WEST HOATHLY BRICKWORKS
SHARPTHORNE
WEST SUSSEX

PROGRAMME OF ARCHAEOLOGICAL RECORDING FOR PHASE 2 EXTRACTION

For

IBSTOCK BRICK LIMITED

CA REPORT: 03176

NOVEMBER 2003

WEST HOATHLY BRICKWORKS
SHARPTHORNE
WEST SUSSEX

PROGRAMME OF ARCHAEOLOGICAL RECORDING FOR PHASE 2 EXTRACTION (PART 1)

CA PROJECT: 1620
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Author:	Jonathan Hart
Approved:	Mark Collard
Signed:	……
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Headquarters Building, Kemble Business Park, Cirencester, Gloucestershire, GL7 6BQ
Tel. 01285 771022 Fax. 01285 771033 E-mail:info@cotswoldarch.org.uk

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SUMMARY

Site Name:	West Hoathly Brickworks Phase 2 Extraction
Location:	Sharpthorne, West Sussex
NGR:	TQ 3763 3286
Type:	Programme of archaeological recording
Date:	October 2003
Planning Reference:	HO/36/98
Location of Archive:	East Grinstead Museum
Site Code:	WHS 03

A programme of archaeological recording was undertaken by Cotswold Archaeology during groundworks associated with the extension of the clay quarry at West Hoathly Brickworks, Sharpthorne, West Sussex.

An undated pit containing charcoal and iron smelting slag, and a spread of redeposited slag within a later quarry pit were recorded. The slag has been dated on technological grounds to the post-medieval to early modern period. Earthwork features previously recorded by field survey and associated with post-medieval marl extraction were identified, including a quarry pit and drainage ditches.

1. INTRODUCTION

1.1 In October 2003 Cotswold Archaeology (CA) carried out a programme of archaeological recording for Ibstock Brick Limited at West Hoathly Brickworks, Sharpthorne, West Sussex (centred on NGR: TQ 3763 3286; Fig. 1).

1.2 The programme of archaeological recording was undertaken as part of ongoing archaeological work required to fulfil a condition attached to a planning consent for an extension to the clay quarry (Planning ref: HO/36/98). The objective of the programme of archaeological recording was to record all archaeological remains exposed during the development.

1.3 The archaeological fieldwork was carried out in accordance with a brief for archaeological recording prepared by Mr John Mills (Archaeologist, West Sussex County Council Economic and Environmental Policy Service), the archaeological advisor to the Local Planning Authority (LPA), and with a subsequent written scheme of investigation (WSI) produced by CA (2003) and approved by the LPA acting on the advice of Mr John Mills. The fieldwork also followed the *Recommended Standard Conditions for Archaeological Fieldwork, Recording and Post-Excavation Work (Development Control), Version 2b* published by West Sussex County Council and the *Standard and Guidance for an Archaeological Watching Brief* issued by the Institute of Field Archaeologists (1999).

The site

1.4 The current works form the phase 2 extraction area of the brickworks and include two distinct areas of former land use: Marepit Wood, which contained visible archaeological earthwork features, and an area of improved agricultural grassland to the east with no visible surface features (Fig. 2). The works which are the subject of this report were carried out as the first part of the site preparation for the phase 2 extraction, and were wholly contained within the northern part of Marepit Wood (Figs 2 and 3).

1.5 The underlying geology of the area is mapped as Wadhurst clay overlying Ashdown Beds Sandstone (Ordnance Survey 1977, Map of Quaternary Deposits, UK South). The site lies at approximately 135m AOD.

Archaeological background

1.6 The programme of archaeological recording formed part of a series of ongoing works during the extension of the clay quarry at West Hoathly Brickworks by Ibstock Brick Limited. The general background to the archaeological works at the quarry have been outlined elsewhere (eg CAT 1999a) and it is not intended to reprise them here. The early parts of this programme included an archaeological evaluation and subsequent watching brief in the Phase 1 extraction area (CAT 1999b; 2001a). Within the Phase 2 extraction area, the visible earthworks within Marepit Wood have been archaeologically surveyed (CAT 2000; 2001b), and archaeological evaluation carried out within the northern part of the wood (CAT 2000).

