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LINWOOD ROAD, MARKET RASEN, LINCOLNSHIRE

ARCHAEOLOGICAL EXCAVATION AND EARTHWORKS SURVEY REPORT

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Report prepared for Kier Homes (Northern) Limited

by

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Summary

- *Part of a Romano-British pottery production centre to the east of Linwood Road in Market Rasen was excavated prior to residential development.*

- *A programme of post-excavation research has established this site as the earliest production centre identified to date; where the main thrust of manufacture appears to have occurred between the early to mid-2nd century AD. For the most part, utilitarian (grey) wares were produced, where some 93% of the pottery recovered had been manufactured at the site.*

- *Two pottery kilns were exposed within the excavated area, as were clay extraction pits (later used for the disposal of industrial waste – including many complete pottery vessels). These features occurred amid a plethora of cut archaeological remains of several phases; pits, ditches, gullies and structural slots. Some of the latter form comprehensive building plans, and it is variously surmised that these structures were associated with pottery manufacture or possibly storage (they certainly were not domestic dwellings).*

- *Scant evidence suggests that there may have been an element of specialised pottery manufacture at Market Rasen; a single sherd of mortaria is thought to have been made locally, within an area more commonly associated with utilitarian production.*

- *There are indications that other industries were practiced within the locality: tap, smithing and smelting slag was recovered from residual contexts, suggesting that metalworking was taking place very close to the area covered by this investigation.*

- *Animal bone and environmental preservation at the site was poor, resulting in only a very rudimentary assessment of potential.*

1.0 Introduction

Pre-Construct Archaeology (Lincoln) was commissioned by Hugh Bourne Developments (Wragby) Ltd. to undertake an archaeological excavation prior to residential development to the east of Linwood Road, Market Rasen, Lincolnshire. These works were undertaken to fulfil the objectives of a project brief issued by the County Archaeologist for Lincolnshire County Council, and a project specification prepared by Pre-Construct Archaeology (Lincoln). This approach is consistent with the recommendations of *Archaeology & Planning: Planning Policy Guidance Note 16* (Department of the Environment, 1990), *Management of Archaeological Projects* (English Heritage, 1991) and *Standards and guidance for archaeological excavations* (IFA, 1994).

Copies of this report have been deposited with the client and the County Historic Environment Record (HER). Reports will also be deposited at The Collection (Lincoln City & County Museum), accompanied with an ordered project archive for long-term storage, curation and public access.

2.0 Site location and description (fig. 1)

Market Rasen is in the administrative district of West Lindsey, approximately 18km north-east of Lincoln. The site is located to the south east of the town centre, to the north of 'The Ridings' residential development, occupying land that is elevated between 25-30m OD. It comprises a sub-rectangular unit of approximately 0.6 hectares. Prior to investigation, this was predominately level, sloping slightly downwards towards somewhat marshy ground to the north, and rising gently in the southwest. It contained permanent grazed pasture, incorporating visible ridge and furrow earthworks (these were surveyed prior to the excavation (see Appendix 9).

The local geology of the area comprises blown sand drift deposits over Upper Jurassic Kimmeridge Clay (B.G.S. 1999).

Central National Grid Reference TA 1125 8870

3.0 Planning background

The archaeological investigation described in this report reflects the results of an agreed mitigation strategy that was attached to the granting of full planning consent for residential development (M02/P/0070).

The site was previously designated for development in the West Lindsey District Council Local Plan (Area MR5).

4.0 Archaeological and historical background

Evidence from a variety of sources indicates, unequivocally, that the general area was of significance since the Romano-British period, if not before.

In the Roman period, the Linwood/Market Rasen area was the focus for utilitarian pottery production. This industry was centred to the south of the town, in the vicinity

of Linwood Road. Evidence relating to this manufacture is extensive, particularly on the west side of Linwood Road (Whitwell (Whitwell 1992) refers to a field in this locality as the 'kiln field').

In 1966, pottery kilns were investigated by members of De Aston School at NGR TF 107 885, and a summary of these findings is held at the County HER. Of three kilns excavated, all were of the single flue up-draught category. The majority of associated pottery comprised grey domestic wares, similar to those associated with the Trentside industries of Torksey, Lea, Knaith and Newton on Trent (Palmer-Brown 1998). The industry appears to have prospered between the 2nd and 4th centuries AD (Todd 1991).

The post-Roman settlement of Market Rasen itself probably emerged as a minor market centre in the late Saxon period, although the focus for this early settlement is unknown (Palmer-Brown 1998). The town is recorded in the Domesday Book of 1086 as *Resne*, from the old English meaning 'at the Planks'. This may refer to a plank bridge or planks laid across marshy ground (Cameron 1998). At this time, the town had a mill on the River Rase, and land was owned by Roger Poitou, Alfred of Lincoln and Jocelyn, son of Lambert (Morgan & Thorn 1986).

An archaeological evaluation in 1997 on land that is now The Ridings Housing Development exposed numerous features of Romano-British date, and large quantities of material associated with pottery production (Albone 1998). Subsequently, two areas were excavated to the south and south west of the current site. This work revealed a number of large Roman quarry pits, smaller pits and ditches and a single truncated pottery kiln. The pottery finds associated with these features suggested that pottery manufacture at The Ridings may have extended into the 4th AD (Lindsey Archaeological Services, 1999).

A fluxgate gradiometer survey of the current site was undertaken by Pre-Construct Geophysics in May 2001. This identified significant levels of magnetic variability, some of which was believed to be of archaeological significance (Bunn and Palmer-Brown 2001). Trial excavation revealed a complex of Romano-British ditches, gullies and pits and an assemblage of finds indicative of a pottery kiln in the near vicinity (Allen, 2001).

5.0 Methodology

The condition attached to the planning permission required the footprint area of the development to be machine-stripped to the first significant archaeological or natural horizon, allowing controlled excavation to take place prior to construction.

Machining commenced on the 29th March 2003 using a 180° excavator fitted with a 1.6m toothless blade. The prevailing boggy conditions, coupled with the depth of the subsoil, meant that the removal of all of the spoil from the site was impractical. It was therefore decided, with the approval of the County Archaeologist of Lincolnshire County Council, that the site would be investigated using a series of alternate 5m wide strips that would be recorded and backfilled consecutively. The machining was therefore on-going to the close of the fieldwork.

Flooding was a perpetual problem, requiring the excavation of large sumps around the edges of trenches and constant use of pumps. Even then, the entire site could not be cleaned and investigated as a single open area, because it re-flooded over night.

An overall site plan was produced at a scale of 1:50 (significant features were also planned at 1:20). Archaeological features and deposits were sample excavated, recorded on standard context record sheets, and drawn in section at 1:20. A conventional photographic record was maintained in both colour and monochrome formats, and bulk environmental samples were taken as required.

A team of ten archaeologists completed the fieldwork over a period of fifteen days.

The post-excavation programme commenced with the digital planning of the site and the production of a detailed annotated stratigraphic matrix. This enabled the complex of intercutting features to be phased.

A range of specialists, who were able to cross check their results using the matrix, examined finds and environmental samples, and the resulting text analysis of the site was finally produced in collaboration with these specialists.

6.0 Results

Machining across the excavation footprint exposed a natural sub-stratum of orange sand. In some areas, earlier deposits of clean light clay and rounded gravels protruded through this. The occurrence of both sand and clay deposits was very clearly one of the attractions to this area for pottery production in the Roman period, and one assumes also that there were managed supplies of woodland to provide the fuel required to fire pottery kilns and possibly other industrial features. Across the site, natural sand deposits were sealed by 0.35m of dark brown sandy subsoil and topsoil.

Cut through the natural substrata were archaeological features, ranging in size from stake holes to substantial curvilinear enclosure ditches. These features were concentrated towards the southern part of the site but were present across the whole of the excavated area. The exception was a slighty raised area in the southwest corner, where deposits appeared to fill possible natural shallow hollows. In this area, machine excavation was limited, and investigation was undertaken largely by hand.

In post-excavation, phasing the archaeology was made difficult by the fact that the fills of many inter-cutting features comprised uniform dark silty sand, making features striking in plan but difficult to differentiate stratigraphically. Furthermore, many of the features contained quantities of abraded residual pottery dating to around the mid 2nd century AD: the detritus of many decades of pottery production.

Despite these difficulties, features have been attributed to seven principal phases; using stratigraphy, dating evidence and spatial relationships.

Phase 1 appears to have commenced in the early to mid 2nd AD, with Roman archaeology extending into the mid or late 3rd century. The last identifiable phase on the site was represented by a pattern of plough furrows, probably created in the late

medieval or early post-medieval period. However, the main thrust of industrial activity appears to have occurred between the early-mid 2nd century.

The sandy deposits that characterised the site were typically acidic, creating poor conditions for the preservation of animal bone. The majority of the small bone assemblage recovered (see Appendix 6) consisted of tooth enamel and burnt bone, both of which are more resistant to decay. A variety of species were present, possibly reflecting fairly typical domestic consumption.

A number of fired clay fragments were recovered from the site (see Appendix 3). Specialist analysis has concluded that these could be split into two groups: the general debris of pottery manufacture and kiln furniture or kiln structural remnants. Two pieces of fired clay were identified as daub, possibly from one or more of the structures represented by certain cut features.

Phase 1: (See figs. 3 and 10).

An initial phase of low-level occupation preceded a palimpsest of industrial use of the site. A single circular structure was revealed, along with a number of associated features, including north east - south west aligned gullies and a later large drainage ditch. Pottery recovered from the features of Phase 1 suggests that these were active in the early 2nd century AD.

A sub-circular gully [150] measuring approximately 5m in diameter was revealed in the south-western part of the site. This had been half-truncated by a later furrow to its north. Four sections through the gully showed that it was approximately 0.60m wide and 0.30m deep. No associated internal features were identified. Its mid-grey sandy silt fill (149) contained three sherds of pottery of indeterminate Roman date. The gully had been truncated by a Phase 4 feature, [152], and it is possible that this had obscured an entrance, assuming that the gully was indeed an eaves drip feature surrounding a circular structure.

To the north and east of the above, five linear features were exposed ([034], [188], [484], [486] and [193]). The extent of this group of features was not clear (each extended beneath the limits of the excavation or was truncated by later features). Each was on a broadly similar north east to south west alignment, displayed a similar rounded profile (approximately 0.50m wide and 0.30m deep), and each was cut by a large enclosure-type ditch (see feature 16 below). These similarities suggested broad contemporeneity.

A large ditch (Feature 16, see context [321]) extended from the southernmost section of the excavation for approximately 23m on a northerly alignment, before turning to the north-west and exiting the site beneath its western boundary. Its course indicated that it possibly respected the sub-circular gully [150], whilst investigation indicated that it truncated gullies [035], [188], [484] and [486] on its eastern side. Its profile was relatively consistent, measuring between 0.80m and 0.90m deep and approximately 2m wide, except at its north-western exit point (see cut [040])) where it tapered to approximately 1.3m wide and 0.4m deep. Its profile changed slightly from being rounded and flat-based in its southern extent (see [318] and [186]) to having a more V-shaped profile further north (see [478]).

The fill of feature 16 consisted largely of dark brownish-grey silty sand, although deposits of slightly lighter grey silty sand were recorded in its base in some areas (see [318], [042]). Pottery from the ditch dates predominantly from the early to mid 2nd century AD, but this was somewhat abraded and may have been residual.

Three of the recorded sections across the central part of feature 16 revealed that, once it had been backfilled, a slighter and shallower ditch was dug along its western edge, partly truncating the earlier alignment (see cuts [206] and [184]). This feature varied in depth from 0.40m deep and 1m wide to 1.6m wide and 0.8m deep towards the southern edge of the site. Its extent beyond its recorded sections was not clear as later features had truncated it, and its dark grey silty sand fill horizon was indistinguishable in plan from that of feature 16. This feature appeared in section close to the sub-circular gully ([150] and [154]) and it is probable that the two curvilinear features were associated. It is possible that this was a partial re-cut of feature 16.

Close to the southern boundary of the excavation, another ditch [329] extended approximately 2.5m northwards. Its extent beyond this was not clear (it had been truncated by several later features) but its alignment and early position in the general statigraphy suggests that it was broadly contemporary with feature 16. Its profile measured 1.2m wide and 0.3m deep and was rounded with moderately sloped sides and a flat base. It too contained a deposit of greyish brown sandy silt containing pottery dating between the early to mid 2nd century AD.

Phase 2: (See Figs. 4 and 11).

The succeeding phase of archaeology encompassed a range of features centred on the south western corner of the site. These amounted to a large curvilinear enclosure, a beam slot, and some other ditches. There was also a large pit containing pottery wasters and a layer of dumped weathered clay.

A large sub-rounded pit [262], approximately 4m in diameter was exposed close to the southern boundary of the site. It had a steep profile, was approximately 1.0m deep and contained three distinct fills of silty sand, ranging from dark grey to yellow-brown (contexts (263) to (265)) These fills contained large amounts of fragmentary pottery and wasters. The pits close proximity to a dump of weathered clay (see (209) below) suggested that it had been created for the purpose of clay extraction.

The shallow deposit of light blue-grey clay (209) was situated to the north-west of pit [262]. It contained lenses of silty sand and had slumped partially across the upper fill of pit [262]. Its source seems very likely to have been the pit itself and it was quite possibly a remnant of a store of a raw material for pottery production.

A few metres to the east of pit [262] was a single straight north-west to south-east aligned beamslot [226]. This had a 0.30m wide and 0.08m deep profile with vertical sides and a flat base and extended from the southern edge of the trench. Although no related features were identified, its structural origin was not in question.

Later than beamslot [226] was a ditch [228], which extended from the southern boundary of the site, turning to the west. It had a curved steep-sided profile, being

0.40m wide and 0.30m deep with a single fill of water-lain mid grey silty sand, suggesting that it was a drainage channel.

The most substantial feature of Phase 2 was a large curved ditch (Feature 14). Several full sections across this revealed its rounded and moderately sloped profile, which had a distinctive step on its southernmost edge (see context [053] and [131] for example). It generally measured around 1.5m wide and 0.7m deep and its regular alignment suggested that it had been a significant boundary in the development of the site rather than a simple drainage channel. Although its fill horizons varied from intersection to intersection, all consisted of grey silty sand deposits of varying hues, and many of these contained pottery of early to mid 2nd century date.

To the west of feature 14, a 5m wide and 0.10m deep spread of dark brown sandy silt fill (454) was recorded. This contained no finds and it appeared to fill a natural depression in the sand substratum rather than a purposely-cut feature.

Further to the south-east, close to southern boundary of the site, a ditch (Feature 15) had truncated Feature 16 and extended away to the east for approximately 10m before becoming lost beneath a plethora of later features. Feature 15 had a regular profile and contained a single fill of dark grey sandy silt (see 266 for example). Although this feature did not have any definite morphological affinity with other Phase 2 features, it was stratigraphically later the archaeology of Phase 1 and very different in character to the right angled linear features and beam slots of Phase 3.

Phase 3: (See figs. 5 and 12).

A number of rectilinear slots with associated postholes, stakeholes and ditches reflected buildings constructed in the south-eastern zone of the site. A series of shallow rectangular pits with possible industrial functions appeared to be associated with these structures, indicating that they were probably workshops rather than dwellings.

Two shallow pits in the south eastern corner of the excavation, [422] and [346], appeared to precede the majority of features associated with Phase 3. The earliest [422] was irregular in plan, measuring 0.70m across and 0.15m deep. It was partly truncated by pit [346], which had a more regular shape and shallow profile. This was 1.5m across and 0.50m deep. Both features contained deposits of dark grey silt (337) and (421).

A third shallow pit [292] was located further to the south. This was sub-rectangular in plan, approximately 1m long and 0.50m wide. It contained a single fill of light grey silty sand incorporating 24 sherds of mid-2nd century pottery. Although stratigraphicall this appeared to pre-date the principal elements of Phase 3, its morphology indicated that it was possibly one in a group of four rectangular shallow pits (see contexts [335], [371] and [130]).

To the west of the above, a right-angled arrangement of beam slots representing a single elongated structure was revealed, cutting the natural sand. The most extensive element of this group was a T-shaped gully ([355] and [353]). The long element of this ([355]) was aligned south west to north east and was approximately 15m long,

whilst the shorter arm [353] extended from it to the south east for approximately 6m before being obscured by later features. Both arms of the feature were 0.15m across and 0.10m deep and had steep-sided, flat-based profiles.

At the eastern and westernmost extremes of beam slot [355], two further slots (see Feature 13 and intervention [418]) branched to the southeast at right angles, forming the short ends of the structure. A number of stake holes were dotted around the line of the eastern slot (Feature 13). The fill of beam slot [418] (see context (417)) contained mid 2nd century pottery.

There was no beam slot along the south east (long) side of the rectangular structure, suggesting that it may have been built in the manner of an open-sided barn. This appeared to have an internal partition represented by slot [353].

A number of features were exposed within the confines of the long rectangular structure. Within the junction of gullies [353]/[355] were two shallow postholes, each measuring approximately 0.40m in diameter and 0.10m deep. Two internal, shallow, rectangular pits were also recorded; pit [335] at the centre of the structure and [459] at its southwest end.

Pit [335] was 1.1m wide, 1.52m long and 0.25 deep and had a lining of blue-grey clay (334), overlain by a layer of mid-grey silty sand. Pit [459] was 1.20m long, 0.70m wide and contained a single fill of mid-grey silty sand. The lining of pit [335] may have enabled it to hold liquid for an industrial process, supporting the notion that the rectangular structure was a workshop rather than a dwelling. Morphologically it was very similar to three further pits (see contexts [130] and [371] below and [292] above) and it is possible that the same industrial process linked all.

Elsewhere within the suggested building, two further postholes, ([401] and [323]), a small irregular and shallow pit [313] and a short gully [416], each containing generically similar grey silty sand fills, were found. These features gave no clues as to their function.

To the north and west, the rectangular building was enclosed by two substantial ditches (features 11 and 12), which met with sub rectangular terminals around 1m from the westernmost corner of the structure. These right-angled ditches clearly respected the building and may have served to keep its environs well drained. They were both in the region of 1m wide and 0.4m deep and contained very similar layers of water-lain mid-grey sandy silt (contexts (387) and (272) for example), bolstering the idea that they were drainage channels. They reflected a clear departure from the curvilinear ditches that characterised Phases 1 and 2.

The north edge of Feature 11 truncated a parallel ditch [390]. This had similar dimensions to Feature 11 but a notably different fill of dark brown silty sand (389), suggesting that it perhaps served a different role, possibly unconnected with the building.

To the south east of the open-sided building, a second smaller group of beam slots aligned at right angles to each other truncated the natural sand: two thin and shallow gullies ran on the same principal alignment as the rectangular building (see

intervention contexts [286] and [317]). Each was approximately 5m long 0.15m wide and 0.08m deep with distinctive steep sided profiles and flat bases. A third, slightly wider gully, [212] connected with beamslot [317] and extended away to the north west at right angles for around 1m. This was 0.27m wide and 0.08m deep. Features [286], [317], [212] each contained single fills of near-black silty sand.

To the northeast, a more substantial gully/ditch [268] extended into the area between gullies [286] and [317]. This was 0.52m across and 0.10m deep and contained a deposit of mid-grey silty sand.

To the north-east and north-west of the elongated rectangular building (Feature 13 and contexts [355] and [418]), were two further structures, and three shallow pits. These included a small sub rectangular structure represented by some short gullys [436] and a number of neatly aligned stakeholes. These were revealed approximately 4m to the north-west of the terminals of Features 11 and 12. All of the stake holes and gullies of this structure contained a uniform dark grey silty sand fill. The gullies had a maximum width of 0.20m and had steep-sided profiles, whilst the stake holes each had diameters of around 0.10m and depths of 0.05m.

A shallow sub-rectangular pit [371], similar in dimensions to pit [335], was revealed cutting the natural sand approximately 1.0m to the west of structure [436]. It was 1.16m long, 0.77m wide and 0.08m deep. Unlike pit [335], its homogenous fill of light grey silty sand (371) indicated little of its function, but the parallels in profile and proportions of the two features were noted.

To the north-east, another distinctly rectangular shallow pit [130] was exposed, partially cut away by a later furrow. This was a larger feature than pits [335], [371] or [292]; the visible part of it being 1.97m long, 1.68m wide and 0.14m deep. Its fill contained large lumps of clean re-deposited light grey clay. There were also significant amounts of pottery dating to the early-mid 2nd century.

Close to the eastern boundary of the site, a large sub-circular pit [156] preceded another sub-rectangular building. This was similar to feature [346] in plan and measured approximately 1.3m in diameter and 0.15m deep. It contained a distinct deposit of firm and clean yellow-grey clay.

Pit [156] was truncated by a neat right-angled slot with a rounded corner [160], which formed the outline of a rectangular structure, half-removed by a later furrow. The visible part of this structure measured 6m long and 1.5m wide. The slot had a steep-sided flat-based profile, measuring 0.15m wide and 0.05m deep, and was filled with mid-grey silty sand. A small post hole [170] with a steep U-shaped profile was exposed within the area demarked by the rectilinear gullies [160] close to the inner north-eastern external corner of the building. This was approximately 0.25m in diameter and 0.18m deep.

Phase 4: (See figs. 6 and 13).

A number of curvilinear ditches were truncated by substantial pits containing large quantities of waste pottery; almost certainly directly associated with the fragmentary remains of two pottery kilns.

In the south-eastern sector of the site, a curved ditch (Feature 10, contexts [299] and [348]) extended north-westwards from the southern edge of the excavation for approximately 15m, after which its course was obscured by later features. Its brown-orange sandy loam fill ((349) for example) was not a water-lain deposit, suggesting that this had been a predominantly dry boundary. It was 1.1m wide and 0.25m deep.

A few metres south-west of this, another curved feature [296] was exposed. This almost certainly was a drainage conduit as it contained three fill horizons of water-lain grey silty sand ((293), (294) and (295)). Its 0.30m deep and 0.95m wide rounded profile was very similar to that of Feature 10. Both features contained pottery of late 2nd century date.

Close to the western edge of the excavation, two 8m long curving gullies ([181] and [453]) cut the natural sand to form a vaguely sub-circular enclosed space. Gully [181] was 0.40m wide, 0.16m deep and ran roughly from north to south. Gully [453] began on an east to west alignment, before turning quite abruptly to the north. It was more substantial than [181], (0.75m wide and 0.30m deep) but it had a similar rounded profile and both features contained generically similar fills of grey sand ((452) and (180)).

1.0m or so east of the northern end of gully [181], an irregular clay-lined pit and two postholes were exposed ([178], [198] and [196]). The postholes ([198] and [196]) were both approximately 0.30m in diameter and 0.25m deep with steep sides, each filled with dark grey silty sand (contexts (199) and (196)).

Pit [178] had cut posthole [196] and was an irregular elongated shape in plan, around 1.5m long, 0.6m wide and 0.18m deep. Its base and westernmost side were lined with 3cm of light grey-yellow clay. A deposit of dark grey sandy silt containing frequent charcoal flecks overlay this. The clay lining likened it to the pits of Phase 3, although its position, so close to the end of gully [181], suggested that it not only belonged in the same, slightly later, phase but also tied gully [181] into the industrial developments of the site. It contained abraded late 2nd century pottery.

This latter point was supported in that a colossal pit [137], full of waste kiln products, had been dug at the northern end of gully [181]'s 'twin' gully [453], suggesting that the putative enclosure was undoubtedly located in the vicinity of industrial activity. In plan the gully can be seen flaying out to meet the pit. This had undoubtedly been caused by water erosion, as gully [453] would have effectively become a drainage channel.

This situation was mirrored in the easternmost pair of gullies (Feature 10 and gully [296]/[276]) where another huge pit full of kiln waste [237] had been deliberately positioned along the run of ditch [296]. Here, this apparently explained the disparity in fill horizons between ditch [296] and Feature 10 as the presence of the pit would

have without doubt inadvertently changed the latter into a drainage channel regardless of its former role.

Pit [237] itself was a 4.5m long and 2.75m wide with very steep sides. Its full depth was not established because of collapse but exceeded 1.6m. It contained a single discernable fill (291) of soot-stained dark grey coarse sand, full of large fragments of dumped pottery: finds included sherds of wide-mouthed bowls (unusual at this particular site), which may have had a mid-3rd century date. It also contained a varied assemblage of biological remains (recovered from a bulk sample); notably, cereal grains and crop weeds in a combination which is more readily associated with assemblages collected from prehistoric contexts (Carrott, 2007, Appendix 5).

Pit [137] was of notably similar proportions to the above, being approximately 4.2m x 3m in plan. Better conditions in this area of the site allowed excavation to its full depth of 1.75m. It had near-vertical sides in places, and a flat base and contained five separate fill horizons of various hues of silty sand (basal fill (218), upper fills (217), (195) and (136). Each contained significant quantities of pottery, including complete or near-complete waster vessels, suggesting that it too was contemporary with a working kiln. The unusual presence of complete vessels was probably attributable to its proximity to the kiln described below (Feature 9) and the soft saturated sand it contained preventing breakages. Fill (136) also contained a number of Iron slag fragments associated with smiting or smelting. These were in relatively low densities and were possibly residual.

A third pit [108] containing apparent direct kiln waste was exposed some 40m to the north of kiln Feature 9. This was sub-circular in plan and roughly 2m in diameter. Its profile was steep enough to lead to an interpretation of a well, but the instability of its natural sand sides discounted this idea and it was more likely to be another waste pit formed by clay extraction.

In the case of all three pits, the scale and depths of these features represented a considerable undertaking. This implied that the pits had, in the first instance, been created to serve a function other than waste disposal, even though this would have been a constant problem on a pottery-manufacturing site. It is most probable that this original function was clay extraction.

Machining around the northern end of the putative enclosure formed by ditches [181] and [453] revealed the remnants of a kiln (Feature 9, main context [488]). The basal elements of this feature were relatively well preserved beneath the subsoil, whilst the upper part was absent.

In plan, the kiln was sub-oval, approximately 1.5m long and 1.1m wide. It was defined primarily by a shallow concave basin, which truncated the natural to a depth of around 0.07m. This shallow depression was surrounded by a thick wall of unfired but hard crude clay blocks, which were c. 0.20m thick. Only a single course of these survived but it is likely that they had once formed a major component of the kiln superstructure. The inside of the clay block wall had been lined with a 0.05m thick layer of clay. This would have given the kiln a more consistent surface and sealed in its heat.

The base of the kiln was not lined and consisted simply of a compacted surface of sandy clay (474) displaying a distinctive red hue induced by heat. This surface was concave, rising gently around its perimeter. It was intersected by a number of contemporary small gullies, (see context [492]) which were around 0.07m wide and 0.05m deep. Two of these ran around the edge of the basin of the kiln in its western and northern sectors, and these features possibly aided the circulation of air around the base of the kiln. A third ran across the centre of the basin and a fourth from the southeastern sector of the kiln to the west, where it met with the edge of the structure. These latter two gullies appeared to fan out from the flue, which extended into the south east quarter of the kiln.

The flue was represented primarily by another shallow depression, which was contemporary with that of the main structure. This stretched away to the south-east for approximately 1m and was 0.09m deep and 0.45m wide. The sparse remnants of a 0.06m thick clay wall were observed along the southern edge of this and further lumps of clay were found within the detritus (493) within the remaining section of flue.

The fills within kiln Feature 9 clearly reflected its use and demise. The earliest was a layer of near-black ash-rich sandy material (477), which lined the base of the kiln and its gullies and clearly reflected the last firing of the structure. Following this, the destruction of the kiln appears to have begun with the collapse of the flue, as a deposit of clay lumps and rubble here (493) appeared to underlay the bulk fill of the kiln chamber (475). Both deposits were rich in kiln furniture fragments, pottery sherds and hardened clay lumps of the outer structure.

A straight gully [483] ran in from the north and terminated very close to the eastern side of the kiln. This was around 4m long, up to 0.5m wide and 0.30m deep and had a neat V-shaped profile. It was filled with a very dark deposit of sand (480), presumably stained near-black by ash. It also contained pieces of a wide mouthed bowl that, like the finds within pit [237], suggested that the archaeology of Phase 3 probably dated to (or at least extended into) the mid-3rd century.

The remnants of a second kiln were indicated by an irregular L-shaped cut [314] in the centre of the southern sector of the site, situated approximately 5m north-west of the limits of ditches [331] and Feature 10. Unlike Feature 9, none of the superstructure survived. It was 2.50m long, 1.56m wide and 0.22m at its deepest point. It comprised the remnant steep-sided hollow of the base of the firing chamber containing a thin basal layer of grey silt (370) overlain by a thicker layer of black ashy silt (332). There was no trace of any clay or other lining. Adjoining the chamber was a 0.4m wide flue gully with one straight edge that extended away to the west. Within this and overlying deposit (332) was a shallow layer of bluish-grey clay mottled with patches of orange-yellow clay; the collapsed matrix of the flue.

The poor state of preservation of the kiln did not disguise the parallels of its form with that of Feature 9: both were oval chambered with single long flues.

A 6m long straight gully [152] was cut through the very edge of the upper fill of pit [137] and this ran into the area loosely defined by gullies [181] and [453]. It was 0.46m wide and 0.14m deep and displayed a rounded profile and flat base. Its fill of dark grey sandy silt (151) contained only residual mid 2nd century pottery sherds.

Phase 5: (See figs. 3 and 15)

Much of the south eastern sector of the site was dominated by a rectilinear enclosure system, the alignment of which was mirrored by a number of slighter gullies in the northern half of the site. The wide ditches appeared to radiate out from a curvilinear ditch in the south western corner of the site. This enclosed a concentration of layers and irregular features containing (amongst other artefacts) a wealth of kiln furniture.

In the very south-west corner of the site, machining exposed a large irregular spread of fine mid-grey silty sand (076) that was quite distinct from the overlying topsoil. This same material appeared to fill a very shallow but large irregular depression in the natural sand. Possibly formed or reworked by trampling and constant disturbance (as opposed to purposeful backfill), which was approximately 25m^2 in area. It contained many fragments of rusticated jars, which appeared to be residual because of their abraded condition. A number of iron slag fragments were also recovered but not in sufficient quantity to suggest a direct link between this layer and smithing or smelting. Layer (076) was overlain and truncated in several places by several other features, which indicated that this corner of the site was at this time a focus of activity.

A large shallow sub-rectangular pit [141] truncated part of the edge of spread (076). This was 1.7m wide, 2.75m long and 0.5m deep. It had a very irregular base, which had possibly been disturbed by roots or animal burrowing. It contained a number of interesting fills, beginning with a band of dark grey silty sand that incorporated large fragments of pottery and hefty pieces of kin furniture (194). Overlying (194) along the south west edge of the pit was a dump of grey clay (142) which showed signs of having been heated, given its slightly pinkish hue. It was obviously redeposited material, being loosely scattered around the edge of the pit, and pieces of the same material had been spread through the subsequent fill deposit (140); a second band of dark grey silty sand approximately 7cm deep. Set within this towards the centre of the feature was a roughly circular dump of waste pottery and kiln furniture fragments (171), some 0.5m in diameter, which again alluded to the pits close proximity to a kiln. Context (140) also contained a fragment of tap slag.

Another spread of material (143), which was reminiscent of layer (076), sealed part of the upper fill of pit [141] to the east. This was a sub-rectangular deposit of dark grey silty sand around 7m^2 containing a large number of abraded pottery fragments and a piece of undiagnostic iron slag. It had a more regular appearance than layer (076) but, like that context, was not contained by a detectable cut and therefore appeared to simply represent a deposit of industrial waste.

In the south-west corner of the site, a curvilinear gully [088] arced from the southern boundary of the excavation for approximately 5m, curving gently to the west before disappearing beneath a later furrow. This feature effectively formed the boundary of layer (076), which it enclosed to the west, and is likely to have demarked the area of activity alluded to by layer (076), cut [141] and layer (143). It had a rounded profile, measuring 0.76m across and 0.25m deep. Of significance was its fill of dark friable sand, incorporating large pottery fragments and kiln bars (087) which showed no sign of having been water-lain and bolstered the idea that this was a marker boundary ditch rather than a drainage channel. Context (087) also contained pieces of iron slag.

At its south end, ditch [088] had truncated a ditch [297] of similar proportions, which branched away on a straight alignment to the north-east for approximately 25m. This feature had two fills horizons of mid grey sandy silt ((269) and (210)) that contained abraded mid 2nd century pottery sherds and a few of 3rd century date. At its easternmost extreme it ended in a rounded terminal; significantly, approximately 1.0 short of another comparable ditch (see contexts [275] and [357]), on an alignment at right angles to [297].

At its northern limit, ditch [088] truncated another ditch [231] that curved away to the east. This feature was 0.35m deep and 0.50m wide and had a V-shaped profile. Its fill of dark silty sand [230] was similar to the fills of the other ditches in this part of the site but gave little indication of its function.

On its southern edge ditch [231] truncated a small gully [233], the function of which is uncertain.

Ditch [275]/[357] was 15m long and its rounded profile was 1.1m wide and 0.30m deep. It ran from the southern edge of the excavation to where it was crossed to form a T-shape by a third similar ditch (Feature 5), which ran all the way from the eastern edge of the excavation back to the curvilinear gully [088] in the south-western corner of the site. It had a fill dark sandy soil (274) that contained 60 sherds of pottery, ranging in date from the late 2nd to the early 3rd century, and a large fragment of iron tap slag.

Together, the above three ditches formed a right angled enclosure system. Three further features (Features 8 and 6 and context [408]) added coverage to this system. Feature 6, 1.2m wide and 0.25m deep, protruded from the southern edge of the excavation area and ran northwards towards ditch [297]. As it reached it, it turned abruptly onto the same alignment and was cut through it, effectively forming an extended recut. Aside from residual 2nd century pottery, a rim indicating a 3rd century date was recovered from feature 6.

Feature 8 (see contexts [359] and [281]) extended from the southern edge of the excavation for approximately 15m on a north-north-west to south-south-east alignment, 5m to the east of ditch [275]/[357]. It ended with a rounded terminal approximately 1.0m to the south of Feature 5. Its dark sandy fills contained residual pottery dating to the 2nd century AD (see context (358), for example).

Ditch [408] was the easternmost of this group of common linear features. It extended from the eastern baulk, ending in a rounded terminal some distance from Feature 5 in a similar manner to Feature 8. A single sherd of abraded 2nd century pottery was recovered from its dark sandy fill.

To the north of feature 5 were a number of slighter linear features (see Feature 17 and contexts [026], [048], [097], [006], [010], [011], [026], [048], [068], [097]) all on the same alignment as their more substantial counterparts described above. None of these features extended to within 10m of Feature 5, but their shared alignment with the other Phase 5 ditches was sufficient to suggest that all comprised elements of the

same pattern of enclosure. They all contained dark sandy fills, incorporating 2nd century pottery. The majority were around 0.45m wide and 0.20m deep.

Phase 6: (See figs. 8 and 15).

Two distinct linear features comprised elements of a final pattern of Romano-British enclosure.

Only two extensive linear gullies can be confidently attached to the final phase of Romano-British activity (see contexts [071], [307] and Feature 4); both running on north-east to south-west alignments. These features were slighter than many of the ditches of earlier phases. They varied slightly in scale, the southernmost (Feature 4) being around 0.35m wide and 0.20m deep whilst the northern alignment [071] was 0.55m wide 0.25m deep. Each feature contained similar dark grey silty sandy fill deposits (see contexts (366) and (070), for example).

Feature 4 had been extended or recut, as a third gully (see context [345]) of almost identical profile was observed truncating it in plan and leading away to the eastern boundary of the site. Towards its west terminal, Feature 4 deviated by approximately 30° to the north-west and at this junction it was flanked by three stakeholes (see contexts [307], [305] and [309]). These each measured approximately 0.15m across and 0.10m deep and contained similar dark sandy fills (contexts (306), (308) and (310).

It is likely that the features of Phase 6 were boundary markers associated possibly with hedges or fences, rather than drainage channels. Their relatively shallow depths and narrow widths, for example, discounted them as practical channels for drainage, and the abrupt turn and stakeholes associated with Feature 4 suggest that the gully may have been used in partnership with a fence or other structured boundary. It is therefore possible that the two main linears represent a final enclosure of the site in the Roman period. Because these features appeared to run unhindered across the site it seems likely that the excavation area had been abandoned in terms of the pottery industry by this time.

Phase 7: (See figs. 9 and 15).

A pattern of furrows crossing the site reflected accurately the post-Roman ridge and furrow earthworks recorded by survey prior to the beginning of the excavation. No secure dating evidence was recovered from any of these features.

Ten substantial furrows traversed the site, with eight of these being on the same south-west-west – north-east-east alignment. The other two extended into the trench from the north boundary before terminating, perhaps indicating a headland. This pattern was clearly reflected by the distribution of extant ridge and furrow that was recorded prior to excavation (see Appendix 9).

A typical example of these furrows is represented by context [051], which ran across the centre of the site. It was approximately 1.20m wide and 0.25m deep and had a typical shallow profile. Like all of its counterparts, it contained little dating evidence,

although a single fragment of glass dating to the late medieval or early post medieval period was recovered (see Appendix 7).

Undated archaeology

A number of inconsequential features were lacking either sufficient dating evidence or stratigraphic/spatial relationships to be confidently assigned to any of the major archaeological phases. These can be best identified from the site matrix and are all located on the site plan (see fig. 2). Details of their dimensions and fills can be obtained from the context register.

7.0 Discussion and conclusion

It is evident both from the sections above and from supporting specialist reports that the results of this excavation are extremely important, adding new and stimulating information to the increasing corpus of data relating to Romano-British pottery manufacture at Market Rasen.

Of particular note is the consistently early date for this site and its industry (see Appendix 9): some six Romano-British archaeological phases reflecting a palimpsest of activity, but mostly associated with industrial use of the area between the early to mid-2nd century AD. Deposits of later date have been identified, although these would appear to be low in number, and the current site is the earliest pottery-manufacturing centre to have been thus far identified at Market Rasen.

