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archaeological field unit

CAM ARC Report Number 951

A Medieval Windmill, Limekilns and Chalk Quarry Pits on Land South of Isaacson Road, Burwell, Cambridgeshire

An Archaeological Excavation

Mo Muldowney

August 2007

Commissioned by Upware Marina Limited

Cambridgeshire County Council
Environment & Community Services

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PROJECT DETAILS				
Project name	Excavation at Isaacson Road, Burwell			
Short description	An archaeological excavation uncovered the remains of Late Bronze Age/early Iron Age structures with evidence for possible metalworking and early medieval industrial activity comprising lime kilns and a post-mill with surrounding C-shape ditch. Many chalk extraction pits and at least one post-built structure were associated with the lime kilns. A late medieval trackway was also identified, which may be a continuation of Mill Lane (to the north). Evidence for metal-working was also identified in the form of slag and smithing/smelting residues. Very low-key activity roughly dating to the Enclosures (1800's) was also identified.			
Project dates	Start	6th March 2007	End	2nd April 2007
Previous work	Geophysical Survey CFIR 004 2006 Evaluation CAM ARC 2006, ECB 2414		Future work	No
Associated project reference codes	BUR ISR 07 ECB 2473			
Type of project	Excavation			
Site status	None			
Current land use (list all that apply)	Private garden			
Planned development	Residential, semi-rural			
Monument types / period (list all that apply)	Windmill/ medieval Extraction pits/ medieval Limekilns/ medieval			
Significant finds: Artefact type / period (list all that apply)	Pottery – medieval Lava quernstone and bone pin beater – Saxon Ironwork - medieval			
PROJECT LOCATION				
County	Cambridgeshire	Parish	Burwell	
HER for region	Cambridgeshire			
Site address (including postcode)	2 Harlech House, Isaacson Road, Burwell, Cambridgeshire			
Study area (sq.m or ha)	1184.37 sq.m			
National grid reference	TL99106587			
Height OD	Min OD	16m	Max OD	18m
PROJECT ORIGINATORS				
Organisation	CAM ARC			
Project brief originator	Kasia Gdaniec			
Project design originator	Upware Marina Limited			
Director/supervisor	Mo Muldowney			
Project manager	Aileen Connor			
Sponsor or funding body	Upware Marina Limited			
ARCHIVES	**Location and accession number**		**Content (e.g. pottery, animal bone, database, context sheets etc)**	
Physical	Cambridgeshire County Stores		Pottery, animal bone, shells, small finds, stone artefacts, photographs, residues	
Paper	Cambridgeshire County Stores		Plans, sections, *pro forma* sheets	
Digital	CAM ARC		Photographs, report, illustrations	
BIBLIOGRAPHY				
Full title	A Medieval Windmill, Limekilns and Chalk Quarry Pits on Land South of Isaacson Road, Burwell, Cambridgeshire			
Author(s)	Mo Muldowney			
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Summary

During March 2006, CAM ARC (formerly Archaeological Field Unit) of Cambridgeshire County Council was commissioned by Upware Marina Ltd to carry out a programme of archaeological excavation on land south of Isaacson Road, Burwell, Cambridgeshire. The excavation followed an evaluation by trial trenching (also carried out by CAM ARC), which took place in November 2006.

The excavation encountered locally and regionally important archaeological remains relating to medieval industrial activity. This included five limekilns (and three stoke holes) with a series of large, contemporary quarry pits and a post-built windmill with surrounding C-shaped ditch.

Other features identified included approximately fifty post holes. Although most were undated, three contained Iron Age pottery and three contained early 12th century pottery. The Iron Age post holes also contained relatively large quantities of iron working debris, suggesting that metal working was taking place in the vicinity. The later post holes, whilst not forming any clear structure, may have been associated with the lime processing activity or alternatively related to the use of the windmill.

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1 Introduction

This archaeological excavation was undertaken in accordance with a Brief issued by Kasia Gdaniec of the Cambridgeshire Archaeology, Planning and Countryside Advice team (CAPCA; Planning Application E/05/01403/OUT), supplemented by a Specification prepared by CAM ARC, Cambridgeshire County Council (formerly Archaeological Field Unit) (Connor 2006). The excavation, 2nd phase, was conducted as the result of the identification of a number of archaeological remains during the 1st phase evaluation work carried out in accordance with a brief issued by the same office. The client Upware Marina Limited was required to carry out the work on 1200 square meters of land adjacent to Harlech house 2 Isaacson Road. The condition was placed on the above planning application in advance of the construction of four houses with garages, access roads, landscaping and services.

The site archive is currently held by Oxford Archaeology East (formerly CAM ARC) and will be deposited with the appropriate county stores in due course.

2 Geology and Topography

The site overlies lower chalk marl deposits (British Geological Survey 1981), and is located on an area of high ground at the south of Burwell village. The land itself slopes gently from the north (just below 18m OD) to the south (16m OD).

3 Archaeological and Historical Background

Burwell is a large, polyfocal fen-edge village with a well-documented history. Finds and archaeological activity from all periods have been identified across the village but it is the evidence from the southern area that is included here.

3.1 Prehistoric

There are numerous entries in the Cambridgeshire HER for Burwell relating to finds of prehistoric date, although few have been recovered by excavation. In close vicinity to the subject site an evaluation on Reach Road (MCB 17708; Allen 2007) found a small quantity of worked and burnt flint in a former water channel, indicating some activity in the area from the later Neolithic/early Bronze Age. Other finds from the south of the village dating to the Bronze Age include a hoard of bronze spear heads, chisels and other implements (MCB7848). Archaeological excavations 300m to the west of the

subject site on Reach Road revealed a single severely truncated crouched burial of probable prehistoric origin (Connor 2002).

3.2 Iron Age and Roman

Evaluation on Reach Road found the partially articulated remains of at least two individuals on the southern edge of a water channel, with a radiocarbon date from one giving a date for deposition in the late Iron Age (Allen 2007). Work by CAM ARC in 2005 at Newmarket Road, Burwell revealed the presence of a new Iron Age settlement within which were two large pits of Early to Middle Iron Age date, containing a range of artefacts and ecofacts. These notably include several semi-complete pots and a pine marten mandible, pierced to form a pendant (Bailey and Popescu, 2006).

Roman finds are more prevalent: a settlement was discovered beneath Burwell Castle (SAM29382) and the remains of ditches, a possible corn drying oven and a single burial were found during excavations at Reach Road in 2001 and 2002 (Connor 2002). Other Roman settlement evidence in the form of pottery, box tiles and roof tiles were found by ploughing a few hundred yards south-west of the castle (CHER04663) (Franklin 2005).

3.3 Anglo-Saxon

Excavations at Reach Road (Connor 2002) identified remains of possible Anglo-Saxon date, which comprised post-built structures and a possible sunken-featured building (SFB). Earlier in the 20th century an early to mid Saxon inhumation cemetery was excavated between what is currently Newmarket Road and Mill Lane (CHER06764).

3.4 Late Anglo-Saxon/Medieval

The remains of a Conquest period castle of national importance are located to the north of the development area (SAM29382). At Reach Road excavations uncovered 11th to 15th century settlement activity including the remains of a later medieval limekiln and a lode channel (Connor 2002). Burwell also contains many buildings of historic interest; nearest to the subject site is No. 6 High Street “Isaacson's”, so called in the 18th century when the family of that name occupied the house. This building has early 14th century origins (CHER 06808, LB489342), there are no direct documentary references for the house (RCHME 1972), but it is thought to have been lodgings possibly belonging to knights hospitallers. A little further to the south-west is a building known as the “Manor House”, an early 17th century house with a range of outbuildings including an aisled barn, Malt Kiln and granary, all 18th century.

3.5 Previous Work

3.5.1 Geophysical Survey

A fluxgate gradiometer survey was commissioned by CAM ARC and carried out by Peter Masters of Cranfield University on the 17th October 2006. The survey identified two indistinct curvilinear anomalies indicating either ditch-like or natural features but concluded that the site had limited archaeological potential (Appendix 7) since most of the anomalies appeared to be derived from modern garden features or trees. The presence of many trees coupled with a great deal of modern ferrous debris in the topsoil are likely to have contributed to a distortion of the results, effectively masking the archaeological features. Even with the benefit of hindsight it is hard to match the results of the geophysical survey to those of the excavation, although an area of high magnetic resistance was located over the southern corner of the windmill ditch (Appendix 7. figure 0).

3.5.2 Geotechnical Assessment

An assessment of the soil and geology over the site was carried out in 2006 by MLM Environmental Limited (Warth 2006). A number of pits were machine excavated across the area, some of which were exposed during both the evaluation and excavation stage.

3.5.3 Archaeological Evaluation

An evaluation was carried out in November 2006 by CAM ARC. Seven trenches were located across the development area with reference to existing tree protection orders and areas of interest highlighted by the Geophysical survey. The evaluation revealed extensive archaeological remains in the form of ditches, pits, post holes and possible plough scars dating to the medieval period (Fig. 2). The features were thought to represent industrial activity, namely chalk extraction and possible iron working.

Trench 1 contained four ditches, three pits and one post hole, five of which were seen in Area A (Fig. 2).

Trench 2 contained two ditches and one pit at its north end and all were re-exposed in Area B.

Trench 3 lay beyond the southern excavation boundary and contained one undated pit (**40**).

Trench 4 contained possible ditches, pits and post holes, largely located near its north end. Almost all of trench 4 was re-exposed during the excavation.

Trench 5 was partially re-exposed in the south-east corner of the excavation and contained features at its east end. These comprised a series of five pits and one ditch. Although pits **78** and **79** were located within the excavation area, they were not re-excavated.

Trench 6 lay just beyond the east edge of excavation and contained two ditches, one pit, one post hole and four plough scars.

Trench 7 was located in the far east of the development area and not included in the excavation area. It contained one ditch, four pits, six plough scars and two layers.

4 Methodology

The objective of this excavation was to record the surviving archaeological deposits within the development area, with the intention of reconstructing the history and use of the site and of preserving the archaeological remains by record. The Brief required that two areas were to be excavated. These areas were located under the footprints of the proposed residential development and, where possible, in the areas of greatest archaeological potential (Fig. 1). Area A covered 257.25m^2 and was positioned to re-examine the features identified in Trench 1, whilst Area B covered 927.12m^2 and was positioned to allow re-examination of the features identified in trench 2 and 4 although almost all of trench 5 was also re-exposed. Trench 3 and trench 7 lay beyond the limit of both Area A and Area B within the areas of the site to be developed only as gardens.

Machine excavation was carried out under constant archaeological supervision with a tracked 360 mechanical excavator using a toothless ditching bucket.
All archaeological features and deposits were recorded using CAM ARC's *pro-forma* sheets. Both areas were planned at 1:50 scale and all sections were drawn at either 1:10 or 1:20, as appropriate. The photographic record comprised 35mm black and white and colour prints, supplemented by digital images taken with a Canon Powershot Pro90 camera.

A programme of environmental sampling was implemented, partly based on the results of the evaluation. Due to the presence of slag in some features, including an iron working hearth bottom (SF2) (pit **64**, Trench 5) it was arranged that every post hole would be 100% sampled with at least 10 litres of that sample investigated for hammerscale. Deposits in other features would be sampled according to their content, for example, high charcoal levels.

All excavation site records are currently held at CAM ARC's headquarters in Bar Hill and stored under the site code: BUR ISR 07.

4.1 Survey

A Leica GPS was used to establish the limits of each excavation area based on data supplied by Upware Marina Limited and a Leica Total Station Theodolite was used to establish the site grid. This grid was oriented to fit the excavation areas, rather than true north, for ease of recording and was also tied into the Ordnance Survey grid.

Two benchmarks were established on site and their values, ascertained using GPS, were:

Station 1 - 16.69m OD
Station 2 - 17.28m OD

4.2 Site Conditions

Site conditions varied over the course of the excavation. During machine stripping, rain fell almost constantly and the dumper caused deep ruts across the development area. Fortunately, this did not adversely affect the underlying archaeology. In the following weeks the weather conditions were generally bright and sunny enabling excavation to be carried out without interruption. Hand-excavation was time-consuming, as highlighted during the evaluation, but for different reasons. Many features were large, or deep and almost all contained varying quantities of loose chalk rubble. In addition, feature clarity was reduced in some areas, particularly in the north and east of Area B, where an extensive soil layer concealed underlying features and in the east where identical fills masked the relationships between a series of intercutting pits.

5 Results

Archaeological features were identified across both excavation areas and in many cases were also seen and examined during the evaluation. Where relevant, the results of the evaluation will be incorporated with those of the excavation, including finds and environmental data. All evaluation numbers lie in a range between 1 and 137 to distinguish them from the excavation numbers, which commence at 200. The results are presented below, chronologically by Period and Phase, across all areas. Detail concerning fill descriptions, etc. can be found in Appendix 1.

The site was first used during the early to middle Iron Age (or perhaps as early as the late Bronze Age) (Period 1, S. 5.1). A hiatus followed the Iron Age and activity recommenced in the 12th century (Period 2, S. 5.2) although some Saxon occupation (8th to 9th century) is thought to have occurred near the site. Industrial activity took place during the 12th century when the site became a focus for lime processing,

followed in the 13th century (Phase 2.3, S. 5.2.3) by milling. Industrial activity ceased prior to the early 14th century and shortly after, a trackway developed. Throughout the post-medieval period (Period 3, S. 5.3) and into the modern period, the land remained under arable use (Wareham and Wright 2002, 335). Most recently, the land was a privately owned garden.

The natural geology largely comprised Cretaceous lower chalk marl and included part of the Totternhoe stone (clunch) stratum in the east corner (trench 7). It was predominantly white in colour with isolated patches whitish pink and whitish yellow in colour. In the south-west corner of the development area the chalk was severely damaged by root activity, primarily from a row of Lawson Cypress (Hayden's, 2005) that previously stood parallel to the site's western boundary.

Subsoil (3) was pale greyish brown chalky clay but not present across the entire development area. Where identified, it varied in thickness from 0.1m to 0.44m. The topsoil, dark greyish brown silty clay (1) was ubiquitous and varied in thickness from 0.08m to 0.53m. It contained finds datable to the 16th to late 18th century.

5.1 Period 1 (Late Bronze Age to early to middle Iron Age)

Post holes and Potential Structures (A to D)

A number of post holes in the excavated area are thought to date to (as early as) the late Bronze Age to the early to middle Iron Age, although only three (**210**, **234** and **453**) contained pottery sherds. Interestingly, two of the three (**234** and **453**) also contained smithing or smelting residues in the form of hammerslag, flakes and spheroids (Appendix 3), which although in small quantities, were generally greater than those from other samples taken from features of medieval date.

Post hole **234** (and its antecedent **224**) formed a four-post structure (Structure A) with post holes **202**, **238** and **214** (Fig. 4), which measured approximately 2m by 2m. It was located in the north half of Area A, on an approximate north-east to south-west orientation. Post hole **214** also contained metal working residues, but as previously, not in particularly large quantities (Appendix 3).

A further two four-post structures were identified near the west edge of Area B and although undated, are assigned to Period 1 due to their similarity. Structure B (Fig. 5) was located immediately to the north of stoke hole **251** (see below) and lay on the same orientation as Structure A. It was slightly larger than Structure A, measuring 2.5m by 2.5m and comprised post holes **512**, **536**, **504**, **498**. Structure C (Fig. 6) was almost square and lay approximately 7m south-east from Structure B. It comprised post holes **463**, **425**, **402**, **406** and was smaller than the previous structures at approximately 1.75m by 1.60m.

It was oriented approximately north-east to south-west. Post hole **453** (truncated by stoke hole **251**) may have formed a porch on the north-east side of this structure.

Post holes **222**, **212**, **216** and **230** (Area A) formed the south-east side of a circular structure (Structure D), approximately 6m in diameter. The north half was located beyond the north edge of excavation. Post hole **204** may be an internal feature.

Two short stretches of curvilinear ditch were identified in trench 1 (**42**) and trench 7 (**31**) Both ditches were 0.5m wide by up to 0.23m deep (although ditch **42** was severely truncated by 20th century landscaping for a tennis court, landowner pers. comm.) with a potential diameter of approximately 10m. Each contained a single fill. Whilst ditch **42** had no visible internal stratigraphy, **31** was truncated by large Phase 2.2 pit **5**, which contained two residual sherds of Iron Age pottery and a possible earlier Neolithic flint fragment (SF1) (presumably derived from the ditch as this is the only feature it was seen to truncate). Given their similarity, both are likely to be Iron Age and may have been contemporary with structures A to D. It is possible that both of these ditches represent the ephemeral and truncated remains of drip gully's which would have surrounded Iron Age round houses. Although this is by no means certain.

Post hole **210** was 0.21m in diameter and 0.05m deep. It was rectangular in plan and contained a single fill from which a single sherd (0.43kg) of Iron Age pottery was recovered.

Post holes **224**, **234**, **202**, **238** and **214** ranged in size from 0.18 to 0.39m in diameter and from 0.13 to 0.21m deep. All were circular with U-shape profiles, with the exception of **202**, which was oval and had a v-shape profile. Each contained a single fill. Post hole **234** was the only one of this group of features to contain artefacts – 0.020kg of pottery sherds.

Post holes **512**, **536**, **504** and **498** were either oval or circular in plan and were between 0.14m and 0.31m in diameter and no more than 0.28m deep. Each contained a single fill, from which no finds were recovered.

Post holes **463**, **425**, **402** and **406** were all oval in plan and again contained only one fill each. They were on average 0.26m long by 0.16m wide and no more than 0.2m deep.

Post hole **453** was circular in plan and 0.23m in diameter by 0.14m deep; it contained a single sherd (0.004kg) of Iron Age pottery.

Post holes **222**, **212**, **216** and **230** were circular or sub-circular in plan and were on average 0.33m long by 0.31m wide and up to 0.4m deep.

Possible internal post hole **204** was 0.36m in diameter and 0.14m wide. No finds were recovered.

Trench **42** was located 4.5m from the west end of trench 7. It lay largely beyond the limits of the trench and was truncated by pit **534**. No finds were recovered.

Trench **31** was located at the south end of trench 1, with the majority of the feature lying beyond the limit of the trench. No finds were recovered.

5.2 Period 2 (Medieval)

No further activity is thought to have taken place on the site until the 12th century (Fig. 7), although two residual artefacts - a Late Saxon bone pin beater (SF15) (Fig. 16) and a single sherd of Buttermarket-type Ipswich ware (AD 725-850) - suggest the proximity of domestic occupation during the Saxon period (Appendix 2).

Period 2 comprises lime kilns, stoke holes, pits, post holes and a gully, and has been sub-divided into two Phases - Phase 2.1: Early 12th century and Phase 2.2: Late 12th century

Some features, although undated, have been assigned to either Phase 2.1 or Phase 2.2 on a stratigraphic basis. All the undated features that were not stratified are included in s.5.7.

5.2.1 Phase 2.1 (Early 12th century)

Phase 2.1 represents the first period of activity since the Iron Age (Period 1) and comprised wide, shallow pit **412** (**105**), ten pits (including one from the evaluation) and eleven post holes (**218**, **502**, **530**, **508**, **510**, **500**, **506**, **461**, **334**, **93** and **496**).

Shallow pit **412** was dug through the topsoil to expose the underlying chalk natural, into which many pits were cut, the earliest of which were **544**, **480**, **486**, **88** and **549** (see below). The cut was left open and more pits were dug throughout the 12th century.

Pit **412** (**105**, trench 4) was approximately 14m long by 11m wide and no more than 0.2m deep. It contained the largest assemblage of pottery, comprising fifty-one sherds (0.866kg) of 13th century pottery as well as a smaller quantity of animal bone. A large volume of mussel shells were also observed throughout the backfill (411). The cut originated in the early 12th century.

Twelve pits were scattered across the area and varied in shape between circular, sub-circular and rectangular and have been divided into two broad groups. The first group comprises pits **256**, **549**, **544**,

124, **486** (**86**), **88** and **480** (**130**); all lie at the north of the site, except **256**, which is located to the west. Of particular interest are sub-rectangular pit **480** and circular pit **544** - the latter may have been a large, deep post hole with vertical sides and a flat base. Currently, the majority of pits in this phase are of unknown function.

Pit **256** contained four fills and was 1.6m wide by 1.24m deep. It was sub-circular in plan, had on overhang on its west and north edge and was truncated by stoke hole **251**. Four sherds of early 12th century pottery were recovered from both the primary (255) and upper (252) fills in addition to a small quantity of animal bone.

Unexcavated pit **549** was visible in the edge of windmill foundation trench **277** and was 0.9m wide by 0.46m deep. No finds were recovered. Although the shape in plan suggests the presence of two pits in this location, it was not possible to determine a distinction between fills.

Pit **544** was 0.75m wide by 0.9m deep and had vertical sides with a flat base. The fills were observed in the exposed face where it was truncated by windmill foundation trench **277** and numbered three (541 to 543). Only the primary fill (543) was excavated in order to ascertain the full depth of the feature and to recover pottery. One sherd was identified and dates to the early 12th century. No other finds were recovered.

Unexcavated pit **124** (trench 4) was located south-west of and truncated by pit **555**. It was recorded as over 1.16m wide by 0.86m deep and contained two fills (125, 126), from which a single sherd of intrusive 13th to late 14th century pottery was recovered.

Pit **486** (**86**) contained two fills (484 and 485) and was at least 1.7m wide by 0.8m deep and had a flat base. It was truncated on the south-west side by pit **527** and on the east side by **490**. Seventeen sherds (0.250kg) spot-dated to the early 12th century and a small quantity of animal bone was recovered from the upper fill (485/85).

Pit **88** (trench 4) was 0.75m wide by 0.5m deep and had a square profile. The fill (87) comprised small, angular chalk blocks in a light greyish white crushed chalk matrix and contained a single sherd of intrusive pottery dated to the 12th or mid 13th century. It was severely truncated by pit **478** and **488**.

Pit **480** (**130**), underlying pit **486**, contained three sherds (0.018kg) of early 12th century pottery. No other finds were recovered.

The second group was located in the south-east corner of the excavated area and comprised wide, shallow sub-circular chalk extraction pits **383**, **389**, **390** and **366** and kiln **325**. An unknown number of pits to the south and north may also belong to this group.

Pit **383** was truncated by **374** and had steep sides and a flat base. It was at least 1.7m wide by 1.28m deep (although it survived to a depth of 0.4m only). No finds were recovered.

Pit **389** was one of the largest excavated in this area, measuring at least 3.84m wide by 1.14m deep. It was probably sub-circular in plan and contained four fills (384 to 387). A small amount of pottery was recovered from fill 386 and dated to the early 12th century. No other finds were recovered.

Pit **390** contained one fill (388) and was truncated by pit **389**. It was probably sub-circular or oval in plan and measured 2.1m wide by 0.64m deep. A single sherd of early 12th century pottery was recovered.

Pit **366** was located to the north-east of kiln **325** and to the east of pit **390**. It was sub-circular in plan and had largely shallow, gently sloping sides. Only the south half was revealed at the base of a machine-excavated slot through trackway **367** (see below). It contained seven compacted fills, from which six sherds of pottery were recovered. All were dated to the early 12th century. Fragments of lava quernstone (SF 17) were also recovered.

Limekiln **325** (**442**) contained four large fills (324, 326, 399, 559) with no tip lines, implying the feature was hastily backfilled. No associated stoke hole was identified, but was probably located to the west or east (overlain by the trackway **367**). Both pottery (a single sherd dating to the early 12th century) and small quantity of animal bone was recovered from the upper fill (324). This kiln was half-sectioned by machine due to its size (4m diameter by 2.7m deep). This was done under close archaeological supervision and the material removed was put to one side and examined, by hand, for artefacts. The section revealed was cleaned and recorded.

Structures

Three post holes (6%) were assigned to Phase 2.1 on the basis of pottery (**530**, **218** and **496**), whilst a further seven were assigned on the basis of spatial association or stratification.

Any structure associated with post hole **218** in the north-east corner of Area A is likely to have lain to the north and therefore beyond the limit of excavation as there are no similar post holes nearby. However, a six-post structure (Structure E) was identified, immediately to the west of windmill ditch **259** and north of limekiln and stoke hole **266** and **251**. It comprised post holes **530**, **508**, **510**, **500**, **506** and **461** and was oriented approximately east to west, measuring 4.5m long by 2.8m wide. There is possibly a second structure (Structure F) located in the north of the area, on a north-east to south-west orientation. It was a four-post structure comprising post holes **496**, **334** and **93** (the fourth

having been truncated by Phase 2.2 pit **478**), which measured 6.4m long by 4m wide. Unfortunately it is difficult to be certain of this structure as it has been heavily truncated, any remaining post holes were lost due to later activity on the site including the cutting of pits and the windmill phases.

Post hole **502** did not appear to form a structure but was truncated by Phase 2.2 pit **490**=**525**. It was at least 0.38m in diameter by 0.3m deep and contained a single dark fill (501).

Post hole **218** was rectangular in plan and had a square profile. It contained a single fill and was 0.4m long by 0.28m wide and 0.28m deep. Two sherds of early 12th century pottery were recovered.

Post holes **530**, **508**, **510** were either circular or sub-circular in plan, whereas **500**, **506** and **461** were all oval. They varied in size from 0.1m to 0.27m in diameter and were between 0.05m and 0.24m deep. All contained a single fill and a little pottery (early 12th century) was recovered from post hole **530** only.

Post holes **496**, **334** and **93** were all circular in plan. They varied in diameter between 0.25m and 0.35m and were up to 0.18m deep. Two fills were recorded in post hole 93; the primary fill (92) was an unusual brownish yellow sandy silt. Only **496** contained pottery and no other finds were recovered.

Post hole **502** had vertical sides and a concave base. No finds were recovered.

5.2.2 Phase 2.2 (Late 12th century)

A large number of pits, the remainder of the limekilns, three stoke holes and a gully have been assigned to Phase 2.2. The majority of the pits are thought to have been for chalk extraction and associated with lime kilns **266**, **365**, **483** and **461**, whilst the remainder were of unknown function. Two broad types were identified based on their size, large pits and small pits, these seem to have been in separate locations. A third type, wells/shafts, was located in trenches 6 and 7.

Large Pits

In general, the large chalk extraction pits were clustered in the south-east corner near kiln **325** (including two which were examined during the evaluation, **78** and **79**), with a further three (**261**=**77**, **263**, **423**) (minimum) to the north and west. The smaller pits were located in the north of the site, some truncated by windmill foundation trench **277**.

The chalk extraction pits varied in size from approximately 1.5m to 5.5m in diameter; depth varied from 1m to over 1.7m. Not all were fully excavated due to the health and safety concerns associated with deep excavation. None were fully visible in plan, due to severe truncation,

but all are thought to have been circular or sub-circular in plan. Most had overhanging edges and flat bases because of the unstable nature of the chalk. Pits **407** to **410**, in the south-east corner were the least distinguishable, suggesting that open quarrying was taking place, whereas (undated) pits **380** and **374** were clearly cut and re-cut (Fig. 8, 13). Although the slots were adjacent (see Fig. 8), the fills of **407** to **410** were so indistinct that it was not possible to equate the pits. A minimum of five other (unexcavated) pits were discernible in plan, but their relationship with each other and the above pits was unclear due to very similar fills and/or partial concealment by a levelling layer (368).

Undated pit **374** was 2.88m wide by 0.8m deep and had a slightly overhanging east side; its west edge was truncated by pit **380**. It contained six fills (369 to 373, 381), all of which are backfills. Like pit **380** (see below) it was overlain by 368, a levelling layer. No finds were recovered.

Undated pit **380** was the latest in this sondage and comprised five fills (375 to 379). It had an uneven, U-shape profile and was 1.64m wide by 1m deep. No finds were recovered.

Pits **407** to **410** were located in the adjacent sondage to **374**, **383**, **380**, **389** and **390**, but did not contain the same clear sequence of cutting and re-cutting. Instead, the sections revealed a series of general backfills with no clearly defined edges, except at the natural chalk. In this sondage, the pits varied in depth from 1.22m to 1.46m. Numbers were allocated for finds only (446 to 449). Shell, flint, animal bone and a relatively small quantity of pottery from the early 12th to 13th centuries was recovered from these fills.

Pit **78** was located approximately 4.5m west of pit **64** and was probably oval in plan. It was +1.3m wide and excavated to a depth of 0.78m. Two fills (100 and 101) were identified, but only the upper one (101) contained pottery (residual), which was dated between the 13th to late 14th century.

Pit **79** was circular in plan and 3m wide by +0.78m deep. One quarter was excavated and seen to contain five fills: 95 to 99. Upper fill 99 was the only deposit from which a very small amount of pottery (< 0.001kg, dating to the 12th to mid 13th century) was recovered.

Levelling layer 368 was silty grey clay and overlaid the fill of pits **380** and **364**. It was between 0.16m and 0.25m thick and contained no finds.

Pits **261**=**77**, **263** and **423** were located in the north and west of the excavated area and truncated by windmill ditch **259**. The former are thought to mark the north limit of the chalk extraction area, as it is near this point that the land slopes sharply to the north and because there were no other (contemporary) pits of this size to either west or east. Pit

423 marks the north-west limit of a group of intercutting pits (approximately 8m by 9m) in the south-east corner of site. The pits were not clearly defined as they were either partly concealed by backfilled deposit 411 (south-east limit unknown) or because the upper fills were so similar that they were indistinguishable. Some were also truncated by the south arm of windmill ditch **259**.

Pit **261**=**77** was 1.87m wide and truncated by windmill ditch **259**. It survived to a depth of at least 0.4m, but was probably originally over 1.7m deep. Only one fill (260) was observed, but did not contain any finds. **77** was originally thought to be a ditch.

