
ARCHAEOLOGICAL SOLUTIONS LTD

**THE PROPOSED RESERVOIR SITE,
MANGREEN HALL FARM, SWARDESTON, NORFOLK.
ARCHAEOLOGICAL EXCAVATION**

RESEARCH ARCHIVE REPORT

Authors: Fieldwork: Walter McCall PhD MIFA Report: Pip Stone BA Illustrations by: Charlotte Davies BA MA AIS	
NGR: TG 2196 0346	Report No. 3287
Borough: Depwade	Site Code: 37649
Approved: Signed:	Project No. 3295
	Date: Nov 2011

This report is confidential to the client. Archaeological Solutions Ltd accepts no responsibility or liability to any third party to whom this report, or any part of it, is made known. Any such party relies upon this report entirely at their own risk. No part of this report may be reproduced by any means without permission.

OASIS SUMMARY SHEET

Project details			
Project name	<i>Proposed Reservoir, Mangreen Hall Farm, Swardeston, Norfolk. A Research Archive Report</i>		
<p>Project description (250 words)</p> <p><i>Between January and February 2009, Archaeological Solutions Ltd (AS) undertook an archaeological strip, map, and sample excavation at the proposed reservoir, Mangreen Hall Farm, Swardeston, Norfolk (TG 2196 0346). The excavation was undertaken in advance of the digging of a water reservoir.</i></p> <p><i>A series of archaeological investigations were undertaken at the quarry site to the immediate south of the proposed reservoir. A desk based assessment (Prosser 2002), field walking (Grant 2003), a geophysical survey (Stratascan 2003), and a trial trench evaluation (Keir & Roberts 2003) were undertaken between 2002 and 2003. The evaluation revealed a low density of undated ditches, gullies and pits. Between May and June 2008, AS undertook archaeological monitoring and recording at the quarry site. Archaeological features comprised seven pits, two postholes, and four ditches. The pits were prehistoric, probably Iron Age. Bronze Age and early Roman pottery was also recovered in small quantities. The ditches were possibly post-medieval.</i></p> <p><i>The current excavation at the adjoining reservoir site revealed 22 features. The principal feature was a circular enclosure ditch, which encompassed six graves. The latter contained at least seven human skeletons and a sheep dating to the Roman period. Other datable features comprised a prehistoric pit and two post-medieval ditches. The remaining three pits, two postholes, six ditches, and one tree hollow were undated.</i></p>			
Project dates (fieldwork)	8 January - 20 February 2009		
Previous work (Y/N/?)	Y	Future work (Y/N/?)	N
P. number	3295	Site code	37649
Type of project	Archaeological strip, map, and sample		
Site status	None		
Current land use	Agricultural land		
Planned development	Reservoir		
Main features (+dates)	Roman funerary enclosure containing six graves, LBA/EIA pit, two post-medieval ditches		
Significant finds (+dates)	97 iron coffin nails, burnished Roman dish		
Project location			
County/ District/ Parish	Norfolk	South Norfolk	Swardeston
HER/ SMR for area	Norfolk		
Post code (if known)	-		
Area of site	1.11 ha		
NGR	TG 2196 0346		
Height AOD (max/ min)	35-40m AOD		
Project creators			
Brief issued by	Norfolk Landscape Archaeology (NLA)		
Project supervisor/s (PO)	W. McCall		
Funded by	Lafarge Aggregates Ltd		
Full title	<i>Proposed Reservoir, Mangreen Hall Farm, Swardeston, Norfolk. Archaeological Excavation. Research Archive Report</i>		
Authors	Pip Stone BA		
Report no.	3287		
Date (of report)	Sept 2010		
Updated Report	Nov 2011		

CONTENTS

OASIS SUMMARY SHEET

1 INTRODUCTION

2 SITE NARRATIVE

- 2.1 Overview**
- 2.2 Historical and Archaeological Background**
- 2.3 Phasing**
- 2.4 Phase 1: late Bronze Age/ early Iron Age**
- 2.5 Phase 2: Romano-British**
- 2.6 Phase 3: post-medieval/ modern**
- 2.7 Unphased**

3 SPECIALIST REPORTS

- 3.1 The pottery** By Andrew Peachey
- 3.2 The struck flint** By Andrew Peachey
- 3.3 The daub and ceramic building materials** By Andrew Peachey
- 3.4 The coffin nails** By Nina Crummy
- 3.5 The human bone** By Dr. Stephany Leach
- 3.6 The animal bone** By Dr. James Morris
- 3.7 The Environmental Samples** By Anita Radini
- 3.8 Radiocarbon Analysis** By Beta Analytic Inc. and Andrew Newton

4 DISCUSSION

BIBLIOGRAPHY

THE PROPOSED RESERVOIR, MANGREEN HALL FARM, SWARDESTON, NORFOLK

RESEARCH ARCHIVE REPORT

1. INTRODUCTION

1.1 This report comprises the research archive for excavations at the site of a proposed reservoir, Mangreen Hall Farm, Swardeston, Norfolk (centred on NGR TG 2196 0346, Figs. 1 and 2). The excavations were carried out by Archaeological Solutions Ltd., and comprised a 'strip, map and sample' excavation undertaken in January and February 2009.

1.2 The excavation was commissioned by Lafarge Aggregates Ltd to comply with a planning condition attached to planning approval for a proposed water reservoir (Planning Ref.C/7/2008/7010). It was undertaken in accordance with a brief issued by Norfolk Landscape Archaeology (NLA) (dated 04/11/08), and a specification compiled by Archaeological Solutions Ltd (dated 04/11/08). The project adhered to the Institute for Archaeologists' *Code of Conduct* and the *Standard and Guidance for Archaeological Field Evaluation* (revised 1999), as well as the relevant sections of *Standards for Field Archaeology in the East of England* (Gurney 2003).

1.3 The purpose of this research archive report is to describe, analyse and interpret the archaeological remains found during the investigations. The report is supported by catalogues, databases and archaeological descriptions compiled during post-excavation analysis (on accompanying CD), plans and section drawings (Figs. 1 - 9).

2. SITE NARRATIVE

2.1 Overview

2.1.1 In January and February 2009, Archaeological Solutions Ltd (AS) carried out an excavation at the site of a proposed reservoir, Mangreen Hall Farm, Swardeston. The excavations revealed archaeological features dating from the late Bronze Age/early Iron Age through to the post-medieval. The features comprised a late Bronze Age/ early Iron Age pit, seven Romano-British inhumations within a three-sided enclosure, and two post-medieval ditches.

2.1.2 Mangreen Hall Farm is located approximately 6.5 km south-east of Norwich in relatively flat countryside adjacent to the rivers Yare and Tas (Figs. 1 and 2). The site comprises a large rectangular field covering 1.11ha, previously utilised for agriculture. It is situated on a narrow strip of land (35-40m AOD) stretching between Swardeston village, c. 1.5 km to the west, and the A140 trunk road, which joins the A47 just to the north of the excavation area. Most of the surrounding area is farm land. The site is located on the high Boulder Clay

plateau that defines the geology of central Norfolk and is dominated by varied but poorly drained soils with limited fertility. The predominant local soils are chalky tills and glacio-fluvial drifts of the Burlingham 3 Association and comprise deep and fine loamy, often sandy soils with slight seasonal waterlogging, generally suitable for arable cultivation (Soil Survey of England and Wales, 1983). The geotechnical profile of the site has documented scattered silty bands of sands and gravels sealing a deposit of Boulder Clay at a horizon of between 4.7 and 5.2 m. The excavation revealed a thick clayey subsoil within the western third of the site. A dry valley, aligned east/ west, traverses the remaining two-thirds (Fig. 4).

2.2 Historical and Archaeological Background (Fig. 3)

Prehistoric

2.2.1 The Tas Valley has been settled and exploited since the early prehistoric period. Isolated Mesolithic flints have been found amongst later flints at Dunston, to the east of the A140 (NHER 31820). Also at Dunston, field-walking recovered sherds of Neolithic pottery, implying settlement in the area (NHER 21820). Within the immediate area of the site, aerial photography has revealed the presence of four ring ditches (NHER 9473). Metal detecting has supplemented this sparse evidence with a scatter of objects including an axe and a bronze rapier (NHER 28718).

2.2.2 The Iron Age remains poorly understood and under-represented in Norfolk. The only local evidence for activity dating to this period was recovered during the expansion of Dunston golf course, where post-holes, pits and pottery sherds were present (NHER 31820, 31856 and 31858).

Romano-British

2.2.3 The Romano-British town at Caistor St. Edmund (*Venta Icenorum*) is located approximately 1.5km to the east of the site. The settlement, whose name means 'the market of the Iceni', is indicative of a deliberate act of Romanisation, when tribal areas were transformed into *civitates* or 'city-states'. It was probably founded c. 70AD, and had a regular street plan, with a forum, basilica, bath-house, temples, town-houses and an amphitheatre. Industrial manufacture including pottery, metal-working and glassware is also attested (Wacher 1996, 243).

2.2.4 To the east of the A140, a double-ditched rectangular enclosure was noted on aerial photographs. In shape it is typical of the outlined plans of Roman temples, and has been proposed as the site of a shrine or religious centre located on the slopes of a hill over looking the river and the Roman town. Field-walking and metal-detecting in the vicinity has revealed a scatter of material including coins and a metal box (NHER 9743).

2.2.5 A concentrated spread of Romano-British material and cropmarks present

on all sides of *Venta Icenorum*, and extending up to 2km in some directions, implies extensive rural settlement around the town, though its exact nature has not been established (NHER 9743, NHER 30476).

Saxon

2.2.6 Evidence for settlement in the immediate post-Roman period is limited to a possible *grübenhaus*, which has tentatively been identified among a cropmark complex to the east of the A140. Stray finds of the mid to late Saxon period recovered by metal-detecting have been found east of the site (NHER 24784), and on the bypass route to the north (NHER 28869). By 1066, Mangreen was a distinct, if small estate. The place name is derived from Old English *Gemooeniggrene*, and is indicative of both peripheral or secondary settlement, and the presence of land which was considered as 'common'. Mangreen is one of just a few communities with a demonstrably pre-conquest origin.

Saxo-Norman onwards

2.2.7 At the time of Domesday, the Mangreen estate was owned by Roger Bigod, and is later recorded in the possession of Osbert of Mangreen and William of Mangreen. The le Neve family possessed it for most of the 14th century, after which time the farm is not recorded in historical records. The house is described as a property of some importance during the 16th century. Traces of a moat survive at the present day farm, which is possibly a medieval or post-medieval feature. The house was purchased by the Davy family c. 1700 (Pevsner 1994, 689) and by 1800 much of the surrounding land had been landscaped, including at least part of the area of the site. By 1845 much of the land was arable and remains so to the present day.

2.3 Phasing

Dateable material was assigned to the three chronological phases outlined below (Table 1 and Fig. 5);

PHASE	DATE
Phase 1	Late Bronze Age/ early Iron Age (1300 BC to 400 BC)
Phase 2	Romano-British (AD 43 to AD 410)
Phase 3	Post-medieval/ modern (AD 1500 to present)
Unphased	

Table 1: A summary of the phasing

2.4 Phase 1: late Bronze Age/ early Iron Age (1300 BC to 400 BC)

2.4.1 The late Bronze Age/ early Iron Age activity comprised one pit (Figs. 5 and 6). Pit F2029 was located c. 30m to the east of Phase 2 enclosure Ditch F2021, just within the bounds of the dry valley (Grid Ref: L4). It contained one sherd of late Bronze Age pottery (12g) and one piece of worked flint (37g). Pottery of a

contemporary date was found residually in Grave F2049 and Ditch F2039. While no diagnostic or decorated sherds were present, the fabric can be compared to material recorded at Harford Farm, Caistor St. Edmund and Valley Belt, Trowse on the Norwich Southern Bypass (Percival 2000, 108 and 170).

2.5 Phase 2: Romano-British (AD 43 to AD 410)

2.5.1 The Romano-British activity consisted of a small inhumation cemetery comprising six graves and seven burials within the bounds of a three-sided enclosure (F2021 – Figs. 5, 7, 8 and 9). The primary grave was F2031, which was situated centrally within the enclosure and which contained two individuals and a neonate sheep/ goat. Graves F2033 and F2027 were to the south and west of this grave. The remaining graves (F2046, F2049 and F2061) were situated to the north, and possibly represent a later phase of burial.

The three-sided burial enclosure

2.5.2 Enclosure Ditch F2021 (Figs. 5 and 7) was located c. 4m north of the southern site edge and c. 27m to the west of the large dry valley which covered most of the eastern part of the site (Grid Refs: I4 and I5). It was c. 25m long and 'C'-shaped, with the northern side open. The shape formed by the exterior of the ditch was angular, while the inside edges were rather more curved. The fill (L2022) was a uniform mid reddish brown silty clay throughout, with varying amounts of flint and gravel found at the base of the cut. Finds within the ditch were confined to the termini and corners and consisted of relatively small amounts of Romano-British pottery (50 sherds, 214g), and CBM (ceramic building materials) (194g). Many of the pottery sherds are thought to be cross-joining parts of the same vessel, likely to have been in jar form (see Peachey, this report). A possible further sherd of this vessel was recovered from Grave F2061, though this is not certain. The ditch surrounded six graves, containing seven inhumations.

2.5.3 The deposition of the dead within bounded enclosures is an important and recurring feature of Romano-British burial practice. Small groups of burials on the outskirts of towns, villages and rural settlements are generally bounded by enclosures (Esmonde Cleary 2001). This is true of cemeteries throughout the Romano-British period, and is evidenced by early Roman sites such as Owlsbury, Hampshire (Collins 1977) and later Roman sites such as Ashville, Oxon (Parrington 1978), and at points along the Fosse Way between Shepton Mallet and Ilchester (Leach *forthcoming*).

The primary Romano-British inhumations (Table 2 and Fig. 8)

2.5.4 Taphonomic distinctions between the two groups of three graves within the enclosure imply that two separate periods of funerary activity occurred. The primary burials comprise F2027, F2031 and F2033. These were all deep, well cut and centrally positioned within the enclosure; the secondary burials were shallow and poorly preserved and were situated in the entrance way to the enclosure.

Grave	Skeleton Number	Characteristics
F2027	Sk2045	Adult male
F2031	SK2051	15 – 18yr old male
	SK2052	18 – 20yr old female, mixed racial traits
F2033	SK2053	Adult male

Table 2: The primary inhumation burials

2.5.5 Of the three earlier burials, it is thought that Grave F2031 was the primary interment. Positioned in the centre of the enclosure, Grave F2031 was almost square (2.13m x 1.62m x 1.84), and contained two inhumations; SK2051 (6178g) and SK2052 (3719g), surrounded by 35 Iron nails (SF7, 23 – 35, 38 – 42, 46 – 48, 51 – 52, 54, 60 – 61, 68 – 69 and 78 – 83). SK2051 was a young male, aged between 15 and 18. It was orientated with the feet to the north and the head to the south and facing slightly to the north-east. The burial was in an extended supine position, with semi-flexed arms so as the hands were crossed upon the pelvis. The second inhumation (SK2052) was an 18 to 20year old woman. It was positioned in the same way as SK2051, but the head was facing to the west. The body was extended and supine though had been twisted slightly to the left. Cranial traits displayed by this skeleton suggest that she was either mixed-race or North African in origin. The accompanying male skeleton shows no such traits. Thirty-five iron nails were found in the grave cut. To the north-east of SK2051 was the skeleton of a neonate sheep/ goat, which had possibly been interred within some kind of box, evidenced by three nails and a stain in the base of the feature.

