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An Archaeological Evaluation at Greenhouse Farm, Newmarket Road, Cambridge 1996

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1.0 Summary

An archaeological evaluation was conducted by Birmingham University Field Archaeology Unit at Greenhouse Farm, Newmarket Road, Cambridge, in the period 22nd July - 2nd August 1996. The evaluation was carried out in advance of the proposed development of the site for a Park and Ride facility. Prior to this project no below-ground archaeological investigations had been conducted within the proposed development site or in its immediate environs and the potential for the survival of archaeological deposits, their nature and condition, was unknown. The evaluation comprised air photograph plotting and analysis, and the excavation of eighteen trial trenches. Archaeological features were identified in Trenches 12-18. These features, which survived at a depth of between 0.40m and 0.70m below the present ground surface, represent Early Iron Age and Middle to Late Iron Age settlement features, some of which had been recorded as cropmarks on aerial photographs, with associated pits and gullies.

2.0 Introduction

This report describes the results of an archaeological evaluation carried out at Greenhouse Farm, Newmarket Road, Cambridge. The work was undertaken by Birmingham University Field Archaeology Unit on behalf of the Department of Transportation, Cambridgeshire County Council and fulfilled a planning application requirement that an archaeological evaluation be undertaken in advance of an application for a Park and Ride facility on land surrounding Greenhouse Farm. The archaeological evaluation was conducted in accordance with the Institute of Field Archaeologists Standard and Guidance for Field Evaluation (Institute of Field Archaeologists 1994), a brief prepared by Cambridgeshire County Council (Sydes 1995), and a Specification and Supplementary Specification prepared by Birmingham University Field Archaeology Unit (Jones 1996). This Evaluation conformed to Planning Policy Guidance Note 16 (Department of Environment 1991).

3.0 The Site and its Location (Figures 1 and 2)

The site consists of approximately seven hectares of cultivated land, at the centre of which is Greenhouse Farm (NGR TL 4920 5940). An access to Newmarket Road is located at the southeast corner of the site. With the exception of a thin strip of land to the east, the site is currently owned by Marshalls Limited. The land is currently allocated as a proposed Park and Ride location for Cambridge.

The site is located within an area of known archaeological context. The County Sites and Monuments Record contains reference to a cropmark ring ditch to the east of the site (PRN 9237), and to spot finds of Iron Age pottery and animal bone to the south and southwest (PRN 5156 and PRN 5151 respectively), and flint artefacts immediately to the north (PRN 04514). The County Archaeology Office considered that there was a potential for locating prehistoric and possible Roman occupation sites within the site (Sydes 1995).

The geology comprises fourth river terrace gravel, overlying Lower Chalk which may impinge slightly along the eastern boundary (Deegan with Palmer 1996).

4.0 Objectives

The objectives of the archaeological evaluation were to determine the location, extent, date, character, condition, significance and quality of any surviving archaeological remains liable to be affected by the proposed development (Sydes 1995).

5.0 Method

The re-assessment and re-plotting of aerial photographic evidence was completed prior to the excavation of a total of eighteen trial trenches. A JCB excavator was used to remove the modern topsoil overburden to the top of any significant archaeological features and deposits, or to the top of the subsoil, in the trial trenches. Trenches 1-12 were spaced randomly to test the site as widely as possible, whilst Trenches 13 and 14 were placed with the objective of transecting a number of features which had been mapped by aerial photography (see Section 6.0 below). Following the identification of archaeological features in Trenches 13 and 14, these two trenches were extended and an additional four trenches (Trenches 15-18) were excavated to help establish the spatial limit of the settlements represented.

The evaluation sampling strategy comprised the sampling of one in every two pits and the majority of the linear features. Sections were not cut across intersecting pits because of the difficulty of defining individual feature fills. All trenches were re-inspected after two to three days of being opened - ditch F272 in Trench 13 and pits F779 and F780 in Trench 14 showed only after this period of 'weathering'.

All stratigraphic sequences were recorded, even where no archaeology was present, and contextual information was supplemented by scale drawings, plans, sections and photographs which, together with recovered artefacts, form the site archive. This is presently housed at Birmingham University Field Archaeology Unit.

6.0 Aerial Photographic Assessment *by Alice Deegan with Rog Palmer*

This section provides a summary of the methodology and results of aerial photographic assessment. A detailed description of the assessment results, and the sources consulted, is provided in Deegan with Palmer (1996).

6.1 Introduction

Detailed archaeological interpretation of contemporary and historical aerial photographs allows the accurate mapping of archaeological and natural environmental features recorded as tonal differences in crop, grassland, soil or vegetation, or as features seen in relief. Aerial photographic evidence is, however, limited by seasonal, meteorological, botanical and other environmental factors. These factors affect the extent to which either buried or upstanding archaeological sites can be detected under a given set of environmental conditions (Riley 1987, 17-40; Wilson 1982, 27-69).

Within their limitations, aerial photography and photographic interpretation provide information which cannot easily be detected by other means, and are complementary parts of multi-disciplinary archaeological investigation. They also provide a cost-effective landscape overview and accurate guidance for ground based investigations or positioning of evaluation trenches.

6.2 The Proposed Development Site

The proposed development site lies on chalky drift and chalk, giving rise to soils of the Swaffham Prior association (Soil Survey of England and Wales 1983a, 1983b) SSEW classification 511e. These soils are well-drained, calcareous and coarse. The underlying chalk provided a soft and easy medium for the digging of ditches in pre-modern times, and the well-drained soils allow the development of crop marks over former embanked and cut features under suitable environmental conditions and favourable arable regimes (Wilson 1979). These chalks also show striped and polygonal soil patterns locally over geological irregularities or eroded areas.

Cambridge Airport is situated immediately to the south of the site, which lies within its landing circuit. The observation and photography of further sites within the proposed development site and its environs may have been hampered by the demands of flying in this busy circuit, which is used by commercial air traffic, private students and pilots, and RAF cadet training schools. The examination of vertical photographs, taken over a long time-span, was thus considered to be particularly important in this instance.

6.3 Photographs Examined

Photographs from the Cambridge University Collection of Aerial Photographs (CUCAP), the National Library of Aerial Photographs (NLAP), and the Cambridgeshire County Record Office were consulted.

6.4 Specification

All available aerial photographs were interpreted to identify archaeological and relevant non-archaeological information (the latter including soil depth changes and any recent sub-surface disturbances which may affect the integrity and understanding of features evaluated in the field). Photograph interpretation aimed to qualify reasons for the visibility of archaeological evidence and to explain, as necessary, any gaps in the aerial record. The search also extended

slightly beyond the boundary of the site, to determine whether any archaeological features were likely to continue from their sources into the site.

The proposed development site and its immediate environs was assessed and all archaeological features (from prehistoric through to the National Monuments Record terminal date of 1945) which were visible on aerial photographs were mapped in detail to an accuracy compatible with that of the scale, the copies of the Ordnance Survey maps and the tolerances of photographic quality. Standing buildings were not recorded.

6.5 Methodology

Photographic interpretation, rectification and mapping was carried out following the procedures defined by Palmer and Cox (1993). All photographs were closely examined under 1.5x and 4x magnification, and viewed stereoscopically, where appropriate. Transparent interpretative overlays were prepared, from which archaeological and associated relevant information was digitised.

Interpreted features were rectified, where appropriate, by computer using the Bradford aerial photographic rectification software, AERIAL 4.20 (Haigh 1993). AERIAL 4.20 calculates values for the closeness of control point match. Using an initial plane surface rectification, the mean control point positioning error in all cases was under ±2.0m.

6.6 Results

Within the Site

Feature centred TL 4931 4928.
A feature of dubious archaeological potential seen on only one set of vertical photographs (MAL/71105 171-173, taken in 1971). These photos are good quality, large scale, and were viewed stereoscopically. The cropmarks are clearly visible amongst patches of faster ripening and lodged crop. Whether the cropmarks are archaeological or geological in origin was difficult to determine from one set of aerial photographs. Areas of geological features, causing diffuse crop marks and 'patterned' ground were observed in fields around the study area. However, given the definition and morphology, the cropmarks were considered to be of potential archaeological origin, perhaps formed by buried archaeological ditches defining a pair of small irregular possible enclosures.

Outside the Site

Feature centred TL 4922 5959.
Linear bank running towards the western edge of the site from the northwest. This is probably the remains of a ploughed-out headland. Continuation into the site could not be observed on the aerial photographs consulted.

Feature centred TL 4957 5939.
A levelled, ditch-defined, curvilinear enclosure with one straight side. This enclosure may date to the Iron Age or Romano-British periods, and lies less than 100 metres from the site. Its presence illustrates the potential for the discovery of archaeological features in the

proposed development site. Positive cropmarks show an area of perpendicular linear ditches, possibly associated with this isolated enclosure, at a distance of 250m to the northeast of the site.