Pit **263** was truncated by pit **261** and windmill ditch **259**. It was at least 1.45m wide and over 0.1m deep. Single fill 262 was described as identical to 260 and was not fully excavated. No finds were recovered.

Pit **423** was located between limekiln **266** and **483** and truncated by windmill ditch **259**. It was probably circular in plan and measured 5.48m wide by 1.56m deep. Six fills (417 to 422) were identified and pottery and animal bone were recovered from two of these (418 and 422). Primary fill 422 contained three sherds of early 12th century pottery, whilst upper mid fill 418 contained ten sherds of late 12th century pottery and a single residual sherd of Iron Age pottery as well as a little animal bone.

Limekilns

Limekilns **266**, **365**, **483** and **561** (Fig. 8) were located across the site and varied in size from 2m to 3.6m in diameter and from 1.3m to 2.15m deep. Where excavated, all were circular or sub-circular in plan and had steep-sided, tapering sides with flat bases; three (**266**, **365** and **483**) were directly linked to their stoke holes via a single small tunnel or flue (Fig. 8, Plate's 3, 4, 5). Unlike the kilns, the stoke holes were not uniform in shape, being either oval (**251**), sub-rounded (**522**) or sub-rectangular (**269**) (Fig. 8), however, all were the same depth as the associated kiln. Every kiln displayed a distinctive band of pinkish red discolouration around the edge of the cut and on the sides and base; it was best seen in kiln **266** where it was a uniform 0.1m wide. The intense heat during firing caused the discolouration. Although no discolouration was evident on the stoke holes, soot had adhered to the upper surface of the stoke holes (where fully excavated). This would have been deposited during firing as the flue drew the smoke from the burning wood out of the kiln.

Limekiln **266** contained fifteen fills (265, 308 to 323) and all but the final two were backfilled from the east side. Small patches of lime were seen adhering to the lower 0.6m to 0.7m sides of the cut. Finds recovered include a sherd of window glass (SF20), a small amount of animal bone, mussel shell and a little pottery. Eight sherds of early 12th century pottery were recovered from upper mid fills 309 and 310,

whilst late 12th century pottery was recovered from primary fill 323 and the latest fills, 208 and 256. Associated stoke hole **251** lay 1m to the east.

Stoke hole **251** (lime kiln **266**) was sub-circular in shape and contained four fills (241, 242, 245, 249). It was 2.2m wide and the same depth as the kiln (1.82m). A single sherd of late 12th century pottery was recovered from the final fill (241).

Limekiln **365** contained ten fills (355-364) of varying thickness, including three accumulation fills at the base of the cut, which imply that it may have been left open for a short period of time, prior to backfilling. Three sherds of early 12th century pottery were recovered from primary fill 364 and upper fill 356. A further eleven sherds of late 12th century pottery were recovered from final fill 355. Animal bone and a discrete dump of mussel shell were also recovered. Associated stoke hole **269** was situated approximately 1m to the east.

Stoke hole **269** (lime kiln **365**) was sub-rectangular in plan and contained two large backfills (267, 268) with a distinct tip line towards the kiln. Primary fill 268 contained a sherd of both early and late 12th century pottery and an iron nail (SF10) and 267 contained a single sherd of late 12th century pottery.

Limekiln **483** was not fully cleaned out after its final firing; it retained a small amount of lime (514) across the base of the cut approximately 0.4m thick. The top of this fill had developed a solid, dark yellow crust, indicating that the kiln had been left open for a short period of time prior to being backfilled. The single sherd of pottery recovered from the primary backfill (515) was datable to the late 12th century, as was the ceramic spindlewhorl (SF13) (Fig. 16) from upper fill 481.

Associated stoke hole **522** was identified at the base of cut **481** and also in plan, approximately 0.75m to the south-east. Although not fully excavated, a single sherd of late 12th century pottery was recovered from the upper fill (523).

The unexcavated limekiln (**561**) was truncated by windmill ditch **304** and measured no more than 4m in diameter. It is likely that any associated stoke hole would have been located to the west of the kiln, south of pit **263** and severely truncated by ditch **304**.

Small Pits

The small pits comprised **478** (**84**)=**527**, **490**=**525**, **75**, **430**, **467**, **307**, **445**, **545**, **551**, **553** (not visible in plan) and **555** and were located in the north and east of the site. Some were overlain by backfill deposit 411, whilst others were truncated by windmill ditch **259**. All were either circular or sub-circular, except pits **478**=**527** and **490**=**525**, which were shallow and rectangular with an oval pit set into a corner (Fig. *).

Due to their size in comparison to the larger pits to the west and south, these small pits may not have been used expressly for the extraction (and subsequent use) of chalk; but for a more domestic purpose, for example storage. Pits **430**, **467** and **478** (**84**)=**257** were all relatively deep (up to 1.7m) and narrow (between 0.6m and 1.4m wide), with slightly overhanging edges and were the best example of this type of pit.

Pit **478** (**527**/**84**) was 0.8m long by 0.74m deep and contained two fills (477, 476). Like pit **490**=**525**, below, pit **478** had an oval pit, here in the south-west corner. This oval pit (same number) was 0.57m wide by 0.32m deep and had steep sides and a flat base. Its fill also partly filled the upper rectangular pit, which suggests that they may be contemporary. It was truncated on the east side by **490**. A small number of 12th century pottery sherds were recovered (477, 476), with a residual early 12th century sherd (526). A further 0.08kg of pottery was recovered during the evaluation (**84**). Additional finds include a very small quantity of animal bone.

Pit **490**=**525** contained one fill (489) and was 2m wide by 0.2m deep. It had steep sides and a flat base and pit **467** was set into the west end. Pit **467** was 1.25m wide by 1.5m deep with a square, flat base. It contained three fills (464, 465, 467) largely comprised of chalk rubble. A bone pin-beater (SF15) and fragments of lava quernstone (SF16) were recovered from fill 465. Other finds included animal bone, CBM, shell and flint. The neck of the pit was slightly overhanging and a series of small vertical grooves (possible construction marks) were identified on the north-west side. A mix of early 12th (8 sherds) and late 12th century (55 sherds) pottery was recovered in addition to animal bone, CBM and mussel shell.

Pit **307** was severely truncated by windmill foundation trench **277** to only 0.2m wide but was 0.65m deep. It contained three fills (296, 305-6) but finds were only recovered from 296, the upper fill; they comprised lava quernstone and late 12th century pottery (0.018kg).

Pit **430** was 1.4m wide by 1.7m deep and contained four fills (426 to 429). It had steeply sloping, slightly undercut sides and a flat base. It had an unknown relationship with post hole **441**, on the north edge. In addition to pottery (late 12th century) and a small quantity of animal bone, finds recovered also included shell, an iron nail (SF 14) and flint.

Pit **445** was 1.2m wide by 0.5m deep with steep sides and a flat base. It contained two fills (443, 444) from which pottery and shell were recovered. Primary fill 444 contained a single sherd of residual early 12th century pottery and upper fill 443 contained 4 sherds of late 12th century pottery. The pit was located 0.14m south-west of pit **430**.

Pit **545** was 1.5m wide by 0.5m deep and had a wide, rounded profile. It contained two fills that were not excavated, but seen in section where they were truncated by windmill foundation trench **277**. The primary deposit (438) was very dark in colour and had a fine, silty consistency with a high organic content. No finds were recovered.

Pit **551** truncated pit **549** and was truncated by windmill foundation trench **277**. It measured 1.16m wide by 0.5m deep and was not excavated. No finds were recovered.

Pit **553** (***114***) was located between and truncated by windmill foundation trench **299** and **327**. It measured 0.95m wide by 0.4m deep. It was not excavated and no finds were recovered. It may be equivalent to pit **107** (trench 4), which was truncated by windmill foundation trench **277**.

Unexcavated pit **555** (***120***) was truncated by windmill foundation trench **327** and measured 0.8m wide by 0.55m deep. No finds were recovered.

Undated pit 75 (trench 2) was at least 0.8m wide and survived to a depth of 0.33m, having been truncated by windmill foundation trench **259**. It contained a single fill (74), from which no finds were recovered.

Uncertain Features

The evaluation part of this archaeological works identified three very large pits (**31**, **34** and **35**). Initially it was thought that these features may have been wells. However the excavation revealed a larger number of similar features that were more positively identified as limekilns. It was therefore uncertain whether these represented wells or limekilns

Two large, deep pits (**35** and **5**=**34**) were located in the south-east corner of the development area in trenches 6 and 7. Both had vertical sides, unlike the other large pits to the north-west and were situated slightly down slope from them at 16.91m OD and 16.86m OD respectively.

Pit **35** was 3.2m in diameter and excavated to a depth of only 1.09m due to space restrictions. It had near-vertical sides and contained a series of at least five fills of which two contained lenses of organic material from which a single *Cladium mariscus* (saw sedge) nutlet was recovered, (Fosberry in Muldowney 2006).

Pit (**5**=**31**) contained twenty-two sherds of 12th to 13th century pottery (plus two residual sherds of Iron Age, see above) and was located at the south-west end of trench 7. It was +1.5m long by +1.6m wide and +0.45m deep, with smooth, vertical sides and concreted fills. It may have been contemporary with undated pit **35**, which also had vertical

sides and was 3.2m in diameter and +1.09m deep. It is likely that these two pits were shafts or wells, given that vertical edges are not conducive to quarrying.

Although pit **35** lay partially beyond the east side of the trench it was thought to be circular in plan. It was of unknown depth and contained no finds.

Pit **5**=**31** was located at the west end of trench 7, partially beyond its limits to the north-east. Finds were recovered from the concreted fills and included flint (SF1), animal bone, lava quernstone fragments and twenty-two sherds of pottery (0.05kg), including two residual Iron Age fragments.

Gully

Unexcavated gully **547** ran for just under 4m in a north-east to south west direction and terminated under pit **430** to the south-west. It was the only feature of its type in any period and of unknown function.

Gully 547 was truncated by pit 430 and windmill foundation trench 277. It contained one (unexcavated) fill (546).

5.2.3 Phase 2.3 (Late 12th - 13th century)

It is possibly during the 13th century, or slightly earlier, that the depression left by pit **412** was filled and the land levelled in preparation for the erection of a windmill. Only three features have been assigned to this phase: a pit/post hole, the windmill foundation trench and the windmill ditch.

Unexcavated pit/post hole **451** was seen at the base of the windmill ditch (**259**) and truncated stoke hole **522** on the south side. A single sherd of 13th century pottery was recovered.

The windmill foundation trench (**277**) and surrounding ditch (**259**) were located in the north corner of site, with only the ditch extending beyond the northern limit of excavation (Fig. 3, 4 and 14). In plan, the foundation trench formed a rough cross-shape approximately 7m in length, which sat centrally within the arc of the ditch. Each arm was no more than 1.36m wide by 0.9m deep and contained crushed chalk packing (394/349/291/393/392/391) at the base (Plate 6). This supported and fixed the timber cross-trees which formed the horizontal base of the mill sub-structure. Although no *in situ* timber remains were found, the depth of packing indicates that they were up to 0.16m thick and 0.3m wide. By comparison, the partially surviving cross-trees of a post mill excavated at Great Linford in Buckinghamshire were estimated as 300mm square for the east-west beam, with the north-south beam being made of two parts, each 300mm wide x 1000mm thick, separated by limestone slabs (Mynard and Zeepvat 1992). The

trench was filled with a series of deposits interleaved with two or three thin (0.01m to 0.10m thick) horizontal compacted crushed chalk layers (for example 344). Directly overlying and within the cut of the foundation trench was layer 109 (seen in the evaluation only). It was comprised of light yellowish white crushed chalk, which varied in thickness to a maximum 0.12m. No finds were recovered from this layer and the nature of these deposits might suggest that it was not back filled as one closure event.

The surrounding ditch was almost certainly C-shaped in plan (a terminus was just apparent on the north-west side), had an internal diameter of approximately 16m and enclosed an area of 200.96 sq m. The outer edge was square in contrast to the inner edge, which was circular, producing a distinctive shape in plan (Fig. 14). Its width varied from 4m to just over 7m, and the depth was on average 0.9m, creating a wide, shallow profile. In general, the west side had a steep internal edge and an oblique external edge and the east side was more symmetrical. Each excavated segment of the ditch contained a similar sequence of fills; the earliest consisted of chalk rubble (up to 0.69m thick) whilst the later fills were mid to light greyish brown silty clays (up to 0.56m thick).

Pit/post hole 451 was unusually narrow (0.55m) and deep (at least 1.2m) and contained at least one fill (523). Only pottery (0.008kg) was recovered.

Windmill foundation trench **277** and **327** formed the north-south oriented arm and contained eight fills. It had a steep-sided, flat-based profile with a shallow 'ledge' at each end. The east-west arm comprised **299** and **348** and contained six fills. It also had a steep-sided, flat-based profile but no shallow ledge. The entire feature was severely truncated by a modern geotechnical pit and evaluation trench 4. A range of finds was recovered from the foundation, including pottery (12th to 13th century), animal bone, slag, an iron nail (SF 12) and an iron barrel padlock key (SF 11) lava quernstone (SF 18; 19) and shell. No additional finds were retrieved from **112** or **82** (the evaluation numbers for this feature) except for 0.831kg of slag, bringing the total quantity recovered to 2.991kg. A number of environmental samples were also taken from this feature (samples 33 and 34).

Windmill ditch **259** (**304**; **354**; **416**; **436**) contained between three and five fills, from which very few finds were recovered. Pottery dating to between the 12th and 14th centuries was recovered from the mid and/or upper fills. Finds from the evaluation (**72**) include three small sherds of 12th to mid 13th century pottery, animal bone, mussel shell, slag and a single charred grain (70 and 71).

5.2.4 Phase 2.4 (14th to 15th century)

This phase comprises the final backfill of the windmill ditch, the trackway and a single pit.

The final fill (257) of the windmill ditch (**259**) contained 14th to 15th century pottery (Appendix 2), which was not present in any other excavation context. The final fills in other areas of the ditch were either undated, or spot dated to the 13th century, which strongly suggests that it was backfilled throughout the 13th century but not completely closed until the first half of the 14th century (P. Blinkhorn pers. comm.).

Trackway 367 was oriented north-west to south-east and was at least 12.5m long and over 5m wide. It was largely comprised of concreted layers of silty clay material and compressed chalk, with some chalky levelling layers where it had overlain pit **366** (Phase 2.1). The base of the trackway was uneven with at least four parallel narrow ruts visible. They varied in size from 0.1m to 0.45m wide and were no more than 0.14m deep. The same ruts continued south-eastwards and were seen in trench 6 (**21**, **26** and **28**) and similar parallel, but not continuous, ones were also recorded in trench 7 (**17**, **19** and two unexcavated). No finds were recovered during the excavation (although six very small and abraded sherds of 13th to 14th century pottery were recovered during the evaluation (24=53)), but it is thought to be late medieval in origin due to its position in the stratigraphic sequence. Ditch **47** (trench 6) may also have been part of the trackway, as it ran parallel with both the ruts and the wider track (367).

Pit **271** truncated windmill foundation trench **277** and was the only late pit on the site. It was oval in plan and measured approximately 1.27m long by 0.9m wide with a flat base. Because it had been truncated during the machining (and re-machining) of trench 4, only the lower 0.34m survived. Both the pottery (Appendix 2) and slag (0.032kg) recovered from the fill were derived from the base of the windmill foundation trench (**277**), the only other feature to contain slag (see Section 5.2.3 above) (Appendix 3).

Backfill 257 was 5.15m wide by 0.74m deep and in addition to 0.229kg pottery contained animal bone and shell. It was composed of pale grey clay silt with occasional chalk inclusions.

Trackway **367**. Context number **367** refers to the interface between the trackway and underlying pits/natural. It continued into trench 6 to the south-east (**23=51 and possibly ditch 47**). No finds other than a very small amount of pottery were recovered.

Pit **271** contained at least one fill (270) and was not seen fully as it was truncated by machine during the evaluation. The full depth of the pit was probably at least 0.9m. Four small sherds of residual early 12th century pottery and a small quantity of slag were recovered.

5.3 Period 3 (Post-medieval)

Ditch **220** (**68** and **61**) was one of only three dated features in this period and comprised a relatively narrow, linear feature running from south-west to north-east across both Area A and Area B. It was almost perpendicular to and respected trackway **367**, terminating approximately 8m from its south-west edge. The ditch was no more than 0.77m wide and 0.26m deep and was at least 60m long from what is visible in the trenches. The second feature was layer 2, observed during the evaluation in trench 7. It was 0.3m thick and contained a relatively large quantity of post-medieval pottery, brick/tile and daub. Pit **57** was the third datable feature in Period 3. It was over-excavated into the natural chalk and recorded as measuring 1m long by 0.35m deep. It had a shallow, U-shape profile and a single fill. One sherd of glazed pottery was recovered.

A fourth feature was undated, but may be assigned to Period 3 on a stratigraphic basis. Pit **110** (trench 4) was +0.3m wide and 0.16m deep and had a U-shape profile. It was filled by mid yellowish grey silty clay (111) from which no finds were recovered.

Ditch **220** (**68** and **61**). Finds recovered from the single fill (246/539) included mid 16th to 17th century pottery, ceramic building material, animal bone and an intrusive iron or steel bar (SF 21) of recent origin.

Layer 2 was located at the north-east end of evaluation trench 7 and consisted of a dump of building material and other domestic waste, including clay tobacco pipe.

Pit **110** was seen in section in the evaluation only and was not excavated. It truncated layer 109 (see Phase 2.3).

Pit 57 contained single fill 56, light whitish grey silty chalk. It was re-exposed during the excavation but not re-excavated. A single sherd of pottery datable to between the early 16th and 18th centuries was recovered.

5.4 Period 4 (Modern)

Three post holes (**226**, **228**, **240**) were located in the south-east corner of Area A and were either square or rectangular in plan with steep sides and a flat base. They were no more than 0.4m long by 0.32m wide and had an average depth of just under 0.2m. Each contained a single fill devoid of pottery, however, some fragments of mortar/concrete were recovered (**226**).

5.5 Unphased

This section includes all undated and/or unstratified features that were not assignable to either Period or Phase and comprises a series of pits and post holes. All were confined to the north and west of the site.

Pits
Pit **488** was unexcavated, but recorded in the edge of re-excavated evaluation trench 4 (s. 78) and windmill foundation trench **348** (**277**). It was at least 1.5m wide by 0.42m deep and contained one fill (487) from which no finds were recovered. It is likely to belong to either Phase 1 or 2 as it is truncated by later features.

Pits (**332**, **473**, **232**, and **534**) were much smaller and may have been contemporary. They were thinly dispersed across the north and west of the site and mainly sub-rectangular in plan. All contained a single fill and were between 0.44m and 0.97m long by no more than 0.32m deep.

Pit **336** was located in the north-east corner of site and was sub-rectangular in plan. It was very shallow (0.12m) and had a disturbed south end. Like all the other pits, it contained only one fill (335).

Post holes
Thirty six percent of post holes were unphased (Appendix 1) and/or unstratified and therefore not assignable to Period or Phase. Although all are thought to form (part of) structures, none could be identified.

5.6 Unphased Evaluation Features

A number of features identified during the evaluation could not be assigned to a phase. The main reason for this is because the trench in which they were located was not included in the excavation area, for example part of trenches 1 and 5 and all of trench 7 (Fig. 3). The features in trench 4 which remain unphased were either not identified again (layer 127) or not possible to equate to an excavation deposit (102 to 104). Additionally, the features are unphased because they contained no datable material.
Two linear features (**134** and **135**) in trench 1 were seen in Area A, but upon excavation were proven to be areas of disturbed chalk.

6 Discussion

The range and type of archaeological feature identified during the excavation exceeded those recorded by the evaluation, which suggested the presence of a series of medieval chalk extraction pits, lime kilns and possible wells. It also proposed that metal working took

place in the vicinity as a number of diagnostic slag fragments with an ashy coating (Eley in Muldowney 2006), including a smithing hearth bottom (pit 64, SF2), were found (Muldowney 2006). In addition to chalk extraction pits, the excavation uncovered Iron Age post holes, 12th century lime kilns and stoke holes, with possible associated structure(s), a 13th century post-mill with surrounding C-shape ditch and a later medieval trackway, thought to sit on the same orientation as the present day Mill Lane (Fig. 17). There was limited evidence for metal working, in both the medieval and Iron Age periods and residual finds comprising a bone pin-beater (SF15) and sherds of Buttermarket-type Ipswich ware indicating the presence of Mid Saxon domestic activity probably part of a residual assemblage associated with the origins of Burwell in the middle Saxon period. The majority of this sites use was during the 12th and 13th centuries as an industrial area on the southern outskirts of Burwell. Dirty, difficult, sometimes dangerous and labour intensive activities, such as lime production, tanning and smithing were often found in peripheral areas of settlements where rents were less expensive and their pollution less objectionable. By the 13th century this part of Burwell may no longer have been considered peripheral and the lime kilns therefore closed down.

6.1 Period 1: Late Bronze Age to early to middle Iron Age.

The earliest activity identified within the development area comprised probable Late Bronze Age or early to middle Iron Age structures (Fig. 6). Three types were identified, including two curvilinear ditches possibly representing the ring gullies around roundhouses, three four-post structures (Structures A, B and C) and a circular post hole structure (Structure D).

Residues of the metal working industry were present across the site, in the form of flake hammerslag and spheroidal hammerslag (Appendix 3 and 6) and although not in particularly large quantities, the highest concentrations of these microscopic particles were found in three post holes (**224**, **214** and **453**), two of which contained early to middle Iron Age shell and fossil tempered pottery sherds (Appendix 2). Despite the presence of concentrations of microscopic metalworking debris in most/all of the post holes/features across site, a clear pattern emerges, indicating that iron working was being carried out near the site during the early to middle Iron Age.

Although no flint was recovered during the excavation, five residual pieces were recovered from two features in the evaluation (pit 5 and pit 64). The presence of these fragments, in particular SF1 and SF3, which may be earlier Neolithic, point to much earlier occupation of the area and add to the evidence gained from various spot, or stray, finds of the same period, for example the worked flints (CHER 04337) found to the north-west of the present site, on the low-lying land behind the Castle.

6.2 Period 2: Medieval

A hiatus appears to have taken place on site between the Iron Age period and the early medieval period. There was no evidence for Roman or Saxon occupation, but there were signs of Saxon activity in the vicinity via a Late Saxon bone pin beater (SF15) (Fig. 16) and a single sherd of Buttermarket-type Ipswich ware (AD 725-850).

Use of the site recommenced in the early medieval period in approximately the first half of the 12th century (Phase 2.1). Its use for industry is clear from the large number of pits excavated and the earliest evidence for lime processing (kiln **325**). At this juncture, not all the pits were necessarily used to extract chalk specifically for the production of lime – although all are intrinsically chalk extraction pits. One of the first actions on the site was the excavation of pit **412**, a large irregular but shallow pit. This cut and depression was the result of removing the topsoil to expose the underlying natural chalk (**412**), therefore preparing the ground for the extraction of chalk from pits **549**, **544**, **124**, **486** (**86**), **88** and **480** (**130**). These pits could be dug as required, without having to continuously dig through the topsoil. Although their function as chalk quarries is less clear than a series of much larger pits (**383**, **389**, **390** and **366**) immediately adjacent to kiln **325,** this preparation of the ground is indicative of quarrying technique.

Additionally, there were a small number of pits very different in character from the first group. Each was an irregular sub-rectangular shape in plan and between 0.2m and 0.46m deep, with steep sides and a flat base. They were reminiscent of sunken-featured buildings, but did not contain post holes (where excavated). Instead, pits **490** and **527** had sub-circular pits (**467** and **478**) cut into the base, which on the basis of the fills are probably contemporary: fill 464 (**467**) is described as being identical to fill 489 (**490**), for example.

A number of post holes were found to be contemporary with this phase of activity but only one structure was identified (Structure E, Fig. 7). This six-post structure immediately north of pit **259** may have been the remains of a building used by the kiln/quarry workers. This structure does not seem to have had a very long life, indeed, it is not a very substantial building. Moreover, kiln **266** is constructed in the second half of the twelfth century in very close proximity to where this building had stood. The remaining post holes around this area hint at the presence of further structures, but due to truncation by later pits, for example, their location and type are unknown. However, it is probable that the kiln workers had any number of short-lived post built structures that occupied this area of the site during the 12th century.

The character of the area remained industrial throughout the rest of the 12th century as lime processing continued and expanded. A further four kilns were identified within Area B accompanied by the excavation of more chalk extraction pits, for example, **374**, **410**, **78**, **79** and **423**.

Chalk continued to be extracted from the area started in the early 12th century and more pits were dug to the south and north-west. This increase is clearly directly related to the higher number of limekilns and therefore the quantity of raw material required

All the kilns are thought to have been fired at least once as each flue connecting the kiln to the stoke hole had a sooty residue on its 'roof' and the base and sides of the kilns themselves were discoloured pinkish red from the heat produced during firing. This discolouration was also visible in plan; around kiln **266** it was a uniform 0.1m wide (Plate 2). No discolouration was seen on the stoke holes, suggesting that the heat produced by the firing process was contained within the kiln. In addition to the discolouration of the kilns and the sooty residue in the stoke holes, lime was found at the base of kiln **483** (Plate 4) and on the base and sides of kiln **266**. In **483** it was extensive, spreading across the entire base of the kiln and partially within the flue to the stoke hole. It was light yellowish white in colour with a dark yellowish orange crust and was up to 0.33m thick. The crust is thought to have formed due to exposure to the atmosphere and suggests that not only was the kiln not fully cleaned out after firing, but also that it was left open for a period of time. The lime residue in kiln **266** was not as extensive as that in kiln **483**; it was observed in patches, adhering to the lower sides and to the base, thus demonstrating that the kiln was fully cleaned out after firing. Lime was not observed in either kiln **365** or **325**.

There was no consistency between the location of the stoke holes in relation to the kilns; **251** and **269** were located to the south-west and **522** was located to the south-east. Although not positively identified, the stoke hole associated with kiln **325** was almost certainly located to the east, under trackway **367** and that for unexcavated kiln **561** was probably located to either the west or south-west, truncated by windmill ditch **259** (Fig. 13). This variation may suggest that it was not necessary to draw the smoke from the kiln using the prevailing wind direction and that their location was entirely at the whim of the original excavator. Indeed it was probably not until the 13th century that wind tunnels were incorporated into lime kiln structures as the demand for more lime increased.

Unlike the kilns at Colchester (Crummy 1984) none of the kilns here had raking out pits; instead the lime was presumably dug from the open kiln as no lime was found in any of the (excavated) stoke holes. This difference may have been a result of the ground conditions and available resources at the time. At Colchester, the kilns, particularly the later ones, appear to have been constructed from broken peg-tile set in daub and also some re-used Roman tile (*Ibid* 1984, 88) forming a dome; others re-used earlier kiln chambers as raking pits. At Burwell, the kilns and stoke holes were pits dug into the ground, where the chalk formed stable, near vertical walls.

The method used to convert chalk into lime in these kilns was a simple process. The raw material was excavated from the extraction pits and broken into smaller pieces; it was then layered with brushwood – probably oak - in the tapering kiln until it formed a mound. Turf, presumably to trap heat within the kiln, was then laid over the mound. The stoke hole, or draw hole, appears to have had at least three functions. Firstly, it provided an access point via which the brushwood at the base of the kiln was lit; secondly, it acted as a flue, drawing smoke from the kiln and thirdly, it provided an access point through which to draw (rake) out the ash and lime (Goodbody 1992). After lighting, the kiln was left to burn continuously at 900° C (Snow 2002) for up to two weeks, although this probably varied from a few days to weeks depending on the size of the kiln.

Despite being a relatively simple industrial activity, the process of lime production was extremely hazardous (Blair, and Ramsey, 2001). During firing, the burning chalk released noxious carbon dioxide gases into the atmosphere, creating a high risk of asphyxiation. After firing, a second danger was from the lime itself. Quicklime is a chemically unstable substance which, when combined with water (to produce slaked lime) releases heat. Burns were probably a common side effect of the job, as were fires - the slaked lime could cause the carts it was transported in to catch alight. Although the risk presented by lime production was high, the end product was in great demand and has been since Roman times, where it was used as the main ingredient in mortars, concretes, plasters, renders and washes. It is not clear what the lime produced at Isaacson Road was for, but it is likely that some was used locally, whilst the rest was transported to other local towns and villages.

Dating using calibrated radio carbon analysis of carbon deposits from stoke hole **269** suggest that the final firing of kiln **365** took place sometime around AD1090 (BP860 +/- 35 years) and in association with the pottery data suggest that this kiln was fired between AD1100 and AD1125, indeed, the first fill of this structure (**268**) has a an assemblage of pottery with 12 of the 14 identifiable sherds coming from the ceramic phase (CP)1 (appendix 2) datable to the early to mid 12th century, the final fill of this kiln (**267**- see fig 13 section 87) has an assemblage dating to the late 12th century suggesting these features were not immediate backfilled but may have been levelled to make way for a different use of the site. The pottery assemblage from **365** indicates that it was backfilled in CP1 except the final, small, secondary fill **356**. Kilns **561** and **483** could well have been later, and could have ceased lime production in the mid or late 12th century, certainly kiln **483**'s largest fill has a pottery assemblage dating to CP2 the late 12th century. Both kilns were also truncated by the windmill ditch (**259**). Kiln **266** has a more mixed range of dates and although Blinkhorn (Appendix 2) places contexts **309**, **310** and **388** into CP1 the stratigraphically earlier context **323** has been given a CP2 date as it contains Ely Ware. These phases are not fixed entities, indeed, most

of the pottery is residual as it forms part of a backfilled context and was deposited in the kiln as part of a primary fill. This implies that kiln **266** can be dated to around the middle of the 12th century. Indeed the kilns on this site are datable to all three quarters of the 12th century suggesting the continuous use, if not activity, of this site for lime manufacture and not a large one off event.