1.7 The Phase 2 area is divided into two distinct former land uses – the area of Marepit Wood containing visible archaeological earthwork features, and an area of improved agricultural grassland to the east with no visible surface features. The earthwork survey within Marepit Wood showed that the earthworks features were formed by infilled iron minepits (presumed to be medieval on the basis of evidence elsewhere within the quarry) and associated spoil heaps, as well as large later marl pits, along with associated trackways and drainage channels. Evaluation trenching in the northern part of the wood revealed little further information about the minepits or any possible associated structures. Examination of the drainage channels suggested that these were associated with the post-medieval marl extraction phase.

Methodology

1.7 The fieldwork followed the methodology set out within the WSI (CA 2003). An archaeologist was present during intrusive groundworks, comprising machine stripping of the topsoil to the top of the natural substrate (Fig. 2).

1.8 Written, graphic and photographic records were compiled in accordance with the CA Technical Manual 1: *Excavation Recording Manual* (1996).

1.9 Subject to the agreement of the legal landowner the finds and site archive will be deposited with East Grinstead Museum.

2. RESULTS

2.1 Most of the features recorded during the works were the result of post medieval marl extraction and had been recorded previously as visible earthworks (CAT 2000). These consisted of a large quarry pit for marl 105 and drainage ditches 103, 108 and 109 (Fig 2). A surviving area of upcast from the excavation of the marlpit was recorded

2.2 These features occupied a large part of the stripped land surface of the Phase 2 area. The only other cut archaeological feature recorded was part of remains of a pit which was identified immediately adjacent to the projected line of Cookham's Lane on the north-western edge of the stripped area. The eastern side been quarried away by the large marl pit 105 and extensive root disturbance meant that what survived of this feature had also been severely truncated and damaged, but the basic form of what remained was still retrievable. This comprised an irregular edged pit 118, which had a basal fill of charcoal 115, with fragments of highly weathered slag, sealed by redeposited clay 117. This was itself overlain by a small patch of burnt clay, 116 which lay beneath a deposit of tap slag 114; the clay was most likely originally attached to the base of the slag, rather than being an *in situ* deposit. A further layer of redeposited clay, 113, formed the latest deposit in the sequence. Although the pit contained charcoal and some burnt clay, there was no evidence for *in situ* burning. No dating evidence was recovered.

2.3 A dispersed spread of iron slag, 111, was identified on the base of quarry pit 108. It is very unlikely that this was *in situ* given the depth and post-medieval date of the quarry pit, and the slag was redeposited.

3. THE METALLURGICAL RESIDUES by Dr T.P.YOUNG

3.1 Slag was recovered from a number of contexts, but all were apparently the result of secondary deposition rather than *in situ* processes. The assemblage appears to contain flows which dominantly contain a dark glassy slag, a good indicator for the origin of these slags in a blast furnace, but which have a morphology more usually found in bloomery slags. The very dark glass of these slags suggests that the blast furnace was being operated without a large enough quantity of flux (limestone) to ensure a low iron content in the slag. The widespread use of limestone flux sufficient

to reduce the iron content of the slag substantially was well established across Britain before the 18th century, although the use of "self-fluxing" ores in the Weald means that slags of this kind continued to be produced there until the 19th century (Cleere & Crossley 1995, p. 274; Hodgkinson pers. comm. 2004).

3.2 The rather insubstantial nature of the flows, with a morphology generally similar to that of bloomery tap slags, suggests that they were being produced from a very small furnace. Although the slab of furnace slag is difficult to interpret, it does also appear to be from a small furnace. The apparently very high iron content of some of the denser slags would also support an earlier age for the material. The possible date range for the assemblage is latest 15th to 19th century, but a 16th to 17th-century age is probably most likely. Isolated occurrences of blast furnace slag such as this are common in the Wealden area. Slags were widely dispersed as materials for tracks and roads, as well as for more general purpose hard-core.

4. DISCUSSION

4.1 The majority of the features identified were the result of post-medieval marl extraction activities. These features accounted for a large proportion of the exposed area and are therefore likely to have removed any earlier features, including those surface activities associated with medieval iron ore extraction and processing. No minepits were identified in the stripped surface.

4.2 The spread of slag in the base of the marlpit was redeposited and undated, and its origins are unclear. It may be associated with the same phase of activity as the pit 118, but this is unclear. The function of this single feature on the western edge of the site is uncertain due to its fragmentary survival, but it has produced evidence of iron smelting, not apparently *in situ*, but presumably derived from within the vicinity. Again, as during previous recording works, no focus or intensity of activity was recorded, and the absolute quantities of slag recovered are low. The date range suggested for the metallurgical residues places it at the earliest the chronological margins of medieval activity on the site, and it most likely belongs in the early post-medieval period.