The area to the south of Newmarket Road has long been occupied by Cambridge Airfield which was seen on all photos examined for this assessment. The maintenance of the airfield as open short-mown grassland has provided many opportunities for the recording of the plough levelled medieval agricultural landscape across this area. Vertical photograph FNO/64 6085 illustrates the crop-marked ridge and furrow and headlands particularly well. This evidence also suggests that the medieval activity would have extended north of the road, into the site.

6.7 Landuse

The area mapped as woodland has comprised mature deciduous trees throughout the duration of photographic coverage. There has been no observable uprooting or planting of new trees since that time.

TABLE 1: Landuse

Decade	*AP source*	*Landuse:*		
		North field	*South field*	*Eastern strip*
1940s	CPE/UK/2359	arable	rough pasture	
1950s	540/1143	arable	arable	arable
1960s	MAL69070	rough pasture	rough pasture	arable
1970s	MAL71105	arable	arable	arable
1980s	RC8-Kn BG	pasture	pasture	arable
1990s	RC8-Kn CS	pasture	pasture	arable

7.0 The Archaeological Results (Figures 2, 3 and 4)

A continuous numbering system was employed for both excavated and non-excavated features and deposits within each of the 18 trial trenches.

Trench 1
(1.50m x 50m, aligned north - south, excavated to a depth of 14.37m AOD).

The subsoil comprised white chalk-clay and brown sand-gravel. This was overlain by 0.15-0.20m of mottled silt-sand which was sealed by 0.25m of topsoil. No archaeological features were identified in this trench.

Trench 2
(1.50m x 50m, aligned north - south, excavated to a depth of 14.38m AOD).

As in Trench 1, the subsoil comprised white chalk-clay and brown sand-gravel. It was overlain by 0.20m of mottled silt-sand which was sealed by 0.25m of topsoil. No archaeological features were identified in this trench.

Trench 3
(1.50m x 50m, aligned northeast - southwest, excavated to a depth of 13.78m AOD).

The yellowish-brown, sandy, clay-gravel subsoil was sealed by 0.30m of topsoil. No archaeological features were identified in this trench.

Trench 4
(1.50m x 50m, aligned north - south, excavated to a depth of 13.69m AOD).

The slightly silty clay-sand subsoil was overlain by 0.10m of yellowish, grey-brown silty-sand. This was sealed by 0.30m of topsoil. No archaeological features were identified in this trench.

Trench 5
(1.50m x 50m, aligned east - west, excavated to a depth of 13.69m AOD).

The subsoil comprised yellow-brown clayey sand, with some gravel. It was overlain by 0.10m of silty-sand, which was sealed by 0.30m of topsoil. No archaeological features were recorded in this trench.

Trench 6
(1.50m x 50m, aligned southeast - northwest, excavated to a depth of 13.67m AOD).

A yellow-brown, clayey, sand-gravel subsoil was sealed by 0.30m of topsoil. No archaeological features were identified in this trench.

Trench 7
(1.50m x 50m, aligned southeast - northwest, excavated to a depth of 13.08m AOD).

A mechanically excavated sondage at the southeastern end of this trench showed that a mixed layer of chalk and yellow sand was overlain by 0.20m of yellow-brown sandy-clay subsoil. This was sealed by 0.30m of topsoil. No archaeological features were identified in this trench.

Trench 8
(1.50m x 47m, aligned north - south, excavated to a depth of 13.75m AOD).

The yellow-brown, clay-sand-gravel was overlain by 0.30m of topsoil. No archaeological features were identified in this trench.

Trench 9
(1.50m x 55m, aligned north - south, excavated to a depth of 13.76m AOD).

A yellowish-brown, clayey, sand subsoil was overlain in part by a band of dark brown sandy clay-silt, which contained two sherds of modern white-glazed pottery. Elsewhere, the subsoil was sealed by 0.30m of topsoil. No archaeological features were identified in this trench.

Trench 10
(1.50m x 47m, aligned northeast - southwest, excavated to a depth of 13.72m AOD).

The yellow-brown, clayey, sand-gravel subsoil was overlain by 0.10m of yellowish-brown silty-sand. This was sealed by 0.26m of topsoil. A number of north-south aligned plough furrows were recorded, and the backfill of an earlier geological test-pit was recorded at the northeastern end of this trench. No archaeological features were identified.

Trench 11
(1.50m x 52m, aligned north - south, excavated to a depth of 13.89m AOD).

The yellow-brown clay-sand-gravel was overlain by 0.30m of topsoil. No archaeological features were identified in this trench.

With the exception of modern pottery fragments from Trench 9, no artefacts were recovered from Trenches 1-11.

Trench 12 (Figure 3)
(1.50m x 55m, aligned northwest - southeast, excavated to a depth of 14.31m AOD).

Three features, all of which cut the yellow-brown sand-gravel subsoil (1207), were identified in this trench. At the southeastern end, a shallow ditch (F652), filled with a grey-black, silt-sand (1206), ran southeast-northwest for approximately 3m before assuming a more northerly alignment. The ditch continued north and southeast beyond Trench 12. Five metres to the northwest, a northeast-southwest aligned gully (F651) cut across the trench. This gully was filled with a brown-grey silt-sand (1205), which closely resembled the upper fill of a ditch (F650, 1202) located immediately to the northwest. This ditch, F650, also aligned northeast-southwest, contained three fills (1202, 1203 and 1204). The lowest of these (1204) had a high silt content and yielded fragments of prehistoric pottery. Fill 1204 was overlain by a buff brown sand-silt (1203) which was, in turn, sealed by a brown-grey silt-sand (1202).

All three features were sealed by a 0.20-0.25m thick layer of grey-brown silty-sand (1201). This was overlain by 0.30m of topsoil (1200).

Trench 13 (Figures 3 and 4)
(1.50m x 65m, aligned northwest - southeast, excavated to a depth of 14.39m AOD).

Twenty-six features were identified; the majority were located within the southeastern two-thirds of the trench. All features cut the orange-brown gravel-sand subsoil (1302). At the northwestern end of the trench, a northeast-southwest aligned dark grey-brown band of silt-sand may represent the fill of a ditch (F727). This feature was not excavated. Approximately

8m to the southeast, an east-west aligned ditch (F717) was excavated. This was a steep-sided feature with a narrow but flat base. The lowest fill, which comprised a brown-grey silty-sand (1329), was cut by a small post-hole (F723). Some slumping occurred on the southeastern side of the ditch (1328), prior to its infilling with a mottled, orange-brown, silty-sand fill (1327), which sealed the post-hole (F723) and the earlier fill (1329). The latest of the three ditch fills was represented by a brown-grey, sandy-silt deposit (1316). The ditch (F717) and the post-hole (F723) were truncated by a later northeast-southwest aligned ditch (F718) which contained three fills: a charcoal-flecked silt-sand (1320), overlain by an orange-brown silty-sand (1312), sealed by a brown-grey sandy-silt (1310).

One gully and two possible palisade trenches, all aligned roughly northeast - southwest, were recorded 7.5m to the southeast (F714, F715 and F719). Palisade trench F715 was cut by the later feature F719. All three features continued to the west in Trench 17 and were filled with a silty-sand deposit (1317, 1318, 1319). This was flecked with charcoal in F714 and F715 (1318, 1317). Fragments of prehistoric pottery were recovered from the fill of F714 (1317).

Further to the southeast, a small cluster of pits (F713, F721), post-holes (F712, F720) and one possibly natural feature (F711), were recorded. With the exception of F711, the pits and post-holes were filled with silty-sand deposits; charcoal flecks and pottery were recorded only in post-hole F712 and pit F713.

A northeast-southwest aligned ditch (F710) was recorded at the junction of Trenches 13 and 14. The steeply-sloping sides extended down to a flat base on the northeastern side, which continued down to form a narrow slot at the base of the ditch. The slot was filled with a brownish-yellow silty-sand (1313) and a charcoal-flecked clayey silt-sand deposit (1311). Later slumping of material into the ditch was represented by a charcoal and chalk-flecked, grey-brown, silty-sand deposit (1308), which was sealed by clayey silt-sand with sparse charcoal inclusions (1307). Pottery and animal bone were recovered from all four fills. The ditch (F710) continued southwest beyond Trench 13, whilst to the northeast, in Trench 14, it was seen to return to the east.

A group of nine shallow pits (F704-F709, F724-F726) were located to the southeast of ditch F710. One further pit (F700), two east-west aligned gullies (F702 and F703), and one east-west aligned ?palisade trench (F701) were identified at the southeastern end of Trench 13.

All features, with the exception of post-hole F723, were sealed by a 0.15-0.20m thick layer of grey-brown silt-sand, with occasional charcoal flecks, small sub-rounded and sub-angular stones (1301). This was sealed by 0.25m of topsoil (1300).

The pottery recovered from Trench 13 together with that from Trenches 17 and 15 (described below) formed a distinct group dated to the Middle to Late Iron Age. This assemblage was characterised by flat rims, some everted round rims on globular jars and a higher incidence of scoring than that recorded on Early Iron Age pottery recovered Trenches 14, 15 and 16. Fragments of finger-impressed and slashed pottery from Trench 13 are likely to be of Early Iron Age date.