With the manufacture of lime stopping in the middle or late 12th century it is interesting that the fills of the windmill cross trees cut (the central cross beam foundations) are almost exclusively filled with CP3 pottery, dating to the 13th century. The lower fills (**391, 394**) and (**347**) contain CP2 pottery, as these are inside the cut and an apparently different event to the upper fills this implies they are associated with the constriction of the mill, indeed, the silty chalk (**394**/**349**/**291**/**393**/**392**/**391**) may be the remains of crude packing and silting alongside the extant beam. This provides us with a date as the packing context must have been deposited during the construction of the mill and the cross trees slot fills after its demolition. The mill was in use for a short period of time, the late 12th century or 12th/13th century transition (the ceramic is residual and could have been on site prior to the construction of the mill) and demolished at some point during the 13th century. This demolition date is suggested as the number of fills within the cross-beam slot implies a slow silting rather than immediate backfill and all are dated to the 13th century. The windmill ditch (**277**) however, contains the only context on site with 14th century, CP4, pottery (**274**) although the majority of these context contain 13th century pottery this is the cross section of a ditch that silted up gradual after the abandonment of the site, or possibly immediately after it was cut, as there were a number of contexts that contained CP2 material (**276**, **337**, **339**, **341**, **342**, **343**, **347**, **345**).

It is difficult to know why this change from lime production to milling occurred at this time. The raw materials for the lime making process don't appear to have run out so perhaps there was less demand, or perhaps the noxious fumes produced by lime burning had forced the industry to move elsewhere. In general terms in the early 13th century windmills were replacing watermills as a source of power particularly in areas where water power was not so reliable, such as East Anglia and the edges of the Fens (Watts 2005). However, what is interesting about the Burwell Mill is that it represents not only a complete transformation in the use of the space it occupied (be it still related to industry) but a transformation that to all intents and purposes was reasonably short lived The reasons for this change in land use may include settlement decline through disease /migration or expansion of settlement at North Town in Burwell.

From the surviving evidence, such as the shape of the foundation trench, the chalk packing and the early date it is possible to suggest that the mills sub-structure comprised a central post held by four cross-trees, with quarter-bars for additional strength and stability (Fig. 18)

(Clarke 1996), the whole sunk beneath the ground. The superstructure was that of a post mill, the earliest form of windmill found in England (Watts 2005, 22). This type of windmill is known from the late 12th century and so this example is relatively early, perhaps of a similar date to the mill at Great Linford, Buckinghamshire, whose cross-trees were radiocarbon-dated to AD1220 ± 80 (*Ibid*, 24) or the Burwell mill may be earlier.

Interestingly, there is no evidence for a mound associated with the windmill foundations in the windmill ditch. Slumped deposits were seen in windmill ditch sondage **304** only (Fig. 13, s46), but their low chalk content suggests that they were actually derived from pit **423** (which the ditch truncated) rather than from any mound. There was, however, evidence for mound material over the foundation trench. A crushed chalk layer (109), identified only during the evaluation, was seen to lie directly over and within the foundation cut (Muldowney 2006, Fig. 3, s6). This layer appears to be the remains of the mound, which would have been composed of chalk excavated from the windmill ditch and thrown over the backfilled foundation trench, around the central post. The primary function of the mound was to provide stability but it also gave the structure greater elevation (Watts 2002, 106); some mounds were up to 3m high, raising the mill much further off the ground than others (*Ibid*, 106). In this instance, the height of the mound is not known, but it may be possible to calculate an approximate size by estimating the quantity of chalk extracted from the ditch. (This has been tentatively done for one of the Neolithic burial mounds at Tansor Crossroads, Northamptonshire (Chapman 1996-7), which provides a useful example of the calculations required to estimate this.) A very rough calculation would suggest that the surrounding ditch for the windmill had a volume of approximately 45 cubic metres. Once dug out the chalk would have expanded by perhaps a further 50%. which would provide enough material to construct a mound of about 5m in diameter by 3m high. It is possible however, that the mound would not need to be particularly high, as the windmill already stood on a 'headland' at approximately 17.5m OD, where the 15m contour swings around the north-west edge of the site from the south to north-east. This elevated position was accentuated by a sharp drop in ground level around the north and north-west edge of the development area, along the boundary with Isaacson Road itself and also along part of the boundary with the adjacent property to the north-east. Add to this the location of the entrance (causeway) to the windmill, which faced north-north-west towards High Street.

Within the foundation the packing appears to have comprised a single phase and relates to the entire use of the windmill. It is largely intact, destroyed only by later truncation (for example by pit **271** and a geotechnical pit) - rather than the deliberate removal of the cross-trees - and filled with loose material that fell from above as the beams rotted *in situ*. Despite the intact nature of the packing material it is not certain whether the superstructure was also left to decay naturally or whether

it was dismantled and the timber re-used elsewhere in the town (perhaps the most likely scenario).

The windmill foundation trench contained a large quantity (2.991kg) of iron slag, not seen elsewhere in the excavated area, except for a residual piece in pit **271** (see Phase 2.4). No slag was recovered from the contemporary C-shaped ditch that surrounded the windmill, suggesting that it was deliberately, rather than accidentally, deposited within the foundation.

Other finds recovered from the windmill foundation include lava quernstone fragments (including SF17, 16, 18 and 19; contexts 296 and 337), an iron barrel padlock key (SF11) and an iron nail (SF12) (Appendix 4), which, whilst providing useful evidence for textile manufacture, general fittings and the grinding of grain during the Late Saxon and early medieval period, unfortunately do not aid understanding of the windmill's function. Undoubtedly it was used for grinding grain, but no evidence survives, at least in the immediate vicinity.

After the demolition of the windmill, the amount of activity on the site became almost negligible and during the 14th and 15th centuries only two events occur which leave traces of pottery; the excavation of a pit, possibly to test for chalk - there is no evidence to suggest that the windmill substructure was removed – and the establishment of a trackway (367) across the east corner of the site (Fig. 5 and 10). Trackway 367 may be the road shown on the *c.*1817 Enclosure map of Burwell (Fig. 17). It lies opposite Mill Lane, which meanders northwards, parallel to High Street and may at one stage have been a continuation of it. This track may have been one of the 'fieldways' referred to in the VCH running south from the south end of High Street (Wareham and Wright 2002, 339). Interestingly there is another road, running north to south, which cuts across both Isaacson Road and the trackway. This lane joins Heath Road (to the south) to Newmarket Road (at the north end). No trace of this second road was found as it lies beyond the east edge of the site, but it may be identified in future investigations along its illustrated route. (An archaeological assessment (Countryside Planning and Management 1994) to the north-east of the current site was located over its possible route, but only found extensive 19th and 20th century clunch quarries, which would have destroyed any evidence for the road).

6.3 Period 3: Post-medieval

Only two features were securely datable to the post-medieval period and comprise ditch **220** and layer 2 (trench 7). The ditch appears to have been instated during the 17th century, which pre-dates the 1815 enclosures (Wareham and Wright 2002), but was probably still in use at that time, as a corresponding field boundary is evident on a plan of

the open fields of Burwell (Franklin 2005, Map 10, 135). The very shallow nature of the ditch suggests some truncation had occurred, perhaps during Enclosure itself.

Although the date when trackway **367** went out of use is unclear, its juxtaposition with ditch **220** indicates that it was extant during the 17th century and probably also until enclosure, as it appears on a map of Newmarket Heath (1798), a composite map of 1800 and 1817 (Wareham and Wright 2002, 335) and Franklin's Map 10 (as Sand Pit Way, see above). By the time of the first Ordnance Survey (1886-7), however, the track was no longer in use and had disappeared from the landscape.

A third feature (pit **110**, trench 4), again seen only during the evaluation, may be of post-medieval date as it truncated layer 109, which itself directly overlay the backfill of the windmill foundation trench (**277**).

6.4 Period 4: Modern

Activity in the modern period was again, minimal, comprising three rectangular post holes, one of which contained concrete. There is no evidence on maps for a late structure on this site, so it may have been temporary. One of the current tenants of Harlech House, immediately adjacent to the site, reported that a tennis court once stood on the ground covered by Area A. This could account for the post holes and certainly accounts for the sharp dip in ground level at the north end of the area and its general flat appearance. The land here slopes very gently from north to south from 16.66m OD to 16.54mm OD, in contrast to 17.7m OD near the highest point at the north end of trench 4, falling to 16.31m OD at the east end of trench 3.

6.5 Research Objectives and Publication

The research aims and objectives for this excavation were set out in a Specification (Connor 2007) prepared by CAM ARC. Period specific aims were subject to the results of the excavation and amended where appropriate/necessary. They are set out below, as follows:

Aim 3.3.1 – Iron Age and Roman: To define the nature of the Iron Age activity on the site.
Further evidence was recovered for Iron Age activity on the site and was collected and studied as appropriate. Archaeological remains from the excavation were analysed with those from the evaluation, leading to re-interpretation of some of the previously undated features. The evidence suggests the presence of a Late Bronze Age/early Iron Age settlement on the site including two roundhouses, four-post structures and a circular post-built structure.

Aim 3.4 – Anglo-Saxon
Although no Anglo-Saxon features were identified a spindle whorl, a pin beater and a single sherd of Buttermarket-type Ipswich ware were recovered which strongly suggest the proximity of Late Saxon settlement, on which activities associated with textile manufacture were taking place. Burwell has Saxon origins and it is known that the settlement first developed at the south end of the current town, probably during 6th or 7th century (Franklin 2005, 10). Evidence for this was identified during excavations at Reach Road (Connor 2002), which uncovered evidence for Saxon and early medieval settlement.

Aim 3.5.2 – Medieval
To contribute to an understanding of the nature of the industrial processing on the site.
Knowledge of the nature of industrial processing on the site changed between the evaluation and excavation as evidence for different types of activities were identified. Excavation has shown that there was evidence for metalworking during the Iron Age and medieval periods, chalk extraction and lime processing during the 12th century and milling in the late 12th/13th century. This is a particularly interesting site as it fit into a known model of medieval suburban expansion but the nature of the industry on the site changes and disappears quickly.

Publication - Medieval
Because of the value in understanding the use and transition of this site within its context, the development of Burwell, medieval urbanism and the use of urban space on the fen edge, this site will be published as part of a synopsis and comparison of Fen edge medieval towns. It will compare other works carried out in Burwell and Swavesey to investigate the nature of landscape and economy in a fen edge urban environment. It is proposed the publication will be with East Anglian Archaeology.

7 Conclusions

This site has provided evidence for Bronze Age or Iron Age structures (possibly relating to settlement) that make a useful addition to the growing corpus of sites of this date on the higher ground surrounding the edges of the Fen. Nearby excavations at the Newmarket Road, Burwell site (Bailey with Popescu 2006), identified post holes and pits of Iron Age date; evidence for possible ritual. While at Reach Road (MCB 17708; Allen 2007) evaluation found evidence for a water channel that had been open from the Neolithic to the Roman period. Adjacent to the channel, the remains of two individuals were found, one of Iron Age date. Further afield Bronze Age and Iron Age 'ritual' activity has been identified on other Fen-edge sites, such as along the Fordham Bypass (Mortimer 2010) and at Landwade Road, Fordham

(Connor, 1997). Other possible prehistoric evidence near the site includes two ring ditches. Both lie within 600m of the site and are probably Bronze Age.

The value of the Isaacson Road site, however, is mainly for the evidence it provides of medieval industry; manufacture of lime soon after the Norman conquest, closely followed by milling. A single medieval lime kiln was excavated on Reach Road (Connor 2002) but this was thought to be later in date, possibly 14th century. Early medieval lime kilns are relatively rare, although a number of broadly contemporary kilns (*c* 1150 to 1250) were excavated at Lion Walk, Colchester (Crummy 1984). These kilns seem to have been used for at least the first three quarters of the 12th century if not slightly beyond. Radiocarbon dating on an early kiln suggested a date around AD1090 (+/- 35 years) although the pottery may suggest the second half of this range, this date coincides with the growth of suburban industry in medieval England and may be on the edge of town because it was a particularly noxious or dangerous process. The lime kilns seem to have been used at different times suggesting a continuous but reasonably small industry (at least visible within excavation) that probably fed Burwell and possibly the local area with lime for mortar and lime wash during a period of growth in English towns. From the 12th century Burwell had two churches in use, standing close together near the south end of the village street. St Mary's on the south-west (which still stands today) and St Andrew's on the east (Wareham and Wright 2002). The churches would have been among the earliest buildings to need quantities of lime, both St Mary's and the now demolished St Andrew's church had 12th century elements (Wareham and Wright 2002), and it is not unreasonable to suggest that some, if not all, of the products from the Isaacson Road lime kilns were used in one or other of those buildings.

When a quarry was first opened the overlying earth was first to be cleared (Salzman 1997, 124). Such an event may have been the reason why shallow pit **412** was excavated ahead of the later pits in the north of the site. Such a clearing event would have been undertaken either to provide access to building material or to ensure that the chalk provided a contamination free source of calcium carbonate for lime production. There is very little evidence to suggest that this site was used to quarry clunch building material particularly as the pits are too shallow so more likely to be directly related to providing raw material for the lime kilns.

The Windmill identified within this excavation was of a later date than the limekilns. It is an early and short-lived example of a post mill that appears to have been built and abandoned during the 13th century. The reasons for this are unclear, perhaps it was found that the location was not so favourable as first thought or the mill may even have been built without the permission of the manor and was consequently dismantled or moved.

The Domesday survey of 1086 states that Count Alan had, since 1066, held a large manor which later became the Manor of Burwell Tiptofts (Franklin 2005, 53) and it is this land which is documented as containing a windmill in 1298 (*Ibid* 2005, 88) possibly the mill which replaced the one identified in this excavation. The location of this windmill, as described in the historic sources is ambiguous and could have been anywhere to the south-east of the town in East (or later, Mill) Field. William Franklin, author of a history of Burwell, has determined that the mill documented in 1298 is the same mill mentioned in the Court Rolls for Tiptofts Manor during the reigns of Elizabeth I and Charles I, although he presents no definitive evidence for this, merely stating that 'a mill was still held' (*Ibid* 2005, 88). The lack of evidence for continuity of use suggests that the later mill, adjacent to Newmarket Road, is almost certainly that referred to in the Court Rolls, but not necessarily the same as the 1298 mill. Additionally, it is clear from the excavated evidence that the windmill at Isaacson Road probably went out of use in the first half of 13th century, so was much earlier than the Court Rolls mill and earlier than the mill mentioned in 1298. Indeed, this later mill may have replaced the post-mill at Isaacson Road after the latter went out of use. The reason for the decline of the Isaacson Road post-mill is obscure, but it is unlikely to be related to the more general urban decline (see Perring 2002, 29-30) of the time as it seems to have been replaced by a series of subsequent mills suggesting that Burwell remained an important centre for some time.

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Appendix 1: Context Summary and Phasing

Area A

Context	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Phase Period/
201	202	fill	post hole	0.33	0.23	0.14	mid brown	silty clay			1
202	202	cut	post hole	0.33	0.23	0.14			oval	U-shape	1
203	204	fill	post hole	0.36	0.36	0.14	mid brown	silty clay			1
204	204	cut	post hole	0.36	0.36	0.14			circular	flat-based U	1
205	206	fill	post hole		0.4	0.31	mid whitish grey	chalky clay			U
206	206	cut	post hole		0.4	0.31			circular	deep U-shape	U
207	208	fill	post hole		0.28	0.05	light whitish grey	chalky clay			U
208	208	cut	post hole		0.28	0.05			circular	shallow U-shape	U
209	210	fill	post hole		0.26	0.05	light whitish grey	chalky clay			1
210	210	cut	post hole		0.21	0.05			rectangular	squared	1
211	212	fill	post hole	0.35	0.38	0.11	mid brown	silty clay			1
212	212	cut	post hole	0.35	0.38	0.11			circular	flat-bottomed U	1
213	214	fill	post hole	0.23	0.18	0.18	mid brown	silty clay			1
214	214	cut	post hole	0.23	0.18	0.18			circular	U-shape	1
215	216	fill	post hole	0.38	0.33	0.4	mid brown	silty clay			1
216	216	cut	post hole	0.38	0.33	0.4			circular	deep U-shape	1

Context	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	PhasePeriod/
217	218	fill	post hole	0.4	0.28	0.28	mid brown	silty clay			2.1
218	218	cut	post hole	0.4	0.28	0.28			rectangular	flat-bottomed U	2.1
221	222	fill	post hole	0.32	0.32	0.13	mid brown	silty clay			1
222	222	cut	post hole	0.32	0.32	0.13			circular	wide v-shape	1
223	224	fill	post hole	0.32	0.32	0.13	mid brown	silty clay			1
224	224	cut	post hole	0.32	0.32	0.13			circular	v-shape	1
225	226	fill	post hole	0.33	0.31	0.23	mid brown	silty clay			4
226	226	cut	post hole	0.33	0.31	0.23			square	flat-bottomed U	4
227	228	fill	post hole	0.36	0.32	0.1	mid brown	silty clay			4
228	228	cut	post hole	0.36	0.32	0.1			square	flat-bottomed U	4
229	230	fill	post hole	0.26	0.19	0.15	mid brown	silty clay			1
230	230	cut	post hole	0.26	0.19	0.15			circular	v-shape	1
231	232	fill	pit	0.97	0.46	0.8	mid brown	silty clay			U
232	232	cut	pit	0.97	0.46	0.08			oval	shallow wide U	U
233	234	fill	post hole	0.32	0.21	0.2	mid brown	silty clay			1
234	234	cut	post hole	0.32	0.21	0.2			circular	U-shape	1
235	236	fill	post hole	0.32	0.32	0.27	mid pale brown	clayey silt			U
236	236	cut	post hole	0.32	0.32	0.27			circular	flat-bottomed U	U
237	238	fill	post hole	0.39	0.39	0.21	mid brown	silty clay			1
238	238	cut	post hole	0.39	0.39	0.21			circular	U-shape	1
239	240	fill	post hole	0.4	0.28	0.2	dark brown	silty clay			4
240	240	cut	post hole	0.4	0.28	0.2			square	flat-bottomed U	4

Area B

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
241		251	fill	pit	2.3	1	0.71	mid greyish brown	clayey silt			2.2
242		251	fill	pit	2.22	1	0.75	mid brownish grey	silty clay			2.2
243		259	fill	ditch		1.16	0.48	mid brownish grey	silty clay			2.4
244		261	fill	pit		0.7	0.56	light grey	silty clay			2.2
245		251	fill	pit	1.94	1	0.12	light grey	silty clay			2.2
248		304	fill	ditch		0.98	0.42	light brownish grey	clayey silt			2.3
249		251	fill	pit	1.9	1	1.2	light greyish white	silty clay			2.2
250	558		layer	surface (external)		1	0.38	pale brownish grey	silty clay			3
251		251	cut	pit	2.3	1	1.6			oval	U-shaped	2.2
252		256	fill	pit	1	0.96	0.34	light greyish brown	silty clay			2.1
253		256	fill	pit	1.12	1	0.32	light greyish brown	silty clay			2.1
254		256	fill	pit	1	0.86	0.32	mid greyish brown	silty clay			2.1
255		256	fill	pit	1	1.6	0.7	light brownish grey	silty clay			2.1
256		256	cut	pit	1	1.6	1.24			sub-circular	U-shaped	2.1
257	300 413	259	fill	ditch		5.15	0.74	pale grey	clayey silt			2.4
258	301 414 304 365 416	259	fill	ditch	1.5	2.5	0.55	light greyish white	chalk/clunch			2.4
259	436	259	cut	ditch	1.5	5.15	1.3			curvilinear	wide, asymmetrical U-shape	2.4
260		261	fill	pit		1.87	0.4	grey	clayey silt			2.2

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
261		261	cut	pit		1.87	0.4			sub-circular	unseen	2.2
262		263	fill	pit		1.9	0.1	grey	clayey silt			2.2
263		263	cut	pit		1.9	0.1			circular		2.2
264				machine slot								
265		266	fill	lime kiln	1.23	1.67	0.36	mid greyish brown	silty clay			2.2
266		266	cut	lime kiln	3	2.42	1.82			circular	flat based U	2.2
267		269	fill	lime kiln	1.45	1.25	0.85	pale yellowish grey	chalky silt			2.2
268	361	269	fill	lime kiln stoke hole	1.45	1.25	0.6	mid beige/creamy yellow brown	silty clunch/chalk			2.2
269		269	cut	lime kiln stoke hole	1.45	1.25	1			square		2.2
270		271	fill	pit	1.27	0.9	0.37	mid greyish brown	silty clay			2.4
271		271	cut	pit	1.27	0.9	0.37			sub-rectangular	extended uneven U-shape	2.4
272		277	fill	ditch (windmill)		1.39	0.29	whitish pale brown	slightly clayey silt			2.3
273		277	fill	ditch (windmill)		0.7	0.09	yellowish white	clunch			2.3
274		277	fill	ditch (windmill)	1.8	1.3	0.27	whitish pale-to-mid brown	slightly clayey silt			2.3
275		277	fill	ditch (windmill)	0.7	0.8	0.08	yellowish white	clunch			2.3
276		277	fill	ditch (windmill)	1.76	1.09	0.23	whitish mid brown	slightly clayey silt			2.3
277	299, 327, 348	277	cut	ditch (windmill)	2	1.39	0.86			rectangular	flat-bottomed U	2.3
278	396, 431		layer	surface (external)	11	4.14	0.37	pale brownish grey	silty clay			2.4
279			layer	surface (external)		0.74	0.1	yellowish off-white	chalk/clunch			2.4

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
280			layer	surface (external)		2	0.22	yellowish off-white	crushed chalk/clunch			2.4
281			layer	surface (external)		0.65	0.13	mid reddish brown	silty clay			2.4
282		366	fill	pit		2	0.31	mid reddish brown	silty clay			2.1
283		366	fill	pit		2.32	0.16	mid reddish brown	silty clay			2.1
284		366	fill	pit		0.72	0.06	mid reddish brown	silty clay			2.1
285		366	fill	pit		1.58	0.15	yellowish off-white	crushed chalk/clunch			2.1
286		366	fill	pit		1.1	0.2	mid reddish brown	silty clay			2.1
287		366	fill	pit		2.72	0.31	mid reddish brown	silty clay			2.1
288		366	fill	pit		1.2	0.92	brownish off-white	chalk/clunch lumps (crushed up)			2.1
289		277	fill	ditch (windmill)	1	0.4	0.21	greyish/whitish mid brown	slightly clayey silt			2.3
290		299	fill	ditch (windmill)	0.66	0.32	0.19	light greyish brown	silty clay			2.3
291	349, 391-394	299	fill	ditch (windmill)	0.5	0.73	0.19	light greyish white	chalk			2.3
292		299	fill	ditch (windmill)		0.74	0.16	mid brownish grey	silty clay			2.3
293		299	fill	ditch (windmill)		1.03	0.02	pale brownish grey	silty clay and compacted crushed chalk			2.3
294		299	fill	ditch (windmill)		1.43	0.58	light brownish grey	silty clay			2.3
295		299	fill	ditch (windmill)		1	0.05	light yellowish white	chalk			2.3
296		307	fill	pit		0.26	0.1	mid grey	silty clay			2.2
298		299	fill	ditch (windmill)		1.34	0.62	light grey	silty clay			2.3

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
299	277, 327, 348	299	cut	ditch (windmill)		1.43	0.77			rectangular	squarish U-shape	2.3
300	257	304	fill	ditch		5.07	0.54	pale grey	clayey silt			2.3
301	258	304	fill	ditch		2.24	0.7	light greyish white	redeposited chalk natural rubble/clunch			2.3
302	415	304	fill	ditch		1.62	0.63	grey	clayey silt			2.3
303		304	fill	ditch		1.56	0.8	light brownish grey	clayey silt			2.3
304	259, 354, 436	304	cut	ditch (windmill)	1.6	5.1	1.15			curvilinear	asymmetrical, slightly irregular, U-shape	2.3
305		307	fill	pit		0.25	0.52	pale brownish grey	silty clay			2.2
306		307	fill	pit		0.45	0.28	mid brownish grey	silty clay			2.2
307		307	cut	pit	1.05	0.2	0.65			sub-rectangular	U-shape with bulbous base	2.2
308		266	fill	lime kiln		0.88	0.45	mid greyish brown	clayey silt			2.2
309		266	fill	lime kiln		1.9	0.76	mid greyish brown	silty clay			2.2
310		266	fill	lime kiln		0.88	0.24	mid greyish brown	silty clay			2.2
311		266	fill	lime kiln		2.26	0.22	light greyish brown	silty clay			2.2
312		266	fill	lime kiln		2.3	0.1	mid greyish brown	silty clay			2.2
313		266	fill	lime kiln		1.36	0.04	light brownish white	silty clay			2.2
314		266	fill	lime kiln		0.88	0.12	mid greyish brown	silty clay			2.2
315		266	fill	lime kiln		2.26	0.97	light brownish white	silty clay			2.2
316		266	fill	lime kiln		0.88	0.04	mid greyish brown	silty clay			2.2
317		266	fill	lime kiln		1.28	0.03	light greyish brown	silty clay			2.2

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
318		266	fill	lime kiln		1.48	0.21	mid greyish brown	silty clay			2.2
319		266	fill	lime kiln		0.76	0.06	light greyish brown	silty clay			2.2
320		266	fill	lime kiln		1.5	0.2	light greyish brown	silty clay			2.2
321		266	fill	lime kiln		2.27	0.26	mid greyish brown	silty clay			2.2
322		545	fill	pit			0.4	light grey brown	clayey silt			2.2
323		266	fill	lime kiln		1.14	0.54	light yellowish white	chalk rubble			2.2
324	397	325	fill	lime kiln		4.1	2.2	mid greyish brown	silty clay			2.1
325	442	325	cut	lime kiln		4.1	2.7			circular	flat-based U	2.1
326		325	fill	lime kiln				light yellowish white	crushed chalk			2.1
327	277, 299, 348	327	cut	ditch (windmill)	2.7	1.7	0.8			rectangular	U-shaped	2.3
328	290	327	fill	ditch (windmill)		0.25	0.87	light greyish brown	silty clay			2.3
329		330	fill	post hole	0.5	0.52	0.11	mid greyish brown	silty clay			U
330		330	cut	post hole	0.5	0.52	0.11			circular	U-shaped	U
331		332	fill	pit	0.3	0.81	0.32	mid greyish brown	silty clay			U
332		332	cut	pit	0.6	0.81	0.32			sub-rectangular	U-shaped	U
333		334	fill	post hole	0.33	0.26	0.11	mid greyish brown	silty clay			2.1
334		334	cut	post hole	0.33	0.25	0.11			circular	U-shaped	2.1
335		336	fill	pit/post hole	0.4	1.02	0.12	mid greyish brown	silty clay			U
336		336	cut	pit/post hole	0.73	1.02	0.12			sub-rectangular	irregular based U-shape	U
337	351	327	fill	ditch (windmill)		1.16	0.24	mid grey brown	silty clay			2.3

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
338	293	327	fill	ditch (windmill)	0.64	0.6	0.04	white	compacted crushed chalk			2.3
339	352	327	fill	ditch (windmill)		1.71	0.55	light grey brown	silty clay			2.3
340	295	327	fill	ditch (windmill)	0.6	0.63	0.04	white	crushed, compressed chalk			2.3
341	342	327	fill	ditch (windmill)		1.54	0.46	mid grey brown	silty clay			2.3
342	341	327	fill	ditch (windmill)		1.54	0.46	mid grey brown	silty clay			2.3
343	272	348	fill	ditch (windmill)	1.7	1.42	0.23	whitish pale brown	slightly clayey silt			2.3
344		348	fill	ditch (windmill)	1.6	1.21	0.22	greyish light brown	slightly clayey silt			2.3
345		348	fill	ditch (windmill)	1.6	0.79	0.13	greyish mid brown	slightly clayey silt			2.3
346		348	fill	ditch (windmill)	1.55	1.02	0.47	greyish light brown	slightly clayey silt			2.3
347	?289?	348	fill	ditch (windmill)	2.2	0.4	0.18	greyish mid brown	slightly clayey silt			2.3
348	277, 299, 327	348	cut	ditch (windmill)	1.7	1.42	0.92			rectangular	U-shape	2.3
349	291, 391, 394	327	fill	ditch (windmill)	0.94	0.9	0.3	white	compressed chalk			2.3
350		299	fill	ditch (windmill)		0.44	0.12	mid brown	silty clay			2.3
351	337	327	fill	ditch (windmill)		0.66	0.22	mid grey brown	silty clay			2.3
352	339	327	fill	ditch (windmill)		1.71	0.55	light grey brown	silty clay			2.3
353		354	fill	ditch	1.25	0.7	0.52	light greyish brown	silty clay			2.3
354	304, 259	354	cut	ditch	1.25	0.71	0.53			curvilinear	unseen	2.3
355		365	fill	lime kiln	1.2	1.08	0.18	mid grey brown	silty clay			2.2
356		365	fill	lime kiln	2	1.8	0.49	brownish off-white	chalk rubble			2.2