Most of the vessel types identified (bolstered by the discovery of two huge pits containing complete and near-complete vessels) reflect utilitarian production of grey vessels (a paucity of Parisian ware has been noted: 0.25% here as opposed to the 2 – 3% that is common at other Market Rasen sites). Kiln fabrics account for some 93% (ie almost all) of the pottery, although non-local/exotic fabrics have also been recorded in low numbers: notably South Gaulish samian, and also mortaria (including one stamped example made by the potter P. Catto, known for his association with the specialised South Carlton industry).

Most of the kiln products identified consisted of jars (see fig 1, Appendix 9), and there is a notable paucity of wide mouthed bowls, and no flanged bowls whatsoever, supporting the predominantly early date for the industry. Where wide mouthed bowls do occur in later phases (some possibly deriving from other local sites), it has been suggested that these are likely to date into the later 2nd, possibly the 3rd century.

Two truncated pottery kilns were exposed within the excavation area, and the characteristics of these features fit well with the distribution pattern presented by Swan more than two decades ago (Swan 1984, 63), extending from Bedfordshire to the middle Trent. The Market Rasen kilns pre-date the nearby Linwood industry.

One very interesting pottery sherd (mortarium sherd no. 66) provides a hint at least that there was a local mortaria industry – an unusual scenario for a production centre that is more typically associated with non-specialist manufacture.

Although not occurring in primary contexts, smelting, smithing and tap slag was recovered from several features, suggesting that metalworking was taking place within the locality. Both industries would have been dependent upon supplies of fuel deriving from local woodland management arrangements, and one imagines that there existed a degree of symbiotic management that worked both for the potters and for other craftsmen. This aspect would benefit from closer future appraisal, as there is currently little or no local data relating to sources of raw materials.

Most of the negative (ie earth-cut) archaeological features at the site appear to have been associated with drainage, boundary delineation or clay extraction, and there is much evidence for re-cutting and reorganisation over a relatively short period of time. Some of this must surely be a reflection of the very unstable soil conditions at the site, where the effects of weathering was probably severe, requiring regular maintenance of ditches and similar features.

The rectangular structures associated with Phase 3 are noteworthy. In context, they were clearly not dwellings, and it is far more likely that they were directly linked with pottery manufacture, possibly as potters workshops or as stores of raw materials (experimental kiln firings show unequivocally that, if not absolutely dry, then much of the energy required for the firing of pottery will be absorbed in the process of evaporating water (Swan 1984, 7)). Unfortunately, no artefactual remains were recovered from which to draw any firm conclusions.

8.0 Effectiveness of methodology

The methodology applied has allowed an entirely satisfactory level of archaeological investigation and recording to take place in advance of a residential development, albeit in challenging circumstances. Although the adverse conditions at the site necessitated controlled investigation within strips, instead of area excavation (which made the subsequent overview slightly more tricky), the works have produced some moderately significant results relating to the local and regional archaeological framework.

9.0 Acknowledgements

Pre-Construct Archaeology (Lincoln) would like to thank Chris Bourne of Hugh Bourne Homes, and the Kier Group for funding this programme of archaeological investigation. Thanks are also due to the site excavation team for their diligence and enthusiasm in often-unfavourable conditions.

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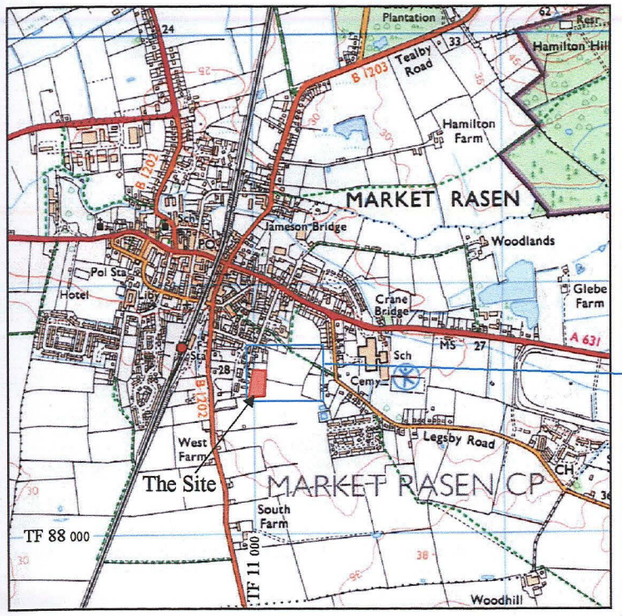
11.0 Site archive

The documentary and physical archive for the site is currently in the possession of Pre-Construct Archaeology (Lincoln). This will be deposited at The Collection, Lincoln within six months from the completion of the project. The global accession number for this scheme is LCNCC 2007.191.



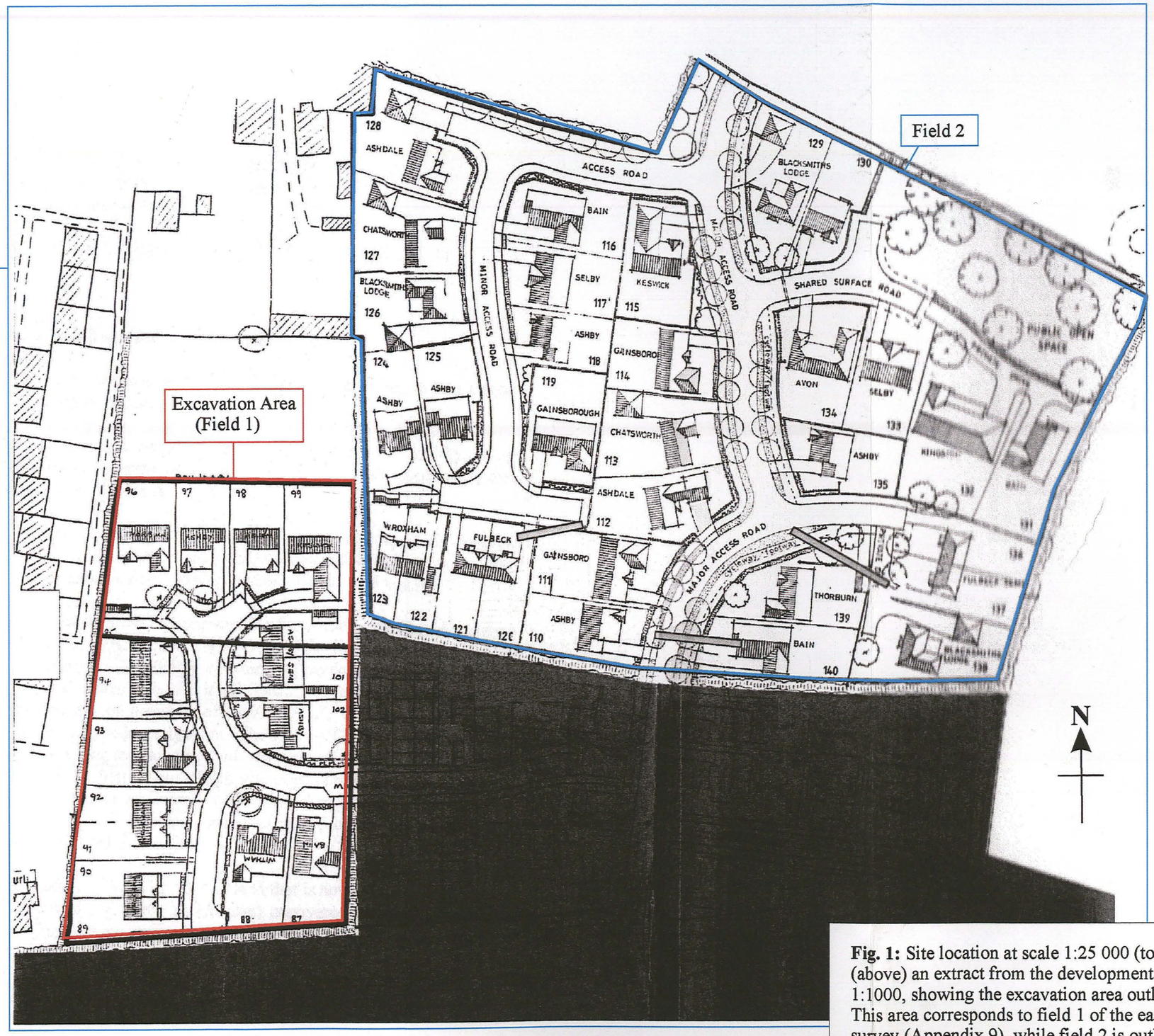


Fig. 1: Site location at scale 1:25 000 (top left) and (above) an extract from the development plan at scale 1:1000, showing the excavation area outlined in red. This area corresponds to field 1 of the earthworks survey (Appendix 9), while field 2 is outlined in blue.