5. CA PROJECT TEAM

Fieldwork was undertaken by Jon Hart, who also compiled this report. The illustrations were prepared by Peter Moore. The archive has been compiled by Jon Hart, and prepared for deposition by Ed McSloy. The project was managed for CA by Mark Collard.

6. REFERENCES

CAT 1999a *West Hoathly Brickworks, Sharpthorne, West Sussex. Phase 1: Cookham's Lane . Archaeological Recording.* CAT typescript report 991046.

CAT 1999b *West Hoathly Brickworks, Sharpthorne, West Sussex. Phase 1: (excluding Cookham's Lane) . Archaeological Recording.* CAT typescript report 991063.

CAT 2000 *West Hoathly Brickworks, Sharpthorne, West Sussex. (Mare Pit Wood): Archaeological Survey and Evaluation.* CAT typescript report 001159.

CA 2003 *West Hoathly Brickworks, Sharpthorne, West Sussex: Written Scheme of Investigation for a Programme of Archaeological recording*.

Cleere, H. and Crossley D. 1995. *The Iron Industry of the Weald*.

APPENDIX 1: CONTEXT DESCRIPTIONS

Context	Description
101	topsoil
102	natural
103	post-medieval drainage ditch
104	fill of 103
105	Post-medieval marlpit
106	fill of 105
107	upcast from the excavation of 105
108	drainage ditch
109	drainage ditch
110	fill of 109
111	poorly-defined spread of iron slag
112	generic number for pit (=118 and contents)
113	redeposited clay ?capping of furnace pit 118
114	tap slag within pit 118
115	charcoal layer in base of pit 118
116	small patch of burnt clay within pit 118
117	redeposited clay above charcoal 115 within pit 118
118	pit

APPENDIX 2: THE METALLURGICAL RESIDUES

By Dr T.P. Young, Geoarch (report 2004/05)

Summary

The material recovered includes a variety of slags produced from an iron-smelting blast furnace. Specimens include both tapped glassy slags, and a slag block from the internal wall of the furnace. Wealden smelting technology was very conservative, but although the present material might belong to a period from 15th to 19th centuries, there are indicators that the furnace was rather small, so a 16th to 17th-century date is most likely. Various blast furnaces of this date are known from the West Hoathly area.

Material (described by context)

101. 3.755kg. Large curved slab of slag from furnace wall. Piece has a moderately smooth inner surface; some fired clay lining is attached to outer surface. The piece is not evenly curved. If interpreted as a steeply oriented wall, then a furnace diameter of 0.3 to 0.4m seems indicated. The piece also curves, and the slag layer thickens, in a direction perpendicular to the tightest curvature, suggesting that, if steep, the piece derives from an area of overhang within the furnace (perhaps from above the tapping arch). Alternatively, the piece could be interpreted as less steep and to be from the lower part of a inverted-conical furnace section of wider diameter. Such a morphology might suit an area below the boshes of a blast furnace, with the slag thickening towards the hearth floor. Wealden furnaces were typically brick-lined above the hearth, and the specimen shows fired clay adhering to the outside.

The slag is variable, in places mid-grey, crystalline, and with small vesicles, but in others a very dark glass. The high density of the specimen, taken together with the high degree of curvature, might suggest that this piece is derived from a bloomery iron smelting furnace, but the similarity of some of the slag to the more glassy material described below raises the possibility this is from a blast furnace (or just possibly a "high bloomery"). The piece has rounded edges and appears to have undergone some abrasion.

101. 245g. 4 pieces of vesicular, brown-weathering slag. Broken surfaces reveal a dark, highly vesicular glass similar to the material from (114).The pieces are all rather rounded and weathered.

111. 290g. 9 fragments of dark vesicular slag, varying from glass to more crystalline materials. Mostly material more dense than that from (114), including one small piece which clearly shows a boundary between crystalline and glassy slags. One piece, apparently dominantly of crystalline slag, shows eroded remnant of a flow-lobed surface.

114. 2.02kg. A fragmented block of flow-lobed black glassy vesicular slag. Flow is up to 40mm in thickness. The lower surface of the flow is slightly dimpled (often an indication of flow over charcoal). The basal part of the flow is vesicular, mid-grey and crystalline, but above those basal few millimetres the flow is uniformly glassy. The glass appears black in hand specimen, but transmitted light shows it to be a very dark green. The upper surface of the flow shows included pieces of fired clay, possibly fallen pieces of the tap-arch blocking. The sample also includes a block of ferruginous limestone (210g).