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
357		365	fill	lime kiln	2	1.4	0.39	light whitish grey yellowish pink and	chalky clay			2.2
358		365	fill	lime kiln	1.7	1.7	0.28	white	chalk rubble			2.2
359		365	fill	lime kiln	1.7	1.64	0.08	mid grey brown	silty clay			2.2
360		365	fill	lime kiln	1.6	1.58	0.36	light yellowish white	crushed chalk			2.2
361		365	fill	lime kiln	1.45	1.4	0.14	light pink/white	chalk rubble			2.2
362		365	fill	lime kiln		0.4	0.07	mid grey brown	silty clay			2.2
363		365	fill	lime kiln		0.3	0.11	mid grey brown	silty clay			2.2
364		365	fill	lime kiln		0.17	0.07	light white	crushed chalk with clay			2.2
365		365	cut	lime kiln	2	1.8	1.4			oval	flat bottomed U	2.2
366		366	cut	pit	2.6	4	0.88				irregular	2.1
367	395, 437		layer	surface (external)	2.6	4.12				linear spread of compaction		2.4
368			layer	occupation build-up	1.86	2.5	0.25	grey	silty clay			2.2
369		374	fill	pit		0.76	0.08	very light grey	silty clay			2.2
370		374	fill	pit		0.93	0.35	grey	silty clay			2.2
371		374	fill	pit	1.8	2.64	0.79	greyish light brown	silty clay			2.2
372		374	fill	pit		0.5	0.12	very light grey	silty clay			2.2
373		374	fill	pit	0.18	1.76	0.3	light grey	silty clay			2.2
374		374	cut	pit	0.44	2.88	0.8			oval ? Unseen	irregular	2.2

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
375		380	fill	pit		1.58	0.32	chalk	mid grey silty clay matrix 3 %			2.2
376		380	fill	pit		1.54	0.2	light grey	silty clay			2.2
377		380	fill	pit		1.03	0.14	mid grey	silty clay			2.2
378		380	fill	pit		0.96	0.23	light grey	silty clay			2.2
379		380	fill	pit		0.84	0.19	mid grey	silty clay			2.2
380		380	cut	pit		1.64	1			circular?	tapering U	2.2
381		374	fill	pit	0.44	1.45	0.63	mid grey	silty clay			2.2
382		383	fill	pit		1.72	0.41	light grey	silty clay			2.1
383		383	cut	pit		1.7	0.4			circular?	flat based U	2.1
384		389	fill	pit		0.98	0.7	mid grey	silty clay			2.1
385		389	fill	pit		2.4	0.32	light grey	silty clay			2.1
386		389	fill	pit		3.65	0.48	mid grey	silty clay			2.1
387		389	fill	pit		1.86	0.14	white	crushed chalk			2.1
388		390	fill	pit		2.08	0.68	mid yellowish brown	silty clay			2.1
389		389	cut	pit		3.68	1.14			circular ?	wide U-shape	2.1
390		390	cut	pit		2.1	0.64			oval	wide, flat-based U shape	2.1
391	391, 291, 349, 393, 394	327	fill	ditch (windmill)	3	2.25	0.23	greyish off-white	silty chalk			2.3
392		277	fill	ditch (windmill)	1.3	0.8	0.08	greyish off-white	silty chalk			2.3

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile		Period/Phase
393	391, 392, 291, 349, 394	327	fill	ditch (windmill)	0.6	0.25	0.18	greyish off-white	silty chalk				2.3
394	391-393, 291, 349	299	fill	ditch (windmill)	1.25	0.75	0.26	greyish off-white	silty chalk				2.3
395	437, 367		layer	trackway		5.4	0.22			linear			3
396		395	layer	trackway		5.4	0.46	mid greyish brown	silty clay				3
397	324	442	fill	pit		1.4	0.36	mid greyish brown	silty clay				2.1
398		395	fill	trackway		0.88	0.2		chalk - 90 % angular chalk nodules				3
399		325	fill	pit				dark brown	silty clay				2.1
400		395	fill	trackway		0.4	0.08	light brown	silty clay				3
401		402	fill	post hole	0.25	0.13	0.26	mid greyish brown	silty clay				1
402		402	cut	post hole	0.25	0.13	0.26			oval	U shaped		1
403		404	fill	post hole	0.28	0.17	0.16	mid greyish brown	silty clay				U
404		404	cut	post hole	0.28	0.17	0.16			oval	U shaped		U
405		406	fill	post hole	0.23	0.2	0.4	mid greyish brown	silty clay				1
406		406	cut	post hole	0.23	0.2	0.4			oval	U shaped		1
407		407	cut	pit		2.74	1.26			oval?	overhanging U shaped		2.2

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
408	383?	408	cut	pit		1.8	1.2					2.2
409		409	cut	pit			1.38					2.2
410		410	cut	pit			1.38					2.2
411		412	fill	pit			0.2	mid brownish grey	silty clay			2.1
412		412	cut	pit	14	11	0.2			amorphous	wide shallow	2.1
413		416	fill	ditch				pale whitish brown	Slightly clayey silt			2.3
414	258, 301	416	fill	ditch	1.65	2.74	0.69	pale whitish brown mid whitish	chalky silt			2.3
415		416	fill	ditch	1.65	1.34	0.44	brown/grey	slightly silty clay			2.3
416		416	cut	ditch	1.65	6.3	1.22			curvilinear	curious stepped profile	2.3
417		423	fill	pit	1.3	2.46	0.28	dark whitish brown mid greyish/whitish	slightly clayey silt			2.2
418		423	fill	pit	1.3	3.38	0.46	brown	slightly clayey silt			2.2
419		423	fill	pit	1.25	3.34	0.42	pale yellowish white yellowish grey off-	clunch/chalk			2.2
420		423	fill	pit	1.2	3.62	0.48	white	chalk/clunch			2.2
421		423	fill	pit	0.65	2.46	0.54	pale yellowish white mid greyish/whitish	clunch/chalk			2.2
422		423	fill	pit	0.65	4.86	0.48	brown	clayey silt			2.2
423		423	cut	pit	1.65	5.48	1.56			unseen	flat bottomed U	2.2
424		425	fill	post hole	0.28	0.14	0.26	mid greyish brown	silty clay			1

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
425		425	cut	post hole	0.28	0.14	0.26			oval	U shaped	1
426		430	fill	pit		1.14	0.2	mid grey brown	silty clay			2.2
427		430	fill	pit		1.4	0.6	mid grey brown	silty clay			2.2
428		430	fill	pit		0.5	0.15	dark-mid brown grey	clayey silt			2.2
429		430	fill	pit		1.14	1.37	mid brown grey	silty clay			2.2
430		430	cut	pit		1.4	1.7			circular	U shaped	2.2
431	27, 396	437	layer	surface (external)		3.5	0.22	mid greyish brown	silty clay			2.4
432	300	436	fill	ditch		6.28	0.56	light greyish brown	silt clay			2.3
433		436	fill	ditch		6.58	1.02	mid greyish brown	silty clay			2.3
434		436	fill	ditch		4.58	0.92	light greyish brown	silty clay			2.3
435		436	fill	ditch		2.5	0.8	white + pale grey	chalk			2.3
436	304, 259, 365, 416	436	cut	ditch		6.7	1.2			linear	U shape	2.3
437	395, 367		layer	surface (external)		3.5	0.22			linear	irregular	2.4
438		545	fill	pit				dark blackish brown	silt			2.2
440		441	fill	post hole		0.68	0.4	mid brown grey	silty clay			U
441		441	cut	post hole	0.68	0.25	0.4			circular	U shaped	U
442	325	442	cut	lime kiln		1.4	0.38					2.1
443		445	fill	pit		0.7	0.1	mid brown grey	silty clay			2.2

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
444		445	fill	pit		1.2	0.5	mid brown grey	silty clay			2.2
445		445	cut	pit		1.2	0.5			circular	flat based U shape	2.2
446								finds number				2.2
447								finds number				2.2
448								finds number				2.2
449		407	fill	pit		2.74	1.26	mid brown + yellowish white crushed chalk	silty clay			2.2
450		451	fill	pit		0.55		mid brownish grey	silty clay			2.3
451		451	cut	pit		0.55				circular		2.3
452		453	fill	post hole		0.23	0.14	mid greyish brown	silty clay			1
453		453	cut	post hole		0.23	0.14			circular	rounded U shape	1
458		459	fill	post hole	0.35	0.17	0.12	mid greyish brown	silty clay			U
459		459	cut	post hole	0.35	0.17	0.12			circular	U shaped	U
460		461	fill	post hole	0.29	0.14	0.07	mid greyish brown	silty clay			2.1
461		461	cut	post hole	0.29	0.14	0.07			oval	flat-bottomed U	2.1
462		463	fill	post hole	0.27	0.16	0.3	mid greyish brown	silty clay			1
463		463	cut	post hole	0.27	0.16	0.3			oval	U-shaped	1
464	(489)?	467	fill	pit		1.1	0.2	mid brown grey	silty clay			2.2
465		467	fill	pit		1.3	1.47	mid grey brown	silty clay			2.2

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
466		467	fill	pit		0.5	0.1	pale grey white	silty clay			2.2
467		467	cut	pit		1.25	1.5			circular	U-shaped	2.2
468		469	fill	post hole		0.23	0.19	light grey brown	fine silt			U
469		469	cut	post hole		0.23	0.19			circular	U shaped	U
470		471	fill	post hole		0.27	0.2	light grey brown	fine silt			U
471		471	cut	post hole		0.27	0.2			circular	U shaped	U
472		473	fill	pit	0.83	0.27	0.2	light grey brown	fine silt			U
473		473	cut	pit	0.83	0.27	0.2			sub-circular	wide shallow bowl	U
474		277	fill	ditch (windmill)	1.7	1	0.1	greyish/whitish mid brown	slightly clayey silt			2.3
475		327	fill	ditch (windmill)	1.65	1	0.08	greyish/whitish mid brown	slightly clayey silt			2.3
476	526	478	fill	pit	2.6	1.8	0.18	pale yellowish brown	crushed chalk - silt clay			2.2
477	527	478	fill	pit	2.6	1.8	0.4	mid greyish brown	silty clay			2.2
478		478	cut	pit	2.6	1.8	0.74			sub-rectangular	stepped	2.2
479		480	fill	ditch	1.92	0.66	0.28	light yellowish brown	silt clay			2.1
480		480	cut	ditch	1.92	0.66	0.28			sub-rectangular	square	2.1
481		483	fill	lime kiln		2.84	0.35	greyish brown	silty clay			2.2
483		483	cut	lime kiln		3.6	2.15			circular	U shaped	2.2

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
484		486	fill	pit	1.7	1.02	0.03	pale yellow	crushed/compressed chalk			2.1
485		486	fill	pit	1.7	1.12	0.44	pale greyish brown	silty clay			2.1
486		486	cut	pit	1.7	1.2	0.46			sub-rectangular		2.1
487		488	fill	pit		1.5	0.42	mid grey brown	silty clay			U
488		488	cut	pit		1.5	0.42					U
489		490	fill	pit	1.93	3.3	0.2	mid brown grey	silty clay			2.2
490	525	490	cut	pit	3.3	2	0.2			sub-rectangular	very wide flat based U shape	2.2
491		492	fill	post hole		0.28	0.13	light grey brown	fine silt			U
492		492	cut	post hole		0.28	0.13			circular	U-shaped	U
493		494	fill	post hole		0.33	0.08	light grey brown	fine silt			U
494		494	cut	post hole		0.33	0.08			circular	shallow U	U
495		496	fill	post hole		0.35	0.15	mid brown grey	silty clay			2.1
496		496	cut	post hole		0.35	0.15			circular	U-shaped	2.1
497		498	fill	post hole	0.28	0.14	0.15	mid greyish brown	silty clay			1
498		498	cut	post hole	0.28	0.14	0.15			oval	U shaped	1
499		500	fill	post hole	0.21	0.1	0.16	mid greyish brown	silty clay			2.1
500		500	cut	post hole	0.21	0.1	0.16			oval	U shaped	2.1
501		502	fill	post hole	0	0.38	0.3	light grey brown	silty clay			2.1

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
502		502	cut	post hole	0	0.38	0.3			circular	truncated U-shape	2.1
503		504	fill	post hole	0.25	0.15	0.19	medium greyish brown	silty clay			1
504		504	cut	post hole	0.25	0.15	0.19			oval	U-shaped	1
505		506	fill	post hole	0.23	0.12	0.2	medium greyish brown	silty clay			2.1
506		506	cut	post hole	0.23	0.12	0.2			oval	U-shaped	2.1
507		508	fill	post hole	0.24	0.13	0.24	medium greyish brown	silty clay			2.1
508		508	cut	post hole	0.24	0.13	0.24			sub-circular	U-shaped	2.1
509		510	fill	post hole		0.27	0.2	mid grey brown	rare small chalk lumps			2.1
510		510	cut	post hole		0.27	0.2			circular	U-shaped	2.1
511		512	fill	post hole		0.31	0.2	mid grey-brown	fine silt			1
512		512	cut	post hole		0.31	0.2			circular	U	1
513		483	fill	lime kiln			0.04	brownish black	charcoal			2.2
514		483	fill	lime kiln			0.33	orange	lime-sandy-like particles and stoney in patches			2.2
515		483	fill	lime kiln		2.75	0.77	brownish grey	silty clay			2.2
516		483	fill	lime kiln			0.1	mid brown	silty clay soil (c. 50%)			2.2
517		483	fill	lime kiln			0.07	brownish grey	silty clay (c.30%)			2.2
518		483	fill	lime kiln			0.3	mid brown	silty clay soil (c.50%)			2.2

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
519		483	fill	lime kiln			0.2	brownish grey	silty clay (c.30%)			2.2
520		483	fill	lime kiln			0.14	greyish brown	silty clay (c.30%)			2.2
521		483	fill	lime kiln			1.58	brownish grey	silty clay (c.30%)			2.2
522		522	cut	pit						sub-circular		2.2
523		522	fill	pit			2.15	dark greyish brown	silty clay			2.2
524		525	fill	pit			0.28	mid brown grey	silty clay			2.2
525		525	cut	pit			0.28					2.2
526	476	527	fill	pit		0.56	0.32	pale yellowish brown	crushed chalk - silt clay			2.2
527	478	527	cut	pit		0.57	0.32			sub-rectangular		2.2
528		527	fill	pit		0.57	0.32	mid greyish brown	silty clay			2.2
529		530	fill	post hole		0.26	0.05	mid grey brown	fine silt, slightly clayey			2.1
530		530	cut	post hole		0.26	0.05			circular		2.1
531		532	fill	post hole		0.23	0.06	mid grey brown	slightly silty clay			U
532		532	cut	post hole		0.23	0.06			circular		U
533		534	fill	pit	0.44	0.36	0.14	mid brown	slightly clayey silt			U
534		534	cut	pit	0.44	0.36	0.14			rectangular	shallow bowl	U
535		536	fill	post hole		0.29	0.28	mid grey brown	very slightly clayey fine silt			1
536		536	cut	post hole		0.29	0.28			circular	U	1
537		538	fill	post hole		0.25	0.32	light grey brown	silt			U

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
538		538	cut	post hole		0.25	0.32			circular	U	U
541		544	fill	pit				mid grey	silty clay			2.1
542		544	fill	pit				mid brownish grey	silty clay			2.1
543		544	fill	pit				dark brownish grey	silty clay			2.1
544		544	cut	pit		0.75	1.3			circular	flat based U	2.1
545		545	cut	pit		1.5	0.5			circular	U shape	2.2
546		547	fill	gully/ditch		0.65	0.6	mid brownish grey	silt			2.2
547		547	cut	gully/ditch		0.65	0.6				U-shape	2.2
548		549	fill	pit		0.9	0.16	light grey brown	silt			2.1
549		549	cut	pit		0.9	0.46			sub-circular	?	2.1
550		551	fill	pit		1.6	0.5	mid greyish brown	slightly clayey silt			2.2
551		551	cut	pit		1.6	0.5			sub-circular	U	2.2
552		553	fill	pit		0.95	0.4	mid greyish brown	slightly clayey silt			2.2
553		553	cut	pit		0.95	0.4			sub-circular	U-shape	2.2
554		555	fill	pit		0.8	0.55	mid brown	silty clay			2.2
555		555	cut	pit		0.8	0.55			sub-circular		2.2
558	250		layer	surface (external)		0.95	0.24	same as 278				2.4
559		325	fill	lime kiln				light brownish white	chalk			2.1
560		354	fill	ditch	1.25	0.6	0.3	light greyish brown	silty clay			2.3
561		561	cut	lime kiln		-	-			Sub-circular?	-	2.2
562		561	fill	limekiln		-	-	mid greyish brown	Silty clay			2.2

Areas A and B

Context	Same as	Cut	Category	Feature Type	Length	Width	Depth	Colour	Fine component	Shape in Plan	Profile	Period/Phase
200			layer	topsoil				dark greyish brown	silt clay			4
219		220	fill	ditch	16.7	0.8		mid whitish grey	chalky clay			3
220	247; 540	220	cut	ditch	16.7	0.8				linear		3
246		247	fill	ditch		0.77	0.26	greyish mid brown	slightly clayey silt			3
247	220, 540	247	cut	ditch		0.77	0.26			linear	wide U	3
539		540	fill	ditch	1.2	0.77	0.26	greyish mid brown	slightly clayey silt			3
540	220; 247	540	cut	ditch	1.2	0.77	0.26			linear terminus	wide U	3

Appendix 2: The Pottery

by Paul Blinkhorn

The pottery assemblage comprises 426 sherds with a total weight of 4.053kg. The estimated vessel equivalent (EVE), by summation of surviving rimsherd circumference is 2.53. All the pottery is of 12th – 14th century date, with the exception of two sherds of Romano-British wares and small assemblages of Prehistoric and post-medieval material.

Fabric

The following are present:

Late Bronze Age/Iron Age
F1002: *Flint-tempered*. Moderate to dense angular white flint up to 4mm. 5 sherds, 62g.

F1003: *Shell-tempered*. Sparse shell fragments up to 2mm. 2 sherds, 20g.

The range of fabric types suggests activity at the site in the early Iron Age, although it is conceivable that the flint tempered sherds could date to the Late Bronze Age, and the shell-tempered vessels could be as late as the Middle Iron Age. Flint-tempered fabrics are typical of the Late Bronze Age pottery of the region, with the majority of sites showing that flint was replaced by sand or shell as the main tempering ingredient in the Iron Age. It is likely that the pottery is of a similar date to that from the Newmarket Road excavations in the town (Bailey and Popescu 2006).

Romano-British
F1001: Miscellaneous Romano-British wares. 2 sherds, 16g.
One sherd is grog-tempered and the other grey ware, with both probably dating to the earlier part of the Romano-British period.

Post-Roman
F97: Buttermarket-type Ipswich Ware AD720-850 (Blinkhorn 1990). AD725-850 (Blinkhorn in prep.) Middle Saxon, slow-wheel made ware, manufactured exclusively in the eponymous Suffolk wic. There are two main fabric types, although individual vessels which do not conform to these groups also occur: The sherd from this site is in the Group 2 fabric: Hard, sandy and mostly dark grey in colour. Their most prominent feature is a scatter of large quartz grains (up to c 2.5mm) which either bulge or protrude through the surfaces of the vessel. This characteristic makes them quite rough to the touch. However, some sherds have the same groundmass but lack the larger quartz grains which are characteristic of this group, and chemical analysis suggests that they are made from the same clay. Forms a range of distinctive, highly-decorated bottles and squat jars with combed girth-grooves. 1 sherd, 21g, EVE = 0.

F102: Thetford-type ware, 10th – 12th century (Rogerson and Dallas 1984) Range of reduced, wheel-thrown and hand-finished fabrics mainly comprising quartz sand up to 1mm. Produced at many centres in eastern England, although the sherds from this assemblage all appear to be the products of the eponymous Norfolk centre. 14 sherds, 155g, EVE = 0.21.

F200: St. Neots Ware type T1(2) c AD1000-1200 (Denham 1985). Wheel-thrown. Fabric as other types, although inclusions tend to be sparser, larger and more ill-sorted, usually weak to strong red, reddish-brown or black. Vessels usually jars, some with thumbed applied strips, 'Top Hat' vessels, large, upright rimmed bowls, lamps and (rarely) pitchers. 2 sherds, 9g, EVE = 0.

F205: Stamford Ware (Kilmurry 1980). c AD900-1200. Wheel-thrown. White, pink, buff or grey fabric, usually with sparse to dense quartz up to 0.5mm, occasional black or red ironstone up to 1mm. Often glazed with yellow, pale or sage green glaze. 1 sherd, 7g, EVE = 0.

F300: Micaceous ware. Grey or orange-brown fabric. Sparse quartz and rounded red ironstone up to 1mm, moderate fine silver mica giving a sparkly appearance to the surfaces. 2 sherds, 6g, EVE = 0.

F301: Ely Ware, mid 12th -15th century (Spoerry 2002). Generic name for a quartz sand and calcareous tempered group of pottery fabrics mainly manufactured in Ely, but also with a second possible source in the Hunts. Fenland. Jars, bowls and jugs dominate the assemblage. Earlier vessels hand-built and turntable finished, later vessels finer and usually wheel-thrown. Wide distribution, including King's Lynn, where it was originally identified as 'Grimston Software'. 64 sherds, 603g, EVE = 0.53.

F303: Cream sandy ware, sometimes with a grey core. Buff to cream coloured fabric, moderate to dense grey and red sub-angular quartz up to 1mm. 12 sherds, 63g, EVE = 0.03.

F304: Medieval greyware. Hard, light grey fabric with sparse to moderate sub-rounded quartz up to 1mm. 31 sherds, 264g, EVE = 0.21.

F328: Grimston Ware: 13th – 15th century (Leah 1994). Wheel-thrown. Dark grey sandy fabric, usually with grey surfaces, although orange-red and (less commonly) buff surfaces are known. Manufactured at the eponymous production centre near Kings Lynn, Norfolk. 9 sherds, 90g, EVE = 0.10.

F329: Hedingham Ware: Late 12th – 14th century. Fine orange micaceous glazed ware (McCarthy and Brooks 1988, 300-2). 13 sherds, 114g, EVE = 0. 19.

F330: Shelly Coarseware, AD1100-1400 (McCarthy 1979). Products of numerous known and very probably many unknown kilns on the Jurassic limestone of west Northants/east Bedfordshire. Pale buff through virtually all colours to black, moderate to dense shelly limestone fragments up to 3mm, and any amount of ironstone, quartz and flint. Full range of medieval vessel types, especially jars and bowls, and 'Top Hat' jars. 24 sherds, 193g, EVE = 0.26.

F360: Miscellaneous Sandy Coarsewares. A range of quartz-tempered coarsewares that are found throughout the east midlands and East Anglia. 237 sherds, 2332g, EVE = 1.00.

F425: Red Earthenware, 16th – 19th century. Fine sandy earthenware, usually with a brown or green glaze, occurring in a range of utilitarian forms. Such 'country

pottery' was first made in the 16th century, and in some areas continued in use until the 19th century. 2 sherds, 77g.

F1000: Miscellaneous 19th and 20th century wares. 5 sherds, 8g.

The range of fabric types is fairly typical of sites in the region, and is similar to that from excavations in the town carried out by Northamptonshire Archaeology in 2003 (Blinkhorn 2003 in Walker and Walsh 2004). There, the bulk of the post-Roman pottery dated to after the Norman Conquest, with most of the assemblage comprising unglazed coarsewares, particularly Ely Ware. As at this site, glazed wares were rare, with those that were present being a small quantity of Grimston and Hedingham jug sherds. The 2003 excavations produced just two sherds of late medieval pottery, one each of Bourne 'D' ware and Cambridge Sgraffito ware, types which are completely absent from this site, and suggests that there was an hiatus from some time between the 14th – 15th century to the early post-medieval period.

Chronology and Pottery Occurrence

The data in the table below (App. 2.1) shows that the majority of the assemblage is medieval, and most dates to the 12th – 14th century. The dating of some contexts has been adjusted with reference to the stratigraphic matrix. The presence of a Stamford ware sherd, along with a few sherds of Thetford ware, suggests that there may have been pre-conquest activity at the site, although both ware types were still in use in the middle of the 11th century.

Phase	Date	Defining Wares	No	Wt	EVE
CP1	?E-M 12th C	Medieval Coarsewares	78	808	0.59
CP2	M12th – 13th C	Ely ware	202	1546	1.09
CP3	13th C	Hedingham Ware, Grimston Ware	103	1298	0.78
CP4	14th – M15th C	Highly-Decorated Grimston Ware	29	229	0.07
CP5	M16th – 17th C	Red Earthenwares	5	97	0
MOD	19th C +	White Earthenwares	5	8	0

Table App. 2.1: Ceramic phase definitions and pottery occurrence per phase

The data in Table App. 2.2 shows that the medieval assemblages are dominated by coarsewares, and glazed wares such as Hedingham and Grimston are generally scarce, except in CP4, when they form over 51% of the assemblage, although only 229g of pottery was of that date.

Phase	F102	F304	F360	F330	F301	F328	F329	F425	Total Weight (gms)
CP1	1.2%	8.0%	78.1%	7.1%	-	-	-	-	808
CP2	3.8%	9.9%	46.6%	7.4%	27.9%	-	-	-	1546
CP3	6.6%	2.5%	70.6%	1.6%	10.0%	1.8%	4.8%	-	1298
CP4	-	5.7%	24.9%	-	12.2%	29.3%	22.7%	-	229
CP5	-	-	7.2%	-	13.4%	-	-	79.4%	97
Total									3978

App 2.2: Pottery occurrence by major fabric type per phase, expressed as a percentage of the entire phase assemblage

The Pottery

Ceramic Phase 1, c AD1100 – 1150. 78 sherds, 808g, EVE – 0.59.
This phase consisted entirely of unglazed coarsewares apart from the only sherd of Stamford ware which occurred at the site. Over 90% of the assemblage was the various sandy wares of uncertain origin, *ie* fabrics F300, F303, F304 and F360. Regional imports, in the form of Shelly Coarseware (7.1%) and Thetford ware (1.2%) made up the rest of the group, with residual pottery in the form of two sherds of prehistoric material (11g) and single tiny Roman sherd (1g) was also noted. The assemblage generally consisted of context-specific groups of small quantities of small sherds, which is reflected in the low mean sherd weight of 10.4g.

The range of vessel types, as is typical of the early medieval period, was very restricted. The only rimsherds present were from jars and bowls, with jars comprising 72.9% (by EVE). A small number of sherds of sandy coarseware had incised decoration, in the form of combed wavy lines on the shoulder.

Ceramic Phase 2, c 1150 – 1200. 202 sherds, 1,546g, EVE = 1.09.
This phase, like that which preceded it, was dominated by coarsewares (around 90% of the assemblage), with the newly-introduced Ely Ware comprising 27.9% of the group. The only regional imports present were Shelly coarsewares (7.4%). The rest of the group was made up of Thetford ware and a single sherd of St. Neots ware, both of which are likely to be residual. One sherd each of Prehistoric and Romano-British ware also occurred. The assemblage generally consisted of context-specific groups of small quantities of small sherds, which is reflected in the very low mean sherd weight of 7.7g.

The rimsherds were again only from jars and bowls, with jars comprising 84% of the assemblage. A single jug handle, in fabric F304 was present, indicating that such vessels were being added to the

potters' repertoire at this time. A small number of coarseware bodysherds again had incised wavy line decoration.

The assemblage included a sherd of F200 (St. Neots ware), which may have been re-used as a spindle whorl. The sherd, weighing 10g, had a post-firing hole drilled through the middle.

Ceramic Phase 3, 13th century. 103 sherds, 1298g, EVE = 0.78.
This phase saw the introduction of glazed jugs in Grimston (1.8%) and Hedingham (4.8%) wares. Nevertheless, coarsewares were again the major ware, making up around 90% of the group, of which 10% were Ely ware and 1.6% Shelly Coarsewares. Residuality was quite high, with 6.6% of the assemblage consisting of Thetford ware, with a single sherd of St. Neots ware and the Buttermarket-type Ipswich ware sherd also present. The group is a little better preserved than the earlier assemblages, having a mean sherd weight of 12.6g, although this is still quite low for a medieval settlement site.

The introduction of glazed jugs is reflected in the vessel occurrence. Four jug rims were noted, with a total EVE of 0.41 (52.6% of the vessel assemblage). Two of the rims were form Hedingham vessels, and one each in Grimston and glazed Ely Ware. The rest of the rimsherds comprised jars (41.0%) and bowls (6.4%).

Eight sherds of Hedingham ware jugs were noted in total, two of which had vertical red slip stripe decoration, which is typical of the tradition. All the other sherds from the assemblage were undecorated, apart from ten sherds of incised coarsewares, including a shelly ware fragment with rouletting.

Ceramic Phase 4, 14th – 15th century. 29 sherds, 229g.
All the pottery from this phase came from one context (257). The mean sherd weight is quite low, being 7.9g. This rather small assemblage was more or less evenly split between coarsewares and glazed jugs, with the latter, in the form of Grimston ware (29.3%) and Hedingham ware (22.7%), making up 52% of the group. The coarsewares were dominated by sandy wares, with Ely Ware comprising 13.4% of the phase assemblage. Two of the Grimston sherds had brown slip stripes, which is typical of the 14th century tradition of the industry.

Only two rims were noted, one from a greyware (F304) jar and the other from a jug in cream sandy ware (F303).

Ceramic Phase 5, mid 16th – 17th century. 4 sherds, 97g, EVE = 0.
This group comprised two sherds of Red Earthenware, with two residual medieval sherds.

