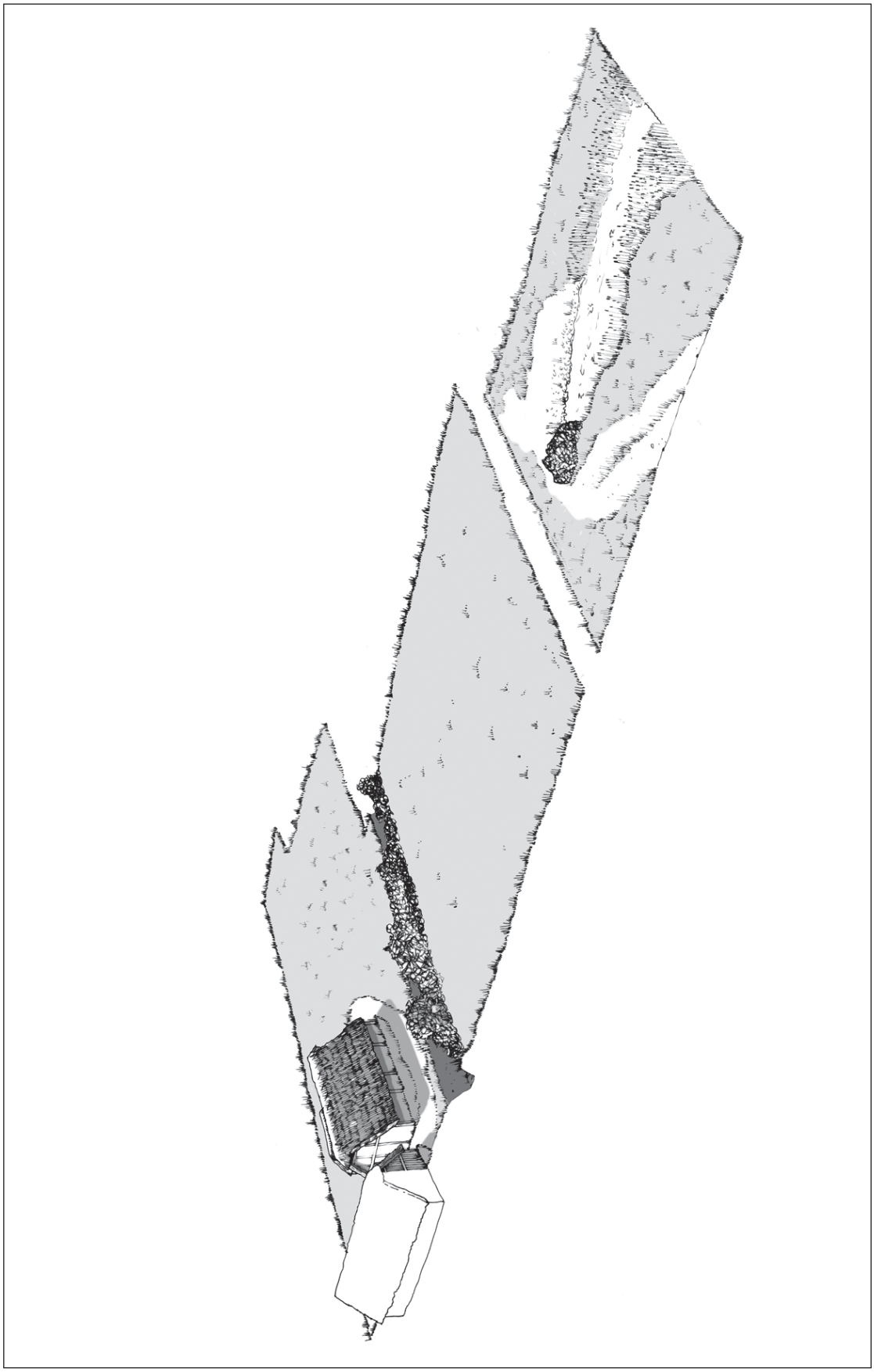


Figure 16 Reconstruction of Phase 1

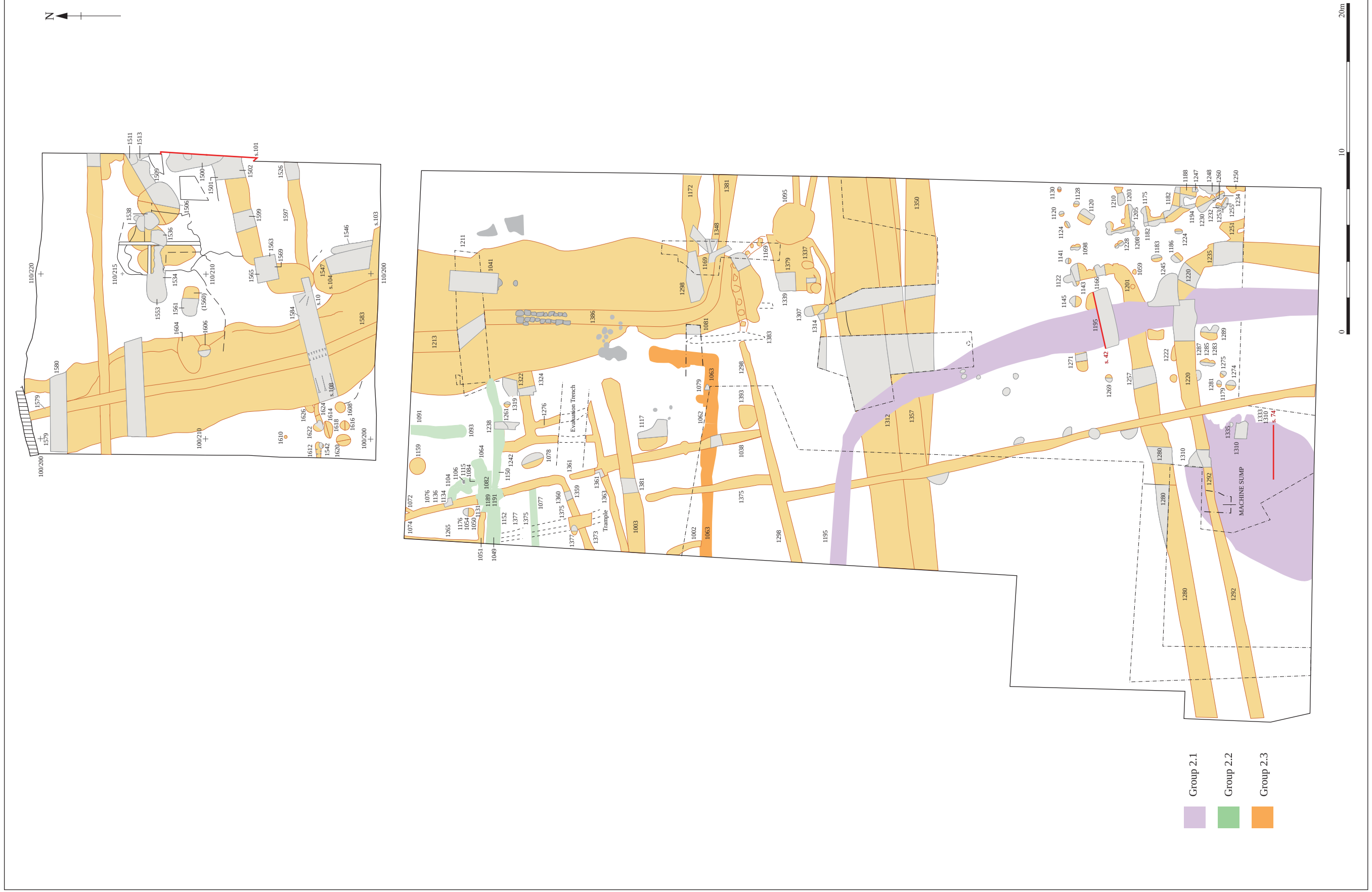


Figure 17 Plan of features attributed to Phase 2 (early to mid 12th century)

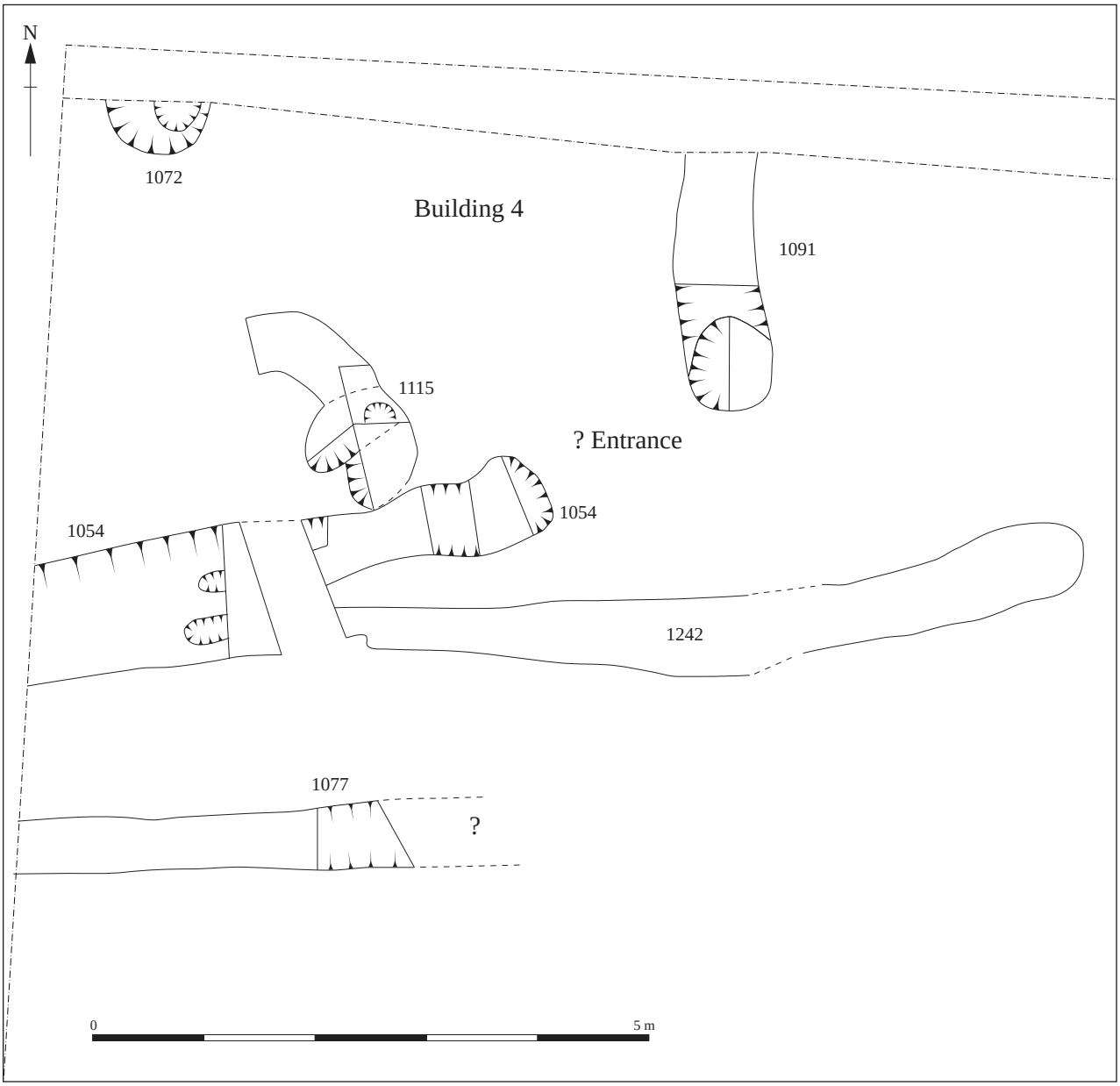


Figure 18 Detail of building 4 and associated features (Phase 2)