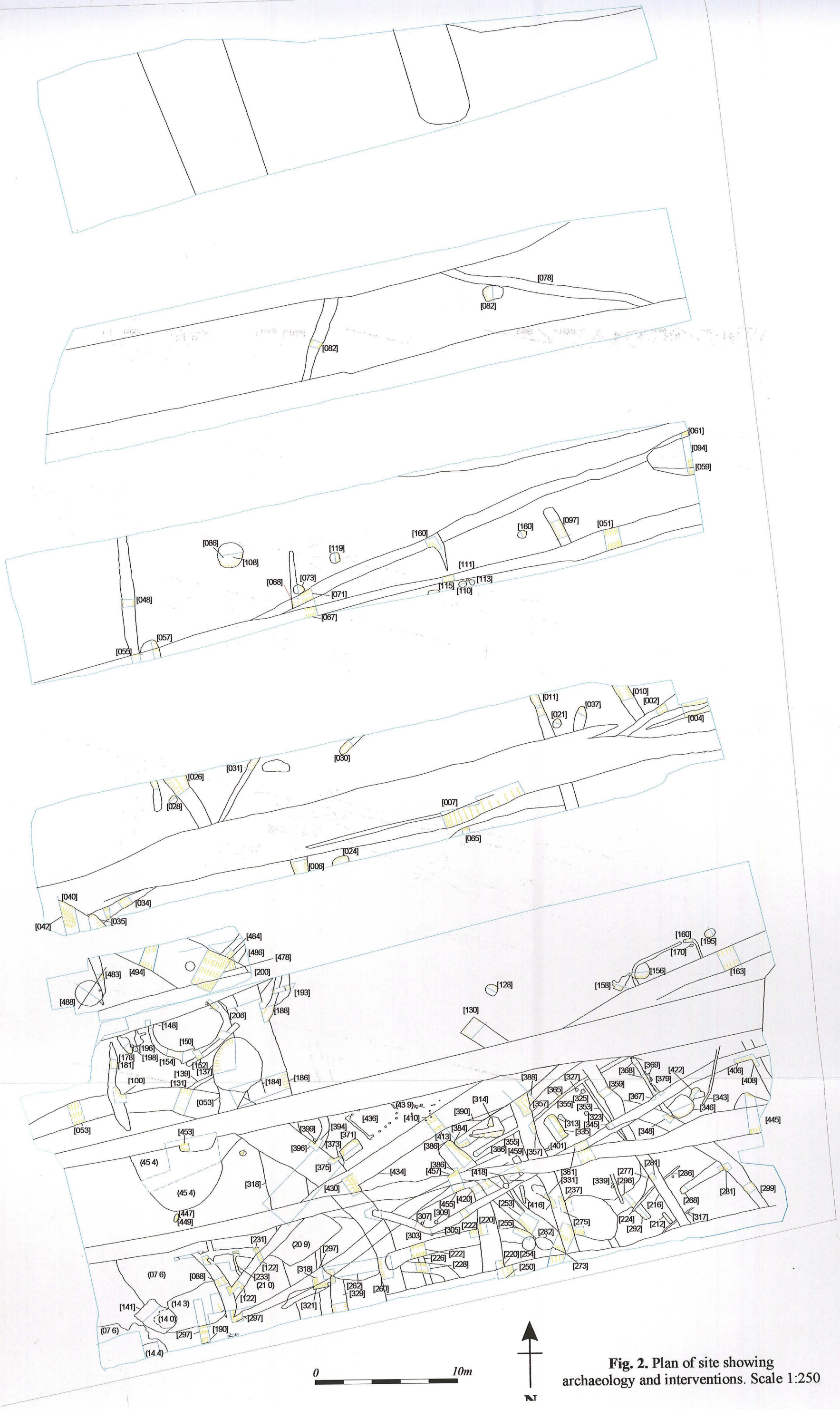


Fig. 2. Plan of site showing archaeology and interventions. Scale 1:250

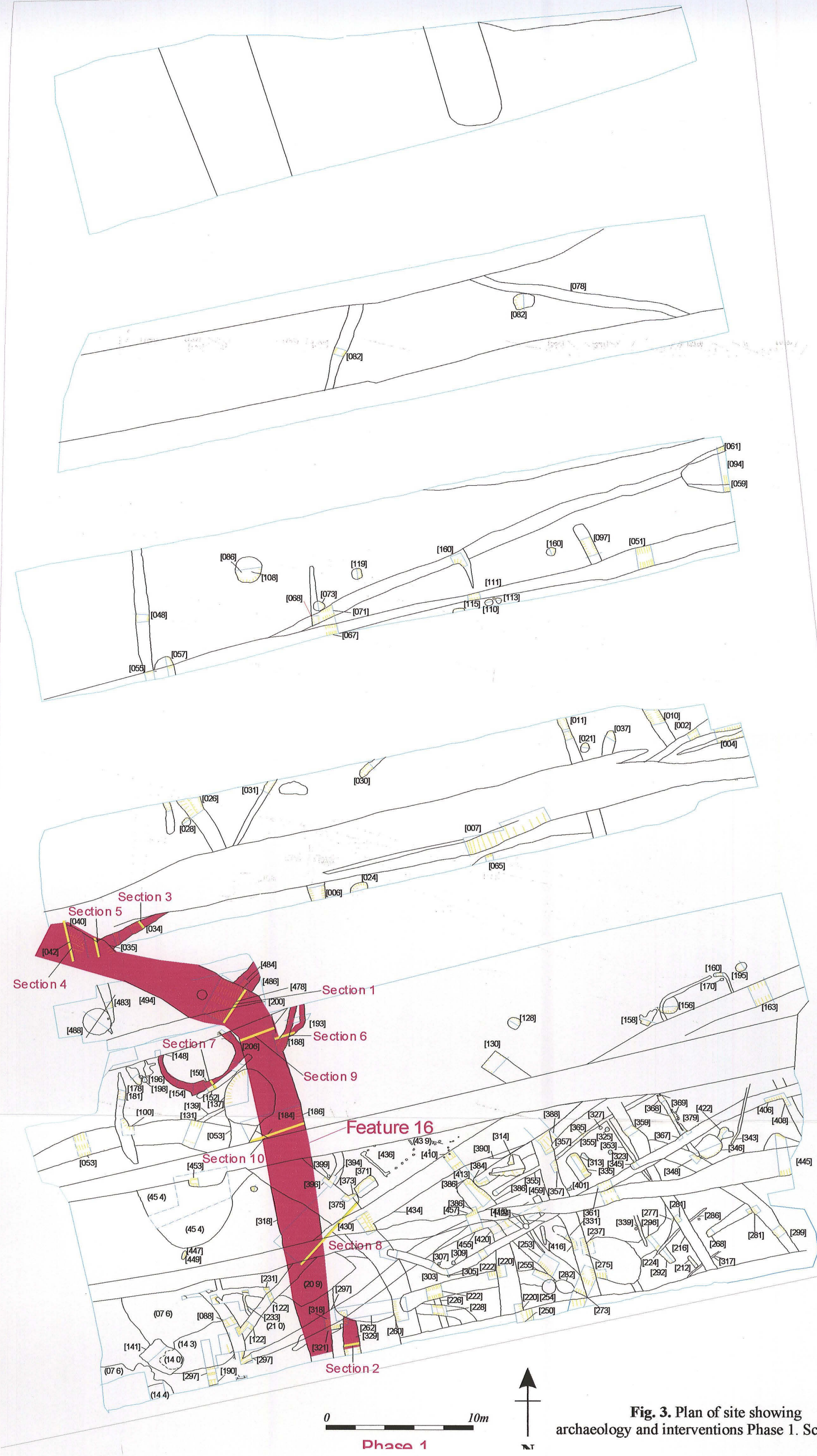


Fig. 3. Plan of site showing archaeology and interventions Phase 1. Scale 1:250

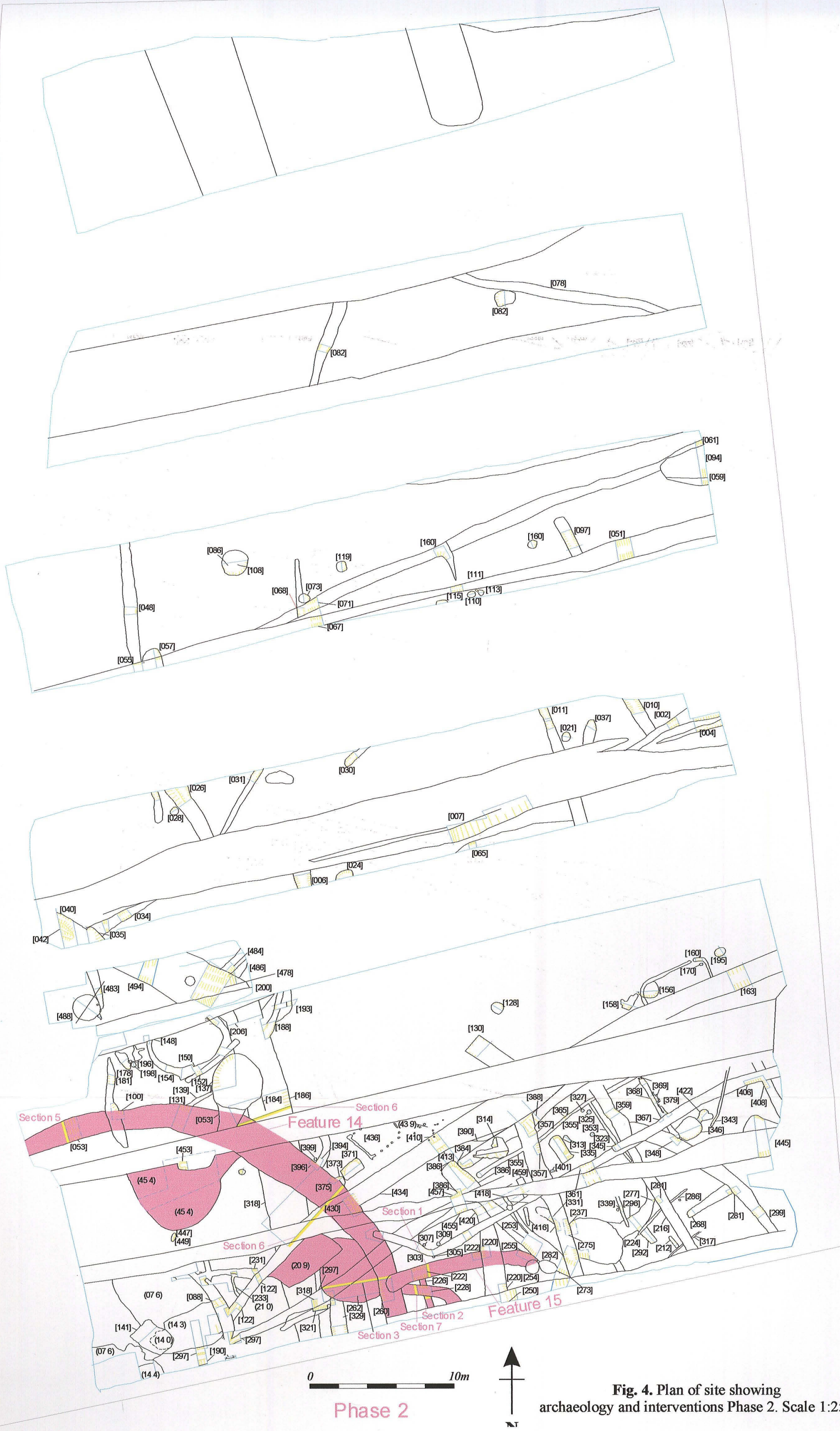


Fig. 4. Plan of site showing archaeology and interventions Phase 2. Scale 1:250

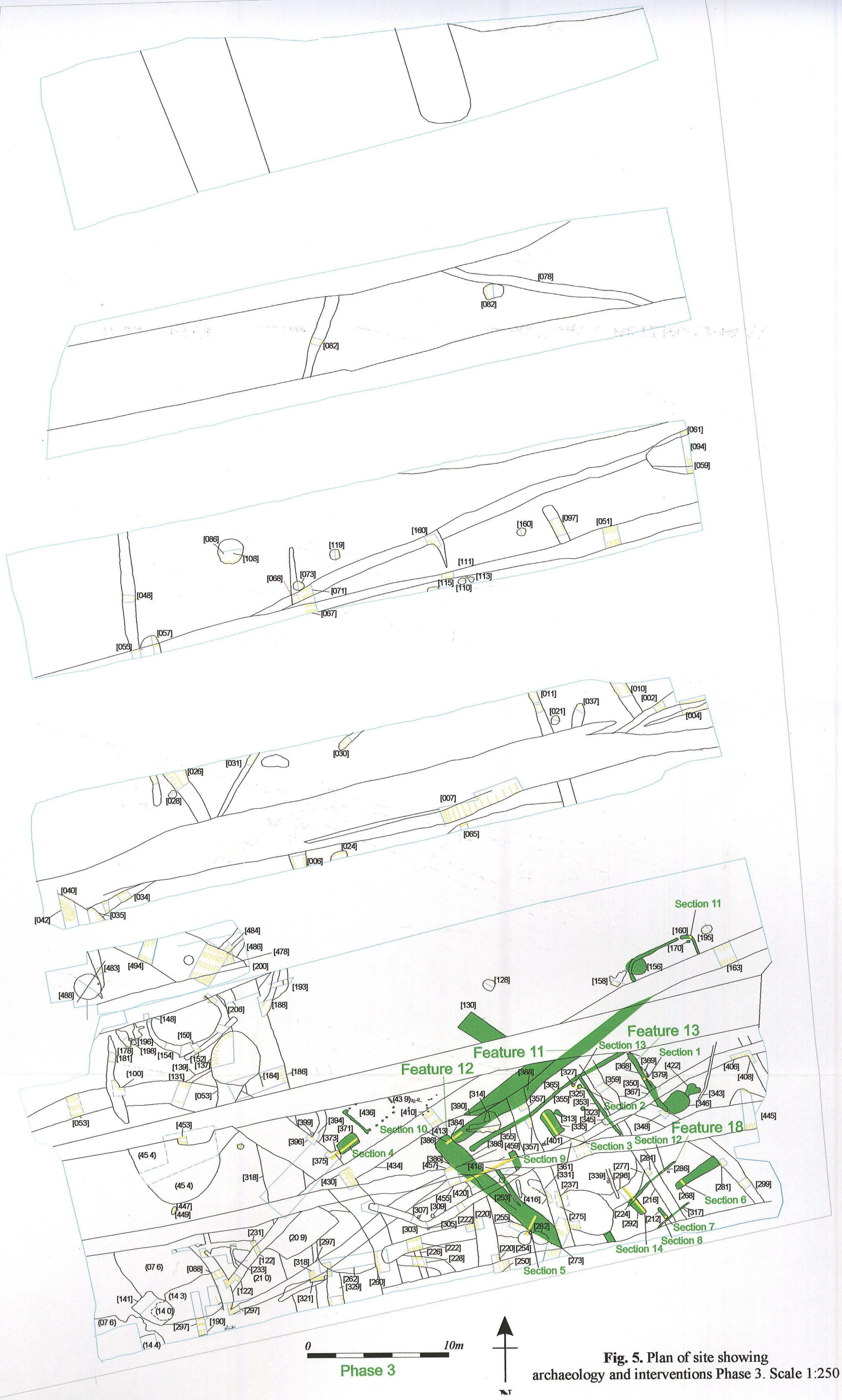


Fig. 5. Plan of site showing archaeology and interventions Phase 3. Scale 1:250

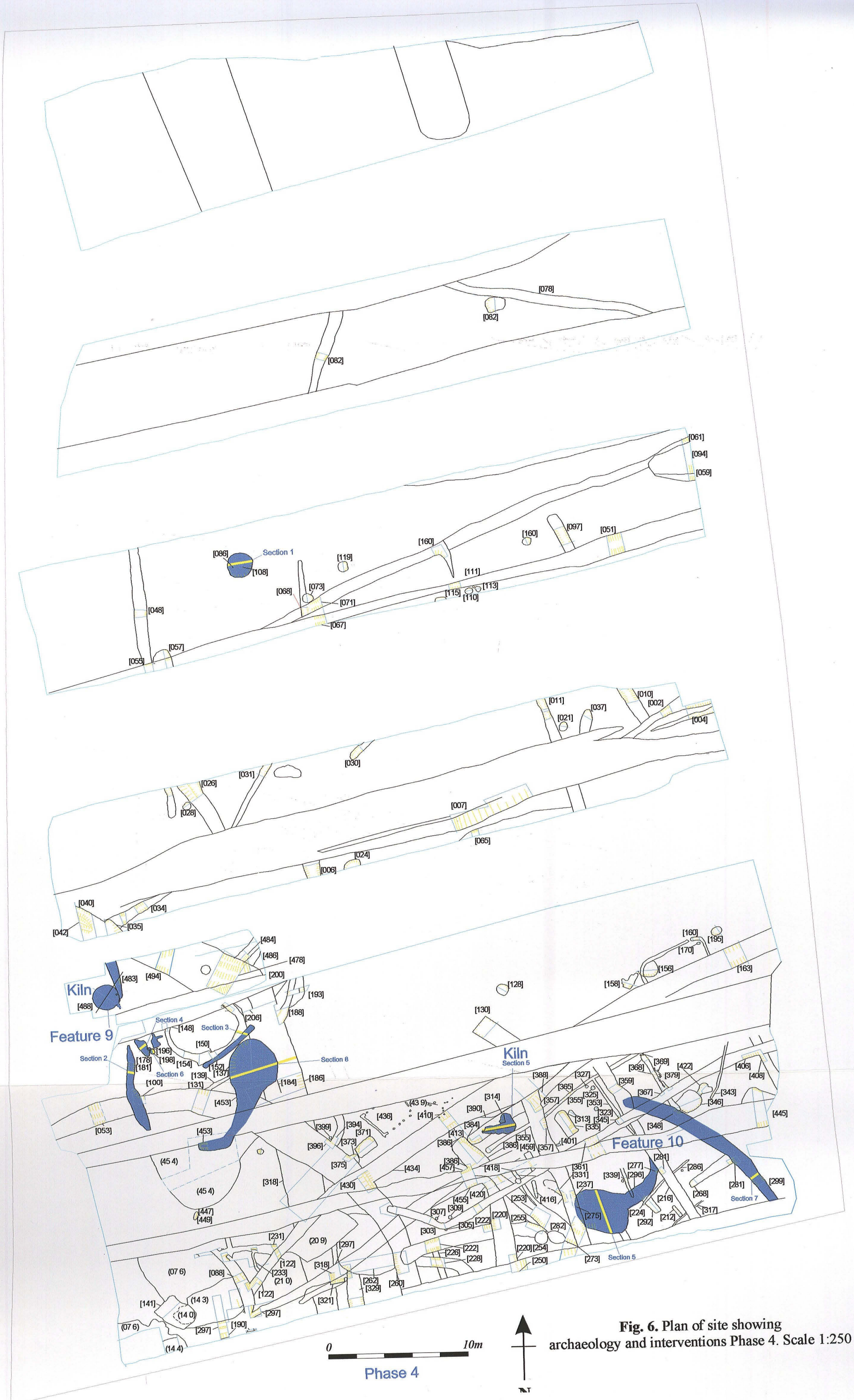


Fig. 6. Plan of site showing archaeology and interventions Phase 4. Scale 1:250

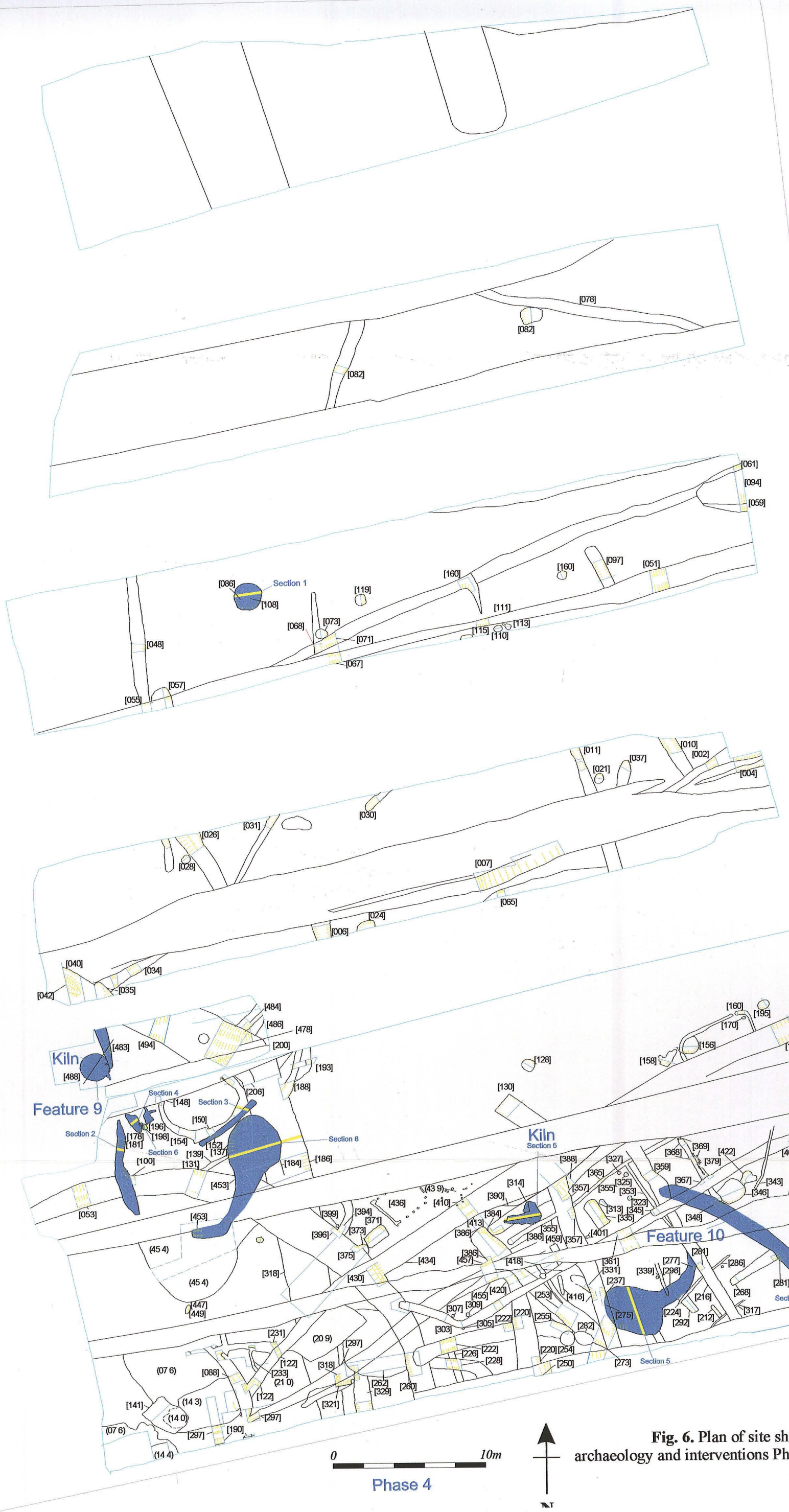


Fig. 6. Plan of site showing archaeology and interventions Phase 4. Scale 1:250

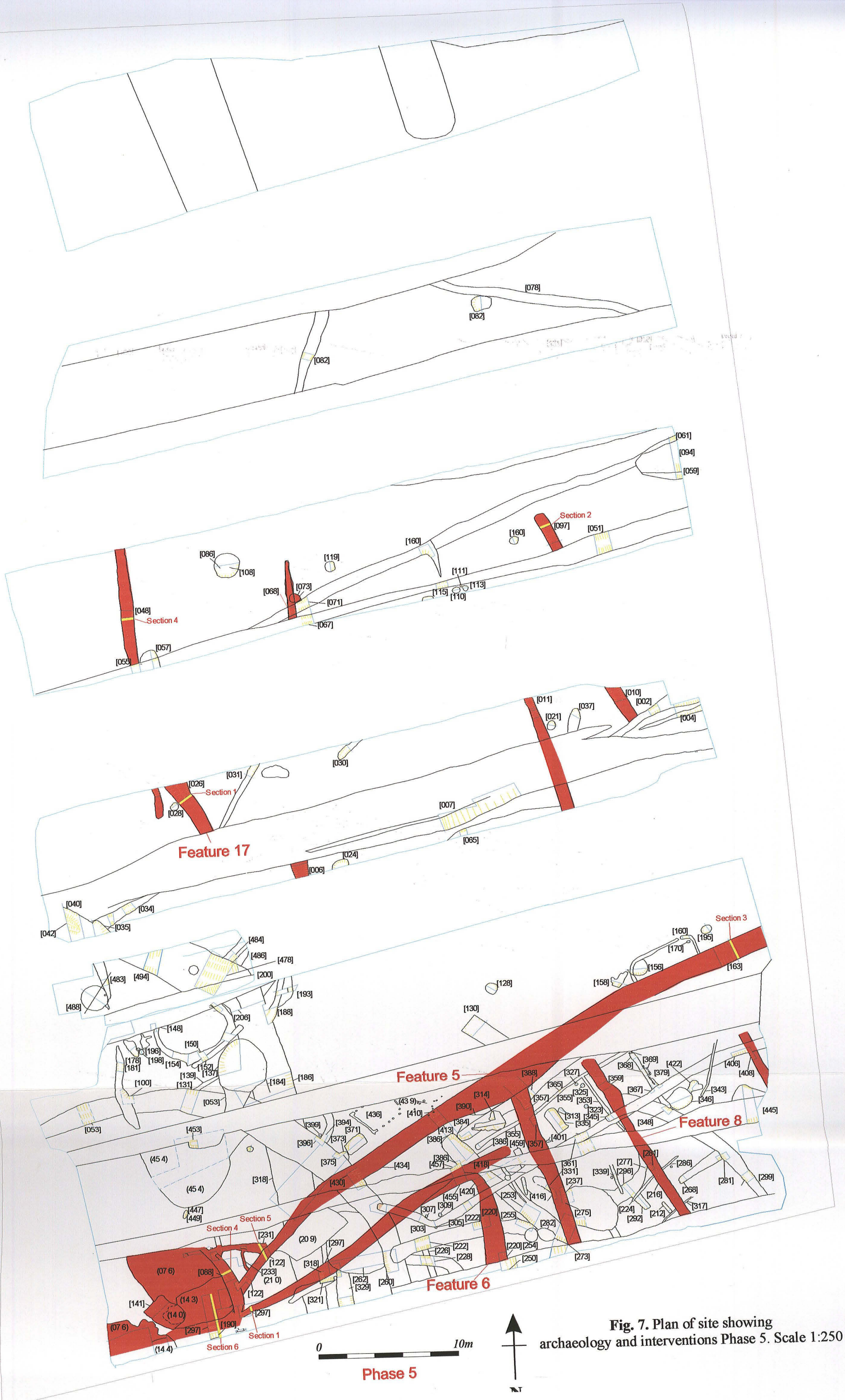


Fig. 7. Plan of site showing archaeology and interventions Phase 5. Scale 1:250

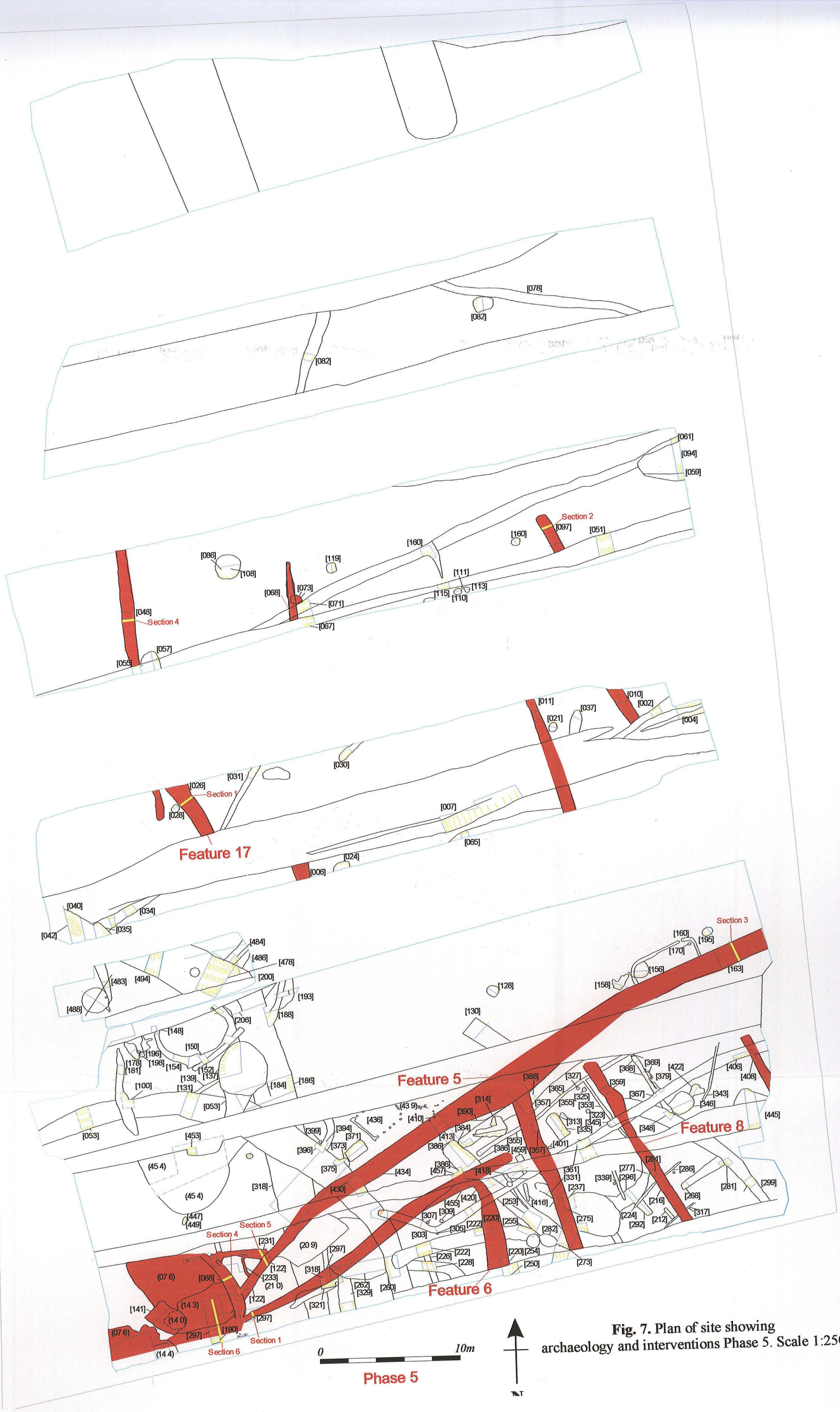


Fig. 7. Plan of site showing archaeology and interventions Phase 5. Scale 1:250

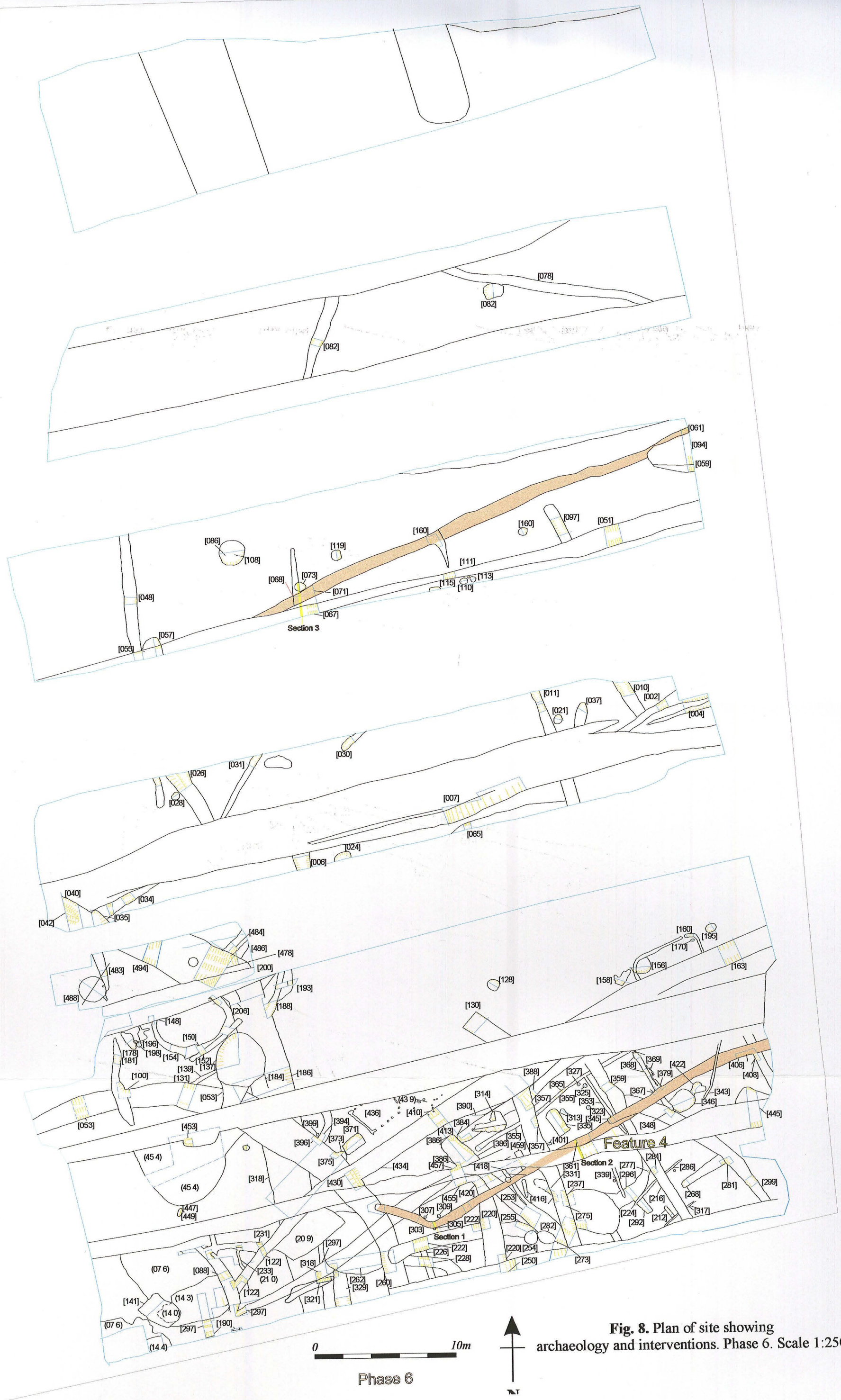


Fig. 8. Plan of site showing archaeology and interventions. Phase 6. Scale 1:250

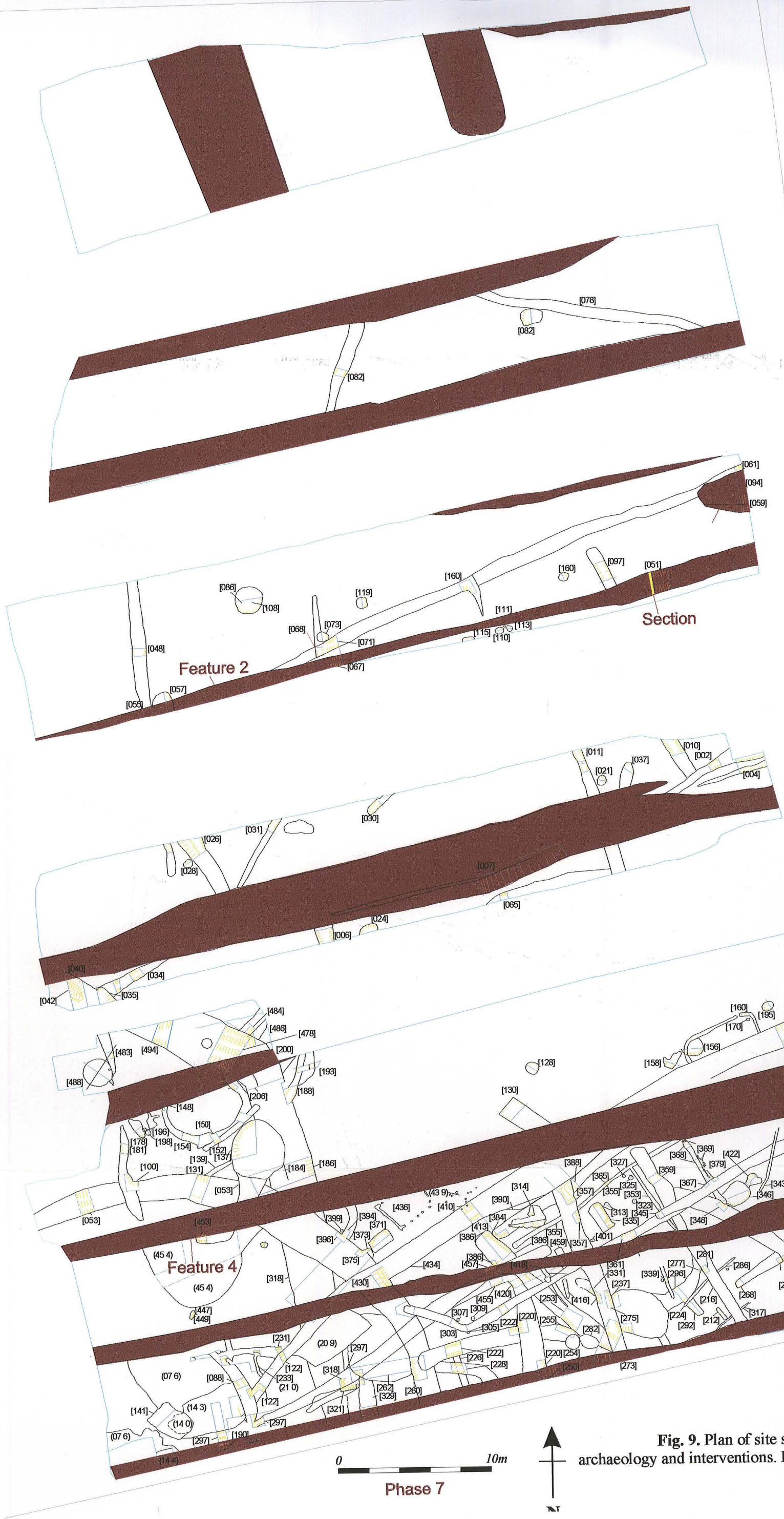
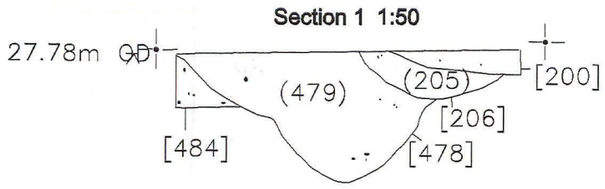
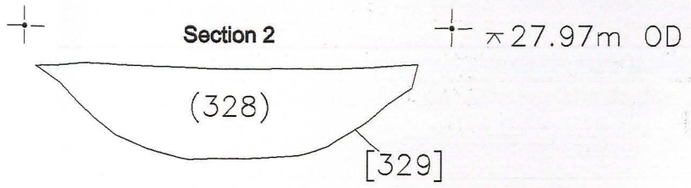
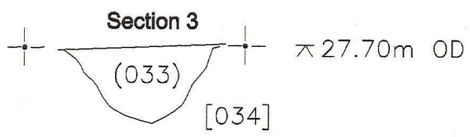
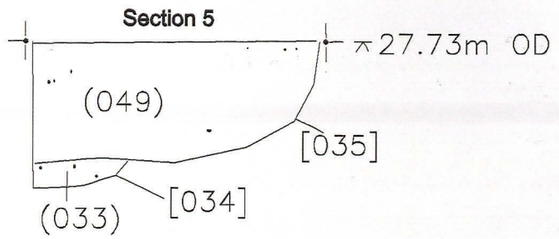


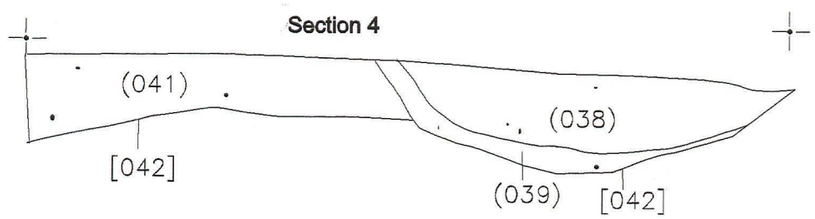
Fig. 9. Plan of site showing archaeology and interventions. Phase 7. Scale 1:250

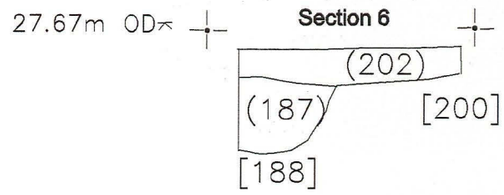


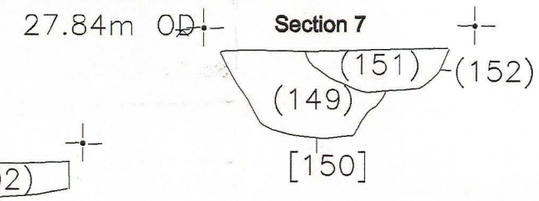


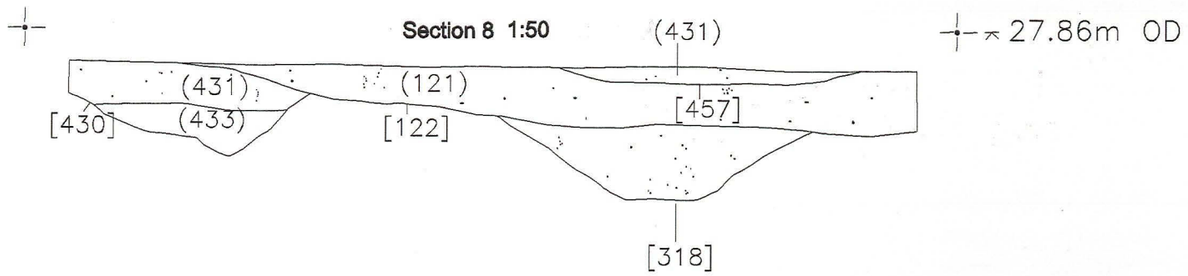


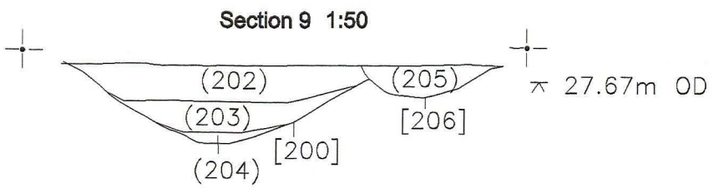












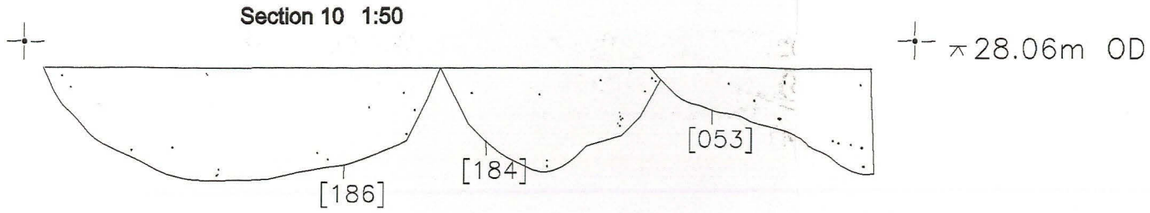


Fig. 10. Phase 1 sections. Scale 1:20 unless otherwise stated. See Figure 4 for locations of sections.

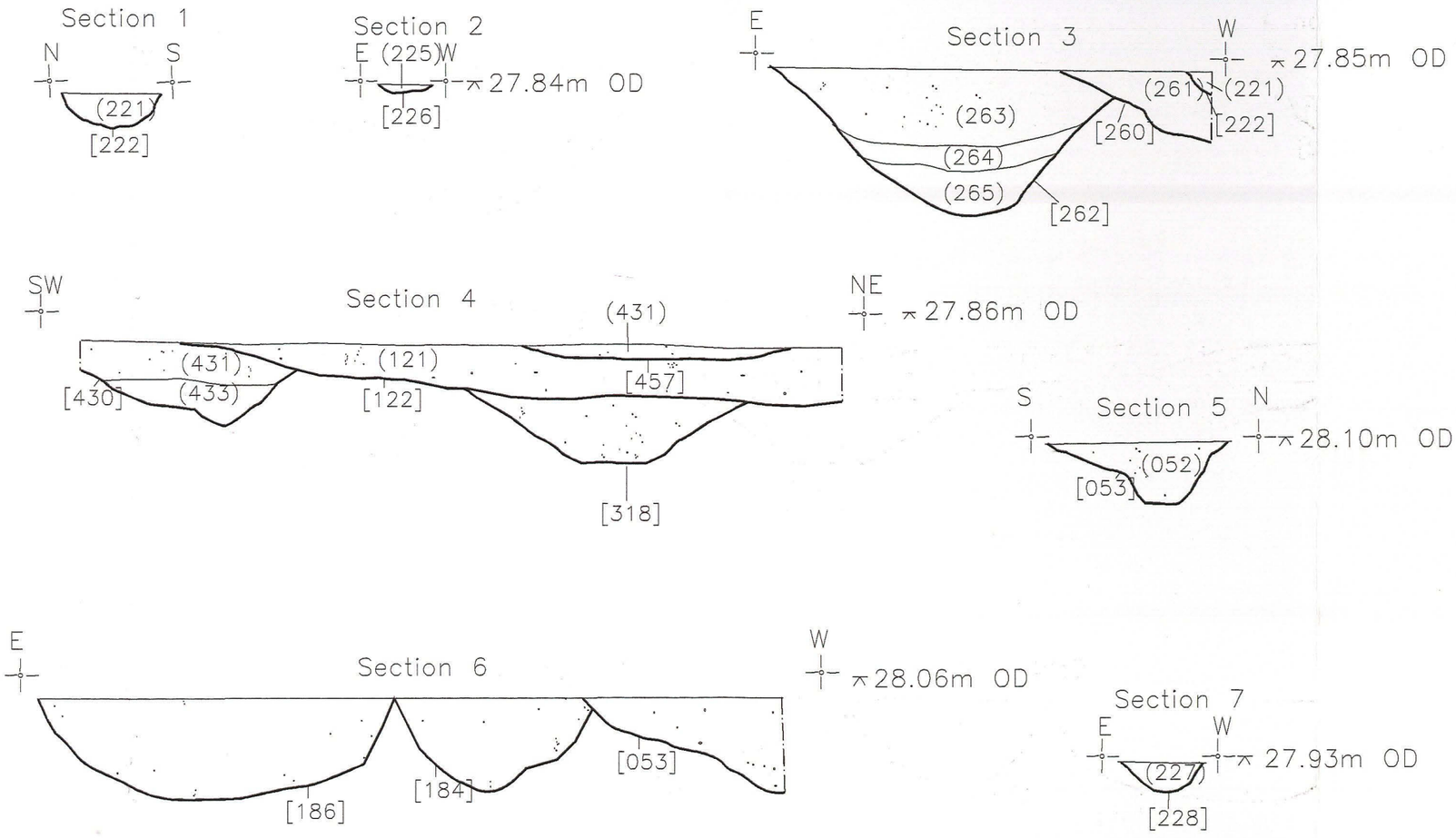


Figure 11. Phase 2 sections at scale 1:50.
See figure 4 for locations.

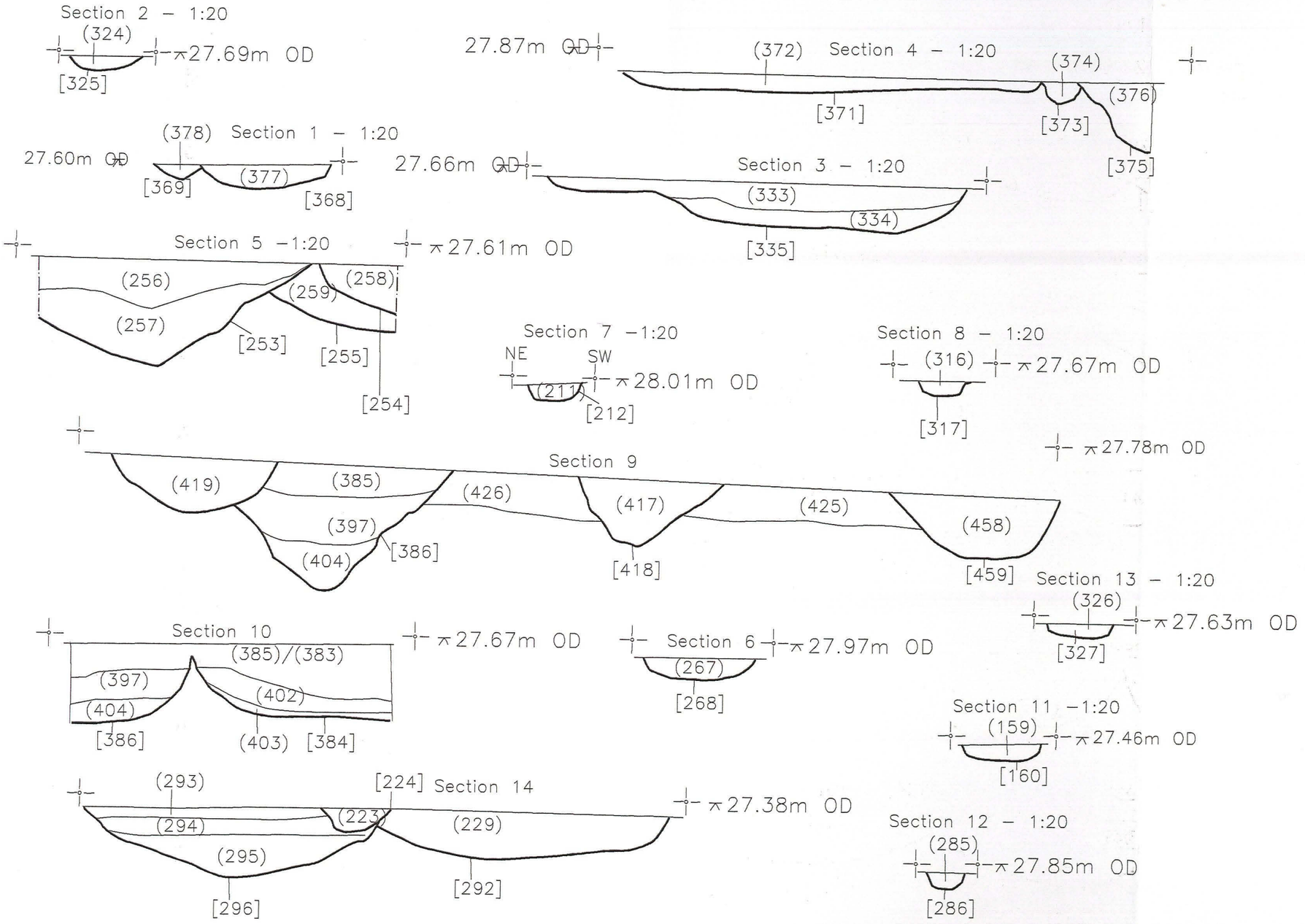


Fig. 12. Phase 3 sections. Scale 1:50 unless otherwise stated. See Figure 5 for locations of sections.

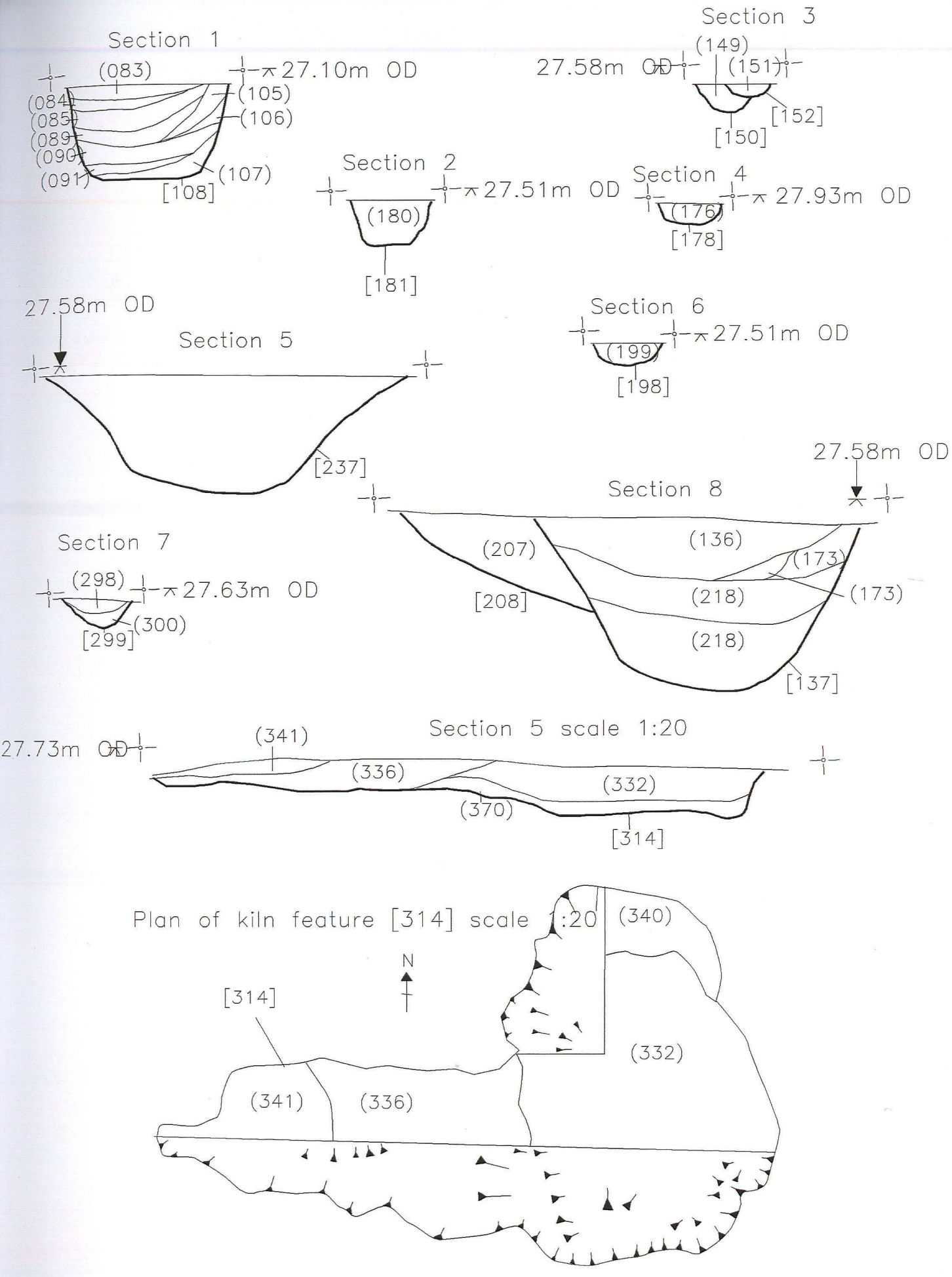
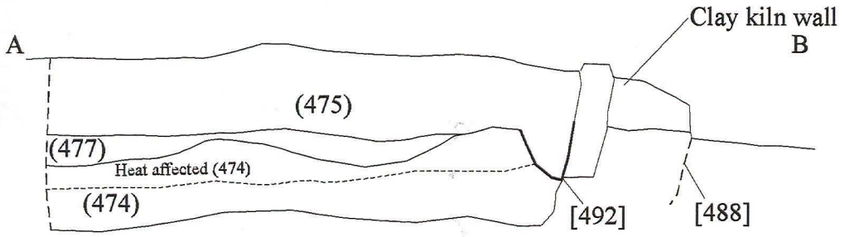
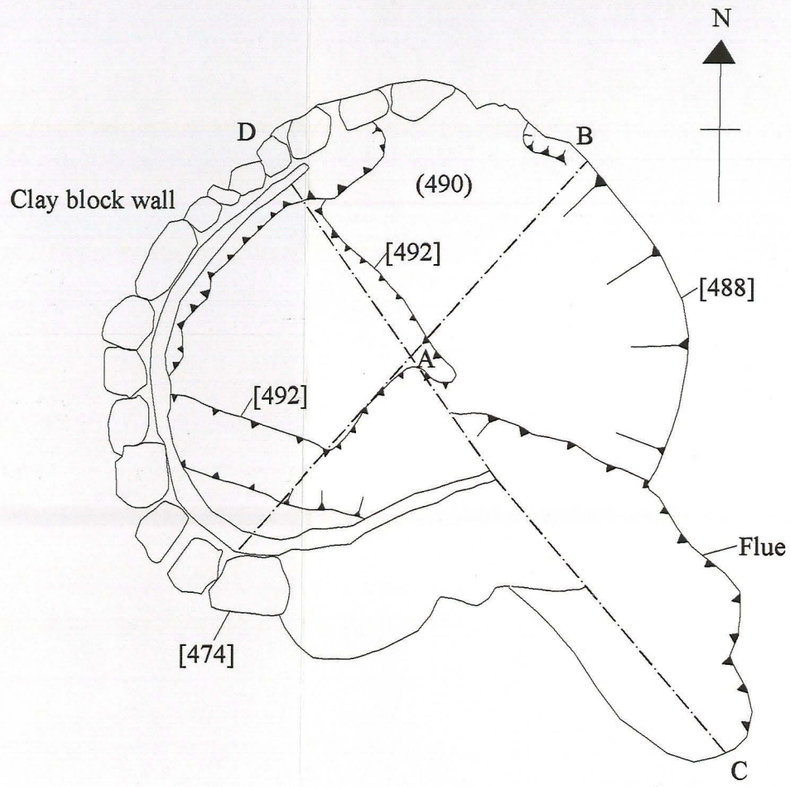


Fig. 13. Phase 4 sections and plan of kiln [314]. At scales 50 unless otherwise stated. For locations see Fig. 6. For kiln[488] see Figs. 14 and 15.





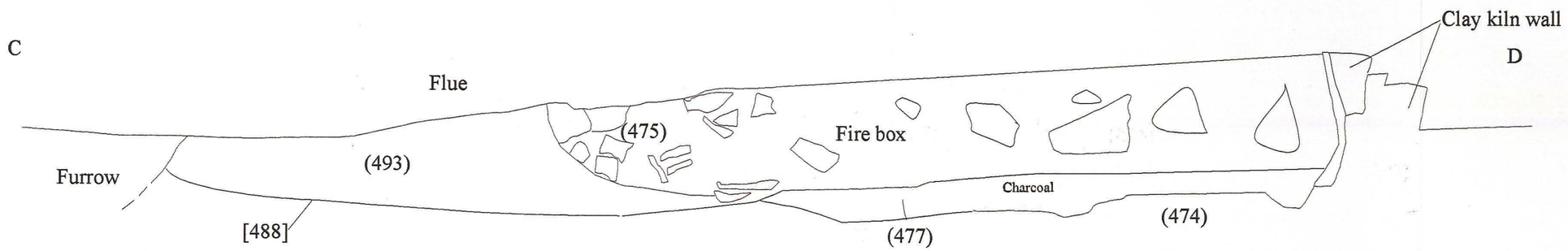


Fig. 14. Kiln [488]. Drawings at 1.20.

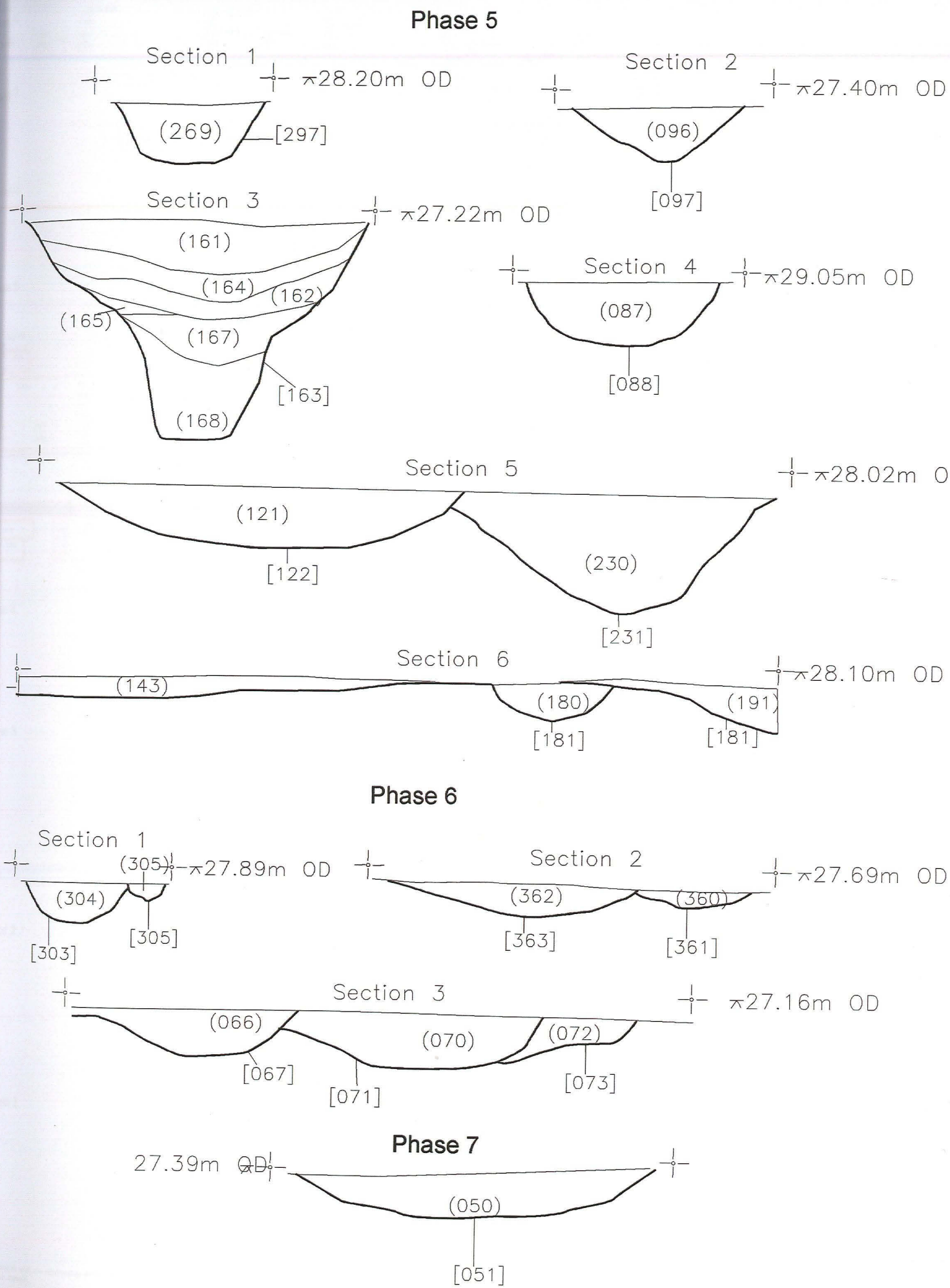
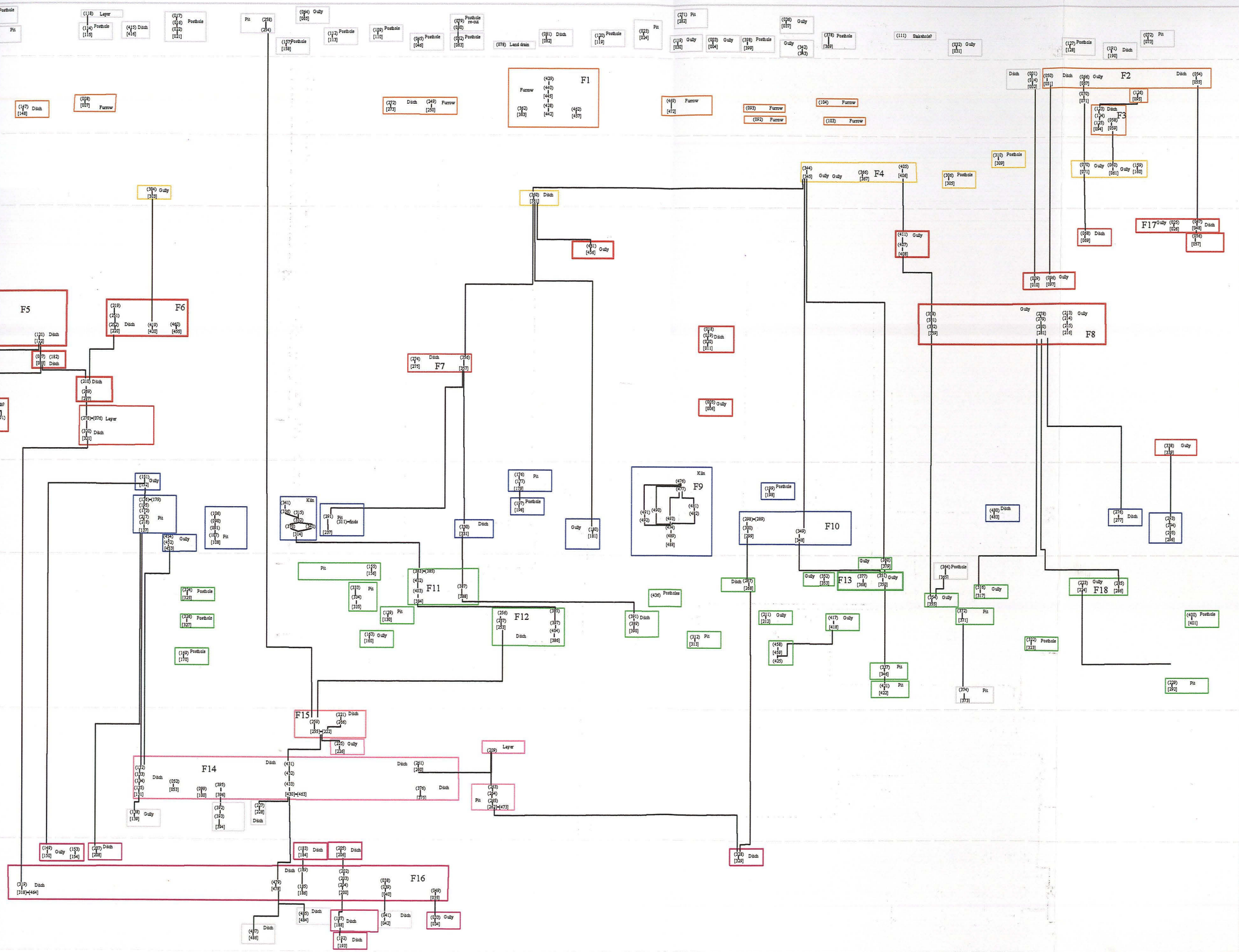


Fig. 15. Phases 5, 6 and 7 sections. Scale 1:20. See Figures 7, 8 and 9 for locations of sections



ts with no relationship above them are covered by subsoil
psoil.
ty of significant features or those with multiple cut numbers have
additional features of F1-F18
features are highlighted in grey boxes. Phased features are coloured
o the site plan
ts with no relationship below them truncate the natural substrata

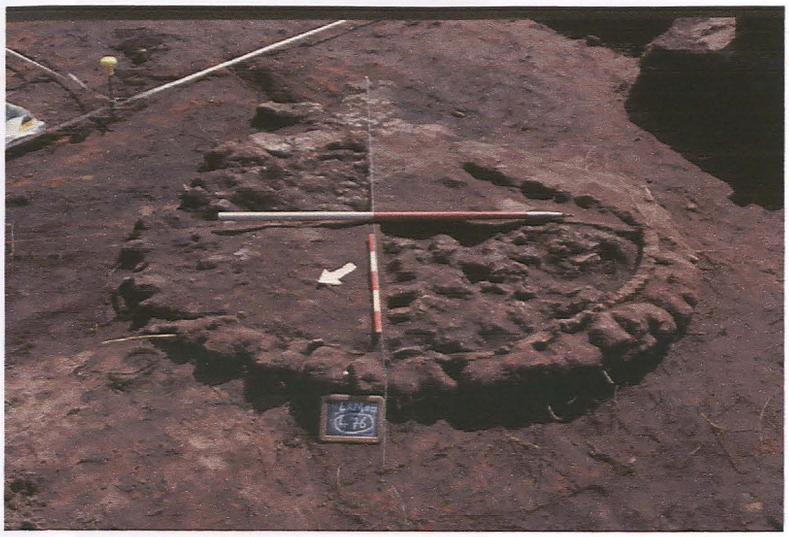
Figure 16. Matrix

Appendix 1

Pl. 1. Ongoing work in the south corner of the site showing part of the long rectangular open sided building.