Context	No	Wt (gms)	Fabric	RimF	RimD	EVE	BaseF	BaseD	Vessel	Inc	App	Handle	Glazecol	Slipcol	Slippat	Ceramdate	Comments
200	5	8	1000													MOD	
209	1	43	1002													EIA?	
217	1	10	304													CP1	
217	1	3	360													CP1	
233	2	20	1003													IA?	
241	1	8	301													CP2	
246	2	7	360													CP5	
246	2	77	425													CP5	
252	2	14	304													CP1	
252	1	3	360													CP1	
255	1	16	360													CP1	
257	5	28	301													CP4	
257	4	16	329										2			CP4	
257	1	36	329									4	1			CP4	
257	1	4	303													CP4	
257	1	8	303	40	160	3			3							CP4	
257	1	13	304	14	260	4			1							CP4	
257	2	38	328													CP4	
257	2	15	328										2			CP4	
257	2	14	328										2	1	1	CP4	
257	10	57	360													CP4	
265	10	46	360													CP2	
267	1	11	301													CP2	
268	1	2	301													CP2	
268	1	12	360													CP1	
270	4	15	360													CP1	
272	1	4	303													CP1	
272	6	41	360													CP1	
274	1	6	329										1			CP3	
276	1	6	304													CP2	
282	1	20	360													CP1	
284	1	1	360													CP1	
287	4	64	360													CP1	
292	1	7	102													CP2	
292	1	5	102							1						CP2	
292	1	4	304	23	180	4			1							CP2	
292	1	14	360	23	160	11			1							CP2	

Context	No	Wt (gms)	Fabric	RimF	RimD	EVE	BaseF	BaseD	Vessel	Inc	App	Handle	Glazecol	Slipcol	Slippat	Ceramdate	Comments
292	2	8	360													CP2	
294	1	9	360													CP2	
296	1	18	360													CP2	
298	1	10	360													CP2	
300	1	6	328	40	120	10			3							CP3	
300	1	13	328													CP3	
300	1	6	329													CP3	
300	1	10	329	40	120	9			3							CP3	
300	3	18	360													CP3	
301	1	6	200													CP2	
308	1	6	301													CP2	
308	1	11	303													CP2	
308	1	5	360													CP2	
309	2	8	303													CP1	
309	1	6	304							1						CP1	
309	1	3	330													CP1	
310	3	28	330	22	300	8			2							CP1	
310	1	9	360													CP1	
323	1	4	301													CP2	
323	1	3	360													CP2	
324	1	7	330													CP1	
328	1	4	301													CP2	
328	1	4	303													CP2	
328	1	11	360													CP2	
337	2	16	303													CP2	
337	7	41	360													CP2	
339	3	20	301													CP2	
339	1	8	304													CP2	
341	1	2	304													CP2	
341	1	8	330	22	300	3			2							CP2	
342	1	4	303													CP2	
342	1	2	360	14	220	2			1							CP2	
343	1	16	301	40	120	12			3				2			CP3	
343	1	3	304													CP3	
343	1	6	329										2	1	1	CP3	
343	1	7	330													CP3	
343	3	13	360													CP3	

Context	No	Wt (gms)	Fabric	RimF	RimD	EVE	BaseF	BaseD	Vessel	Inc	App	Handle	Glazecol	Slipcol	Slippat	Ceramdate	Comments
344	1	8	360													CP3	
345	2	12	360													CP3	
346	1	8	102													CP3	
346	1	3	200													CP3	
346	1	28	301	14	300	5			2	1						CP3	
346	4	41	301													CP3	
346	1	9	303													CP3	
346	2	10	304													CP3	
346	2	10	329													CP3	
346	1	5	330							10						CP3	
346	7	46	360													CP3	
346	1	22	360	14	180	9			1							CP3	
347	1	5	304													CP2	
352	1	3	102													CP2	
352	1	10	304													CP2	
355	3	23	102													CP2	
355	1	6	102	40	160	2			1							CP2	
355	1	13	102	14	180	12			1							CP2	
355	1	9	301													CP2	
355	1	22	304								1					CP2	
355	4	25	360													CP2	
356	1	10	102	40	220	7			1							CP1	
356	1	8	1002													CP1	
364	1	21	360	5	180	8			1							CP1	
386	1	1	360													CP1	
386	1	32	360	22	300	4			2							CP1	
388	1	5	360													CP1	
391	2	16	360													CP2	
391	1	3	360							1						CP1	
391	1	22	360	14	220	8			1							CP1	
394	1	2	102													CP2	
411	1	21	97							1						CP3	3
411	3	78	102													CP3	
411	1	8	303													CP3	4
411	1	4	328										2			CP3	
411	5	133	360							1						CP3	1
411	1	127	360	5	280	18			1	1						CP3	1

Context	No	Wt (gms)	Fabric	RimF	RimD	EVE	BaseF	BaseD	Vessel	Inc	App	Handle	Glazecol	Slipcol	Slippat	Ceramdate	Comments
411	6	86	360													CP3	1
411	1	111	360	14	200	7			1	1						CP3	
411	30	216	360													CP3	
411	1	71	360				1	240								CP3	1
411	1	11	360								1					CP3	1
418	1	16	301	23	240	5			1							CP2	
418	1	17	330	22	280	7			2							CP2	
418	8	51	360													CP2	
418	1	4	1002													CP2	
422	2	28	360													CP1	
422	1	9	360	5	180	5			1							CP1	
426	1	12	301	14	200	7			1							CP2	
426	16	124	301													CP2	
426	1	14	304	23	280	5			1							CP2	
426	4	20	330													CP2	
426	1	27	330	22	300	5			2							CP2	
427	1	43	301	5	240	21			1							CP2	
427	7	28	301													CP2	
427	1	1	300													CP2	
427	3	16	304													CP2	
427	2	30	330													CP2	
427	1	7	330	5	220	3			1							CP2	
427	1	4	360	64	220	2			1							CP2	
428	1	15	301													CP2	
429	1	4	301													CP2	
429	4	22	360													CP2	
432	1	11	360													CP3	
433	1	7	301													CP3	
434	1	9	330													CP3	
434	1	19	360													CP3	
443	1	5	301													CP2	
443	1	5	304													CP2	
443	2	13	360													CP2	
444	1	19	360													CP1	
446	2	38	301													CP3	
446	2	5	304													CP3	
446	1	15	304	14	220	8			1							CP3	

Context	No	Wt (gms)	Fabric	RimF	RimD	EVE	BaseF	BaseD	Vessel	Inc	App	Handle	Glazecol	Slipcol	Slippat	Ceramdate	Comments
446	1	10	329										2	2	1	CP3	
446	3	12	360													CP3	
447	4	15	360													CP1	
449	1	11	301													CP2	
450	1	14	329	40	140	10			3				1			CP3	
452	1	4	1002													IA?	
464	1	2	330													CP2	
464	2	16	360													CP2	
465	1	15	301							1						CP2	
465	1	9	301													CP2	
465	1	5	300							1						CP2	
465	3	14	304													CP2	
465	1	1	330													CP2	
465	35	178	360													CP2	
465	1	15	1001													CP2	
465	1	3	1002													CP1	
474	2	10	360													CP2	
475	1	36	304													CP2	
476	1	7	360													CP2	
477	2	33	301													CP2	
477	1	90	360	5	220	17			1							CP2	2
479	2	12	360													CP1	
479	1	6	360	5	180	5			1							CP1	
481	1	12	301													CP2	
485	1	11	330													CP1	
485	11	214	360													CP1	
485	1	42	360	23	300	4	1	260	2							CP1	
489	1	20	301													CP2	
489	1	11	304									4				CP2	
489	1	3	330													CP2	
489	15	122	360													CP2	
495	1	5	330													CP1	
515	1	8	301													CP2	
523	1	8	301	22	260	3			2							CP2	
524	1	7	205													CP1	
524	2	31	304													CP1	
524	3	17	360													CP1	

Context	No	Wt (gms)	Fabric	RimF	RimD	EVE	BaseF	BaseD	Vessel	Inc	App	Handle	Glazecol	Slipcol	Slippat	Ceramdate	Comments
524	1	1	1001													CP1	
526	1	3	330													CP1	
529	1	4	304													CP1	
539	1	13	301													CP5	
543	1	1	360													CP1	
552	1	5	301													CP2	

Notes: 1 – Same Vessel. 2 – Obvious Coil Join. 3 – Buttermarket. 4 – Romano-British?
Table App 2.3 Spot dating by ceramic phase

Overview

This assemblage, although rather small and fragmented, is a useful addition to the known archaeology of Burwell. The prehistoric pottery is similar in fabric terms to the large assemblage excavated at Newmarket Road in the town in 2005 (Blinkhorn 2005 in Bailey, with Popescu 2006).

The presence of the middle Saxon Buttermarket-type Ipswich ware sherd is of some interest, as very few finds of this material have been made outside Suffolk. It shows that there was middle Saxon activity in the vicinity of these excavations, and perhaps relates to the 9th century bone pin-beater.

The medieval assemblage is small and fairly fragmented. The range of fabric types is very similar to that which occurred at BYB03, and the range of vessel types is typical of the early and high medieval periods. Medieval glazed wares are fairly scarce, perhaps due to the largely industrial nature of the site, but the same is true of the assemblage from the 2003 excavations. As noted above, there is no medieval pottery, which can be dated to the 15th century or later, and it is likely that the site was abandoned in the earlier part of the 14th century. Interestingly, the stratification of the pottery from the 2003 site suggested that there was virtually no activity at that site in the same period, an overall picture, which suggests that Burwell may have been severely affected by the plagues and economic recessions of the period.

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Appendix 3: Slag and Metalworking Debris

by Tom Eley and Rachel Fosberry

Due to the presence of a smithing hearth bottom (pit 64, SF2) in the evaluation (BUR ISR 06) a sampling strategy was adopted to identify the presence or absence of hammerscale. The aim of this was to identify features that may have been related to metalworking.

A total of seventy-one bulk samples were taken from features including several post holes, pits, limekiln and windmill foundation. Each post hole was 100% sampled with the intention of specialised processing for the recovery of traces of industrial residue in the form of hammerscale.
Sixteen samples from post holes, many of which are undated, were selected and processed as a trial in order to assess their potential to provide useful data for further study. A further twelve samples were subsequently processed and their results included here.
Ten litres of each sample were processed by tank flotation. The flot and the magnetic residues were collected in a 0.3mm nylon mesh and the residue was washed through a 0.5mm sieve. Both flot and residue were allowed to air dry. The dried residue was passed through 5mm and 2mm sieves and a magnet was dragged through each resulting fraction prior to sorting for artefacts. Any artefacts present were noted and reintegrated with the hand-excavated finds. The flot was examined under a binocular microscope at x16 magnification and the presence of any metal residues are noted in Table App.3.1 below.

Results

The results are recorded in table App. 3.1 below.

Small amounts of hammerscale are present in all of the samples in various forms. During the excavation no further iron slags were recovered but twenty-six post holes were found to contain iron smithing residues along with the windmill foundation trench. Levels of hammerscale recovered were low, particularly of spheroidal hammerscale, and cannot be taken as conclusive evidence for iron smithing being practised at this location. Iron smithing slag regularly occurs in small quantities on archaeological sites and caution should be used before identifying features and phases with iron smithing activity. Hammerscale is produced during metalworking activities. Flake hammerscale is indicative of the smithing process whereas spheroidal hammerslag can be formed in either of the smithing or smelting process. A further category of

metallic residue, here described as hammerslag, is not generally recognised as hammerscale and probably results from the corrosion or cleaning of iron objects. The size of these magnetic residues varies from 0.3mm to 2mm. Such microscopic particles are easily transported across site by wind, rain and even human and animal activity. They are also subject to movement within a deposit through bioturbation and percolation and so small quantities of residues should be interpreted with caution. This is particularly relevant, as all of the flots were almost entirely comprised of modern rootlets.

Sample No.	Context No.	Cut No.	Feature Type	Sample Size (L)	Residue Volume (ml)	Magnetic residues	Flot Volume (ml)
10	201	202	post hole	10	250	+	100
11	203	204	post hole	10	500	+	250
15	213	214	post hole	10	400	+	40
16	215	216	post hole	15	200	+	60
19	217	218	post hole	10	1000	+	30
20	205	206	post hole	40	300	+	1
23	221	222	post hole	10	500	+	100
24	223	224	post hole	10	600	++	40
27	229	230	post hole	15	2000	+	40
28	233	234	post hole	20	200	+	250
29	237	238	post hole	25	900	+	60
31	235	236	post hole	30	2000	+	30
33	289	277	windmill foundation	20	600	++	40
34	290	299	windmill foundation	10	2000	++	15
38	333	334	post hole	10	100	+	20
42	401	402	post hole	10	1200	+	60
43	403	404	post hole	10	800	+	60
44	405	406	post hole	10	800	+	30
45	424	425	post hole	10	2000	++	15
47	440	441	post hole	10	500	++	0
48	452	453	post hole	10	200	++	130
54	491	492	post hole	10	1000	+	65
55	493	494	post hole	10	300	++	2
56	495	496	post hole	10	1300	+	200
57	497	498	post hole	10	1500	+	400
60	503	504	post hole	10	600	+	40
67	529	530	post hole	10	400	+	80
70	535	536	post hole	20	170	+	15
71	537	538	post hole	20	300	+	170

Table App 3.1: Metallic residues from samples

+ = 1 – 10 specimens ++ = 10 – 100 specimens +++ = 100+ specimens

Appendix 4: Small Finds Assemblage

by Nina Crummy

The majority of the objects in this small assemblage form three functional groups representing textile manufacture, general fittings and the grinding of grain. All are typical of artefact types for the twelfth to thirteenth centuries.

A rudimentary spindlewhorl made from a St Neots ware pot sherd came from the upper fill of lime kiln **483** (Fig. 16, SF 13). Made for use on a wooden spindle, the central hole is worn, suggesting that the whorl functioned adequately despite its irregular shape. It was, however, unlikely to have seen prolonged use. Even though there was no real need to handle a whorl once it was fitted onto the spindle, most show some wear on the edge and surfaces. The use of sherds from broken pots as spindlewhorls is a practice carried on from at least the Roman period, but from Late Saxon times onwards it was less common, with purpose-made stone whorls being preferred, with bone examples made from *bos* femur heads. At the Coppergate site, York, only eight out of 230 whorls were made from recycled sherds, and all were of Roman ceramics (Walton Rogers 1997, 1735-43). Roman sherds often seem to have been preferred as spindlewhorls, no doubt because of the hardness of the fabrics. At Winchester five out of six sherd whorls were made of Roman pottery, but the sixth was of early medieval ware, as was an example from Colchester; both were probably contemporary with the Burwell whorl (Woodland 1990, 225; Crummy 1988, 32, fig. 34, 1929).

The spinning of fibres into yarn was a female activity that could be carried out by all ages and all levels of society in between other domestic and social duties. This was particularly clearly demonstrated in the Late Saxon manor of Goltho, Lincolnshire, where spindlewhorls were mainly found in the hall and bower, while the tools used in the more specialised crafts of weaving and finishing, which at that period were usually carried out by unmarried girls employed full-time for the purpose, came from the weaving shed and the adjacent part of the courtyard (Beresford 1987, 55-7, 68; Crummy 2002, 38).

Weaving is represented at Burwell by a bone pinbeater from pit **467** (Fig. 16, SF 15). These tools were used in a variety of ways on the two-beam vertical loom, such as to separate the warp threads and push down the weft. Although less well-shaped than most examples, the Burwell pinbeater is well worn and clearly saw considerable service. It may have been made for a weaver with a developed personal preference for the shape and length required, as in form it lies somewhere between the single-ended flat pinbeaters that first appeared in the Late Saxon period and continued in use

perhaps until as late as the fourteenth century, and the longer slightly curved contemporary form (Walton Rogers 1997, 1755-7).

The combination at Burwell of a spindlewhorl and a pinbeater used with the two-beam vertical loom points to the production of cloth in the immediate vicinity, probably only enough for domestic self-sufficiency but perhaps with any surplus sold on. True commercial production of cloth is associated with the introduction of the horizontal loom, which was much faster than the two-beam vertical loom and the earlier warp-weighted loom, and went hand in hand with the rise of guilds and the various stages of textile production moving into the sphere of specialist craftworkers (Crummy 2002, 37).

The general fittings from Burwell consist of a key from a barrel padlock and three iron nails from twelfth to thirteenth century contexts. A fragment of iron sheet may also come from a fitting of some kind, and a flat piece of glass may come from a window. Two of the nails have a distinctive narrow rectangular head and could be products of the same smith. Pegging was preferred in timber building construction at this period, so these nails may instead have been used on fences, in the construction of furniture such as caskets or chests, or for attaching iron strapwork or other fittings to doors or walls. The barrel padlock key (Fig. 16, SF 11) came from the upper fill of the windmill foundation trench **348**. Keys of similar form occur in both the Roman and medieval periods and cannot be closely dated. They represent the protection of wealth and property, but this example may pre-date the most substantial building in the immediate area, the mill itself. The glass fragment is very decayed and is likely to be potash window glass, which began to be manufactured in the eleventh century (Keys 1998, 218-19).

The remaining group of objects is composed of a small quantity of fragments of Rhenish lava from hand-querns. Although these were present in several features they only totalled 478 g, with most pieces consisting of small weathered and abraded chips with no remaining original surfaces. Small areas of grinding surfaces worn flat from use survive on pieces from pits **366** and **467** and part of a tooled surface on a fragment from the windmill foundation trench **348**. Most, if not all, pre-date the construction and use of the windmill and would have been used for domestic flour milling. Imported from the Rhineland, where the principal source was the Eifel Hills, lava quernstones dominate hand-quern assemblages from Middle Saxon to Late Medieval sites, particularly in the east, although they spread much further across Britain. They may have been the *petrae nigrae* referred to in the only surviving letter of Charlemagne to Offa of Mercia (Whitelock 1955, 779). The querns from medieval Norwich were almost exclusively made from lava and, although a rather more varied assemblage came from the Ashwell site at Ely, lava was again predominant there (Margeson 1993, 202; Blinkhorn *et al.* 2005, 83-4). In East Anglia, the preferred use of querns made from this stone

over those from British sources, such as Millstone Grit from the Pennines, highlights the importance of trade with the Rhineland. The stone was highly suitable for both hand-milling and industrial milling, being comparatively light thanks to its vesicular nature, and the importation of large roughly-shaped blanks of lava into Late Saxon London allowed stones of the appropriate size to be produced at the point of sale (Vince 1988, 83; Freshwater 1996). The watermills at Tamworth and at Shrewsbury Abbey used stones of Rhenish lava (Rahtz 1981, 4; Rahtz & Meeson 1992, 79, fig. 61; Baker 2002, 131-2), and the chips of the stone from the upper fill of the windmill foundation trenches at Burwell, if not residual, may point to it also having been fitted with lava millstones.

Fig. 16, SF 13. (481), fill of lime kiln 483. Pierced pot sherd of St Neots Ware with irregular edge. The perforation has the hourglass profile typical of a hole drilled through from each side of the sherd. It is worn, suggesting that the sherd was used as a spindlewhorl, but the edge shows no sign of deliberate trimming or abrasion. Maximum diameter 35 mm, thickness 7 mm; diameter of spindle hole 6 mm.

Fig. 16, SF 15. (465), fill of pit 467. Bone pinbeater, slightly curved on one edge, with well-shaped oval-section lower end and irregular upper end, where some cancellous tissue is exposed. The whole surface is worn smooth from use. Length 117 mm.

Fig. 16, SF 11. (344), fill of windmill foundation trench 348. Iron barrel padlock key, with the outer part of the round bit broken off. Length 102 mm.

SF 14. (429), fill of pit 430. Iron nail with round flat head. Length 30 mm.

SF 10. (268), fill of lime kiln stoke hole 269. Iron nail with narrow rectangular head and hooked shank. Length 23 mm.

SF 12. (343), fill of windmill foundation trench 348. Iron nail with narrow rectangular head. Length 81 mm.

SF 21. (294), fill of windmill foundation trench 299. Iron sheet fragment. 38 by 33 mm.

SF 20. (323), fill of lime kiln 266. Fragment of decayed and friable glass; its present green colour is due to the presence of copper salts. 26 by 18 mm.

SF 17. (287), fill of pit 366. Fragment of lava quernstone, from a grinding surface that has worn smooth. Weight 73g.

SF 16. (465), fill of pit 467. Fourteen fragments of lava quernstone, and a quantity of flakes and powder. Patches of the worn grinding surface survive on some fragments. Weight 146g.

(296), fill of pit 307. Two fragments of lava. Weight 3g.

(337), fill of windmill foundation trench 327. Two fragments of lava. Weight 3g.

SF 18. (345), fill of windmill foundation trench 348. Eight fragments of lava. Weight 61g.

SF 19. (343), fill of windmill foundation trench 348. Twelve weathered fragments of lava, some fitting, and a quantity of flakes and powder. Weight 189g. The stone is noticeably

denser than the other lava fragments from the site, but almost certainly still came from the same source, where denser rock occurs both in substantial areas and as inclusions in a more vesicular matrix.

(346), fill of windmill foundation trench 348. Two fragments of lava quernstone, one spalled from the ridged grinding surface. Weight 3g.

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Appendix 5: Faunal Remains

by Chris Faine

Introduction

A total of 23 “countable” bones were recovered from 47 contexts with 50 fragments being unidentifiable to species (68.4% of the total sample). Fragments were obtained from a variety of features including pits, ditches and layers dating from the medieval period, this being subdivided into several phases. The condition of the small assemblage is extremely good, with the majority of fragmentation being attributed to butchery rather than any taphonomic processes. The assemblage is nonetheless fragmented therefore metrical analysis was only possible in very few instances.

The following contexts contained bone but no identifiable fragments: 1, 2, 7, 36, 46, 69, 87, 205, 252, 255, 257, 272, 276, 309, 310, 323, 328, 339, 345, 346, 355, 418, 422, 426, 446, 448, 464, 477, 524 and 529.

Methodology

All elements identifiable to species and over 25% complete were noted and recorded. Loose teeth, caudal vertebra and ribs without proximal epiphyses were noted but not included in any quantification. Elements not identifiable to species were classed as “large/medium/small mammal” but again not included in any quantification. Initially all elements were assessed in terms of siding (where appropriate), completeness, tooth wear stages (also where applicable) and epiphyseal fusion tooth wear was assessed using Grant (1982). Completeness was assessed in terms of percentage and zones present (after Dobney & Reilly, 1988). Initially the whole identifiable assemblage was quantified in terms of number of individual fragments (NISP) and minimum numbers of individuals MNI. Any instances of butchery were also recorded. The type of lesion, its position, severity and direction were all noted. The presence of any further taphonomy, i.e. burning, gnawing etc was also noted. No pathology was noted on any fragments.

The Assemblage

The faunal assemblage from this site was small.

Only three identifiable fragments were recovered from phase **2.1** (Early 12th century) contexts. These consisted of butchered fragments of cattle ulna, humerus and sheep/goat scapula.

By far the largest amount of faunal remains was recovered from phase **2.2** (Late 12th century) contexts, in particular pit fill **465**. These consisted of a number of butchered postcranial cattle remains, along with portions of goat cranium, humerus and lumbar vertebrae. Metrical analysis of the intact humerus suggests an animal at the lower end of the size range for this period (Bourdillon, 1993). All fragments were from adult (i.e. physically mature) animals. Several cattle carpals showed evidence of burning on their plantar surfaces.

Further remains were recovered from contexts **241**, **267**, **481**, **489** and **526**. These largely contained butchered sheep long bones and pelvis, along with a single cattle metacarpal showing evidence of gnawing at both epiphyses. Butchery marks seen in phase **2.2** contexts are all severe and most likely indicate rough disarticulation with a large knife or cleaver.

Although bone fragments were recovered from phases **2.3** (13th century) and **2.4** (14th-15th century), no identifiable elements were seen. Only 1 fragment was recovered from phase **3** (post-medieval) contexts, in the form of a butchered cattle metacarpal.

Conclusions

Unfortunately the assemblage is on the whole too small and scattered with which to draw any detailed conclusions from. The material from context 465 most likely represents food waste, given the elements represented and patterns of butchery. The remaining material from Phase 2.2 contexts again consists largely of heavily butchered meat bearing elements, again suggesting butchery or food waste.

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APPENDIX 6: Plant Remains

by Rachel Fosberry

Introduction and Methods

Previous samples taken during evaluation of this site had shown that plant preservation was poor.
A total of seventy-one bulk samples were taken from features including several post holes, pits, limekiln and windmill foundation.
Sixteen samples from post holes, many of which are undated, were selected and processed as a trial in order to assess their potential to provide useful data for further study. A further twelve samples were subsequently processed and their results included in this appraisal.
Ten litres of each sample were processed by tank flotation. The flot and the magnetic residues were collected in a 0.3mm nylon mesh and the residue was washed through a 0.5mm sieve. Both flot and residue were allowed to air dry. The dried residue was passed through 5mm and 2mm sieves and a magnet was dragged through each resulting fraction prior to sorting for artefacts. Any artefacts present were noted and reintegrated with the hand-excavated finds. The flot was examined under a binocular microscope at x16 magnification and the presence of any plant remains or other artefacts recorded

Results

The results are recorded in table App.6.1 below.

Preservation was by charring and is generally poor. Flot volumes were generally large (Charred plant remains occur in half the samples in the form of grains, sparse charcoal fragments and a single culm node in Sample 71 (Context 537).The two samples taken from the Windmill foundation trenches each contain single specimens of charred barley (*Hordeum* sp) grains. The other charred grains present in this assemblage are identified as wheat grains although this identification is tentatively due to the degree of fragmentation and degradation.
Small sherds of pottery were recovered from Sample 10, (post hole **201**), Sample 33 (windmill foundation trench **289**), Sample 56 (post hole **496**) and Sample 60 (post hole **503**). Small amounts of hammerscale were present in all of the samples but not in significant quantities (Appendix 3).

Sample No.	Context No.	Cut No.	Feature Type	Sample Size (L)	Residue Volume (ml)	Flot Volume (ml)	Cereals	Charcoal	Weed Seeds	Large animal bones	Marine molluscs
10	201	202	post hole	10	250	100	0	0	0	0	0
11	203	204	post hole	10	500	250	0	0	0	0	0
15	213	214	post hole	10	400	40	+	+	0	0	0
16	215	216	post hole	15	200	60	0	0	0	0	0
19	217	218	post hole	10	1000	30	0	0	0	0	0
20	205	206	post hole	40	300	1	0	0	0	0	0
23	221	222	post hole	10	500	100	0	0	0	0	0
24	223	224	post hole	10	600	40	0	0	0	0	0
27	229	230	post hole	15	2000	40	0	0	0	0	0
28	233	234	post hole	20	200	250	0	0	0	0	0
29	237	238	post hole	25	900	60	+	0	0	0	0
31	235	236	post hole	30	2000	30	0	0	0	0	0
33	289	277	windmill foundation	20	600	40	+	0	0	0	0
34	290	299	windmill foundation	10	2000	15	+	0	0	0	+
38	333	334	post hole	10	100	20	+	0	0	0	0
42	401	402	post hole	10	1200	60	0	0	0	0	0
43	403	404	post hole	10	800	60	0	+	0	0	0
44	405	406	post hole	10	800	30	0	+	0	0	0
45	424	425	post hole	10	2000	15	+	+	+	0	0
47	440	441	post hole	10	500	0	0	0	0	0	0
48	452	453	post hole	10	200	130	+	+	0	0	0
54	491	492	post hole	10	1000	65	+	+	0	0	0
55	493	494	post hole	10	300	2	+		0	0	0
56	495	496	post hole	10	1300	200	0	0	0	0	0
57	497	498	post hole	10	1500	400	+	0	0	+	0
60	503	504	post hole	10	600	40	+	+	0	0	0
67	529	530	post hole	10	400	80	+	+	0	0	0
70	535	536	post hole	20	170	15	0	0	0	0	0
71	537	538	post hole	20	300	170	+	+	0	0	0

Table App. 6.1: Results from Environmental Samples
+ = 1 – 10 specimens ++ = 10 – 100 specimens +++ = 100+ specimens

Conclusions

The samples selected all contained small amounts of metallic residues, however none of the samples produced significant quantities. The evidence of the fuel required for metalworking activities i.e. coal or charcoal, is unusually absent from this assemblage.

The flots produced a low abundance of charred material in the form of cereal grains. This suggests general scatters of burnt debris rather than discrete purposeful deposits. Further work is not recommended for this assemblage.

Cranfield UNIVERSITY

Appendix 7: Gradiometer Survey

By Peter Masters

GRADIOMETER SURVEY OF
LAND AT 2 ISAACSON ROAD, BURWELL,
CAMBRIDGESHIRE

TL5910 6587

Cranfield Forensic Institute Report No. 004

Peter Masters

October 2006

CONTENTS

ILLUSTRATIONS

PLATES

ABSTRACT

A fluxgate gradiometer survey was undertaken on c.0.5 hectares of land at 2 Isaacson Road, Burwell, Cambridgeshire. The survey identified a wide range of magnetic variation, the strongest of which reflects known features such as deposits of modern ferrous/ceramic material associated with the garden.

Two emphemeral curvilinear anomalies were detected indicating possible ditch-like features although it is more likely that these represent natural features within the lower chalk geology. Limited archaeological potential was recorded at this site considering its location within the historic core of the village.

1.0 INTRODUCTION

Cambridgeshire County Council Archaeological Field Unit commissioned Centre for Archaeological and Forensic Analysis, Cranfield University to undertake a fluxgate gradiometer survey on land adjacent to Harlech House, 2 Isaacson Road, Burwell, Cambridgeshire. This work was carried out in advance of a planning application for the erection of 4 new dwellings, access road, landscaping and services (Planning App. no. E/05/0/403/OUT). The work was undertaken on the 17th October 2006.

The survey methodology described in this report was based upon guidelines set out in the English Heritage document *'Geophysical Survey in Archaeological Field Evaluation'* (David, 1995).

2.0 LOCATION AND DESCRIPTION

Sections 2 and 3 include information contained within a specification for an archaeological evaluation of the site (Connor, 2006).

The site is located within the medieval core of the historic village of Burwell. The area of survey is located adjacent to Harlech House, 2 Isaacson Road, Burwell, Cambridgshire (Fig 1: TL 5910 6587).