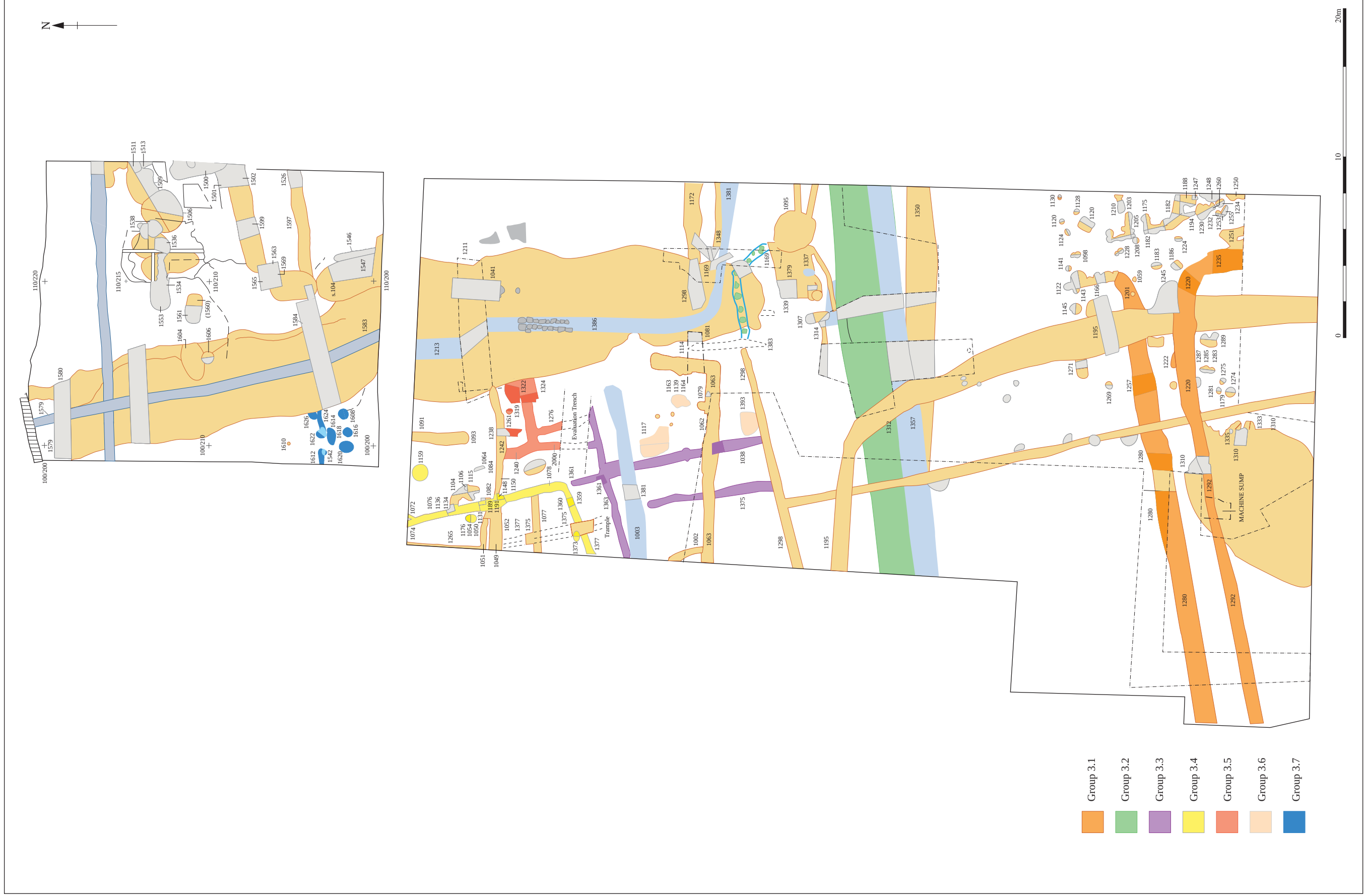


Figure 19 Plan of features attributed to Phase 3 (mid 12th to 13th centuries)

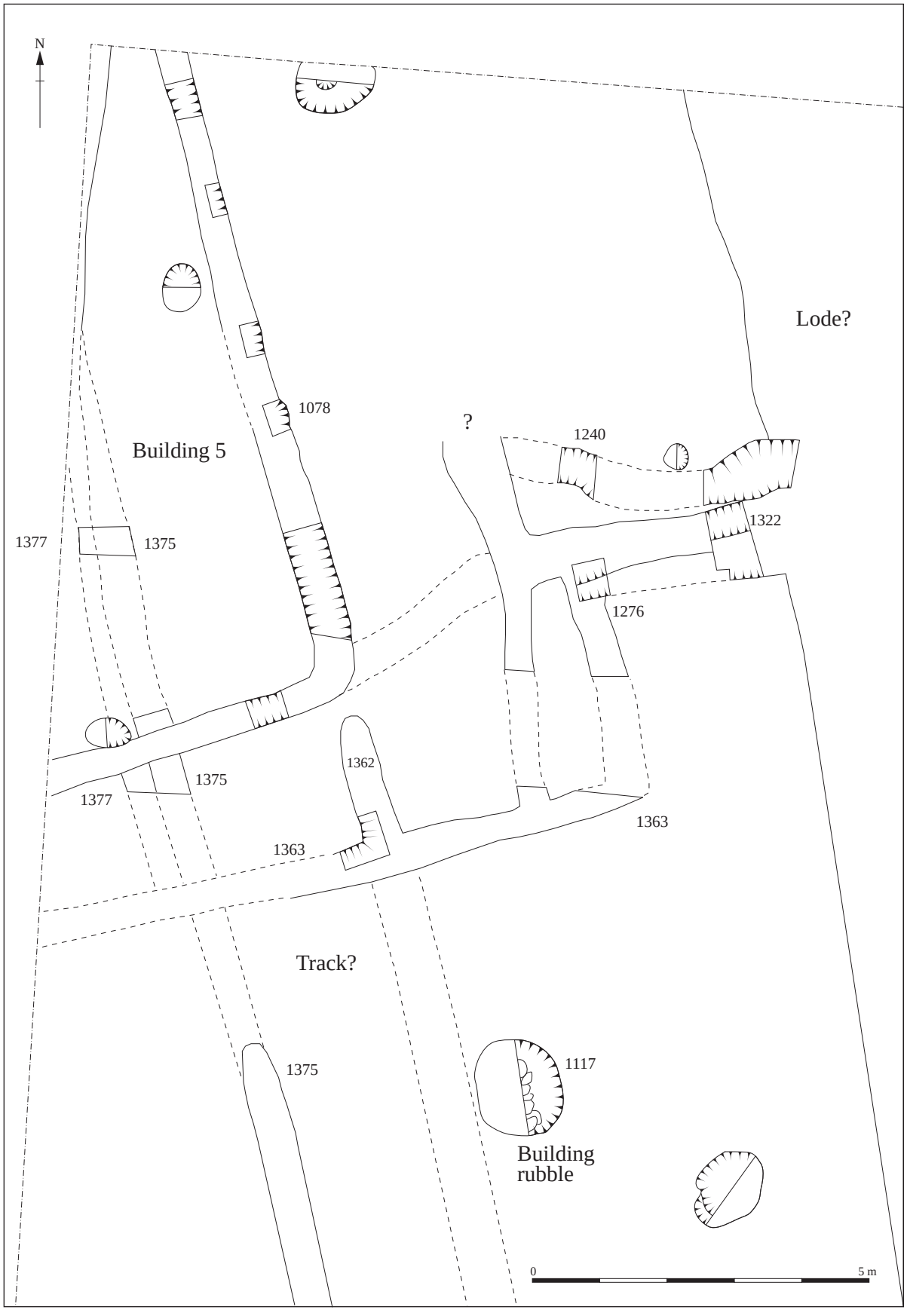


Figure 20 Detail of building 5 and related features (Phase 4)