2.5.6 One metre to the west of Grave F2031 was Grave F2033. It was about half the size of Grave F2031 (2.15m x 0.85m x 1.23m), and on the same alignment to Grave F2031. It contained a single inhumation (SK2053 - 1918g) of an adult male. Though extremely fragmentary and degraded, it was evident that the body had been interred in an extended, supine position. Twenty-two iron nails (SF8 – 10, 37, 44 – 45, 50, 58, 62 – 67, 71 – 77) were found at the base of the grave.

2.5.7 One metre to the south of Grave F2031 was Grave F2027, a single, rectangular inhumation burial. Unlike the graves to the north, this was orientated east to west (head to feet). The burial comprised SK2045 (4098g), a well preserved, robust adult male. It was in an extended supine position, with the skull facing to the south. Both arms were semi-flexed with the left hand resting on the pelvis, and the right hand beneath it. Nine iron nails (SF1 – 6 and 11 – 13) were positioned around the head and feet of the burial.

The secondary Romano-British inhumations (Table 3 and Fig. 9)

2.5.8 The secondary burials were situated side by side in the entrance way to the enclosure ditch; all were shallow and poorly preserved. The central of the three was F2046. It was positioned c. 1m to the north of SK2051 in Grave F2031. The grave was rectangular in plan, and was orientated north to south (feet to head). It contained SK2048 (2067g) which comprised the remains of an adult

?male individual in an extended supine position, with a fully extended right arm, and slightly flexed left arm and legs. Six iron nails (SF14 – 17, 21 and 53) were present within the feature.

Grave	SK Number	Characteristics
F2046	SK2048	Adult male
F2049	SK2060	5 – 7 year old Child
F2061	SK2063	Adult ?male

Table 3: The secondary inhumation burials

2.5.9 Grave F2049 was positioned to the east of Grave F2046. It was rectangular and orientated north to south (feet to head). It contained SK2060 (373g), which was very poorly preserved and comprised just the occipital lobe, a piece of mandible and the long bones. As with all of the other graves, the body was interred in an extended supine position, with semi-flexed arms, and extended legs. A small scatter of teeth present in the chest region of SK2060 suggests the individual was aged between 5 and 7 years. Finds present within the grave comprised four Iron nails (SF87 – 90), and a complete 1st to 2nd century black burnished Roman dish (7 sherds, 183g), which appears to have been deliberately broken at the time of deposition, with the sherds concentrated around the left hand, mandible and pelvis (SF 84, 86 and 91), in the lower fill, and six further nails (SF18 – 19, 22, 36, 43 and 49), Roman pottery (2 sherds, 4g) and possibly more pieces of the black burnished from the lower fill (SF20), in the upper fill. The practice of deliberately breaking pottery vessels was first identified by T. C. Lethbridge at Guilden Morden, Cambridgeshire (Fox and Lethbridge 1924). This 'rite' has since received little academic attention, although more recent examples have been identified at a number of cemeteries in East Anglia including Dunmow (Wickenden 1988) and Braughing (Partridge 1977), and in non-funerary contexts such as East Winch (Lally *forthcoming*).

2.5.10 The remaining secondary burial (Grave F2061) was located c. 1m west of Grave F2046. As with all the other graves it was rectangular and orientated north to south (feet to head). Within the grave was SK2063 (3337g), which was as poorly preserved as SK2060 and SK2048. It was in an extended supine position, with arms crossed at the pelvis and legs extended, but bowed. A clearly defined coffin stain surrounded the body on three sides; a separate plank stain spanned the south-east end of the grave cut. Nine iron nails (SF85, 92, 94 – 99 and 102) were preserved within the coffin stain and are thought to have remained *in situ*. Three further nails and a small piece of Romano-British pottery were recovered from the environmental samples (SF103 – 105). The sherd of Romano-British pottery (1g) is thought to have possibly been part of a vessel present in the Enclosure Ditch F2021. It is plausible that the vessel was deliberately destroyed prior to deposition, and that a sherd was taken and interred with the inhumation. Possibly this was the final of the six inhumations to have been buried within the enclosure, and the presence of fragments of the same pottery vessel in both the enclosure and the final grave represent an act of closure or completion (see Chapman and Gaydarska 2007).

2.5.11 The presence of Iron nails in all of the features, some with mineralised

wood deposits, allows for further interpretation as to the nature of the inhumation practice. Despite all nails being classified as Manning's Type 1b coffin nails (1985, 134), only in Grave F2061 does the pattern of nail distribution provide evidence for the use of a wooden coffin, placed in an unlined pit. Apart from this instance, the practical approach to inhumation at Mangreen Hall Farm seems to have been to dig the grave pit, revet it, possibly quite crudely and possibly using old planks, and then to place the corpse, uncoffined, within the lined hole (Crummy 2009). The method of construction, which unlike building a coffin requires no skill in joinery, may be compared to that of timber vaults or lidded chambers used for both single and multiple burials at Butt Road, Colchester, although there the use of vaults appears to be related to status and familial practice as the corpses were also coffined (Crummy *et al.* 1993, 111-14).

2.6 Phase 3: post-medieval (AD 1500 to AD 1750)

2.6.1 Post-medieval activity comprised three linear ditches (F2009, F2023 and F2041) which were positioned so as to form three sides of a rectangle. Ditches F2023 and F2041 yielded post-medieval remains; however F2009 was sterile of finds. Ditches F2023 and F2041 intersected at right-angles c. 3m to the east of Romano-British Ditch F2021. Ditch F2023 was orientated north to south, and Ditch F2041 was orientated west to east. To the north, Ditch F2009 intersected with Ditch F2023, c. 15m to the north of Ditch F2021. It extended past the site boundaries to both the east and west. It is probable that these ditches formed part of a field system.

2.7 Undated

2.7.1 Eleven undated features were identified, comprising five gullies (F2007, F2025, F2035, F2037 and F2039), four pits (F2012, F2015, F2017 and F2019) and two postholes (F2011 and F2043).

Features possibly associated with post-medieval activity

2.7.2 Of the eleven undated features, Gully F2039 may represent post-medieval activity. Though it did not contain post-medieval material, it is associated with Phase 3 Ditch F2041 by proximity and alignment and may have formed part of the same system of land division. Gullies F2037, F2007, F2035 and F2025 are not so readily associable with the Phase 3 features, and based on their stratigraphic relationships with the Phase 3 features, result from an earlier phase of land use.

3 SPECIALISTS' FINDS AND ENVIRONMENTAL REPORTS

3.1 The pottery – By Andrew Peachey

Introduction

Excavations recovered a total of 68 sherds (533g) of pottery, of which the bulk comprised slightly abraded to well-preserved Romano-British sherds associated with the burials and their enclosure. Rare, highly abraded late Bronze Age or early Iron Age sherds were also present in the assemblage, as was a single post-medieval sherd from the topsoil.

Methodology

The assemblage was recorded by sherd count, weight (g) and R.EVE (rim estimated value equivalence). All fabrics were examined at x20 magnification and be referenced wherever possible to the National Roman Fabric Reference Collection (Tomber & Dore 1998), to equivalent fabric descriptions from local or regional kiln sites or typologies, or described fully in the site report. All form and fabric data was recorded by context and entered into a Microsoft Excel spreadsheet that forms part of the site archive.

Fabric Descriptions

F1	Flint and sand tempered ware. Oxidised red-brown surfaces and a dark grey core. Inclusions of common calcined flint (0.1-5mm) and sparse quartz (<0.25mm). Moderately hard with an abrasive feel (late Bronze Age/early Iron Age).
UNS BB	Unspecified black burnished ware (Bates and Lyons 2003, 99: UBB; Gurney 1995, 101; Andrews 1985, 93). Possibly a product of the unpublished kiln at Brockdish and almost certainly produced locally in the south-central Norfolk region (Roman)
ROB SH1	Romano-British shell-tempered ware (Bates and Lyons 2003, 99: STW). Probably a product of the Lakenheath kilns.
ROB SH2	Romano-British ('late') shell-tempered ware (Tomber and Dore 1998, 212). Potentially produced in kilns at Harrold (Bedfordshire), Lakenheath or the Lower Nene Valley.
PMED	Post-medieval lead glazed red-earthen ware.

The Prehistoric Pottery

The assemblage contains a total of four sherds (20g) of fabric F1, which tentatively date to the late Bronze Age or early Iron Age. though calcined flint was used as temper throughout the Prehistoric period in Norfolk. No diagnostic or decorated sherds are present in fabric F1, but the fabric is comparable to those recorded at Harford Farm, Caistor St. Edmund and Valley Belt, Trowse on the Norwich Southern Bypass (Percival 2000, 108 and 170). Small, highly abraded sherds of fabric F1 were contained as potentially *in situ* material in Phase 1 Pit

F2029 (L2030), and as residual material in Phase 2 Grave F2049 (L2050) and unphased Ditch F2039 (L2040 Seg. B).

The Roman Pottery

The bulk of the Roman pottery is accounted for by sherds from two vessels in Phase 2 features. The former is a well-preserved, fragmented but complete dish in Grave F2049, almost certainly deposited to accompany SK2060. The latter comprises cross-joining body sherds from a moderately abraded vessel in Enclosure Ditch F2021 which may have comprised a vessel deliberately deposited in the feature that surrounded the graves. Small sherds were also present in three further Phase 2 features.

The dish in Grave F2049 (L2050 and L2064) comprises an UNS BB shallow, plain rim dish, the interior and exterior of which had been highly burnished. Comparable vessels have been recorded from mid to late 3rd century AD contexts at Brancaster (Andrews 1985: type 157.4) and Caistor St. Edmund (Atkinson 1937: type W7). The cross-joining vessel fragments in Enclosure Ditch F2021 (L2022 Segs. A, J and L) form part of the body of a ROB SH1 vessel, probably a jar, although no diagnostic sherds are present. A further single body sherd of ROB SH1 was contained in Grave F2061 (L2062) and is possibly also from the ROB SH1 vessel in Enclosure Ditch F2021 (L2022 Segs. A, J and L). The remaining Roman pottery comprises single small body sherds of GRS and ROB SH2 in Enclosure Ditch F2021 (L2022 Seg. M) and a single body sherd of GRS in Grave F2046 (L2047). It appears highly probable that the Roman sherds represent contemporary deposition, probably in the mid to late 3rd century AD.

Post-Medieval Pottery

A single body sherd of post-medieval lead-glazed red earthen ware was recovered from Topsoil L2000.

3.2 The struck flint – By Andrew Peachey

Introduction

Excavations recovered a total of three fragments (51g) of struck flint, including a blade from Phase 1 Pit F2029. The flint is entirely in an unpatinated and fresh condition.

Raw Materials

The raw flint is mid to dark grey in colour and of relatively high quality, as may be expected in a region with plentiful flint from primary chalk deposits (Orna and Orna 1984, 2). The three flakes do not exhibit any surviving cortex.

Composition and Technology

Phase 1 Pit F2029 (L2030) contained a large blade (110x40x10mm), probably of earlier Neolithic origin. The blade comprised a soft-hammer struck, uncorticated flake with extensive dorsal scars and evidence of a pre-prepared striking platform. Pottery contained in Pit F2029 is tentatively dated to the late Bronze Age or early Iron Age but a wider Prehistoric, including Neolithic date, cannot be discounted as the sherds are so small.

The remaining two flakes of struck flint were present as residual material in Phase 2 (Roman) graves. These comprised a further (probably Neolithic) blade, snapped in antiquity, with finely retouched lateral edges in Grave F2033 (L2034). Phase 2 Grave F2049 (2064) also contained a thumbnail scraper with abrupt retouch around the bulbar end and lateral edges, formed on an uncorticated flake with a hinged termination. Thumbnail scrapers are characteristic of later Neolithic/early Bronze Age flint work.

3.3 The daub and ceramic building materials – By Andrew Peachey

A total of 13 (543g) fragments of Roman CBM were present in an abraded and fragmented condition. The fragments are all in a hard, orange-red fabric with inclusions of common medium quartz sand and occasional coarse flint. All are flat tile and probably formed part of tegula roof tile, although no flanged fragments are present to confirm this.

Potentially *in situ* fragments were contained in Phase 2 Enclosure Ditch F2021 (L2022 Seg. E) and Phase 2 Grave F2027 (L2028), although their context and limited quantity suggest they were re-deposited within the Roman period. Further residual fragments were contained in Phase 3 Ditch F2023 (L2024) and Topsoil (L2000).

3.4 The coffin nails – By Nina Crummy

Graves F2027, F2031, F2033, F2046, F2049 and F2061 each contained a number of iron nails, all of Manning's Type 1b (1985, 134), with flat or slightly convex roughly circular heads and shanks below 150 mm in length (the minimum for Type 1a), although some are very close to that length. Many are complete or only slightly damaged, and some have mineral-preserved wood on their shanks. The pattern of nail distribution in one grave provides evidence for the use of a wooden coffin, in the other graves it suggests that the sides of the grave pits were revetted but no coffin was used, although coffins may also have been jointed or fixed with timber pegs. Board thickness can be estimated from the mineral-preserved wood on the nail shanks.

The usual method of coffin construction was to nail the head and foot (end) boards between the side boards, with both the base board and lid running the full length of the box and nailed to it on all four sides. A variation with a slightly shorter base board set inside the end and side boards may sometimes have been used, and sometimes the lid may not have been nailed down (Crummy *et*

al. 1993, 34-6, 120-2). In all these cases, even when no wood stain survives, excavation reveals nails from the lower part of the box lying in a reasonably neat frame around the skeleton, with those from the upper part lying at various heights both inside and outside the frame due to the idiosyncratic collapse of each coffin. Where wood stains appropriate for a coffin are found but without any accompanying iron nails, the boards were probably pegged together. The boards were usually substantial, with a range of 33.6 to 64.4 mm and an average of 44 mm recorded at Butt Road, Colchester (Crummy *et al.* 1993, 120).

The number of nails used on each coffin would have varied, influenced by factors such as the species of wood used, the thickness of the boards and the height and weight of the deceased. For both methods of construction described above a minimum of 18-20 nails would be needed: eight securing the side boards to the end boards (one at the top and one at the bottom of each corner), with a further six fixing the base board onto the frame (two at each end and one in the middle of each long side) and another four or six fixing the lid. Often more would be used. The size of the nails varied for the same reasons that their number did, and studies of the coffin nails from the large cemeteries of Lankhills at Winchester and Butt Road at Colchester show that they tend to be of a reasonably consistent size on individual coffins and were probably made in batches on demand (Clarke 1979, 332; Crummy *et al.* 1993, 34).

The only grave at Mangreen Hall Farm that conforms to the pattern of nail distribution defined above is F2061, which also had a substantial wood stain present (Fig. 9). The absence of wood stain and the recovery of only one nail on the western side is probably due to factors of burial and recovery. No nails were complete, but one incomplete nail with transverse wood grain at the top of the shank and longitudinal grain at the lower part gave a board thickness of about 26 mm, which is 7mm less than the thinnest board noted at Butt Road, Colchester.

In F2046 only two nails lay at the head (south) end of the grave pit and three nails lay in a row close to the foot (north) end (Fig. 9). There were no nails along the long sides. The small gap between the skull and the southern wall of the grave pit suggests that the body was uncoffined. The location of the nails suggests that the walls of the grave pit were revetted by planks set behind upright posts in each corner, with nailed planks used as cross braces between the posts on the short sides. One nail from the north end gave a plank thickness of 20 mm, well below the thinnest coffin board recorded at Butt Road.