Fragments of possible refractory material, which may derive from outer mould casings associated with the casting of bronze objects, were recovered from Trench 13 (See Section 8.3 below).

Trench 14
(1.50m x 72m, aligned northeast - southwest, excavated to a depth of 14.36m AOD).

Twenty-seven features cut the orange-brown, slightly clayey, gravel-sand subsoil (1402) in this trench. As described above, a ditch identified in Trench 13 (F710), continued to Trench 14 where it was seen to curve around to return to the east. At this point it was truncated by a later, northwest-southeast aligned ditch (F770) which continued beyond Trench 14. Ditch F770 had a U-shaped profile and was filled with a buff brown silt-sand deposit (1406), which included fragments of pottery and animal bone.

A northwest - southeast aligned ditch (F768), which had gently sloping sides and a flat base, was identified 2.50m to the northeast of ditch F770. The base of this ditch was overlain by a thin band of weathered silt-sand (1434). This was sealed by a series of four deposits (silt-sand (1430, 1431), silt-clay (1432) and sand-silt (1433)) which slumped into the ditch from the west. The most recent slumping (1430) was truncated by a small cut, which was itself filled with a sand-silt deposit (1428) and a sandy stone deposit (1429) slumped in from the west.

An isolated pit (F772) was identified 2m to the northeast of ditch F768. A further 7.5m separated this pit from a concentration of pits and gullies. Here, the fill of a northeast-southwest aligned gully (F763, 1416) could not be distinguished from that of a small pit (F764, 1435). The relationship between these two features could not be established. Gully F763 was cut by a large, steep-sided and flat-bottomed, pit (F771), filled with a grey-brown silt-sand deposit (1419). A cluster of five small pits (F758-F760, F773 and F775) were located in the centre of Trench 14. A small, northwest-southeast aligned gully (F757) separated these pits from a further nine examples (F750-756, F776 and F780), some of which were intercutting. One of the pits (F750), which contained decorated pottery, animal bone, flint and worked, burnt stones, was encircled by two post-holes (F777 and F778) and two very small stake-holes (F781 and F782). A further two pits (F779 and F780) were identified at the northeastern end of Trench 14.

All features were sealed by an approximately 0.25m thick layer of grey-brown silt-sand, with occasional charcoal flecks, small sub-rounded and sub-angular stones (1401). This was overlain by 0.25m of topsoil (1400).

The pottery recovered from Trenches 14, 15 and 16 formed a distinct group, which is dated to the Early Iron Age. The assemblage was characterised by sharp-shouldered jars with flat rims and concave necks. Some decoration was present, as was fine vertical scoring. One fragment of ?briquetage was recovered from pit F750.

Fragments of possible refractory material, which may derive from outer mould casings associated with the casting of bronze objects were recovered from Trench 14.

Trench 15
(1.50m x 35m, aligned northwest - southeast, excavated to a depth of 13.58m AOD).

Five features, of which four were pits (F801-F804) and one was a natural scoop (F800), were identified in this trench. All features cut the orange-brown, gravel-sand subsoil (1502). Pit F801 formed one part of the cluster identified at the centre of Trench 14, whilst pits F802-F804 were more widely scattered. Pottery and fragments of animal bone were recovered from the fills of all four pits.

The features were sealed by a 0.20-0.25m thick layer of grey-brown, clayey, silt-sand, with occasional charcoal flecks and natural flint (1501). This was sealed by 0.25-0.30m of topsoil (1500).

Trench 16
(1.50m x 30m, aligned northwest - southeast, excavated to a depth of 13.71m AOD).

Four features, all of which cut the orange-brown, gravel-sand subsoil (1602), were identified in this trench. A pit, filled with a mottled, orange-brown, sand-silt deposit (F850, 1603), was located at the northwestern end. Immediately to the southeast, a thin band of grey-brown sand-silt, aligned northeast-southwest, may represent the fill of a small gully (F853), and a semi-circular area of dark grey-brown, charcoal-flecked, sand-silt may represent the fill of a pit (F851). A ditch (F852), aligned roughly north-south, was identified in the centre of the trench. Although the ditch was only partially excavated, it was seen to have steeply sloping sides; ten sherds of prehistoric pottery were recovered from its charcoal-flecked, silty-sand fill (1604).

The two pits, gully and ditch were sealed by an approximately 0.20m thick layer of grey-brown, charcoal-flecked, silt-sand (1601). This was sealed by 0.30m of topsoil (1600).

Early Iron Age pottery recovered from this trench formed a distinct group with that recovered from Trenches 14 and 15. A burnished footing base fragment recovered from Trench 16 was dated to the later Iron Age.

Trench 17
(1.50m x 13m, aligned northeast - southwest, excavated to a depth of 13.75m AOD).

Seven features, which cut the orange-brown, gravel-sand subsoil (1702), were identified in this trench. Two linear, charcoal-flecked silty-sand deposits, aligned roughly east-west, were interpreted as the fills of three gullies (F714, F715 and F719), also excavated in Trench 13. A shallow pit a the centre of Trench 17 (F902) appeared to be cut by a large, northwest-southeast aligned, linear feature (F903). The relationship of F902 and F903 with a small gully, aligned north northwest - south southeast, is not clear.

All seven features were sealed by an approximately 0.20-0.25m thick layer of grey-brown, charcoal-flecked, silt-sand (1701). This was sealed by 0.30m of topsoil (1700).

The pottery recovered from Trenches 17, 13 and 18 formed a distinct group dated to the Middle to Late Iron Age.

Trench 18
(1.50m x 14m, aligned northeast - southwest, excavated to a depth of 13.98m AOD).

Three features cut the mottled orange-yellow, sand-gravel subsoil (1805) in this trench. An area of dark, grey-brown sand-silt possible feature fill (1802) was interpreted as the fill of a pit (F950). The relationship of this pit with a small east-west aligned gully (F951) was not clear. The gully (F951) was cut by a large, northwest-southeast aligned, linear ditch (F952). This may represent the continuation southeast of a linear ditch recorded in Trench 17 (F903).

The three features were sealed by 0.17m thick layer of buff brown, charcoal and chalk-flecked, silt-sand (1801). This was sealed by 0.30m of topsoil (1800).

The pottery recovered from Trenches 18, 13 and 17 formed a distinct group dated to the Middle to Late Iron Age.

8.0 The Artefacts

8.1 Flint *by Lynne Bevan*

The collection of 119 items of worked flint comprises: a flake knife, a borer, a scraper fragment, a serrated blade, a pebble core, a possible hammerstone, six retouched flakes, 98 flakes and nine struck pieces. Tools are listed by context and flakes are summarised by trench below:

Table 2: Occurrence of flint tools and flakes.

Trench	**13**	**14**	**15**	**16**	**18**
Tools by feature:					
Knife	-	F756	-	-	-
Borer	F717/F718	-	-	-	-
Blade	F717	-	-	-	-
Core	-	F756	-	-	-
Scraper	-	F752	-	-	-
?Hammerstone	-	F710/F770	-	-	-
Total flakes/struck pieces:					
Retouched Flakes	3	3	-	-	-
Flakes	54	31	5	5	3
Struck pieces	-	9	-	-	-
Total items:	**59**	**47**	**5**	**5**	**3**

With the exception of the flake knife and several flakes, all of which are of a fine quality dark brown-grey flint, the collection is of a light grey to orange-brown flint of generally poor quality with a high incidence of abrasion and some re-cortication.

The knife, made from a large de-corticated flake of dark flint, might appear to have originated from a primary source, a mine at some distance from the site. However, the survival of a compacted, discoloured cortex characteristic of river gravel flint on some of the finer, as well as the poorer, quality flakes indicates that both kinds of flint were obtained locally from secondary deposits.

Whilst the knife can be assigned a generally Neolithic date and the borer is probably later, the remainder of the collection is not chronologically diagnostic. Although the size and broad shape of the flakes suggest a later Neolithic to Bronze Age date, the collection was residual, found within Early Iron Age and Middle to Late Iron Age fills.

Whilst the majority of flakes and tools came from Trenches 13 and 14, the retrieval of only one rough pebble core, one possible hammerstone (also made from a pebble), and one fragmentary scraper suggests episodic usage of the landscape during prehistory rather than intensive flint-working or settlement of any duration in any chronologically distinct period.

8.2 Prehistoric Pottery *by Ann Woodward*

A large assemblage totalling 357 sherds was recovered from Trenches 9, 12, 13, 14, 15, 16, 17 and 18. Of these, 172 were from Trench 13 and 127 from Trench 14. Many sherds are large in size and several almost complete profiles are represented. The pottery includes two distinct assemblages dating to the Early Iron Age and Middle to Late Iron Age respectively. No earlier prehistoric sherds are present. The pottery is unabraded with crisp breaks and unworn decoration.