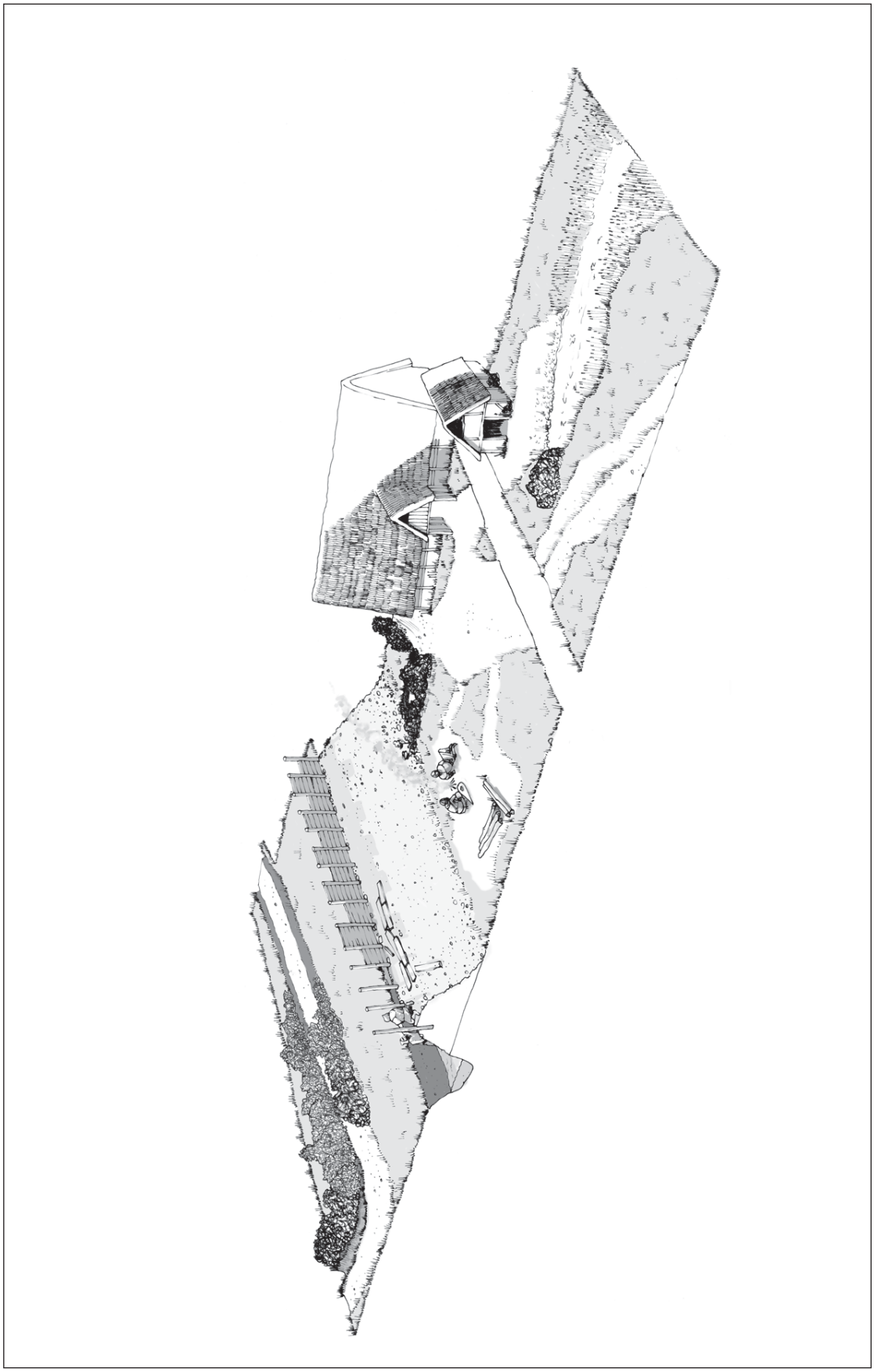


Figure 21 Reconstruction of Phase 3

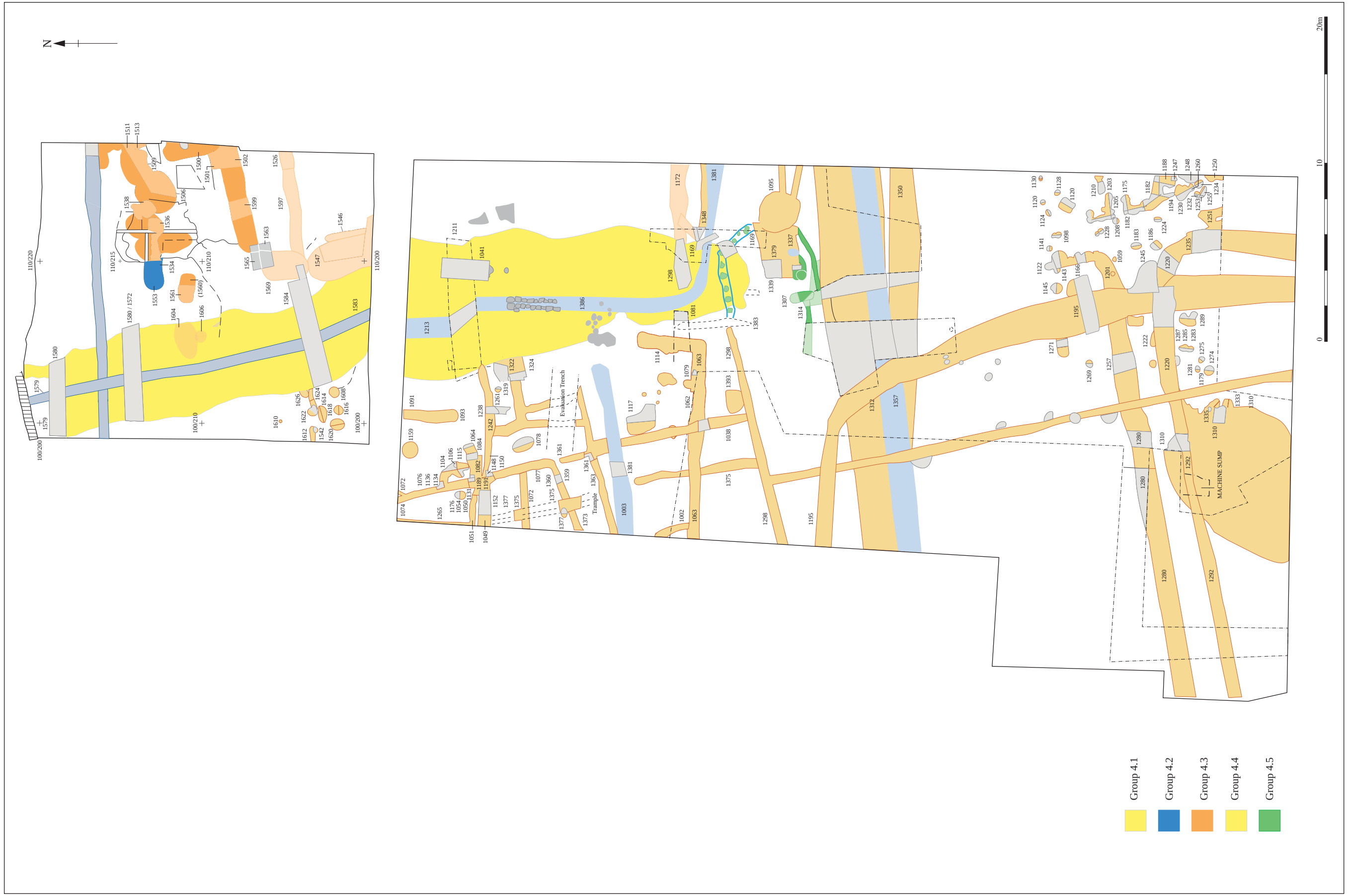


Figure 22 Plan of features attributed to Phase 4 (13th century to c.1539)

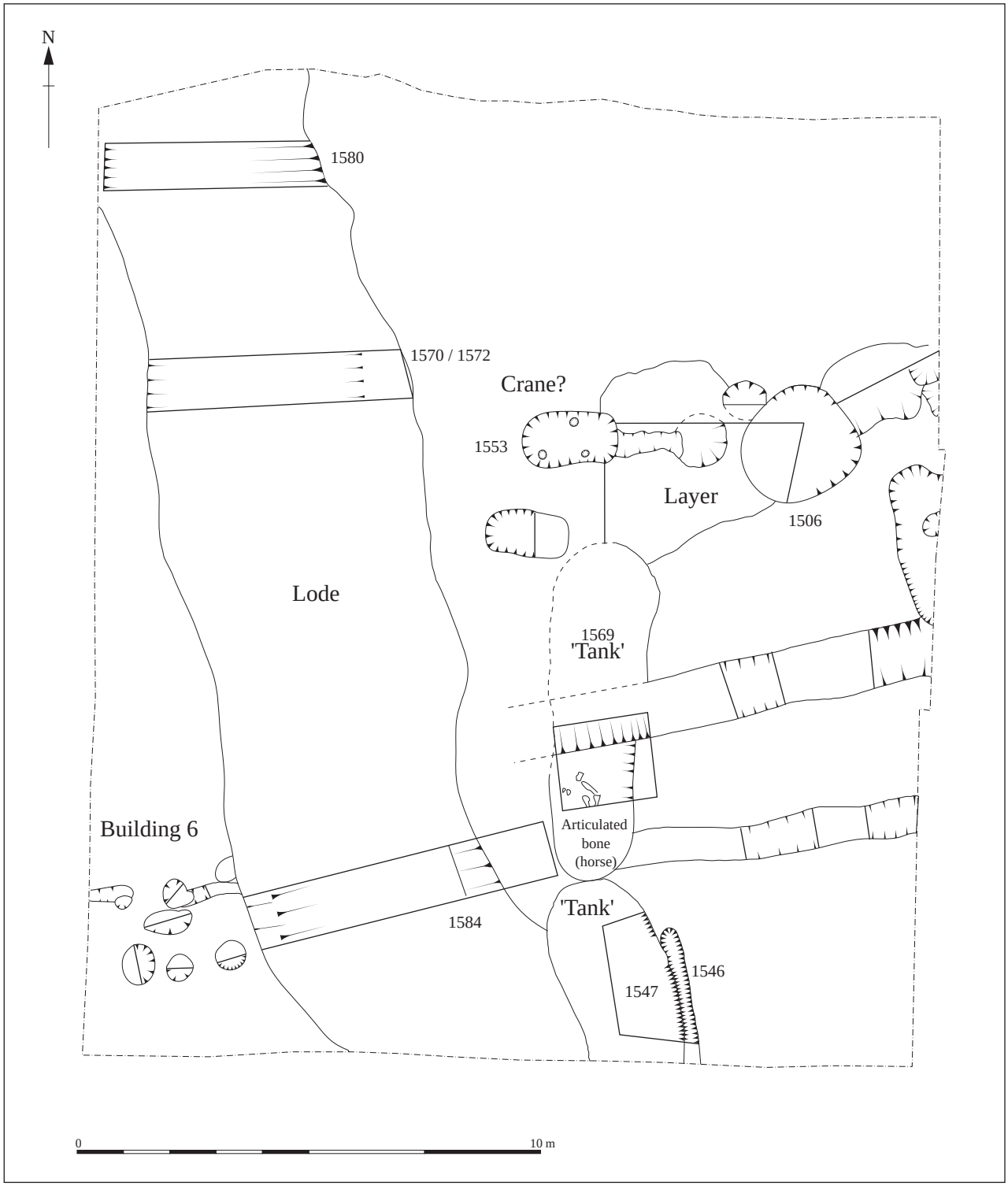


Figure 23 Detail of lode, 'crane' and associated features (Phase 4)