The site is currently under grass containing a number of trees and shrubs (Plates 1-3). To the south of the application area is an orchard. The geology of the area is comprised of Lower Chalk (British Geological Survey sheet 188, published 1974).

3.0 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The Historic Environment Record (HER) for Cambridgeshire indicates no known archaeological remains within the site. However, in the immediate vicinity a number of archaeological sites have been recorded.

The earliest Prehistoric remains recovered in the vicinity of site consist of a Palaeolithic handaxe, which was found when postholes were dug for a new fence around the castle site in 1992 (HER 01775B).

A Bronze Age hoard containing a bronze axe, spear heads, chisels, and other implements (MCB7848) were found in St Mary's church yard. Excavations at Station Gate uncovered a single severely truncated crouched burial likely to be prehistoric in date.

Roman settlement is known to have been located beneath Burwell Castle (SAM29382). Excavations to the west of the development site in 2001 and 2002 at Station Gate/Railway Close found the remains of ditches, a possible corn drying oven and a single burial all dating to the Roman period (CCC AFU BUR RR 02)

Remains of possible Saxon post built structures and a possible SFB have been found in recent excavations at Station Gate/Railway Close (CCC AFU BUR RR02).

To the north of the area of investigation, an Anglo-Saxon burial ground was excavated during the latter half of the 1920's (HER 06764-MCB8158). The Anglo-Saxon cemetery was first discovered in 1884 during the working of Victoria Lime Pits. The cemetery was excavated between 1925and 1929 when 150 inhumations were uncovered and all date from the 6th century A.D. The cemetery lies about 500 yards north of the church, on the crest of a low chalk ridge.

The remains of a nationally important Conquest period castle are located to the north of the development area (SAM29382). At Station Gate excavations uncovered 11th – 15th century settlement remains including the remains of a later medieval Lime Kiln and a lode channel. Closer to the development area is an early 14th century manor house (MCB8213, LB003493). Another manor house (17th century) is located further along the High Street to the north.

The 1889 First Edition Ordnance Survey map depicts the area of investigation as a large plot land running down to the Great North-Eastern railway line (Fig. 2).

4.0 METHODOLOGY

Gradiometry is a non-intrusive scientific prospecting technique used to determine the presence/absence of some classes of sub-surface archaeological features (eg pits, ditches, kilns, and occasionally stone walls). By scanning the soil surface, geophysicists identify areas of varying magnetic susceptibility and can interpret such variation by presenting data in various graphical formats and identifying images that share morphological affinities with diagnostic archaeological remains.

The use of gradiometry is used to establish the presence/absence of buried magnetic anomalies, which may reflect sub-surface archaeological features.

The area survey was conducted using a Bartington Grad 601 dual fluxgate gradiometer with DL601 data logger set to take 4 readings per metre (a sample interval of 0.25m). The zigzag traverse method of survey was used, with 1m wide traverses across 30m x 30m grids. The sensitivity of the machine was set to detect magnetic variation in the order of 0.1 nanoTesla.

The data was processed using *Archeosurveyor v.1.3.2.8*. It was clipped to reduce the distorting effect of extremely high or low readings caused by discrete pieces of ferrous metal on the site. The results are plotted as greyscale and trace plot images (Fig. 3).

5.0 RESULTS (Fig. 3)

A limited gradiometer survey was carried out over the area of an existing garden, which produced few significant anomalies.

Two curvilinear anomalies (solid/dashed red lines) possibly indicate ditch-like features of unknown origin. It is feasible that these could reflect the remains of ephemeral ditches or are more likely to represent modern garden features/natural features within the lower chalk.

Other anomalies detected in the survey area (circled pink) indicate modern ferrous-like remains such as modern debris relating to domestic garden activities.

A series of positive anomalies (outlined in blue) may represent the backfill of geotechnical test pits or could even indicate garden features such as planting beds or tree boles.

6.0 CONCLUSIONS

The survey has identified only limited evidence of significant archaeological remains; most of the definitive magnetic variation appears to reflect relatively modern features such as backfilled geotechnical pits and modern buried garden features.

The survey may have identified ephemeral traces of two curvilinear features, such as ditches of unknown origin but is more likely to be related to garden features.

Based on the survey results, it is concluded that the site possesses limited archaeological potential even though it is in close proximity to known archaeological sites of importance that lie to the immediate north of the site such as the castle remains.

7.0 ACKNOWLEDGEMENTS

Cranfield University, Centre for Archaeological and forensic analysis would like to thank the Archaeological Field, Cambridgeshire County Council for this commission.

8.0 BIBLIOGRAPHY

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David, A. 1995 *Geophysical Survey in Archaeological Field Evaluation.* London, English Heritage: Research & Professional Guidelines No.1.

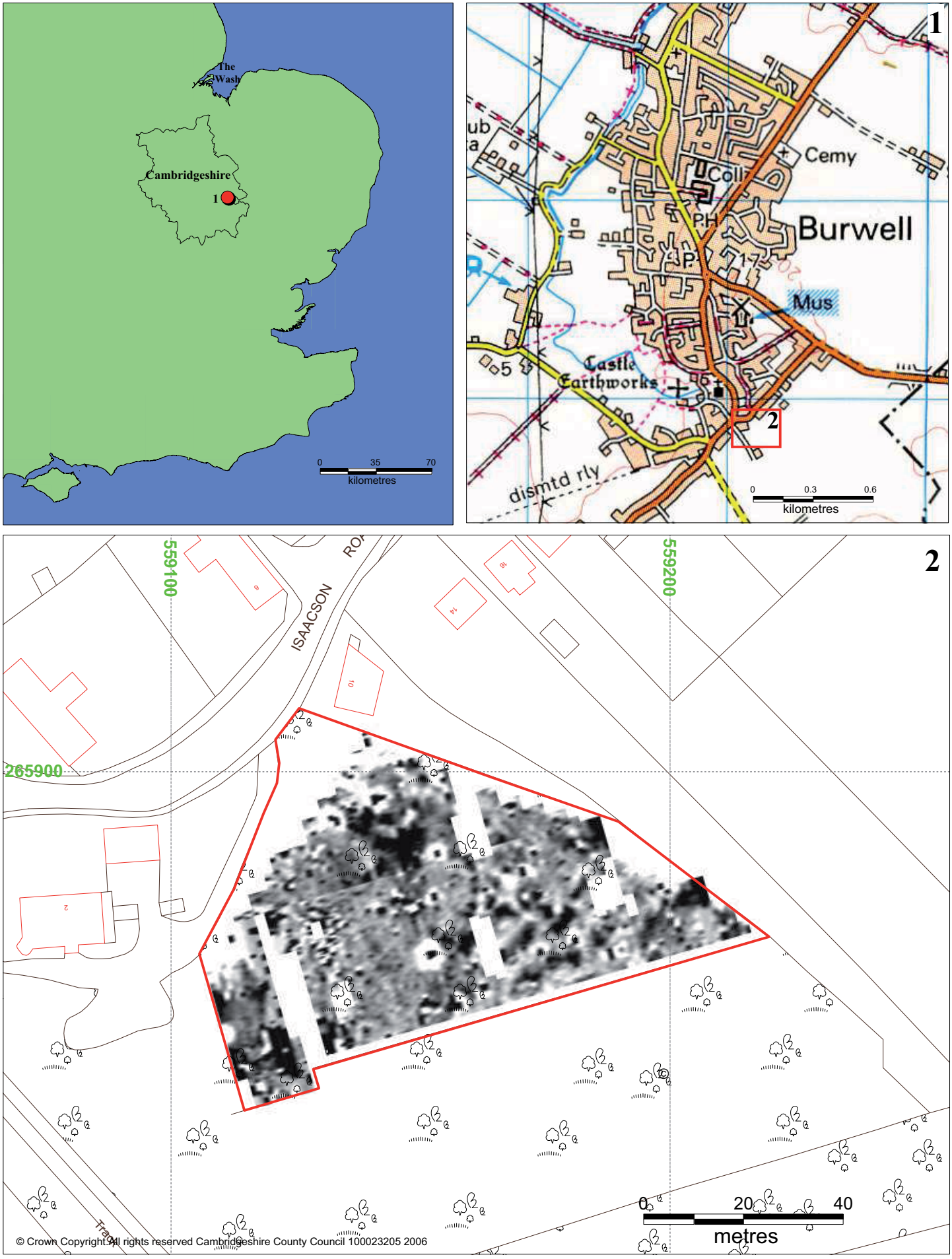


Fig. 1 - Location plan.

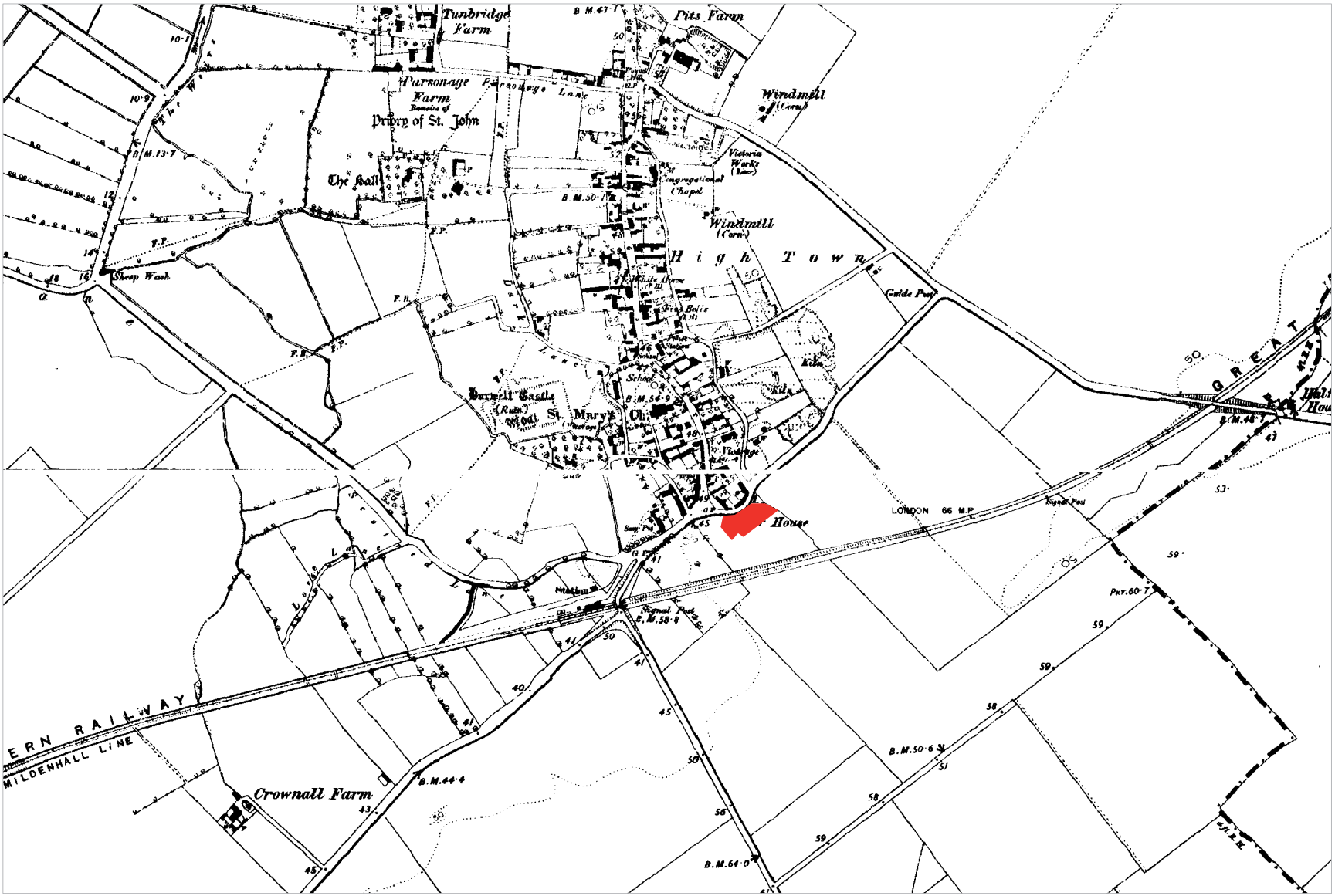
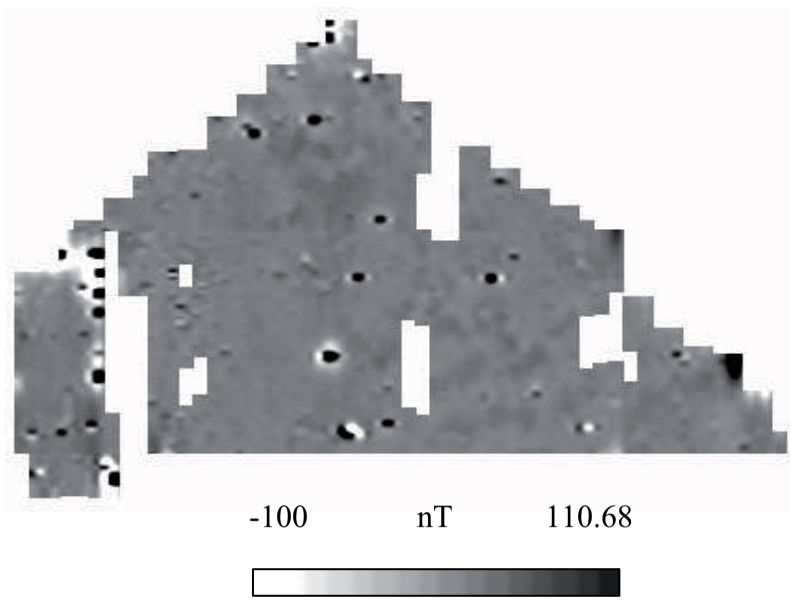
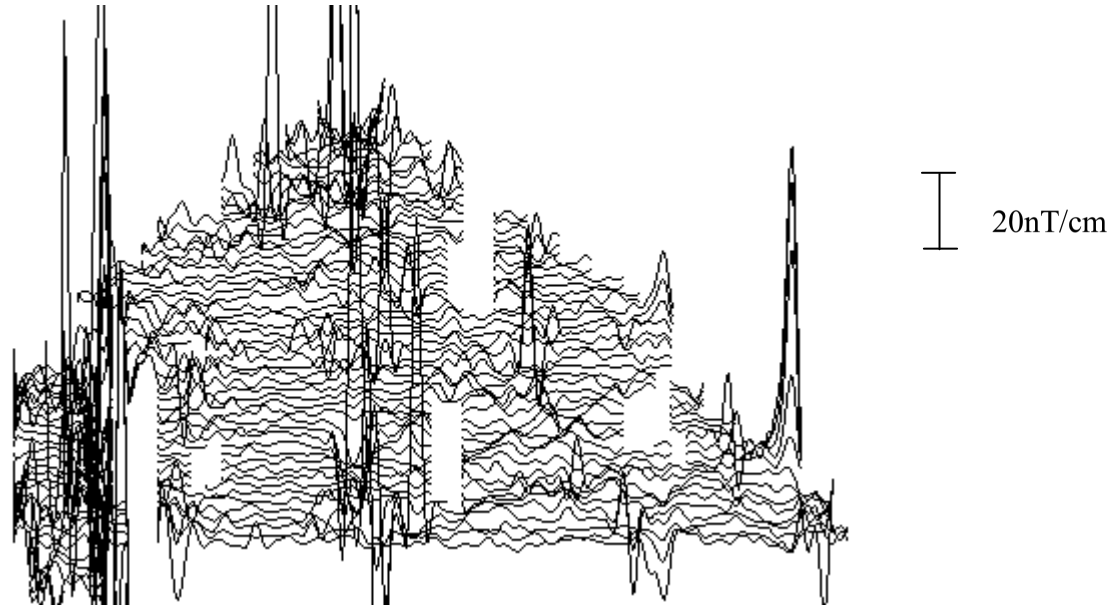


Fig. 2 – First Edition Ordnance Survey map of 1890 showing the location of the site (red), not to scale.

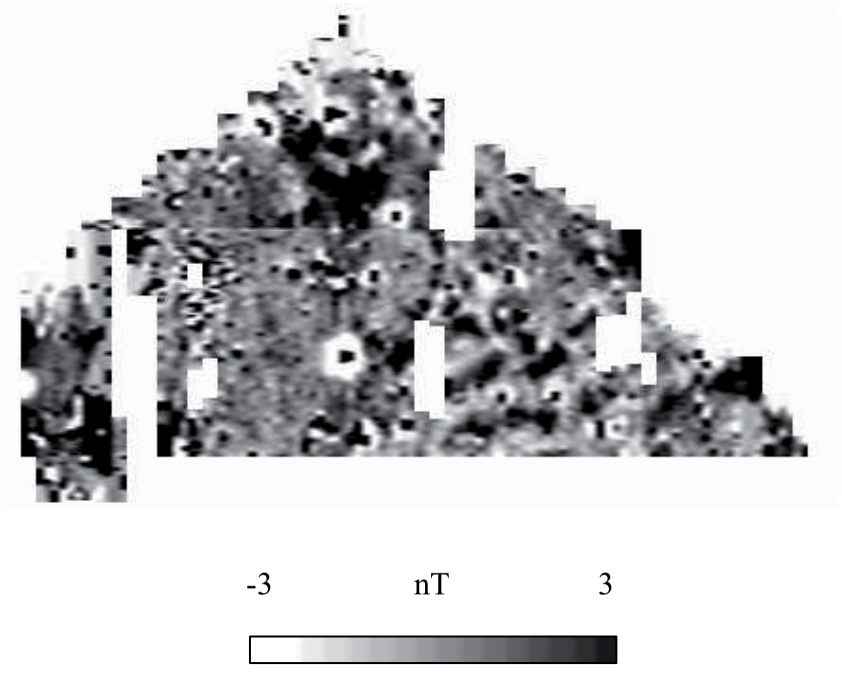
RAW DATA



TRACE PLOT



ENHANCED IMAGE



INTERPRETATION

Fig. 3 – Geophysical survey results with interpretation, scale – 1:1000

PLATE 1 – General view looking south-east

PLATE 2 – General view looking south

PLATE 3 – General view of western end of application area looking south

Drawing Conventions

Plans

Limit of Excavation

Evaluation Trench

Deposit - Conjectured

Natural Feature

Sondages/Machine Strip

Test Pit

Intrusion/Truncation

Illustrated Section S.14

Archaeological Feature

Archaeological Deposit

Excavated Slot

Cut Number 118

Sections

Limit of Excavation

Cut

Cut-Conjectured

Deposit Horizon

Deposit Horizon - Conjectured

Intrusion/Truncation

Top Surface/Top of Natural

Break in Section/
Limit of Section Drawing

Cut Number 118

Deposit Number 117

Ordnance Datum 18.45m OD

Inclusions

Small Find 40

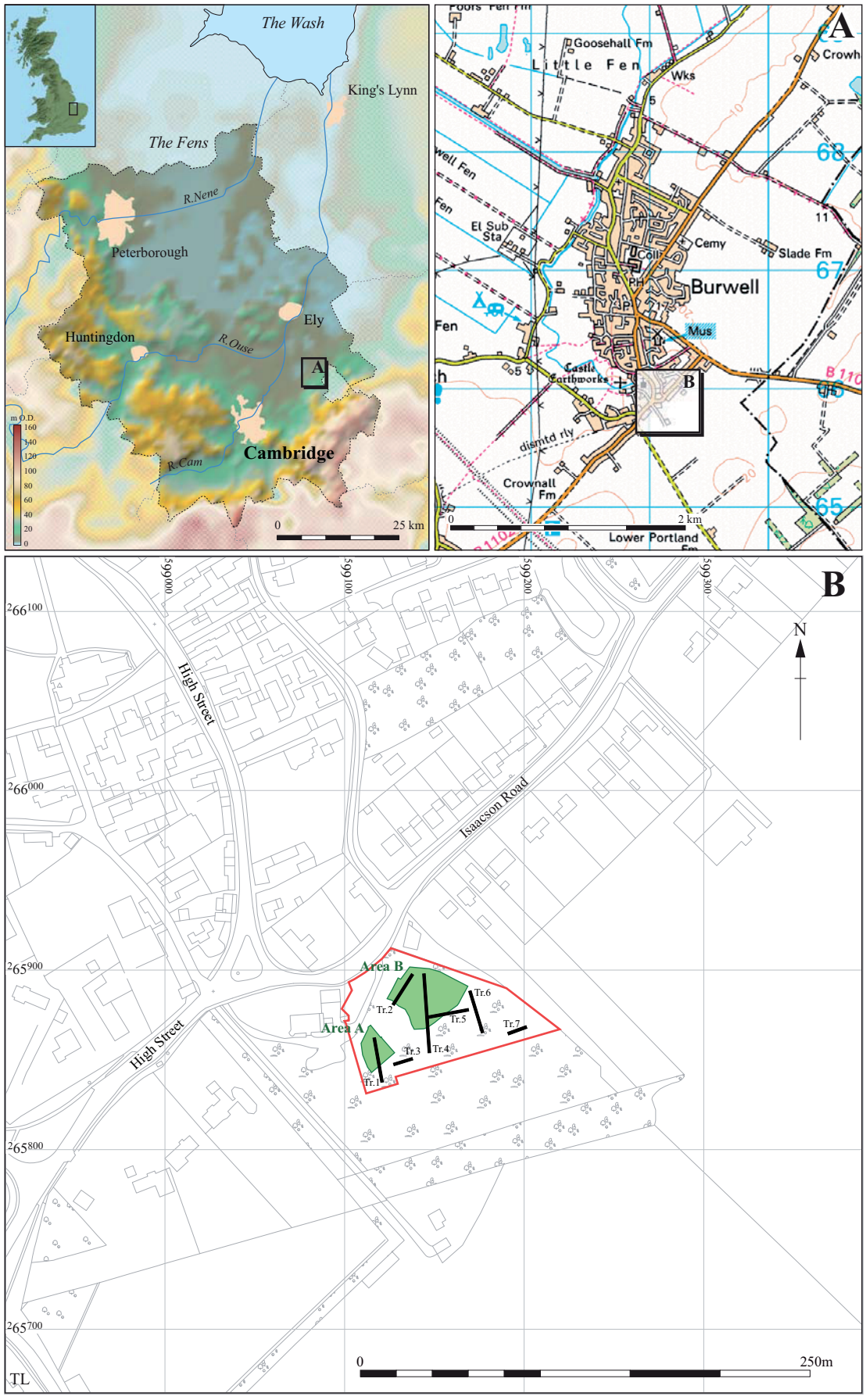


Figure 1: Site location (green) with the evaluation trenches (black) and the development area outlined (red)