115 310g. Fragmented, highly weathered, mainly highly vesicular slag. Fresh material shows an extremely highly vesicular dark glassy slag. There is also a single piece of much denser slag (30g). This denser slag comprises a flow of weathered grey crystalline slag with a single layer of flow-lobes. The lobes have a wrinkled surface. Adhering to the top of the flow is a bleb of extremely well flow-foliated dark green glass.

116. c. 5g. Fired clay,

Interpretation

The assemblage appears to contain flows which dominantly contain a dark glassy slag, an good indicator for the origin of these slags in a blast furnace, but which have a morphology more usually found in bloomery slags.

The very dark glass of these slags suggests that the blast furnace was being operated without a large enough quantity of flux (limestone) to ensure a low iron content in the slag. The widespread use of limestone flux sufficient to reduce the iron content of the slag substantially was well established across Britain before the 18th century, although the use of "self-fluxing" ores in the Weald means that slags of this kind continued to be produced there until the 19th century (Cleere & Crossley 1995, p. 274; Hodgkinson pers. comm. 2004).

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The possible date range for the assemblage is latest 15th to 19th century, but a 16th to17th century age is probably most likely.

Isolated occurrences of blast furnace slag are common in the Wealden area. Slags were widely dispersed as materials for tracks and roads, as well as for more general purpose hard-core.

Reference

Cleere, H. and Crossley D. 1995. *The Iron Industry of the Weald*.