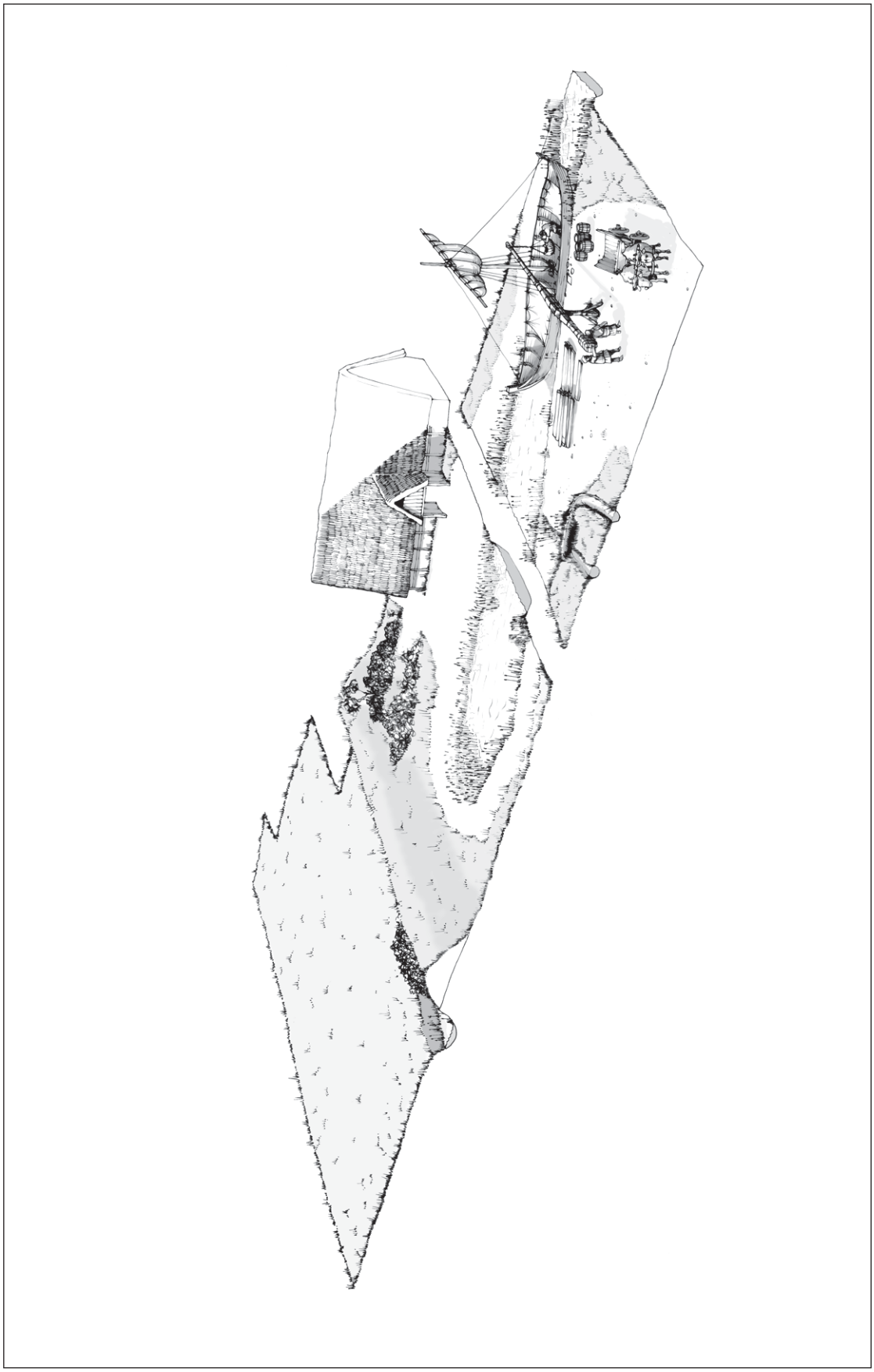


Figure 24 Reconstruction of Phase 4

Figure 25 Plan of features attributed to Phase 5 (post-Dissolution)