The nails in F2027 are similarly grouped with only two at the head (east) end, but there were seven at the foot (west) end (Table 1). None was complete, and no plank thickness can be determined.

Most of the nails in F2049 and F2033 (Fig. 8 and 9) were also grouped at the two short ends of the grave pit, but in these two burials there are also two nails towards the centre of the grave. In F2049 they are sited above the pelvis, and in F2033 they are two in a line parallel to the grave wall between the right arm and the right side of the body. The absence of a line of nails framing the corpse again points to these being uncoffined burials, and again the clusters of nails on each

short side probably come from revetment planks or cross braces between corner posts. In F2033 this is supported by the range of the lengths of the complete nails, from 77 to 142 mm, and by the range of plank thickness, from 26 to 42 mm. In F2049 the range of nail lengths runs from 55 to 124 mm, with planks of 20, 24 and 30 mm thick. In each grave the nails found towards the middle of the feature probably come from planks nailed to posts set in the centre of the long sides; they are too few for a nailed lid over the pit.

The nailing pattern in the multiple burial (F2031) is again very similar, with lines of nails along the head (south) and foot (north) ends of the grave pit (Table 1). There are no nails down the western side, but there is a cluster towards the centre of the eastern side. There are none framing the two adult individuals. The absence of nails on the western side points to revetting formed by planks slotted behind upright posts rather than plank walls nailed to timber framework. The cluster of nails on the eastern side may come from an extra upright in that position. Nails at the south end range in length from 99 to 113 mm, with plank thicknesses ranging from 32 to 47 or 49 mm; and at the north end from 91 to 102 mm, with plank thicknesses of 31, 32 and 42 mm. Nails on the east side were smaller, from 60 to 70 mm and a plank thickness of 24 mm. Also found in the eastern cluster was a holdfast, used to clamp two overlapping boards together, which had a shank measurement of 40 mm, giving two planks of 20 mm each. A single hobnail (SF 7) at the northern end of the grave is either residual or was lost by the gravedigger.

3.5 The human bone – By Dr. Stephany Leach

Introduction

A minimum number of seven individuals (five male / male?, one female? and one child) were recovered from one double and five single graves, placed within a three-sided funerary enclosure ditch. Stratigraphic evidence suggests that the six graves may be divided into two sub-phases representing earlier and later burial activities within Phase 2, perhaps representing two generations of burials at this site.

The primary burials (F2027, F2031 and F2033) were deep well cut graves, centrally located, and contained a minimum number of four individuals: F2027 contained SK2045 an adult male; F2031 contained two individuals; SK2051, a young male and SK2052, a young female, together with the remains of a neonate sheep/ goat (SK7); F2033 contained SK2053, an adult male. The three later burials F2046, F2049 and F2061 were shallow and located across the north facing entrance to the funerary enclosure ditch. These were single graves; F2046 contained SK2048, an adult male; F2049 contained SK2060 a child aged approximately 5 – 7 years at death; F2061 contained SK2063, an adult male.

Methodology

Preservation and completeness of the skeletal remains were assessed and

graded following standards set out in Brickley and McKinley (2004). In addition to a complete skeletal inventory, completeness was broadly assigned into four categories: >75%, 75-50%, 50-25% and <25%. Preservation was graded on a scale of 0 (excellent) to 5 (extremely poor) (Brickley and McKinley 2004, 16). Estimations of the age-at-death of the immature skeletal remains were based on an evaluation of dental development and eruption (Buikstra and Ubelaker 1994; Moorrees et al. 1963a,b; Smith 1991), and appearance of centres of ossification and epiphyseal fusion (Krogman and Iscan 1986; McKern and Stewart 1957; Scheuer and Black 2004; Suchey et al. 1984). Biological age at death estimations for the adult skeletal remains were based on skeletal degenerative changes and dental wear (Brooks and Suchey 1990; Iscan and Loth 1989; Lovejoy et al. 1985; Smith 1984). Assignment of sex was based on the assessment of dimorphic traits of the pelvis and skull following the development of secondary sexual skeletal characteristics after puberty (Buikstra and Ubelaker 1994; Sutherland and Suchey 1991). These were supplemented by metrical data, specifically the joint dimensions of the shoulder and hip (Chamberlain 1994). Adult skeletal material was placed into one of five categories; Male, Male?, ??, Female?, Female, depending on the presence and concord of the skeletal characteristics, and all subadult material was placed in the '??' category. For the purpose of data interpretation, Female? and Male? individuals have been included in the Female and Male categories respectively.

Cranial and postcranial metrics and non-metrics were recorded where present (Bass 1995; Berry and Berry 1967; Brothwell 1981; Buikstra and Ubelaker 1994) and stature estimated from maximum lengths of completely fused and undamaged long bones (Trotter 1970). Pathological lesions, traumatic injuries and activity related skeletal changes were also recorded (Brickley and McKinley 2004; Buikstra and Ubelaker 1994; Hawkey and Merbs 1995; Ortner 2003).

Results

Summary details of the anthropological analysis of the Mangreen human skeletal remains are presented in Table 4. Full details are recorded on individual skeletal inventories contained in the skeletal archive report.

Number	Sex	Age Category	Age Range	Stature	Growth Stress	Pathology	Genetic Anomaly
Primary							
SK2045	M	Middle Adult	30 - 39 YRS	171 - 178 cm	Yes	Yes	Yes
SK2053	M?	Middle Adult	25 - 45 YRS	165 cm	Yes	Yes	Yes
SK2051	M?	Older adolescent/ Young adult	16 - 19 YRS	170 cm	No	Yes	No
SK2052	F?	Older adolescent/ Young adult	17 - 20 YRS	159 - 161 cm	No	No	Yes
Secondary							
SK2048	M?	Adult		NP	NP	NP	NP
SK2060	??	child	5 - 7 YRS	NP	NP	NP	NP
SK2063	M?	Middle Adult	25 - 35 YRS	NP	NP	NP	NP

Table 4: Summary details of Mangreen Human Skeletal Remains

Key: NP = evidence not present for assessment

Preservation and Completeness

As can be seen in Table 5, the preservation of the remains in the central, earlier phase of burial is much better than the more shallow later phase burials. Skeletal remains from the later phase exhibited extremely poor preservation, mainly represented by cortical bone fragments, and were very incomplete as much of the cancellous bone had not survived in this harsh burial microenvironment. The earlier burials were mostly complete and fairly well preserved; the exception being SK2053. This individual exhibited quite poor bone preservation; however, the tibiae and foot bones were well preserved, indicating a change in the burial microenvironment and less harsh taphonomic conditions at the north end of the grave cut.

Number	Completeness	Preservation
Primary		
SK 1 (2045)	> 75%	fair
SK 4 (2053)	25-50%	poor
SK 5 (2051)	> 75%	good
SK 6 (2052)	> 75%	fair
Later		
SK 2 (2048)	< 25%	v. poor
SK 3 (2060)	< 25%	v. poor
SK 8 (2063)	< 25%	v. poor

Table 5: Completeness and preservation of the Mangreen human skeletal remains

Sex and age-at-death

Within this small burial group the sex ratio is 5:1, with an excess of males (Chart 1). There is also a lack of infants or younger children in this death assemblage, perhaps indicating differential funerary treatment for the very young. The death assemblage lacked older adult individuals, although one adult could not be assigned to a specific age category. Apparent

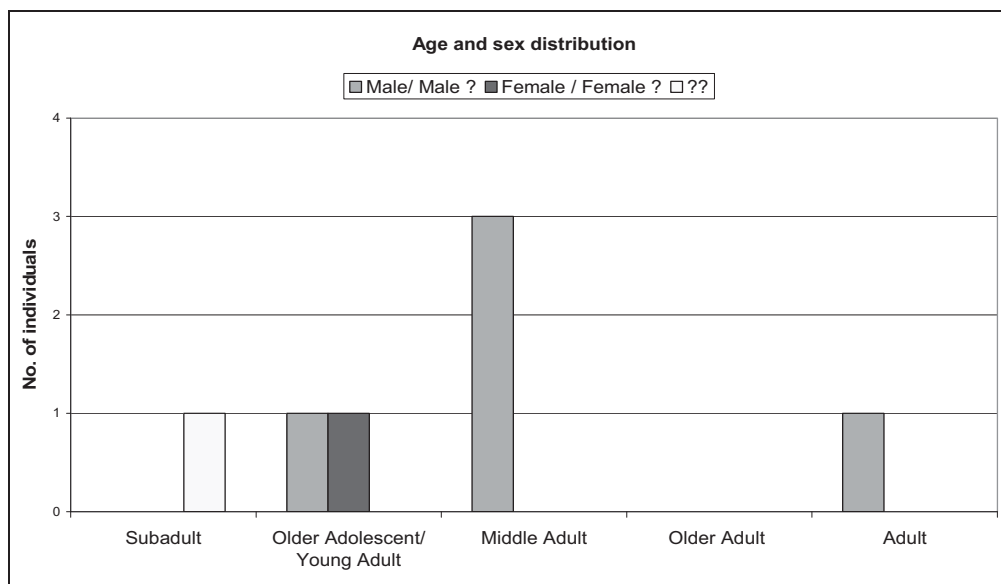


Chart 1: Demographic characteristics of the Mangreen death assemblage

Stature

Due to the variation in preservation, stature estimations could only be calculated for the earlier burials. Male stature ranged from 165 cm to 178 cm / 5'5 – 5'10", the tallest male being SK2045 and stature for the female individual was estimated between 159 – 161 cm / 5'2" – 5'3".

Health and activity indicators

Due to the poor preservation and incompleteness of the three later phase inhumations, resulting in the loss of relevant evidence, the following health and activity discussions concern only the four earlier or primary inhumations.

Growth, development and nutritional stress

Two of the four individuals within the primary death assemblage (the middle adult males) exhibited developmental or nutritional stress indicators; SK2045 and SK2053 both exhibited evidence of dental development stress (linear enamel hypoplasia) caused by a number of variables that include periods of inadequate nutrition or ill health (Goodman 1996; Goodman and Rose 1990). SK2045 suffered multiple periods of dental developmental stress between the ages of two to five years; he also exhibited moderate cribra orbitalia, orbit lesions associated with iron deficiency anaemia (Stuart-Macadam 1991; Stuart-Macadam and Kent

1992). SK2053 also exhibited linear enamel hypoplasia, occurring at approximately the same age range; however this individual did not exhibit evidence of iron deficiency anaemia. The two younger individuals (SK2051 and SK2052) buried together in the centre of the funerary enclosure (F2021) did not exhibit evidence of growth and development or nutritional stress.

Dental pathology

All of the individuals relating to the primary phase of burial suffered slight calculus or mineralised plaque build up on their dentition, occurring mostly on the lingual enamel surface. However, alveolar resorption, indicative of gum disease and often associated with the presence of calculus, was absent from this assemblage. Dental infection in the form of carious cavities was present in two of the four individuals, SK2045 exhibited an occlusal carious cavity in the third mandibular molar and SK2053 exhibited two cavities, one occlusal cavity in a premolar and one interstitial cavity in a third molar. The dentition of the two younger individuals in this sub-assemblage appeared extremely healthy, and the overall caries prevalence for this earlier phase death assemblage was very low, 2.9% (Table 6).

Number	Sex	Age	n	caries	%
SK 1 (2045)	M	MA	32	1	3.1
SK 4 (2053)	M?	MA	13	2	15.4
SK 5 (2051)	M?	OA/YA	26	0	0
SK 6 (2052)	F?	OA/YA	31	0	0
TOTAL			102	3	2.9

Table 6: Prevalence of dental caries in the primary inhumations at Mangreen

Key: MA = middle adult; OA/YA = older adolescent / young adult; n = number of teeth present in the assemblage

Trauma

No direct evidence of interpersonal violence or perimortem trauma was observed in this death assemblage. This may, however, be due to the poor preservation noted especially in the later inhumations. One definite and two possible cases of healed antemortem fractures were observed.

SK2045 exhibited a healed fracture of the left clavicle. The bone is thickened and there is malformation of the lateral third of the element with a bony spur protruding inferior to the lateral curve. A deep cortical lesion is also present at costoclavicular attachment site; this may relate to the presence of the trauma or to previous activities.

This robust male individual also exhibited a possible antemortem yet un-united fracture of the atlas or first cervical (neck) vertebra, differential diagnosis would be a congenital anomaly resulting in a lack of fusion or cleft in this bone. A vertical separation through the anterior arch of the atlas was noted. This may

either be caused by an anterior vertical midline fracture, or bifid neural arch, through the fovea of the atlas. The margins were uneven and porous with small protruding bony spurs, the second cervical vertebra appeared unaffected, and the facet on the dens appeared healthy and of normal morphology. Vertical fractures through the anterior atlas occur as part of a “Jefferson” type bursting fracture, resultant from an axial loading injury to the head with compression force to the atlas (Vaughan and Clark West 1998). However, the noted separation of the anterior atlas may also have resulted from a developmental delay causing a cleft (if major) or bifid arch (if minor) due to failure of the two halves to coalesce (Barnes 1994, 117-121). The cleft is covered with protective tough fibrous tissue, and therefore usually asymptomatic and clinically insignificant (*ibid.*). Clefting of the posterior arch of the atlas is more common but occasionally clefting of the anterior arch occurs (Barnes 1994, 120; Scheuer and Black 2004). It is perhaps more likely to be a developmental defect than a fracture injury as a lower thoracic vertebra (TV 11) also exhibited a bifid neural arch. However, the margins of the two sections of anterior atlas neural arch exhibited bony reaction, rather than being smooth at the ‘junction’, and this perhaps indicates some degree of stress or trauma overlying a development defect.

SK2051 exhibited a marked asymmetrical deformity of the ascending ramus of the mandible. The cause of this anomaly may relate to a well healed trauma, perhaps during childhood, although the exact location of the fracture was not observed. The temporomandibular articulation appeared healthy, lacking secondary osteoarthritic degenerative changes. The left condylar neck and condyle were considerably smaller than the right side, the ramus height on the left side was 54mm, on the right 62.7mm, and the condyle width on the left side was 13.5mm compared to 18.5mm on the right side. It was not possible to articulate the mandibular condyles with the cranium due to post-mortem warping of the inferior cranium, however, the articulation areas appeared healthy, but the left side was correspondingly of reduced size compared to the right. Dental attrition appeared only slightly uneven between the left and right dental arcade, suggesting the deformity caused only limited mastication impairment (also note retention of dm2 (deciduous molar 2)).