Pl. 2. Shallow rectangular pit [130], of phase 3.

Pl. 3. The eastern quadrant of kiln, Feature 9 of phase 4 showing its clay block wall and compact base.



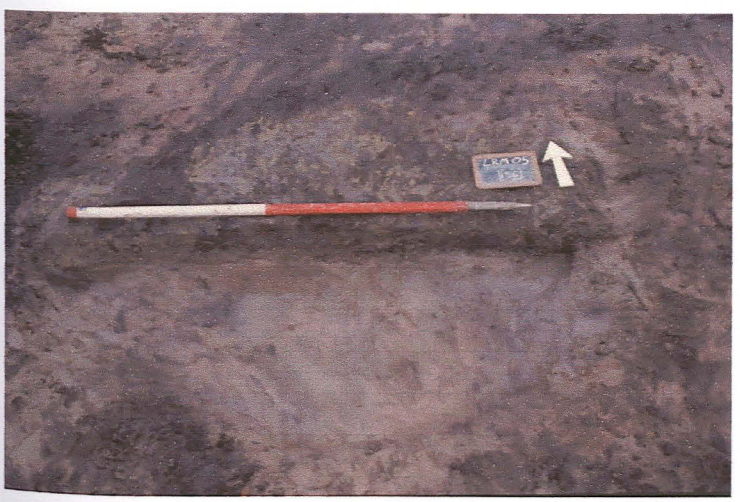
Pl. 4. Kiln Feature 9 of phase 4, before its rubble fill was removed.

Pl. 5. Clay lined Pit [335] of phase 3, which was set within the long rectangular building .

Pl. 6. Steep sided waste pit [108] of phase 4.

Pl. 7. Beam slot [368] of Phase 3.

Pl. 8. Ditch [200] of Phase 1 illustrates the substantial nature of some of the features excavated on the site.



Pl. 9. Pit [156] of Phase 3, which was associated with another rectangular building.

Appendix 2

REPORT 215 ON POTTERY FROM EXCAVATIONS TO THE EAST OF LINWOOD ROAD, MARKET RASEN, LINCOLNSHIRE, LRM05

For PRE-CONSTRUCT ARCHAEOLOGY

By Margaret J. Darling, M.Phil., F.S.A., M.I.F.A.

September 2007

The pottery totalled 3556 sherds, weighing 103.139kg, representing 100.6 vessel equivalents, from 161 deposits. Although some deposits were scrappy and abraded, much of the pottery is in extremely fresh condition, including complete vessels from pits, the average sherds weight overall being 29g, rising to 43g in Phase 4. No problems are anticipated for future storage. The pottery has been archived according to the guidelines laid down for the minimum archive by *The Study Group for Roman Pottery*, using count and weight as measures but as a kiln site, extended to include rim diameters and estimated vessel equivalents (EVEs) based on the rim percentage. The archive codes and format originated with the City of Lincoln Archaeology Unit. The archive record for the pottery and the kiln furniture (available on disk) will be curated for future study.

INTRODUCTION

Quantities by phase are shown in Table 1.

Table 1

Phase	Eves	%	Sherds	%	Weight	%	g/sherd
1	565	5.62	139	3.91	3715	3.60	26.7
2	193	1.92	98	2.76	2250	2.18	23.0
3	567	5.64	235	6.61	6879	6.67	29.3
4	4561	45.34	1265	35.57	55725	54.03	44.1
5	3613	35.91	1579	44.40	30162	29.24	19.1
6	37	0.37	6	0.17	225	0.22	37.5
7	25	0.25	37	1.04	516	0.50	13.9
8	119	1.18	57	1.60	1125	1.09	19.7
unph	380	3.78	140	3.94	2542	2.46	18.2
Total	10060	100	3556	100	103139	100	

A detailed list of all pottery by deposit with quantities, dating and comments is in Appendix 3. The largest quantities came from Phase 4, particularly the pits, representing 54% Eves and 60% weight, with the highest average sherd weight of 41.5g. This is partly due to the number of complete vessels, mostly from pit 137. The next largest group came from ditches, at 19-21%, with a relatively high sherd weight of 33g. Deposits associated with the kilns produced smaller quantities of more fragmented pottery. The high average sherd weight from Phase 4 is due largely to the complete vessels from Pits 137 and 237.

Sherds links occurred between: Gully 042 and ditch 040 (2) Phase 1; Occupation layer 425 and gully 418, Phase 3; Pit 108 and re-cut 086. Phase 4. All other links were between layers in the same feature (see Appendix 3).

OVERVIEW OF FABRICS

The fabrics are detailed in table 2 below.

Table 2 lrmfbph.xls

Fabric	Code	EVEs	%	Sherds	%	Weight	%
Grey fine	GFIN	70	0.7	6	0.17	182	0.18
Grey quartz-gritted	GREY	8472	84.21	3209	90.24	80922	78.46
Grey fairly fine	GRFF	494	4.91	29	0.82	1655	1.6
Parisian ware	PART	15	0.15	9	0.25	84	0.08
Oxidized	OX	215	2.14	37	1.04	1250	1.21
Kiln products		**9266**	**92.11**	**3290**	**92.52**	**84093**	**81.53**
Cream	CR	200	1.99	4	0.11	257	0.25
Fired clay	FCLAY	0	0	59	1.66	2250	2.18
Grey non-kiln	GRNK	0	0	3	0.08	137	0.13
Grog-tempered	GROG	288	2.86	100	2.81	11561	11.21
Grey round quartz	GRRO	159	1.58	50	1.41	2379	2.31
Grey sandy	GRSA	32	0.32	8	0.22	244	0.24
Mortaria local	MOLO	17	0.17	1	0.03	266	0.26
Mortaria	MORT	5	0.05	1	0.03	63	0.06
Mortaria South Carlton	MOSC	48	0.48	7	0.2	1162	1.13
Oxidized light	OXL	0	0	1	0.03	10	0.01
Oxidized round quartz	OXRO	0	0	1	0.03	58	0.06
Oxidized sandy	OXSA	0	0	2	0.06	47	0.05
Post-Roman	PRO	0	0	1	0.03	12	0.01
Samian Central Gaul	SAMCG	5	0.05	2	0.06	14	0.01
Samian Les Martres de Veyre	SAMLM	10	0.1	3	0.08	60	0.06
Samian South Gaulish	SAMSG	5	0.05	7	0.2	78	0.08
Shell-gritted	SHEL	0	0	2	0.06	73	0.07
Vesicular	VESIC	25	0.25	14	0.39	375	0.36
	Total	10060	100	3556	100	103139	100

The main fabrics produced at Market Rasen are the grey wares. There is a notable paucity of Parisian ware found in excavations of other Market Rasen kilns. Samian is, however, better represented, and includes a notable collection of South Gaulish sherds, only previously seen in the assemblage from the 1960s excavations, together with three vessels from Les Martres-de-Veyre, and two from Lezoux. Five mortaria occur, two of which are stamped, one made by the potter Catto, who worked at the South Carlton kilns (MOSC, in Phase 4), while the other is only the edge of a stamp on a grey mortarium, which seems to be a local product (MOLO), (see report below). Another grey mortarium is too burnt for certainty as to its origin (MORT). A base sherd possibly from a South Carlton mortarium occurred in Phase 1.

The fabrics by phase and weight for the Roman phases are detailed in Table 3, excluding the occasional fired clay fragments included with the pottery. Full details of the occurrence by phase is in Appendix 1.

Table 3 Fabrics by phase, weight percentages

	Ph 1	Ph 2	Ph 3	Ph 4	Ph 5
GREY	80.48	75.02	92.89	77.76	81.10
GRFF	1.44	0	2.54	1.37	2.22
GFIN	0	0	1.96	0.00	0.13
OX	1.66	11.6	0	1.32	0.54
PART	1.38	0	0	0.05	0
MOLO	0	0	0	0.60	0
Kiln	**84.96**	**86.62**	**97.39**	**81.10**	**83.99**
Cream/Oxid	0	2.26	1.29	0.09	0.65
Non-Kiln Greys	0	3.78	1.34	0.83	6.40
Grog	11.92	3.38	0	15.62	8.18

MOSC	3.12	0	0	1.74	0.32
SAMCG	0	0	0	0.00	0.01
SAMLM	0	0	0	0.09	0
SAMSG	0	0	0	0.12	0.4
Shell/Vesicular	0	3.96	0	0.41	0.43
	100	100	100	100	100
Sample kg	3.72	2.25	6.88	55.73	30.16

Overall kiln fabrics account for up to 93% of the pottery. Most of the other fabrics have occurred on the other Market Rasen sites, the only ones apart from normal grey fabric accounting for above 1% on sherd count are the fabrics with rounded quartz, (GRRO and OXRO) and grog-tempered (GROG), the latter being the most common non-kiln fabric, accounting for 11% weight. Grog-tempered fabrics are used for vessels in the local native tradition, bowls, cooking pots and storage jars, but also for lid-seated jars of the same type as made in kiln grey ware (J105), everted-rim jars and lug-handled jars. These are discussed below. Just as the high percentage of grog-tempered vessels is unusual relative to other Market Rasen sites, so is the low occurrence of vessels in vesicular fabrics (VESIC), many of which were originally shell-gritted. Also notable is the paucity of Parisian ware (PART) which, due to the variability of this ware from the kilns, can be viewed with the fine grey (GFIN) since typical Parisian stamps have been found on both fine and standard grey fabrics. The 0.25% sherd count can be contrasted with between 2-3% from other sites.

OVERVIEW OF VESSEL FORMS AND TYPES

An analysis of the main forms produced in the grey kiln fabrics is given in Table 4. Details of the vessel types by phase are in Appendix 2.

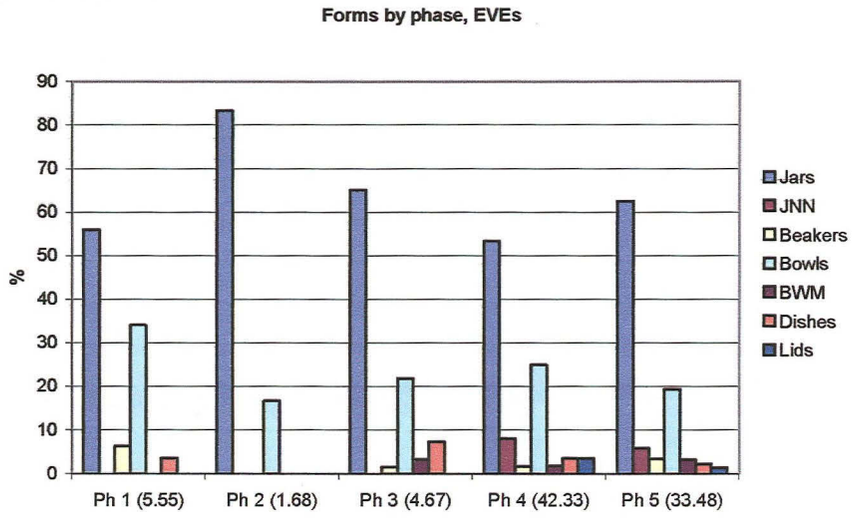
Table 4 Grey wares forms lrmtbfmph.xls

	EVEs	%	Sherds	%	Weight	%	G/sh.	Broken
Bowl	20.86	22.51	133	21.14	6789	24.38	51.0	6.4
Dish	2.65	2.86	20	3.18	997	3.58	49.9	7.5
Bowl/dish	0.2	0.22	2	0.32	53	0.19	26.5	10.0
Bowl wide-mouth	2.11	2.28	22	3.50	1271	4.56	57.8	10.4
Lid	2.13	2.30	11	1.75	893	3.21	81.2	5.2
OPEN	**27.95**	**30.16**	**188**	**29.89**	**10003**	**35.93**	**266.35**	**39.5**
Jar or bowl	1.9	2.05	19	3.02	517	1.86	27.2	10.0
Jar narrow-neck	5.8	6.26	18	2.86	2229	8.01	123.8	3.1
Jar	54.27	58.57	386	61.37	14453	51.91	37.4	7.1
Jar Beaker	0.2	0.22	1	0.16	15	0.05	15.0	5.0
Beaker	2.29	2.47	15	2.38	528	1.90	35.2	6.6
Jar handled	0.18	0.19	1	0.16	64	0.23	64.0	5.6
Jar large	0.07	0.08	1	0.16	34	0.12	34.0	14.3
CLOSED	**64.71**	**69.84**	**441**	**70.11**	**17840**	**64.07**	**336.69**	**51.6**
Total	**92.66**	**100.00**	**629**	**100.00**	**27843**	**100.00**	**44.3**	**6.8**

These figures show the main product to be jars, at a higher level than seen on some of the other Market Rasen sites, closed vessels accounting for over 70%. In the open forms, there are fewer dishes than seen elsewhere, but a relatively high number of narrow-necked jars. A notable feature is the paucity of wide-mouthed bowls relative to their occurrence in other Market Rasen kiln assemblages; this is normally a later vessel form, indicating the generally earlier dating of this assemblage. Many of these bowl rims were fragmentary, and dating these is difficult in north Lincolnshire, since such bowls are being made in the Antonine period at the Roxby kilns (Rigby & Stead, 1976, 138-147), Dragonby kiln 3 (ibid., 136-9), kiln 5 (May et al 1996, 577) and in waste probably from Dragonby kiln 3 (Swan 1996).

The occurrence of forms by phase is shown in fig 1. Uncertain groups, as bowls or dish, jar or bowl, have been excluded. The incidence of forms and individual vessel types by phase is given in Appendix 2.

Fig 1 Forms by phase.



This shows a restricted range of vessel forms until Phase 3 and onwards, due in part to the smaller samples in these early phases, particularly from Phase 2, and it is not until Phase 4 that the full range occurs.

The main vessel types produced at Market Rasen include many also produced at the Roxby kilns (Rigby & Stead 1976, 139, figs 65-68), lid-seated jars with stabbed decoration, everted rim jars, rusticated jars, bowls with everted rims, carinated jars (B334), folded beakers, and lattice decorated beakers. But there are differences in the two assemblages, the absence of narrow-necked jars (nos 1-7), and the carinated flat-rimmed bowls (nos 54-56) at Roxby, while lug-handled jars from this Market Rasen kiln are in grog-tempered fabric, and there are none of the grooved jars of Roxby type C, the triangular rim latticed dishes, Roxby type P, or the Gallo-Belgic derived dish (Gillam type 337), Roxby type H, although some of these types occur on other Market Rasen kiln sites. Many of these types appear in Lincoln and are widely used in the northern part of Lincolnshire and the Trent Valley kilns, and across the Humber in Yorkshire.

When the vessel types are examined from the recent excavations at Market Rasen, the commonest form is the everted rim jar, averaging overall at 24% EVEs, but this site has a high 40.9%. The other type from the site with a high percentage is the carinated jar or bowl (B334) at 11.7% against the overall average of 6.4%, and equally the lid-seated jar (J105) at 7.2% against the overall 4.7%, and narrow-necked jars at 6.3% against the overall 4.7% (largely due to the four vessels from pit 137). Lids are also well represented. Where the percentages from this site are low, it is on the later types, flanged bowls (none) and wide-mouthed bowls at 2.3% against the overall 9.2%, although it is clear that some types start in the 2nd century, becoming commoner later.

There are two important deposits, the two large pits, 137 and 237 in Phase 4. Both pits seem likely to have been clay pits, re-used to dump waste material from the kilns. These produced 45 of the 84 illustrated vessels. Pit 137 was exceptional in containing ten complete vessels: five everted-rimmed rusticated jars, all of the same type (nos 8-12), two narrow-necked jars (nos 3, 5), one lid-seated jar (J105, no 19), and two complete carinated necked jars or bowls (B334, nos 29-30). All were wasters in that most had spalling and cracks. The pit also contained a large assemblage of grog-tempered vessels (GROG, nos 76-79), a sherd from a Parisian fabric poppy-head beaker, three South Gaulish samian vessels, and one from Les Martres de Veyre, accounting for much of the samian from the site.

There were probably fragments from at least 129 vessels based on rims and bases. Some of the complete vessels appeared to have been deposited upright in groups, but given the nature of the subsoil, highly mobile running sand, this may have been due to natural causes. This remarkable group represented 20% of all pottery by EVEs measure, and nearly 18% on weight. There are sherd links between the three main deposits in the pit. Notably none of the more normal bowls or dishes made at the kilns occurred. There were also fired clay fragments of discs, probably used to aid stacking in the kilns (below, fig 00, nos 19-20 [kiln section]). An unusual find from the pit is a handle, possibly from a tool used for pottery work (fig 00, no 23 [kiln section]

The contents of pit 237 were more fragmentary, but had a wider vessel range, four jars, the unusual cylindrical vessel no 24 (discussed below), two carinated jars (B334) nos 26-7, a folded jar or beaker in oxidized fabric no 31, six bowls including larger wide-mouthed types, nos 34, 40-2, 45-6, unusual bowls nos 51 and 52, bowl no 54, dishes, nos 59-60, lid no 65, and notably the mortarium no 66, considered to be made locally, and non-kiln products, a grog-tempered jar no 80, and the mortarium stamped by Catto from the South Carlton potteries, no 84.

An unusual vessel is the cylindrical jar, no 24 from pit 237. Fragments of similar vessels occurred in the pottery rescued from Gordon's Field, Market Rasen in 1968 (Darling forthcoming, nos 245-7, in a grey fabric considered to be not from the kilns. Similar vessels have also occurred at Dragonby in a variety of fabrics including shell-gritted (Gregory 1996, 520, nos 799, 1122, 1305, 1316, and 1341), the earliest from Horizon II dated Flavian to early 2nd century. There is also an example from Kiln 5 at Dragonby (Gregory 1996, 577, fig 20.33, 1436) for which a Hadrianic date is suggested. Other examples are known from Brough-on-Humber (Wacher 1969, nos 260, 517), Winterton (Rigby & Stead 1976, fig 82, no 65) and Shiptonthorpe (Millett 2006, fig 7.17, R11.37). A similar vessel appears to be a cylindrical jar with a lid-seating from London in coarse white-slipped fabric made either at Verulamium or London (Davies et al 1994, 54, 59, fig 48, no 271); the form is noted as also being used as a cremation urn, while a fragment also in a cream fabric from the shore fort at Caister-on-Sea is likely to be of the same type (Darling with Gurney 1993, fig 157, no 700). None of the Lincolnshire examples appear to be lid-seated, and the function of this extraordinary vessel type is unknown; no evidence for use, sooting, deposits or wear occur. It is taller than any normal jar and with a comparatively narrow rim, decorated mostly with grooving but latticing also occurs on examples from Dragonby and Winterton (the latter in Roxby kiln fabric, Rigby & Stead 1976, 139), the decoration alone suggests this is not a mundane vessel. A possibly use for metallurgical processes was suggested for the Dragonby kiln 5 example which was undecorated apart from grooving.

But there is a further vessel which is closely similar from Old Winteringham (Rigby & Stead 1976, 160, fig 78, no 80), in a fine grey ware, burnished with a deep band of rouletted decoration, and considered to be a very tall imitation of a butt beaker, unfortunately not usefully stratified, of almost identical proportions to the Winterton example. This example is now considered to be an import from North Gaul (pers. comm. Valery Rigby). A vessel in a fine grey fabric from the villa at Rudston, Yorkshire is also related (Rigby 1980, fig 45, 203). The grooving, decoration and the details of the bases (as Rigby & Stead 1976, fig 82, 65; Darling forthcoming, no 247) of some of these vessels suggest that these are copies of continental beakers from Gallo-Belgica, noted for their large size (see Hawkes & Hull 1947, pl LVII, 116A; Tuffreau-Libre, 1992, 127 in a grave assemblage; 41 in terra rubra). This is, therefore, an example of a highly unusual vessel, ultimately derived from an early continental vessel.

Other vessels also show the potters' continental links, as the shallow bowl no 51. Another example of this type was found in the 1966 excavations in Austin's Field, Market Rasen (Darling forthcoming, no 82) and others have occurred in all previous Market Rasen kiln excavations. This dish type occurs sparsely but widely in northern Lincolnshire into Yorkshire. Examples are known from Lincoln (Webster 1949, fig 14, no 72; Coppack 1973, no 11; Darling 1984, fig 15, no 45-6), Brough-on-Humber (Corder & Romans 1937, fig 10, no 3; fig 12, no 61; 1938, fig 14, no 18; fig 13, no 90; Wacher 1969, fig 63, no 274), York (Monaghan 1997, fig 400, no 4003); Malton (Bidwell and Croom 1997, fig 26, no 125; fig 36, no 409), and Dragonby (Gregory 1996, fig 20.6, no 835; fig 20.26, no 1329; fig 20.27, no 1361; fig 20.34, nos 1459-1460 from Pit F 2567 with kiln waste; variant: fig 20.24, no 1290). A possible derivation of the form from a Pannonian type has been suggested by Swan (1996), who notes other British examples including from Verulamium (Frere 1984, fig 100, Nos

2383-4, deposit AD110-130), and an unpublished example from Braughing, Herts. Swan has drawn attention to the broad similarity of the form to the bowl Gose Type 494 (type example from Trier, later 1st century), but the closer parallel is in Pannonia (Bónis 1942, fig 21, No 23; fig 23, No 10). The first of these Pannonian vessels is a shallow dish, while the second is more of a bowl; both are painted on the flange, and have much larger diameters (*c.* 20 and 34cm) than the British examples. It is also curious that vessels of closely similar type occur in early pre-Hadrianic pottery groups at Vindolanda, where these are considered to be confined to the Flavian period (Hird 1977, 20, nos 182-4 etc.). These often occur together with another type known from other Market Rasen kiln sites, a bowl with a bifid rim (Gillam type 301), although no examples came from the current site.

A similar unusual bowl is no 52, which may be a variant of the same type, another example coming from the 1965 excavations in Chantry's Field (Darling forthcoming, no 81), which has a complete curved flange. These bowl types, with parallels suggesting derivation from forms appearing in the eastern provinces of the Roman Empire, are of considerable interest for a better understanding of the pottery of this region. Further examples are known from Barrow-on-Humber, Scunthorpe, Horncastle, Sudbrooke, and Wickenby, with a single outlier at Wrangle on the south Lincolnshire coast, probably arriving there by coastal trade.

Copies of samian forms are comparatively common from the 2nd century, but curiously the Market Rasen potters seldom produce these, the dish, no 53, being a rough imitation of a samian dish, form Dr. 36, and no 50 may be a variant on a Curle 15, a form less frequently imitated. The Dr. 37 bowl is commonly copied in 'London ware' (also made in the Nene Valley) contemporaneously with the production of Parisian ware at Market Rasen, and while no copies occur at Market Rasen, the rouletted bowl no 49 may be a copy of a Dr. 30 (as in kiln debris from Dragonby (Swan 1996, fig 20.34, no 1462). There is a copy of a Dr. 36 in Parisian type fabric (from Chantry's Field, Darling forthcoming, no 203), and copies of Dr. 38 bowls occur later in the same fine burnished fabric.

DECORATION

Decoration amounts to over 15% on sherd count and a massive 22% based on the estimated vessel equivalents (EVEs) measure, this latter high figure directly related to the number of nearly complete decorated jars. The commonest decoration is rustication on jars, almost entirely of the linear type although a few certain nodular examples occur, and accounts for over 77% of all decorated sherds. The decoration is summarized in table 5.

Table 5

Type	Fabric	Forms	EVEs	%	Sherds	%	Weight	%
Burnished intersecting wavy line	Greys	Jars	0	0.00	1	0.20	6	0.03
Burnished wavy line	Greys	Dishes [1]	126	6.01	5	0.99	539	3.06
Burnished wavy line	Greys	Jars [2]	38	1.81	27	5.35	943	5.35
Lattice	Greys	Jars; beakers	118	5.62	35	6.93	1361	7.72
Linear rustication	Greys	Jars	1413	67.35	256	50.69	9726	55.20
Linear/nodular rustication	Greys	Jars	0	0.00	138	27.33	2139	12.14
Rouletted zone	Oxidized	Bowl/dish	17	0.81	2	0.40	28	0.16
Rouletted zone	Oxidized	Jar/beaker	0	0.00	1	0.20	15	0.09
Slashed	Greys	Jars [3]	0	0.00	1	0.20	21	0.12
Stabbed	Greys	Jars [4]	355	16.92	31	6.14	2559	14.52
Scored wavy line	Greys	Jars [5]	31	1.48	8	1.58	283	1.61
			2098	100.00	505	100.00	17620	100.00

NOTES: 1 Flat-rimmed dishes; 2 Mostly narrow-necked jars; 3 Jar? body only; 4 Lid-seated J105 jars, everted-rim jar; 5 Lid-seated J105, a curved rim jar and a lug-handled jar.

Five types of decoration also occur on non-kiln vessels, burnished wavy line on a grog-tempered storage jar, lattice on sandy grey (GRSA) jars, and scored wavy line, stabbing and slashing on grog-tempered jars.

Comparison with other Market Rasen sites on the basis of sherd count shows this site to have the highest percentage of rusticated jars, the fewest vessels with both burnished and scored wavy lines, and lattice decoration. The paucity of dishes from this site may account for the low figures for burnished wavy lines, which are common on other sites on open forms including wide-mouth bowls, while the low percentages for lattice may be due to dating differences. A decoration not seen in this assemblage but occurring from other kilns at Market Rasen is the burnished scroll, seen in the 1960's pottery on narrow-necked jars, wide-mouthed bowls, flanged and triangular-rim dishes (Darling forthcoming, nos 8, 11, 72, 98, 129-33), and from the Old Cattle Market site to the east of Linwood Road (MRH04; Darling forthcoming (a), on wide-mouthed bowls, nos 69-71), and this may well be a later style of decoration.

Firing faults are not common at Market Rasen, with notably little over-firing and distortion, 'spalling' of the surfaces due to inadequate clay preparation being one of the main causes of discard.

NON-KILN VESSELS

The non-local mortaria are discussed below (p00). Cream ware represents less than 1% weight of the total assemblage, all from closed vessels, flagons, and first appears in Phases 2 and 3, with the largest quantity in Phase 5. Both the flagons, nos 67-8, are early to mid 2nd century types. Sherds of the grey fabric with rounded quartz inclusions (GRRO, 2.4% weight), appear in Phase 3-4, but are mostly in Phase 5, nos 69-73. The narrow-necked jar no 69 is closely similar to the grey jars, nos 3-4, with a cordon at the base of the neck., while the two jars and bowl, nos 70-72, all derive from the underlying native tradition of the area. The jar no 73 is of the same type as the lid-seated jars from the kilns, and those made in grog-tempered fabric; the fabric is atypical. The source of this fabric is unknown, but it includes sand derived from Spilsby sandstone, perhaps to the south of Market Rasen (Vince forthcoming).

The grog-tempered vessels form a varied group, first appearing in Phase 1 but mostly from Phase 4 (particularly from pit 137) and Phase 5, accounting for over 11% on weight. All the vessels from the site appear wheel-made. The earliest vessel illustrated is the strange rim no 74, with sparse grog, from a large jar, and is unparalleled. The lug-handled jar no 75 is an early type which continues in use in the 2nd century. The grog content of the fabric of the jars nos 76-80 varies, some having pimply surfaces, and the lid-seated versions are typical of the area, similar to those made in grey fabrics in the kilns at both Market Rasen and Roxby; grog-tempered versions also came from the 1960s kiln excavations (Darling forthcoming, nos 256-7). All these jars came from Phase 4 pits 137 and 237. The dolia type jar, no 81, with its native type rim, occurs on other sites in the area, including a grog-tempered vessel from Gordon's Field 1968 (Darling forthcoming, no 258). A strange vessel is the dish no 82, clearly copying the dishes made in the Market Rasen kilns, Gillam type 337, although no kiln example came from this excavation (1960's excavations, Darling forthcoming, nos 88, and 213-5 from Gordon's Field 1968 in atypical fabrics; Old Cattle Market site, MRH04, Darling forthcoming (a), nos 102-3).

SAMIAN

Based on identifications by Felicity Wild, F.S.A.

Only plain vessels are represented:
South Gaulish: possibly 4 vessels; forms plate 18, cup 27G, and flakes from a dish.
Les Martres de Veyre: 3 vessels; forms dish 18/31, dish 36 (rivetted) and bowl Curle 11.
Lezoux: 2 vessels; forms plate or dish 18 or 18/31, and a 36 dish.

All sherds are in very poor abraded condition. The South Gaulish ware is likely to date to the later 1st century, while the vessels from Les Martres de Veyre belong to *c.* AD 100-120. The two dishes from Lezoux can only be broadly dated to the early to mid 2nd century. These latest sherds came from Phase 5, dump 209 and Phase 7, furrow 250. The Les Martres de Veyre sherds came from the pit 137 in Phase 4, together with South Gaulish sherds, and from a gully 061 in Phase 6.

MORTARIA STAMPS K.F. Hartley, F.S.A.

Fig 00, no 66 1 sherd, 266gms Diam 340mms 17%. A mortarium in a distinctly micaceous fabric, pink-brown with very thick, well-defined, black core and matt, self-coloured slip. Inclusions: fairly frequent, ill-sorted quartz, few red-brown sandstone and very rare black material. Trituration grit: there are only about ten grits on the surviving sherd, all but two (one red-brown and one ?quartz sandstone), are rounded quartz (transparent and pinkish). The very edge of a left-facing potter's stamp survives, too fragmentary for identification, but, judging from the fabric, almost certainly that of an unrecorded potter. The rim-profile would fit best with an Antonine date. There is every likelihood that this mortarium was made locally and spent more time in a reducing atmosphere during the firing than was customary with mortaria. There is no indication of use on the sherd. Pit 237, Cxt 291, Dwg 55.

Fig 00, no 84 4 sherds, 956gms Diam 270-280mms.27% Rim fragment from a worn mortarium which has been burnt throughout to grey. What is probably the left-facing potter's stamp survives. This retrograde and incuse stamp reads CATTO; it is distinctive and unusual because very few mortarium stamps were incuse. His work is uncommon, being recorded at only the following occupation sites: Castleford (unpublished); Thealby, Lincs. and York (Monaghan 1997, 936, no. 3389). Two of his mortaria were also found in surface material on the kiln-site at South Carlton, Lincoln (Webster 1944, these two surface finds were not published). His fabric (Tomber and Dore 1998, 162) fits perfectly with the production there. Several mortaria stamped by Crico, one of the major potters there, have been found at sites on the Antonine Wall leaving no doubt that the workshop was active in the Antonine period. Pit 237/297, Cxt 311. Dwg. 40.

DISCUSSION

External dating rests on the samian, starting in the later 1st century, and ending in the early to mid-2nd century, and the stamped mortarium, dated to the Antonine period. The presence of South Gaulish and Les Martres de Veyre samian provides valuable evidence of the spatial spread of early activity in this industry as sherds from these earlier sources have only been seen hitherto in the 1960s excavations in Austin's Field, to the west of Linwood Road (a single sherd of South Gaulish and seven from Les Martres de Veyre).

Typological dating of the coarse wares suggests a similar date-range, but some wide-mouthed bowls found in the late phases are likely to date into the later 2nd to 3rd century. These latter bowls are as likely to come from other kilns in the vicinity, as with the excavations nearby in 1999 (Darling 2000) where more 3rd and 4th century vessels occurred. The main activity on this site appears to lie in the early-mid 2nd century, making it the most important excavation on this kiln field to date.

The unusual groups from the pits 137 and 237 produced a large percentage of the pottery from the site, ranging from 22% sherd count to over 46% weight, and inevitably have a disproportionate effect on analysis of vessel forms and decoration, leading to more jars and less open forms than seen on other kiln sites at Market Rasen. Assessment of the decoration on this site is complicated by the fact that nearly all the rusticated sherds in Phase 4 came from the pit 137, and this pit accounted for approximately half of all rusticated ware on EVEs and weight due to the complete vessels, leaving sherd count as a more reliable measure (Pit 137 producing 13% of all rusticated ware on sherd count). However the high percentage of this type of decoration is confirmed by the quantity in Phase 5. To set this important type in context of other sites, identified rusticated ware accounts for over 15% on EVEs of all vessel types, while on a vessel count from the Roxby kilns (Rigby & Stead 1976, 138-147) rusticated jars of type E represent under 8%, the commonest jar being the lid-seated type A. While several types appear at both Market Rasen and Roxby suggesting a similar Antonine date, the high percentage of rusticated ware at Market Rasen may suggest an earlier start.

Another piece of important new evidence from this site includes the mortarium no 66, the fabric of which suggests it was a local product. This is unusual as mortaria were usually made by specialist potters, as at South Carlton (Webster 1944), such potters not producing general cooking vessels. A similar example does, however, occur in the area since the potter Q IVSTIVS CRESCENS appears to have fired some of his mortaria at the kiln at Newton-on-Trent (Field & Palmer-Brown 1991, 54, fig 17, nos 23-26; Darling & Hartley, forthcoming), alongside general coarse wares. The presence of a fragment of a potter's stamp is particularly interesting. The pottery includes types well known in the

northern part of Lincolnshire, many showing distinct continental influences. The important aspect of this site is that it produced a consistent early assemblage for the industry at Market Rasen, and provided the most evidence recovered to date for the kiln structure and furniture.

Future work on the industry will focus on integrating the evidence of the excavated pottery from the various excavations, and exploring their relationship to other kilns in the area, and their marketing area. This latter aspect is hampered by the lack of distinction in the fabric, and the paucity of excavation on normal occupation sites in the area. Petrological work on the main grey fabric has shown it to be similar to the fabrics produced at various sites in the Trent Valley, and at the Swanpool kilns in Lincoln, so that Market Rasen greyware is indistinguishable from these wares, and chemical analysis would be required.

CATALOGUE

Ill	Fabric	Form		Phase	Deposit	Cut	Cxt	D#
1	GREY	JNN	Distorted. Common quartz. Lattice.	5	Ditch	275	274	065
2	GREY	JNN		4	Pit	137	173	037
3	GREY	JNN	Complete. Spalled.	4	Pit	137	173	033
4	GREY	JNN		4	Pit	137	173	072
5	GREY	JNN	Complete. Spalled.	4	Pit	137	136	023
6	GREY	JNN	Burnished wavy line.	4	Pit	237	291	052
7	GREY	JHA		-	Unstrat.		144	079
8	GREY	JEV	Complete.	4	Pit	137	173	035
9	GREY	JEV	Complete.	4	Pit	137	173	036
10	GREY	JEV	Complete. Spalled.	4	Pit	137	173	034
11	GREY	JEV	Complete. Spalled.	4	Pit	137	136	025
12	GREY	JEV	Complete. Spalled. Traces string marks.	4	Pit	137	136	024
13	GRFF	BKEV	Lattice.	3	Ditch	390	389	077
14	GREY	BKEV	Lattice.	1	Ditch	329	328	005
15	GREY	JEV	Lattice.	1	Ditch	329	328	006
16	GREY	JEV	Lattice unusually to rim.	5	Hollow	141	140	078
17	GREY	JCUR	Distorted.	4	Pit	237	291	044
18	GREY	JEVH	Stabbed.	4	Pit	237	291	046
19	GREY	J105	Complete. Stabbed.	4	Pit	137	145	069
20	GREY	JEVH	Stabbed.	4	Pit	237	291	045
21	GREY	JEV	Burnished wavy line.	4	Pit	137	136	076
22	GRFF	JMR	Unusual rim type.	unph	Gully	042	041	001
23	GREY	JEV	Unusual rim type.	4	Pit	137	136	075
24	GREY	JCYL	Near complete.	4	Pit	237	291	057
25	GFIN	BKEV	Very thin wall.	5	Ditch	410	409	064
26	GREY	B334		4	Pit	237	291	049
27	GREY	B334		4	Finds	237;297	311	041
28	GREY	B334	Complete. Diagonal gouge pre-firing.	1	Ditch	206	205	068
29	GREY	B334	Complete. Split.	4	Pit	137	136	022
30	GRFF	B334	Complete.	4	Pit	137	173	032
31	OX	BKFOCUR		4	Pit	237	291	053
32	GREY	BEV	Common quartz.	5	Pit occupn.	141	194	011
33	OX	BNNK	Oxidized.	5	Pit occupn.	141	194	012
34	GREY	BNNK		4	Pit	237	291	043
35	GREY	BNNK	Common quartz.	4	Kiln fill	314	332	021
36	GREY	BNK	Burnished wavy line.	4	Pit	137	136;173	031
37	GRFF	BNK	Burnished wavy line.	4	Pit	137	173	038
38	GREY	BNK		4	Pit	178	176	060
39	GREY	BNK		1;unph.	Ditch; gully	040;042	038;041	073
40	GREY	BNK		4	Pit	237	291	080
41	GRFF	BNK		4	Pit	237	287;291	042
42	GREY	BWM52	Commoner quartz.	4	Pit	237	291	082
43	GREY	BNK		4	Pit	137	136	026
44	GREY	BNK		4	Pit	137	136	030
45	GREY	BWM97	Commoner quartz.	4	Pit	237	291	083
46	GREY	BWM101		4	Pit	237	291	081
47	GREY	BWM104	Commoner quartz.	3	Pit	282	271	084

48	GREY	BEV	Commoner quartz.	5	Pit occupn.	141	194	013
49	OX	BCAR?	Oxidized ?mis-fire. Rouletted.	4	Pit	178	176	059
50	GRFF	DCU15	Unusual bifid rim. Curle 15 copy?	1	Ditch	184	183	002
51	GREY	B321V		4	Pit	237	291	050
52	GREY	BFLBD	Unusual rim type.	4	Pit	237	291	051
53	GREY	D36		3	Ditch	273	272	020
54	GREY	BFL		4	Pit	237	291	056
55	GREY	B318		1	Ditch	329	328	007
56	GREY	B318V		5	Ditch	275	274	066
57	GREY	DCUR	Unusually thick wall.	5	Ditch	122	121	062
58	GREY	DTR		5	Ditch	434	431	008
59	GREY	DFL	Fabric as no 60. Burnished wavy line.	4	Pit	237	291	048
60	GREY	DFL	Fabric as no 59. Burnished wavy line.	4	Pit	237	291	047
61	GRFF	DFL		3	Pit	335	333	018
62	GREY	DFL		3	Ditch	388	387	071
63	GRFF	B318V		5	Occup layer	See 270	076	074
64	GREY	LBIF		5	Occup layer	See 270	076	070
65	GREY	L	String-marked knob.	4	Pit	237	291	054
66	MOLO	MHK	see report. Local fabric. Unused.	4	Pit	237	291	055
			NON-KILN PRODUCTS					
67	CR	FR		5	Ditch	163	162	063
68	CR	FR		3	Pit	130	129	019
69	GRRO	JNN		5	Pit occupn.	141	194	010
70	GRRO	JEVH		5	Pit occupn.	141	194	016
71	GRRO	CPN		5	Pit occupn.	141	194	017
72	GRRO	BNAT		5	Pit occupn.	141	194	015
73	GRRO?	JLS	Hard fired unusual fabric. Unusual stabbing.	5	Pit occupn.	141	194	014
74	GROG	JL	Sparse grog.	1	Gully	034	033	004
75	GROG	JLH	Dark grey grog.	5	Ditch	122	121	061
76	GROG	J105	Sparse grog. Pimply. Scored wavy line.	4	Pit	137	136;173	029
77	GROG?	J105	Indeterminate grog. Pimply. Slashed.	4	Pit	137	136	028
78	GROG?	JLS	Light brown grog or clay pells. Stabbed.	4	Pit	137	136	027
79	GROG	CPN	Light grey grog.	4	Pit	137	173	039
80	GROG	JL?	Light grey grog.	4	Pit	237	291	058
81	GROG	JS		5	Ditch	357	356	067
82	GROG	B333	Sparse grog.	5	Gully	231	230	003
83	VESIC	JEV	Elongated vesicules, ?shell.	2	Pit	262	263	009
84	MOSC	MHK	see report. Stamped by Catto.	4	Finds	237;297	311	040

KILN FURNITURE

The following deals with all the recognisable fragments of kiln furniture and fired clay, including those submitted to and archived by Dr Alan Vince. The incidence by phase is shown in table 5.