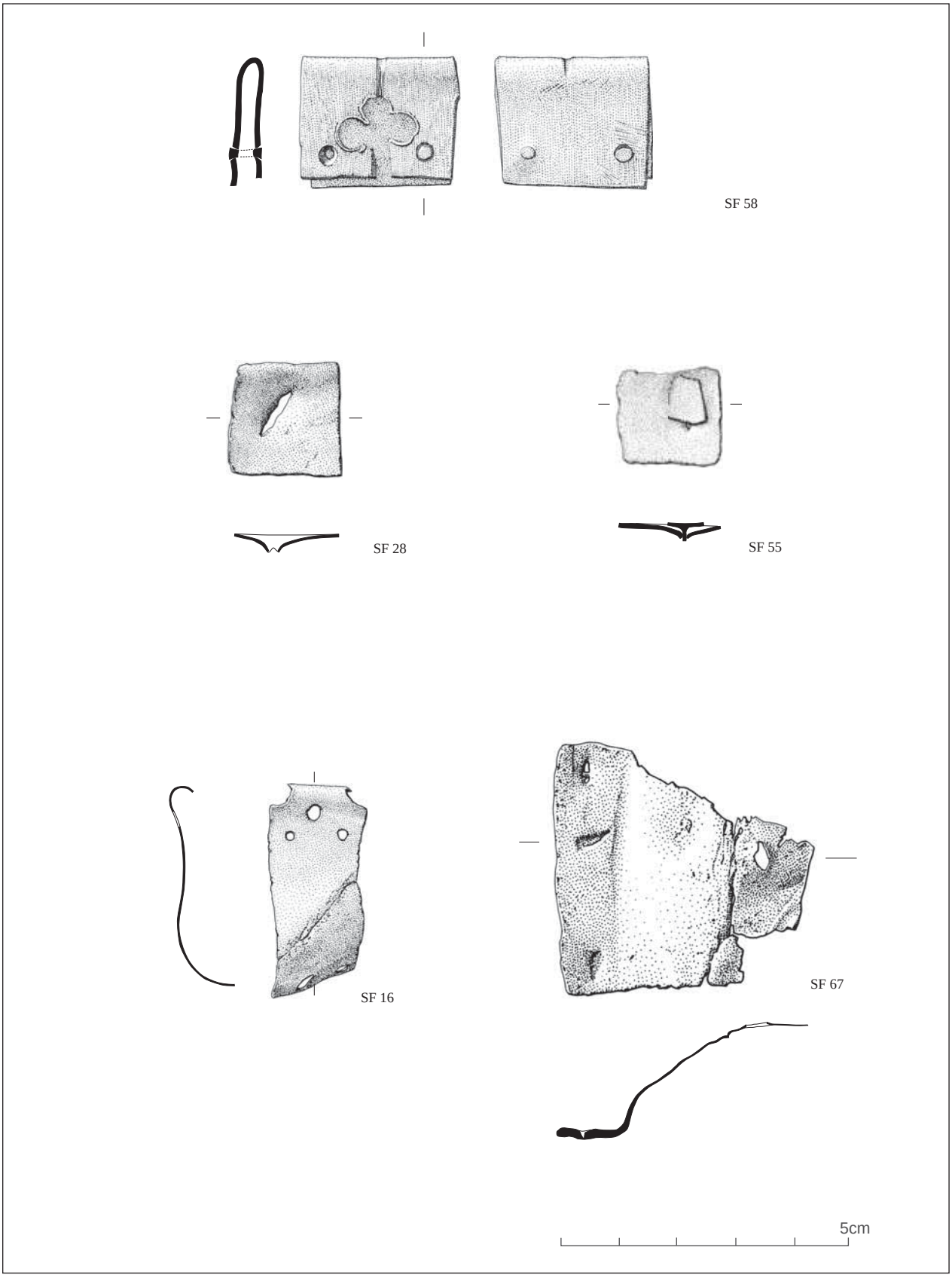


Figure 26 Copper alloy objects Scale 1:1

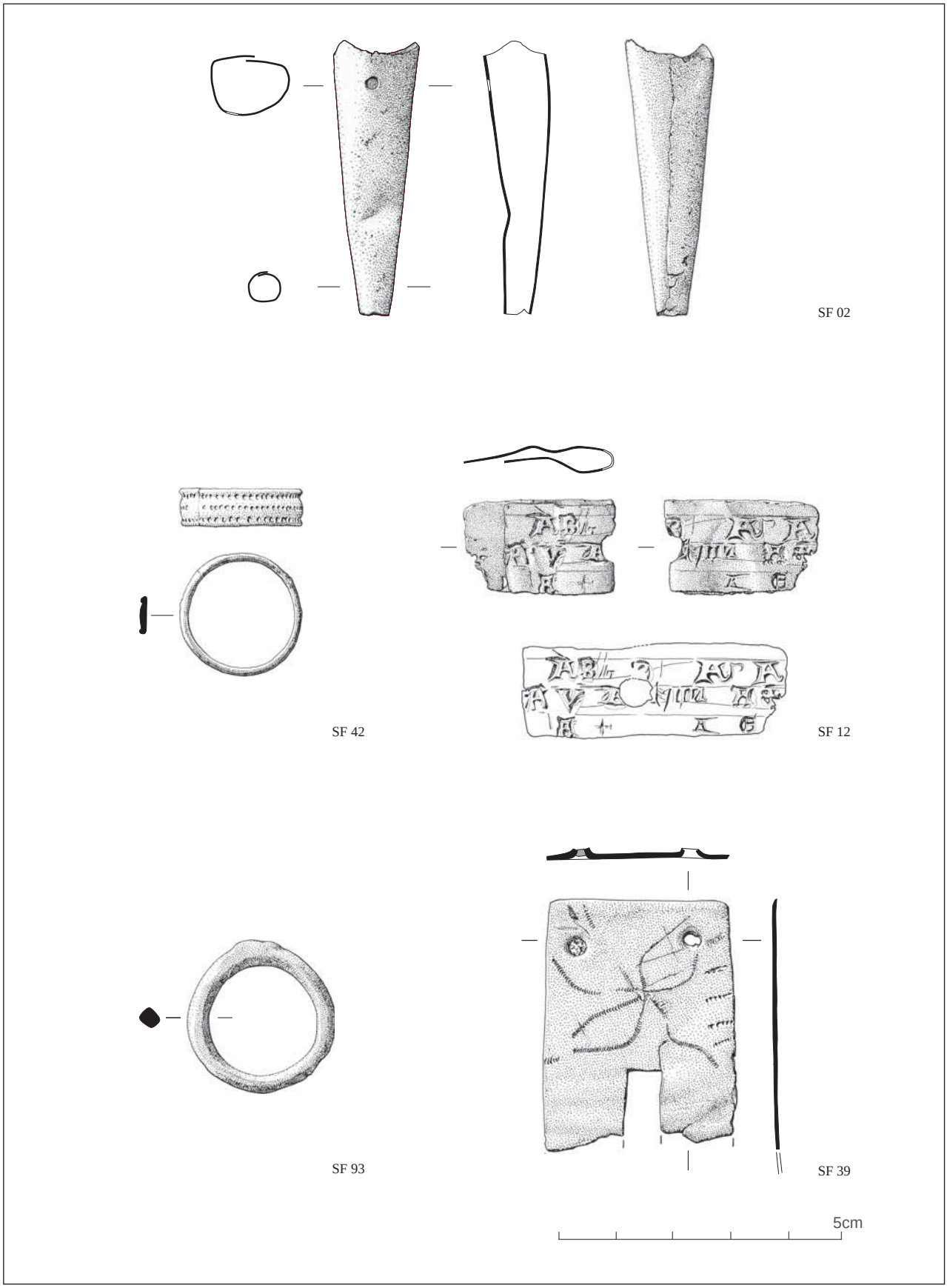


Figure 27 Copper alloy objects Scale 1:1

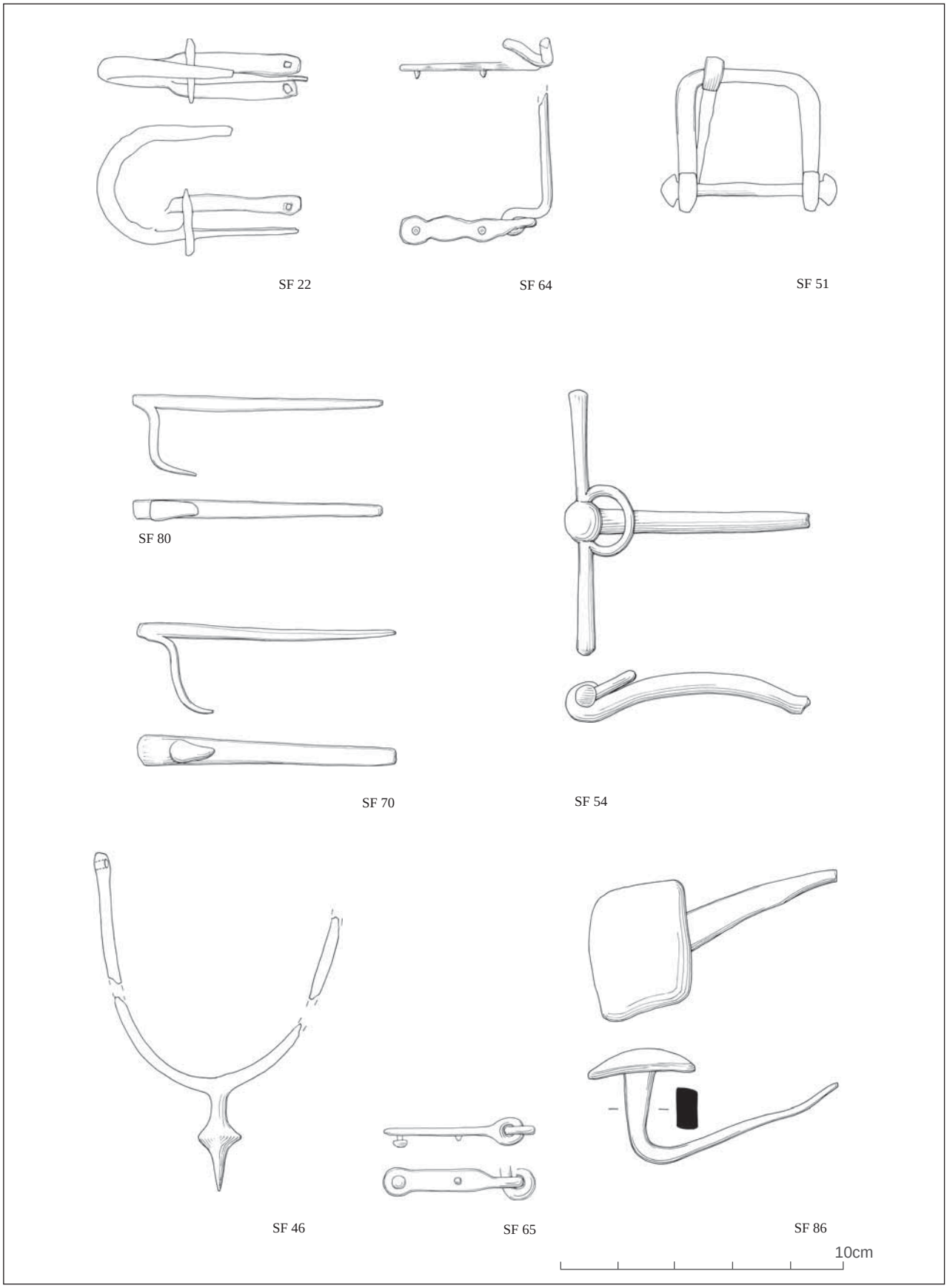


Figure 28 Iron objects Scale 1:2

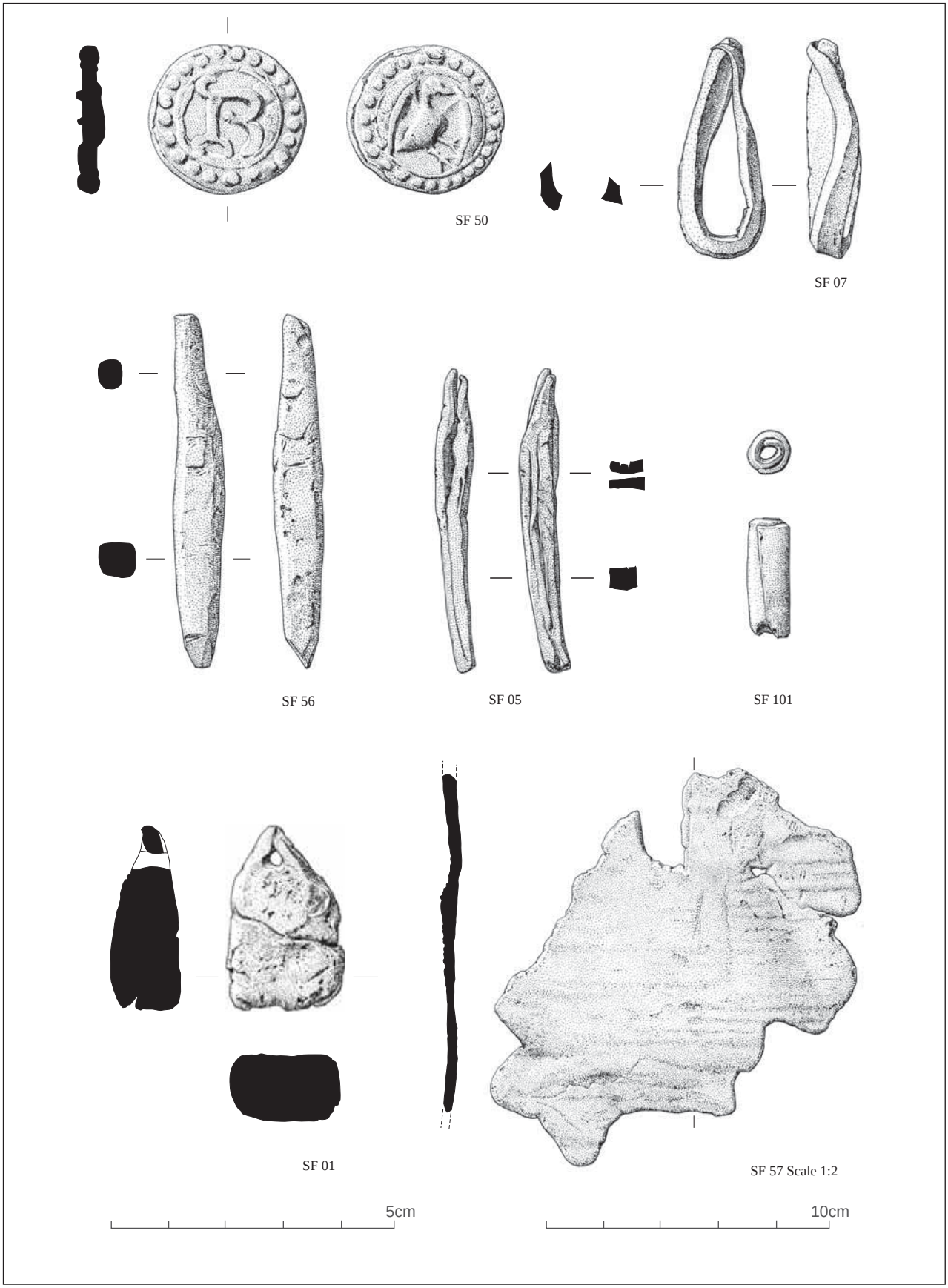


Figure 29 Lead objects Scale 1:1, SF 57 Scale 1:2

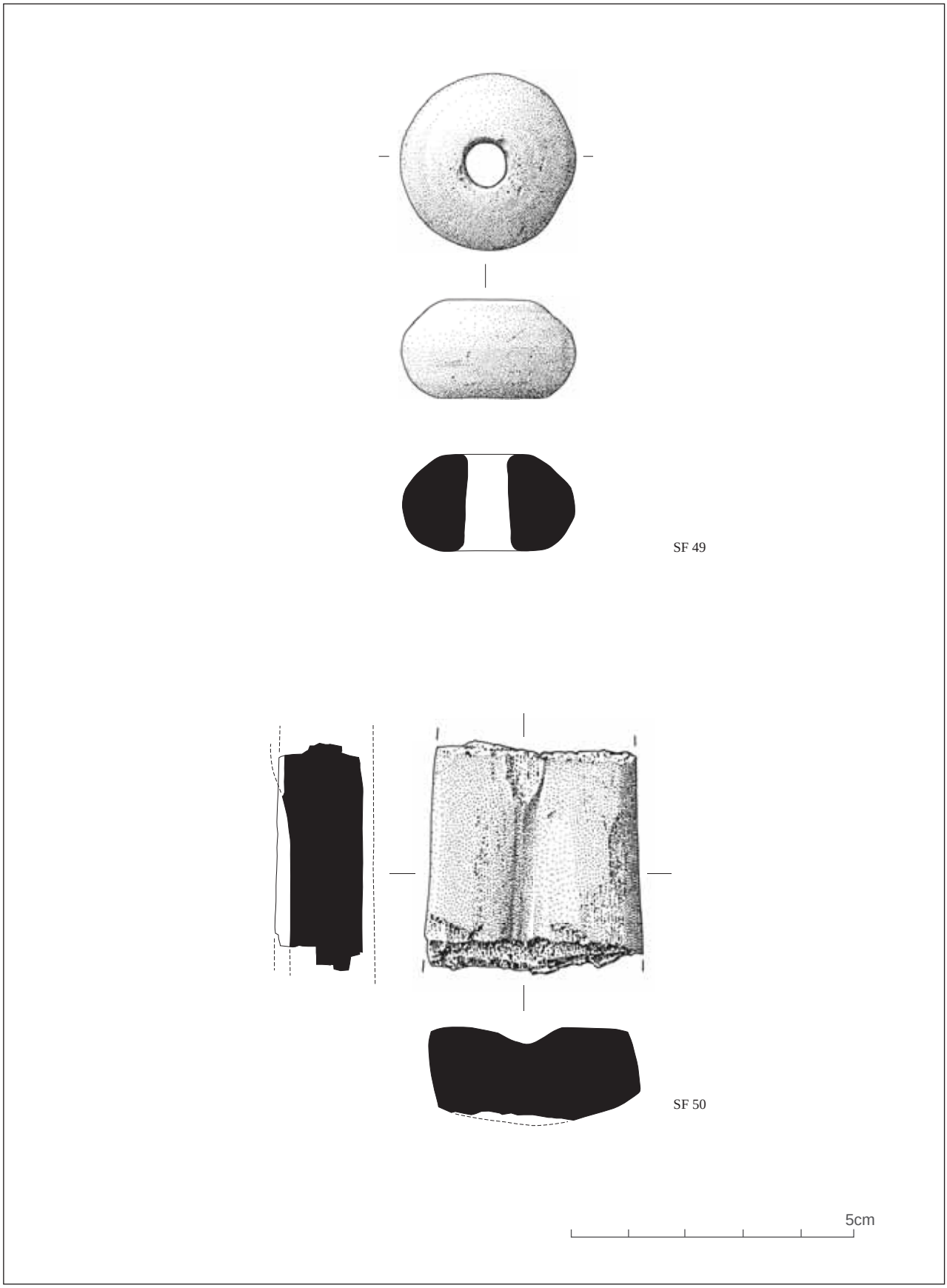


Figure 30 Stone objects: Scale 1:1

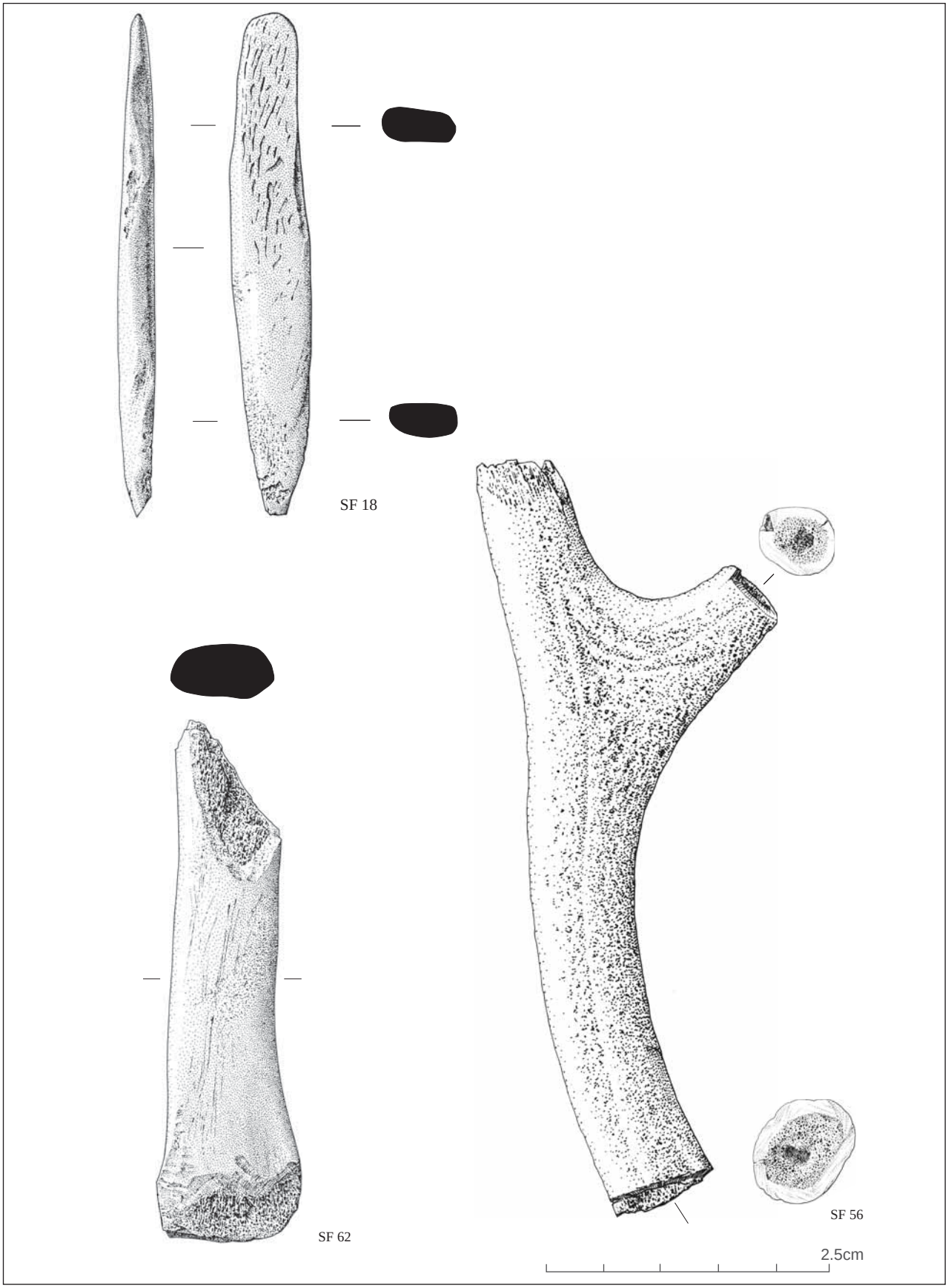


