RIVER CAM HABITAT AND ACCESS ENHANCEMENT PROJECT

TRUMPINGTON MEADOWS, HASLINGFIELD

CAMBRIDGESHIRE

ECB 3199 AND ECB 3327

ARCHAEOLOGICAL EVALUATION BY TRIAL-TRENCHING

Essex County Council

FIELD ARCHAEOLOGY UNIT

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RIVER CAM HABITAT AND ACCESS ENHANCEMENT PROJECT, TRUMPINGTON MEADOWS, HASLINGFIELD, CAMBRIDGESHIRE CHER EVENT NUMBERS 3199 AND 3327

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SUMMARY

Archaeological trial trenching and monitoring took place prior to and during the construction of a large drainage ditch and an on-line flood storage area alongside the river Granta to the west of the M11 in Haslingfield parish. The archaeological work was recommended by Cambridgeshire Archaeology, Planning and Countryside Advice and was carried out by the Essex County Council Field Archaeology Unit on behalf of South Cambridgeshire District Council.

The archaeological work revealed river-related palaeoenvironmental remains, but no man-made features or finds. The remains included a palaeosol, a former peat bed, a probable silted-up inside edge of a former meander, and a thick covering layer of pale brown alluvium. Some of the deposits contained pollen and plant macrofossils, although these were only poorly to moderately preserved. All of the palaeo-environmental remains remain undated.

The results of the archaeological work suggest that at least one section of the floodplain of the river Granta contains a wide a variety of geo-archaeological deposits and features, buried beneath and protected by a thick layer of topsoil and alluvium. It man-made features and finds are present within the wider area then these are also likely to be well-preserved beneath these layers.

1.0 INTRODUCTION

This report presents the results of archaeological trial-trenching and monitoring prior to habitat and access enhancement works alongside the Granta branch of the River Cam in Haslingfield parish, Cambridgeshire. The archaeological work was commissioned by South Cambridgeshire District Council and was undertaken by the Essex County Council Field Archaeology Unit (ECC FAU) in response to a recommendation by Cambridgeshire Archaeology, Planning and Countryside Advice (CAPCA) in accordance with an archaeological brief and two written schemes of investigation (CAPCA 2009; ECC FAU 2009a, 2009b).

The habitat and access enhancement works consisted of the construction of a new section of drainage ditch and an on-line flood storage area (Fig. 1, Areas A and B). The river and an existing ditch were linked by the new drainage ditch (Area A), while the flood storage area was created by enlarging an existing ditch and by reducing the level of a D-shaped area of meadow by *c*. 0.8m (Area B).

Copies of this report will be sent to the client and CAPCA and to the Cambridgeshire Historic Environment County Archaeological store, along with the site archive. A digital copy of the report will form part of the Online Access to Index of Archaeological Investigations (OASIS) at http://ads.ahds.ac.uk/project/oasis/ in accordance with the guidelines provided by English Heritage and the Archaeological Data Service.

2.0 BACKGROUND

2.1 Location

The site sits below the 10m contour line in the floodplain of the Granta, a branch of the River Cam, and is surrounded by arable land and is used as a meadow (Fig. 1) (TL 543183 253445). The northern and western sides of the site are defined by the river and a gentle incline below the 10m contour line, and the eastern and southern sides by a hedge and drainage ditch and a small clump of trees. The nearest settlements are the villages of Grantchester and Trumpington to the north, and Hauxton and Haslingfield to the south-east and south-west.

2.2 Geology

The geology of the site comprises undifferentiated river terrace deposits of sand and gravel of probable Pleistocene date, above chalk.

2.3 Archaeology

Records held by the Cambridgeshire Historic Environment Record (CHER) document archaeological remains from Hauxton Mill and the area between the Cam and the Granta, to the south-east and west of the site respectively. These include Bronze Age and Late Iron Age artefacts and Roman and Saxon cremation and inhumation burials from near Hauxton Mill (CHER 04978, 04979, 04979a, 04979b and MCB 16942), and sherds of Roman and Saxo-Norman pottery, cropmark enclosures and a possible ring-ditch from the area between the Cam and the Granta (CHER 09641, CHER 4725 and 4725a).