Pathology

SK2051 exhibited evidence of a diffuse infection/ disorder, resulting in prolific plaques of new bone formation on the shafts of long bones and a rib. The cause of these lesions has yet to be determined. Scurvy is unlikely as there is no cranial involvement, the superior orbits and sphenoid bone appear healthy and unaffected. The condition would appear chronic and active at the time of death as the lesions were unhealed. The lesions are bilateral and appear on most of the long bones and on a section of rib. Due to fragmentation and erosion of the ribs and long bone surfaces, the lesions may have extended over much more of the bone surface than noted during analysis. Bones affected include:

- Rib – unsided, visceral surface sternal end approximately 24 mm x 6 mm
- Right humeral shaft – midshaft lateral surface 60mm x 9mm also several smaller plaques on the distal posterior surface 10 mm x 8 mm
- Left humerus – distal medial shaft 25 mm x 10 mm
- Left and right femoral shaft – 2 / 3 cm below the lesser trochanter, medial shaft area, diffuse over much of this area and also around the greater trochanter epiphysis.
- Left and right tibial shafts – interosseous border, lateral shaft, plaques of dense dark new bone formation covering much of the antero-lateral border approx 110 mm x 12 – 15 mm

SK2045 exhibited endocranial lesions on the frontal bone, and deep arachnoid granulations were also present in this bone. Endocranial lesions are caused by haemorrhage or inflammation, but their precise aetiology remains undetermined. Various conditions have been proposed, including chronic meningitis, trauma, anaemia, neoplasia, scurvy, rickets, venous drainage disorder and tuberculosis (Lewis 2004, 82). As SK2045 had suffered antemortem trauma and anaemia during his lifetime, these may be likely causes of the noted lesions.

This individual also exhibited a smooth ovoid swelling or thickening of the bone on the right tibia, medio-anterior mid shaft, 39 mm (AP) x 23 mm (ML). The bone surface area was lost due to post-mortem bone erosion, but the remaining underlying bone was extremely dense. Differential diagnosis would include a subperiosteal haematoma following localised trauma or an osteoblastoma (benign bone tumour) which is rare condition (Ortner 2003).

As noted above, the skeletal remains of SK2053 were poorly preserved, the exception being the lower leg and foot bones. These exhibited new bone proliferations at articulation margins and entheses. Such bony changes are observed in individuals described as ‘bone formers’ (Rogers and Waldron 1995, 53), in which ossification of the entheses and large marginal osteophytes are common, and possibly linked to the development of diffuse idiopathic skeletal hyperostosis (DISH). However, due to the poor preservation of other skeletal elements, especially the vertebrae, it is not possible to further evaluate the skeletal lesions and presence of this disease.

Activity

Due to post-mortem bone surface erosion, an assessment of musculoskeletal stress markers (MSM) was only possible for individuals SK2045, SK2051 and SK2052. SK2045 exhibited evidence of high levels of repetitive activity and physical loading. Cortical lesions were present on the right proximal humerus (pectoralis major and teres major) but not the left, indicating asymmetrical use or stress on the upper right arm and shoulder. Stress lesions were also present of the posterior surface of the both left and right tibiae (soleus attachment site), again suggesting mechanical loading to the lower legs.

Where the evidence survived the harsh post-mortem environment, SK2051 exhibited very little evidence of repetitive or strenuous activities with regard to

MSM development. This may related to the noted pathological changes discussed above and possibly indicative of a long term debilitating illness and lack of physical activity.

SK2052, the only female in this death assemblage, exhibited diffuse development of MSMs, indicative of moderately high levels of repetitive physical activity. Some asymmetry in development was noted, however, neither left nor right side appeared specifically developed. This individual was the only one to exhibit pronounced lateral squatting facets on the anterior distal border of the tibia. Two other males (SK2151 and SK2053) did not exhibit these facets, and the tibiae of the other individuals in the assemblage were too damaged to assess.

Familial associations and ancestral traits

Post-mortem erosion and damage precluded a full assessment of all the nonmetric cranial and postcranial traits within this death assemblage; however, a number of interesting correlations were observed. Two unusual genetic anomalies or features were noted, an occipital protuberance of the posterior cranial vault and accessory tubercles on the maxillary lateral incisors. This may indicate quite a close familial connection between certain individuals interred within the funerary enclosure, as might be expected. However, due to the poor preservation and incompleteness of the skeletal remains relating to the later burial group (SK2060, SK2048 and SK2063), it was not possible to assess presence and prevalence of nonmetrics and other skeletal features of this sub-assemblage, unfortunately precluding these individuals from the analysis.

SK2045, SK2053 and SK2052 all exhibited the pronounced occipital protuberance. In SK2053 this protuberance was also associated with a large accessory apical bone at the lambda, in the other two individuals this bone was absent, but their occipital bone extended posteriorly, although the lambdoid sutures were not extended or complex. The sagittal suture did not appear to be prematurely fused in these individuals, thus excluding a pathological cause for the noted anomaly. These three individuals also exhibited an accessory tubercle on the lingual surface of their maxillary lateral incisors. SK2051, the other individual in this primary burial phase, did not exhibit these features; however, this does not directly imply a lack of familial connection. All of the individuals in the primary burial group exhibited a divided calcaneal facet on the calcaneus or ankle bone. This is a relatively common nonmetric, yet it is interesting that all exhibited this trait.

An anthroposcopic assessment of cranial ancestral traits (Byers 2005) of SK2052, a young female, indicated this individual was likely of either mixed ancestry or perhaps North African origins. Her cranial characteristics exhibited both Caucasian (White) and Negroid (Black) features, while some traits were of intermediate expression (Table 7). Unfortunately, it was not possible to carry out a craniometric analysis due to post-mortem warping and damage. All the other individuals present in this death assemblage, where the evidence survived, exhibited only Caucasian cranial features.

Feature *	Characteristic	Ancestry
Nasal root	low, rounded and wide (some damage)	Negroid
Nasal bridge	low and quite broad (some damage)	Negroid
Nasal aperture	quite wide	Intermediate
Lower nasal border	guttered	Negroid
Nasal spine	pronounced	Caucasian
Orbit shape	rectangular	Intermediate
Facial profile	quite prognathic, forward projecting maxilla	Intermediate
Dental arcade	large and extended beyond third molar	Negroid
Palate shape	Parabolic, yet fairly wide	Caucasian

Table 7: SK2052 Cranial Ancestral Traits (*Byers 2005)

Individual summary bioprofiles

Earlier burials

SK 1 (2045)

Feature: [2027]

Preservation: Fair

Completeness: > 75%

Age: Middle Adult (30 – 39 years)

Sex: Male

Stature: 171 – 178 cm

Activity: High levels repetitive activity

Trauma / Pathology: Healed fracture left clavicle; possible trauma / congenital anomaly atlas vertebra and cleft in thoracic vertebra; endocranial lesions; probable subperiosteal ossified haematoma; occlusal caries

Growth, development or nutritional stress: Cribra orbitalia; linear enamel hypoplasia

Nonmetrics: occipital protuberance, incisor accessory tubercle, divided calcaneal facet

SK 4 (2053)

Feature: [2033]

Preservation: Poor

Completeness: 25 – 50%

Age: Middle Adult (25 – 45 years)

Sex: Male?

Stature: 165 cm

Activity: NP

Trauma / Pathology: 'Bone former'; occlusal and interproximal caries

Growth, development or nutritional stress: Linear enamel hypoplasia

Nonmetrics: Occipital protuberance and large apical bone, incisor accessory tubercle, divided calcaneal facet

SK 5 (2051)

Feature: [2031]

Preservation: Good

Completeness: >75%

Age: Older adolescent / young adult (16 – 19 years)

Sex: Male?

Stature: 170 cm

Activity: very little indicated

Trauma / Pathology: diffuse periosteal lesions active at time of death – cause yet to be determined; deformity of mandible

Growth, development or nutritional stress: None

Nonmetrics: divided calcaneal facet

SK 6 (2052)

Feature: [2031]

Preservation: Fair

Completeness: > 75%

Age: Older adolescent / young adult (17 – 20 years)

Sex: Female?

Stature: 159 – 161 cm

Activity: Moderate and diffuse

Trauma / Pathology: None visible

Growth, development or nutritional stress: None

Nonmetrics: occipital protuberance, incisor accessory tubercle, divided calcaneal facet; mixed ancestral traits, both Caucasian and Negroid

Later burials

SK 2 (2048)

Feature: [2046]

Preservation: Very poor

Completeness: < 25%

Age: Adult

Sex: Male?

Stature: NP

Activity: NP

Trauma / Pathology: NP

Growth, development or nutritional stress: NP

Nonmetrics: NP

SK 3 (2060)

Feature: [2049]

Preservation: Very poor

Completeness: < 25%

Age: Child (5 – 7 years)

Sex: ??

Stature: NP

Activity: NP

Trauma / Pathology: NP

Growth, development or nutritional stress: NP

Nonmetrics: NP

SK 8 (2063)

Feature: [2061]

Preservation: Very poor

Completeness: < 25%

Age: Middle adult (25 – 35 years)

Sex: Male?

Stature: NP

Activity: NP

Trauma / Pathology: NP

Growth, development or nutritional stress: NP

Nonmetrics: NP

Discussion

The seven individuals representing the Mangreen death assemblage, excavated from the six graves within the Roman funerary enclosure, appear to represent a cohesive and perhaps extended family group. It is unfortunate that the poor preservation of the remains excavated from the graves located in the northern entrance to the enclosure precluded in depth analysis with regard to the traits and anomalies noted in the individuals recovered from the central graves. The remains of these later interments yielded only minimal life-history data.

The demographic structure of the group demonstrated a male bias, outnumbering female interment by 5:1 (Chart 1). Although this is a common feature of the extensive Roman cemeteries associated with large military settlements (Davison 2000; Warwick 1968), the reason for the bias noted within the Mangreen funerary enclosure remains undetermined. The lack of infants and young children appears within the cultural norm for funerary customs of this period (Philpott 1991; Scott 1999; Taylor 2008).

The skeletal remains of the three males and one female excavated from the three central graves, SK2053, SK2051, SK2052 and SK2045, were better preserved and generated more comprehensive life-history data described above. From a growth and development perspective, these four individuals appear to have enjoyed quite a beneficial environment. The youngest individuals from the central grave (SK2051 and SK2052) lacked any bony scars relating to growth and development retardation and their ultimate stature estimates were within the norm and above average for Roman Britain: male range: 159 cm – 178 cm, mean 169 cm and female range: 150 cm – 168 cm, mean 159 cm (Roberts and Cox 2003, 142). The two middle adult males (SK2045 and SK2053) did exhibit evidence of growth stress in the form of linear enamel hypoplasia, and SK2045 also exhibited cribra orbitalia. The incidence of these lesions or stress indicators increased during the Roman period, however, Roberts and Cox (2003, 140) consider their increased prevalence is more indicative of high pathogen load than nutritional deficiencies. Ultimate stature estimate for SK2045 placed him at the top end of the stature range for this period, suggesting that beneficial periods enabled 'catch-up' growth to occur (Tanner 1989). The stature estimate for SK2053 is below average, but within the range for the period.

The dental health of these individuals was also good, the caries rate of 2.9 is more indicative of low Iron Age prevalence, compared to the increase in caries prevalence during the Roman period to 7.5% (Roberts and Cox 2003, 131). The Mangreen central group also lacked any evidence of periodontal disease or dental abscesses; again this is healthier than expected for the later Roman period (*ibid.*) and suggests a low intake of carbohydrates, especially sucrose.

With regard to repetitive activities and sexual division of labour indicated by MSMs and wear and tear of the skeletal remains, only minimal evidence survived the relatively harsh burial environment. Where the evidence survived, the female appeared relatively active with diffuse musculoskeletal development, and the development of pronounced squatting facets. The adult male, SK2045, also exhibited diffuse evidence of quite high levels of physical loading, with asymmetrical distribution of development, but lacked squatting facets. Although the evidence is very limited it perhaps suggests quite different habitual activities between this male and female. The young male exhibited only minimal musculoskeletal development, but as this individual also exhibited diffuse bony lesions, ill health may have impeded normal activities.

Direct evidence of cause of death, interpersonal violence or any other perimortem trauma was lacking in this death assemblage. During the Roman period there was an increased prevalence in trauma, especially in males (Boylston 2000;

Roberts and Cox 2003, 151), but in this assemblage the only positive evidence for traumatic injury was exhibited by the tall adult male SK2045, in the form of a healed fractured clavicle, and possible complications relating to a genetic weakness in his first cervical vertebra. The ossified haematoma may also relate to a localised leg trauma.

Of great interest is the presence of the young female (SK2052) exhibiting facial characteristics suggestive of mixed ancestry, with features more indicative of Negroid than Caucasian ancestral origins. This was the only female buried within the funerary enclosure, and shared the grave of a young male (SK2051). During this period, diaspora communities were settling in this northern province of the Roman Empire and analysis or re-analysis of human skeletal remains is forming a vital resource with which to research the demographics of population migration and cultural integration or isolation (Evans *et al.* 2006; Leach *et al. in press*; Leach *et al. in prep.*). In addition, most Roman cemetery excavations relate to large urban centres (Clarke 1979; Molleson 1993; Warwick 1968; Wells 1982), this small group forms a valuable counterpart to these death assemblages. As Millet (1995, 121) states "...burial information has an enormous and largely untapped potential for providing a deeper understanding of Roman Britain".

3.6 The Animal Bone – By Dr. James Morris

Introduction

The excavation resulted in the hand collection of 39 fragments (70 g) of animal bone. The majority of faunal material (38 fragments) was recovered from Graves F2031 and F2033, which have been dated to the Romano-British period (Newton, this report). The only other fragment of faunal material was recovered from section B of ditch F2023 (see below).

Methods

The faunal remains from each context were assessed in accordance with MAP2 procedures (Archaeological Solutions 2003; Davis 1992; English Heritage 1991; 2002), during which each fragment was identified to species. When it was not possible to identify to species the bones were recorded as unidentified. Counts of the number of identified specimens present (NISP) included any identified limb bone fragments, ribs, skull fragments, loose teeth and vertebral bodies.

For an assessment of this nature element information was not recorded. The number of fragments with available taphonomic, butchery, ageing and metrical information was also recorded.

Preservation

The assemblage present is poorly preserved. All of the elements present are eroded and the majority of the identified elements are fragmented. The sites subsoil appears to be poor for bone preservation.

Species Present (Table 8)

Period	Feature Type	Feature No.	Context	Sheep/ Goat	Domestic Fowl	Unidentified	Total
Unknown	Ditch	2023	2024	1			1
Roman	Grave	2031	2032	1	7	3	11
			2058	3		2	5
Roman	Grave	2033	2034		17	5	22
Total				5	24	10	39

Table 8: NISP counts for species per context

The majority of faunal remains recovered are domestic fowl (chicken). One highly eroded sheep/ goat element was recovered from ditch F2023. Sheep/ goat elements were also recovered from the grave fills. The domestic fowl elements recovered from each grave fill appear to be associated bone groups (ABGs).

The remains from fill L2032 (Grave F2031) consist of the upper elements from the left hand wing, a right Humerus, ribs and fragments of tibio-tarsus. The elements all appear to be from a young individual as the epiphysis that are present are not fully formed.

The domestic fowl remains from fill L2034 (Grave 2033) also appear to be from a young individual. Both coracoids and the left scapular are present along with the upper elements of the right wing. Both femur and the distal ends of both tibio-tarsi are present along with ribs and vertebra elements.

It is possible that the partial remains of young domestic fowl were placed in each of the abovementioned graves, although unfortunately it is unclear if the identified elements were recovered articulated or simply in close association. No butchery marks are present on the domestic fowl ABG elements.

Shells

Only one marine shell was recovered during the excavation. A fragment of right oyster valve was recovered from section B of ditch F2023 (Fig. 4 and 6). The majority of the shell is eroded which may suggest that shell preservation on the site is poor, and precludes any further analysis of this fragment.