Figure 31 Bone objects: Scale 1:2

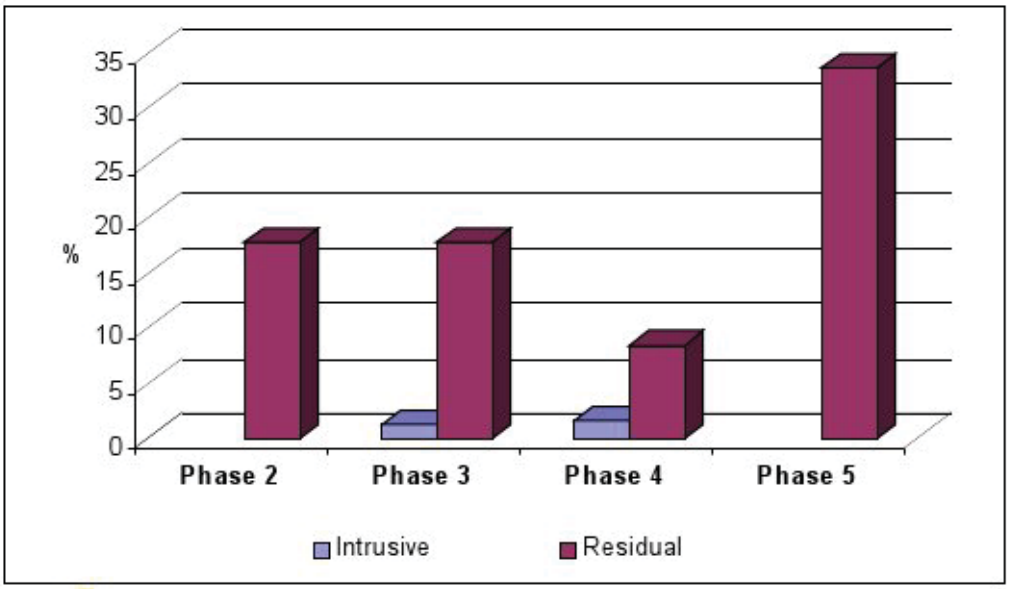


Figure 32: Ceramic residuality and intrusiveness by stratigraphic phase and sherd count

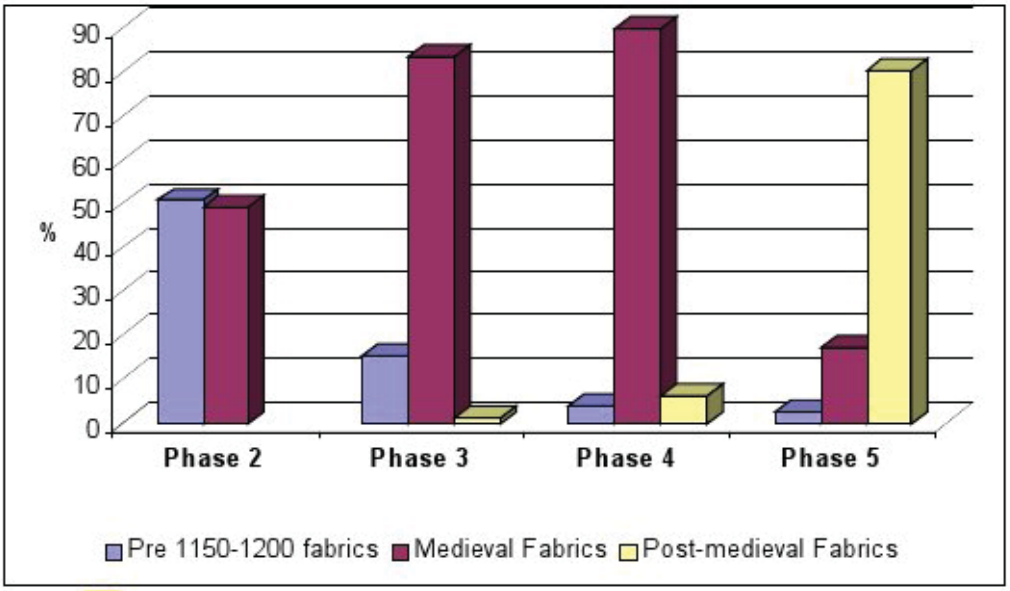


Figure 33: Percentages of pottery compring pre-1150/1200 fabrics and later medieval fabrics (by weight)

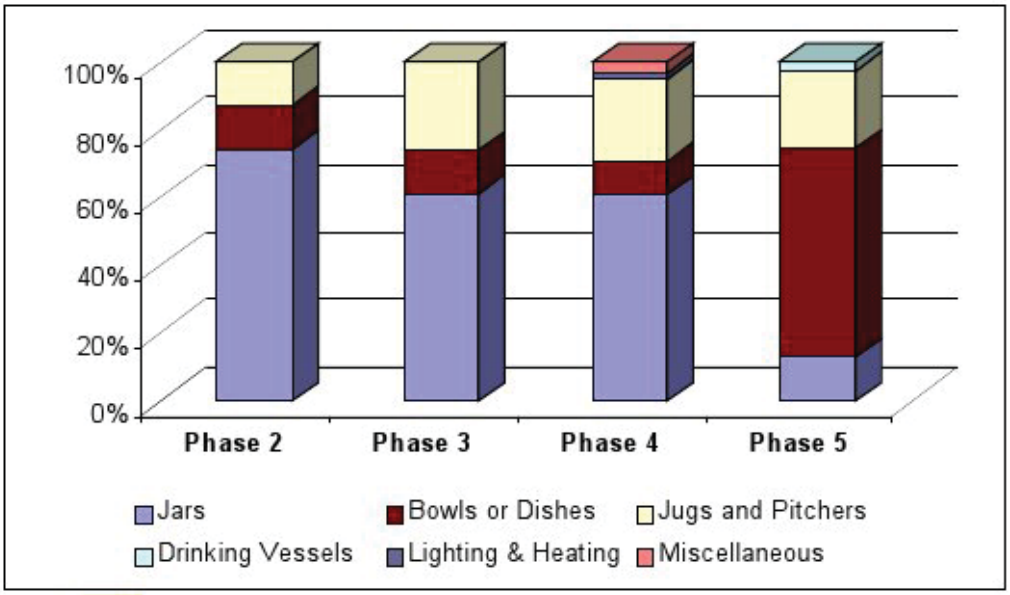


Figure 34: Percentage of vessel functional types in phase assemblages (by weight)