Table 5 Fragment by phase

Phase	Frags	%	Weight	%	g/frag
1	12	3.47	652	1.28	54.3
2	30	8.67	6662	13.1	222.1
3	7	2.02	1771	3.48	253.0
4	127	36.71	16278	32.01	128.2
5	159	45.95	24768	48.71	155.8
7	1	0.29	3	0.01	3.0
?	1	0.29	375	0.74	375.0
-	9	2.6	340	0.67	37.8
	346	100	50849	100	147.0

This shows the highest deposition in phases 4-5. Analysis of the major deposits (table 6) shows most of fragments coming from various features in the south-west corner of the site (61%, phases 2-5 but mainly Phase 5), and in the north-west, specifically the kiln cuts 474 and 488, (21% of major deposits), and the pit 137 (13%), both phase 4. A few fragments came from Phase 1 in this area. The kiln 314 and adjacent ditch 357 (phases 4-5) produced mostly indeterminate fragments.

Table 6 Major deposits

Location	Deposit	Frags	%	Weight	%	g/frag
NW	Kiln 488	61	21.33	8815	21.20	144.5
NW	Pit 137	33	11.54	5421	13.04	164.3
NW	Misc	7	2.45	260	0.63	37.1
mid	Kiln 314	13	4.55	418	1.01	32.2
mid	Ditch 357	11	3.85	1099	2.64	99.9
SW	Multi-features	161	56.29	25560	61.48	158.8
		286	100.00	41573	100.00	

The disturbed nature of the main kiln 488 and the structure 314 is typical of kilns discovered at Market Rasen, all leaving little or no evidence for the internal arrangements. Kiln 488 (see 00) had a wall of unfired clay blocks and stones, clay-lined, and the central disturbance 492 on the NW-SE section line may suggest the removal of a central feature on abandonment. A wide diagonal cutting 492 occurred in the north-west quadrant, opening wider in the south-west quadrant. **$$Depth?**. There was a gully occurred running immediately inside the clay block wall in the north-west quadrant.

Fragments from the kiln included a possible brick, some sub-rounded 'support' fragments (no 15), including one very large square-sectioned curved fragment with a chamfered end (no 16). The sub-rounded fragments were only found in this kiln, most similar fragments being squared. The pit 137 was more productive, containing two fragments of probable bricks, a fragment of a square fire-bar, a possible incomplete rectangular fire-bar, four fragments of square 'supports', one with a transverse hole (no 16), and circular plate fragments, c. 20-22cm diameter (nos 19-20). It also contained what may be the handle of a potter's tool, fig 00, no 23.

This excavation differs from other kiln excavations at Market Rasen in having produced a large quantity of kiln furniture, and given the disturbed nature of all excavated kilns, these fragments are the main evidence for the internal arrangements of the kilns. Other kilns are likely within the vicinity, and differing types may have occurred, giving rise of a varied assemblage of kiln furniture. All kilns appear to be semi-sunken, derived from the Late La Tène type and relied on re-usable temporary pre-fabricated kiln furnishings. These are summarised below.

Two types of kiln-bar, square- (nine complete sections) and rectangular-sectioned (ten complete sections), both slightly tapering, of which one rectangular-section example is complete (no 1), the sections varying from 40 x 25 to 95 x 40mm, (mostly *c.* 50-65 x 35mm) maximum length from single complete example *c.* 290mm. The square sections vary from 40 x 38 to 55 x 50mm; most square-sectioned bars have sections 55 x 50mm, also tapering. Several of both types of bar are slightly curved. A few fragments are sub-rounded. Illustrated nos: 1-7.

Two curved rectangular section bars, sections 70 x 40mm and 75 x 60mm, the maximum surviving length being 140mm, the wider ends flattened to form a foot. Illustrated nos 8-9.

Square ?supports include six complete sections, ranging from 110 x 100 to 90 x 80mm section, maximum surviving length 170mm. There are also smaller fragments, the smallest 70 x 65mm section, surviving length 135mm, no 11 which is curved, perhaps due to clay shrinkage but it may have had a different function. One of the fragments, no 14, had a hole pierced parallel to the top or bottom end, a feature also seen in a similar block from another excavation in the area in 1999, (Linwood Road, MRL99 excavations). Illustrated nos 10-15.

A very large square-sectioned ?support (no 16), 95mm square, also differed in being curved and sub-rounded in contrast to the squared other fragments, and this had a flattened chamfered end, and the longest length at 310mm. The nature of the chamfer could indicate that it formed part of an arch, resting on the chamfer, perhaps related to the flue. Slightly larger examples of this type occurred in other Market Rasen kilns, up to 125 x 120mm, to a maximum of 310mm surviving length. Illustrated no 16. A smaller sub-round bar fragment

no 10 is similar in having a flattened end, while two small rectangular bar ends, nos 6-7, also had flattened zones close to the ends, giving a good angle of rest.

Bricks, about 11 fragments, none with complete section, largest 90 x 50+mm, one complete length 160mm. Illustrated no 17.

Three fragmentary plates, varying in thickness 12-20mm, one domed, two roughly circular, 20-22cm diameter. The most interesting is no 18, with an estimated diameter of 24-25cm, a central hole, diameter 50mm, and a smoothed upper surface. Illustrated nos 18-20.

Two fragments of Late Iron Age loom-weights, also found in the Old Cattle Market (MRH04) kiln excavation, 60 to 80mm thick, one with a hole pierced parallel to the face through the apex, the other having evidence for a similar hole. Illustrated nos 21-22.

Possible fragment ?floor, large fragment with a rounded edge, unknown thickness, no complete edges, 125+ x 50+ x 130+mm. (not illustrated) From the kiln collapse 474.

Rectangular and square-sectioned firebars could have been used together or separately. The smaller section rectangular firebars, nos 6 and 7 are unusual with their angled ends, and may have had a special function.

It is possible that the square 'supports' were part of a central support on which the fire-bars rested, although arrangements at the flue is another possible location. The varying size of both 'supports' and fire-bars suggests fragments from a number of kilns. On present evidence, it is impossible to determine how these were arranged. The last firing of Kiln 2 at Newton-on-Trent was stacked on top of randomly placed cylindrical and square-section clay pedestals (Field & Palmer-Brown 1991, figs 12-14), the latter being of similar section but shorter than the longest fragment found at Market Rasen. Another Trent valley kiln at Lea also had square-sectioned block, 80mm square, 160mm high, and two cylindrical ?supports, 160-180mm diameter (Field & Palmer-Brown 1991, figs 4, 6). Both these kilns date to the 2nd century. A kiln at Thealby contained a 'number of small 'pillars' or stands (one apparently supporting a small pot), including a square section example 100mm thick, 200mm high, and a round-sectioned example, 90-100mm diameter by 150mm high (Dudley 1949, 213-214). The only pot identified from this kiln appears to be a 2nd century type, similar to those made at both Market Rasen and Roxby (Rigby & Stead 1976, 147, fig 69, no 7). These local examples are unusual and demonstrate the difficulties involved in determining the function of these blocks, but indicate similar technology in the area. The function of the 'bricks' is also unknown, and these could equally have been used to create a central pedestal. Given the use of sun-dried bricks and stone in the kiln walls, such materials may have been used to form central supports.

The two fragments of curving bars with defined feet, nos 8-9, are difficult to assess. While their sections lie within the range of the rectangular fire-bars, the defined bases set them apart. These appear similar to the banana-shaped 'props' found against the kiln wall at the Norton kilns (Corder 1950, 20, Pl Vb, 3, 5), and Swan has suggested that these may have been to keep the sides of the kiln clear to allow unimpeded circulation of hot air around the kiln edge (Swan 1984, 110).

The 'plate' fragments are all small and incomplete, nos 18-20. As with the other furniture, these have vegetal impressions, one on both surfaces, but do not appear to be part of the temporary dome. These seem likely to have been used as stacking aids, 'stackers' or 'setters' (Swan 1984, 40), either on the fire-bars, or higher up in the load. A thicker fragment of a possible rectangular plate pierced with holes came from another Market Rasen kiln excavation on the Old Cattle Market site (MRH04), which resembles the plates found in the Elstow kiln (Swan 1984, 65, pl. 22, pl. 22), used for stacking above fire-bars, as suggested for the late La Tène-derived kiln (Swan 1984, fig VIII), or the thicker pedestal fragment at Hardwick Park, Wellingborough in the Upper Nene Valley (Woods 1974, 274, fig 5, B). No parallels have been found for the circular plate fragment with central hole, no 18. The Old Cattle Market (MRH04) site also produced another type of spacer closely similar to examples from the Crambeck kilns (Corder 1928, fig 18).

The triangular loom-weights are of the same clay and firing as the rest of the kiln furniture. These occur on a number of kiln sites (Newton-on-Trent, Field & Palmer-Brown 1991, fig 14, no 4, found in both kilns; Dragonby, Swan 1984, 465; Elsdon & Barford 1996, 327, fig 13.3, 7, from kiln 3, Hadrianic, apparently re-used as kiln flooring; Rossington Bridge, Buckland et al 2001, 34, fig 32 from the stokehole of kiln 4; Longthorpe, Wild 1987, 113, fig 30, 171-4; Derby, Dool 1985, 217, fig 94, 59; Wherstead, Suffolk, Gill et al, 2001, 26, fig 16, where the fragments are considered likely to have been made in the kilns; West Stow, West 1990, 68, fig 51; 1st century kilns at Tottenham Deer Park, Great Bedwyn, Wiltshire, Swan 1984, 659; Old Winteringham, Stead 1976, 227, fig 123, 211). While Iron Age occupation occurs on some of these sites, the fairly frequent occurrence of these objects suggest they had some function, perhaps secondary to their normal use, relating to kilns, and the fragments from both this excavation and the Old Cattle Market (MRH04) excavation are identical to the rest of the kiln furniture.

The fragment of a possible tool handle came from Pit 137. This is in normal fairly fine pottery fabric, and is included with the kiln material mainly on the basis of the small 20mm diameter of the shaft, and hole for a cord. It has the head of either a bird or snake, pierced through the eye. Tools are very rare. A ceramic handle was used for a tool at Cantley but of an entirely different design (Buckland et al 1980, 152, fig 5), although it is interesting that it was decorated with a stylised swan motif. The question of tools used for stamping Parisian vessels remains unresearched (Elsdon 1982, 30). While diameter of the surviving shaft is 20mm, this may not be the diameter of the business end, which could be smaller. Most Parisian ware ring-stamps range from under 5mm to over 10mm diameter, while there is the occasional stamp up to 20mm, as a fine rosette stamp, Elsdon 1982, fig 7, no 102, from Owmby; another example from Lincoln (East Gate) clearly showing the edge of the stamp. The stamp used for samian moulds, the poinçon, was mostly carved from clay, and it is possible that similar stamps were used for Parisian decoration. Whether this is the handle of one such stamp is entirely speculation.

CONCLUSIONS

The importance of the finds from this excavation lies in the consistently early date of the pottery, and the quantity of kiln fragments, not found on the other excavations at Market Rasen. The latter includes a rare find, the handle of a possible potter's tool. This is the earliest group excavated at Market Rasen, much of the pottery belonging to the early- to mid-2nd century. Other excavated kilns are similarly fragmentary and, as with their accompanying assemblages, all differ. The pottery from the Cattle Market site (MRH04/98) also has an early emphasis but includes more later vessels, while the assemblage from the housing development west of Linwood Road (MRL99) south of the present site, is of very mixed dates, running to the 4th century. What the known Market Rasen kilns have in common is that they appear to be semi-sunken, used kiln bars and with indeterminate central supports, all kiln furniture pre-fabricated and apparently portable, and in this they resemble Late La Tène-derived kilns. They fit into a distribution pattern defined by Swan (1984, 63) running from Bedfordshire to the middle Trent Valley. Given the continued production into the later Roman period, differing kiln types are to be expected, as seen at Rossington Bridge and other long-lived sites, and even the kiln fragments found within kiln structures could have come from other kilns, let alone kiln fragments found in rubbish deposits across the site.

The Market Rasen industry is the earliest in this area of Lincolnshire, and pre-dates the nearby kilns at Linwood (Swan 1984, 455-6), about which little is still known, but where parallel blocks of limestone were used as the central support. The proximity of these kilns suggest they are related but, as with the evidence for kilns at Buslingthorpe (Swan 1984, 437), only 4-5 km away, it is unclear whether these represent a later spread of the industry, or dispersed potteries. Similar pottery types characteristic of north Lincolnshire are made in a number of Lincolnshire kilns, including North Hykeham, Roxby, Dragonby, Lea, Newton-on-Trent, but what is known of the kiln structures suggests these kilns differ.

The Market Rasen kilns appear to differ from the varied kilns at Cantley of similar date (Annable 1960), although there are similarities, and until the problem of the central support at Market Rasen is solved, the possibility of parallels remain. Equally there are connections with the kilns at Rossington Bridge, in addition to the production of Parisian wares at both kiln areas (Buckland et al, 2001). It is, however, clear that the series of kilns in Yorkshire, both in the Doncaster area and north of the

Humber, have strong connections with north Lincolnshire kilns both in structure and in the derivation of their pottery types (Swan 2002, 57). The occurrence of a spacer closely similar to those found at Crambeck (Corder 1928, fig 18) at the kiln site (Old Cattle Market site, MRH04) may link with new evidence from Hutton Hill for an earlier phase of that industry (Swan & Evans forthcoming).

CATALOGUE KILN FURNITURE

1 Complete rectangular section fire-bar, tapered, slightly curved. Vegetal impressions. Section *c.* 55 x 45; 45 x 35mm; length 290mm. Phase 5 Ditch 088 D5
2 Large part rectangular section fire-bar, tapered end. Vegetal impressions. Section *c.* 65 x 35; 50 x 35mm; length 240mm+. Phase 5 Ditch 088 D8
3 End squared tapered fire-bar; light grey-brown, sharply angled. Flint inclusions. Section *c.* 45 x 45; 40 x 38mm; length 195mm+. Phase 5 Ditch 088 D6
4 End squared tapered fire-bar. Vegetal impressions. Section *c.* 55 x 55; 40 x 45mm; length 140mm+. Phase 5 Hollow 141 D10
5 Sub-square fire-bar end, tapering and slightly curved. Section *c.* 40 x 38; 25 x 35mm; length 100mm+. Phase 1 Ditch 040 D12
6 Curving rectangular bar, light grey-brown, angle of rest on outer side, the base rounded and slightly indented. Section *c.* 50 x 35; 45 x 20mm; length 105mm+. Phase 5 Pit 141 D22
7 Curving rectangular bar, finer clay. Angle of rest equal on end or outer side, cf. no 22. Section *c.* 40 x 25;35 x 25mm; length 55mm+. Phase 5 Pit 141 D23
8 Prop? Roughly rectangular-section, with expanded foot. Vegetal impressions. Section *c.* 70 x 40mm; length 140mm+. Phase 5 Ditch 088 D3
9 Prop? Rough curving rectangular-section, with expanded foot. Vegetal impressions. Section *c.* 75 x 60mm; length 120mm+. Phase 5 Ditch 088 D4
10 Irregular sub-rounded bar, tapering section, with a flat chamfered end. Illustrated angle of rest. Roughly moulded. Light grey-brown. Section *c.* 60 x 55; 50 x 40mm; length 160mm+. Phase 5 Pit 141 D1
11 Base squared ?support, smooth finer clay, slightly curving. ?Due to clay shrinkage. Section *c.* 70 x 60; 65 x 60mm; length 135mm+. Phase 2 Pit 262 D15
12 Base squared ?support. Vegetal impressions. Similar no14. Section *c.* 110 x 100;100 x 90mm; length 170mm+. Phase 5 Gully 231 D13
13 Base squared ?support, slightly sunken sides. Vegetal impressions. Similar no13. Section *c.* 95 x 85; 85 x 85mm; length 105mm+. Phase 2 Ditch 228 D14
14 Corner of a squared ?support with a transverse hole parallel to the ?top. Section 80+ x 60+mm; length 100mm+. Phase 4 Pit 137 D16
15 Irregular section ?support, indent impression on side near base. Vegetal impressions. Section *c.* 85 x 80mm; length 140mm+. Phase 4 Kiln upper fill 474 D20
16 Large curved square-sectioned block, roughly moulded, ended flat on one surface. Section *c.* 95mm sq; length 310mm+. Phase 4 Kiln upper fill 474 D17
17 Brick, complete length; unknown thickness. Roughly moulded; smoothed surfaces. Section *c.* 90 x 65+mm; length 187mm. Phase 5 Pit 141 D21
18 Roughly circular plate, smoothed upper surface, rough underside. Inner aperture c. 50mm diameter suggests an outer diameter *c.* 240-250mm; >20mm thick. Outer edge finished; inner aperture grooved horizontally. Two hollows on upper surface. Spacer? Phase 5 Ditch 088 D2
19 Circular plate, rising towards the centre; smoothed upper surface, rough below. Diameter *c.* 240mm. Spacer? Phase 4 Pit 137 D26A
20 Roughly circular plate, ?rising towards centre, vegetal marks both surfaces. Diameter *c.* 200-220mm. Spacer? Phase 4 Pit 137 D26
21 Upper part triangular loom-weight, with transverse hole through apex which has a grooved top. 80mm thick. Phase 5 Occup. layer cxt 076. D19
22 Lower part triangular loom-weight, most of apex missing with part of transverse hole. 60mm thick. Phase 5 Ditch 088 D7
23 Handle of a tool? Fairly fine light grey standard potting clay, round-section, with a pierced end resembling the head of a bird or snake? Shaft 20mm diameter. 85mm surviving length. Phase 4 Pit 137 D18

FABRIC DEFINITION

Publication of *The National Roman Fabric Reference Collection*, abbreviated NRFRC (Tomber and Dore 1998), obviate the need to describe the major imported and widely traded Romano-British wares in detail.

CR	Cream, miscellaneous cream wares. Sherds attributed to a fabric group rather than a discrete fabric, usually from flagons or closed forms.
FCLAY	Fragments of fired clay, sometimes daub but more likely to be from kiln structure. Fragments and flakes, oxidized and reduced, some very burnt.
GFIN	Grey fine. This coding is used for reduced fabrics lying between the common quartz-gritted GREY used for most jars and bowls, and the very fine fabrics used for London-type ware and Parisian ware. Some Parisian ware is coarser and featureless body sherds fit into this coding.
GREY	Grey, undifferentiated quartz-gritted grey fabrics, hard wares with sparse to common sub-rounded quartz inclusions, and sparse feldspar, fine-grained sandstone fragments and chert. The grains include both well-rounded and sub-rounded examples and range from c.0.2mm to c.1.0mm. See Vince forthcoming.
GRFF	Grey, fairly fine fabric. This code covers fabrics intermediate between the common grey wares with sparse to common quartz and fine grey wares (GFIN), which itself is coarser than the very fine fabrics used for Parisian and 'London' wares. Often used for finer vessels for the table, particularly beakers.
GRNK	Grey wares clearly not produced on the kiln site. Hard, quartz-gritted, sparse to common sub-rounded quartz.
GROG	Grog-tempered. Miscellaneous unsourced grog-tempered fabrics. Usually dark grey fabric with light grey grog inclusions, often with pimply surfaces.
GRRO	Grey, quartz-gritted fabric, with fairly abundant rounded quartz inclusions, particularly visible on the surface. These grains range from 0.5 to 1.5mm across. The fabric is not dissimilar to a late Roman grey fabric in Lincoln (Lincoln code LCOA). See Vince forthcoming.
GRSA	Grey, with common to abundant quartz sand inclusions.
MORT	Mortaria, unknown source. A single flaked rim in a dark grey fabric without surviving trituration grit, possibly of local origin.
OX	Oxidized, miscellaneous oxidized wares. This coding comprises all miscellaneous oxidized sherds, usually in varying red-brown shades and degrees of grittiness, for which no significant fabric groupings are evident. Both open and closed forms occur. Red-brown fabrics, some with grey core, common quartz, occasional mica flakes on some sherds. Most appear to be mis-fired or re-fired grey sherds.
OXL	Oxidized lighter red-brown. Fabrics in light cream-brown shades, usually relatively fine-textured, often used for flagons.
OXSA	Oxidized red-brown fabrics with common to abundant quartz inclusions.
PART	Parisian type ware. A very fine silty grey fabric, often with a sandwich fracture showing a lighter cortex, usually with a fine black of grey polished external surface. The fabric colour can range from light grey, grey-brown to dark grey. Fine grained with smooth fracture, small quartz grains occurring usually very sparsely but occasionally more frequently. Rare clay pellets of the same colour as the matrix also occur. See Vince forthcoming. Parisan ware is decorated with stamps or rouletting, and can be dated to the 2nd century (Elsdon 1982), although the fabric continues to be used in the later Roman period for different vessel forms (Darling 1984, 77-80). Known to have been made at Market Rasen, Lincs (Darling, forthcoming). **NRFRC: LMR FR**, and at the Rossington Bridge Doncaster kilns (Buckland et al 2001) **NRFRC: ROS FR**. Body sherds can be confused with London Ware, a very similar fabric, but used for different forms with differing decoration. This ware is common in London, but is also made in the Nene Valley (Perrin 1990).
PRO	Post-Roman sherds
SAMCG	Samian Central Gaul, from Lezoux. **NRFRC : LEZ SA**
SAMLM	Samian Central Gaul, from Les Martres de Veyre. **NRFRC: LMV SA**
SAMSG	Samian South Gaulish, from La Graufesenque. **NRFRC: LGF SA**
SHEL	Shell-gritted, miscellaneous shell-gritted ware.
VESIC	Vesicular, vesicular sherds, due to loss of inclusions. Mostly dark grey/brown fabrics, with oxidized surfaces, and ill-sorted rounded quartz sand and abundant angular voids, almost certainly indicating the leaching of shell particles. Sparse clay pellets are also present. Likely to be of local origin (Vince forthcoming).

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APPENDIX 1 FABRICS BY PHASE

EVES	Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6-8	Unphased	Total
GREY	511	146	428	3957	2952	124	354	8472
GRFF	20	-	39	160	265	-	10	494
GFIN	-	-	-	-	70	-	-	70
PART	-	-	-	15	-	-	-	15
OX	24	22	-	101	61	-	7	215
MOLO	-	-	-	17	-	-	-	17
MORT	-	-	-	5	-	-	-	5
CR	-	-	100	-	100	-	-	200
GRNK	-	-	-	-	-	-	-	0
GROG	10	-	-	210	59	-	9	288
GRRO	-	-	-	9	101	49	-	159
GRSA	-	-	-	32	-	-	-	32
MOSC	-	-	-	43	5	-	-	48
OXL	-	-	-	-	-	-	-	0
OXRO	-	-	-	-	-	-	-	0
OXSA	-	-	-	-	-	-	-	0
PRO	-	-	-	-	-	-	-	0
SAMCG	-	-	-	-	-	5	-	5
SAMLM	-	-	-	7	-	3	-	10
SAMSG	-	-	-	5	-	-	-	5
SHEL	-	-	-	-	-	-	-	0
VESIC	-	25	-	-	-	-	-	25
Total	565	193	567	4561	3613	181	380	10060

Sherds	Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6-8	Unphased	Total
GREY	123	81	226	1122	1437	86	134	3209
GRFF	2	-	3	6	17	-	1	29
GFIN	-	0	2	-	3	-	1	6
PART	3	-	-	5	-	1	-	9
OX	4	10	-	14	8	-	1	37
MOLO	-	-	-	1	-	-	-	1
MORT	-	-	-	1	-	-	-	1
FCLAY	1	-	-	17	40	-	1	59
CR	-	1	1	-	2	-	-	4
GRNK	-	2	-	-	1	-	-	3
GROG	5	2	-	64	25	2	2	100
GRRO	-	-	2	7	34	7	-	50
GRSA	-	-	1	7	-	-	-	8
MOSC	1	-	-	5	1	-	-	7
OXL	-	1	-	-	-	-	-	1
OXRO	-	-	-	-	1	-	-	1
OXSA	-	-	-	2	-	-	-	2
PRO	-	-	-	-	-	1	-	1
SAMCG	-	-	-	-	1	1	-	2
SAMLM	-	-	-	2	-	1	-	3
SAMSG	-	-	-	3	4	-	-	7
SHEL	-	-	-	2	-	-	-	2
VESIC	-	1	-	7	5	1	-	14
Total	139	98	235	1265	1579	100	140	3556

Weight	Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6-8	Unphased	Total
GREY	2964	1688	6390	42783	23257	1455	2385	80922
GRFF	53	-	175	755	636	-	36	1655
GFIN	-	-	135	-	37	-	10	182
PART	51	-	-	30	-	3	-	84
OX	61	261	-	727	155	-	46	1250
MOLO	-	-	-	266	-	-	-	266
MORT	-	-	-	63	-	-	-	63
FCLAY	32	-	-	706	1484	-	28	2250
CR	-	41	89	-	127	-	-	257
GRNK	-	85	-	-	52	-	-	137
GROG	439	76	-	8596	2345	68	37	11561
GRRO	-	-	34	266	1782	297	-	2379
GRSA	-	-	56	188	-	-	-	244
MOSC	115	-	-	956	91	-	-	1162
OXL	-	10	-	-	-	-	-	10
OXRO	-	-	-	-	58	-	-	58
OXSA	-	-	-	47	-	-	-	47
PRO	-	-	-	-	-	12	-	12
SAMCG	-	-	-	-	4	10	-	14
SAMLM	-	-	-	50	-	10	-	60
SAMSG	-	-	-	66	12	-	-	78
SHEL	-	-	-	73	-	-	-	73
VESIC	-	89	-	153	122	11	-	375
Total	3715	2250	6879	55725	30162	1866	2542	103139

APPENDIX 2

Kiln products Vessel types by phase, EVEs and weight

Phase:		Ph 1		Ph 2		Ph 3		Ph 4		Ph 5		Ph6-8		Unph		Total	
Vessel Type	Code	VE	g.	VE	g.	Ve	g.	VE	g.	VE	g.	VE	g.	VE	g.	VE	g.
Everted rim	BKEV	35	258	-	-	7	14	15	8	113	56	5	7	-	-	175	343
Folded curve rim	BKFOCUR	-	-	-	-	-	-	39	179	-	-	-	-	-	-	39	179
Poppy Head	BKPH	-	-	-	-	-	-	15	6	-	-	-	-	-	-	15	6
Carinated flat rim	B318	50	359	-	-	33	93	10	8	106	361	-	-	-	-	199	821
Inturned flange	B321	-	-	-	-	-	-	10	30	-	-	-	-	-	-	10	30
Squared carination	B334	95	442	16	27	10	7	528	1722	433	590	-	-	-	-	1082	2788
Carinated	BCAR	-	-	-	-	-	-	17	28	-	-	-	-	-	-	17	28
Curved rim	BCUR	-	-	-	-	-	-	33	73	-	-	-	-	-	-	33	73
Everted rim	BEV	-	-	-	-	-	-	53	275	37	178	-	-	-	-	90	453
Flat rim	BFL	21	47	12	20	14	18	172	370	10	18	4	27	15	32	248	532
Flat rim beaded	BFLBD	-	-	-	-	-	-	15	62	-	-	-	-	-	-	15	62
Inturned bead & flange	BIBF	-	-	-	-	-	-	-	-	-	-	8	44	-	-	8	44
Native type	BNAT	6	31	-	-	-	-	13	145	28	138	-	-	7	46	54	360
Necked	BNK	17	62	-	-	30	71	174	843	11	24	-	-	9	31	241	1031
No neck	BNNK	-	-	-	-	15	80	31	356	17	56	-	-	-	-	63	492
Triangular rim	BTR	-	-	-	-	-	-	-	-	6	22	-	-	-	-	6	22
Wide mouth	BWM	-	-	-	-	15	156	76	473	111	601	-	-	9	41	211	1271
Everted rim	BDEV	-	-	-	-	-	-	10	30	-	-	-	-	-	-	10	30
Reeded	BDREED	-	-	-	-	-	-	-	-	10	23	-	-	-	-	10	23
Imit Dr 36	D36	-	-	-	-	14	86	5	7	-	-	-	-	-	-	19	93
Imit Cu 15	DCU15	20	53	-	-	-	-	-	-	-	-	-	-	-	-	20	53
Curved rim	DCUR	-	-	-	-	-	-	-	-	20	54	-	-	-	-	20	54
Flat rim	DFL	-	-	-	-	20	119	116	531	-	-	-	-	-	-	136	650
Plain rim	DPR	-	-	-	-	-	-	-	-	5	8	-	-	-	-	5	8
Triangular rim	DTR	-	-	-	-	-	-	27	56	41	90	-	-	7	23	75	169
Plate or lid	P/L	-	-	-	-	-	-	-	-	10	23	-	-	-	-	10	23
Cooking pot	CP	-	-	-	-	-	-	99	231	-	-	-	-	-	-	99	231
Cooking pot native	CPN	-	-	-	-	-	-	-	-	10	28	-	-	-	-	10	28
Jar	J	-	-	-	-	-	-	6	7	-	-	-	-	-	-	6	7
Lid-seated	J105	126	317	36	97	20	75	305	1809	83	183	13	43	88	229	671	2753
Curved rim	JCUR	-	-	6	8	50	62	248	356	182	261	17	33	48	89	551	809
Cylindrical	JCYL	-	-	-	-	-	-	36	1203	-	-	-	-	-	-	36	1203
Everted rim	JEV	185	287	98	164	234	384	1386	4852	1725	2769	38	69	122	140	3788	8665
Everted rim heavy	JEVH	-	-	-	-	-	-	87	278	42	137	-	-	-	-	129	415
Everted rim large	JEVL	-	-	-	-	-	-	-	-	10	54	-	-	8	26	18	80
Handled	JHA	-	-	-	-	-	-	-	-	-	-	-	-	18	64	18	64
Lid-seated	JLS	-	-	-	-	-	-	25	49	5	9	5	10	-	-	35	68
Moulded rim	JMR	-	-	-	-	-	-	-	-	-	-	-	-	10	36	10	36
Round rim	JRR	-	-	-	-	-	-	20	53	-	-	-	-	-	-	20	53
Squared rim	JSQ	-	-	-	-	-	-	13	23	-	-	-	-	-	-	13	23
Triangular rim	JTR	-	-	-	-	-	-	32	61	9	21	-	-	-	-	41	82
Large	JL	-	-	-	-	-	-	-	-	7	34	-	-	-	-	7	34
Narrow neck	JNN	-	-	-	-	-	-	341	1805	197	371	27	36	15	17	580	2229
Everted rim	JBKEV	-	-	-	-	-	-	-	-	20	15	-	-	-	-	20	15
-	JB	-	-	-	-	-	-	16	17	24	121	-	-	-	-	40	138
Curved rim	JBCUR	-	-	-	-	-	-	37	119	5	14	7	11	-	-	49	144
Everted rim	JBEV	-	-	-	-	5	12	73	146	13	50	-	-	-	-	91	208
No neck	JBNK	-	-	-	-	-	-	-	-	10	27	-	-	-	-	10	27
Lid	L	-	-	-	-	-	-	144	678	10	16	-	-	15	30	169	724
Squared rim	L107	-	-	-	-	-	-	6	7	26	94	-	-	-	-	32	101
Bifid rim	LBIF	-	-	-	-	-	-	-	-	12	68	-	-	-	-	12	68
	Totals	555	1856	168	316	467	1177	4233	16896	3348	6514	124	280	371	804	9266	27843

Prefix expansion: BK Beaker; B Bowl; BD Bowl or dish; D Dish; J Jar; JB Jar or bowl.

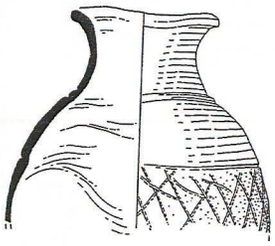
APPENDIX 3

Summary of quantities and dating by phase and feature.