Conclusion

The faunal assemblage from the Mangreen site is small and poorly preserved. The presence of domestic fowl ABGs within the grave fills is of interest as deposits of animal remains are not uncommon in Roman graves (Lauwerier 1993; Parker 1998), with a large number of such deposits consisting of domestic fowl, especially in the middle and late Romano-British periods (Morris *in press*). Such deposits may represent food offerings for the deceased's journey into the afterlife, or potentially the remains of grave side ritual events. It is possible that the sheep/ goat remains recovered in association with Grave F2031 represent a similar ritualistic depositional event.

3.7 The environmental samples – By Anita Radini

Introduction

Five soil samples produced flots which were investigated for bio-archaeological evidence.

Processing methods

The processing of the samples was carried out by staff at Archaeological Solutions. The samples (Table 9) were sieved using a 1mm aperture mesh for the retention of the heavy residue with flotation onto a 0.5mm mesh. The resulting flots were packed in self-seal polythene bags and submitted for this assessment. The residues were kept at Archaeological Solutions.

Sample	Size (l)	Feature	Context	Seg.	Description	Dry sieved	Flot (ml)	Comments
1	20	2021	2022	A	Ring ditch fill	No	5	No plant remains
2	10	2021	2022	K	Ring ditch fill	No	5	No plant remains
3	80	2072	2028		Grave Fill	No	10	No plant remains
5	10	2031	2032		Grave Fill	No	5	No plant remains
7	10	2072	2028		Grave Fill	No	5	No plant remains

Table 9: Sample Details

Results and conclusion

The flots were screened carefully for the recovery of small fragments of plant remains and insects but with no results. The only remains recovered were very small flakes of charcoal extremely low in number. There was no evidence of any biological activity in the ground and no soil disturbance by modern roots or land snails was noted.

3.8 Radiocarbon analysis – By Beta Analytic Inc. and Andrew Newton

Three samples of human bone were submitted to Beta Analytic Inc., Miami, Florida for radiocarbon dating analyses. Radiocarbon dates (Table 10) were obtained in order to provide absolute dates for Skeleton 5 (SK2051), Skeleton 6 (SK2052), both from Grave F2031, and Skeleton 8 (SK2063) from Grave F2061 and to provide guidance for the dating of the site as a whole.

Laboratory number (Beta-)	AS sample number	Analysis	Conventional radiocarbon age	Calibrated results: 2 sigma calibration (95% probability)	Calibrated results: 1 sigma calibration (68% probability)	Intercept of radiocarbon age with calibration curve
282588	37649SK5	Atomic Mass Spectrometry-Standard Delivery	1730 ± 40 BP	Cal AD 230 to 410 (Cal BP 1720 to 1540)	Cal AD 250 to 380 (Cal BP 1700 to 1570)	Cal AD 260 (Cal BP 1680) and Cal AD 280 (Cal BP 1670) and Cal AD 330 (Cal BP 1620)
282589	36649SK6	Atomic Mass Spectrometry-Standard Delivery	1710 ± 40 BP	Cal AD 240 to 420 (Cal BP 1710 to 1530)	Cal AD 260 to 300 (Cal BP 1690 to 1650) and Cal AD 310 to 390 (Cal BP 1640 to 1560)	Cal AD 340 (Cal BP 1610)
282590	36649SK8	Atomic Mass Spectrometry-Standard Delivery	1760 ± 40 BP	Cal AD 140 to 390 (Cal BP 1810 to 1560)	Cal AD 230 to 330 (Cal BP 1720 to 1620)	Cal AD 250 (Cal BP 1700)

Table 10: Calibration of radiocarbon age to calendar years

Sampling strategy

The human bone assemblage was sub-sampled for material for radiocarbon dating at the post-excavation stage. This was carried out to select suitable bone to aid the dating of the inhumations.

Method

Calibrations were compiled using a recent calibration database (Talma and Vogel 1993). No multiple calibration ranges were returned. The samples were not known to have been contaminated by groundwater or disturbed by later archaeological activity.

Results

It was anticipated, based on taphonomic evidence and spatial relationships, that Skeleton 8 (SK2063) would be more recent in date than Skeletons 5 and 6 (SK2051 and SK2052). As Sk2052 is understood to represent a secondary interment in the same grave as Sk2051 it was also anticipated that the former would return a more recent date than the latter. SK2051 returned a date of Cal AD 230 to 410 (Cal BP 1720 to 1540), SK2052 returned a date of Cal AD 240 to

420 (Cal BP 1710 to 1530) while SK2063 returned a date of Cal AD 140 to 390 (Cal BP 1810 to 1560).

As was expected from the artefactual evidence, all of these dates place the burials in the Romano-British period. It would appear the interpretations made regarding the relative ages of the two burials in Grave F2031 were correct. However, the anticipated chronological order in which the two groupings of human remains recorded at the site were interred would appear to be contradicted by the results of the radiocarbon analysis. The implications of this are discussed below.

4. DISCUSSION

The Romano-British burial enclosure

The small number of inhumations and their location within a bounded enclosure implies that they were all part of a family group, and is the sort of cemetery which one might expect to find associated with a villa or small settlement or see on a road or routeway (Oltean *pers. comm.*). It is commonly seen along the Fosse Way that burials were inserted into the backlands of plots, which fronted onto the road with occupied buildings along the road frontage. Here, burials were often inserted into, or placed close to boundary ditches; however it is also observed that slightly away from the Fosse Way, groups of burials were located within small enclosures, though buildings are usually present within close vicinity (Esmonde-Cleary 2001).

No evidence pertaining to such domestic activity has been excavated, nor is any identified on aerial photographs of the site. However, it is thought that the settlement activity surrounding the Roman town of *Venta Icenorum* c. 1km to the east extended west to within metres of the site boundary, perhaps implying that further settlement activity is present to the south of the site (NHER 9759). While many Roman roads and trackways have been identified leading from virtually every side and corner of *Venta Icenorum* into the surrounding countryside, the River Tas flows directly past the western entrance, apparently preventing a roadway from extending in this direction. If a road had extended directly from this western entrance it would have passed immediately to the north of the cemetery at Mangreen. Having said this, given that settlement extended for at least 1km to the west of the river, it is possible that a trackway did extend on a trajectory leading directly from opposite the western entrance to the walled town. This possibility might explain the location and orientation of the cemetery enclosure at Mangreen.

The inhumation of the dead within bounded enclosures is an important and recurring feature of Romano-British burial practice. Small groups of burials on the outskirts of towns, villages and rural settlements are generally bounded by enclosures (Esmonde Cleary 2001). It might be argued that the importance of boundedness was simply a functional result of property and rights over space. This argument is particularly pertinent where there is likely to have been an issue

of restricted space, something which does not seem to have been the case at Mangreen. Another explanation for the importance of funerary enclosures proposes an analogous concept to Christian 'consecrated ground', whereby land was ritually as well as physically set apart and made suitable for burial (*ibid*). Furthermore, there is the common argument that the dead were viewed as having the powers to intervene in the lives of the living, thus it is important to prevent or control the ability of the dead to leave the place of interment (*ibid*).

The Romano-British burials

Location

The burial enclosure surrounded six graves containing seven individuals. SK2051 was positioned directly in the centre of the cut of the double grave, which was in turn directly in the centre of the burial enclosure, making it likely that it was the primary burial. The position of SK2052 within the same grave cut implies that this female was a secondary interment, as she is close to the western edge of the feature, facing to the east and slightly to the north of SK2051. Although Radiocarbon dating does provide a slightly later date range for SK2052 (Cal AD 240 to 420) compared to SK2051 (Cal AD 230 to 410), the considerable overlap between these ranges cannot be ignored. As such, any interpretation of interment order must rely primarily on the physical positioning of and relationship between the two individuals.

Thought to be roughly contemporary with SK2051 and SK2052 were SK2053 and SK2045. The grave cuts which contained both of these burials were similarly well defined as that which contained SK2051 and SK2052, and the bodies were similarly preserved, having suffered none of the truncation to which the remaining three burials had been subject. SK2053 was situated directly to the west of and orientated similarly to SK2051 and SK2052. However, despite there being the same space to the east of the primary burial as there was to the west for SK2053; SK2045 was located to the south of and at right-angles to the primary burial. It is unclear as to why this would be the case given the amount of space available for the burial to be symmetrical to the burial of SK2053. The three remaining burials, SK2048, SK2060 and SK2063 were situated in the entrance way to the enclosure. They are thought to have belonged to a later generation than the burials discussed above, although such chronological patterning appears contradicted by the Radiocarbon evidence (Newton, this report). Each of the three burials was aligned similarly to the primary burial. Their presence within the entrance of the enclosure may represent an act of closure of the monument, an interpretation applied to the entranceway burial at Lankhills, Winchester.

Demography

It is likely that the inhumations formed part of a small family group (Leach, this report and Oltean *pers. Comm.*). There was a strong male bias (5:1) within the group as well as a lack of infants and young children, although not so strong as to be considered unusual for funerary customs of this period (Philpott 1991; Scott

1999; Taylor 2008). Davison (2000, 232) argues that one of the reasons for the frequently recorded dominance of males in Romano-British cemeteries might be related to an influx of males to urban centres for military or economic purposes. However, given that it is suggested that the inhumations at Mangreen formed a family cemetery, this reasoning might not be particularly applicable.

The skeletal remains of the three males and one female excavated from the three central graves (SK2053, SK2051, SK2052 and SK2045) were better preserved than those from the graves found in the entrance way to the enclosure. It is likely that the two groups represent two distinct generations of burials, and it is suggested that the better preserved graves were the original interments. These four individuals appear to have lived in relatively beneficial conditions, with little or no evidence of nutritional or developmental stress during their lives. Having said this, there was pathological evidence of heavy loading present on SK2045. None of the individuals displayed evidence pertaining to cause of death.

Of particular importance and interest is that the young female (SK2052) exhibits facial characteristics suggestive of mixed ancestry, with features more indicative of Negroid than Caucasian ancestral origins, but with the shared genetic trait of a pronounced occipital protuberance as SK2051 and SK2045. This was the only female buried within the funerary enclosure, and shared the grave of a young male (SK2051). During this period, diaspora communities were settling in this northern province of the Roman Empire. The mixed ancestral traits of this individual, but the similarities with associated burials makes it plausible that she represents a 2nd or 3rd generation migration community in the *Venta Icenorum* area, though of course the presence of just one individual can not possibly indicate how extensive this may have been.

Chronology of the cemetery

Taphonomic distinctions, spatial organisation and the deeper, and apparently more carefully carried out excavation of Graves F2027, F2031 and F2033 appears to suggest that these were the primary inhumations within the enclosure. In contrast, the shallow, poorly preserved nature of Graves F2046, F2049 and F2061 and their position within the entrance to the enclosure (and their positions relative to the other group of burials) has been taken to suggest that these burials were later additions to the cemetery.

Radiocarbon dating of SK2063 from Grave F2061 returned a date of Cal AD 140 to 390 (Cal BP 1810 to 1560); although this date range appears earlier than those attributed to SK2051 and SK2052 from Grave F2031, there still exists considerable overlap between the calibrated ages of all three internments. If in fact earlier however the date for SK2063 would suggest that the chronology of interment at the site differs to that suggested by the spatial relationships between the graves and the enclosure ditch. It seems unlikely that the cutting of the enclosure ditch was contemporary with the creation of Graves F2046, F2049 and F2061 due to their position within the entrance to the enclosure. The spatial relationship between the enclosure ditch and Graves F2027, F2031 and F2033

more strongly suggests that it was contemporary with these graves. The results of the Radiocarbon dating therefore suggest that the enclosure was created sometime after the interment of the bodies in Graves F2046, F2049 and F2061 and, for some reason, was positioned with these graves between its termini.

The chronology of the cemetery suggested by the spatial relationships between features appears much neater than that indicated by the Radiocarbon dates. It is possible that the C14 data are anomalous and that the more visually convincing pattern of development is accurate. However, this is unlikely and it would appear that Graves F2027, F2031 and F2033 were added to a pre-existing cemetery and the enclosure ditch added as some kind of embellishment. The relative positions of the graves and the placement of the enclosure ditch so that the earlier graves lay within its entrance may be linked to issues of ceremony, ritual or the status of the individuals.

Conclusions

In conclusion, it seems the most plausible explanation that this cemetery belonged to a small family group who inhabited a rural settlement to the north-west of *Venta Icenorum*. Such a settlement is likely to have been on the periphery of a settled area which surrounded the Roman town. The absence of surrounding contemporary features is probably relatable more to the extent of the excavation area than an actual physical lack of archaeology. It is highly likely that a trackway ran to the north of the site, on an easterly trajectory from the Roman town, though it is not clear whether this originated at the western gate. The presence of a young lady with Negroid ancestral traits is important and interesting, and may be representative of a 2nd or 3rd generation diaspora community in the local area who have settled and integrated with the native community.

BIBLIOGRAPHY

Andrews, G. 1985 'The coarse wares' in Hinchcliffe, J. with Sparey Green, C. *Excavations at Brancaster 1974 and 1977*. East Anglian Archaeology 23, 82-97

Archaeological Solutions 2003 *Guidelines for bone reports*. Archaeological Solutions Ltd unpublished report

Atkinson, D. 1937 'Roman Pottery from Caistor-next-Norwich,' *Norfolk Archaeology* 26, 197-230

Bass, W. M., 1995 *Human Osteology: A laboratory and Field Manual*. 4th Ed. Special Publication No. 2 of the Missouri Archaeological Society Columbia

Bates, S. and Lyons, A. 2003 The Excavation of Romano-British Kilns at Ellingham, Postwick and Two Mile Bottom, Norfolk, 1995-7. East Anglian Archaeology Occasional Paper 13

Barnes, E., 1994 *Developmental Defects of the Axial Skeleton in Paleopathology*. Colorado: University Press of Colorado

Berry, A. C. and Berry, R. J., 1967 Epigenetic Variation in the Human Cranium. *Journal of Anatomy* 101:361-379

Boylston, A., 2000 'Evidence for Weapon-Related Trauma in British Archaeological Samples' in Cox, M. and Mays, S., (eds.) *Human Osteology in Archaeology and Forensic Science*. 357-380 London: Greenwich Medical Media Ltd

Brickley, M. and McKinley, J., 2004 *Guidelines to the Standards for Recording Human Remains*. Institute of Field Archaeologist Paper No. 7, BABAO, 9-14

Brooks, S. T. and Suchey J. M., 1990 Skeletal Age Determination of the Os Pubis: A comparison of the Acsadi-Nemeskeri and Suchey-Brooks Methods. *Human Evolution* 5: 227-238

Brothwell, D. R., 1981 *Digging up Bones*. London: British Museum (Natural History)

Buikstra, J. E. and Ubelaker, D. H., 1994 *Standards for Data Collection from Human Skeletal Remains*, Fayetteville, Arkansas: Arkansas Archaeological Survey Report No. 44

Byers, S. N., 2005 *Introduction to Forensic Anthropology: A Textbook* (2nd ed.) London: Pearson

Chamberlain, A. T., 1994 *Human Remains*. London: British Museum Press

Chapman, J. and Gaydarska, B. 2007 *Parts and Wholes: Fragmentation in*

Prehistoric Context. Oxford: Oxbow Books 1-19

Clarke, G., 1979 *The Roman Cemetery at Lankhills*. Oxford: Clarendon Press

Collins, J. 1977 'Owlsbury (Hants.) and the problem of burials on rural settlements' in Reece, R. M. (ed.) *Burial in the Roman World*. London: CBA Research Report No. 22

Crummy, N., Crummy, P., and Crossan C., 1993 *Excavations of Roman and later cemeteries, churches and monastic sites in Colchester, 1971-88*, Colchester Archaeological Report 9