Numerous archaeological investigations have taken place within the area between the access and habitat enhancement site and Trumpington, to the north. An excavation at Edmundsoles found prehistoric and Romans remains, and one at Lingey Fen a Late Bronze Age timber trackway beneath 3m of peat and sand (Miller and Miller 1982; Pullinger and Young 1982). The investigation of both sites took place in advance of and during construction work for the M11 western by-pass during the 1970s. A trial-trenching evaluation at Trumpington Meadows revealed a Bronze Age ring-ditch overlooking the river Cam, Early to Middle Iron Age pits, several Late Iron Age enclosures, and a Romano-British field system (Brudenell and Dickens 2007). One of the trenches (trench 68) closest to the river contained a sequence of floodplain deposits, although these were not investigated in detail. The sequence consisted of two layers of peat separated by layers of alluvium above earlier deposits of clay silt, and silt sand and gravel. Hollows in three of the other trenches contained remnants of palaeosol beneath subsoil and topsoil.

The Trumpington Inclosure map dated 1804 (CRO 60/24/2/70(a)) records that the current site was formerly part of a large unenclosed field covering most of the area between Hauxton Road and the river Granta. The present day field boundaries relate to and post-date the implementation of enclosure in 1809.

3.0 AIMS AND OBJECTIVES

The aim of the trial-trenching was to determine the location, extent, date, character, condition, significance and quality of any surviving archaeological remains liable to be threatened by the construction of the new drainage ditch and on-line flood storage area.

The trenching sought to establish:

- The extent and amount of truncation to buried deposits
- The presence or otherwise of a palaeosol or 'B' horizon
- The preservation of deposits within negative features
- Site formation processes generally

The trenching revealed palaeosol, peat deposits, alluvium and accretion deposits left by the meandering of the river, but no archaeological features or finds.

The objectives of the monitoring were:

- To obtain more information about soil formation processes generally
- To find stratified, datable artefacts by which to date the floodplain deposits
- To establish the extent of the palaeosol

4.0 METHOD

4.1 Trial-trenching

Areas A and B were investigated by a total of five trenches, excavated under archaeological supervision by a tracked excavator with a 1.8m wide toothless bucket. Trenches 1 and 2 were placed across the line of the proposed new section of drainage ditch (Fig. 2, Area A), and trenches 3, 4 and 5 within the footprint of the proposed flood storage area (Fig. 3, Area B). The positions and lengths of the trenches were partly determined by the presence of obstacles (a large dead tree, trees and tree stumps and a need to maintain vehicle access) and by a need to minimise damage to the existing flora and fauna. Each trench was either fully or partially stripped to the level of the latest probable Pleistocene deposit.

Column and bulk samples were taken of key deposits exposed by the trenching in order to facilitate the investigation of soil formation processes and the palaeoenvironment (Fig. 1, Samples 3, 5, 12 and 13).

The locations of the trenches were recorded by using a directional GPS with on-board map-based software. The error margin of the GPS varies, but is always less than 0.2m. A bench mark with the arbitrary height of 10m (the height of the nearest contour line) was used for the taking of levels in the absence of an accessible Ordnance Survey datum point.

The trenching was carried out in accordance with the Institute of Field Archaeologists' Standards and Guidance for Archaeological Field Evaluation and the Association of Local

Government Officers' Standards for Field Archaeology in the East of England (IFA 1999; Gurney 2003). The ECC FAU is a registered archaeological organisation with the Institute of Field Archaeologists. The ECC FAU uses its own recording system to record all archaeological deposits and features (ECC FAU 2006). Further details of the recording strategy and method can be found in the written schemes of investigation (ECC FAU 2009a, 2009b).

4.2 Archaeological monitoring

The monitoring observed the construction of the new section of drainage ditch in area A, and the ground reduction for the flood plain extension in area B. The construction work was carried out by the developer using a tracked excavator with toothed and toothless buckets.

The drainage ditch in Area A linked an existing drainage ditch to the river and consisted of two sections separated by a sluice gate. It had moderately-sloping sides and a broad, slightly concave base and measured *c*. 9m wide and *c*. 2m deep. The base of the ditch lay beneath groundwater and was beyond observation. The section of ditch to the east of the sluice gate was less substantial. It had steeply-sloping sides and a flat base and measured *c*. 2.2m wide and *c*. 1.6m deep.

The flood plain extension in Area B took place to both sides of an existing drainage ditch and consisted of the reduction of a U-shaped area of ground by *c*. 0.8m. The existing ditch, which was originally *c*. 2.2m wide, was widened and deepened during the course of the groundworks. It contained groundwater and was *c*. 1m deep below the reduced level of the floodplain extension.