Three main fabric groups were represented: tempered with sand, fossil shell and quartz/flint. The occurrence of these was fairly uniform amongst the various trenches with sandy wares most common (73%), followed by the shell-tempered (26%) and quartz/flint fabrics (1%). The features appear to fall into two main groups, one around the junctions of Trenches 14, 15 and 16 and a second in Trenches 13, 17 and 18. The northern cluster contained mainly Early Iron Age forms, while the assemblage from the southern cluster was characterised by pottery of later Iron Age date (Middle to Late Iron Age). The occurrence of diagnostic formal features is summarised in Table 2. The Early Iron Age assemblage, concentrated in the area of Trench 14, is characterised by sharp-shouldered jars with flat rim and concave neck. Some decoration on the shoulder or top of rim is present and some fine vertical scoring in sub-shoulder zones. Base angles are invariably simple in form. The Middle to Late Iron Age assemblage displays mainly flat rims, some everted round rims on globular jars and a higher incidence of scoring. The scoring is often deeper and more widely spaced than on the earlier vessels noted above. The finger-impressed and slashed sherds from Trench 13 are probably Early Iron Age pieces. The later Iron Age base angle forms include deep footed, splayed and expanded examples from Trench 13 and a burnished footring base fragment from Trench 16.

The Early Iron Age assemblage can be compared with vessels from Maxey and Fengate, and the later assemblage with those from Tixover (Leics), Fengate (Padholme Road and Cats Water) and Little Paxton. The wide variety of specialised base forms appears to be unusual,

but deep footed bases do occur on some decorated globular jars from the Nene valley, e.g. Breedon-on-the-Hill (Leics).

The assemblages indicate that both main areas of Iron Age activity at Greenhouse Farm are accompanied by major groups of pottery which display a wide variety of form, vessel size and decoration. In addition, the sherds are large and unabraded. In several cases incidences of sooting and other residues were noted. The potential of these assemblages for addressing questions of chronology, vessel function, site status and spatial patterning is very high.

TABLE 3: Occurrence of formal features

	Simple rim	*Flat rim*	*Everted rim*	*Concave neck*	*Sharp shoulder*	*Rounded shoulder*
Trench 14	2	6	1	6	3	1
Trench 13	-	9	2	1	-	1
Other Trenches	-	2	1	-	1	-
Totals	**2**	**17**	**4**	**7**	**4**	**2**

	Finger-impressed decoration	*Slash decoration*	*Scoring*	*Simple base*	*Splayed base*	*Footring base*	*Deep footed base*
Trench 14	1	1	7	5	-	-	-
Trench 13	1	1	11	5	1	-	2
Other Trenches	1	-	3	1	-	1	-
Totals	**3**	**2**	**21**	**11**	**1**	**1**	**2**

8.3 Briquetage and Refractory Material *by Ann Woodward*

One possible fragment of briquetage was recovered from pit F750, Trench 14.

There are 26 fragments of clay in an extremely fine, light, creamy fabric, from six features in Trenches 13 and 14, which may represent refractory material. One piece has a smooth concave surface and all fragments may derive from outer mould casings associated with the casting of bronze objects. This identification would need to be verified by an appropriate specialist in due course.

8.4 Animal Bone *by Umberto Albarella*

The animal bones are in an excellent state of preservation and mainly derive from pit fills. The assemblage is entirely represented by domestic mammals. Cattle is the most common species - being present in 23 different feature fills - followed by caprine (16 features), horse (9 features), dog (4 features) and pig (3 features). However, an obvious bias towards larger bones must be taken in to account in assessing the frequency of different species. No human

bones have been noted. The presence of bones in articulation suggests some contexts have been left undisturbed since ancient times.

Provided that the contexts containing bones can be securely dated this will make a remarkable assemblage. The Iron Age economy in the area is poorly known and, also due to its excellent preservation, this assemblage can make an important contribution to the understanding of Iron Age life in this region.

8.5 Charred Plant Remains *by Angela Monckton*

Introduction

Samples taken during the evaluation were processed by flotation. Eight samples which contained charred material were submitted for assessment for charred plant remains. Plant remains from sites of Iron Age date are scarce nationally in both quantity and in number of find-spots, so retrieval of these remains may be considered a priority.

Method of Assessment

The dry flotation fractions (flots) were sorted using a stereo microscope at x10 magnification. The plant remains were removed to glass tubes and identified and counted for six of the samples. A further two samples were scanned for the presence of remains. More detailed analysis may be possible of some of the remains. Snails were observed in some of the samples, but were not removed.

Preservation Condition and Storage

Charred plant remains were found and were thought to be contemporary with the fills of the features. However, roots and uncharred remains were also present and assumed to be later intrusive material as often occurs on sites sealed only by ploughsoil.

Samples ranged from 8-20 litres in size amounting in total to 121 litres.

Range and Variety of Material

All the samples examined had charred plant remains present.

Trench 13

F701 (1305) Palisade Trench Charred cereal remains included two grains and fragments with three grains of barley (*Hordeum vulgare*). Six seeds included grasses *(Poaceae)* and goosefoots (*Chenopodium* sp). (10 items from 16 litres).

F707 (1305) Pit This sample was the least productive and had only a small charred grass seed amongst the 7 items from 20 litres.

F717 (1329) Ditch The most cereal chaff was found in this sample, amounting to 14 wheat glumes (chaff) including emmer (*Triticum dicoccum*) and spelt (*Triticum spelta*).

Only four cereal grains were found and charred seeds included docks (*Rumex* sp), medick or clover (*Medicago* type) and large grass. (35 items from 19 litres).

F710 (1310) Ditch The most productive samples examined included 33 cereal grains with 5 barley grains and four wheat grains, one of which was a grain of free threshing wheat, probably bread wheat (*Triticum aestivum* s.l.). Charred seeds included goosefoots, docks, knot-grasses (*Polgonum* sp), large grasses, small grasses and a few seeds of corn gromwell (*Lithospermum arvense*) were possibly charred. Of the 132 items from 20 litres, 19 were uncharred seeds thought to be intrusive.

F723 (1331) Post-hole Cereal remains included a spelt glume amongst seven glumes found with three cereal grains, which included one of wheat. A few charred weeds were also found. (30 items from 8 litres).

F725 (1336) Pit This sample was less productive, having a few wheat glumes and seeds present. (13 items from 10 litres).

Two samples from Trench 14 were scanned, from feature F750 (1405) and feature F768 (1428). Both had plant remains present in small quantities.

Remains from the samples examined show the use of barley and glume wheats (spelt and emmer) on the site along with charred seeds of arable or ditsturbed ground. The presence of glumes with the grains suggests the small-scale domestic cleaning of the glume wheat for consumption, showing food preparation on the site. The results could contribute towards further understanding of diet, and the distribution of cereals in the Iron Age.

The retrieval of the charred plant remains during the evaluation confirms that the site has the potential to produce further evidence of this type, which may extend our understanding of the range of plants exploited. The site has been shown to have a number of phases of occupation, so there is the potential to investigate changes over the time the site was occupied. The preservation of chaff on the site allows the identification of the cereals present and retrieval of a larger assemblage may show the proportion of the cereals exploited, or provide evidence of crop processing activities. Analysis of the plant remains would contribute to the evidence for diet and economy of the site, and as bone is also preserved on this site, which is not always the case, more detailed interpretation of the type of farming economy may be possible.

9.0 Discussion of the Archaeological Results

9.1 Introduction

Significant archaeological remains were confined to a discrete area in the southwest zone of the site (Trenches 12-18). This is the highest point of the site. The remainder of the site, evaluated by Trenches 1-11, produced no remains of archaeological significance (Fig. 2).

9.2 Neolithic-Bronze Age

Flint artefacts were recovered from Trenches 13-16 and 18, where they were found redeposited in Iron Age contexts. Diagnostic artefacts in the assemblage suggest activity in the Neolithic and possibly the Bronze Age. Given the absence of associated features, the nature of this activity cannot be characterised. However, identification of a crop-marked ring ditch to the east of the site (Air Photo Services 1996, fig. 1) may provide a context for this early prehistoric activity.

9.3 Iron Age

Within the area of Trenches 12-18, two spatially and chronologically distinct settlement areas of Iron Age date have been identified. These appear to comprise farmstead type settlements of a size suggestive of a single family group. The Early Iron Age settlement may have been unenclosed, and was characterised by a cluster of pits, possibly of both domestic and industrial function. By contrast the Mid-Late Iron Age settlement comprised two conjoined enclosures. The southeastern enclosure, which contained the greatest density of features, including possible storage pits and post-holes, may have contained the principal dwelling. The northwestern enclosure may have been intended for livestock. Ditch F727/F651 may also have formed one side of a stock enclosure.