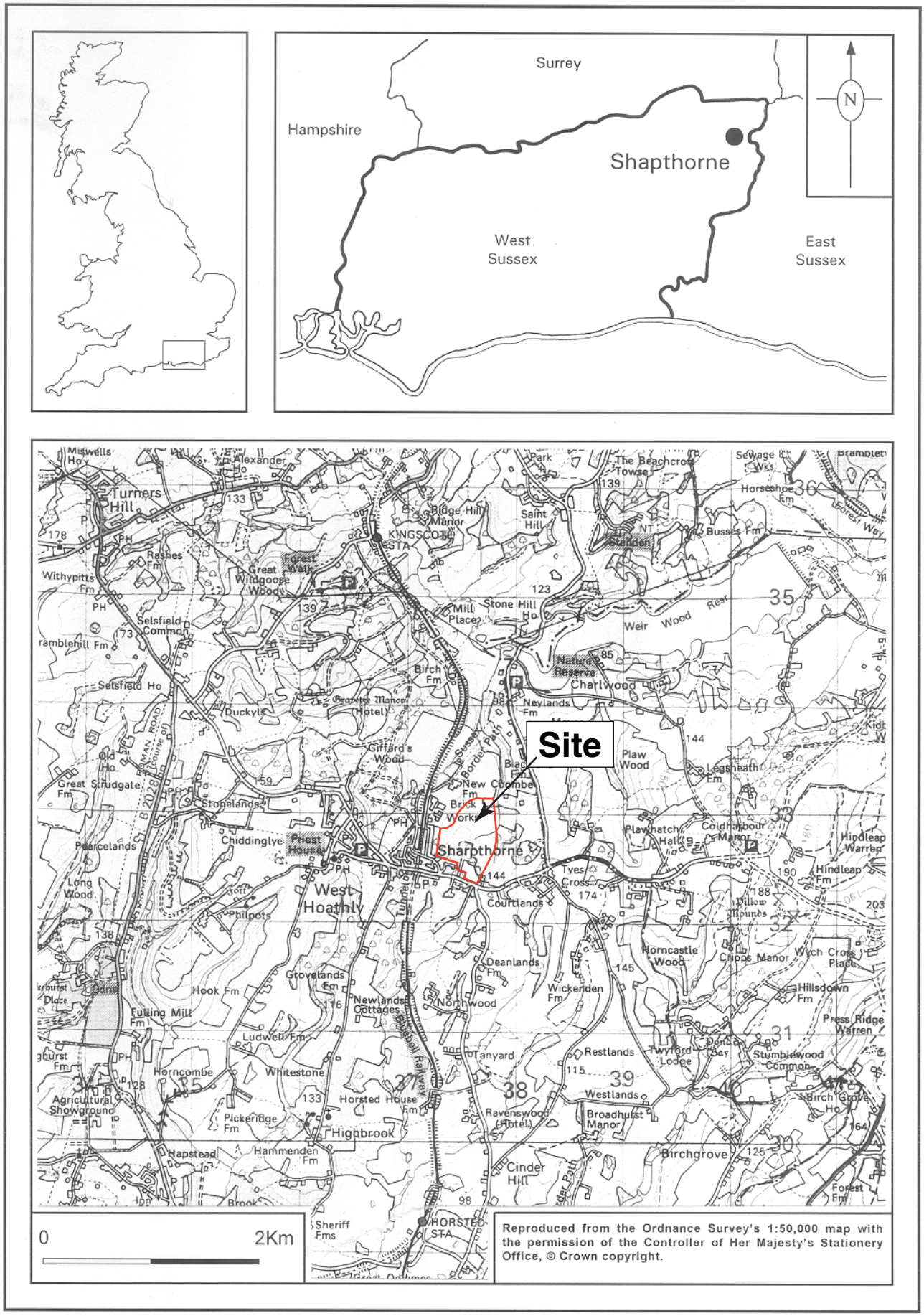

Fig. 1 location plan

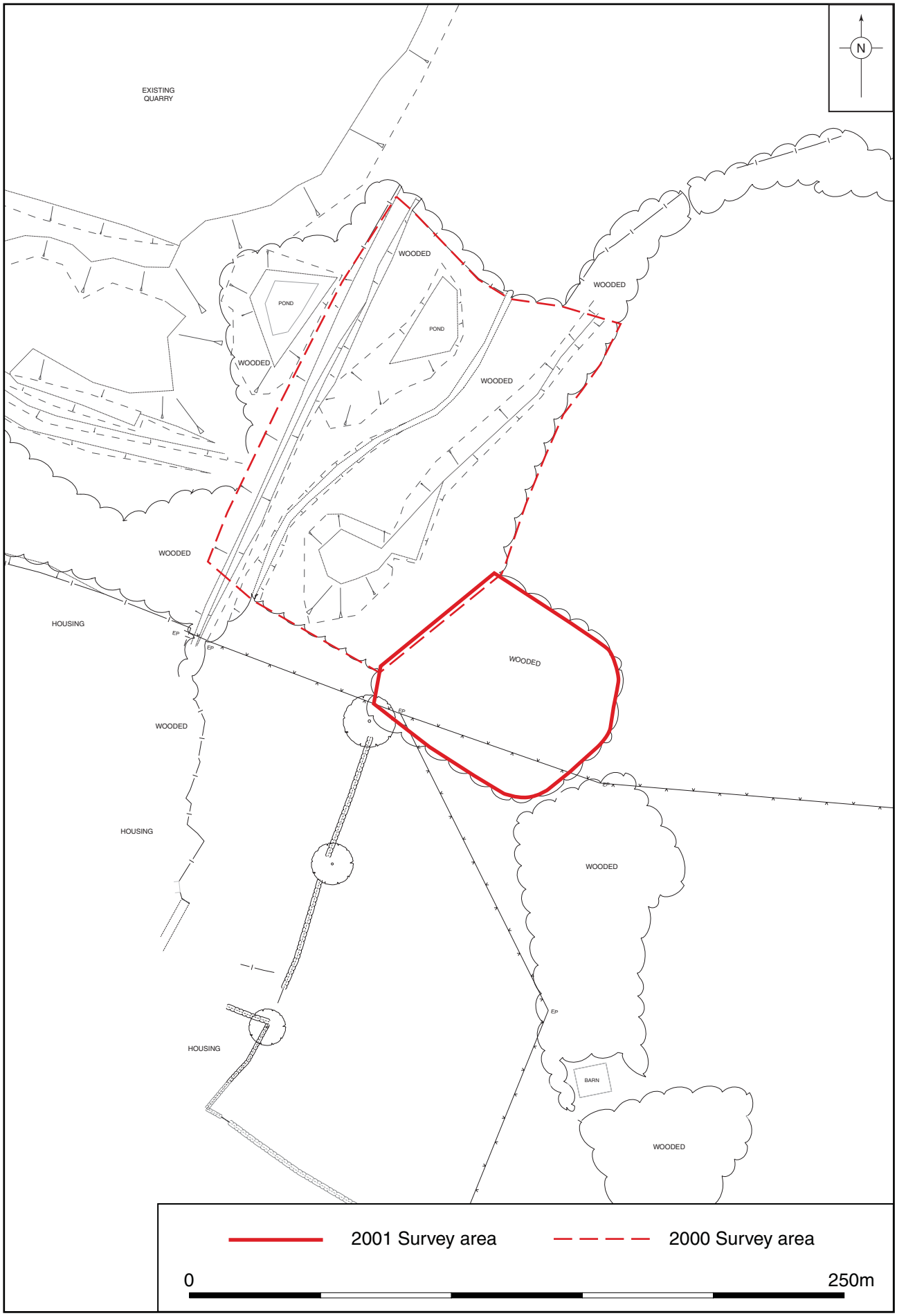

Fig. 2 Mare Pit Wood showing location