5.0 FIELDWORK RESULTS

5.1 Trial trenching

The trenching revealed sequences of horizontal layers beginning with probable Pleistocene deposits of sand (13, 26 and 27) and sand and gravel (4 and 15) (Fig. 4, Sections 1 to 5). There were no archaeological features or artefacts. The sequences in all five trenches concluded with pale brown silt clay alluvium (2, 6, 9, 17 and 22) and dark greyish brown silt clay topsoil (1, 5, 8, 16 and 21). Groundwater seeped into trenches 1 and 3, and lay just beneath the surface in trenches 4 and 5. Trench 2 remained dry. Some of the sampled layers contained molluscs and other plant remains typical of mixed short-turfed grassland and marsh conditions. Spot heights indicate that Area B was approximately half a metre lower

than Area A. Further information on the layers can be found in Appendix 2, while a lithostratigraphic analysis of the deposits is presented in Section 6.

Area A

Trench 1 revealed peat (14) and a very dark greyish brown silt clay alluvium (7), and Trench 2 a probable palaeosol of brownish grey silt sand with infrequent small stones (3).

Area B

Trenches 3, 4 and 5 contained identical sequences of largely stone-free layers. Sandwiched between the alluvium and the probable-Pleistocene deposit were layers of peat (10, 18 and 19), very dark brown silt (11, 18 and 24) and black silt sand (12, 20 and 25).

5.2 Archaeological monitoring

The groundworks affected the majority of the layers which had been previously encountered during the trial-trenching, although some of the deposits were not able to be fully recorded since they lay or extended beneath the water table or had been disturbed by the uprooting of tree stumps. As before, there were no artefacts or archaeological features.

Area A

The construction of the drainage ditch exposed accretion deposits and palaeosol (3) sealed beneath alluvium and topsoil and areas of modern disturbance caused by the uprooting of tree stumps (5 and 6) (Fig. 5).

The accretion deposits occupied a depression in the probable-Pleistocene deposits (4) and extended *c*. 15m out from the edge of the river. They comprised a small spread of pale brownish yellow silt (28), a layer of dark brownish grey sand silt (30), layers of clay silt (31 and 32) and a bank of brownish white sand (29). Deposit 30 merged with the palaeosol (3) previously encountered in Trench 2 and was possibly the same as deposit 7 in Trench 1. Deposit 14 in Trench 1 and the base of the depression were unable to be investigated because they lay beneath groundwater.

Area B

The groundworks in Area B revealed the peat deposit (10, 18 and 23) and patches of some of the underlying layers (11, 18, 23 and 12, 20 and 25) previously exposed during the trial trenching (Fig. 4, Sections 3 to 5). The peat extended across the whole of the reduced area and no new deposits were present.

6.0 LITHOSTRATIGRAPHY AND POLLEN

By C.R. Batchelor and D. Young

6.1 Introduction

This report summarises the findings arising out of an environmental archaeological assessment undertaken by Quaternary Scientific (QUEST), University of Reading, in connection with the River Cam habitat and access enhancement project, Trumpington Meadows, Haslingfield, Cambridgeshire (event numbers ECB 3199 and ECB 3327). Excavations carried out by Essex County Council Archaeology Unit revealed a sequence of Pleistocene sediments, overlain by alluvium (including peat) and topsoil in five trenches across the site (ECC FAU, 2009). Two column samples were taken for pollen assessment and lithostratigraphic description from Trenches 1 (sample <3>) and 3 (sample <5>) (Figs. 4 and 6). The overarching aim of the environmental archaeological assessment was to evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs. In order to achieve this aim, the environmental archaeological assessment consisted of:

1. Recording the lithostratigraphy to provide a preliminary reconstruction of the sedimentary history
2. Assessment of the preservation and concentration of pollen grains and spores to provide a preliminary reconstruction of the vegetation history, and to detect evidence for human activities: e.g. woodland clearance and cultivation.