Early Iron Age

Early Iron Age activity appears to concentrate around the junction of Trenches 14, 15 and 16, and is mainly represented by a cluster of large, intercutting pits. The pits are associated with ditches (F751, F852), but the layout of these ditches cannot be determined within the trial trenches. However, the relatively dense clustering of the pits suggests a well-defined focus for this phase of activity. The ceramic assemblage is characterised by sharp-shouldered jars, some with decoration on the rim and shoulder and vertical scoring in the sub-shoulder zones. A number of the pits also contained possible refractory material, which may have originated from the outer mould casings associated with the casting of bronze objects. This evidence is of particular interest, although no other evidence of bronze-working was found. However, the possibility of industrial activity of some nature is suggested by evidence of intense burning, including burnt stones and heat-fractured clay within the fills of two pits (F750, F776). The large size of pit F750, and its association with encircling stake-holes and post-holes, which may have formed the foundation of part of a timber structure, is perhaps also suggestive of industrial activity, as well as indicating the survival of comparatively slight structural remains.

A number of smaller pits and gullies, and two large ditches, lay to the east of the settlement.

Mid-Late Iron Age

The second focus of Iron Age activity, dating to the Mid-Late Iron Age, corresponds approximately with a pair of conjoined enclosures, first revealed as crop-marked features by aerial photography (Figure 2). This focus was concentrated within Trenches 13, 14, 17 and 18. During the trial-trenching the enclosures were found to be defined by two palisade trenches (F701 and F715/F719) and by a series of ditches (F710, F716, F717, F903 and

F952), some of which appear to correspond with the crop-marked features revealed by aerial photography. A post-hole cut into the base of ditch F717 and a slot at the base of ditch F710 could suggest that the enclosure ditches were associated with a timber palisade or fence. Some intercutting of ditches suggests more than one phase in the development of this settlement.

The interior of the southeastern enclosure contained a concentration of ten pits. These pits were notably smaller than those of Early Iron Age date located to the north. Their fills yielded fragments of pottery and animal bone, which suggest a domestic rather than industrial character. One pit (F700) was also located immediately outside the southeastern limit of the enclosure. Two small pits and two post-holes were located between the two enclosures. The northern enclosure also contained pits and post-holes.

The post-holes scattered within the enclosures may be the remains of one or more timber-framed buildings, although no ground-plans could be identified in the trenches.

Two ditches, one located immediately to the northwest of the enclosure (F727) and one which cut enclosure ditch F710 (F770), could represent boundaries which separated agricultural land from domestic settlement. The cultivation of the surrounding land is evidenced by the recovery of charred plant remains within the fills of pits and gullies. In addition, the plant remains recovered suggest that crops were being cleaned and processed on-site.

The Mid-Late Iron Age pottery assemblage comprises mainly flat rims, although some everted rims on globular jars, and a higher incidence of scoring are also recorded. The base-angle forms included deep footed, splayed and expanded examples from Trench 13.

Within the area of Trenches 12-18 was recorded a layer of silt-sand-soil, overlying the fills of the Iron Age features. This layer may be interpreted as the remains of the ploughed-out earthwork banks associated with the enclosure ditches. This layer may also have afforded some protection to the Iron Age settlement features from modern plough disturbance.

The previous discovery of Iron Age pottery and a brooch (PRN 5151) just outside the south-western corner of the site may suggest the continuation of Iron Age activity in this direction.

10.0 Assessment of the Archaeological Importance of the Proposed Development Site

The evaluation has provided further artefactual evidence of Neolithic-Bronze Age activity in the vicinity. It is possible that wider excavation may uncover features dated to this period.

The two discrete Iron Age settlements were occupied over an extended timescale, from the Early to the Mid-Late Iron Age. Trial-trenching has permitted the definition of the extent of both settlements, which appear to be substantially complete in plan. The wide range of settlement features identified include enclosure and other ditches, pits, post holes and stake holes. The survival of post-holes and stake holes indicates a high level of preservation of the remains, perhaps assisted by the overlying layer of silt-sand soil. Identification of post holes and stake holes also suggests that considerable potential exists for the identification of the

ground plans of individual timber-framed buildings, and also, perhaps, of their functions. Additionally, evidence of the surrounding field systems may be forthcoming.

The stratigraphic evidence was complimented by large, and potentially informative assemblages of pottery, animal bone and charred plant remains. The pottery assemblage consists of large, mainly unabraded sherds, and unworn decoration, and displays a wide variety of form, vessel size and decoration. It derives from primary contexts in feature fills which have been protected from plough disturbance by the overlying layer of silt-sand soil. The sherds were recovered from sealed feature-fills, and have the potential to address questions of chronology, vessel function, site status, and trade. The pottery could usefully be compared with assemblages from Maxey, Fengate and Little Paxton (all Cambridgeshire). The animal bone assemblage is also large, well-preserved and potentially informative. It comprises cattle, sheep/goat, horse, dog and pig. Its further analysis could help determine the function and economy of the settlements. As is noted in Section 8.5, the preservation of charred plant remains, notably within the Mid-Late Iron Age settlement, suggests a potential for the study of diet and distribution of cereals. Of particular interest is the identification of possible evidence for *in-situ* bronze working, although the present limited evidence does not indicate whether this activity was conducted for domestic consumption or for trade.

The potential for the complementary study of pottery, animal bone and charred plant remains should not be underestimated. Given the good survival of artifactual and ecofactual remains, combined with the possibility of good survival of structural information, including house-plans, the potential for the analysis of spatial patterning, and 'structured deposition' is high. Furthermore, the close proximity of two distinct settlements, of different periods (Early and Mid-Late Iron Age) offers the possibility of studying the changes in such patterning through time.

At a wider, regional level Greenhouse Farm will provide important comparative data for contemporary sites, such as Maxey, Fengate and Little Paxton, all in Cambridgeshire.

11.0 Implications and Proposals

11.1 Implications

Despite the limitations necessarily imposed by this evaluation, it has been possible to identify a well-preserved focus of Iron Age date, containing a dense concentration of pits and other associated features, complemented by large and potentially informative assemblages of pottery, animal bone and charred plant remains.

The proposed Park and Ride development involves the construction of an access road, and the creation of a large area of hardstanding for parking (Fig. 5). This proposed development could involve the removal of up to 0.5m to 0.7m of deposits over the entire site as a preliminary to the construction of the parking facility. Further sub-surface disturbance may be caused by the construction of service trenches, principally for drainage. It is also possible that the access road would require a deeper foundation than the car parking.

11.2 Proposals

Fieldwork

Given that archaeological deposits were recorded at a depth of between 0.40-0.70m below the modern surface, the uppermost 0.10m to 0.50m of these features, and feature fills could be affected by the proposed development groundworks. Furthermore, shallower features could be totally eradicated by these groundworks.

Given that the archaeological remains identified are relatively extensive, although spatially well-defined, it may not be feasible to re-plan the proposed development to avoid disturbance to these prehistoric settlement areas. Equally, it would be impractical to limit the construction groundworks to the removal of the topsoil, since the operation of heavy plant over the top of the subsoil (and at the uppermost level of the archaeological features) would necessarily cause significant disturbance to the archaeology, and possibly eradicate the shallower archaeological features.

Two alternative mitigation strategies may be proposed:

OPTION 1 Alteration of development plan.

This option would involve the construction of the car parking foundation directly above the modern topsoil. This construction method would eliminate disturbance caused by the lowering of the ground level, and by the operation of heavy plant, notably in wet weather.

Limited archaeological excavation and recording may still be appropriate where deeper sub-surface disturbance cannot be eliminated, such as in the area of the access road, and possibly along the route of some of the more deeply-dug service trenches.

If this option was selected, some limited further post-excavation analysis, leading to the publication of the trial-trenching results should be considered, in tandem with the publication of the results of any further limited archaeological investigations.

OPTION 2 Large-scale archaeological excavation

This option would involve the preservation of the archaeology by record, and would involve archaeological excavation of the settlement areas, followed by post-excavation analysis and publication of the results. This option could be conducted in two stages. Stage 1 would involve the excavation and recording of archaeological deposits and features in advance of construction of the access road. Stage 2 would involve the excavation and recording of archaeological features and deposits in the remainder of the affected area. This area, measuring approximately 60m by 85m (Fig. 5), would be positioned to examine the settlements, as revealed by trial-trenching. Additionally, it is proposed to open four further peripheral trenches, to examine the potential of the areas adjoining the settlement to contain associated features, such as field boundaries. Detailed excavation methodology would follow the requirements of a Design Brief, to be prepared by the County Archaeology Office.

No further archaeological fieldwork is recommended over the remainder of the site.

Display and presentation

It is recommended that consideration be given to the preparation of a display board describing the results of any excavation, to be located in an area of open public access.