of areas surveyed in 2000 and 2001

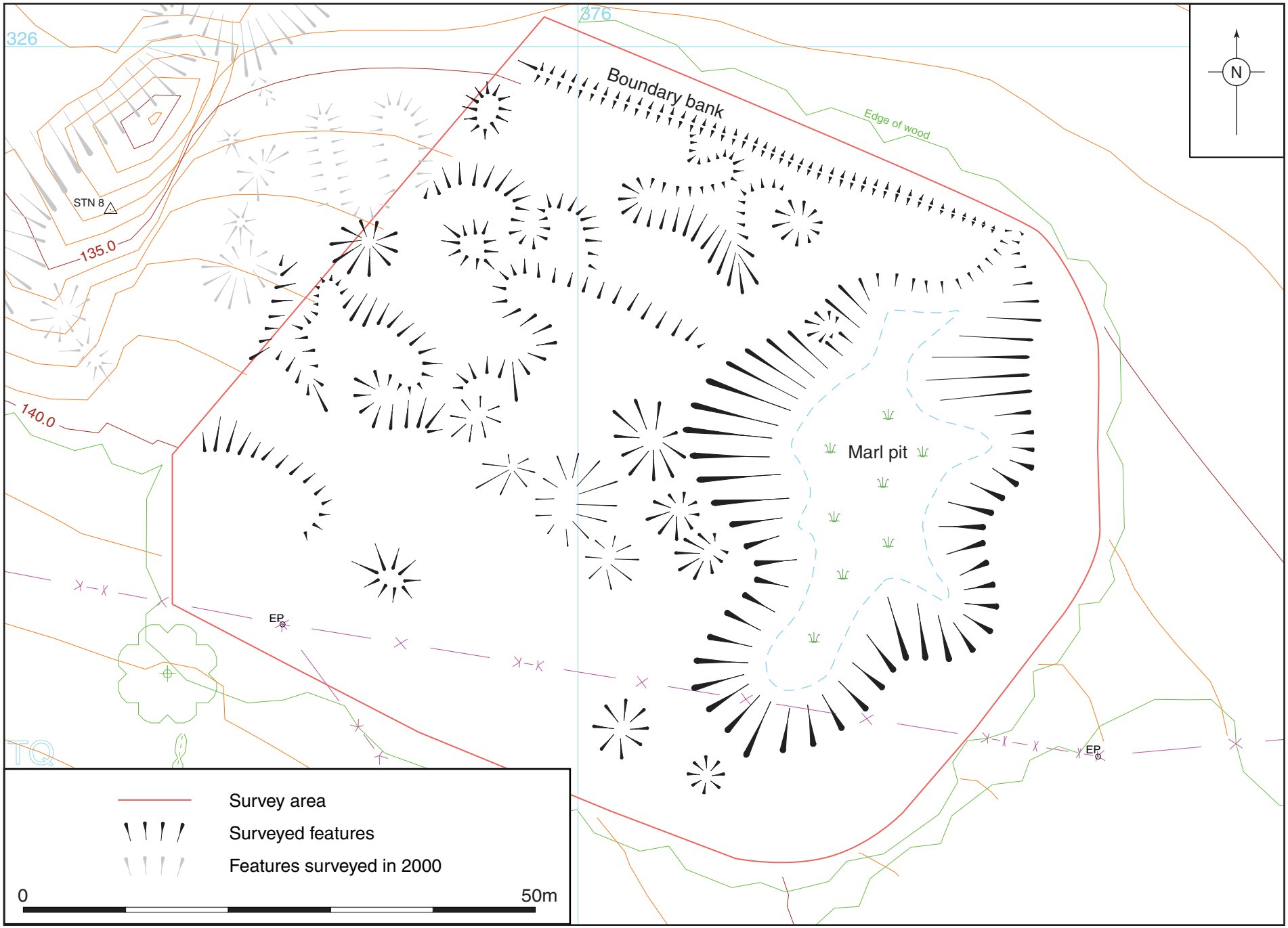

Fig. 3 Mare Pit Wood, South East, Earthwork Survey (1:500)