Davis, S. 1992 *A rapid method for recording information about mammal bones from archaeological sites*. English Heritage AML report 71/92

Davison, C. 2000 Gender imbalances in Romano-British cemetery populations: a re-evaluation of the evidence. In Pearce, J., Millet, M. and Struck, M., (eds.) *Burial, Society and Context in the Roman World*. Oxbow, Oxford

English Heritage 1991 *Management of Archaeological Projects*. English Heritage, London

English Heritage 2002 *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation*. English Heritage, London

Esmonde Cleary, A.S. 2001 'Putting the dead in their place: burial location in Roman Britain', 127-42 in J.Pearce, M.Millett, M.Struck (eds.) *Burial, Society and Context in the Roman World*. Oxford

Evans, J., Stoodley, N., Chenery, C., 2006 A strontium and oxygen isotope assessment of a possible 4th century immigrant population in a Hampshire cemetery, southern England. *Journal of Archaeological Science* 33. 2: 265 – 72

Goodman, A. H. 1996 Early life stresses and adult health: insights from dental enamel development. In Henry, C. J. K. and Ulijaskez, S. J. (eds.) *Long-term consequences of early environments: Growth, development and the lifespan developmental perspective*. 37th symposium volume of the Society for the Study of Human Biology. Cambridge: Cambridge University Press

Goodman, A. H. and Rose, J. C. 1990 Assessment of systemic physiological perturbations from dental enamel hypoplasias and associated histological structures. *Yearbook of Physical Anthropology* 33: 59 – 110

Gurney, D. 1995 'The Roman Pottery' in Rickett (ed.) *Spong Hill: Part VII: The Iron Age, Roman and Early Saxon Settlement*. Norfolk: East Anglian Archaeology 73. PP. 94-125

Hawkey, D. E. and Merbs, C. F., 1995 Activity-induced musculoskeletal stress

markers and subsistence strategy changes among ancient Hudson Bay Eskimos. *International Journal of Osteoarchaeology* 5: 324 – 38

Iskan, M., Y. and Loth, S., R., 1989 Morphological Assessment of Age in the Adult: the Thoracic Region. In Iskan, M. Y., (ed.) *Age Markers in the Human Skeleton*. Springfield, Illinois: Charles C Thomas

Krogman, W. M. and Iskan, M. Y., 1986 *The Human Skeleton in Forensic Medicine*. 2nd ed. Springfield, Illinois: Charles C. Thomas

Lally, M. forthcoming *Fosters End, East Winch: Research Archive Report*. Archaeological Solutions Unpublished Report No. 2922

Lauwerier, R. C. G. M. 1993 'Bird remains in human graves' *Archaeofauna* 2, 75-82

Leach, P. J. forthcoming *Fosse Lane: Excavation of a Romano-British Roadside Settlement at Shepton Mallet, Somerset 1990*. London: Britannia Monograph.

Leach, S., Lewis, M., Chenery, C., Muldner, G., Eckardt, H., (*in press*) Migration and Diversity in Roman Britain: a multidisciplinary approach to the identification of immigrants in Roman York, England. *American Journal of Physical Anthropology*

Leach, S., Eckardt, H., Chenery, C., Muldner, G., Lewis, M., (*in prep.*) Lady of the North: Migration, ethnicity and identity in Roman York. (*Antiquity*)

Lewis, M., 2004 Endocranial lesions in non-adult skeletons: Understanding their aetiology. *International Journal of Osteoarchaeology* 14: 82–97

Lovejoy, C. O., Meindl, R. S., Pryzbeck, T. R., Mensforth, R. P., 1985 Chronological Metamorphosis of the Auricular Surface of the Ilium: A new method for the determination of age at death. *American Journal Physical Anthropology* 68: 15 – 28

Manning, W. H., 1985 *Catalogue of the Romano-British Iron Tools, Fittings and Weapons in the British Museum*. British Museum Press, London

McKern, T. and Stewart, T. D., 1957 *Skeletal Age Changes in Young American Males, Analyzed from the Standpoint of Identification*. Technical Report EP-Natick, Massachusetts: Quartermaster Research and Development Command

Millett, M. 1995 *Roman Britain*. London: English Heritage / Batsford

Molleson, T. I., 1993. The human Remains. In, D.E. Farwell and T.I. Molleson *Poundbury: Volume 2: The Cemeteries*. Dorset Natural History and Archaeological Society Monograph 11: 142-215

Moorees, C. F. A., Fanning, E. A. and Hunt, E. E., 1963a Formation and Resorption of Three Deciduous Teeth in Children. *American Journal of Physical*

Anthropology 21: 205 – 213

Moorees, C. F. A., Fanning, E. A. and Hunt, E. E., 1963b Age Formation by Stages for Ten Permanent Teeth. *Journal of Dental Research* 42: 1490 – 1502

Morris, J., (*in press*) 'Associated Bone Groups: burial, sacrifice and rubbish' in Campana, D., Choyke, A., Crabtree, P., Defrance, S. and Lev-Tov, J. (eds.) *Anthropological Approaches to Zooarchaeology: colonialism, complexity and animal transformations*. Oxbow, Oxford

Muldner, G. and Richards, M. P., 2007 1500 years of human diet in York: the evidence from stable isotopes. *American Journal of Physical Anthropology* 133: 682 – 697

Orna, B. & Orna, E. 1984 *Flint in Norfolk Building*. Running Angel, Norwich

Ortner, D. J., 2003 *Identification of Pathological Conditions in Human Skeletal Remains*. London: Academic Press

Parker, A. 1988 'The birds of Roman Britain', *Oxford Journal of Archaeology* 7, 197-226

Parrington, M. 1978 *The excavation of an Iron Age settlement, Bronze Age ring-ditches and Roman features at Ashville Trading Estate, Abingdon (Oxfordshire) 1974 – 76*. London: OAU Report 1, CBA Research Report No. 28

Partridge, C. 1977 'Excavations and fieldwork at Braughing, 1968-73' *Hertfordshire Archaeology* No. 5, 22-108

Percival, S. 2000 'Pottery' in Ashwin, T. and Bates, S. *Excavations on the Norwich Southern Bypass, 1989-91 Part 1: Excavations at Bixley, Caistor St. Edmund, Trowse, Cringleford and Little Melton*. East Anglian Archaeology 91, 108-114 and 170-179

Philpott, R., 1991 *Burial Practices in Roman Britain. A survey of grave treatment and furnishing AD 43 – 410*. BAR British Series 219 Oxford: Tempus Reparatum

Roberts, C. A. and Cox, M. 2003 *Health and Disease in Britain. From Prehistory to the Present Day*. Stroud: Sutton Publishing

Rogers, J. and Waldron, T., 1995 *A Field Guide to Joint Disease in Archaeology*. Chichester: Wiley Smith

Scheuer, L. and Black, S., 2004 *The Juvenile Skeleton*. London: Elsevier Academic Press

Scott, E., 1999 *The Archaeology of Infancy and Infant Death*. British Archaeological Report S819 Oxford: Archaeopress

Smith, B. H., 1984 Patterns of Molar Wear in Hunter-Gatherers and Agriculturalists. *American Journal of Physical Anthropology* 63: 39 – 56

Smith, B. H., 1991 Standards of Human Tooth Formation and Dental Age Assessment. In M. A. Kelly and C. S. Larsen, (eds.) *Advances in Dental Anthropology*. pp 143 – 168. New York: Wiley-Liss

Stuart-Macadam, P. S. 1991 Anaemia in Roman Britain. In H. Bush and M. Zvelebil (eds.) *Health in past societies. Biocultural interpretations of human remains in archaeological contexts*. British Archaeological Reports International Series 567 pp 101 – 113 Oxford: Tempus Reparatum

Stuart-Macadam, P. S. and Kent, S. 1992 *Diet, Demography and Disease. Changing perspectives on anemia*. New York: Aldine de Gruyter

Suchey, J. M., Owings, P. A., Wiseley, D. V. and Noguchi, T. T., 1984 Skeletal Aging of Unidentified Persons. In Rathbun, T. A. and Buikstra, J. E., (eds.) *Human Identification: Case Studies in Forensic Anthropology*. 278 – 297 Springfield, Illinois: Charles C Thomas

Sutherland, L. D. and Suchey, J. M., 1991 Uses of the Ventral Arc in Pubic Sex Determination. *Journal of Forensic Science* 36: 501 – 511

Talma, A S & Vogel, J C 1993, 'A simplified approach to calibrating 14C dates', *Radiocarbon* 35 (2), 317

Tanner, J. M., 1989 *Foetus into Man (2nd edition)*. Ware: Castlemead

Taylor, A., 2008 Aspects of Deviant Burials in Roman Britain. In E. Murphy (ed.) *Deviant Burial in the Archaeological Record*. pp 91 – 114 Oxbow, Oxford

Tomber, R. and Dore, J. 1998 *The National Roman Fabric Reference Collection*. Museum of London, London

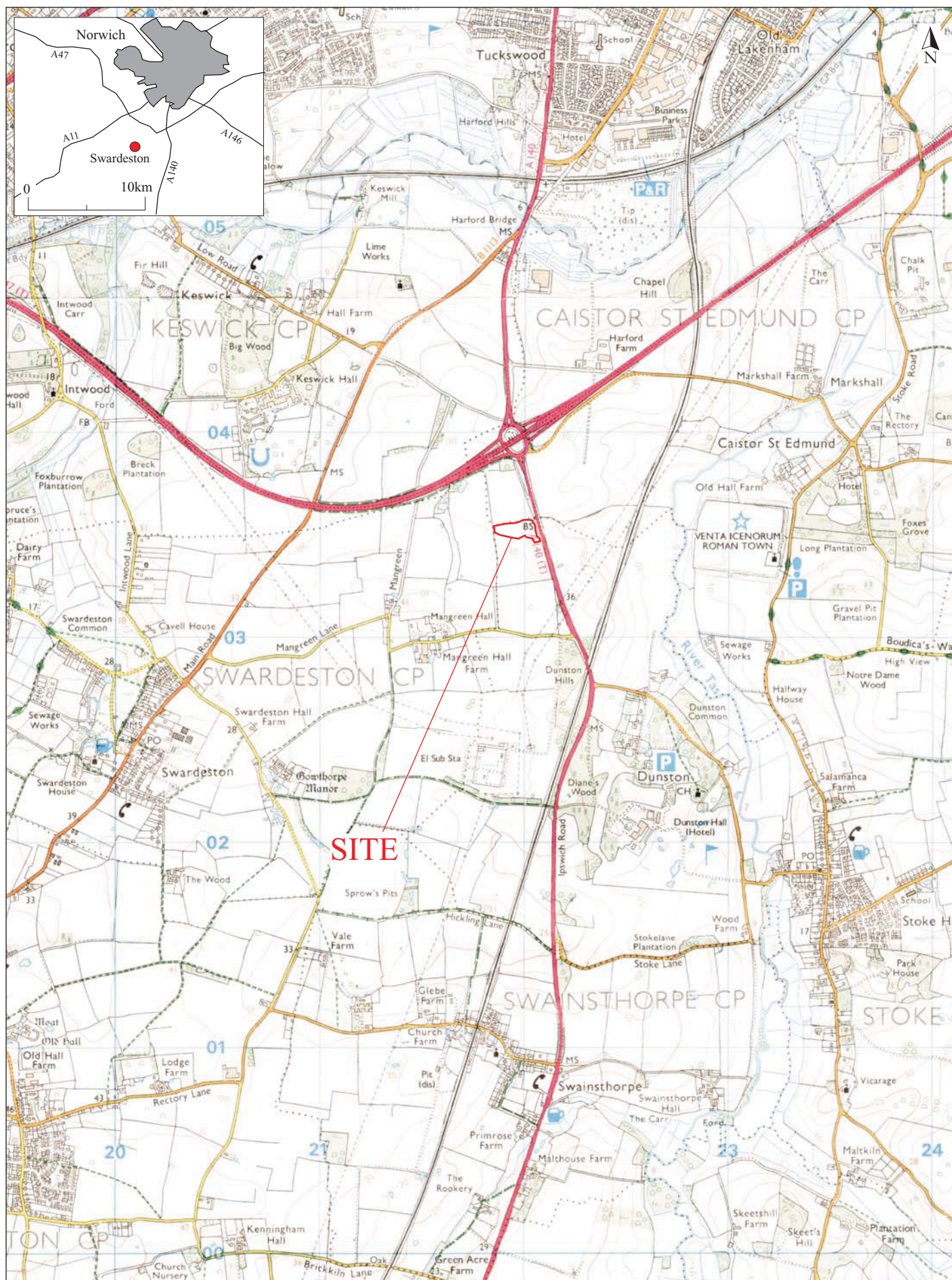
Trotter, M., 1970 Estimation of height from intact limb bones. In T. D. Stewart (ed.) *Personal Identification in Mass Disasters*. pp. 71-97 Washington: Smithsonian Institute

Vaughan, T. E. and Clarke West, O. 1998 Isolated vertical fracture through the anterior atlas arch: a previously unreported fracture. *Emergency Radiology* 5.4: 259-262

Warwick, R., 1968 Part II: skeletal analysis. In L. P. Wenham *The Romano-British cemetery at Trentholme Drive, York*. pp 113-171. London: HMSO Ministry of Public Buildings and Works Archaeological Report 5

Wells, C. 1982 The Human Burials. In, A. McWhirr, L. Viner and C. Wells, *Romano-British cemeteries at Cirencester*. pp 135 – 202 Cirencester: Excavations Committee

Wickenden, N. 1988 *'Excavations at Great Dunmow, Essex', East Anglian Archaeology* 41