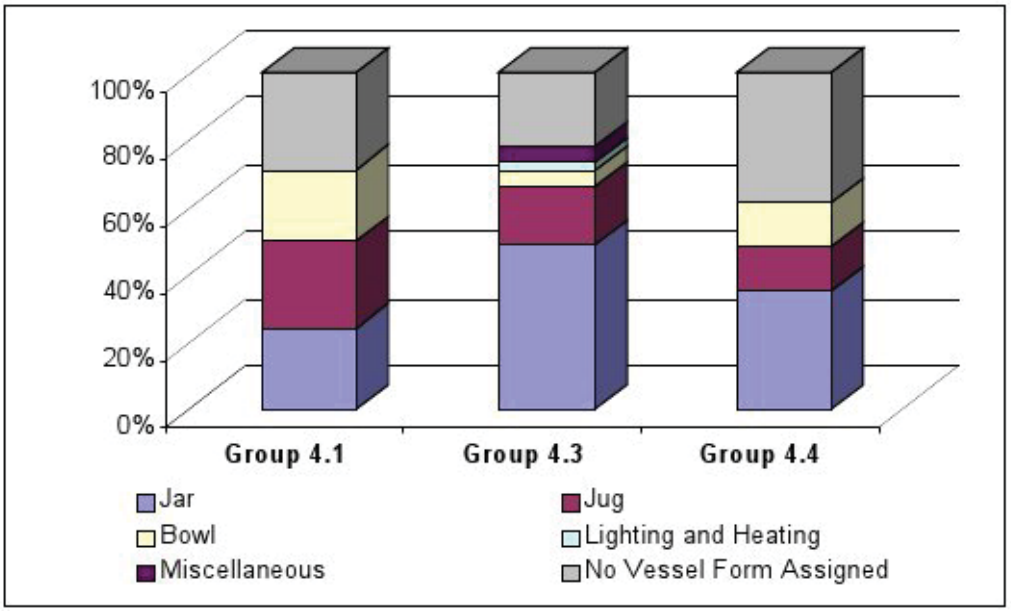


Figure 35: Percentage of vessel functional types in Phase 4 sub-groups (by weight)