Ph	F#	Deposit	Cut	Cxt	EVEs	Shs	Wt	Date	Comments
-		U/S	?	495	0	8		60ROM	Abr;scrappy
-		Gully	042	041	294	68		1408EM2+	Abr; scrappy; links >038;039
-		Natural	101	101	0	3		682C	
-		Beam slot	284	283	0	1		6ROM	
-		Unstrat Tr 1		098	53	31		490ML2?	
-		Unstrat		144	33	30		5162C?	
1		Gully	034	033	22	9		328EM2	
1	16	Ditch	040	038	153	42		637EM2	Abr; scrappy; link >041 unphased
1	16	Ditch	040	039	25	11		136EM2?	Abr; link >041 unphased
1		Gully	150	149	0	3		5ROM	
1		Ditch	184	183	65	16		341EM2	
1	16	Ditch	186	185	0	1		13ROM	
1		Gully	188	187	0	4		77EM2?	
1		Gully	193	192	0	3		322C	
1	16	Ditch	200	202	15	1		43EM2	
1		Ditch	206	205	95	1		442EM2	
1	16	Ditch	318	319	47	5		95EM2	Jar sooted in use?
1		Ditch	329	328	80	11		951EM2	
1	16	Ditch	478	479	63	32		615M2?	Abr;scrappy;Parisian bs
2	14	Ditch	053	052	26	11		241EM2	
2	14	Gully	100	099	0	4		96EM2?	
2	14	Ditch	131	132	6	6		48EM2	
2	14	Ditch	131	135	0	1		7ROM	
2	14	Ditch	134	133	27	3		137EM2	
2	15	Ditch	222	221	10	2		59EM2	Vabr;scrappy
2		Beam slot	226	225	0	2		46ROM	
2		Ditch	228	227	0	7		230ROM	
2	14	Ditch	260	261	12	13		282EM2	
2		Pit	262	263	70	10		539EM2?	Link >265
2		Pit	262	264	20	8		170EM2	
2		Pit	262	265	0	4		83ROM	Link >263
2		Pit	292	229	22	24		280M2?	String base
2	14	Ditch	375	376	0	3		322C	
3		Pit	130	129	175	67		710EM2	Flagon & jars only
3		Posthole	170	169	0	1		7EM2	
3		Beam slot	212	211	7	6		37EM2?	
3	18	Deposit	224	223	0	8		353EM2	
3	12	Ditch	253	256	0	4		115EM2	
3	12	Ditch	253	257	0	1		18EM2	
3		Pit	254	258	98	8		316M2?	
3		Gully	268	267	0	3		82ROM	
3	12	Ditch	273	272	10	10		368EM2	
3		Pit	282	271	36	10		308EM2	?Intrusive BWM x Ditch 275
3	18	Gully	286	285	0	1		18ROM	
3		Posthole	313	312	0	1		6ROM	
3		Beam slot	317	316	5	5		36EM2?	
3		Pit	335	333	36	6		493EM2	
3		Pit fill	346	337	0	6		210EM2?	
3	13	Beam slot	353	352	4	4		31EM2?	
3		Deposit	371	372	0	1		21ROM	
3	11	Ditch	384	403	15	7		171EM2	
3	12	Ditch	386	383	15	16		1335EM2?	Most bss
3	12	Ditch	386	385	81	29		1087EM2	
3	12	Ditch	386	397	0	5		151EM2?	
3	11	Ditch	388	387	12	4		79EM2?	
3		Ditch	390	389	42	7		364M2?	String base
3		Posthole	401	400	0	1		33EM2	
3		Gully	418	417	11	8		237M2?	Link >425; String base
3		Pit	422	421	0	1		60ROM	
3		Pit occup	459	425	20	5		96EM2	Link >417
3		Pit	459	458	0	10		137EM2	
4		Gully	181	181	0	12		140ROM	
4		Posthole	198	198	15	6		140EM2?	
4		Pit	086	083	0	5		136ROM	
4		Pit	086	084	0	3		23ROM	
4		Pit	086	085	17	2		74EM2	
4		Pit	086	089	29	2		204EM2	Link >091
4		Pit	108	091	0	15		722M2?	Only bss; link >089
4		Pit	137	136	1135	213		9780ML2?	Strange grp;links >173;179
4		Pit cut146=137	137	145	145	21		1544EM3	Comp jar & later ?intrusive shs
4		Pit	137	173	760	63		6286EM2	Strange grp; links >136
4		Pit	137	179	26	20		687M2?	Link >136 Possible intrusive BWM

4		Gully	152	151	64	38	481EM2	
4		Pit	178	176	63	17	262L2?	Abr
4		Pit?	237	236	338	140	7997ML2	
4		Pit	237	287	33	7	170ML2?	Link >291
4		Pit	237	291	1272	263	18941M3?	Mixed dates; link >287; BWMs
4		Finds	237;297	311	191	57	2477EM2?	
4		Gully	277	276	7	2	56M2?	
4		Ditch	296	293	0	10	129L2+	
4		Ditch	296	294	0	5	1692C	
4		Ditch	296	295	0	2	50ROM	
4	10	Ditch	299	289	32	7	143ML2?	Link >298
4	10	Ditch	299	298	15	8	1022C	Link >289
4	10	Ditch	299	300	0	1	51ROM	
4		Kiln?	314	315	11	3	15ROM	
4		Kiln fill	314	332	73	35	883EM2	
4		Kiln	314	340	0	3	38ROM	
4		Kiln flue	314	341	0	1	4ROM	
4		Kiln	314	370	42	14	290EM2	
4		Ditch	331	330	0	1	13ROM	
4		Kiln	474	475	59	42	582M2?	Abr; scrappy
4	09	Kiln collapse	488	476	20	16	415EM2	
4	09	Kiln	488	477	91	66	809EM2	
4		Ditch	488	480	5	14	346M3?	Large thick BWM frag
4	09	Gully	488	481	50	98	905EM2	
4	09	Kiln	488	491	0	2	15ROM	
4	09	Kiln	488	493	68	51	646EM2	
5		Hollow	141	141	29	15	165EM2?	
5	05	Ditch	413	412	17	6	224L2?	
5		Gully	006	005	0	3	106ROM	
5		Ditch	010	009	8	2	652C	
5		Ditch	011	019	0	3	402C	
5	09	Gully	026	025	0	7	118ROM	
5	09	Ditch	048	047	0	2	30ROM	
5		Ditch	069	068	6	1	313C	
5		Pit	073	072	0	3	23ROM	
5		Ditch	088	087	430	74	2197EM2	Link >088
5		Gully	088	182	72	22	492EM2	
5		Ditch	097	096	0	1	112ROM	
5	05	Ditch	122	121	86	40	1866M2+?	
5		Hollow	141	140	404	298	3678M2-?M3	Abr;scrappy; BWM=date
5		Hollow	141	142	0	11	107EM2?	Only bss
5		Hearth	141	143	196	213	1830M-?L2	Abr;scrappy;?L2 BWM
5		Kiln Finds	141	171	34	69	393M-?L2	
5		Pit	141	194	1006	499	9023EM2	Abr;scrappy
5	05	Ditch	163	161	0	3	115ROM	
5	05	Ditch	163	162	100	4	212ML2	
5	05	Ditch	163	168	0	4	73ROM	
5	08	Beam slot	216	215	43	5	276ML2	
5	06	Ditch	220	219	5	5	1912C	No good dating
5		Gully	231	230	41	11	378EM2	
5		Gully	233	232	0	2	7ROM	
5		Ditch	275	274	299	44	1697L2E3?	BWM=date
5	08	Ditch	281	278	0	10	68ROM	V.abr;scrappy
5	08	Ditch	281	280	0	2	33ROM	
5		Ditch Occup	297	210	115	39	625ML2?	Abr
5		Ditch	297	269	6	5	1503C?	BWM=date
5		Ditch Occup	321	270	31	1	62EM2	
5		Ditch	357	356	61	16	1249ML2?	
5		Ditch	359	358	10	2	172C?	
5		Ditch	359	381	0	2	20ROM	
5		Ditch	408	411	0	1	462C	
5		Ditch	410	409	100	14	616EM3?	
5	06	Ditch	420	419	26	2	982C	
5	05	Ditch	434	431	40	6	3242-?3C	Poss BWM
5	06	Ditch	455	460	36	1	169EM3?	Single BWM rim
5		Occup layer	See 270	076	347	87	2211EM2	Many rustic jars
5		Ditch		088	0	6	89EM2?	Link >087
5		Dump?		209	65	37	930EM2	
6		Gully	061	060	19	1	332C	Samian only
6		Gully	061	061	3	1	10L1	
6		Ditch	303	304	0	1	133ROM	
6		Furrow	361	360	15	2	452C	
6	04	Ditch	406	405	0	1	4ROM	
7		Furrow	007	008	0	2	16ROM	
7	02	Gully	055	054	0	1	4ROM	
7		Furrow	250	249	5	11	168ROM	

7	01	Furrow	363	362	0	3	172C
7		Ditch	424	423	13	15	1812C?
7		Furrow	472	469	7	5	1302C
8		Fill	030	029	0	1	12POST-RO
8		Gully	031	032	0	2	6ROM
8		Ditch	037	036	0	1	792C
8		Ditch	082	081	0	3	29ROM
8		Posthole	128	127	0	11	3672C
8		Furrow	190	191	45	28	3512C
8		Posthole	307	308	0	1	15EM2
8		Ditch	416	415	0	1	252C
8		Topsoil		012	21	3	87M4+
8		Medieval ditch		077	53	6	154ML2?
					10060	3556	103139



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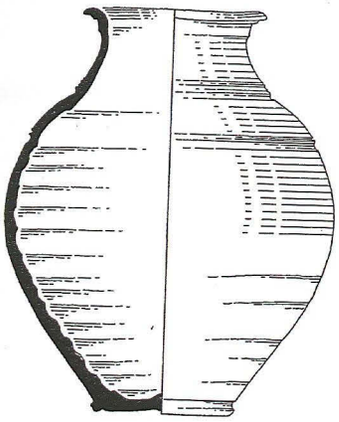

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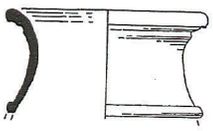

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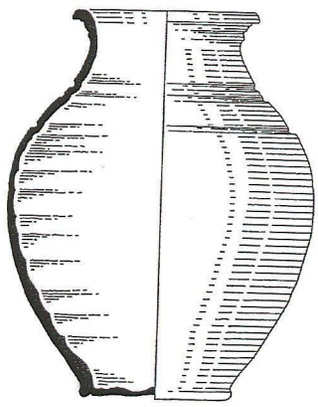

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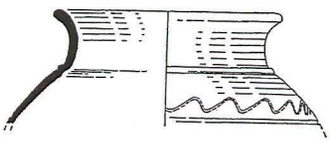

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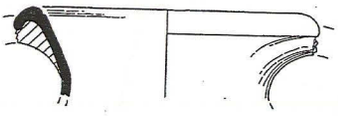

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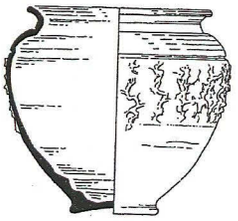

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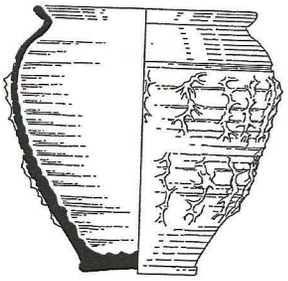

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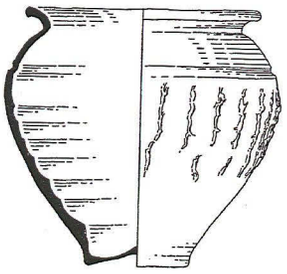

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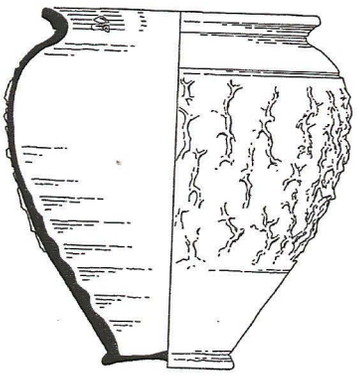

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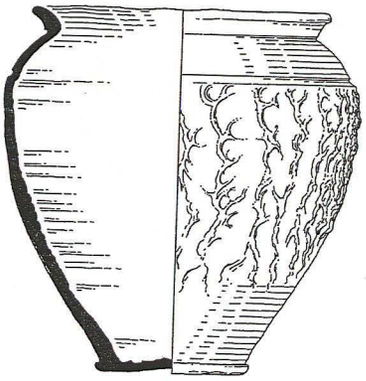

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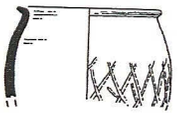

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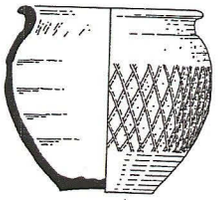

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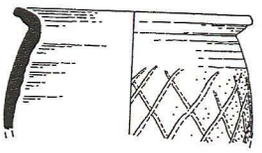

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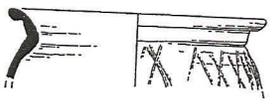

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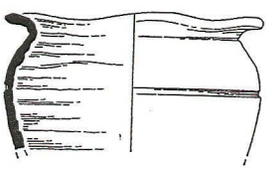

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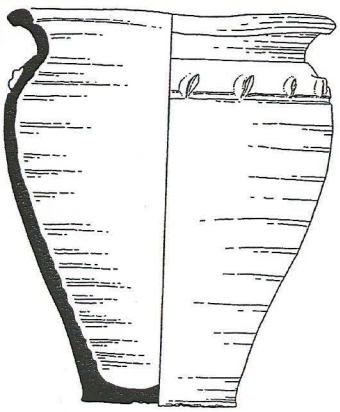

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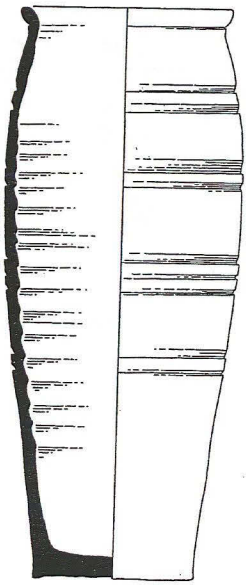

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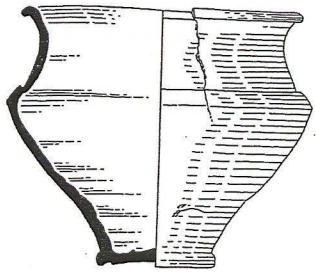

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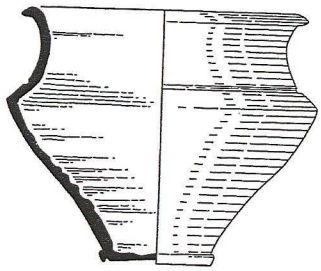

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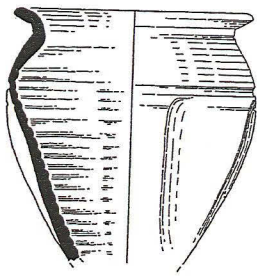

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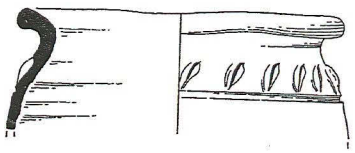

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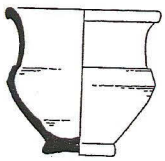

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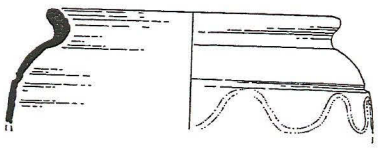

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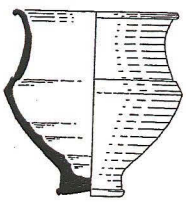

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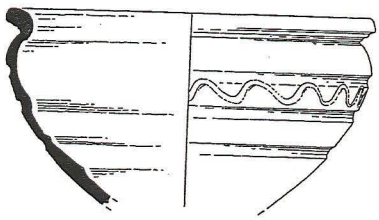

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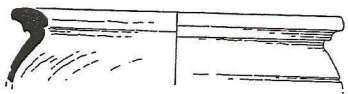

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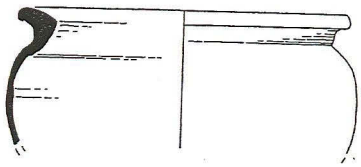

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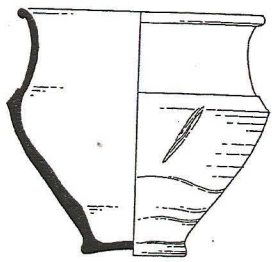

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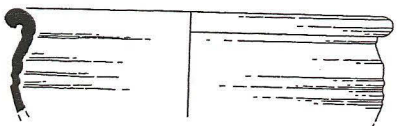

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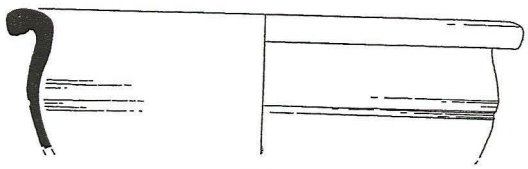

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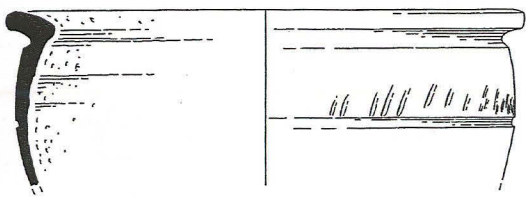

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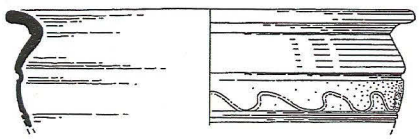

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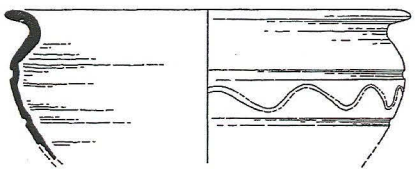

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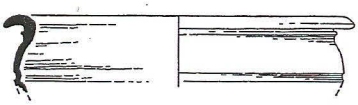

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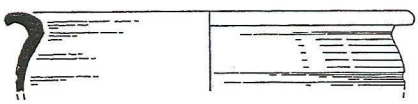

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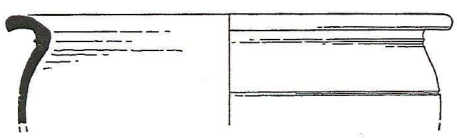

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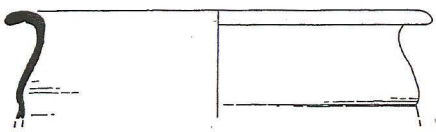

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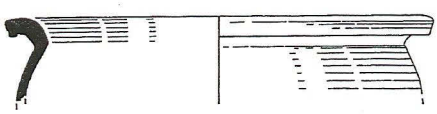

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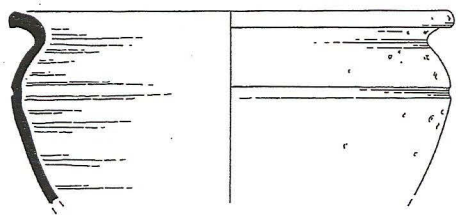

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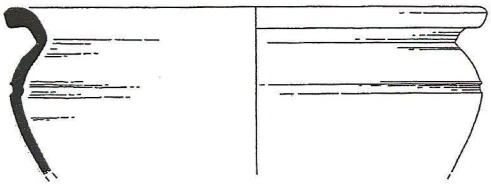

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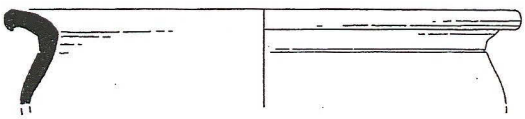

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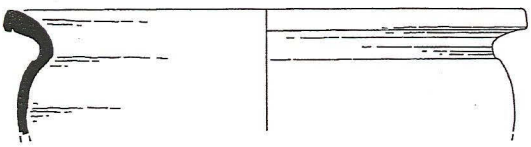

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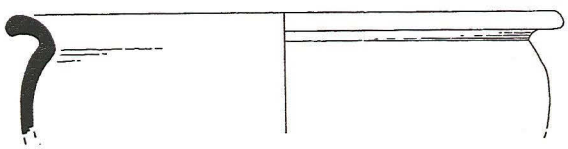

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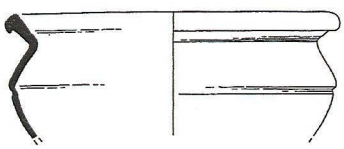

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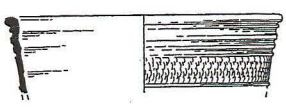

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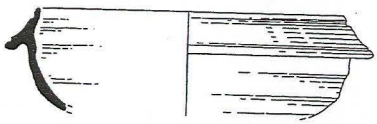

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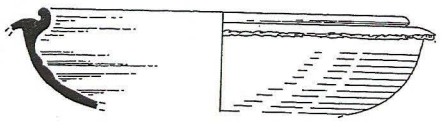

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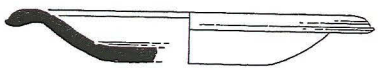

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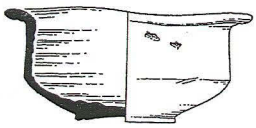

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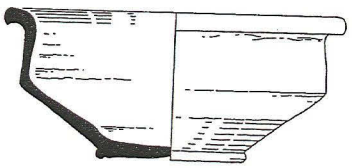

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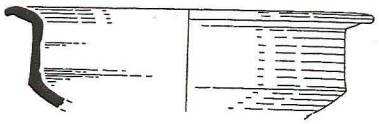

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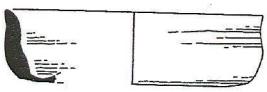

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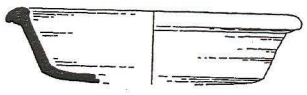

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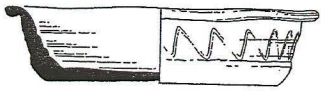

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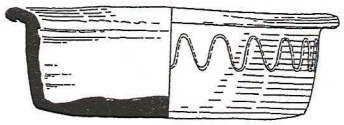

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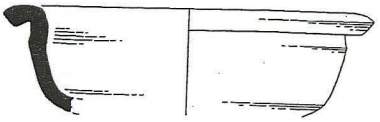

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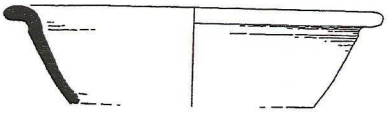

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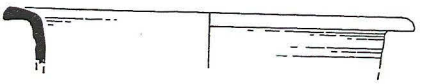

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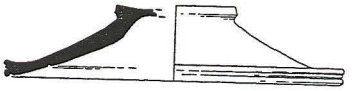

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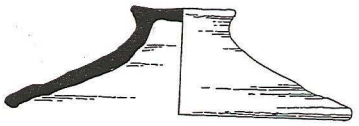

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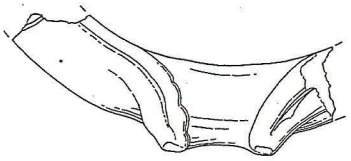

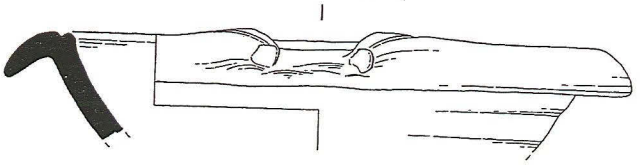

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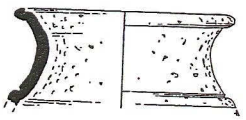

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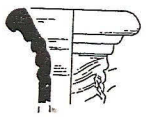

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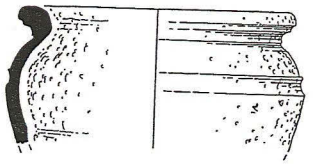

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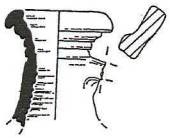

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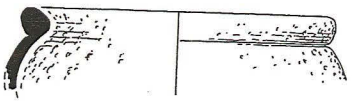

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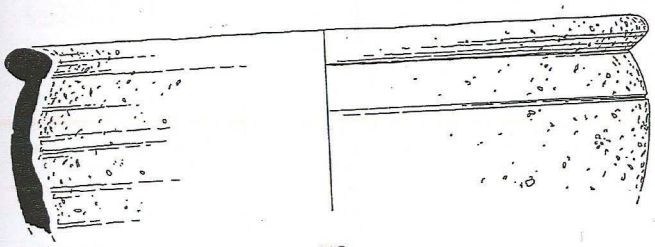

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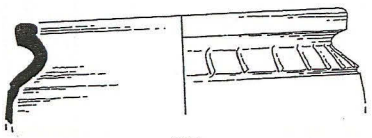

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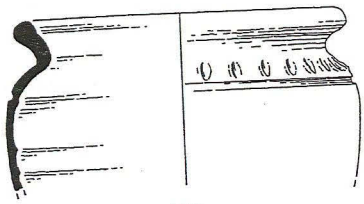

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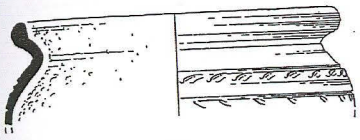

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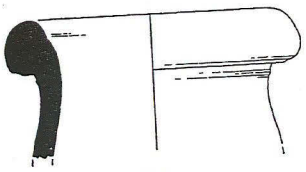

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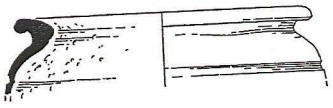

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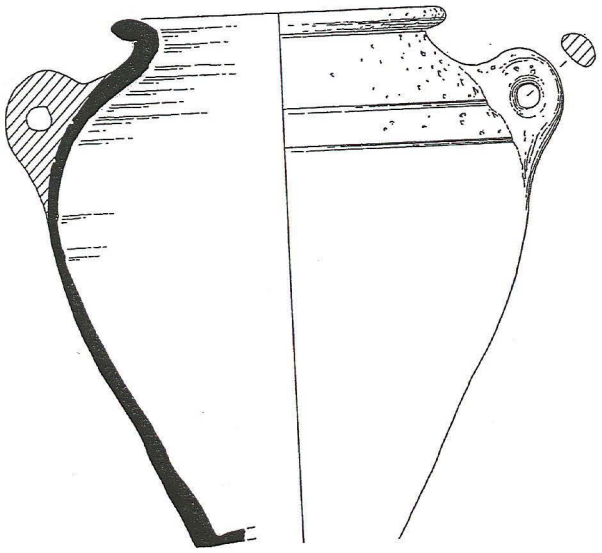

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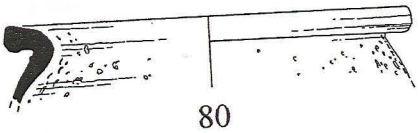

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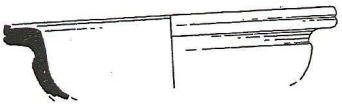

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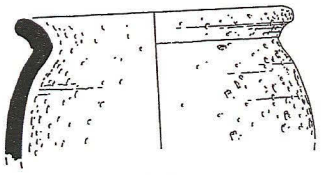

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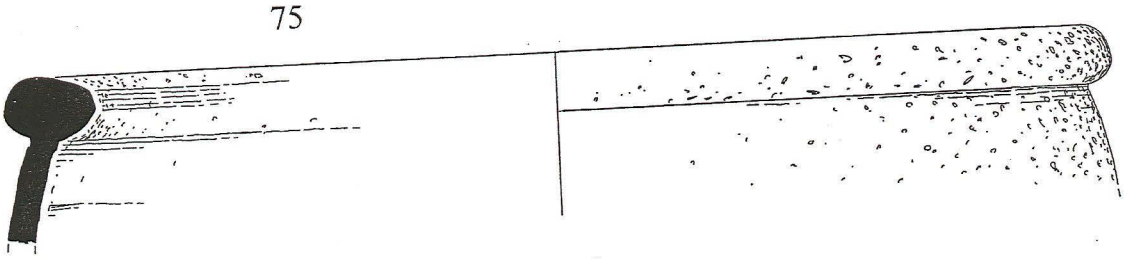

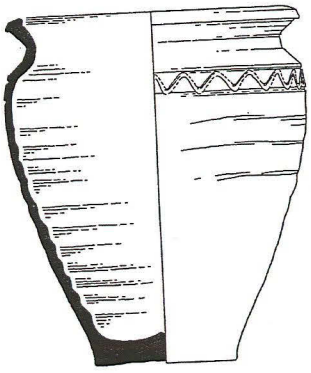

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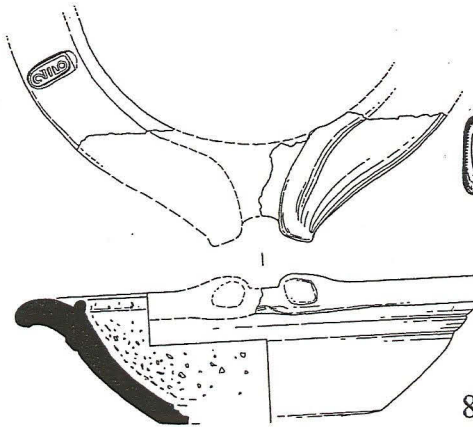

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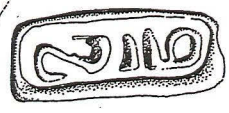

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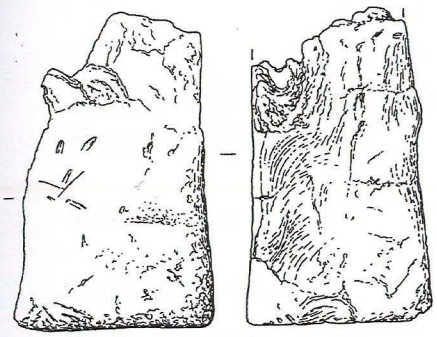

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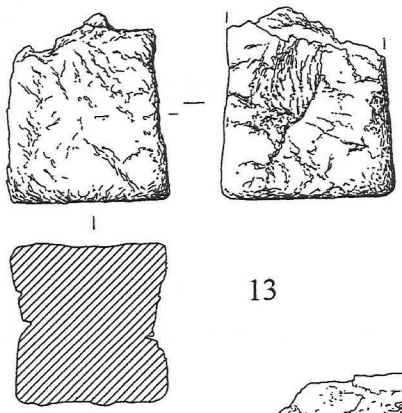

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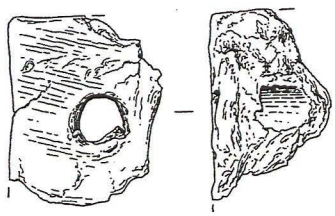

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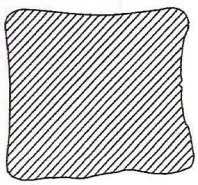

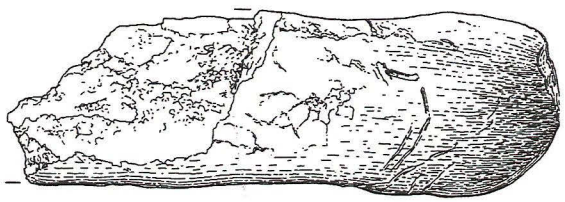

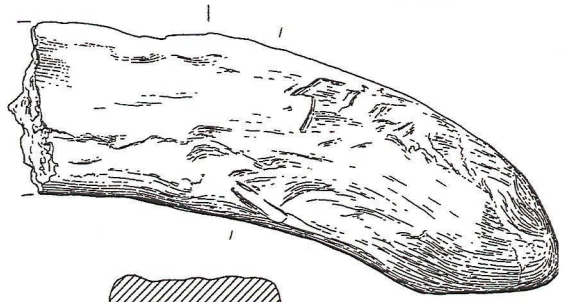

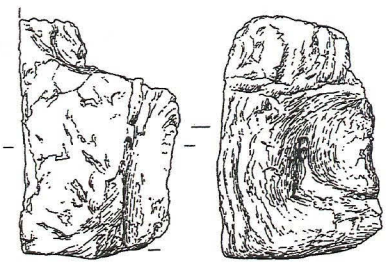

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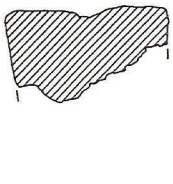

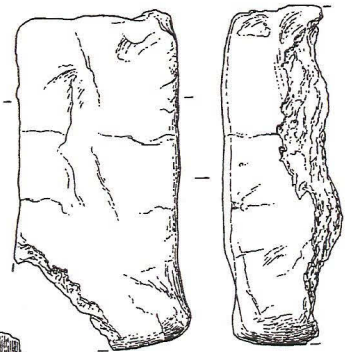

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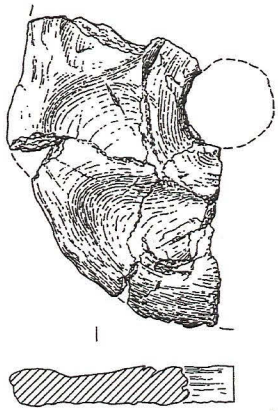

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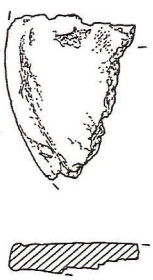

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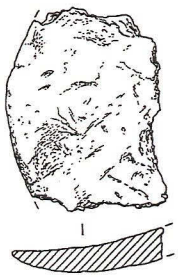

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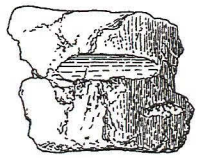

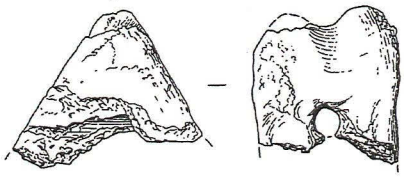

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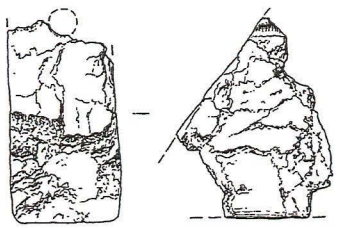

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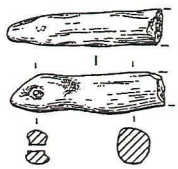

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0 5 10 20 cm

Appendix 3: The Fired Clay from Linwood Road, Market Rasen (LRM05)

Alan Vince

A collection of fragments of fired clay from excavations on land to the east of Linwood Road, Market Rasen, was submitted to the author for identification and assessment. The site was investigated by Will Mumford on behalf of Pre-Construct Archaeology (Lincoln) Ltd.

The material in the main comes from two types of object, mud brick walling and rough thin slabs of clay. Given the presence of Romano-British pottery kilns in this area, it is likely that both object types were used in pottery production. Two of the objects, in a different fabric, are probably fragments of kiln furniture and should be included with the remaining kiln furniture which is being assessed by M J Darling.

Description

Eighty-two fragments of fired clay were recorded, of which a small number joined, giving a maximum number of 79 different objects (Table 1). Most of these were featureless lumps, some of which had a flattened face and showed signs of being humanly worked (being rolled and kneaded into shape).

Form

Table 1

Form:	Nosh:	NoV:	Weight:
	65	62	1380
DAUB	2	2	69
FIREBAR	1	1	78
MUDBRICK	3	3	702
KILN FURNITURE	1	1	73
SLAB	9	9	327
SLAB?	1	1	135
Grand Total	82	79	2764

Only one fragment had any claim to be from a wattle and daub structure, in that it has the indubitable impression of a rounded wattle. However, this impression shows that the wattle impression is perpendicular to the 'daub' surface and is more likely to indicate the presence of a deliberate circular-sectioned hole through a fired clay structure. Three fragments came from a flat mud brick wall. The clay had been formed into round sausages (with quartz sand

used to stop the sausage sticking to the rolling surface) and the wall built up whilst the sausage was still pliable (rather than, as in mud brick *sensu stricto* where the bricks are left to dry and then luted together in a leather-hard state with further clay acting as a cement). The wall was c.40mm thick and it is probable that the majority of the unidentified fragments come from this or similar walls.

A circular aperture, c.80mm in diameter, may have come from this walling (perhaps forming the socket into which a firebar slotted) or be part of another object.

The second object type consists of crudely-made flat slabs. One of these survives with two edges, indicating that they were probably rectilinear. They were made entirely by hand forming, without the use of a knife or other tool. Some examples have chaff impressions on the top and bottom surfaces, presumably used in a similar way to the moulding sand found in the mud brick fragments.

One fragment comes from a square-sectioned firebar. Only one dimension can be recorded, which suggests that the bar was c.67mm square with an unknown length.

Finally, one fragment is part of a second item of kiln furniture which cannot be reconstructed based on the piece submitted but which is similar to others from Market Rasen currently being assessed by M J Darling.

Fabric

The objects occur in five fabrics. The first, FAB1, consists of poorly mixed inclusionless clay with a micaceous groundmass and sparse polished rounded quartz and flint pebble inclusions. The clay often contains numerous laminae, sometimes separated by layers and lenses of quartzose sand (here termed "moulding sand"). The moulding sand found on Fabric 1 objects does not contain either polished quartz grains or flint and instead contains matt – surfaced, spherical quartz grains, of Permo-Triassic origin.

The second fabric, FAB2, is similar to FAB1 but contains numerous voids from burnt-out organic inclusions. Examples tend to have a black, carbon-rich core. Since the surface of these objects often have organic impressions which appear to be from chaff it is likely that this is the identity of the organic inclusions.

The third fabric, FAB3, contains abundant quartz sand inclusions, similar to that of the moulding sand found in FAB1.

The fourth fabric, FAB4, contains abundant voids, probably from chaff, together with abundant fine-textured quartz sand (much finer than in the other fabrics).

A fifth fabric, FAB5, appears to be the standard kiln furniture fabric sand and contains fine quartz sand, as in FAB4, but without the abundant voids.

Assessment

It is likely that all of the material is debris from pottery production. It includes fragments which are probably part of the kiln walling or a suspended floor, indicating that the structure was constructed incrementally from sausages of clay. The flat slabs may have been used as separators to keep vessels in position or to separate them during firing. The remaining fragments, which have a different fabric, are kiln furniture.

Table 2 lists the contexts and an interpretation of the finds.

Table 2

Context:	Data	UNID	DAUB	FIREBAR	KILN FURNITURE	MUDBRICK	SLAB	SLAB?
013	NoV:	1						
	Weight:	29						
033	NoV:	1						
	Weight:	8						
041	NoV:	3						
	Weight:	43						
076	NoV:						3	
	Weight:						75	
087	NoV:	3						
	Weight:	115						
088	NoV:						2	
	Weight:						113	
098	NoV:	2		1	1			
	Weight:	60		78	73			
121	NoV:	1						
	Weight:	22						
131	NoV:	3						
	Weight:	34						
142	NoV:	1				1		
	Weight:	314				482		
145	NoV:	1					1	
	Weight:	26					34	
151	NoV:	1						
	Weight:	17						
176	NoV:	1	1					
	Weight:	17	31					
181	NoV:	1	1					
	Weight:	36	38					
196	NoV:	2						

	Weight:	5				
210	NoV:	1				
	Weight:	24				
219	NoV:				1	
	Weight:				27	
247	NoV:	2				
	Weight:	19				
291	NoV:	2				
	Weight:	57				
315	NoV:	2			1	
	Weight:	45			27	
328	NoV:	1				1
	Weight:	26				135
332	NoV:	6				
	Weight:	108				
341	NoV:	2				
	Weight:	13				
362	NoV:	1				
	Weight:	3				
397	NoV:	1				
	Weight:	21				
403	NoV:				1	
	Weight:				51	
409	NoV:		1			
	Weight:		64			
417	NoV:			1		
	Weight:			103		
475	NoV:	8				
	Weight:	89				
475A	NoV:	12				
	Weight:	150				
476	NoV:	2				
	Weight:	52				
480	NoV:	1		1		
	Weight:	47		117		

Further Work

It is recommended that the kiln furniture is passed to M J Darling for inclusion in her assessment report and that Ms Darling has an overview of the material to ensure consistency of recording of the fired clay and kiln furniture. A fragment of the mud brick walling should be drawn to illustrate the method of manufacture.

Samples of the four fabrics should be characterised using thin sections and Inductively-Coupled Plasma Spectroscopy in order, firstly, to determine whether they were made from

different clays or were formed by different preparation of a single clay source and, secondly, to compare with samples of the natural Jurassic clay and pottery products from Market Rasen, which have already been characterised.

Costing

Thin section production would take place at the University of Manchester and the thin sections would be analysed and a report written by Dr Vince in Lincoln. ICPS sample preparation would take place in Lincoln and the ICPS analysis would take place at the Department of Geology, Royal Holloway College, London, under the supervision of Dr J N Walsh. The data would be examined and compared with the results of other Market Rasen analyses by Dr Vince at Lincoln. Current prices (valid until 31st March 2006) are £23.50 per analysis, including report. After 1st April 2006 the price will rise to £24.00 plus VAT per sample.