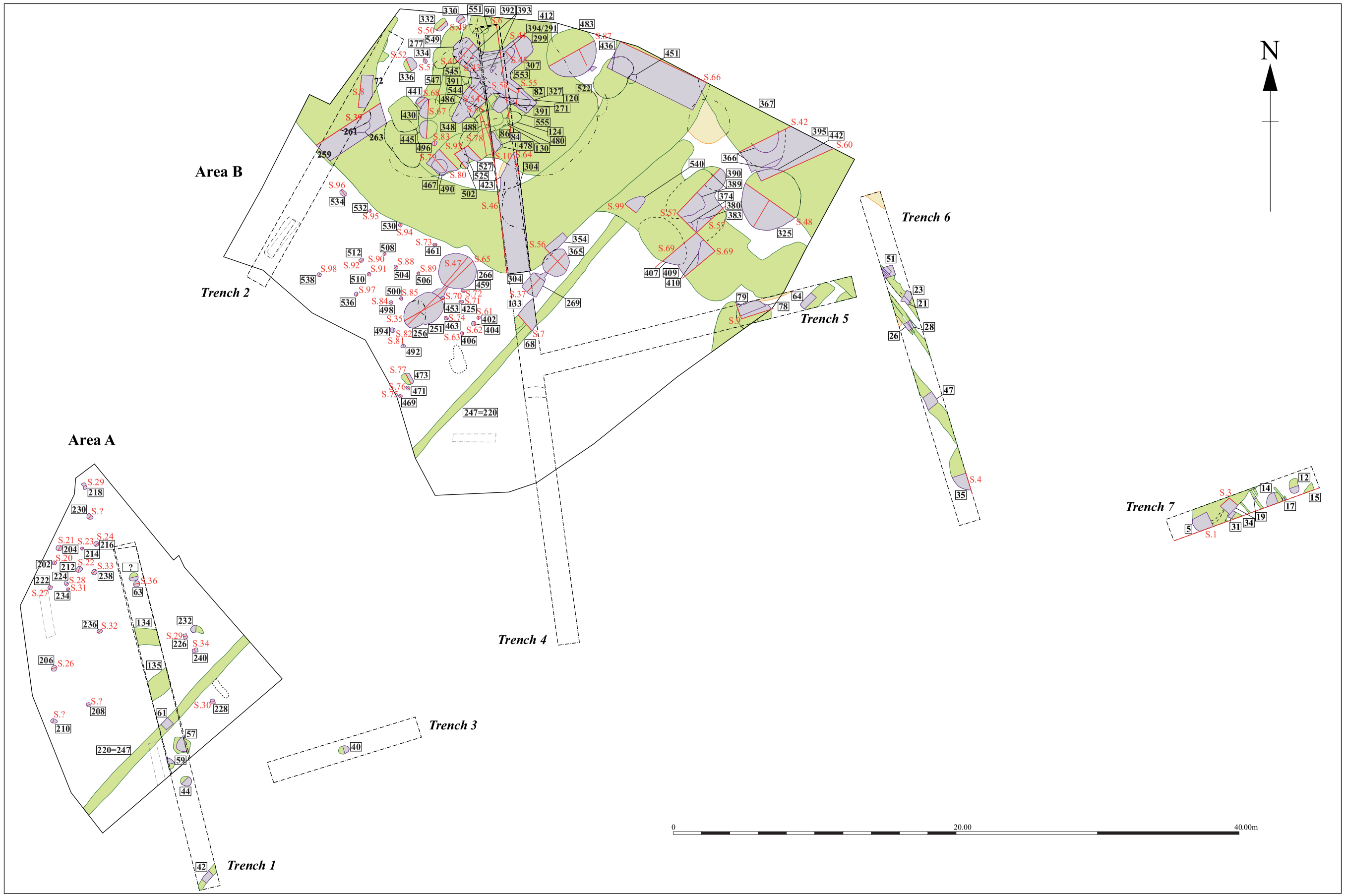


Figure 2: Excavation plans: Areas A and B, with evaluation trenches

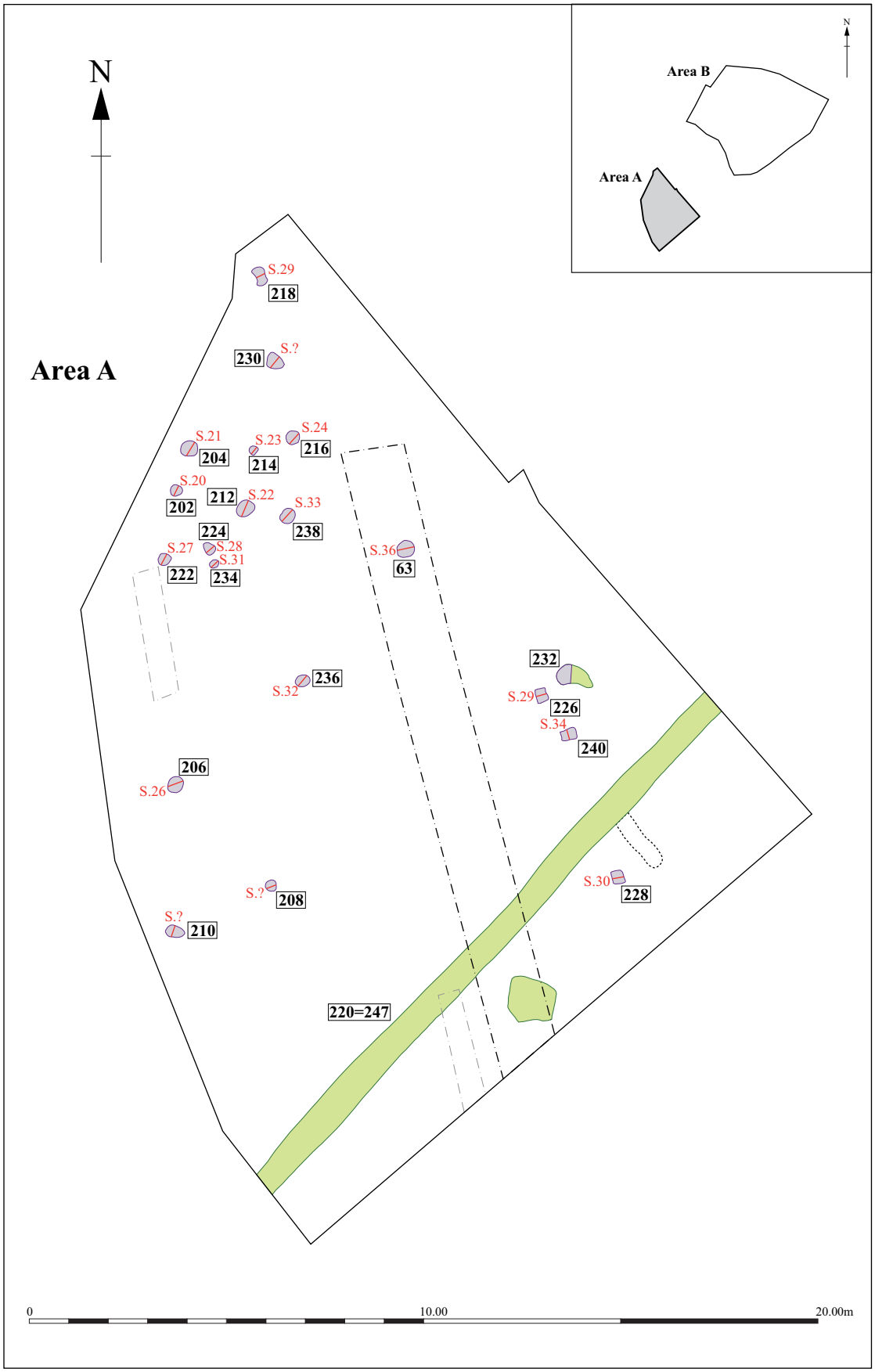


Figure 3: Area A

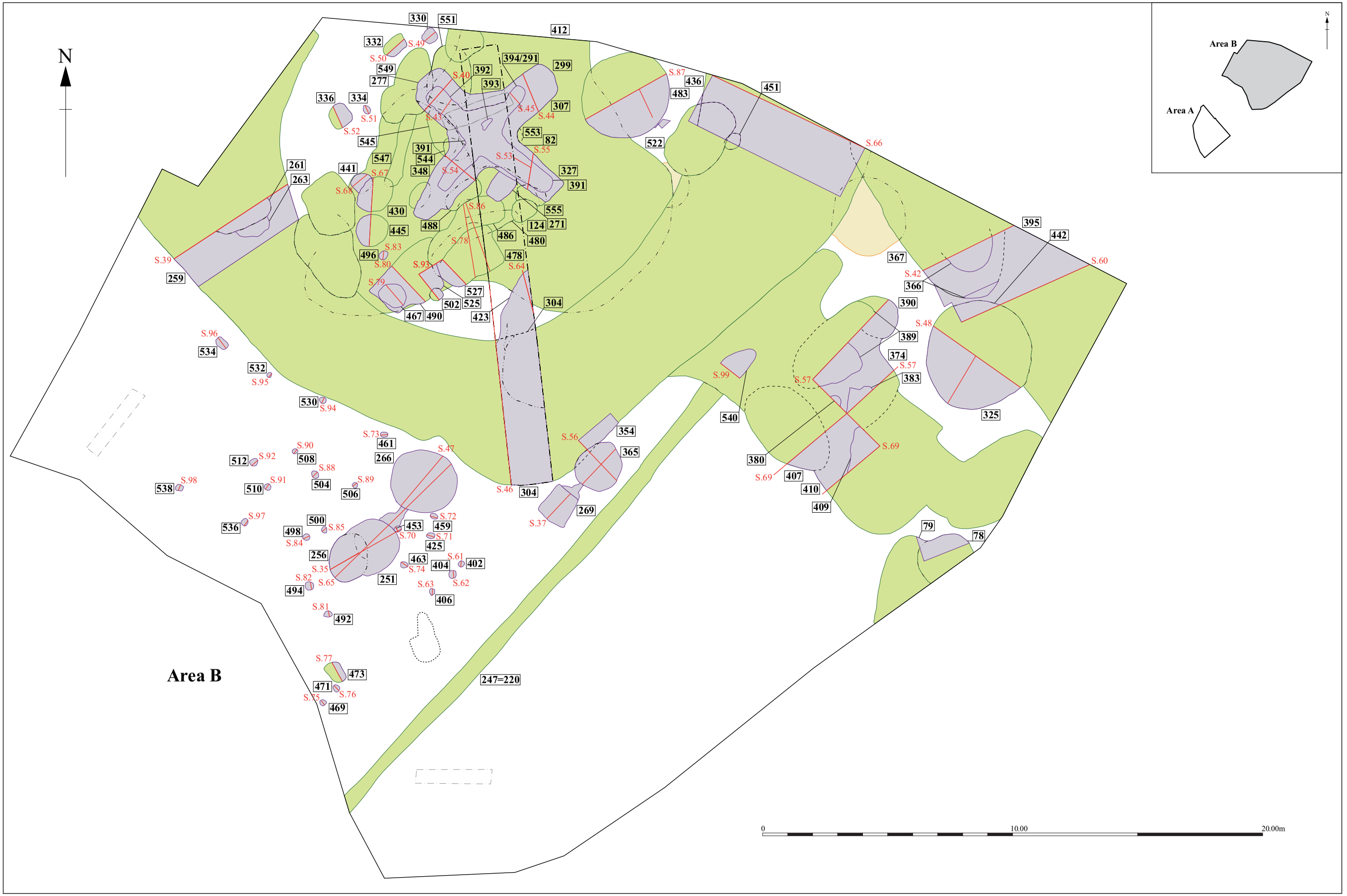


Figure 4: Area B

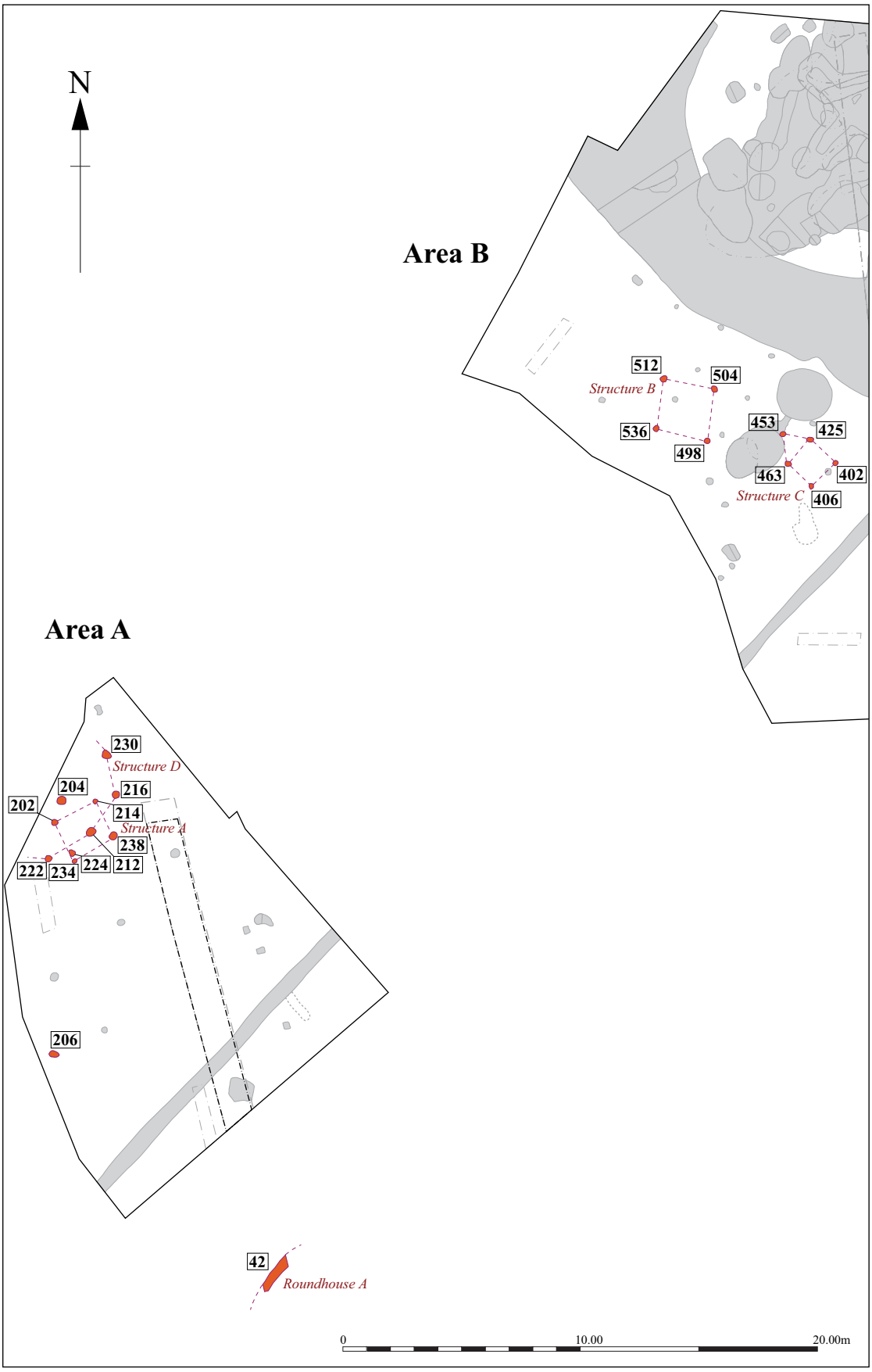


Figure 5: Period 1 - Late Bronze Age to early to middle Iron Age (red)

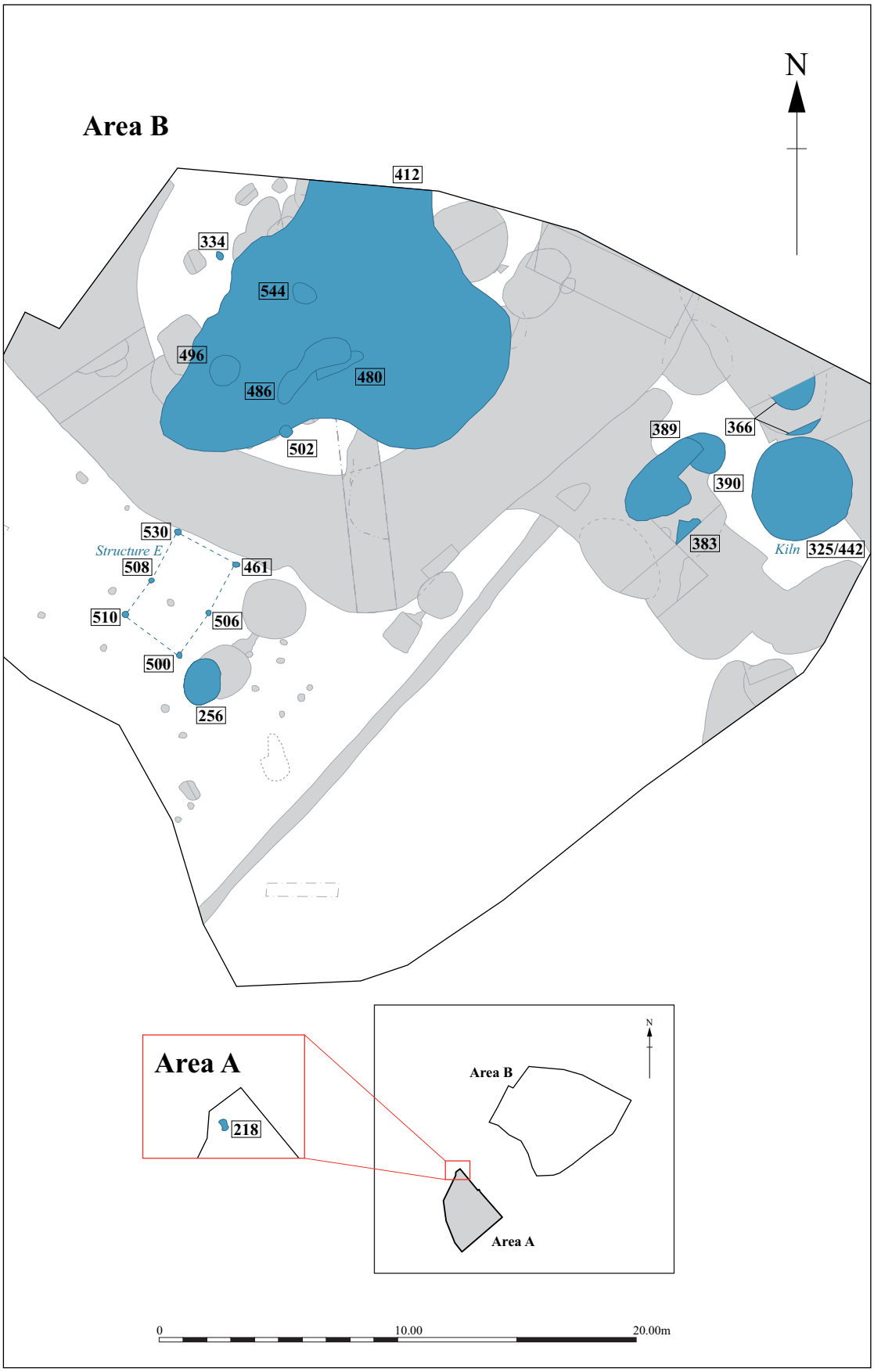


Figure 6: Period 2, Phase 2.1 - Early 12th century (blue)

Figure 7: Period 2, Phase 2.2 - Late 12th century (dark green)

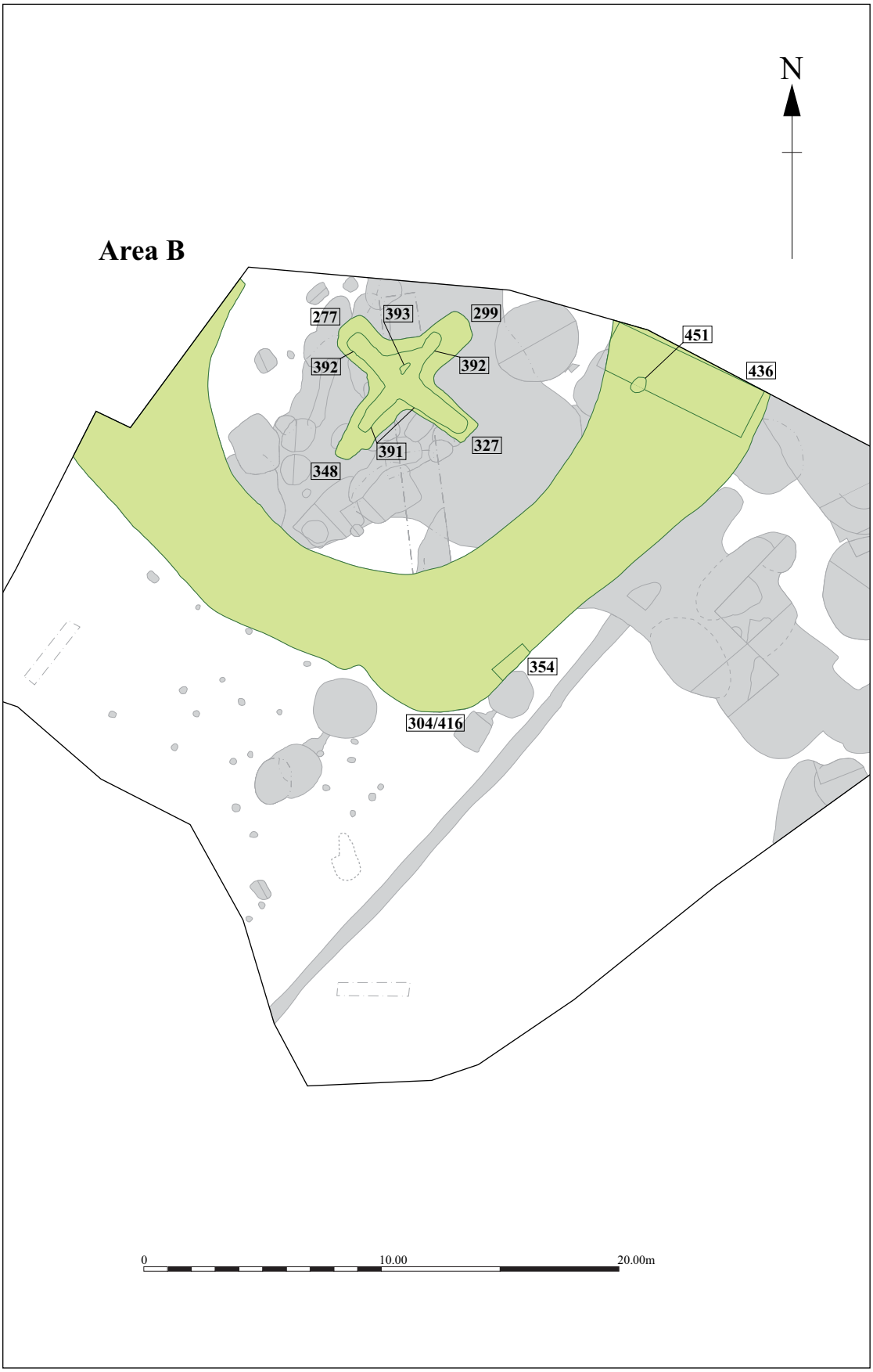


Figure 8: Period 2, Phase 2.3 - 13th century (green)

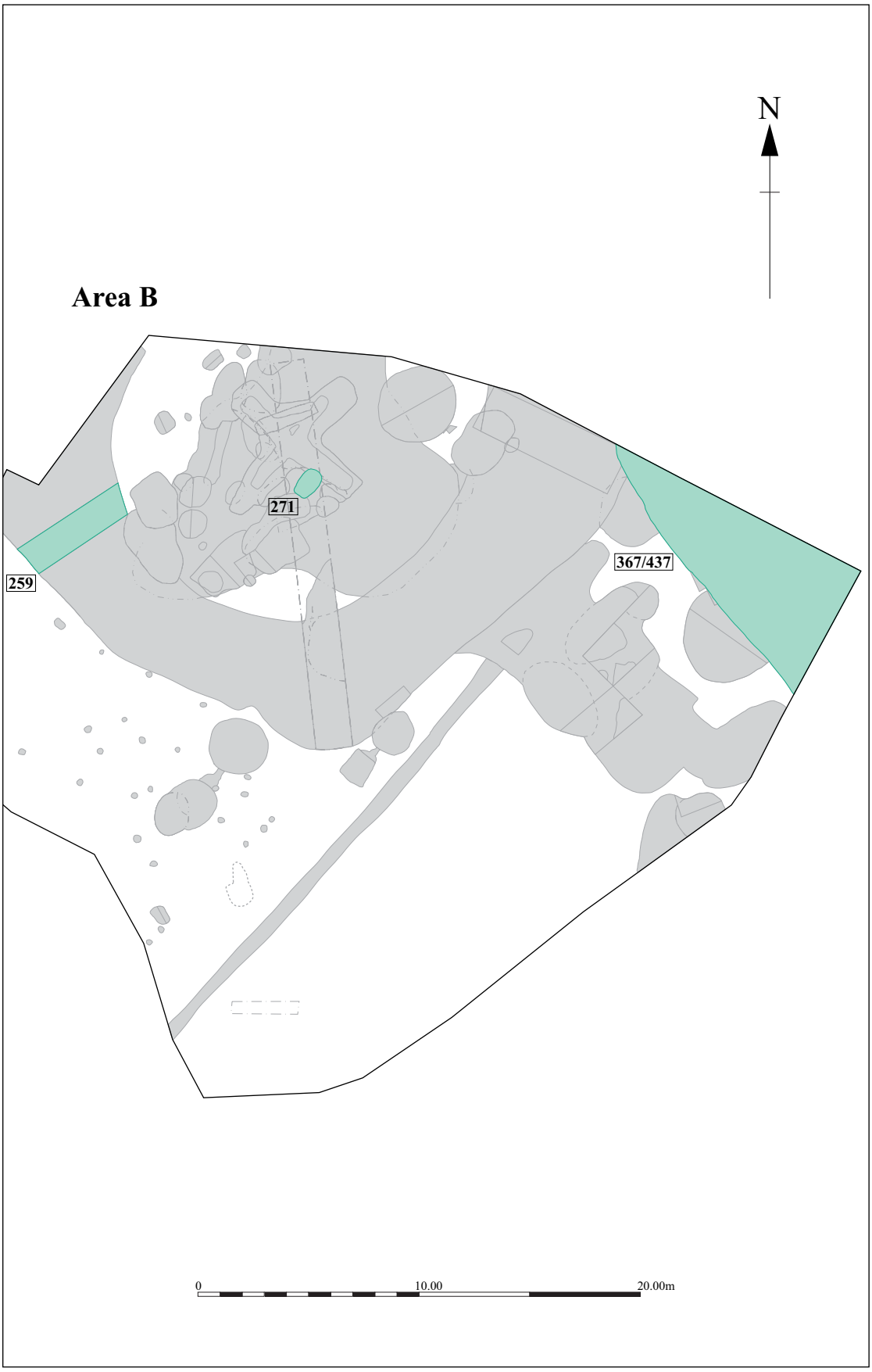


Figure 9: Period 2, Phase 2.4 - 14th to 15th century (light green)

Figure 10: Period 3 - Post-medieval (orange)

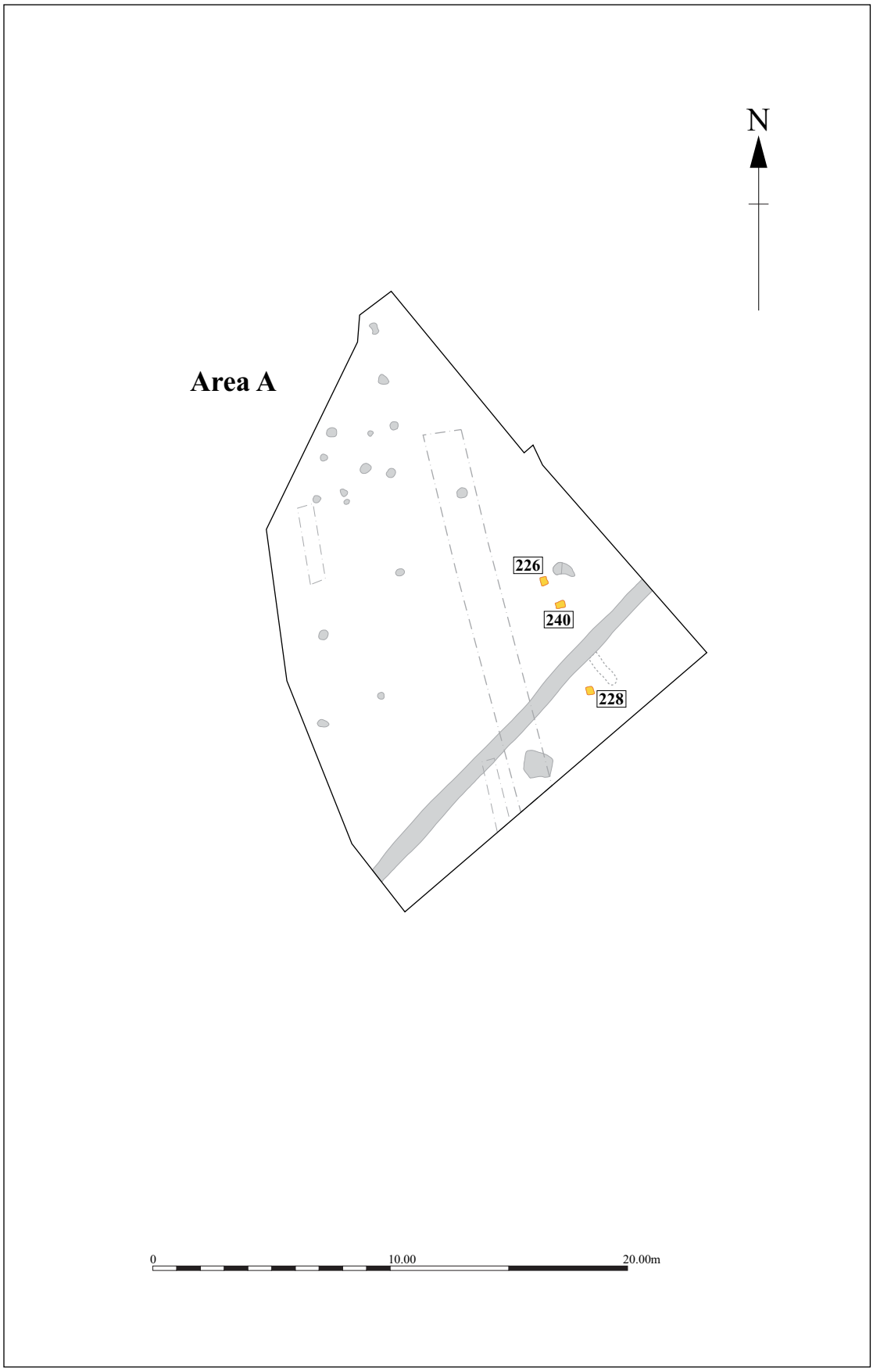


Figure 11: Period 4 - Modern (yellow)