6.2 Methods

Lithostratigraphic descriptions

The lithostratigraphy of two column samples <3> and <5> were described in the laboratory using standard procedures for recording unconsolidated sediment and organic sediments, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts) (Troels-Smith, 1955). The procedure involved: (1) cleaning the samples with a spatula or scalpel blade and distilled water to remove surface contaminants; (2) recording the physical properties, most notably colour using a Munsell Soil Colour Chart; (3) recording the composition; gravel (Grana glareosa; Gg), fine sand (Grana arenosa; Ga), silt (Argilla granosa; Ag) and clay (Argilla steatoides); (4) recording the degree of peat humification and (5) recording the unit boundaries: e.g. sharp or diffuse. The results are displayed in Appendix 3, Tables 1 to 2, and illustrated in Figure 6.

Pollen assessment

Fourteen sub-samples were extracted from the column samples <3> (seven samples) and <5> (seven samples) for pollen assessment. The pollen was extracted as follows: (1) sampling a standard volume of sediment (1ml); (2) deflocculation of the sample in 1% Sodium pyrophosphate; (3) sieving of the sample to remove coarse mineral and organic fractions (>125µm); (4) acetolysis; (5) removal of finer minerogenic fraction using Sodium polytungstate (specific gravity of 2.0g/cm3); (6) mounting of the sample in glycerol jelly. Each stage of the procedure was preceded and followed by thorough sample cleaning in filtered distilled water. Quality control is maintained by periodic checking of residues, and assembling sample batches from various depths to test for systematic laboratory effects. Pollen grains and spores were identified using the University of Reading pollen type collection and the following sources of keys and photographs (Moore *et al* 1991; Reille 1992). Plant nomenclature follows the Flora Europaea as summarised in Stace (1997). Plant nomenclature follows the Flora Europaea as summarised in Stace (1997). The assessment procedure consisted of scanning the prepared slides, and recording the concentration and preservation of pollen grains and spores, and the principle taxa on four transects (10% of the slide) (Appendix 3, Tables 3 and 4).

6.3 Results and interpretation of the lithostratigraphic descriptions

Trench 1

The results of the lithostratigraphic descriptions (Appendix 3, Table 1; Fig. 6) indicate that the sequence contained within column sample <3> commences with an organic-rich silty sand (Unit 1), and passes gradually into a very organic-rich well humified horizon containing herbaceous peat at 8.05m OD (Unit 2). The boundary between Units 2 and 3 (8.20m OD) is sharp indicating a possible hiatus in deposition and/or erosion, prior to the recommencement of less organic-rich sediments containing herbaceous peat (Unit 3). The sequence represented in column sample <3> culminates with a diffuse contact into organic-rich silts and clays (from 8.31m; Unit 4).

Overlying the probable Pleistocene sediments identified in the field were two organic-rich and peaty horizons (context (14)) representing deposition in a semi-terrestrial environment. These were succeeded by an abrupt change to a less organic-rich horizon and finally fine grained mineral-rich sediments which represents a hiatus in deposition and/or erosion followed by a transition to semi-aquatic and finally alluvial conditions.

Trench 3

The results of the lithostratigraphic descriptions (Fig. 6; Appendix 3, Table 2) indicate that the sequence contained within column sample <5> commences with a silty sand containing

gravel (8.49m to 8.55m OD; Unit 1) which becomes gradually less sandy in Unit 2 (8.55m to 8.70m OD). The boundary between Units 2 and 3 (8.70m OD) is sharp indicating a possible hiatus in deposition and/or erosion, prior to the deposition of silt containing detrital plant material and Molluscan remains (Unit 3). At 8.88m OD, there is a gradual transition into a very organic-rich well humified herbaceous peat horizon.

Units 1 and 2 (context 12) are representative of the potential palaeosol identified in the field. However, no definitive indications of soil forming processes were identified in the field and it is suggested that these deposits may represent the reworking of underlying Pleistocene deposits in a waterlain environment. Unit 3 (context 11) is representative of the deposition of fine-grained deposits in an alluvial environment. The presence of Mollusca and detrital plant remains is also indicative of an alluvial environment. The transition into the herbaceous peat of Unit 4 (context 10) represents a shift towards semi-terrestrial conditions. The pale brown alluvium of context (9) was recorded in the field but not collected within column sample <5>; however, photographic records indicate that the boundary between the two units was sharp indicating either a rapid environmental change, and/or erosion of the peat surface.