Table 3

Task	Description	Amount
1	Illustration of mud brick	Ideally to be undertaken by D Hopkins and not estimated here. (approx £20.00 max)
2	Thin-Section analysis of samples of five fabrics	£117.50 plus VAT
3	ICPS analysis of samples of five fabrics (ideally, 6 samples per fabric, but only FAB1 has more than 6 examples). 15 samples (6 of FAB1, 4 of FAB2, 2 of FAB3, 2 of FAB4 and 1 of FAB5.	£352.50 plus VAT
Total (Tasks 2 and 3 only)		£470 plus VAT
Total inc VAT		£552.25

Appendix 1

REFNO:	Context:	Cname:	Action:	Form:	SUBFABRIC:	Nosh:	NoV:	Weight:	Length:	Breadth:	Thickness:	Description:
	013	FCLAY			FAB1	1	1	29				ONE FLAT SURFACE
	033	FCLAY			FAB1	1	1	8				
	041	FCLAY			FAB1	3	3	43				
	076	FCLAY		SLAB	FAB1	1	1	10	35	22	12	OXIDIZED WITH BLACK CORE;OXIDIATION SUGGESTS O
	076	FCLAY		SLAB	FAB2	1	1	24				CHAFF ON SURFACE;BLACKENED THROUGHOUT
	076	FCLAY		SLAB	FAB2	1	1	41	75	50	20	TWO ORIGINAL EDGES;FLAT SURFACES HAVE CHAFF IN
	087	FCLAY			FAB1	2	1	83				CRUDE CIRCULAR APERTURE;BLACKENED SURFACES (
	087	FCLAY			FAB1	2	2	32				
	088	FCLAY		SLAB	FAB1	1	1	49	80	40	20	TWO BLACKENED SANDED SURFACES
	088	FCLAY		SLAB	FAB2	1	1	64	95	60	16	OXIDIZED LUMP;CHAFF IMPRESSIONS ON ONE SURFAC
	098	FCLAY			FAB1	2	2	60				FLAT SURFACES
	098	FCLAY		FIREBAR	FAB4	1	1	78		67		
	098	FCLAY		KILN FURNITURE	FAB4	1	1	73				
	121	FCLAY			FAB1	1	1	22				
	131	FCLAY			FAB1	2	1	5				
	131	FCLAY			FAB1	1	1	17				FLAT SURFACE
	131	FCLAY			FAB3	1	1	12				
	142	CBM		BRICK		1	1	70				
	142	FCLAY			FAB1	1	1	314				
	142	FCLAY	DR	MUDBRICK	FAB1	1	1	482	105	95	40	TWO BRICKS/SAUSAGES OF CLAY LUTED TOGETHER
	145	FCLAY		SLAB	FAB1	1	1	34				FLAT FACE, POSSIBLY WITH CORNER
	145	FCLAY			FAB1	1	1	26				
	151	FCLAY			FAB1	1	1	17				ONE FLAT SANDED SURFACE

The Alan Vince Archaeology Consultancy, 25 West Parade, Lincoln, LN1 1NW

http://www.postex.demon.co.uk/index.html

A copy of this report is archived online at http://www.avac.uklinux.net/potcat/pdfs/avac2005138.pdf

	176	FCLAY		FAB3	1	1	17				FLAT SURFACE;BLACK CORE
	176	FCLAY	DAUB	FAB1	1	1	31				FLAT SURFACE;POSSIBLE WIDE DIAMETER WATTLE IMF
	181	FCLAY	DAUB	FAB1	1	1	38				FLAT SURFACE WITH ONE WATTLE HOLE PIERCING SUI
	181	FCLAY		FAB1	1	1	36				
	196	FCLAY		FAB1	2	2	5				
	210	FCLAY		FAB1	1	1	24				FLAT SANDED SURFACE
	219	FCLAY	SLAB	FAB1	1	1	27	55	30	13	
	247	FCLAY		FAB1	2	2	19				
	291	FCLAY		FAB1	3	2	57				
	315	FCLAY		FAB1	2	2	45				
	315	FCLAY	SLAB	FAB1	1	1	27	55	42	12	
	328	FCLAY		FAB1	1	1	26				
	328	FCLAY	SLAB?	FAB1	1	1	135	90	80	22	POSSIBLE SANDED SURFACES, BUT COULD HAVE SPLI
	332	FCLAY		FAB1	4	4	40				
	332	FCLAY		FAB1	2	2	68				FLAT SURFACE
<40>	341	FCLAY		FAB1	2	2	13				
	362	FCLAY		FAB1	1	1	3				
	397	FCLAY		FAB1	1	1	21				
	403	FCLAY	SLAB	FAB2	1	1	51	60	60	15	ROUGHLY FLATTENED SLAB;CHAFF ON BOTH SURFACE
	409	FCLAY	FIREBAR	FAB5	1	1	64				CORNER OF BAR FINE SANDED SURFACES;REDUCED L
	417	FCLAY	MUDBRICK	FAB1	1	1	103				
	475	FCLAY		FAB1	1	1	45				ONE FLAT SANDED SURFACE
	475	FCLAY		FAB1	7	7	44				
	476	FCLAY		FAB1	2	2	52				
	480	FCLAY	MUDBRICK	FAB1	1	1	117			35	
	480	FCLAY		FAB1	1	1	47				CURVED FRAG;OXIDIZED AFTER BREAKAGE
	475A	FCLAY		FAB1	12	12	150				

APPENDIX 4: THE IRON SLAG FROM LINWOOD ROAD, MARKET RASEN (site code: LRM 05)

Lynne Keys (2006)

During excavations by Pre-Construct Archaeology Lincoln at the above site a medium assemblage (just under 15.6kg) of iron slag was recovered by hand. For this report it was examined by eye; each slag type within each context was weighed; and smithing hearth bottoms were individually weighed and measured for statistical purposes. Quantification details are given in the table below:

Quantification table: slag from Linwood Road, Market Rasen

cxt	identification	wt.	len	br	dep	comment
25	undiagnostic	225				
76	furnace slag	1309				
76	undiagnostic	104				
76	undiagnostic	175	75	55	40	possibly small smithing hearth bottom
87	furnace slag	98				runny, with large voids from burnt out fuel
87	undiagnostic	15				possibly smelting
132	run slag	66				
136	cinder	135				
136	run slag	265				
136	smithing hearth bottom	688	120	100	55	
136	undiagnostic	72				
140	run slag	522				
140	tap slag	534				
143	undiagnostic	101				
173	smithing hearth bottom	715	120	75	60	is this really a smithing hearth bottom
194	undiagnostic	74				
210	furnace slag	1008				vesicular with run on top
210	undiagnostic	623				one piece
221	tap slag	775				smelting?
270	furnace bottom	1030				smelting?
274	tap slag	1071				multi-facetted
383	furnace slag	2375				
385	vitrified hearth lining	744				
387	undiagnostic	269				
431	furnace bottom	2062				
433	furnace slag	505				

Total wt. 15560g

Explanation of processes and terminology

Activities involving iron can take two forms:

1) the manufacture of iron from ore and fuel in a *smelting* furnace. The resulting products are a spongy mass called an unconsolidated bloom (iron with a considerable amount of slag still trapped inside) and slag (waste). The latter may take various forms depending on the technology used: tap slag, run slag, dense slag, or furnace slag.

2a) *primary smithing* (hot working by a smith using a hammer) of the bloom on a stringhearth (usually near the smelting furnace) to remove excess slag. The bloom becomes a rough lump of iron ready for use; the slags from this process include smithing hearth bottoms and micro-slags, in particular tiny smithing spheres.

2b) *secondary smithing* (hot working by a smith using a hammer) of one or more pieces of iron to create an object or repair it. As well as bulk slags, including the smithing hearth bottom, this generates micro-slags: hammerscale flakes from ordinary hot working of a piece of iron or tiny spheres from high temperature welding to join two pieces of iron.

Some types of iron slags are diagnostic of smelting or smithing, while others are not. Slag may considered undiagnostic because it could have been produced by either process; which one can only be determined in the light of diagnostic evidence from the site. Slags may be broken up during deposition, re-deposition or excavation and may have to be assigned to the undiagnostic category.

Smelting

Tap slag is a dense, low porosity, fayalitic (iron silicate) slag with a ropy flowed structure. It is formed as the liquid slag is allowed to flow out continuously or intermittently through a hole in the side of the furnace into a channel in the ground. This removal of the slag facilitated retrieval of the bloom after the smelting operation. It used to be believed that furnaces with tap holes replaced bowl furnaces as their efficiency was recognised early in the Roman period. However, analysis by Sarah Paynter (Ancient Monuments Laboratory, English Heritage) of Iron Age slag from several sites has led to some modification of this idea. Slag from these sites indicates the slag pit below the smelting furnace may have been deliberately slanted to allow slag to run out, slag that might sometimes resemble tap slag. Run slag is what its name suggests and was produced by smelting. If tap slag is very fragmentary it can be hard to identify as such and the term 'run slag' has been used in these instances.

Other smelting slags present in the assemblage are furnace bottoms (resembling large smithing hearth bottoms) which were produced in a covered bowl furnace, and furnace slag.

Smithing

The presence of what appear to be smithing hearth bottoms amongst the slag indicates some smithing was taking place. A smithing hearth bottom is plano-convex in shape and was formed as a result of high temperature reactions between the iron, iron-scale and silica from either a clay furnace lining or the silica flux used by a smith. Before it could grow large enough to block the tuyere hole (where the air from a bellows entered the hearth) it was removed and dumped in the nearest pit, ditch or unused area. As no hammerscale (a micro-slag produced by smithing) was present in the Linwood Road assemblage it appears the smithing hearth bottoms were deposited well away from the immediate smithing area or are re-deposited.

Discussion of the assemblage

The slag is concentrated in the south-west corner in ditches and pits but no definite focus of smelting was located. The quantities found in the features described as hearth or kiln are too small to indicate they were used for smelting. The overall quantity of slag, however, indicates that smelting took place (at least once) somewhere on the site or just off it to the south-west. The slag types would seem to indicate an early Roman date.but some may be re-deposited late Iron Age material.

Appendix 5

Palaeoecology Research Services PRS
2007/48

Technical report: biological remains recovered from samples from excavations on land to the east of Linwood Road, Market Rasen, Lincolnshire (site code: LRM05)

by

John Carrott and Alexandra Schmidl

Summary

Remains from thirty-one bulk sediment samples recovered from deposits encountered during excavations on land to the east of Linwood Road, Market Rasen, Lincolnshire, were submitted for analysis. Five phases of archaeological activity were identified at the site, the earliest relating to a single round house dating from the early 2nd century AD. The features of the subsequent phases appeared to mostly relate to craft/industrial activity at the site, pottery production in particular.

Ancient biological remains from the sediment samples largely consisted of small amounts of poorly preserved unidentified charcoal, with occasional charred cereal grains (or grain fragments) and/or seeds and a little unidentified bone (some burnt). One or two shell fragments (Context 140) were probably also 'ancient'.

Only one of the deposits (291) gave any quantity of identifiable biological remains. Here, rather more remains were recovered, but these still only amounted to a total of perhaps twenty cereal grains and some seeds of crop weeds. The grains almost certainly represented food waste but were too few for detailed interpretation. However, the composition of this assemblage was consistent with a prehistoric date and it appeared to represent the remnants of a fully processed crop – although, these impressions can only be tentatively asserted because of the small size and the poor preservation of the assemblage.

There were occasional records for waste products from metal working (slag/hammerscale) and other artefactual remains.

KEYWORDS: LAND TO THE EAST OF LINWOOD ROAD; MARKET RASEN; LINCOLNSHIRE; TECHNICAL REPORT; ROMANO-BRITISH; PLANT REMAINS; CHARRED PLANT REMAINS; CHARRED GRAIN; INVERTEBRATE REMAINS; SNAILS; VERTEBRATE REMAINS

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3 August 2007

Technical report: biological remains recovered from samples from excavations on land to the east of Linwood Road, Market Rasen, Lincolnshire (site code: LRM05)

Introduction

Thirty-one sediment samples were recovered by Pre-Construct Archaeology (Lincoln), from deposits encountered during an excavation on land to the east of Linwood Road, Market Rasen, Lincolnshire.

Five main phases of activity were identified and summarised as follows:

Phase 1 – a preliminary phase of low key occupation prior to more industrial periods on the site. A single roundhouse was revealed along with a number of associated features, including north-east to south-west aligned gullies and a later large drainage ditch. Pottery recovered from the features of Phase 1 indicated that they had been created in the early 2nd century AD.

Phase 2 – the second phase of archaeology contained a diverse assortment of features linked by stratigraphy. Whilst these could be sub-divided, collectively they represented a period of activity focused on the south western corner of the site. Features included a large curvilinear enclosure ditch, a beam slot, some subsidiary ditches and a substantial waste pit. No dating information was available for this phase.

Phase 3 – a number of right angled beamslots and associated postholes, stakeholes and ditches represented several buildings constructed in the south eastern zone of the site. A series of shallow rectangular pits, with possible industrial functions, appeared to link the structures and indicated that they were workshops rather than homes. No dating information was available for this phase.

Phase 4 – a number of distinct curvilinear ditches truncated by substantial pits containing large amounts of waste pottery associated with the remains of a well preserved kiln and the traces of another. No dating information was available for this phase.

Phase 5 – much of the south eastern sector of the site was overlain by a distinct right angled enclosure system, the alignment of which was mirrored by a number of minor features in the northern half of the site. These long ditches radiated out from a curvilinear ditch in the south western corner of the site. This enclosed a concentration of layers and irregular features containing (amongst other artefacts) a wealth of kiln furniture, which implied that the focus of manufacturing on the site had shifted to this area. No dating information was available for this phase.

All of the thirty-one bulk sediment sample ('BS' *sensu* Dobney *et al.* 1992) were processed by the excavator. Some of the resultant fractions, the 'flot' hereafter termed 'washover' and components of the residues, were submitted to Palaeoecology Research Services Limited (PRS), County Durham, for a report on their content of biological remains.

Methods

The sediment samples were processed by Pre-Construct Archaeology (Lincoln) to 1 mm, with a 300 micron sieve for the washover. The resultant residues were dried and separated into fractions using 5 mm and 10 mm sieves prior to sorting.

The washovers and parts of the residue were submitted to PRS. The residues had been sorted for biological and artefactual remains and only certain components—e.g. charred plant remains, a few fragments of ?hammer scale/iron object and the less than 5 mm

fraction of the residue—were included in the submitted material.

Plant and other biological remains (where present), and the general nature of the washovers and the submitted residue components, were recorded using a low power (x7 to x45) binocular microscope. Notes on the quantity and quality of preservation were made for each fraction. Identifiable taxa and other components were listed on paper. Nomenclature for plant taxa follows Stace (1997), snails follow Kerney (1999) and marine shellfish follow Hayward and Ryland (1995).

The fractions were also examined for the presence of hammerscale/slag.

Results

Very few biological remains were recovered from the samples. Details of these and the other components of the submitted material are presented as Table 1.

Discussion

Ancient biological remains from the sediment samples largely consisted of small amounts of poorly preserved unidentified charcoal (rather eroded and degraded, but some was almost certainly charred root/rhizome), with occasional charred cereal grains (or grain fragments) and/or seeds of plants that could grow as agricultural weeds (from Contexts 087, 143, 171, 210, 291, 278, 291, 312, 342, 423 and 495, and possibly also Contexts 352, 480 and 493) and a little unidentified bone (Contexts140, 210 and 239, some or all of which was burnt in the last two). One or two shell fragments (Context 140) were, perhaps, also of 'ancient' origin; records of the burrowing land snail *Cecilioides acicula* (Context 370) almost certainly represent modern intrusions into the deposits, however. Other modern intrusions or contaminants, such as modern rootlets, seeds/fruits (uncharred) and other invertebrate remains (e.g. earthworm egg capsules, beetle sclerites), were present in each of the deposits.

Only one of the deposits (Context 247 – a possible cremation; no phasing information available (reassigned as (291) gave any quantity of identifiable biological remains – although these still only amounted to a total of perhaps twenty cereal grains and some seeds of crop weeds. The grains almost certainly represented food waste but were too few for detailed archaeobotanical interpretation. Uniquely amongst the samples, there was also a little cereal chaff present allowing the identification of two wheat species (emmer and spelt) in the assemblage There was also a single grain of barley and approximately 30 caryopses of rye brome. The cereal assemblage, though very small, would be consistent with a prehistoric date (see Greig 1991); also, rye brome was grown as an early crop plant (see Schmidl *et al.* 2007, for example). Glume wheats are usually stored in their glumes and separated from them only during the last stages of processing, so the relative lack of chaff might imply that this assemblage represented the remnants of a fully processed crop – again, the small size of the assemblage and the poor preservation of the remains must be considered, however.

Cereal grains recovered from the samples would provide sufficient suitable material for radiocarbon dating (via accelerator mass spectrometry), if required. However, given the evidence of recent biological intrusion and bioturbation (modern rootlets and earthworm egg capsules were often recorded) isolated remains may not be contemporaneous with deposit formation and any date obtained from them could not necessarily be taken as applicable to the fill as a whole.

There were occasional records for waste products from metal working (slag/hammerscale in Contexts 140, 143, 149, 169, 209, 210 and 291, and perhaps also

Contexts 087 and 291) and other artefactual remains (e.g. pot from Contexts 209 and ?495).

Retention and disposal

All of the material reported here should be retained as part of the physical archive of the site.

Archive

All material is currently stored by Palaeoecology Research Services (Unit 8, Dabble Duck Industrial Estate, Shildon, County Durham), along with paper and electronic records pertaining to the work described here.

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Table 1. Details of the submitted remains recovered from sediment samples from excavations on land to the east of Linwood Road, Market Rasen, Lincolnshire. Key: 'CN' = context number; 'SN' = sample number; 'Size' = size in litres of samples processed; 'Label' = labelling on fraction as submitted; 'Description' = description of remains present; 'Vol/Wt' = approximate volume in millilitres for the flots or weight in grammes for residues and other fractions.
The results are presented as descriptions of the remains present in each fraction as labelled by the excavator.

CN	SN	Phase	Size	Context type	Label	Description	Vol/Wt
087	19	5	30	Fill of linear	flot	Mostly matted modern rootlets and fine sediment, with some other modern plant remains (including fragments of cereal 'straw'). There was also a little charcoal and coal (both to 6 mm, but mostly very fine <1 mm), a few fragments of unidentified charred cereal grain and 1 or 2 elder (*Sambucus nigra* L.) seeds (not charred and probably modern)	35
					Charcoal 4-1	Charcoal and part burnt wood fragments to 14 mm	2
					Coal 4-1	Approximately 20 small fragments of coal (to 5 mm)	~1
					Fuel ash waste 4-1	Mostly ash/cinder/slag lumps (to 10 mm), with an occasional piece of charcoal/wood (to 5 mm) and some sand grains	~1
					Grain 4-1	1 ?barley (cf. *Hordeum*) grain and 1 unidentified cereal grain	<1
					Pb obj 4-1	1 ?lead shot (to 3 mm)	<1
					Residue 4-1	Mostly stones and sediment lumps (to 14 mm), with traces of charcoal, coal, modern rootlet and earthworm egg capsules	213
					Charcoal 9-5	12 pieces of charcoal (to 13 mm)	~1
					Coal 9-5	1 piece of coal to 7 mm	<1
					Fuel ash waste 9-5	As noted for the 4-1 fuel ash waste fraction but 2 larger ash/cinder/slag lumps (to 13 mm)	~1
140	6	5	30	Fill of Pit 141	flot	Mostly matter rootlets, with a little sand and fine sediment, modern leaf and cereal chaff fragments, coal (to 5 mm), cinder (to 5 mm) and charcoal (to 5 mm), some earthworm egg capsules and very many *Heterodera* cysts	25
					Bone 4-1	2 very small (to 10 mm) unidentified fragments of bone	<1
					Charcoal 4-1	Approximately 20 small fragments of unidentified charcoal (to 11 mm), including some charred root/rhizome	~1
					Coal 4-1	Approximately 20 pieces of coal (to 5 mm)	~1
					Fuel ash waste 4-1	Mostly cinder (to 7 mm), with a occasional burnt stone (to 11 mm), a few sand grains and a few magnetic fragments (including 1 spheroid slag 'bead')	~2
					Glass 4-1	2 tiny fragments of ?glass (to 3 mm)	<1
					Grain 4-1	3 tiny unidentified charcoal fragments (to 5 mm)	<1
					Hammerscale 4-1	3 tiny magnetic flakes of hammerscale (to 3 mm)	<1

CN	SN	Phase	Size	Context type	Label	Description	Vol/Wt
					Residue 4-1 'stone'	Mostly stones (to 9 mm), with a little charcoal, coal and cinder (all to 4 mm), and some modern rootlet	186
					Shell 4-1	1 mussel (*Mytilus edulis* L.) shell fragment (to 9 mm) and 1 *Cochlicopa ?lubrica* (Müller) land snail	<1
					Fuel ash waste 9-5	5 pieces of concreted ash/cinder (to 8 mm), 1 stone (to 7 mm), 2 lumps of non-magnetic slag (to 18 mm) and 1 piece of coal (to 6 mm)	5
					Fuel ash waste >10	2 pieces of low-grade coal (to 25 mm)	2
143	7	5	30	Occupation layer	flot	Mostly modern rootlets and sand grains, with modern plant and invertebrate remains including seeds/fruits of orache/goosefoot (*Atriplex/Chenopodium*), elder and blackberry (*Rubus fruticosus* L. agg.), earthworm egg capsules, beetle sclerites (including staphylinid heads). Also, small amounts of coal, cinder and charcoal (all to 6 mm) and a few 'beads' of spheroid slag	30
					Charcoal 4-1	Mostly charcoal (to 5 mm), with a little cinder (to 5 mm)	~1
					fuel ash waste 4-1	Mix of coal and cinder (both to 5 mm)	2
					PB 4-1	One 'bead' of spheroid slag to 3 mm	<1
					Residue 4-1	Mostly stones and sand, with some modern rootlet fragments	159
					Seed/grain 4-1	9 items, mostly charcoal (to 6 mm), with 1 unidentified charred grain and 1 earthworm egg capsule	<1
					Coal 9-5	1 piece of coal to 7 mm	<1
					Coal/charcoal 9-5	2 pieces of coal (to 14 mm; <1 g) and 1 of cinder (to 6 mm; <1 g)	~1
					Seed 9-5	1 'head' of a modern winged fruit of the maple family (probably sycamore or field maple)	<1
149	50	1	15	Fill of ring/annular ditch	flot	Mostly matted rootlets, with some fine sediment; also some modern seeds (including orache/goosefoot) and ?*Heterodera* cysts	15
					Charcoal 4-1	Approximately 50 small fragments of charcoal (to 8 mm, including some charred ?root/rhizome or small ?twig), with a few pieces of coal (to 6 mm)	~1
					Coal 4-1	Approximately 40 tiny pieces of coal (to 5 mm)	~1
					Fuel ash waste 4-1	Mostly small pieces of cinder/fused ash (to 6 mm), with an occasional piece of coal (to 4 mm) and one or two small pieces of magnetic slag (to 4 mm)	~2
					Glass 4-1	1 tiny fragment of glass (to 3 mm)	<1
					Residue 4-1 'stone'	Mostly small stones (to 4 mm), with sand and small lumps of concreted sediment (to 3 mm). There was also quite a large amount of charcoal (to 3 mm, including some charred root/rhizome), coal (to 3 mm) and some modern rootlet	127
169	11	?	10	Beam slot fill	flot	Mostly matted modern rootlets and sand grains, with occasional fragments of modern leaf and cereal 'straw', fine coal and charcoal (the two last to 1 mm)	10
					Charcoal 4-1	Twenty small unidentified charcoal fragments (to 4 mm) and 1 stone (to 8 mm)	~1

CN	SN	Phase	Size	Context type	Label	Description	Vol/Wt
					Fuel ash waste 4-1	Mostly concretions of sediment rich in iron oxide, with some composed of fused ash (both to 5 mm), occasional pieces of cinder and slag (both to 5 mm) and 1 stone (to 9 mm)	3
					Grain 4-1	3 small lumps of fused ash/cinder (to 3 mm)	<1
					Residue 4-1	Mostly mineral-rich (iron oxide) concretions of sediment/ash/slag, with some sand, stones (to 12 mm) and traces of fine charcoal and cinder	197
					Charcoal 9-5	5 unidentified charcoal fragments (to 12 mm) and 1 sediment/slag concretion (to 10 mm)	2
					Fuel ash waste 9-5	A few fragments of cinder (to 7 mm), 1 sediment/slag concretion and 4 pieces of charcoal, with sediment and ?slag adhering to their surfaces	2
171	10	5	30	Deposit near to kiln	flot	Almost exclusively of modern root and rootlet fragments. Other modern remains included some seeds (unidentified), leaf fragments, earthworm egg capsules and ant heads. There was also a little cinder (to 2 mm) and an occasional ?charred seed (including corncockle – *Agrostemma githago* L.)	10
					Charcoal 4-1	Approximately 40 small charcoal fragments (to 7 mm), most perhaps charred root/rootlet, with a few sand grains and modern rootlet fragments	2
					Fuel ash waste 4-1	Mostly silted charcoal and cinder (both to 6 mm), with occasional pieces of coal (to 5 mm), a few small stones (to 6 mm), some sand grains and traces of modern rootlet	4
					Grain 4-1	1 charred wheat (*Triticum*) grain, 10 small charcoal fragments (to 7 mm), 1 earthworm egg capsule and 1 uncharred leaf fragment	~1
					Residue 4-1	Mostly small stones (to 6 mm), with some ?indurated lumps of sediment (to 5 mm), a little fused ash/cinder and charcoal (both to 5 mm), sand and traces of modern rootlet	324
					Charcoal 9-5	4 slightly larger unidentified charcoal fragments (to 10 mm, including 1 thin – 3 mm thickness – ?twig fragment)	~1
					Fuel ash waste 9-5	Larger pieces of fused ash/cinder (to 14 mm) and some lumps of indurated (probably burnt) clay (to 9 mm), with an occasional stone (to 10 mm), a little sand and a trace of modern rootlet	10
194	12	5	30	Kiln waste pit fill	flot	Mostly matted modern rootlets, with some sand and fine sediment, traces of charcoal (to 4 mm, including charred root/rhizome), many earthworm egg capsules and very many orache/goosefoot seeds (apparently not charred and probably modern)	60
					Charcoal 4-1	Around 60 fragments of charcoal (to 11 mm, including some charred root/rhizome)	~1
					Fuel ash waste 4-1	Mostly cinder (to 9 mm), with a little coal (to 7 mm)	2
					?Grain 4-1	4 unidentified charcoal fragments (to 5 mm)	<1
					Residue 4-1 'scanned for bone'	Mostly stones, sediment and ash concretions and charred material (fused ash lumps, charcoal and cinder), with some coal (all components to 12 mm). Also some modern rootlets	261
					Charcoal 9-5	17 slightly larger unidentified charcoal fragments (to 13 mm)	~1
					Fuel ash waste >10	A few sediment and ash concretions (to 7 mm), 1 piece of charcoal (to 6 mm), a little sand and some modern rootlet	~1

CN	SN	Phase	Size	Context type	Label	Description	Vol/Wt
209	23	2	30	Clay dump	Charcoal 4-1	Over 100 small pieces of unidentified charcoal (to 12 mm), including an occasional charred ?root/rhizome/twig fragment, with a trace of sand and modern rootlets	2
					Coal 4-1	Approximately 40 small pieces of coal (to 7 mm)	1
					Fuel ash waste 4-1	About 95 small fragments, mostly of cinder (to 7 mm), but with an occasional piece of coal (to 4 mm) and charcoal (to 3 mm) and traces of sand and modern rootlets	~1
					Pottery 4-1	Around 75 items in total , some of pottery (to 7 mm) and some of stones (to 10 mm), with occasional pieces of slag (to 4 mm), coal (to 5 mm) and cinder (to 5 mm) and a little modern rootlet	3
					Residue 4-1 'stone'	Mostly small stones (to 7 mm), with a little charcoal, coal, cinder and black vitreous slag (all to 4 mm), a trace of ?shell and a little modern rootlet (some very fine and some up to 2 mm thick and 'woody')	176
					Charcoal 9-5	10 fragments of unidentified charcoal (to 13 mm) and 1of fused ash/cinder (to 11 mm)	~1
210	24	?	20	Occupation layer	flot	Mostly modern rootlets and fine sand, with a little coal and charcoal (to 4 mm) and a few charred orache/goosefoot seeds and unidentified grain fragments. There were also some uncharred elder and ?raspberry (cf. *Rubus idaeus* L.) seeds and numerous earthworm egg capsules which were probably modern	60
					Bone 4-1	6 unidentified bone fragments (to 6 mm), four of which were burnt	<1
					Charcoal 4-1	Mostly unidentified charcoal (to 6 mm), with 1 piece of coal (to 4 mm)	~1
					Coal 4-1	Small fragments of coal (to 8 mm)	~2
					Fuel ash waste 4-1	Mostly fine cinder/fused ash (to 5 mm), with occasional unidentified charcoal fragments (to 4 mm)	~1
					Residue 4-1	Stones (to 10 mm), sand and fine sediment, with some modern rootlet fragments and a trace of cinder/coal (to 2 mm)	285
					Seed 4-1	1 earthworm egg capsule	<1
					Fuel ash waste 9-5	A few pieces of cinder/fused ash (to 7 mm) and one stone (to 12 mm)	~2
					Slag? >10	1 piece of slightly magnetic slag (to 25 mm)	4
211	14	?	10	Beam slot fill	flot	Mostly modern rootlets, with fine sediment and sand , small lumps of fused ash (to 3 mm), unidentified charcoal (to 4 mm, including charred ?root/rhizome), cinder and coal (both to 4 mm), a modern contaminant beetle and a few elder seeds (also probably modern)	100
					2nd flot	Approximately equal parts of modern rootlets and unidentified charcoal (to 11 mm, including some charred ?root/rhizome), a few modern elder seeds and an occasional earthworm egg capsule	80
					Residue 4-1	Mostly ashy concretions (to 12 mm) and small stones (to 4 mm), with some unidentified charcoal (to 12 mm, including some charred ?root/rhizome)	888
					Charcoal 9-5	Approximately 100 larger unidentified charcoal fragments (to 22 mm)	12
					Charcoal >10	20 unidentified charcoal fragments (to 27 mm) and a little sand	16
223	13	?	5	Possible cremation/	flot	Approximately equal parts modern matted rootlets and fine sand	10

CN	SN	Phase	Size	Context type	Label	Description	Vol/Wt
				small pit	Charcoal 4-1	25 unidentified charcoal fragments to 10 mm	~1
					Coal 4-1	3 pieces of coal and 2 of cinder (all to 4 mm)	<1
					Grain 4-1	6 rounded fragments of charcoal and 4 of cinder (all to 5 mm)	<1
					Charcoal 9-5	Approximately 45 larger charcoal fragments (to 18 mm, including charred root/rhizome), poorly preserved, unidentified and mostly coated with fine sediment/sand	6
					Charcoal >10	2 large, but poorly preserved and unidentified, pieces of charcoal (to 16 mm)	~2
					Manganeeze [manganese] residue	Mostly small sediment concretions and sediment coated charcoal (to 8 mm, including charred root/rhizome fragments), with some small stones (to 5 mm), a little coal (to 4 mm), some modern rootlets and sand grains	245
239	17	?	5	Possible cremation	flot	Mostly matted modern rootlets, with a little fine sediment 'dust', an occasional fragment of modern 'straw' and a little ?charred plant material (including culm node fragments)	5
					Ceramic 4-1	3 pieces of ?mortar to 15 mm	~1
					Charcoal/fuel waste 4-1	Mostly charcoal (to 15 mm, including charred root/rootlet), with a few stones (to 7 mm)	3
					Residue 4-1	Mostly indurated lumps of sediment, with some charcoal and occasional fragments of uncharred ?woody root. Also a few fragments of unidentified calcined (white) burnt bone (to 2 mm), some small stones and a few pieces of modern rootlet. Some of the residue was magnetic but this was baked/burnt earth (~3 g) rather than hammerscale or slag	223
					Charcoal/fuel waste 9-5	Mostly cinder, burnt sediment or stone, and a little unidentified charcoal (all to 20 mm)	10
291	18	?	2	Possible cremation	flot	Mostly fine modern rootlet, sediment and sand, with a trace of unidentified charcoal (to 2 mm) and an occasional ?charred orache/goosefoot seed	5
					Charcoal 4-1	Unidentified charcoal fragments (to 7 mm), including some charred ?root/rhizome	7
					Fuel ash waste 4-1	Trace of ?cinder (to 3 mm)	<1
					Grain 4-1	This context contained a small grain assemblage (approximately 20 grains) but this was of very poor preservation (being distorted and eroded) and most of the remains were fragmentary. The grains that could be identified, at least to some degree, were mostly of emmer/spelt wheat (*Triticum dicoccum* Schübl./*T. spelta* L.). The separation of the grains of these two species is often problematic (see, for example, Hillman *et al.* 1995), but there was one spikelet with grains identified as emmer wheat (*Triticum dicoccum*) and one glume base of spelt wheat (*Triticum spelta*). On this basis, it is probable that grains of both wheat species were present in this assemblage. In addition, a single grain was identified as barley (*Hordeum distichon* L./*H. vulgare* L.). Other identifiable charred plant remains were mostly of weeds of cultivated land, including approximately 30 caryopses of rye brome (*Bromus secalinus* L.) and two seeds of tare (*Vicia hirsute* (L.) Gray/*V. tetrasperma* (L.) Schreb.)	~1

CN	SN	Phase	Size	Context type	Label	Description	Vol/Wt
					Residue 4-1 'stone'	Mostly stones, charcoal (including charred ?root/rhizome) and cinder (all to 7 mm), with a little sand and some modern rootlet fragments	94
					Charcoal/fuel waste 9-5	Approximately 25 larger but unidentified charcoal fragments (to 17 mm)	2
					Residue 9-5	Mostly stones (to 22 mm), with some ?slag (to 13 mm), a little unidentified charcoal (to 4 mm) and modern rootlet	28
278	27	?	10	?	flot	Almost all matted modern rootlet, with some sand, small stones (to 5 mm), occasional fragments of coal and cinder (both to 3 mm) and a few modern beetle sclerites and ?earthworm egg capsules	50
					Charcoal 4-1	Approximately 40 small fragments of unidentified charcoal (to 6 mm), with a few pieces of coal (to 4 mm)	~1
					Coal 4-1	Approximately 40 small fragments of coal (to 6 mm), with a few pieces of cinder (to 3 mm)	~1
					Fuel ash waste 4-1	Mostly cinder (around 50 small fragments to 7 mm), with a few fragments of charcoal (to 4 mm)	<1
					Grain 4-1	3 unidentified charred grain fragments, 3 pieces of cinder and 4 charcoal fragments (all to 5 mm)	<1
291	29	4	30	Kiln waste/pit fill	flot	Almost all of modern rootlet and sand, with traces of fine cinder, charcoal and coal (all to 2 mm), a wood fragment (to 8 mm), some earthworm egg capsules, a few beetle sclerite fragments (including a ground beetle – Carabidae – elytron fragment) and 1 elder seed. All of the uncharred organic remains were almost certainly modern contaminants	20
					Charcoal 4-1	Mostly charcoal (to 9 mm, including charred ?root/rhizome), with a little cinder (to 9 mm)	17
					Coal 4-1	Approximately 25 pieces of coal (to 3 mm)	~1
					Fuel ash waste 4-1	Approximately 25 pieces of cinder (to 5 mm)	~1
					Grain 4-1	1 barley (*Hordeum*) grain and 1 'bead' of slag (to 5 mm)	<1
					Residue 4-1	Mostly cinder and ?slag (both to 5 mm), with some charcoal and small stones (also both to 5 mm), sand grains and modern rootlet (including a few rather 'woody' pieces). The vast majority of the 'slag' (perhaps 99%) was not magnetic and there were no pieces that could be 'typed' (e.g. as spheroid)	842
312	30	?	5	Burnt deposit	flot	Almost all of matted modern rootlets, with just a trace of fine charcoal/cinder (to 1 mm)	3
					Charcoal scanned sample 4-1	1 unidentified charred grain fragment and 1 piece of coal (to 3 mm) but mostly composed of unidentified charcoal (to 14 mm, around 30 fragments in total most of which appeared to be charred root/rhizome)	~1
					Residue 4-1	Mostly small concretions of black ash (to 4 mm), with a little charcoal (to 4 mm, perhaps mostly charred rootlet), some small stones (to 3 mm), sand grains (most of which were fused into the ash concretions) and occasional modern rootlet fragments	505
					Charcoal 9-5	Approximately 70 larger charcoal fragments (to 22 mm) – most appear to be of charred root/rhizome	6

CN	SN	Phase	Size	Context type	Label	Description	Vol/Wt
316	31	?	5	Beam slot fill	flot	Mostly modern rootlets, with a little sand and an occasional fragment of coal (to 2 mm) and some modern beetle sclerites	~10
					Charcoal 4-1	Approximately equal thirds of coal, cinder and charcoal (all to 4 mm)	~1
					Fuel ash waste 4-1	Small cinder fragments (to 3 mm)	<1
					Glass 4-1	One fragment of glass (to 3 mm)	<1
332	41	4	20	Kiln fill	flot	Mostly modern rootlets, with some fine charcoal (to 3 mm), a little sand and numerous ?*Cenococcum* sclerotia	~8
					Charcoal/fuel waste 4-1	Mostly unidentified charcoal (to 6 mm), including some charred ?twig/root/rhizome fragments – also a little ?silicified ash (to 2 mm)	3
					Worked flint? 4-1	One small flint fragment (to 5 mm) - ?debitage	<1
					Residue 4-1 'scanned 10% sample only'	Mostly fine unidentified charcoal (to 2 mm) and sand, with a few stones (to 8 mm)	1448
					Charcoal 9-5	Unidentified charcoal fragments (to 29 mm), including charred ?twig/root/rhizome	10
					Charcoal >10	One fragment of unidentified wood charcoal (to 10 mm)	~1
337	38	3	20	Fill of internal feature	flot	Fine matted rootlets, sand and atrace of fine (to 1 mm) charcoal	10
					Residue 4-1	Mostly small lumps of undisaggregated sediment (often concreted with iron-oxide), with some small stones (to 5 mm, including flint), sand and modern rootlets, and traces of coal and charcoal (both to 5 mm)	472
					Charcoal 9-5	Larger charcoal fragments (to 20 mm) – unidentified, most with iron-oxide mineral replacement and coated with sand grains	2
341	40	?	0.5	Kiln fill	flot	Mostly modern rootlet fragments, with a few sand grains and a trace of very fine charcoal (to 1 mm)	2
					Charcoal 4-1	Mostly unidentified charcoal fragments (to 10 mm), with 1 piece of coal (to 6 mm), two stones (to 5 mm)and a few modern rootlet fragments	~2
					Charred grain 4-1	1 rounded and poorly preserved charcoal fragment (to 5 mm)	<1
					Residue 4-1 'scanned'	Mostly small stones (to 7 mm), with quite a lot of charcoal (to 4 mm) and a little cinder and coal (both to 4 mm)	50
					Charcoal 9-5	35 larger charcoal fragments (to 20 mm) – unidentified but no root/rhizome fragments were present	~3
342	34	?	5	Beam slot fill	flot	Mostly matted modern rootlets, with a little modern 'straw', some sand and a trace of charred material (?charcoal). Also 1 charred orache/goosefoot seed	5
					Fuel ash waste 4-1	A mix of small fragment of coal, cinder, ash and charcoal (all to 6 mm) and a few lumps of undisaggregated sediment (to 4 mm)	~1