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13.0 Acknowledgements

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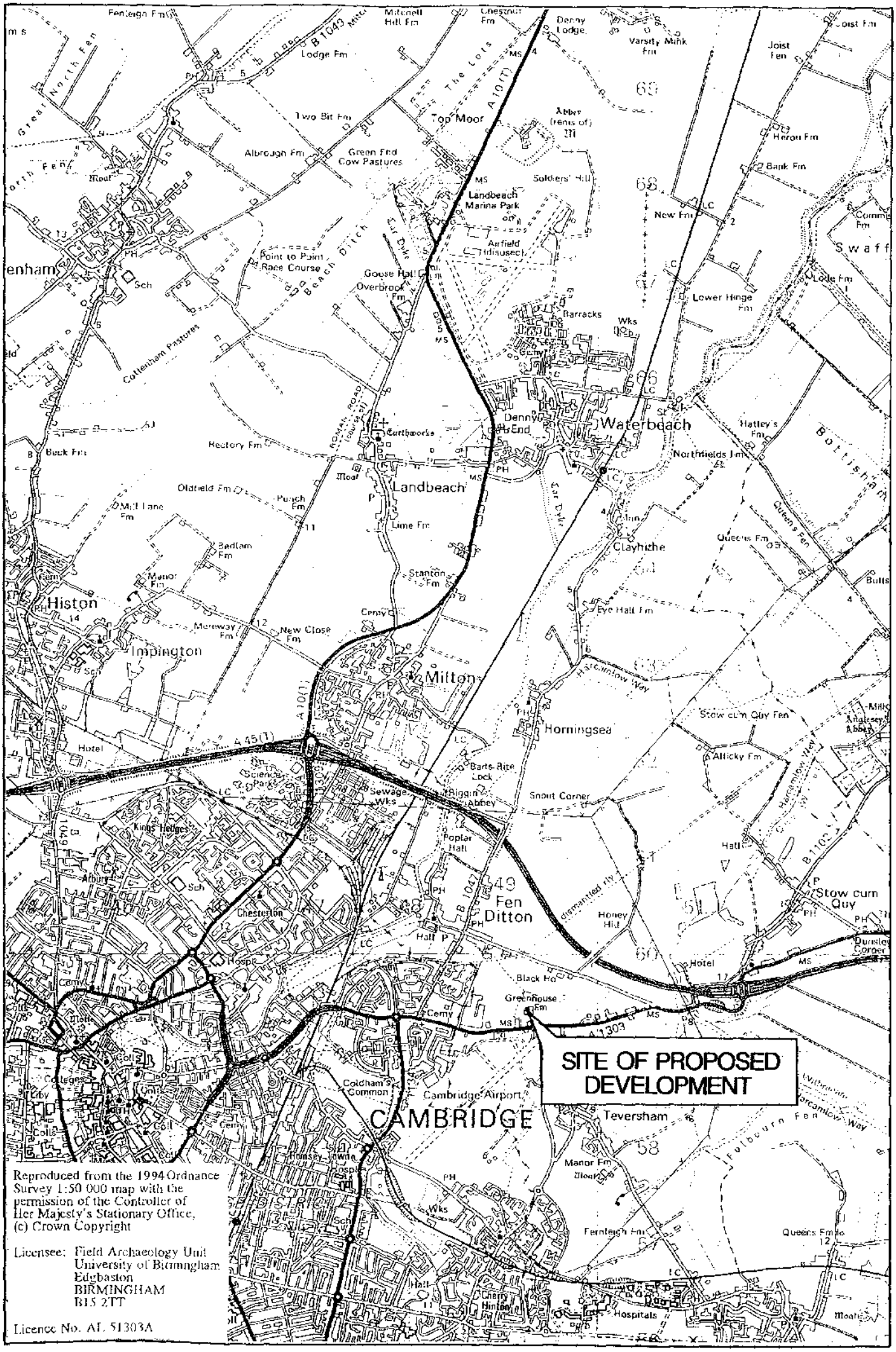
SITE OF PROPOSED DEVELOPMENT
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Impington
Milton
Landbeach
Waterbeach
Clayhithe
Horningsea
Fen Ditton
Stow cum Quy
Teversham
Cambridge Airport
Coldham's Common
Chesterton
Hospitals
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Figure 1

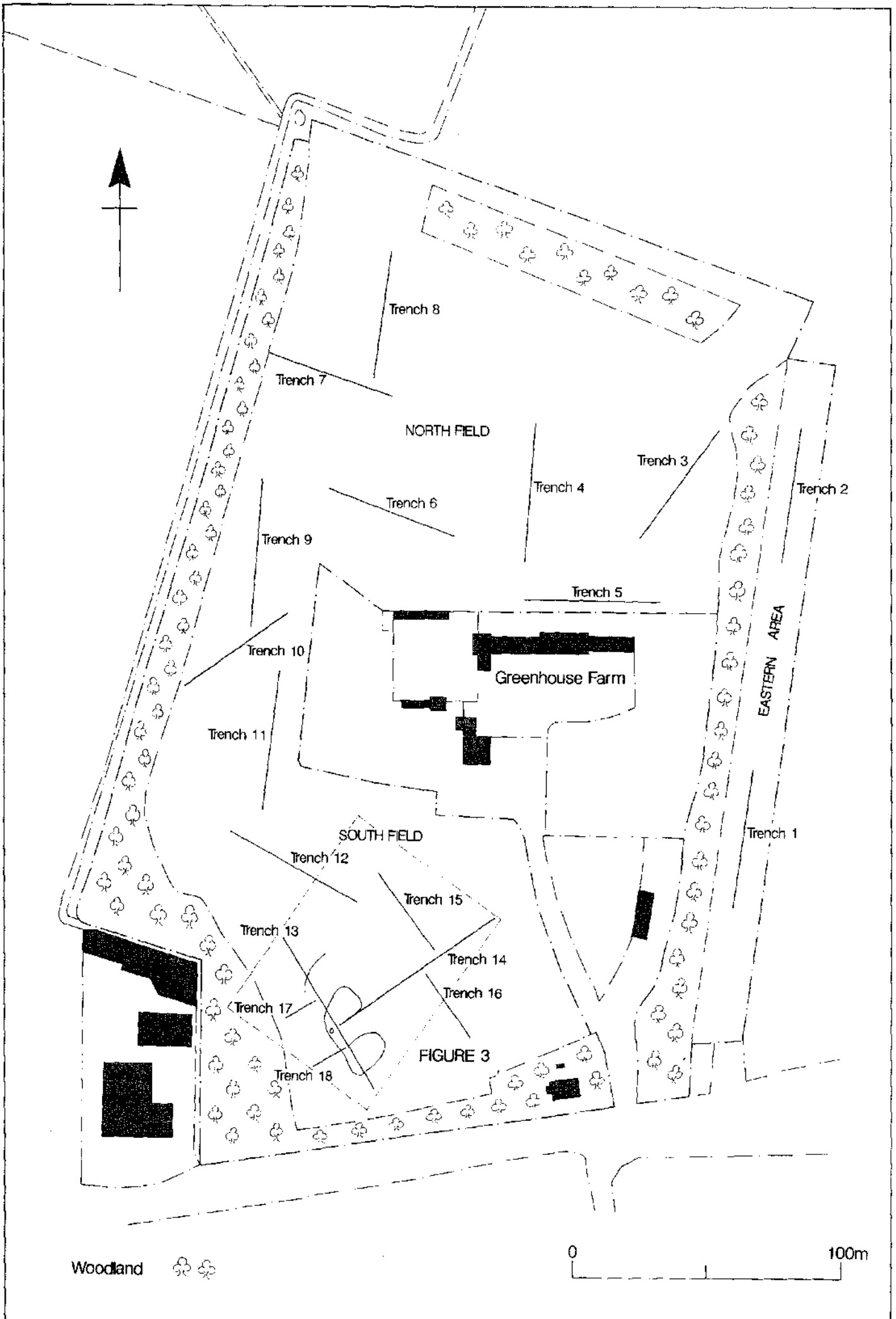
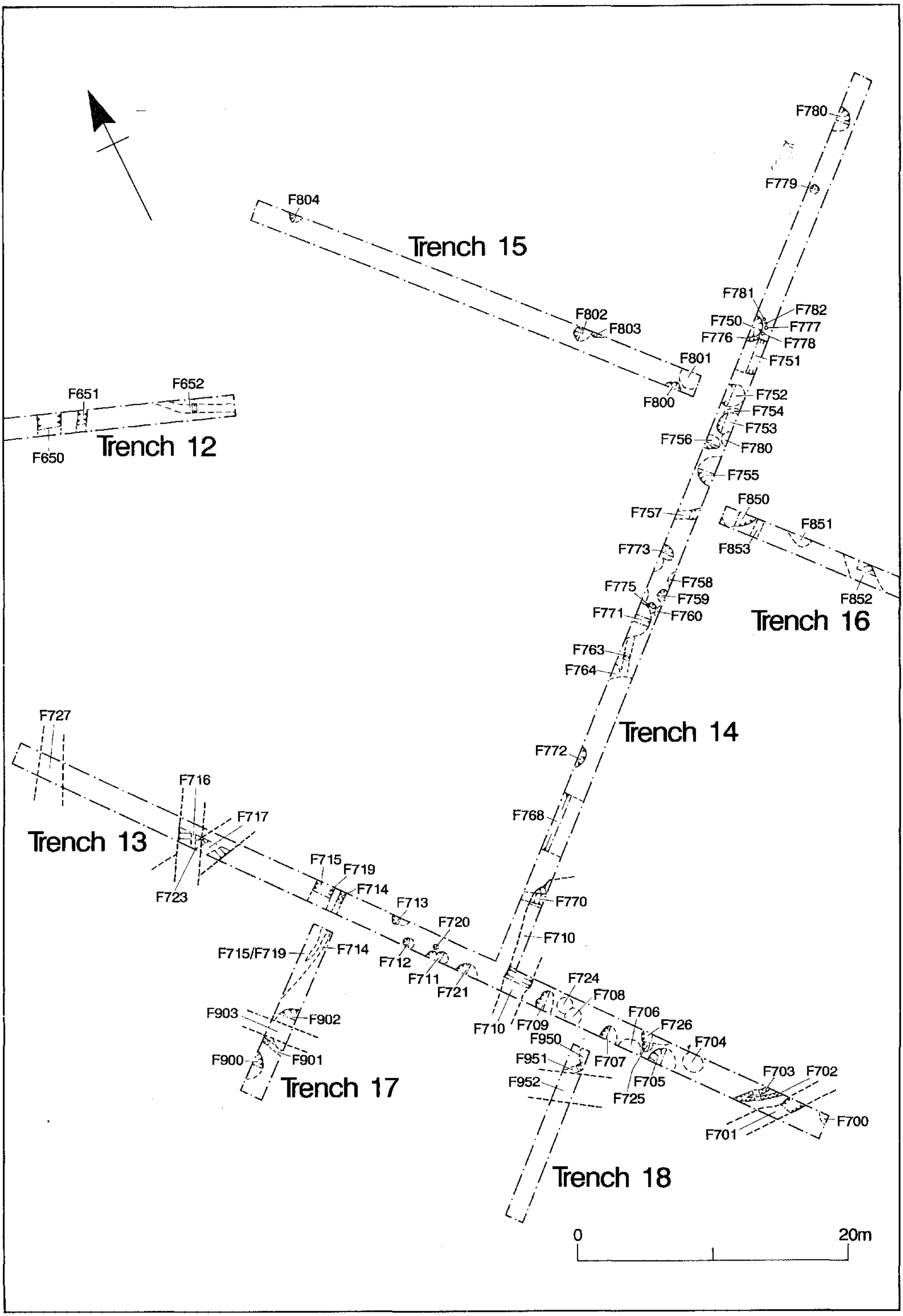