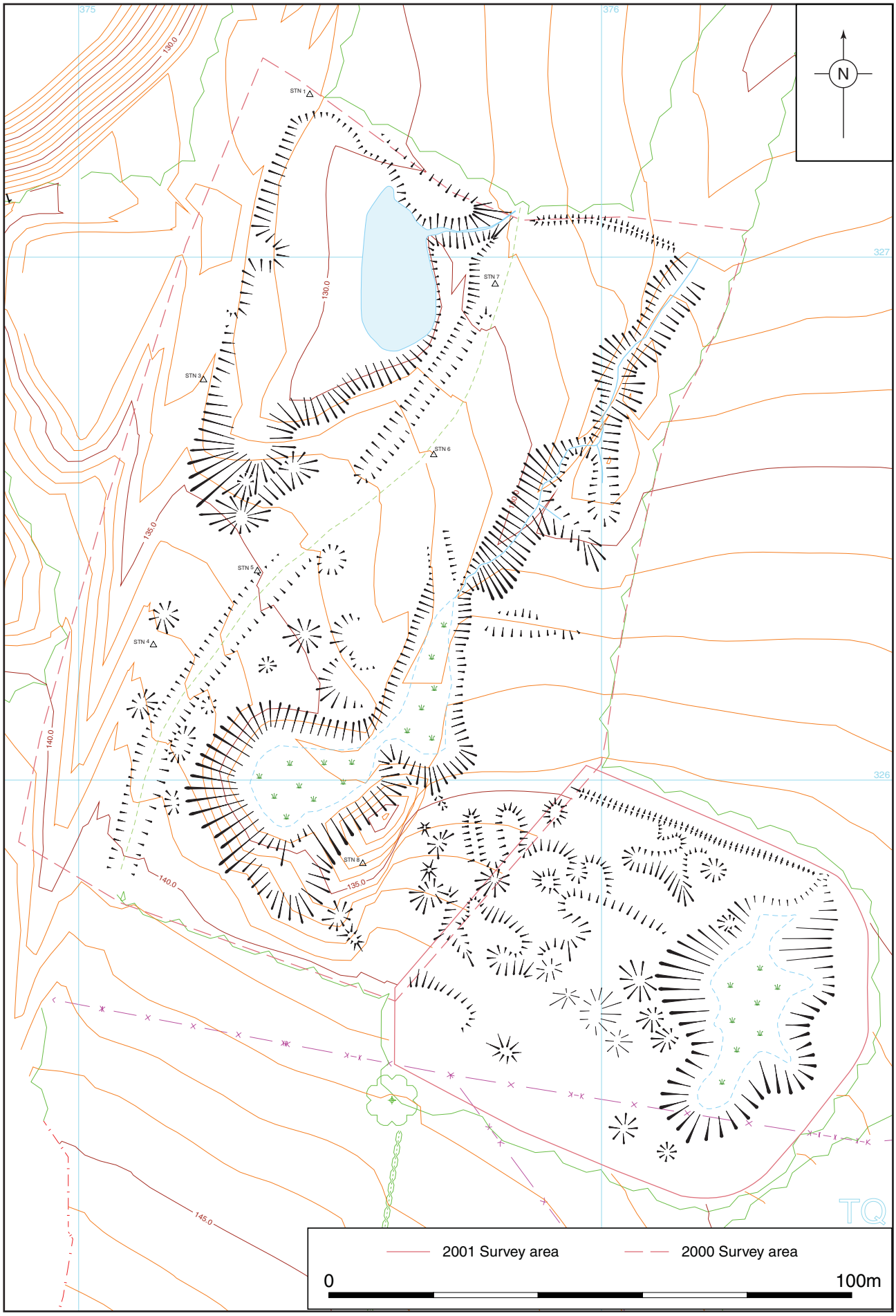

Fig. 4 Mare Pit Wood, combined plot of 2000 and 2001 surveys (1:1000)