CN	SN	Phase	Size	Context type	Label	Description	Vol/Wt
					Residue 4-1	Small lumps of undisaggregated sediment (to 4 mm, concreted by iron-oxide), stones (to 4 mm), with traces of coal/charcoal and cinder (both to 5 mm) and modern rootlets	75
					Residue 9-5	As for Residue 4-1 but with larger sediment lumps (to 18 mm)	41
352	35	?	5	Beam slot fill	flot	Mostly modern rootlets and sand grains, with one earthworm egg capsule (modern) and one unidentified seed/fruit (modern); ~3 ml	3
					fuel waste 4-1	Mix of fragments of charcoal, cinder and coal, with some stones (all to 6 mm)	~1
					fuel waste 9-5	7 items to 14 mm – 2 of charcoal/cinder, 1 stone, 1 of ?mineralised wood and 3 of ?mineral sediment concretion	~1
					grain 9-5	3 ?grain/cinder fragments (to 5 mm)	<1
354	36	?	4	Beam slot fill	Fuel waste 4-1	15 small pieces of cinder/fused ash, a few fragments of unidentified charcoal and 1 piece of coal (all to 4 mm)	<1
					Residue 4-1	Mostly mineralised (?iron oxide) sediment concretions (to 5 mm), with some sand, a few small stones (to 4 mm) and an occasional fragments of fine cinder and coal (both to 3 mm)	<1
370	42	4	10	Kiln fill	flot	Matted modern rootlets, with a little sand and a trace of fine (to 1 mm) charcoal	5
					2nd flot	Mostly charcoal (to 15 mm) – largely charred rootlet/rhizome – with a little sand and modern rootlet. There were also 1 or 2 unidentified ?charred seeds, a *Cecilioides acicula* (Müller) shell apex fragment (this is a burrowing species of land snail and almost certainly intrusive to the deposit) and a few pieces of modern beetle sclerite	30
					Residue 4-1	Large mixed ash/sediment lumps and charcoal (mostly more charred root/rhizome), with an occasional small stone (to 6 mm) and a little sand	990
					Charcoal 9-5	Larger fragments of charred root to 24 mm	9
377	43	?	3	?	flot	Mostly matted modern rootlets and sand, with an occasional fragment of other modern plant material and a trace of fine (to 1 mm) charcoal	5
					Residue 4-1	Mostly small lumps of undisaggregated sediment (to 8 mm) – concreted by iron-oxide impregnation – with some sand grains and a few modern rootlets	127
423	47	?	10	Possible cremation	flot	Fine modern rootlets and sediment	3
					Charcoal 4-1	Small fragments of sediment coated charcoal (to 11 mm)	5
					Coal 4-1	7 pieces of coal (to 5 mm)	<1
					Fuel ash waste 4-1	1 piece of cinder/fused ash (to 2 mm; <1 g) and 1 unidentified charred plant fragment (<1 g)	~1
					Grain 4-1	4 unidentified charred grains and 4 charcoal fragments (to 4 mm)	<1
					Residue 4-1 'stone'	Mostly ?indurated fused sediment lumps (to 9 mm), with traces of charcoal (charred root/rhizome), an occasional modern rootlet fragment and a little sand	283
					Charcoal 9-5	36 pieces of sediment coated unidentified charcoal (to 17 mm)	7
					Charcoal >10	12 larger unidentified charcoal fragments (to 19 mm) and 1 piece of cinder (to 15 mm)	7

CN	SN	Phase	Size	Context type	Label	Description	Vol/Wt
480	54	?	10	Possibly associated with kiln	flot	Mostly matted modern rootlets, with a little sand, numerous ?*Heterodera* cysts, traces of coal and cinder (both to 4 mm) and a few ?charred orache/goosefoot seeds. Also 1 modern (not charred) elder seed	5
					Residue 4-1	Mostly small stones (to 8 mm), with some sand and mineral concretions, with a little coal and cinder (both to 5 mm), occasional charcoal fragments (to 4 mm) and a few modern rootlets	72
					Coal >10	1 piece of coal to 17 mm	1
481	53	?	3	?	flot	Approximately equal parts fine charcoal (to 4 mm, including charred ?rootlet/rhizome) and modern rootlet (not charred). There were also a few earthworm egg capsules, a little sand and an occasional modern elder seed.	10
					Residue 4-1	Mostly lumps of undisaggregated sediment (to 14 mm), with some sand, small stones (to 3 mm, including flint) and charcoal (addditional charred ?root/rhizome)	201
491	52	?	3	?	flot	Mostly fine charcoal (to 10 mm, including some charred root/rhizome), with a little modern rootlet (very fine) and a trace of sand	5
					Charcoal/fuel waste 4-1	30 charred fragments (to 10 mm) – mostly of fine root/rhizome – and a few small sediment concretions (to 4 mm)	~1
					Residue 4-1	Mostly small stones (to 4 mm), with some charcoal (to 4 mm, including charred root/rhizome), a little concreted sediment and traces of modern rootlet	84
					Charcoal/fuel waste 9-5	Mostly larger charcoal fragments (to 30 mm), perhaps 60 in total including some charred root/rhizome, with a little sand	5
493	55	?	10	Burnt fill of possible firebox	flot	Mostly modern rootlet, with a little modern 'straw', some earthworm egg capsules, a trace of charcoal/cinder and 1 ?charred seed of orache/goosefoot	5
					Charcoal/fuel waste 4-1	Mostly charred root/rhizome fragments to 14 mm, with a little modern rootlet, some burnt stones (to 8 mm) and a few lumps of undisaggregated sediment (to 5 mm)	4
					Residue 4-1	Composed of stones (to 15 mm, including flint), sand, charcoal (as for 4-1 fraction, above) and modern rootlet, with coal and lumps of ash and undisaggregated sediment (all to 12 mm), present	261
495	56	?	10	Fill of ditch closest to kiln	flot	Approximately equal parts matted modern rootlets and fine (to 2 mm) unidentified charcoal (including some charred rootlet/rhizome), with a little sand and a few charred seeds of orache/goosefoot	8
					Charcoal 4-1	Mostly unidentified charcoal (to 14 mm, including further charred root/rhizome), with 1 fragment of modern rootlet	~3
					Fuel ash waste 4-1	6 small pieces of ?cinder (to 9 mm)	<1
					Residue 4-1 'scanned and sampled'	Mostly unidentified charcoal (to 5 mm) and fused ?ash lumps (to 5 mm), with some modern root/rootlet, a little sand and small stones (to 4 mm)	210
					Charcoal 9-5	Unidentified charcoal fragments (to 18 mm) – most probably charred root/rhizome	~2

CN	SN	Phase	Size	Context type	Label	Description	Vol/Wt
					Fuel ash waste 9-5	1 piece of cinder (to 7 mm) and 1 piece of coal (to 4 mm), both <1 g	~1
					Residue 9-5	Mostly stones (to 22 mm), with occasional fragments of modern rootlet, some fine sand and 1 sherd of ?pot (to 11 mm; ~1 g)	53

Appendix 6

Linwood Road, Market Rasen, Lincolnshire
The Animal Bone
By Jennifer Kitch

Introduction
A total of 18 (48g) fragments of animal bone were recovered by hand during the excavation at Linwood Road. A further 262 (63g) fragments were recovered from the environmental samples sieved through meshes of >10mm, 10 - 5mm and 5 - 2mm.

Methodology
Identification of the bone was undertaken at PreConstruct Archaeology (Lincoln) with access to a reference collection and published guides. All the animal remains were counted and weighed, and where possible identified to species, element, side and zone (Serjeantson 1996). Also fusion data, butchery marks (Binford 1981), gnawing, burning and pathological changes were noted when present. Ribs and vertebrae were only recorded to species when they were substantially complete and could accurately be identified. Undiagnostic bones were recorded as micro (rodent size), small (rabbit size), medium (sheep size) or large (cattle size). The separation of sheep and goat bones was done using the criteria of Boessneck (1969) and Prummel and Frisch (1986), in addition to the use of the reference material. Where distinctions could not be made, the bone was recorded as sheep/goat (s/g).

The condition of the bone was graded using the criteria stipulated by Lyman (1996). Grade 0 being the best preserved bone and grade 5 indicating that the bone had suffered such structural and attritional damage as to make it unrecognisable.

The quantification of species was carried out using the total fragment count, in which the total number of fragments of bone and teeth was calculated for each taxon. Where fresh breaks were noted, fragments were refitted and counted as one. In addition the minimum number of individuals (MNI) was calculated using the zoning method (Serjeantson, 1996). The elements used for working out MNI do not include ribs, vertebra, loose teeth, tarsals and carpals.

Tooth eruption and wear stages were measured using a combination of Halstead (1985), Grant (1982) and Levine (1982), and fusion data was analysed according to Silver (1969). Measurements of adult, that is, fully fused bones were taken according to the methods of von den Driesch (1976), with asterisked (*) measurements indicating bones that were reconstructed or had slight abrasion of the surface.

Results

The condition of the bone is relatively poor, averaging grades 3 and 4 on the Lyman (1996) criteria.

The site geology on site was of blown sand, naturally acidic creating poor preservation conditions for bone. The majority of the assemblage consists of tooth enamel and burnt bone, both of which are more resistant to decay.

Table 1, Summary of Taxa from the Hand Collected Assemblage

Taxon	Total
Cattle	13
Horse	1

Large Mammal	1
Medium Mammal	3

Table 2, Summary of Taxa from the Sieved Assemblage

Taxon	**Total**
Cattle	2
Sheep/Goat	4
Large Mammal	3
Medium Mammal	2
Small Mammal	1
Unidentified	248

Table 1 and 2 summarises the number of identified taxa recovered from the hand collected and sieved assemblage. The majority of the remains were burnt suggesting that the remains were burnt as part of the disposal process or utilised as fuel in hearths. The assemblage is too small to provide any meaningful data on animal husbandry or utilisation. Little further information can be gained save the presence of the species on site.

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Ctxt No	Sample No.	Taxon	Element	Side	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Prox	Dist	Path	Butch	Burnt	Gnaw	Fresh Break	Assoc'd	Meas'd	Tooth Wear	Surface	Condition	No.	(g)	Notes
479	0	Cattle	Tooth	L	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	X	2	1	12	Lower M2 unworn
479	0	Cattle	Tooth	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	X	2	3	3	Molar fragments
417	0	Medium Mammal	Skull	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	2	0	Burnt white
417	0	Medium Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	1	0	Burnt white
269	0	Cattle	Tooth	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	X	2	5	5	Molar enamel fragments
291	0	Equid	Metapodial	L	N	N	N	N	N	N	Y	Y	X	F	N	N	N	N	N	N	N	N	X	5	1	22	
187	0	Large Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	1	2	Burnt white
274	0	Cattle	Tooth	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	Y	N	N	N	X	2	1	1	Molar enamel
52	0	Cattle	Tooth	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	X	2	3	3	
337	38	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	4	0	burnt white
337	38	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	4	0	Burnt grey
247	18	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	4	0	Burnt white
291	24	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	2	1	Burnt white grey
291	24	Sheep/Goat	Tooth	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	Y	N	N	N	X	3	3	0	Enamel fragments
291	24	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	X	4	8	1	
232	13	Medium Mammal	Rib	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	1	1	Burnt white
232	13	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	1	0	Burnt white
247	18	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	30	1	Burnt white/grey
209	23	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	X	4	1	0	
239	17	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	4	8	0	Burnt grey
239	17	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	19	1	Burnt white
239	17	Medium Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	1	0	Burnt white/grey
239	17	Small Mammal	Rib	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	1	0	Burnt grey

Ctxt No	Sample No.	Taxon	Element	Side	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Prox	Dist	Path	Butch	Burnt	Gnaw	Fresh Break	Assoc'd	Meas'd	Tooth Wear	Surface	Condition	No.	(g)	Notes
423	47	Cattle	Metapodial	X	N	N	N	N	N	N	Y	Y	X	X	N	N	Y	N	N	N	N	N	X	5	2	19	Burnt grey white
423	47	Large Mammal	Skull	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	4	1	9	Burnt grey white
423	47	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	2	3	Burnt white
423	47	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	4	4	5	Burnt grey
291	29	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	4	10	0	Burnt white
291	29	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	X	4	10	0	
239	17	Sheep/Goat	Humerus	R	N	N	N	N	Y	N	Y	Y	X	F	N	N	Y	N	Y	N	N	N	X	3	1	3	Burnt white
239	17	Large Mammal	Rib	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	3	5	Burnt white
239	17	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	4	5	4	Burnt grey
239	17	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	4	36	1	Burnt white
87	19	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	4	4	0	Burnt white
223	13	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	4	6	0	Burnt white
223	13	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	1	0	Burnt white
223	13	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	X	4	4	0	
423	47	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	4	50	3	Burnt white
247	18	Medium Mammal	Rib	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	1	0	burnt brown/grey
423	47	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	3	10	1	Burnt white
423	47	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	Y	N	N	N	N	N	X	4	25	5	Burnt grey/bown

Key:- Zones According to Serjeantson (1996)

Fusion, P= Proximal (U=unfused, F=Fused, B=Unfused epiphysis present)
D= Distal (U=unfused, F=Fused, B=Unfused epiphysis present)

Surface, R=rootlet etched
W= weathered
A= abraided

Lyman Condition Criteria (1996), 1= Pristine, 5=Unrecognisable

Appendix 7

Assessment of Non-Ceramic Finds from Linwood Road, Market Rasen (LRM05)

Alan Vince

Archaeological fieldwork on land to the east of Linwood Road, Market Rasen, undertaken under the direction of Will Munford for Pre-Construct Archaeology (Lincoln) Ltd produced a small quantity of metal and stone finds.

Description

Glass

A small fragment of light green window glass was recovered from context 66, the fill of ditch F2. Glass of this type is usually of late medieval to early post-medieval date (i.e. 14th to mid 17th century) and would have been uncommon on rural settlements before the late 16th century.

Iron

A completed corroded lump of iron was recovered from the fill of Pit 237 (context 291). It is possible that radiography would reveal the shape of the object, which now is represented by a void surrounded by corrosion products.

Stone

Three lumps of flint, all of them probably casts of fossil sea urchins, were recovered from the fill of Furrow F1 (context 429), Furrow 472 (context 469) and Ditch 390 (context 389). There is no evidence that they were selected by man rather than being present in the underlying gravels. However, the finding of three such fossils is remarkable.

Assessment

Only one of the finds can be independently dated, the window glass. It probably came onto the site with manure, either dung from the farm or night soil from the town's middens. In either case, a window of this type was probably leaded with diamond panes and could have survived for decades before being broken or replaced. The complete corrosion of the iron suggests that it is of Roman date, as does its presence in a pit. The remaining finds are

probably not artefacts, and two of the three come from furrows where redeposited natural gravel might be expected.

Further study

The iron object could be x-rayed in the hope that the form of the object survives as a void. None of the remaining items require further study.

Retention

The glass and the iron should be retained. Since the flint nodules are unmodified there is little to be gained from retaining them, even if they did arrive on the site as a result of human agency.

Appendix 1

REFNO	Context	class	Cname	Subfabric	Form	Part	Description	Nosh	NoV	Weight
	291	IRON	IRON		OBJECT	BS		4	4	10
SF1	066	PMGL	PMGL	LTGR	WIND	BS		1	1	1
SF5	429	STONE	STONE	FLINT	GEO	BS	FOSSIL SEA URCHIN	1	1	149
	469	STONE	STONE	FLINT	GEO	BS	FOSSIL SEA URCHIN	1	1	106
SF4	389	STONE	STONE	FLINT	GEO	BS	FOSSIL SEA URCHIN	1	1	115

Appendix 9

Market Rasen Earthworks Survey
By Simon Savage

1.0 Methodology

The survey was carried out on 23rd and 24th March 2005 using a Pentax PCS-325N total station. After a rapid walkover, a baseline was established and the areas of ridge and furrow surveyed. The survey was undertaken with reference to a local benchmark enabling OD heights to be directly recorded. Two transects were selected in order to produce typical profiles across the areas of surviving ridge and furrow (figs. 3 and 4).

Colour photographs complement the survey (appendix A).

2.0 Results (Figs. 3-4)

The site is divided into two fields. The smaller field (Field 1) was in the south west and occupied approximately 0.6 hectares. It was bounded to the west and north by the gardens of neighbouring properties, to the south by a housing estate (under construction) and to the east by open fields (including Field 2). It was generally bounded by mature hedges, but the north side was delimited by a post and rail fence. Ground cover comprised rough grass, recently grazed.

Field 2 was located to the north east of Field 1. It occupied an area of c. 1.75 hectares, and was bounded to the north and south by open fields, and to the east by the gardens of neighbouring properties. Again, the boundaries generally comprised mature hedges, but the northern part of the west side consisted of a mixture of post and rail fencing, brick walls and fence panels, while the northern boundary comprised an iron railing.

Field 1
The ridge and furrow in this field was generally not well preserved, but survived better in the eastern part of the field. This field contained two distinct areas of medieval ridge and furrow earthworks, clearly divided by a double headland feature running east-west across the southern third of the field. The ridge and furrow to the north of this feature were oriented north-south and displayed a typical reverse 'S' curve in plan and had a larger ridge (or possibly a hedge bank on their eastern side. This ridge and furrow once continued beyond the northern boundary of the field. In the southern part of the field, earthworks could only be identified near to the eastern boundary where a small patch of east-west oriented ridge and furrow was seen. On the west side a low ridge aligned NW-SE was identified.

Field 2
This field contained three areas of medieval ridge and furrow earthworks. These were generally well preserved, but were better preserved in the eastern part of the field. A depression in the northwest part of the field appears to have been a pond. The ridge and furrow seen here falls into two distinct types, that in the western part of the field

was broader than that to the east: this suggests that a field boundary once separated the two areas, and this is further reinforced by the fact that the present north side of the field kinks in the area where the two fields would have joined. The broader ridge and furrow was generally aligned north-south, while the narrower ridge and furrow was aligned NE-SW and displayed the typical reverse 'S' curve of medieval ploughing. The earthworks extended beyond the northern field boundary. To the west of the pond a further small area of east-west oriented ridge and furrow was present.

3.0 Discussion and Conclusions

The survey has demonstrated that the application area contains parts of five distinct fields of a wider medieval agrarian landscape. These fields are characterised by ridge and furrow separated by headlands, and are identifiable by the separation and direction of the ridge and furrow. The earthwork remains of a pond survive in the northwestern part of Field 2.

The survey did not identify any evidence for domestic occupation such as closes or building platforms.

The earthwork survey has mitigated the loss of these landscape features that will be caused by the proposed development.

4.0 Effectiveness of Methodology

The methodology employed has allowed the rapid and accurate preservation by record of the earthworks present in these fields.

9.0 Acknowledgements

Pre-Construct Archaeology (Lincoln) would like to thank Hugh Bourne Homes for this commission. Thanks are also due to Jennifer Kitch and R D Gardner for their assistance during the course of the earthwork survey.

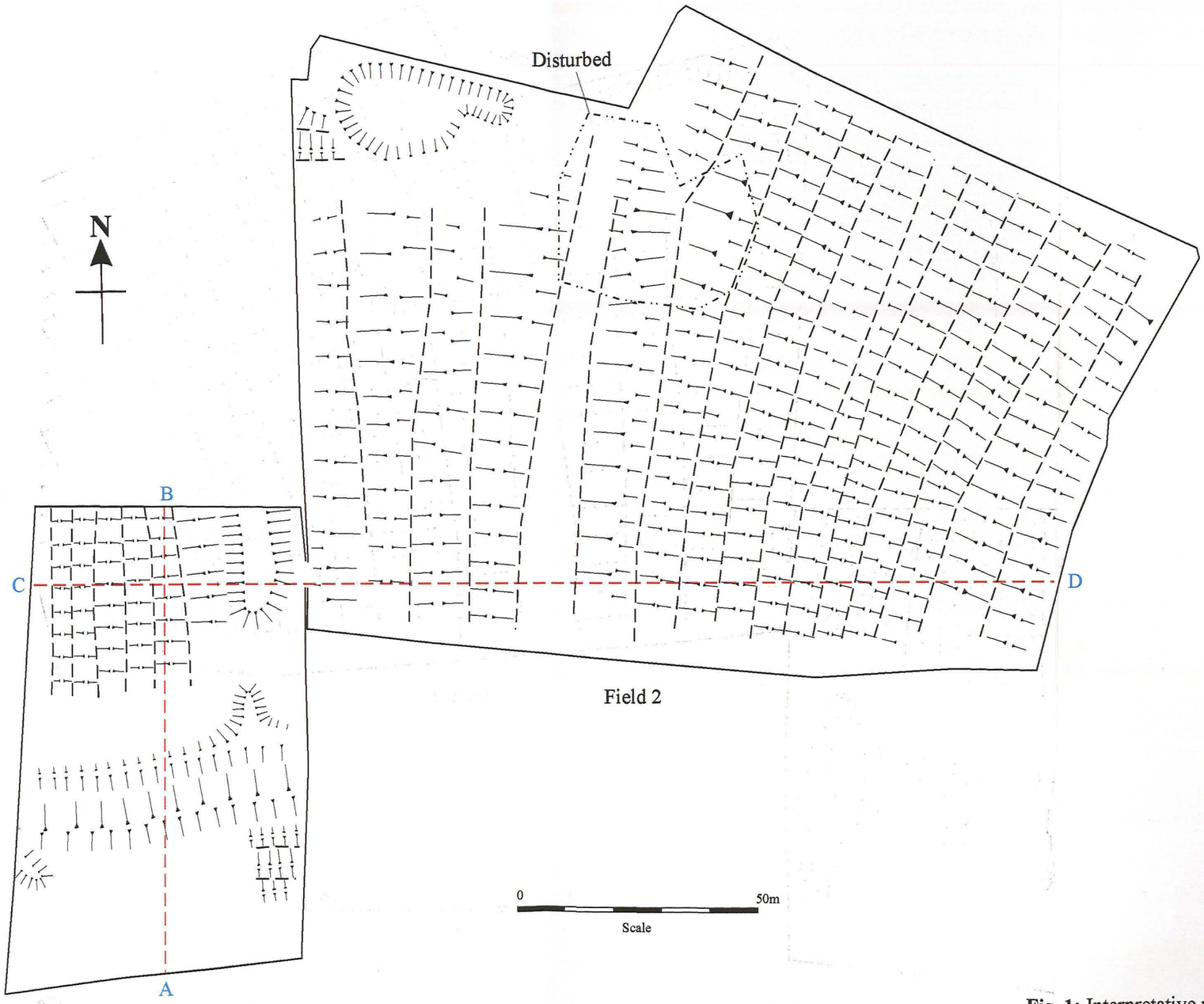


Fig. 1: Interpretative plan of the earthworks, with all slopes shown as hachures. The furrows in the have been shown for clarity. Scale 1:1000.

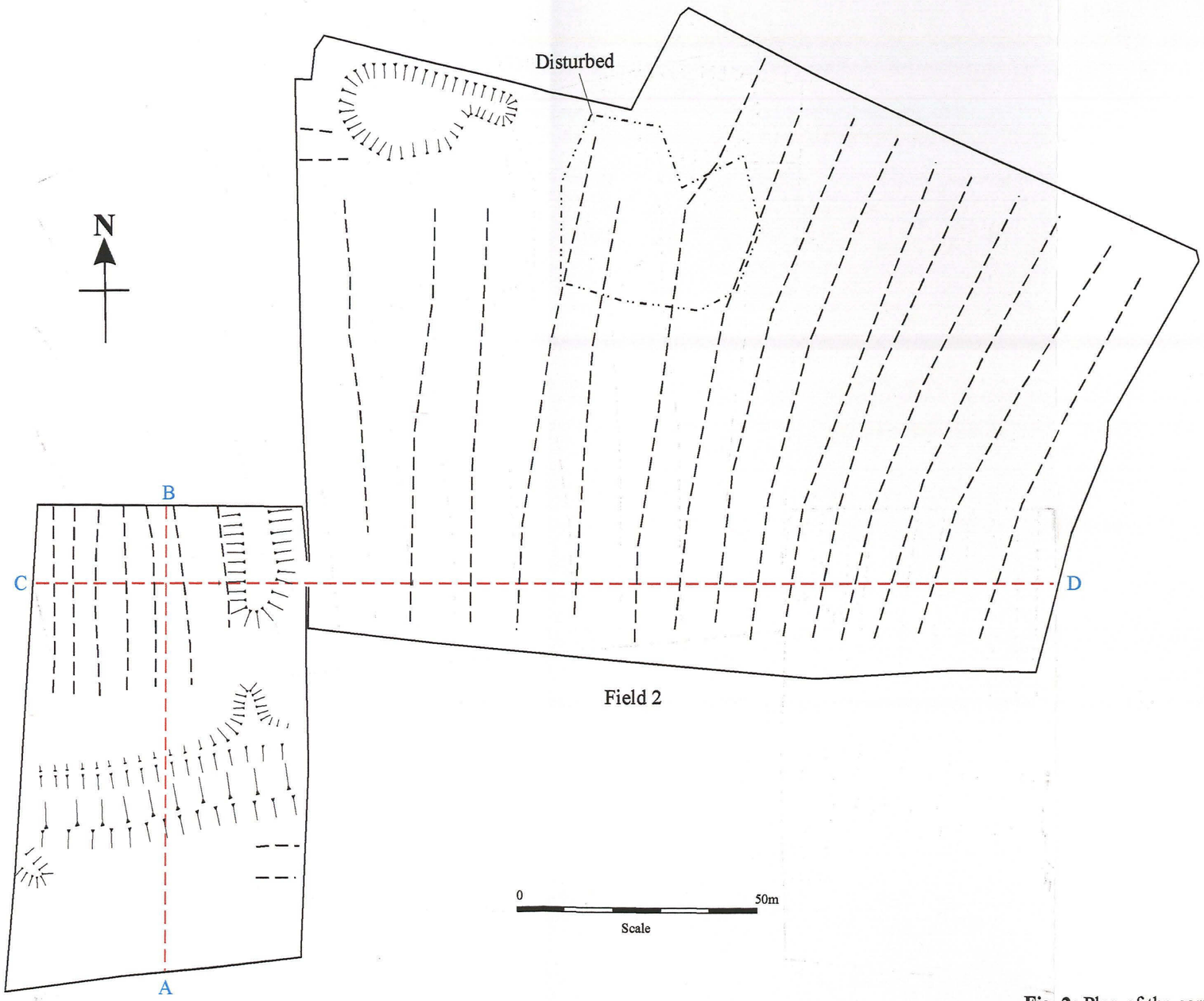


Fig. 2: Plan of the earthworks, with features shown to RCHME conventions. Scale 1:1000

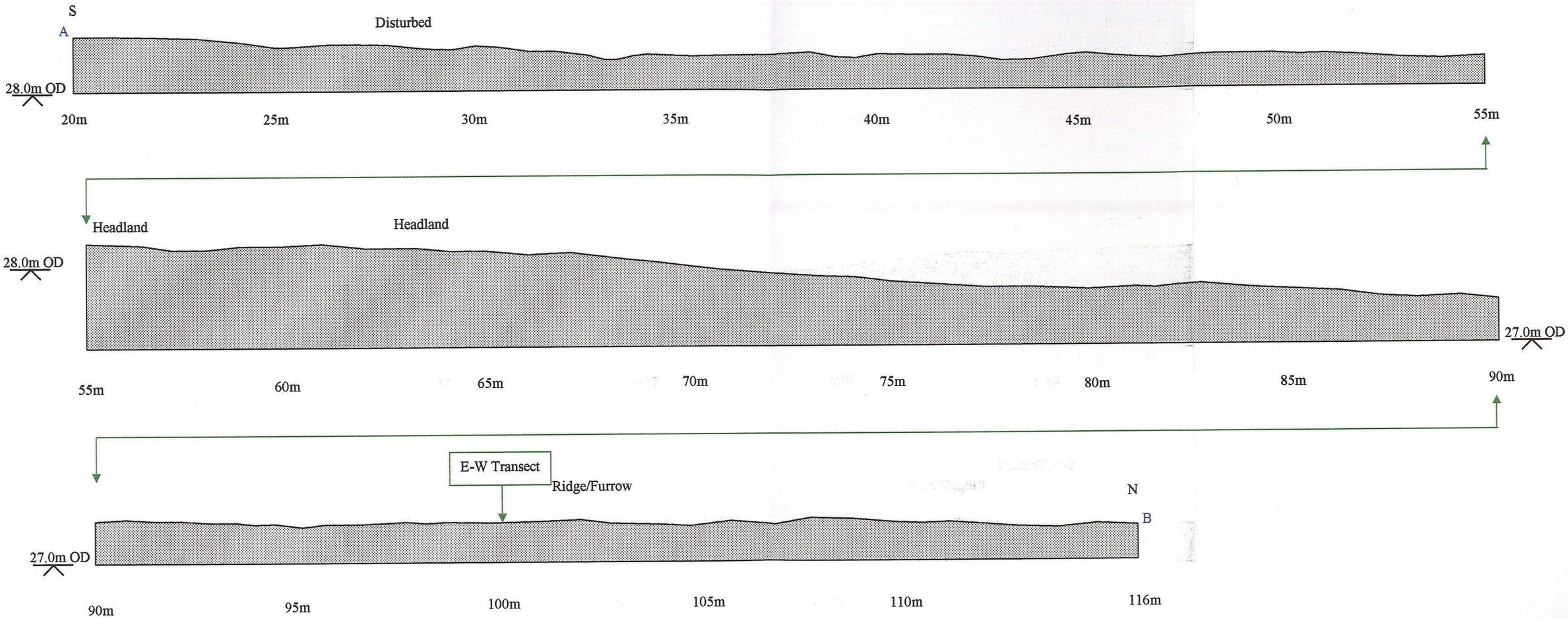


Fig. 3: East facing profile across earthworks in Field 1. Scale 1:100

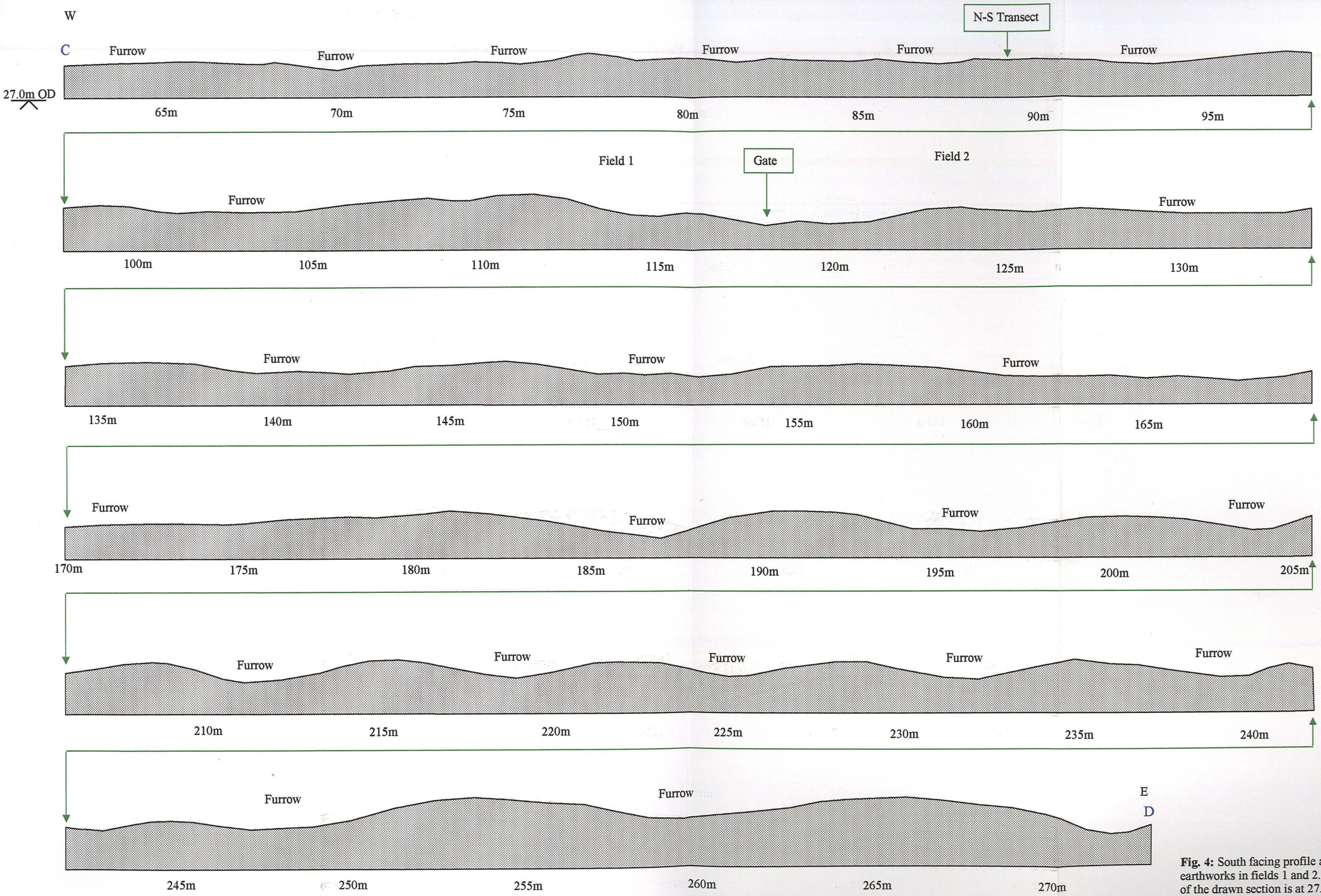


Fig. 4: South facing profile across earthworks in fields 1 and 2. The base of the drawn section is at 27.0m above sea level. Scale 1:100.

Appendix A: Colour Plates

Plate 1 (left): General view of Field 1, taken from the southeast corner, looking north.

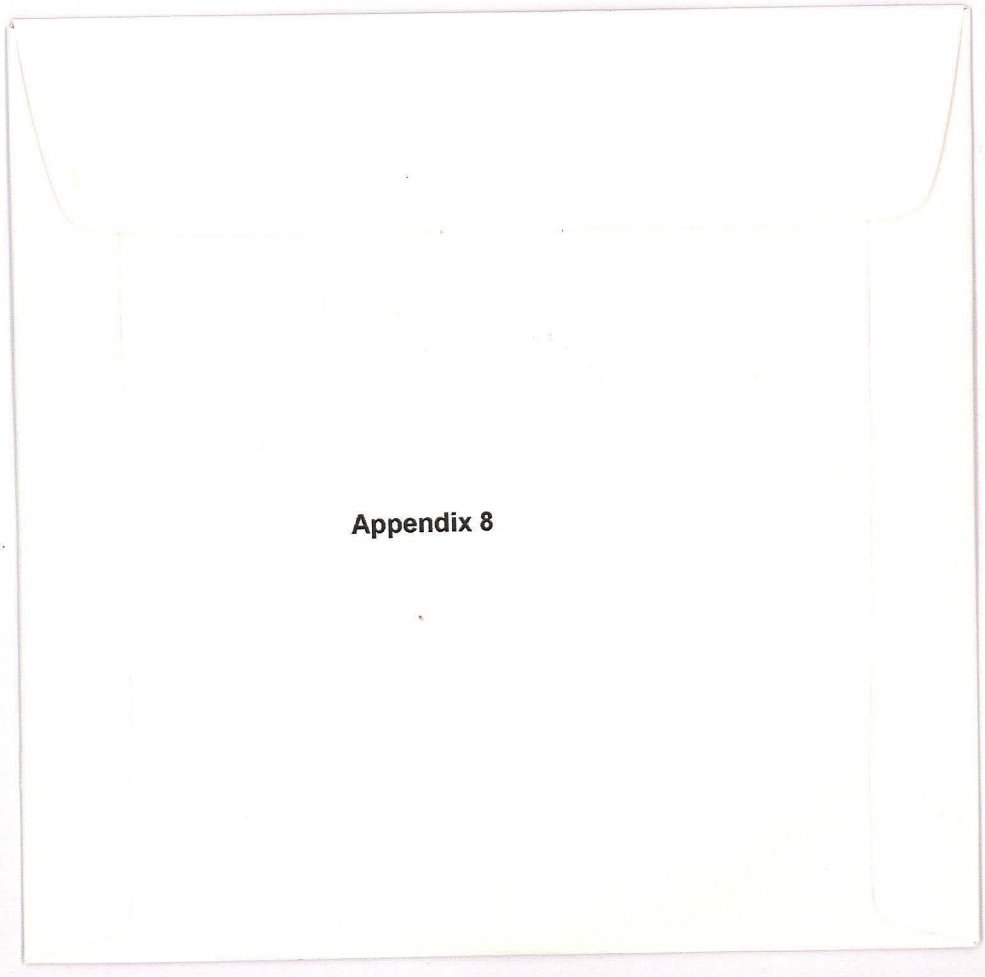
Plate 2 (right): General view of Field 1, looking northeast from the southwest corner.

Plate 3 (left): General view of Field 1, taken from the northeast corner, looking south.

Plate 4 (above): Panoramic view of Field 2, from the northeast corner panning from south west to west.

Plate 5 (above): Field 2, looking northwest from the south eastern corner.

Plate 6 (left): General view of field 2, taken from the southwest corner, looking northeast.



Appendix 8