Trench 8
Trench 7
NORTH FIELD
Trench 3
Trench 4
Trench 2
Trench 6
Trench 9
Trench 5
Trench 10
Greenhouse Farm
EASTERN AREA
Trench 11
SOUTH FIELD
Trench 1
Trench 12
Trench 15
Trench 13
Trench 14
Trench 16
Trench 17
FIGURE 3
Trench 18
Woodland
0
100m

Figure 2


Trench 15
F804
F802
F803
F800
F801
F780
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F782
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F777
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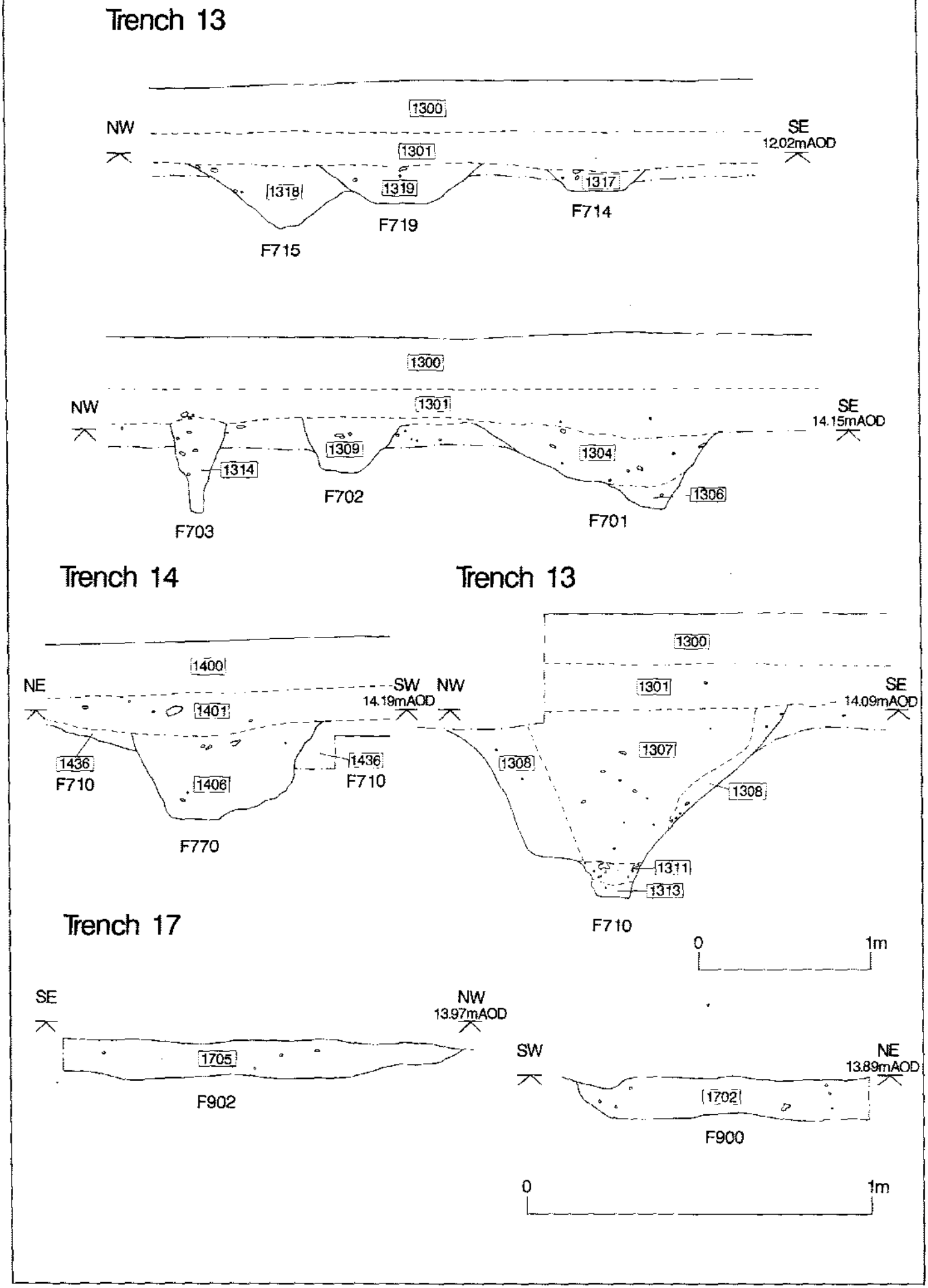
F754
F753
F756
F780
F755
Trench 12
F650
F651
F652
Trench 16
F757
F850
F851
F853
F852
F773
F775
F758
F759
F771
F760
F763
F764
Trench 14
F772
F768
F770
F710
F724
F708
F706
F726
F704
F950
F951
F952
F707
F705
F725
F703
F702
F700
F701
Trench 13
F727
F716
F717
F723
F715
F719
F714
F713
F720
F712
F711
F721
F715/F719
Trench 17
F903
F902
F900
F901
F710
F709
0
20m

Figure 3


Trench 13
1300
NW
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1301
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1317
F715
F719
F714
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NW
1301
SE
14.15mAOD
1309
1304
1314
1306
F703
F702
F701
Trench 14
Trench 13
1400
NE
SW
14.19mAOD
NW
1300
1301
SE
14.09mAOD
1401
1436
F710
1406
1436
F710
1308
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F770
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1313
F710
Trench 17
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F900
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1m