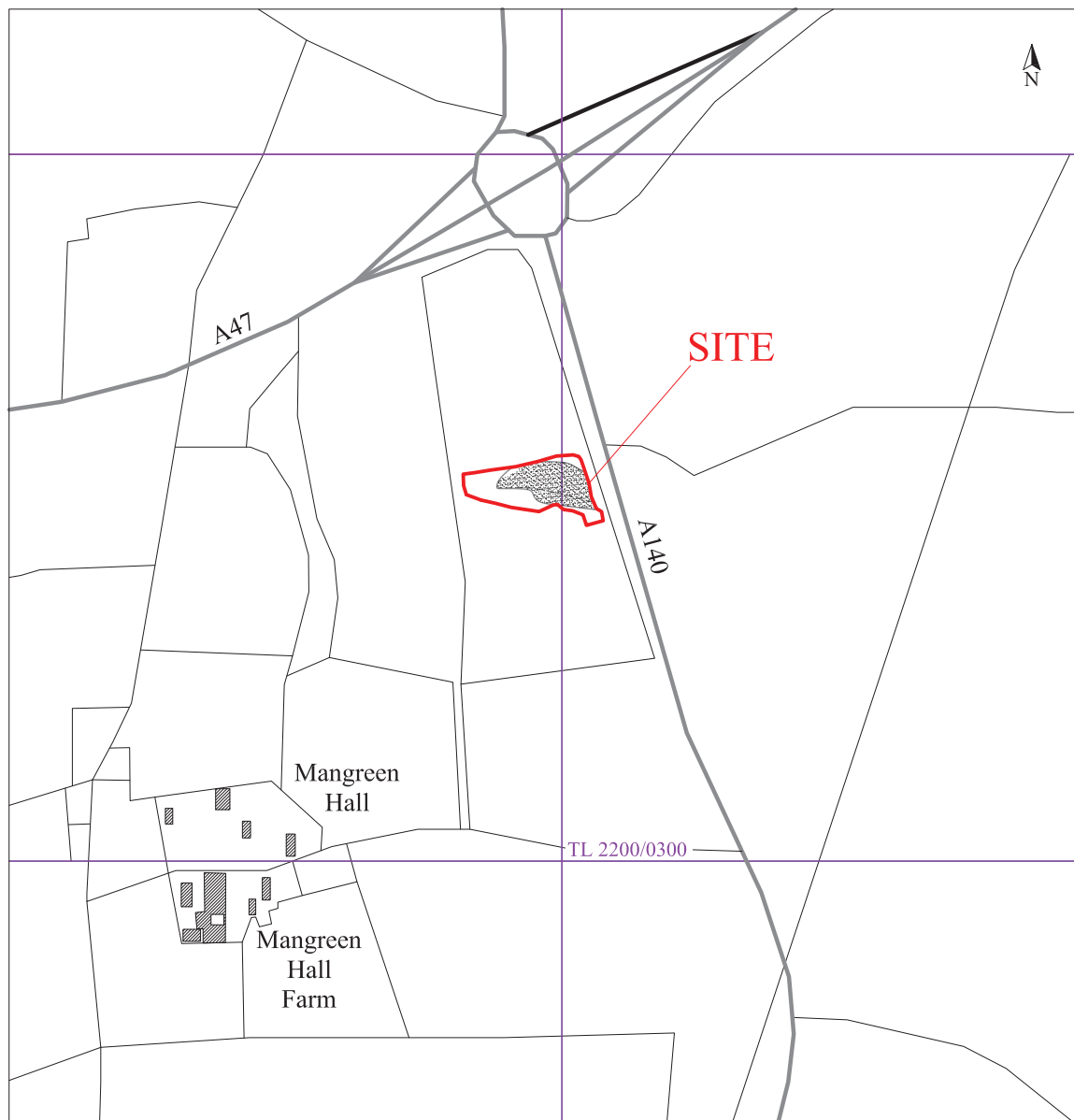


Reproduced from the 1999 Ordnance Survey 1:25000 map with the permission of Her Majesty's Stationery Office. © Crown copyright Archaeological Solutions Ltd. Licence number 1000366680

Archaeological Solutions Ltd

Fig. 1 Site location plan

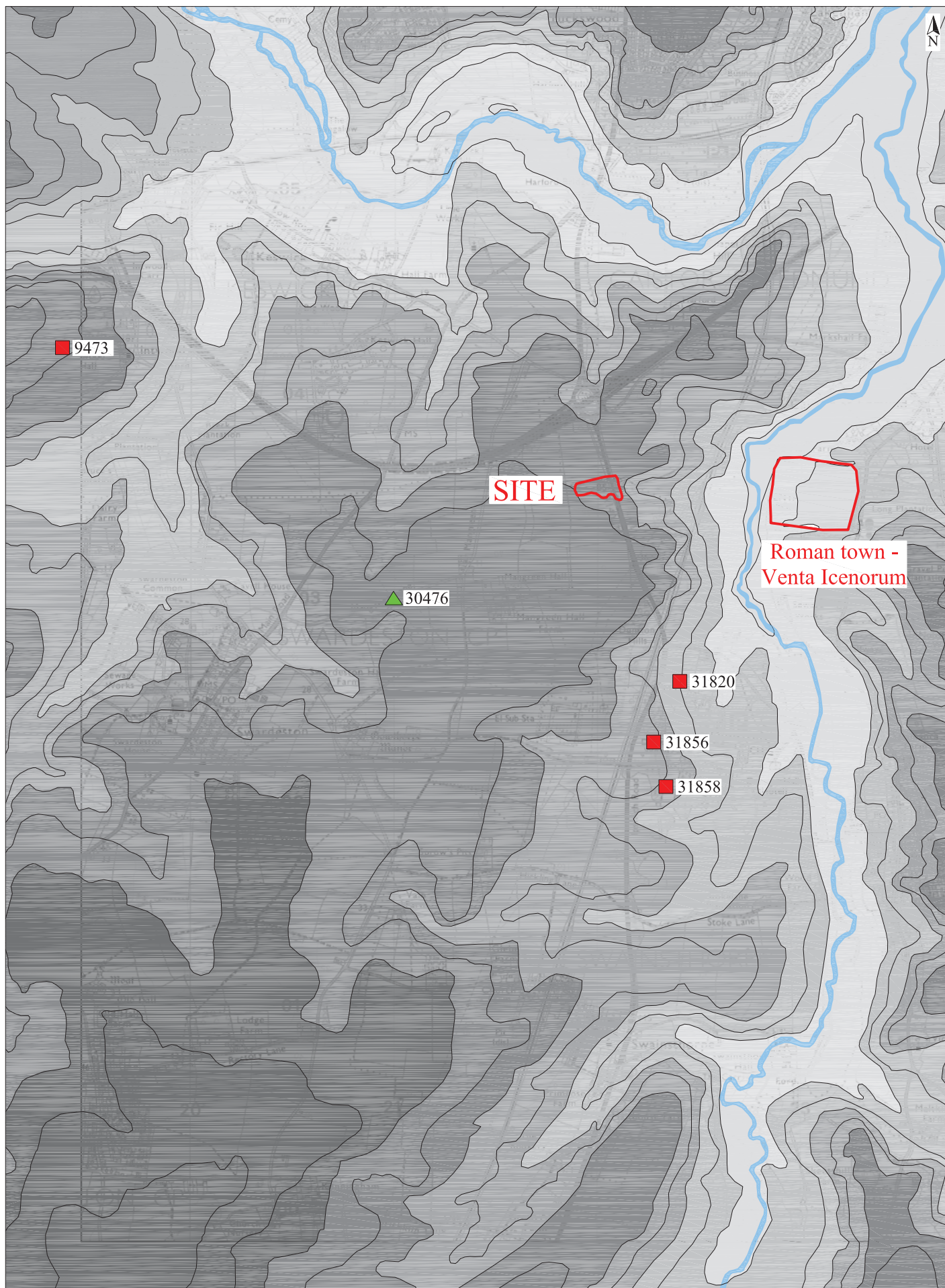
Scale 1:25,000 at A4



Reproduced from the 1999 Ordnance Survey 1:25,000 map with the permission of Her Majesty's Stationary Office. © Crown copyright Archaeological Solutions Ltd Licence number 100036680.

0 50m

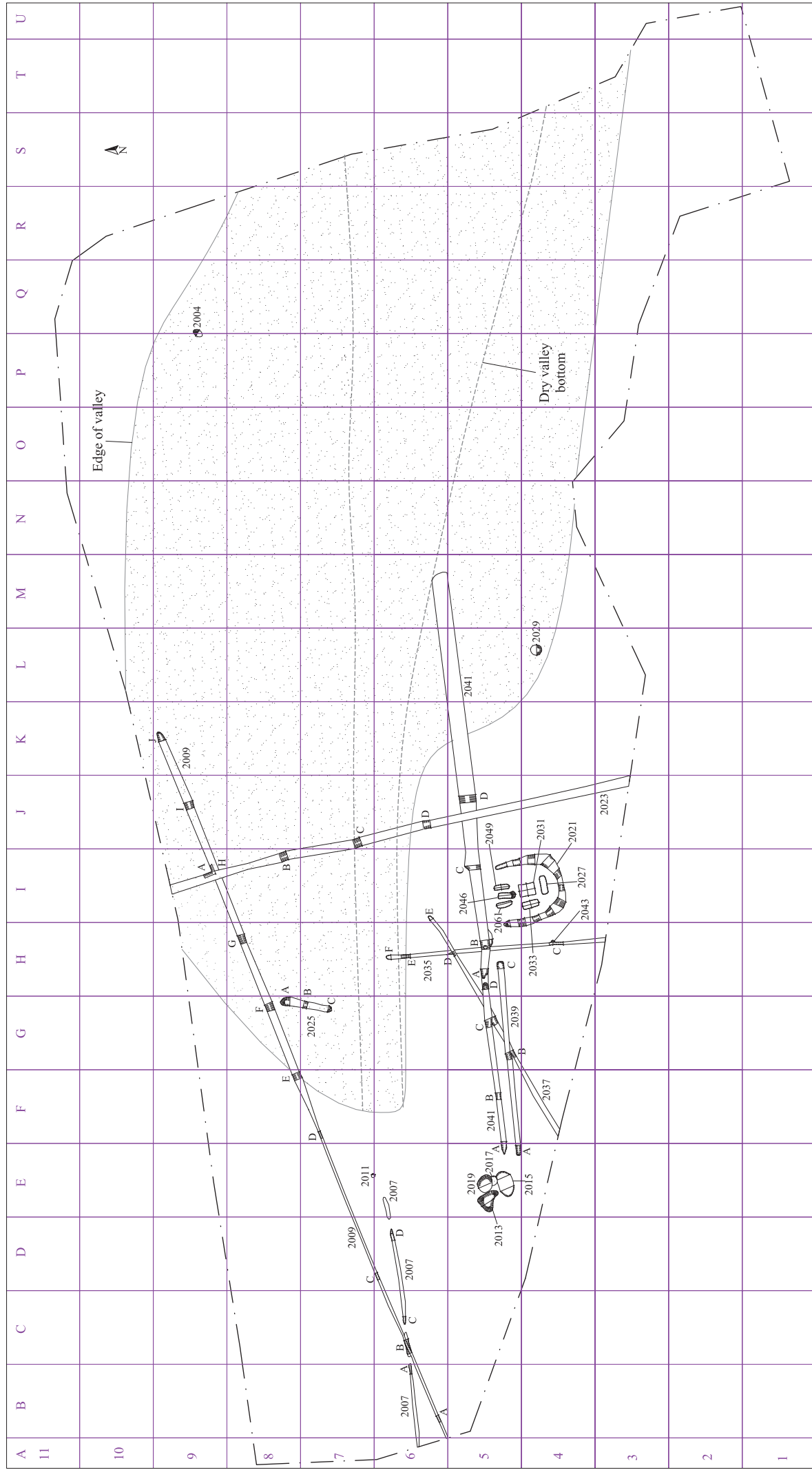
Archaeological Solutions Ltd.
Fig. 2 Detailed site location plan
Scale 1:1000 at A4



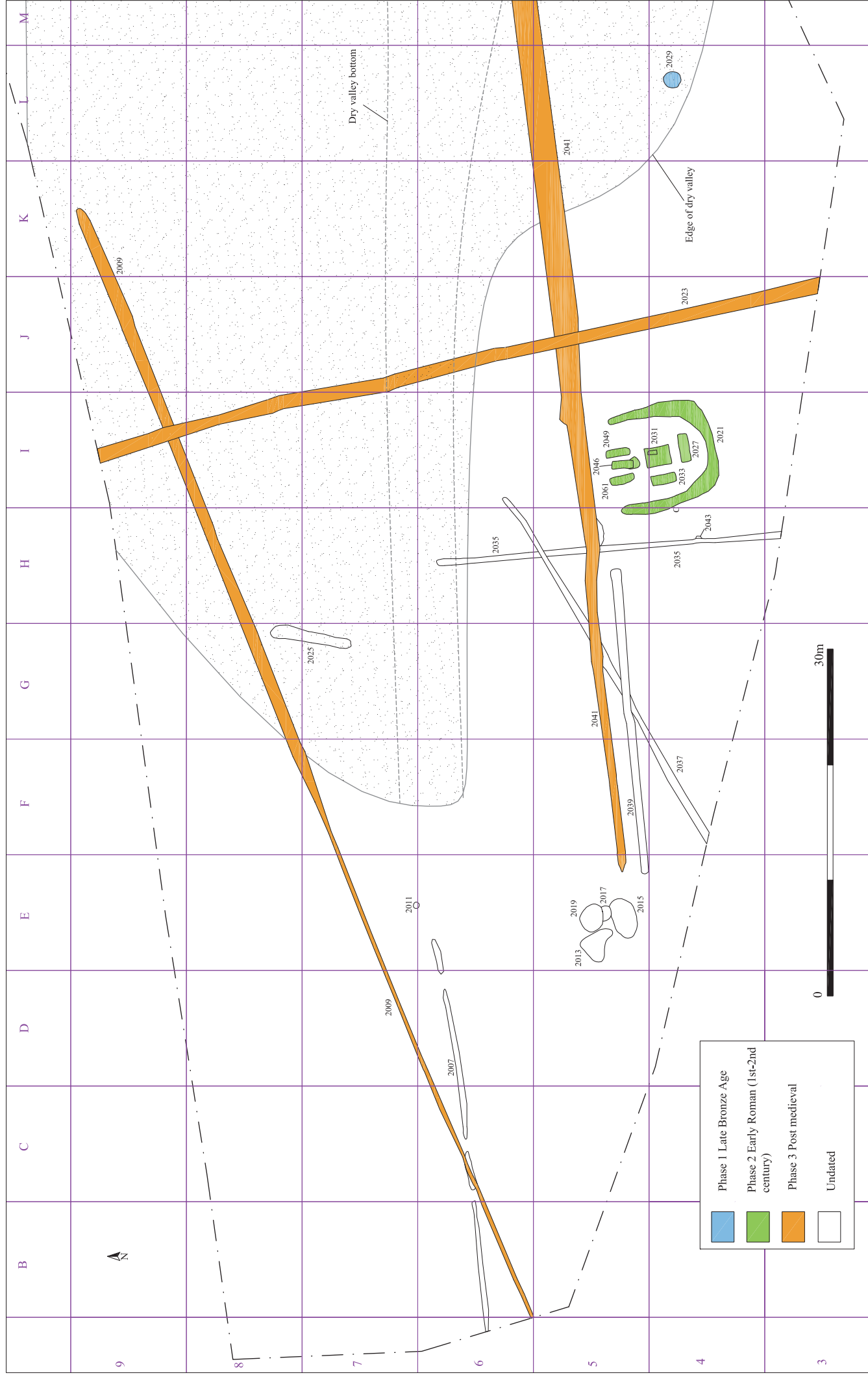
Archaeological Solutions Ltd

Fig. 3 Topography & HER plots of Prehistoric, Bronze Age, Iron Age, Roman, & post-medieval date

Scale 1:25,000 at A4



Archaeological Solutions Ltd.
Fig. 4 All features plan
 Scale 1:500 at A3



Archaeological Solutions Ltd.