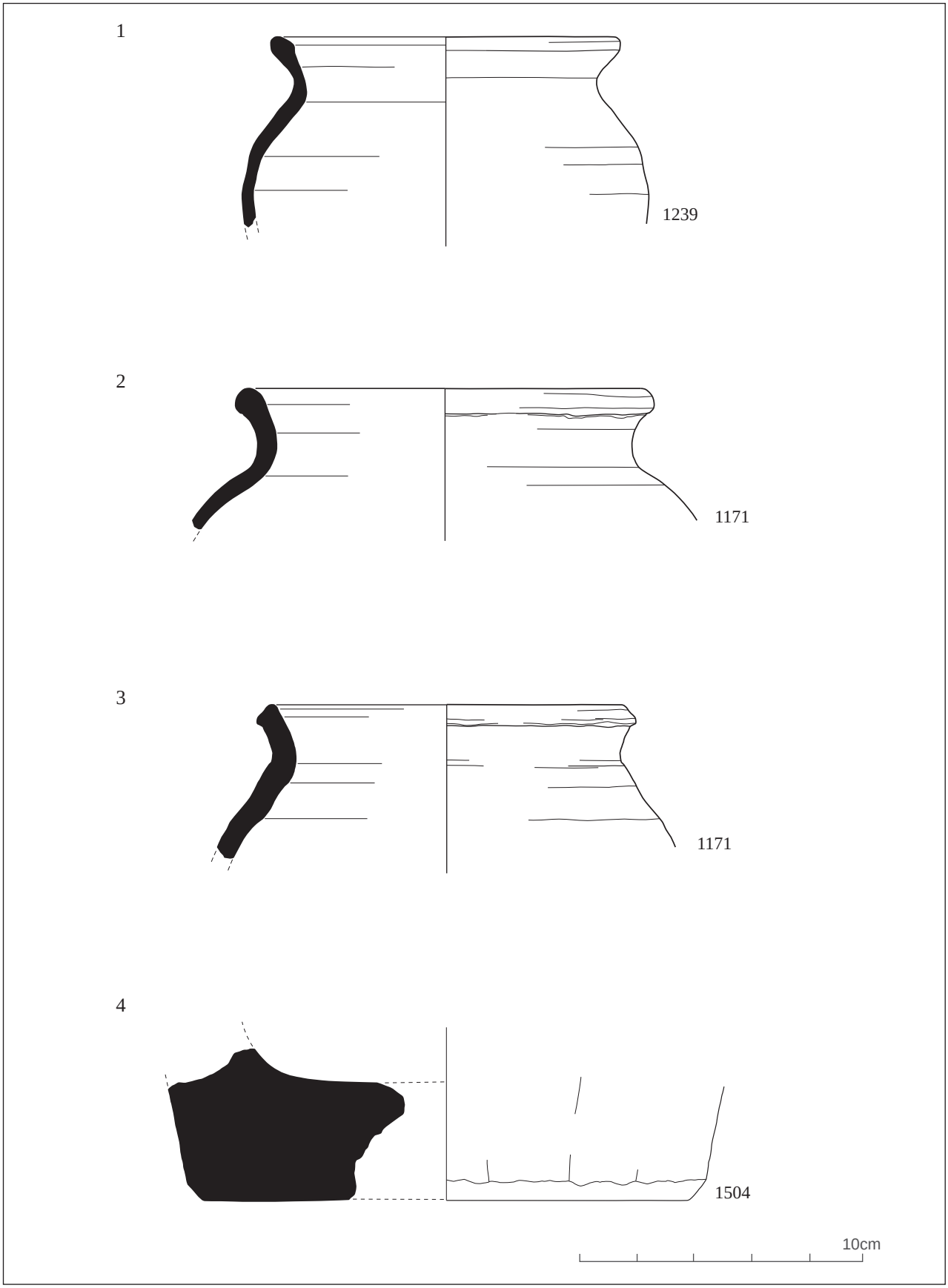


Figure 36 Pottery: Scale 1:2

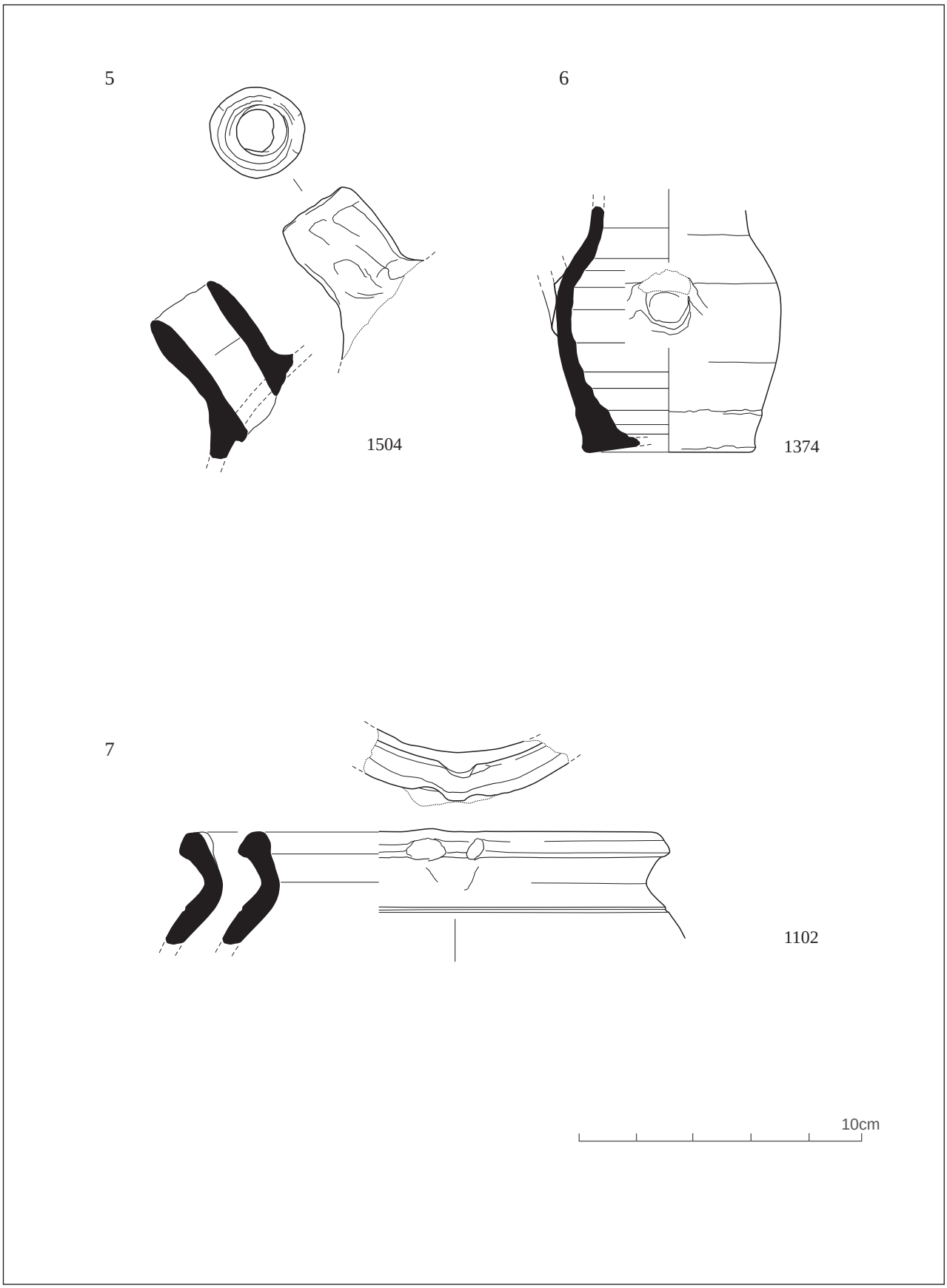


Figure 37 Pottery: Scale 1:2

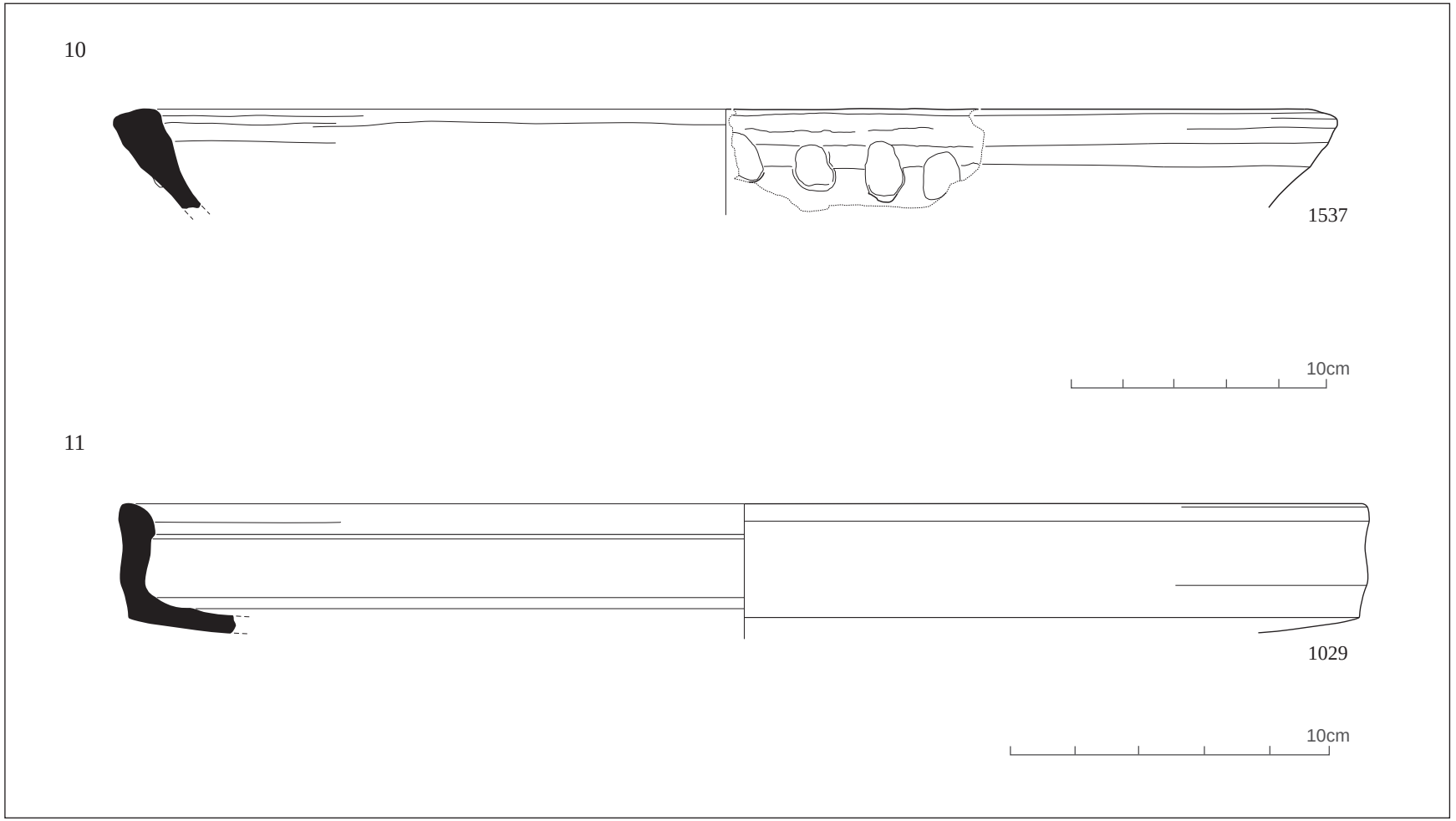


Figure 38 Pottery: Scale as shown.

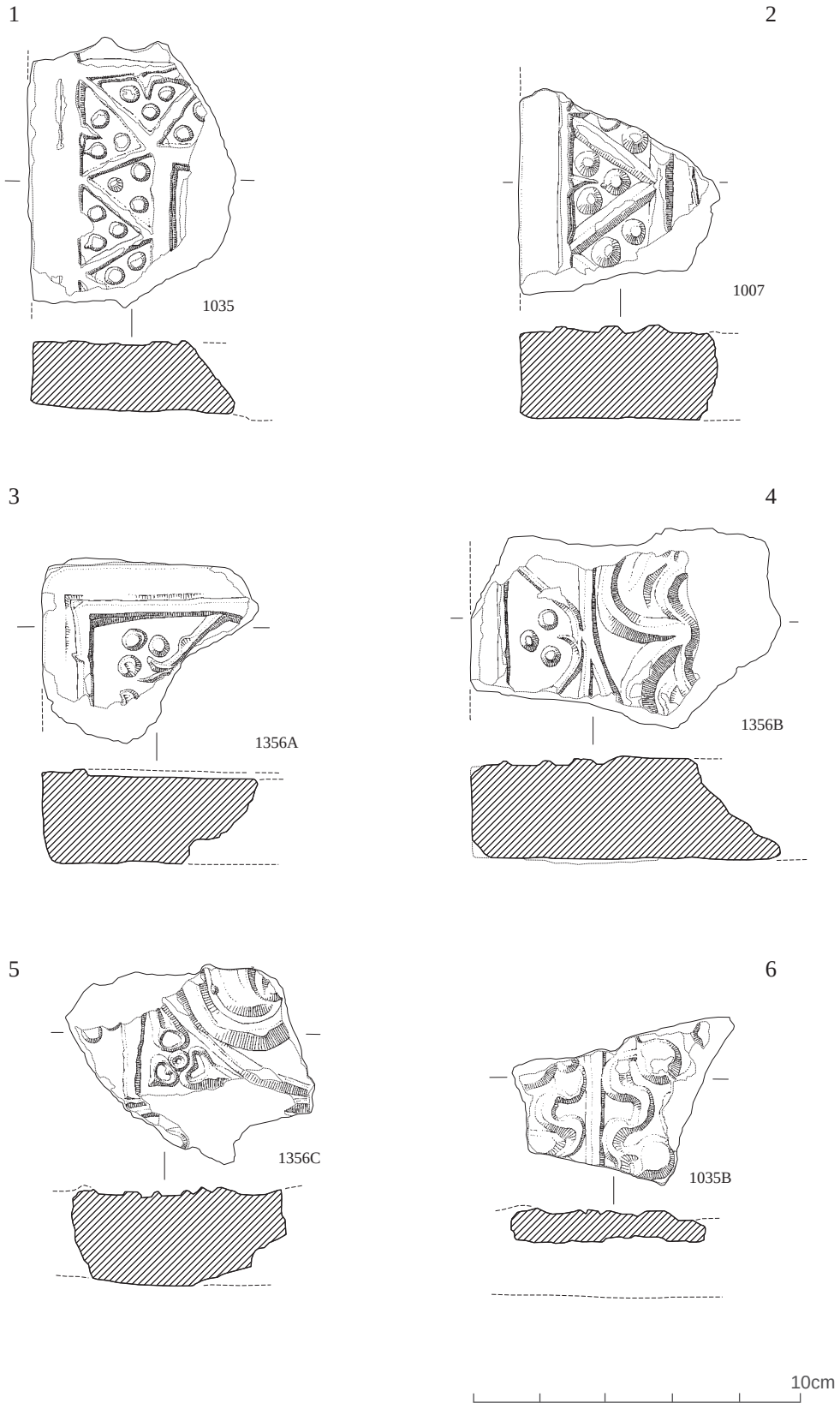


Figure 39 Decorated tiles: Scale 1:2

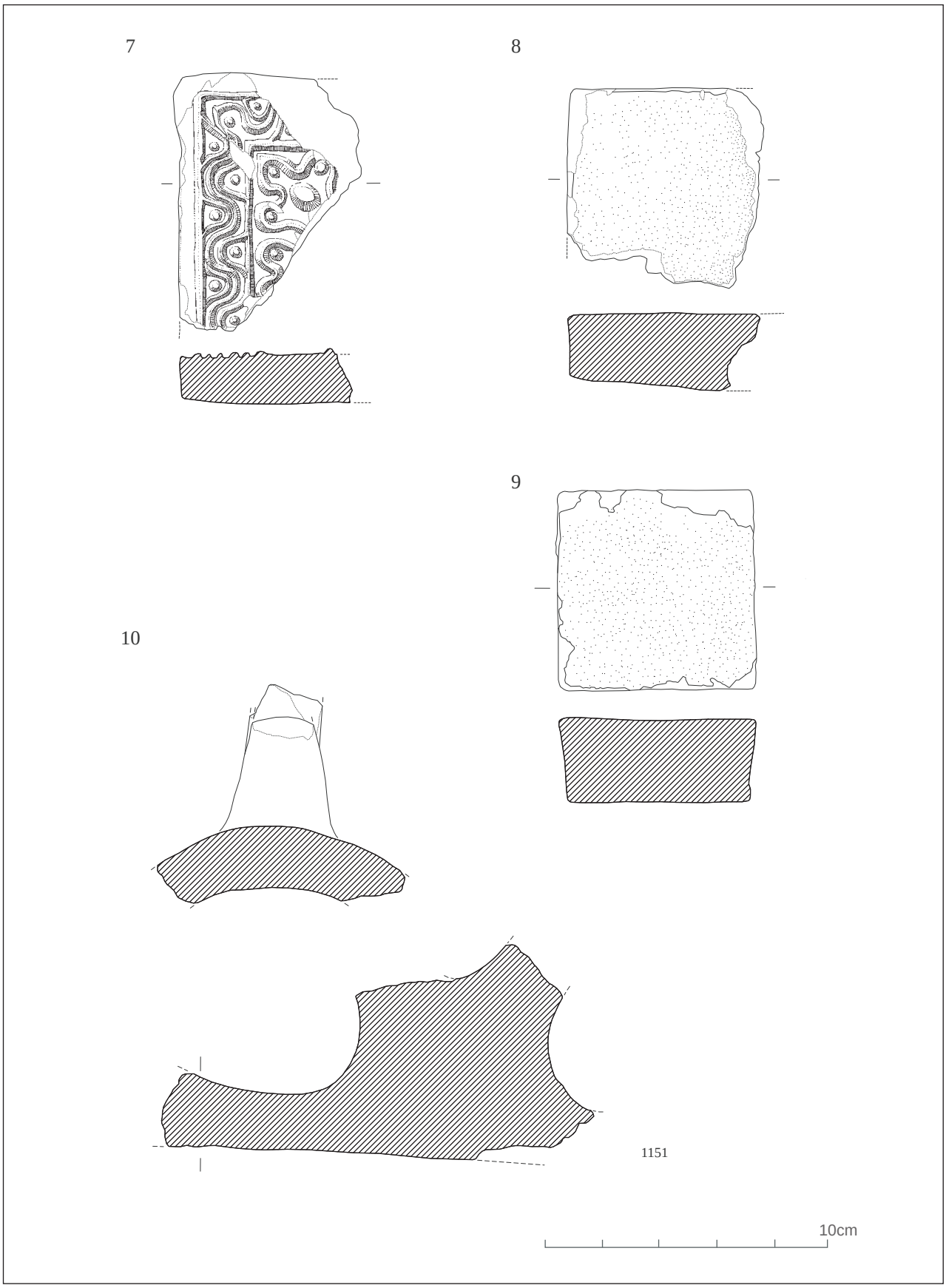


Figure 40 Plain and decorated tiles: Scale 1:2

Plate 1: Excavations in progress (2002)

Plate 2: Possible crane setting (1553, Phase 4)

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