6.4 Results and interpretation of the pollen analysis

Trench 1

The results of the pollen assessment from column sample <3> indicate low pollen concentration and poor to moderate preservation (Appendix 3, Table 3). In context (14) the pollen assemblage included *Pinus* (pine), *Alnus* (alder), *Quercus* (oak), *Betula* (birch), *Corylus* type (e.g. hazel), Cyperaceae (sedges), Poaceae (grasses) and *Polypodium vulgare* (polypody). This assemblage is indicative of damp fen woodland with an understorey of sedges, grasses and fern vegetation.

In context (7) the assemblage contained *Pinus* (pine), *Corylus* type (e.g. hazel), Cyperaceae (sedges), Poaceae (grasses), Lactuceae (daisy family), *Chenopodium* type (e.g. fat hen) and *Typha latifolia* (bulrush). This assemblage is indicative of a herb-rich community, whilst the presence of *Typha latifolia* is indicative of semi-aquatic conditions.

However, the pollen concentration and preservation is very poor leading to biased pollen assemblages and preventing detailed vegetation reconstructions from being carried out. For example, although *Pinus* is consistently recorded, it is produced in significant quantities, is more resistant than other pollen/spore types to corrosion, and so is likely over-represented. Furthermore, *Pinus* pollen may be transported over long distances, reflecting the local–regional environment. Other pollen taxa frequently recorded such as *Chenopodium* type,

Lactuceae, *Alnus* and *Corylus* type are all either more resistant to decay or more readily identified than other pollen taxa.

Trench 3

The results of the pollen assessment from column sample <5> indicate very low pollen concentration and very poor preservation (Appendix 3, Table 3). Unfortunately the state of the pollen remains within the captured sequence is lower than in sample <3> and as a consequence, no meaningful comments can be made on the likely vegetation environment.

6.5 Conclusions and recommendations

In Trench 1, two organic-rich, peaty horizons were recorded overlying the probable Pleistocene sediments identified in the field, and represent deposition in a semi-terrestrial environment. These were succeeded by an abrupt change to a less organic-rich horizon and finally fine grained mineral-rich sediments. In Trench 3, a potential palaeosol, (or reworked Pleistocene deposits) were recorded at the base of the sequence and were succeeded by a gradual transition from alluvium to semi-terrestrial peat to alluvium. Pollen was generally poorly preserved in low concentrations in the samples from both trenches and thus only limited reconstruction of the former vegetation cover was possible.

No further pollen work is recommended due to the poor concentration and preservation of remains

7.0 MOLLUSCS AND PLANT MACROFOSSILS

By V. Fryer

Method

Layers 3, 7, 10, 11, 12, 14, 18, 20, 23, 24 and 25 were bulk sampled for environmental analysis (Fig. 4). The samples were processed by manual water flotation/washover and the flots were collected in a 300 micron mesh sieve. The dried flots were scanned under a binocular microscope at magnifications up to x 16 and the plant macrofossils and other remains noted are listed in Appendix 4. All plant remains were waterlogged unless otherwise stated.

The non-floating residues were collected in a 1mm mesh sieve and sorted when dry. Artefacts/ecofacts were not present within the residues.

Results

All eleven assemblages were largely composed of waterlogged root/stem fragments. Those from deposits 10, 12, 18 and 23 were severely comminuted, giving the assemblages a very homogenous texture typical of a weathered or desiccated peat. Other remains were exceedingly scarce within these deposits, although all four samples did contain occasional seeds of dry land and wetland plants including fat hen (*Chenopodium album*), buttercup (*Ranunculus* sp.), mint (*Mentha* sp.) and bogbean (*Menyanthes trifoliate*). The assemblages from deposits 10 and 23 also contained a small number of poorly preserved moss fronds.

The remaining assemblages were largely non-discript, although those from deposits 11 and 14 appeared to be comprised of a compacted highly organic mud. Seeds/fruits were present throughout, with taxa noted including orache (*Atriplex* sp.), musk thistle (*Carduus* sp.), dock (*Rumex* sp.), elderbury (*Sambucus nigra*), bugle (*Ajuga* sp.), sedge (*Cares* sp.), spike-rush (*Eleocharis* sp.) and marsh pennywort (*Hydocotyle vulgaris*). Charcoal fragments were recorded within the assemblages from deposits 3, 14, 20 and 25. All were retained for potential identification and C14 dating.

Small assemblages of mollusc shells and occasional individual specimens were noted within all but the samples from deposits 10, 12 and 23. Shells of marsh/freshwater obligate species occurred most frequently, although two of Evans (1972) ecological groups of terrestrial taxa were also represented.