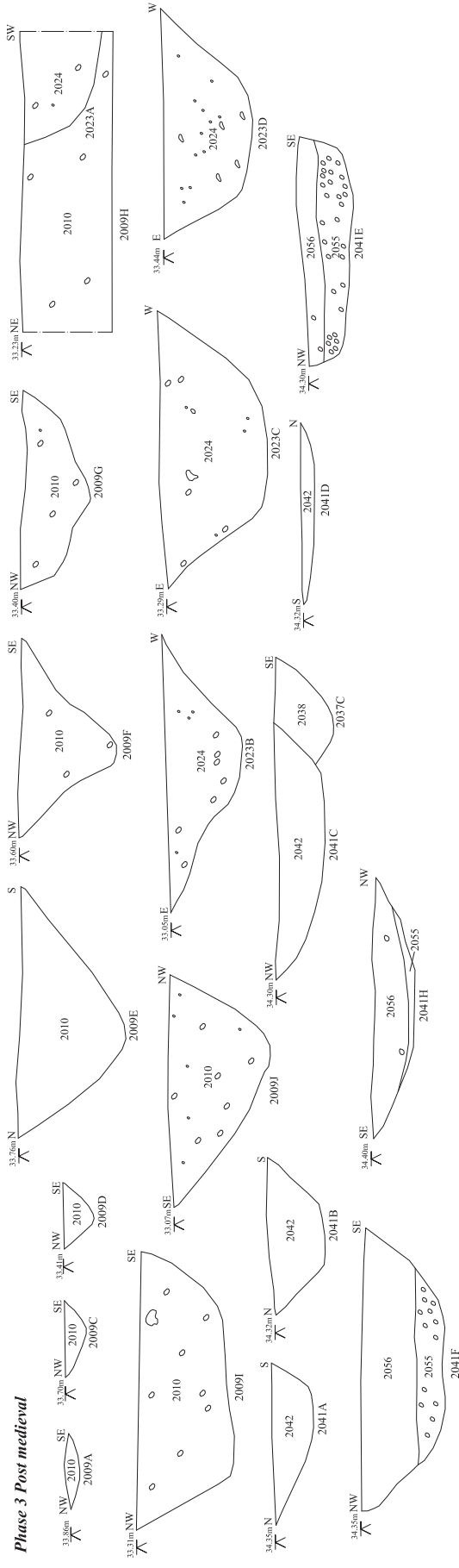
Fig. 5 Phase plan

Scale 1:300 at A3

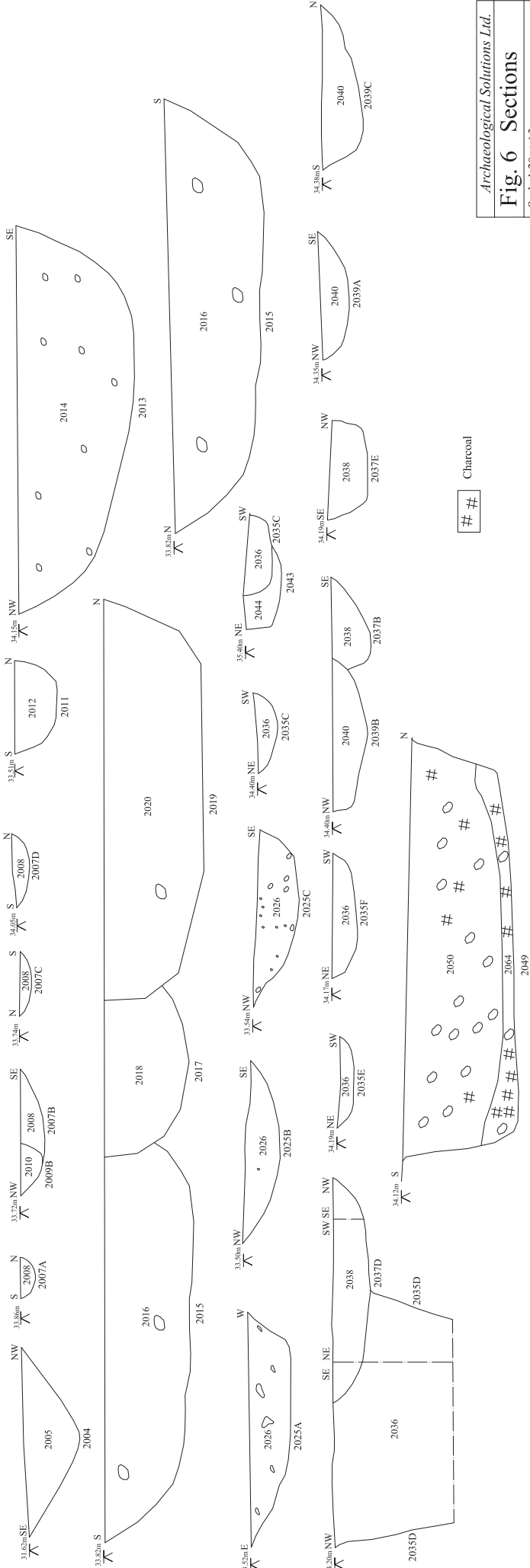
Phase 1 Late Bronze Age - Early Iron Age



Phase 3 Post medieval

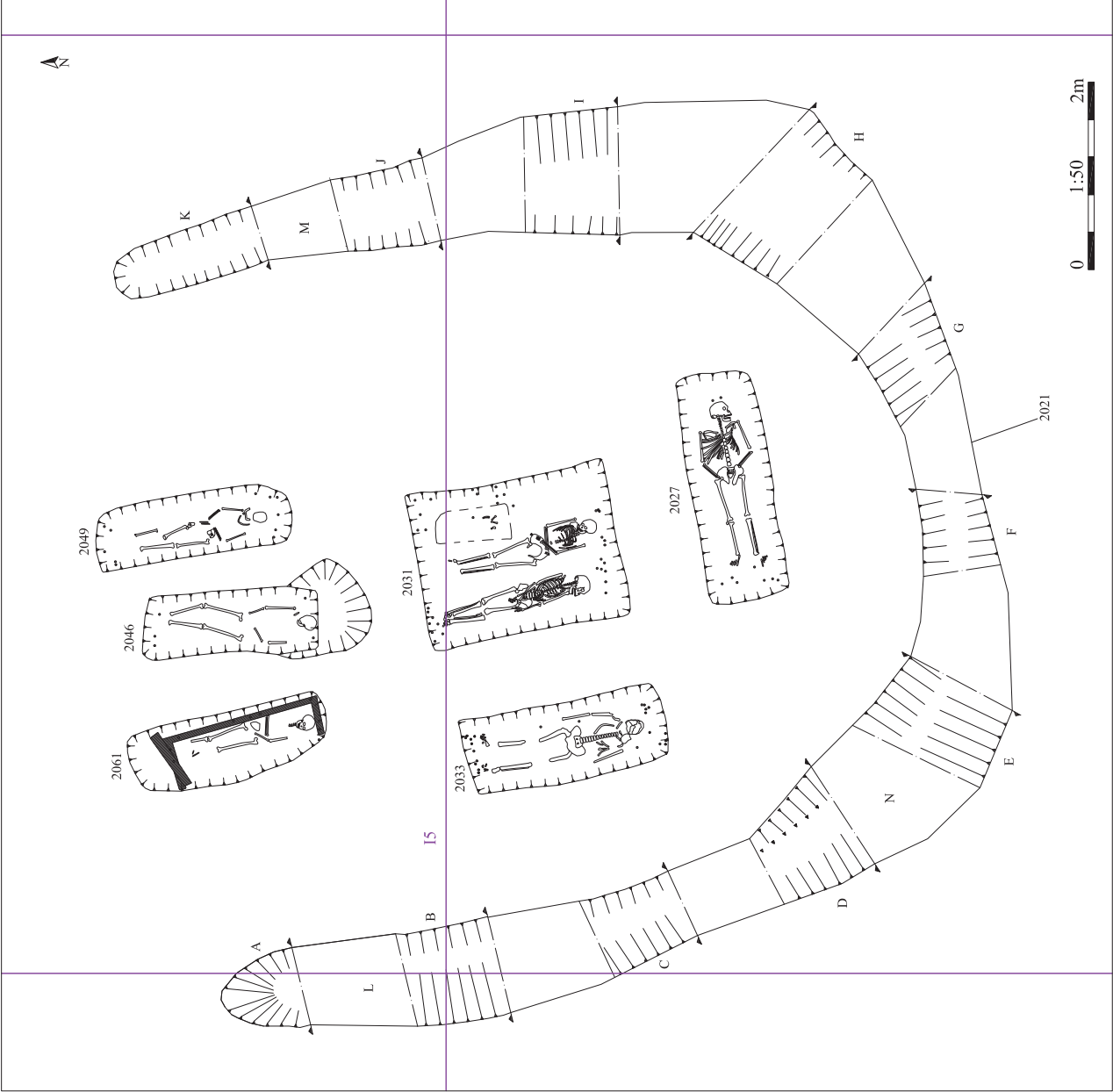


Undated

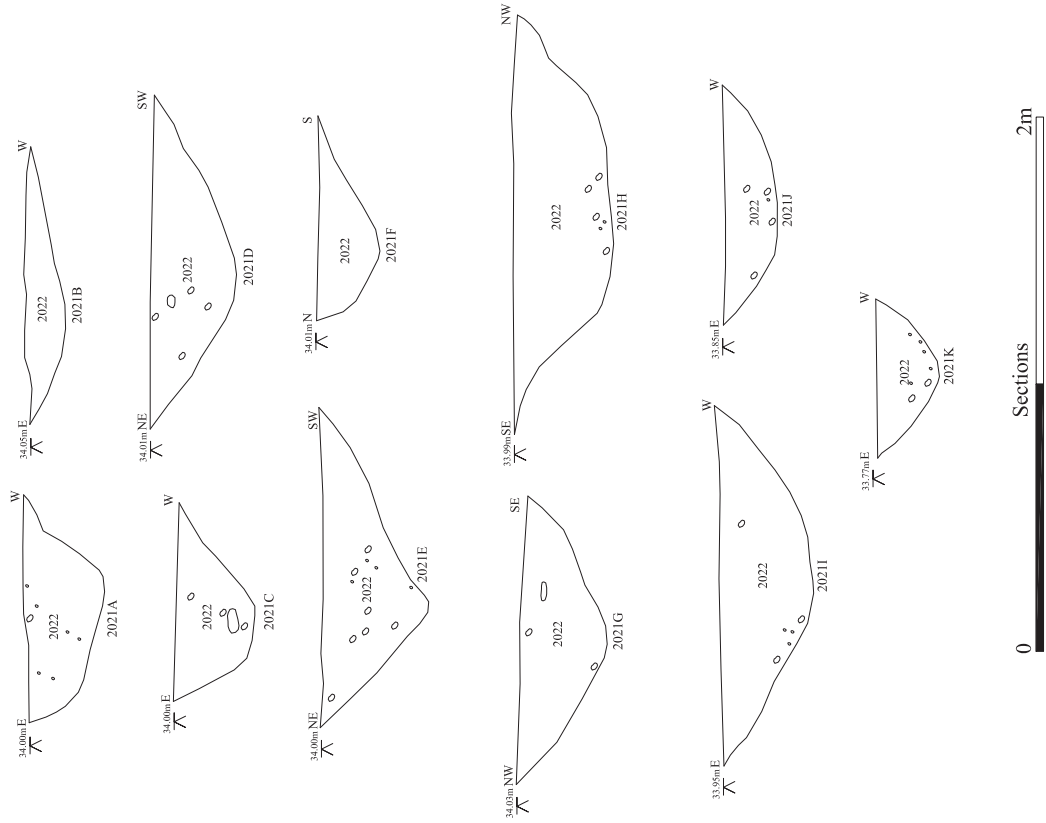


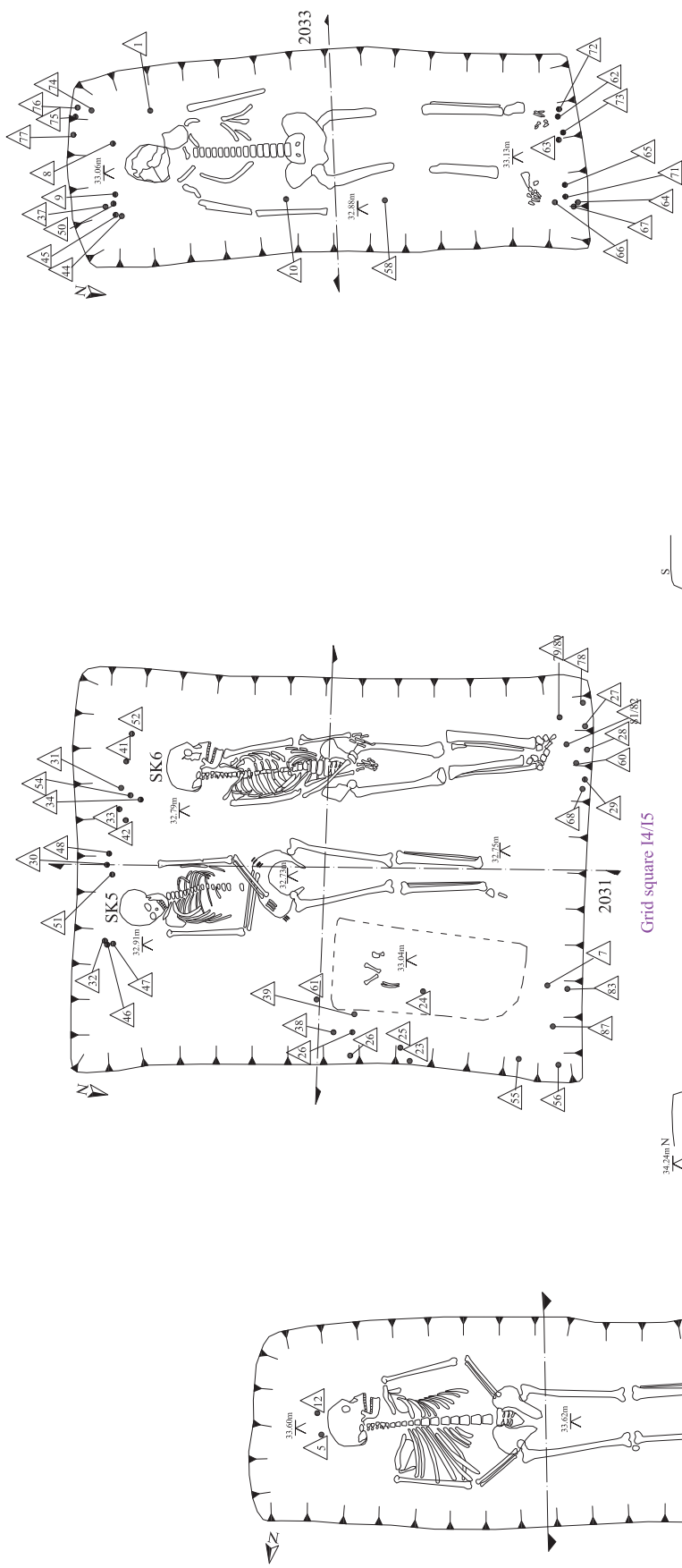
#

Charcoal

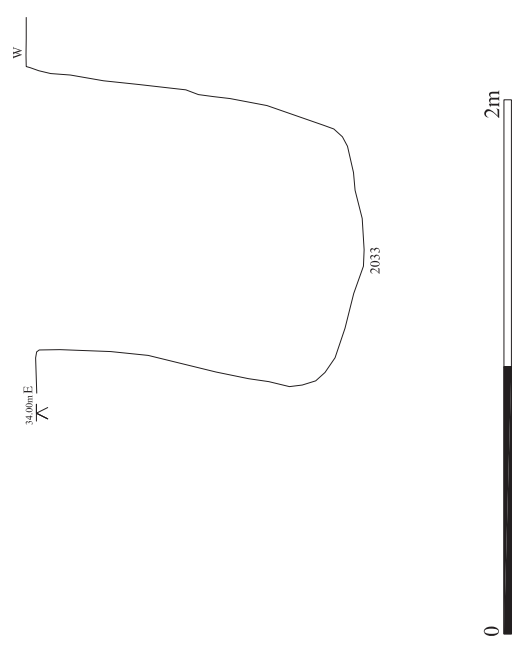


Sections of Ditch F2021





Grid square 14/15



Grid square 14

Grid square 14