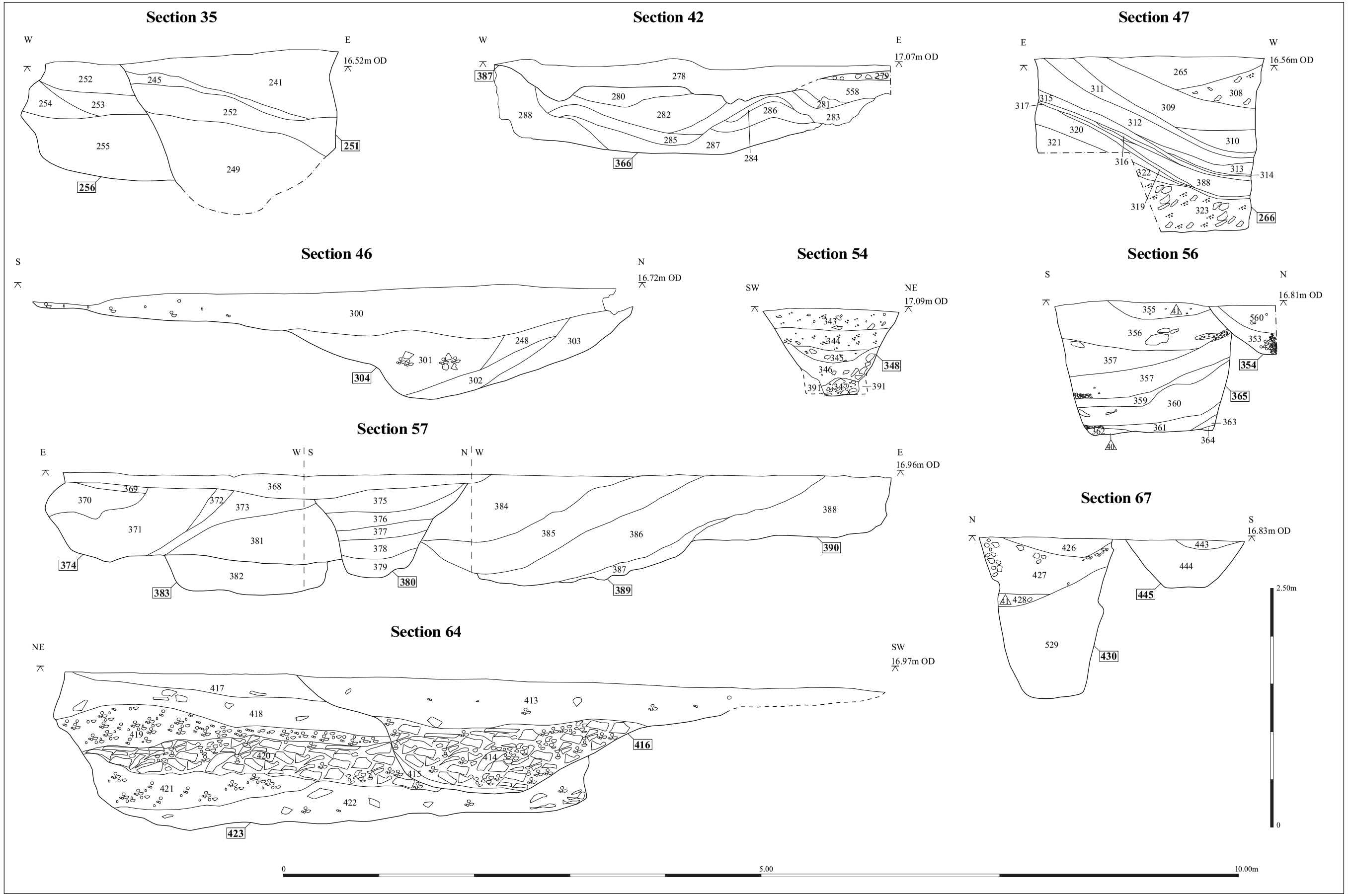


Figure 12: Selected section drawings

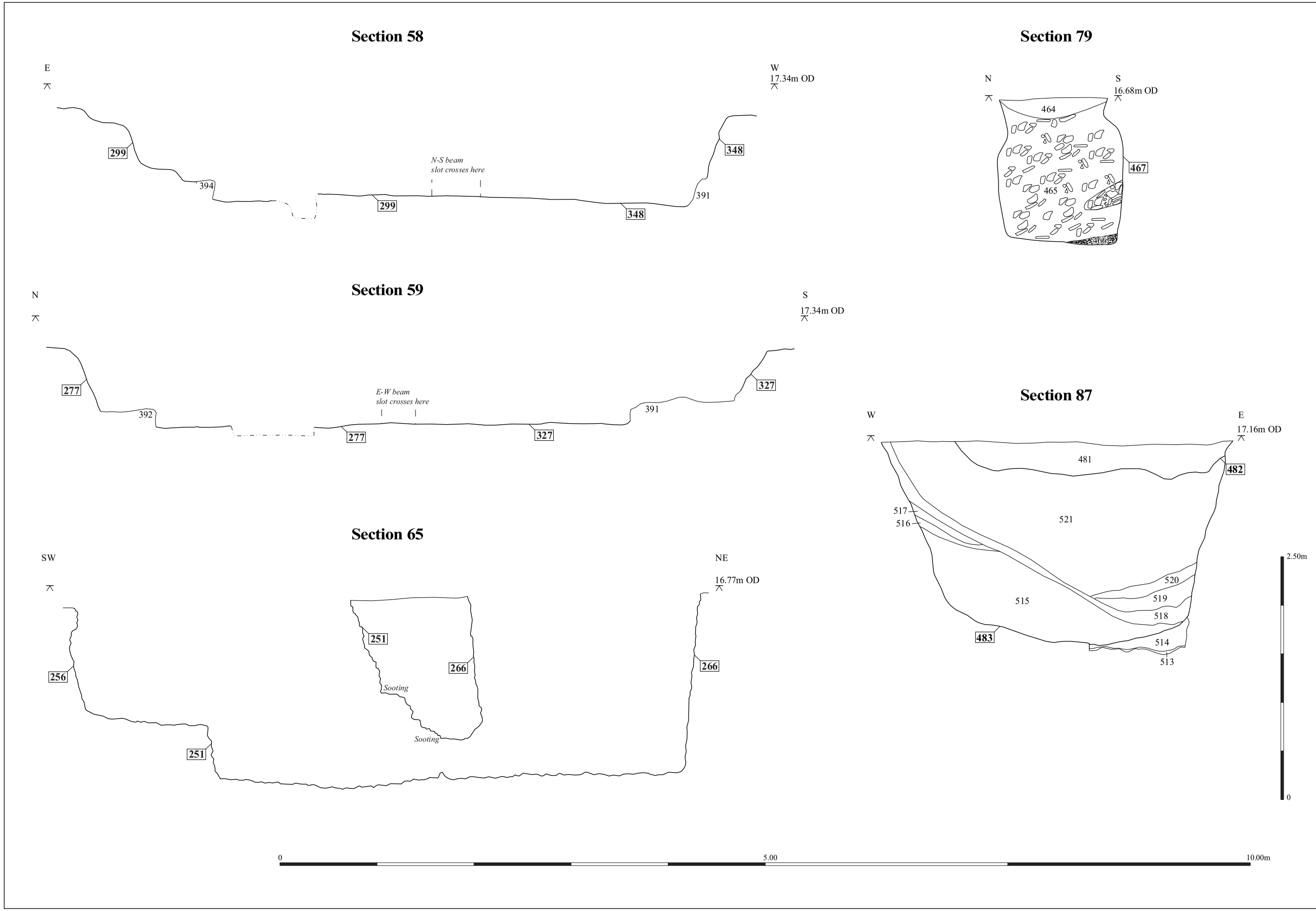


Figure 13: Selected section drawings

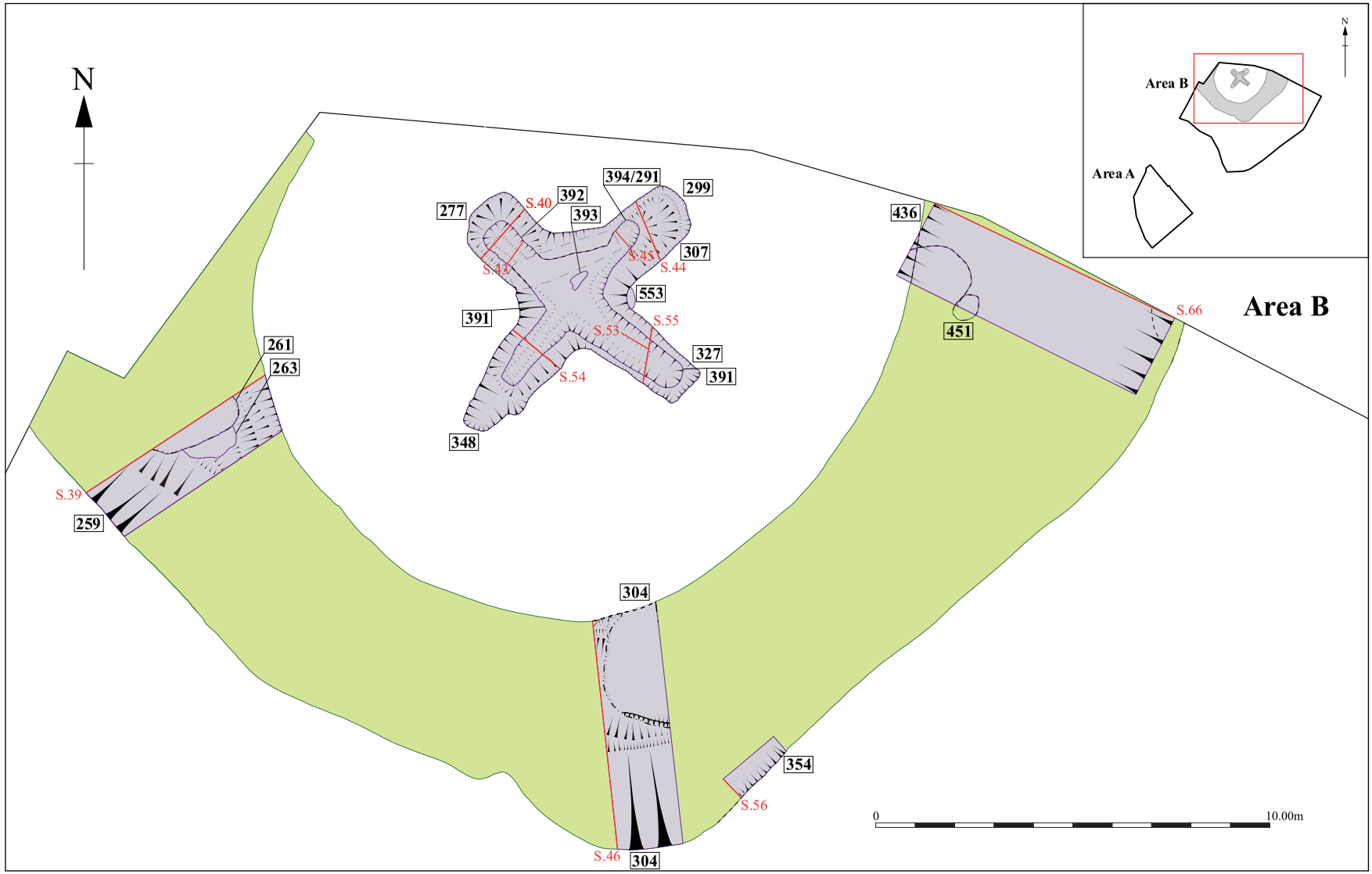


*Figure 14: Windmill **277** and surrounding C-shape ditch **259***

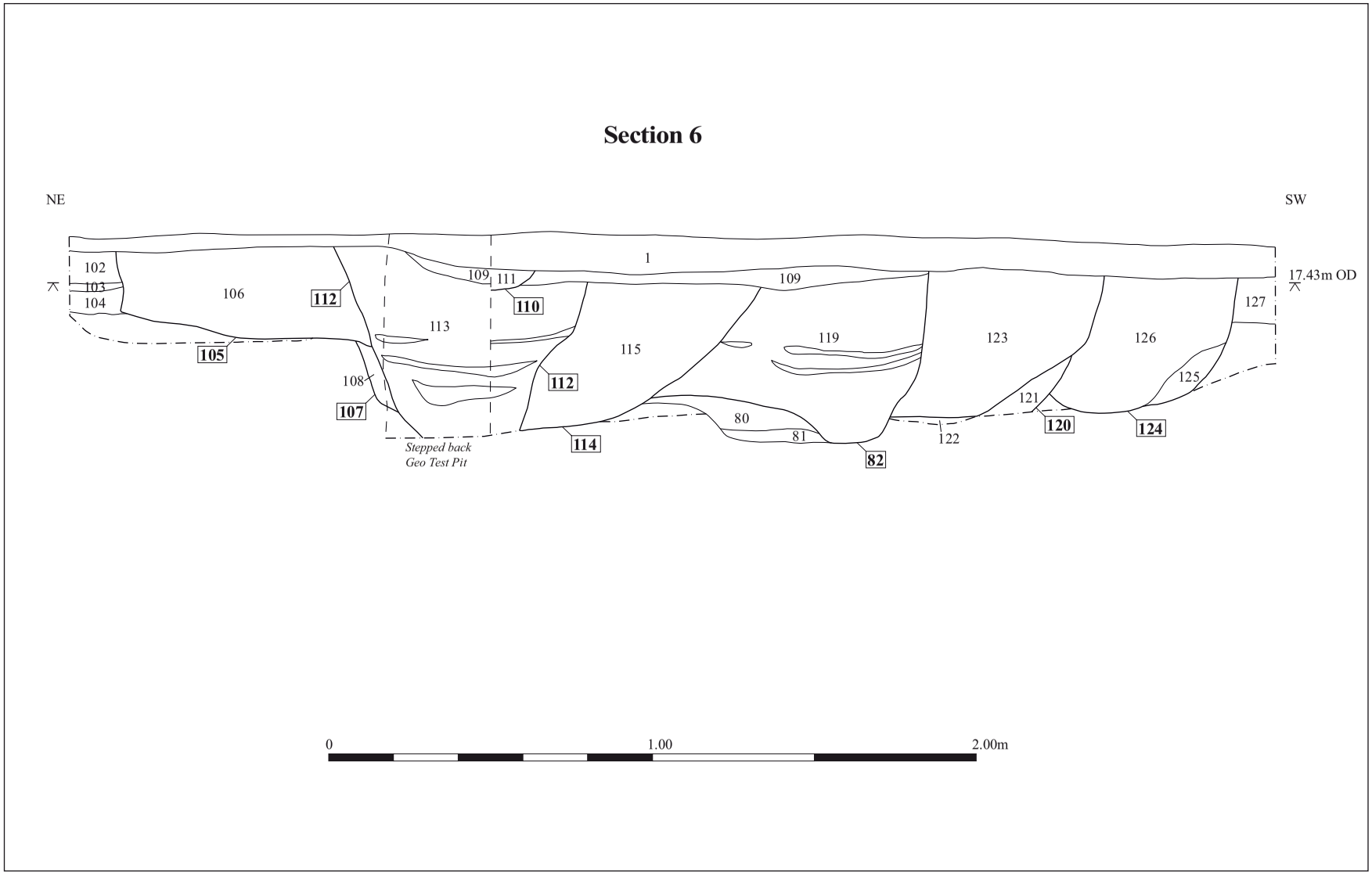


Figure 15: Longitudinal profile through windmill foundation ***277***

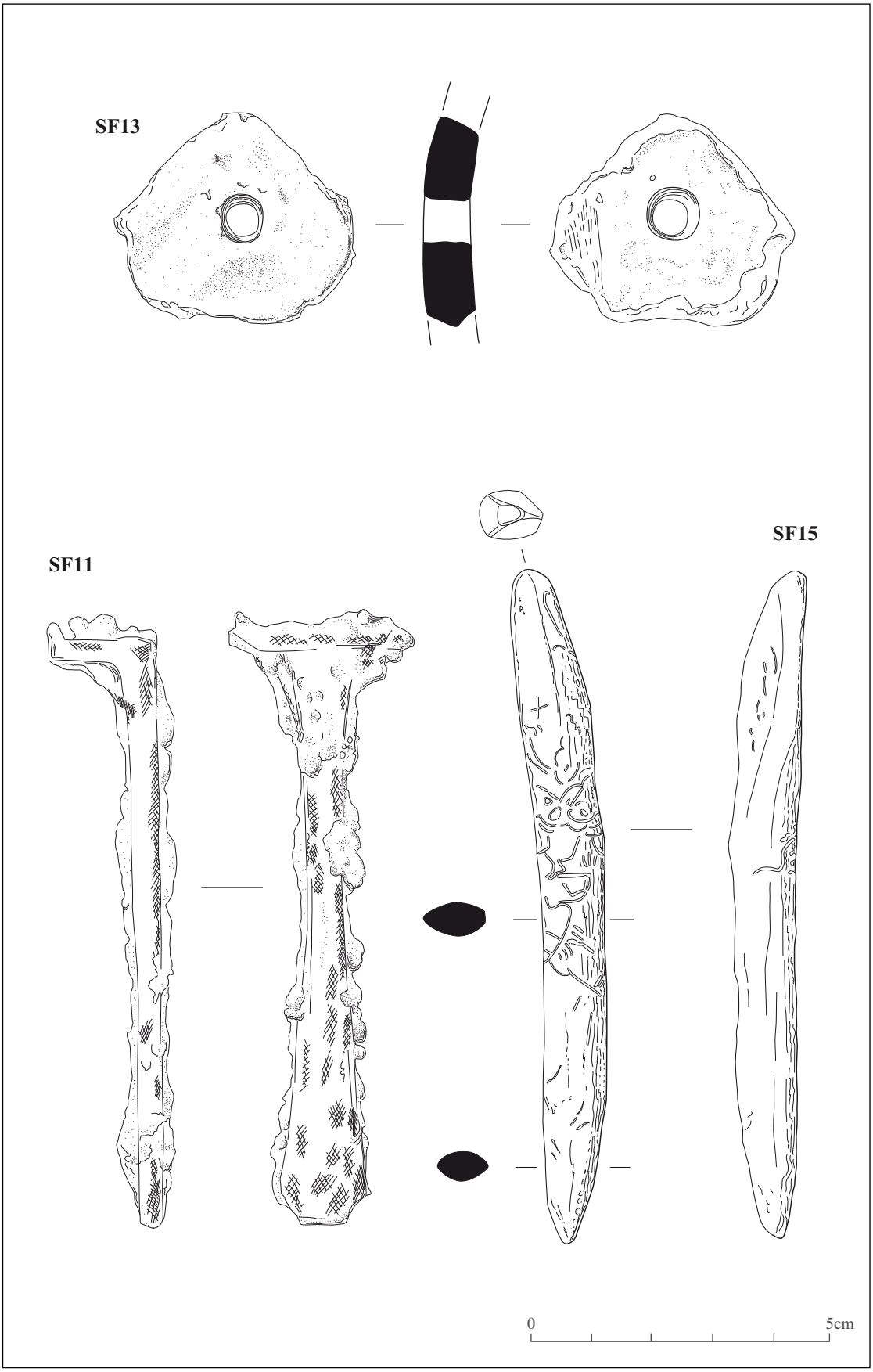


Figure 16: Spindle whorl (SF 13), bone pinbeater (SF 15) and barrel padlock key (SF 11)

Figure 17: Extract from Enclosure Map (1817) (CRO QRDc 29) with approximate site outlined (red)

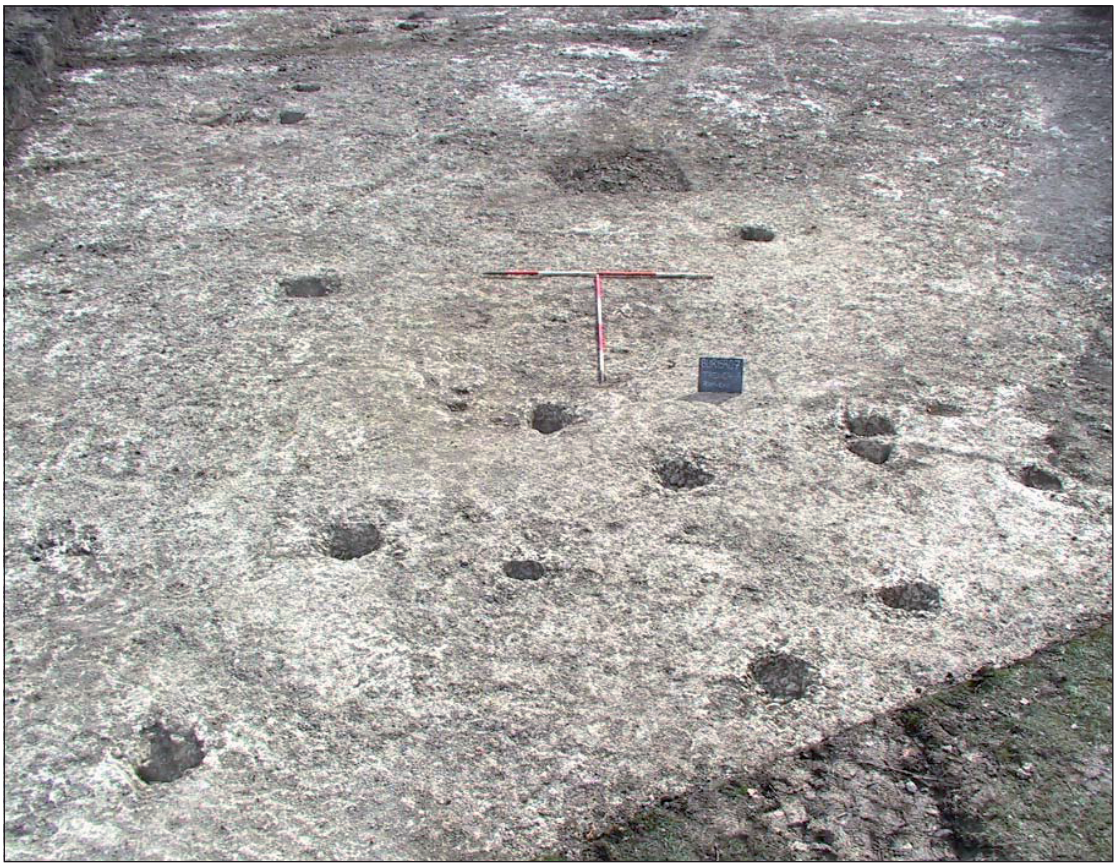


Plate 1: Area A Late Bronze Age to early to middle Iron Age structures

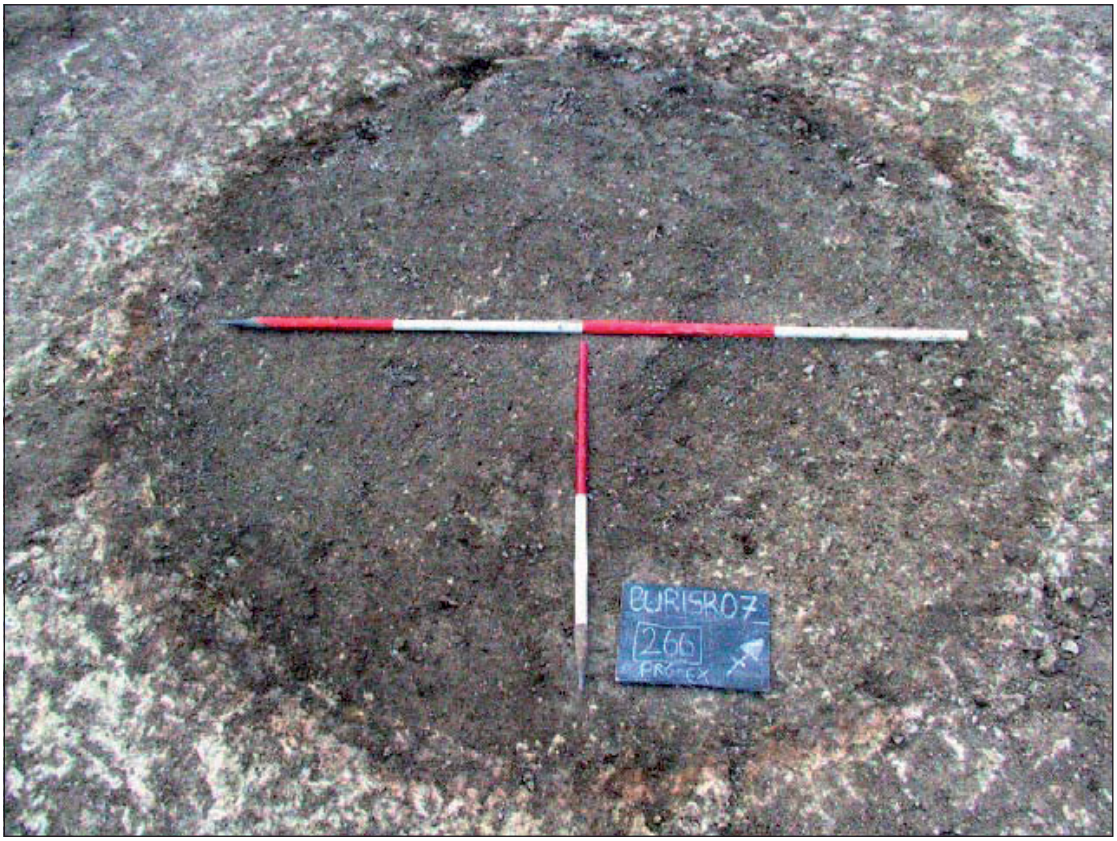


*Plate 2: Phase 2.2 lime kiln **266** pre-excavation*

*Plate 3: Phase 2.2 lime kiln **266** during excavation, showing tip lines*

*Plate 4: Phase 2.2 kiln **483** showing lime in situ and flue tunnel to stoke hole **451**. Note the charcoal and soot in the flue and the pink discolouration of the chalk on the kiln sides, caused by firing*

*Plate 5: Phase 2.2 lime kiln **365** and associated stoke hole **269***

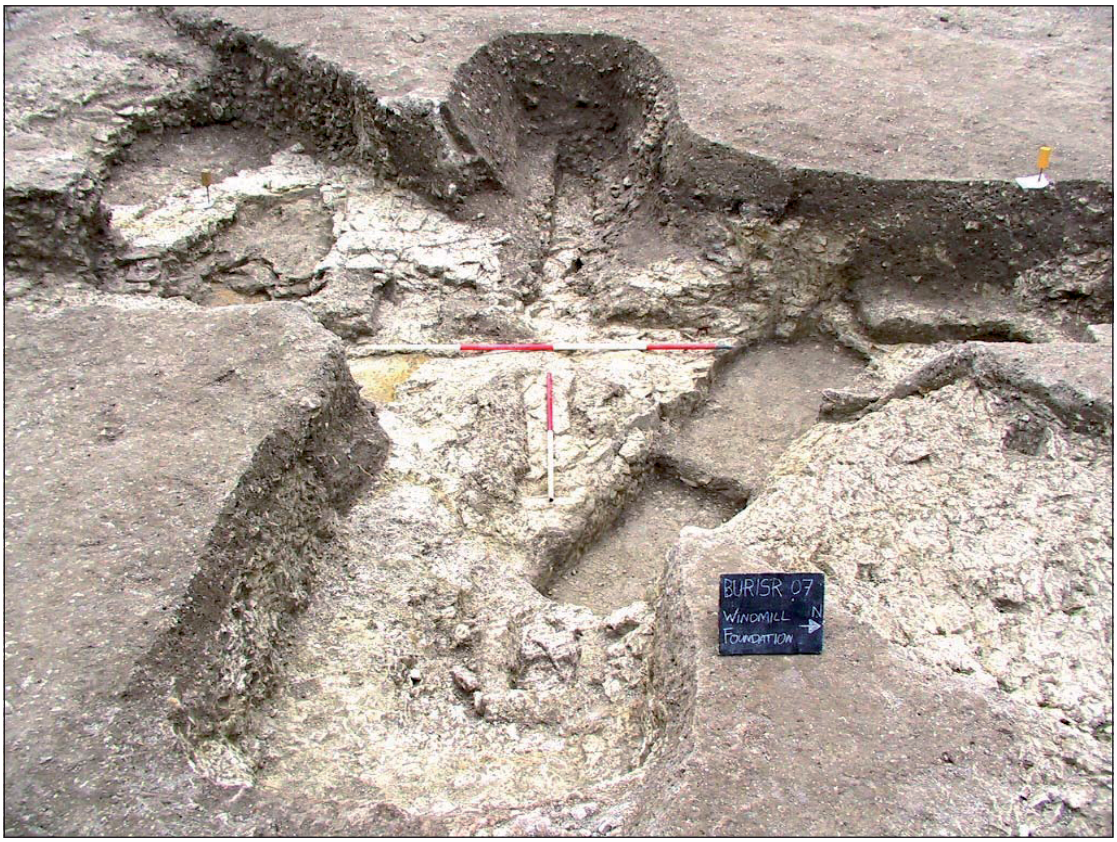


*Plate 6: Windmill foundation **277** showing chalk packing for the cross-tree timbers*

Plate 7: Detail of chalk packing in north-west arm of windmill foundation ***277***

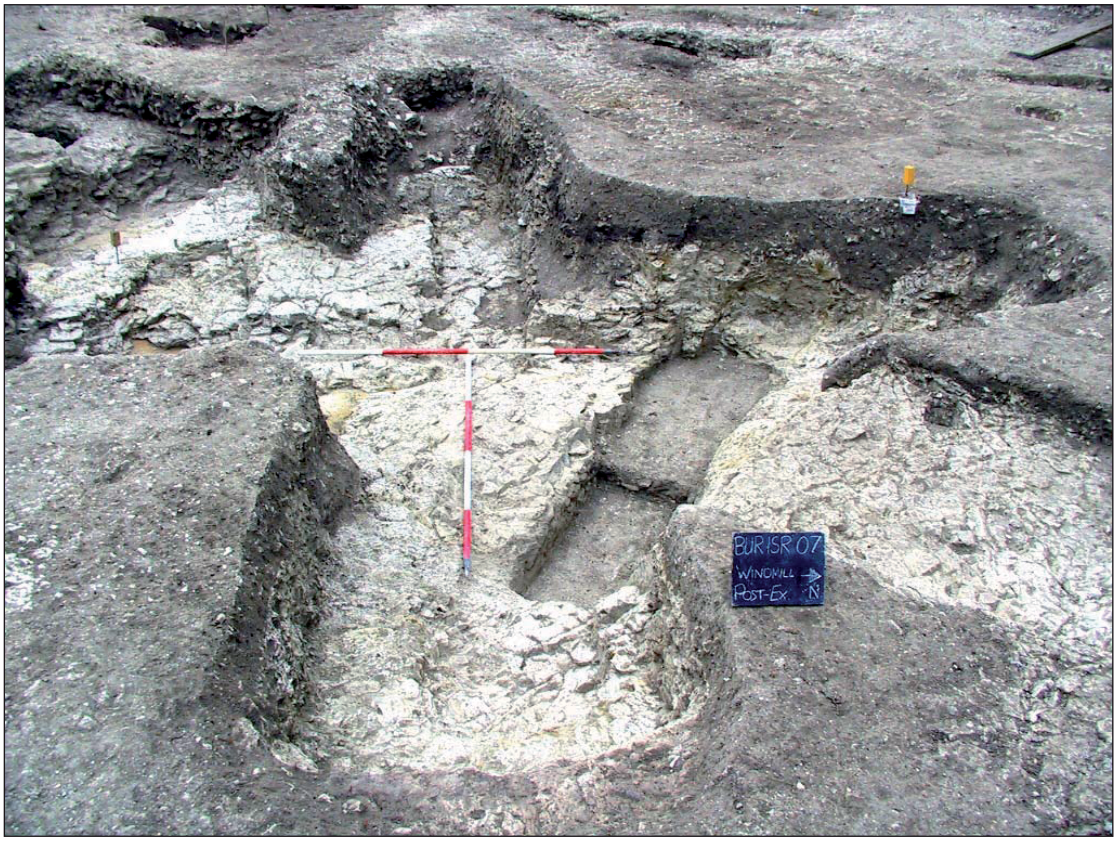


Plate 8: Fully-excavated windmill foundation ***277***

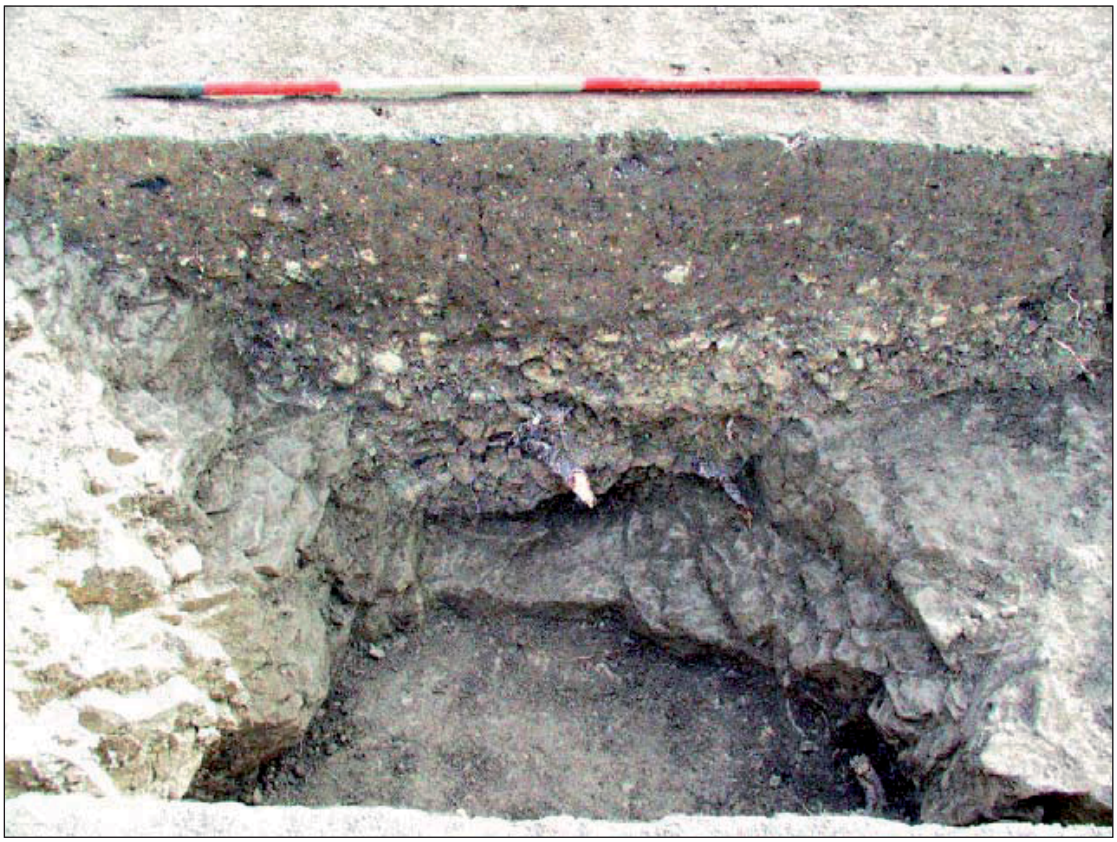


*Plate 9: Windmill ditch **259***

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