Figure 4

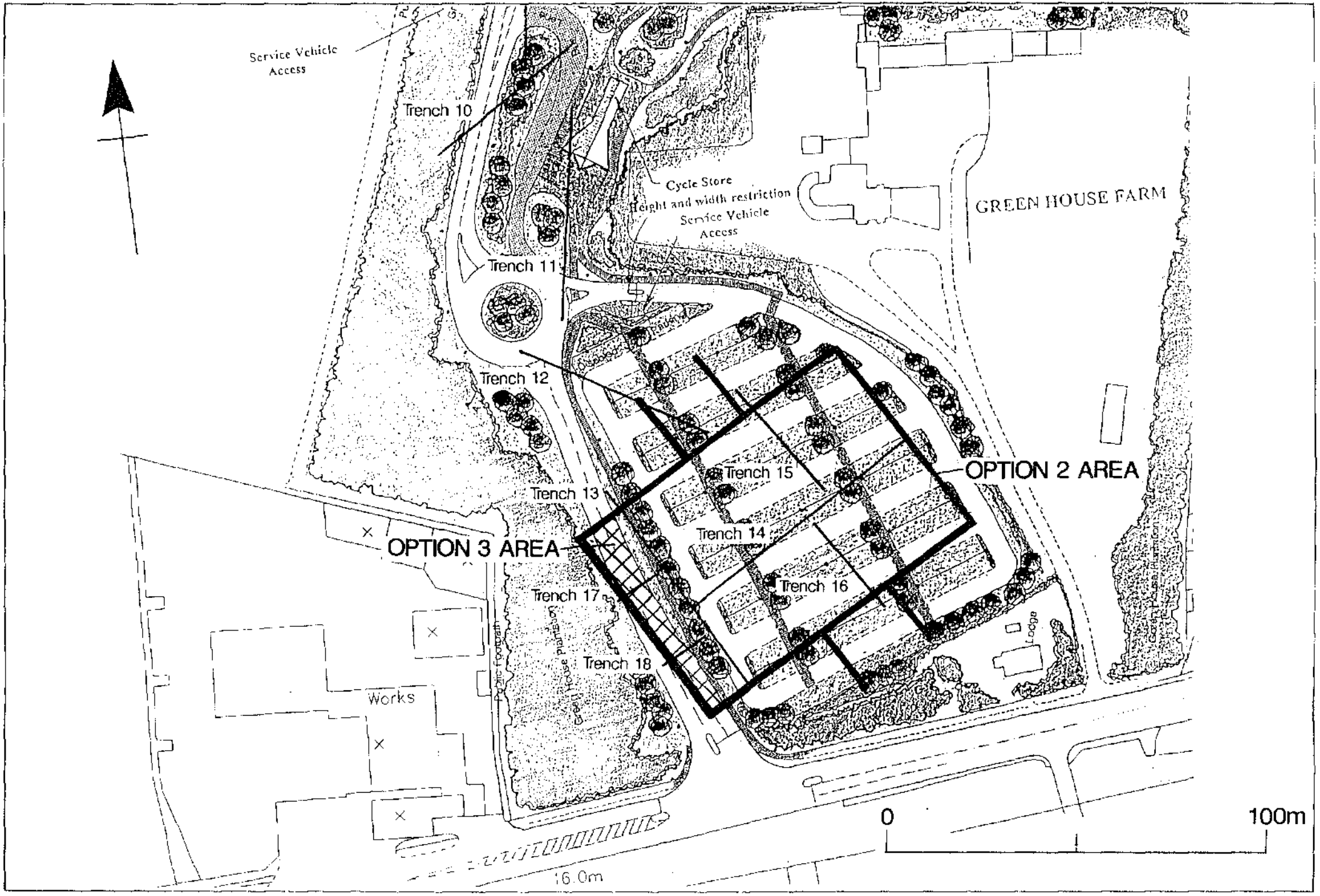
Service Vehicle Access
Trench 10
Cycle Store
Height and width restriction
Service Vehicle Access
GREEN HOUSE FARM
Trench 11
Trench 12
Trench 15
OPTION 2 AREA
Trench 13
Trench 14
OPTION 3 AREA
Trench 16
Trench 17
Trench 18
Works
Lodge
0
100m
16.0m

Figure 5

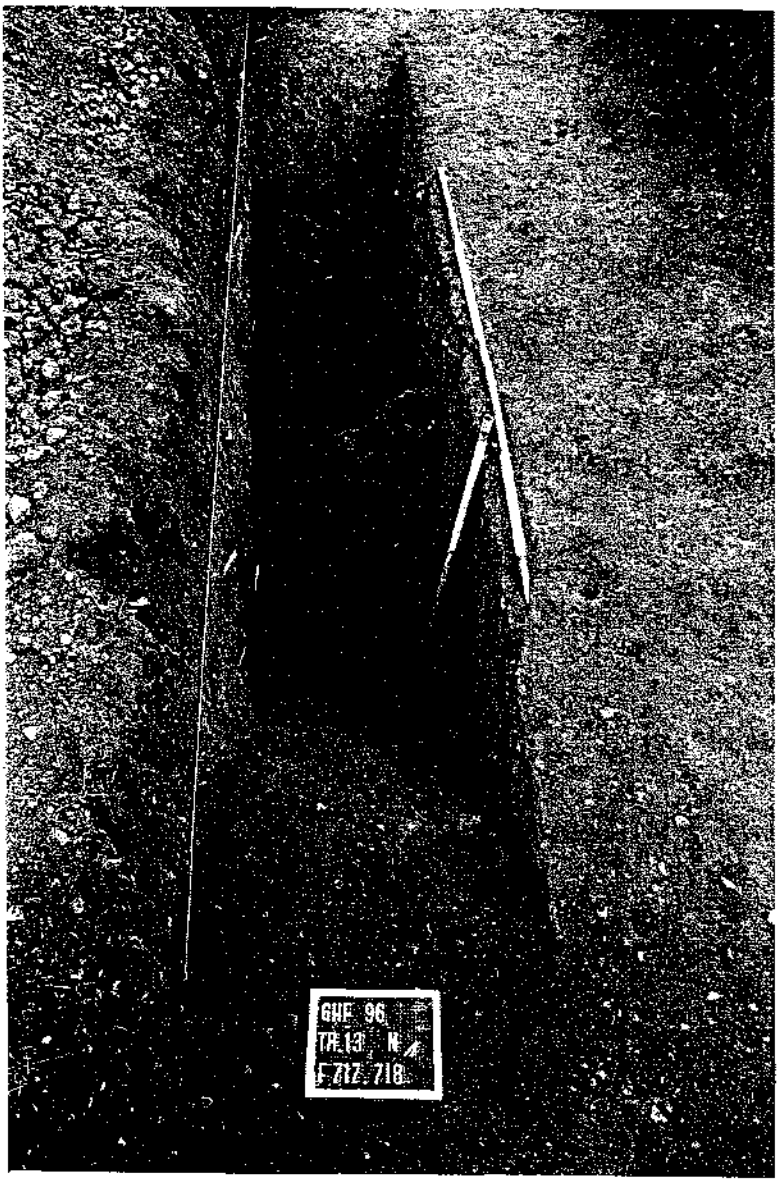

Plate 1

Plate 2

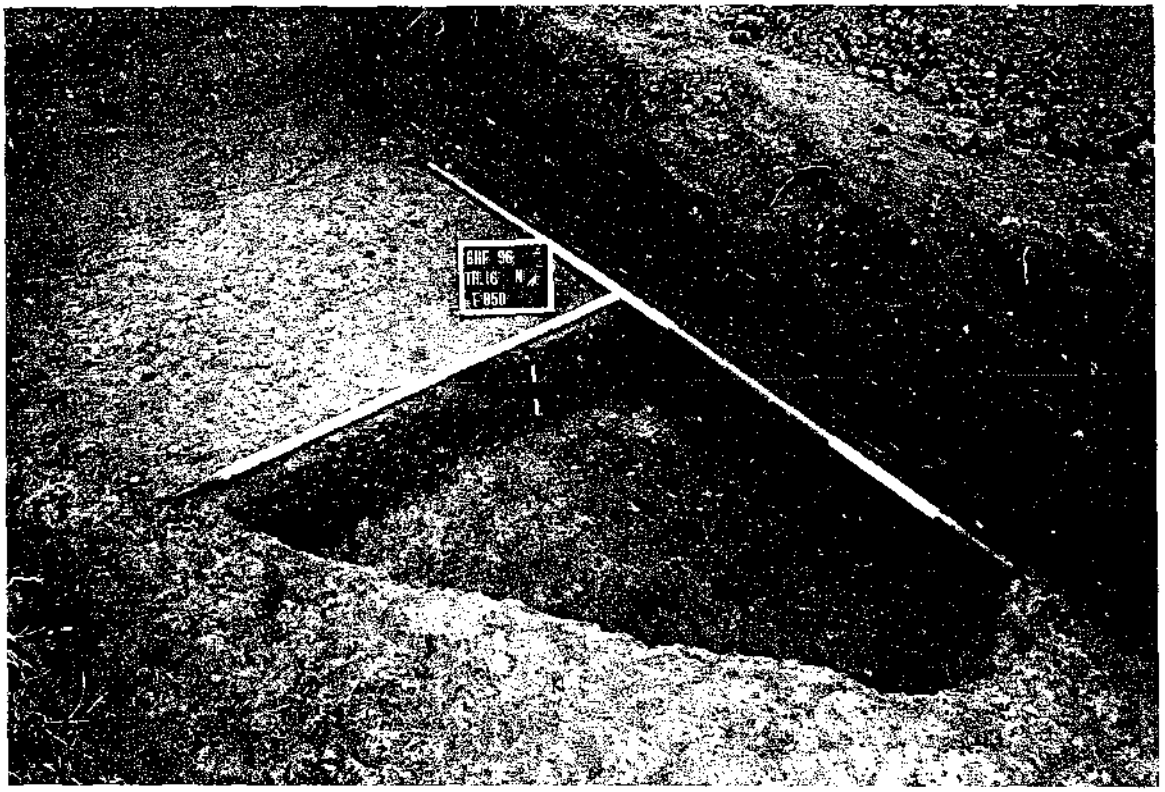

Plate 3

Plate 4