Conclusions and recommendations for further work

In summary, the plant macrofossil and mollusc assemblages both appear to be indicative of mixed short-turfed grassland and marsh conditions surrounding a channel with a moderate velocity of water flow. However, it should be noted that the limited composition of the assemblages precludes any accurate interpretation of the deposits. If further archaeological interventions are planned within the immediate area, further plant macrofossil samples of approximately 10-20 litres in volume can be taken, although it should be stressed that their value is limited if the deposits are not intrinsically datable.

8.0 CONCLUSIONS

The trial-trenching and the monitoring of the groundworks have revealed sequences of post-glacial floodplain deposits overlying probable Pleistocene deposits in the floodplain of the Granta. The fieldwork has found no man-made features or finds, probably due to the site having been wet and boggy for most of its history, making it non-conducive to human

settlement. The sequences can be cross-referenced and separated into four episodes of deposition, all of which remain undated due to the absence of man-made artefacts.

The palaeosol represents the first episode and is a former topsoil and land surface. It has a sandy matrix and is probably derived from the underlying Pleistocene deposits of sand and gravel. It is indicated by deposit 3 in Trench 2 in Area A, and deposits 12, 20 and 25 in Trenches 3, 4 and 5 in Area B. The deposit is thinner in Area B and this is possibly due to truncation, perhaps caused by flooding or by changes in the course of the river.

The second and third episodes post-date the formation of the palaeosol and are represented by accretion deposits 7, 14 and 28 to 31 in Area A and by peat deposits 10, 18 and 23 in Area B. Because of the absence of dating evidence it is not known if the two episodes overlapped or if one was earlier than the other.

The presence of the accretion deposits inside a depression in the probable Pleistocene deposits close to the river probably indicates that they were deposited within an isolated former channel or across a slip-off slope along the inside edge of a former meander. Conditions across the slip-off slope appear to have been variable as the lithostratigraphy of column sample 3 indicates they became wetter before they became drier and that they were separated by a period or truncation or non-deposition. Deposit 14 represents peat formation in a semi-terrestrial environment located either near or within an area of damp fen woodland, and deposit 7 the deposition of silt clay and peat in a semi-aquatic environment.

The peat deposit in Area B overlies a thin layer of alluvium (11, 18 and 24) and a possibly truncated area of palaeosol (12, 20 and 25). The full extent of the localised peat bed which it represents is not known, although its western and northern sides are probably defined by the river and by the base of the slope for the 10m contour line. The alluvial layer beneath the peat suggests that the peat was preceded by a semi-aquatic phase during which the area was subject to occasional flooding. The peat in Area A (Trench 1, deposit 14) lies at a distance from and at a different level from that in Area B and it is unlikely that the two are connected. A fall in the water table following inclosure and the introduction of drainage ditches in the 19th century is conjectured to be responsible for the compressed and semi-desiccated condition of the peat in Area B when found.

The final episode comprises extensive alluviation represented by the pale brown layer of alluvium (2, 6, 9, 17 and 22) and the overlying layer of present-day topsoil (1, 5, 8, 16 and 21). The alluviation is speculated to have been caused by wide-spread flooding and soil erosion following tree clearance and tillage of large areas of hitherto unploughed or only

lightly ploughed land upstream from the river. One of the affects of the alluviation is that it has increased the height of the banks and has buried the earlier deposits, including the palaeosol, by up to 0.9m. It is likely that before the alluviation began, the river was wider, shallower and more braided and that the ground surface was the top of the palaeosol (3, 12, 20 and 25). Modern-day dredging has further increased the canal-like form of the present-day river.

9.0 ASSESSMENT OF RESULTS

The fieldwork has found no archaeological features or finds, although this is no guarantee that no archaeological remains are present within the wider scheme area. If man-made features and finds are present then they are likely to be well-preserved because they are partially waterlogged and because they are protected by a thick covering layer of topsoil and alluvium.

Some of the layers revealed by the trenching contain insect, mollusc and plant remains, including pollen, although these are only poorly to moderately preserved, possibly due to soil conditions and / or to the layers having dried out during the past.

No further pollen assessment is required, although consideration should be given to obtaining radiocarbon determinations on the sequences revealed by both areas in order to provide a chronological framework for peat accumulation in the area. This could be achieved through the recovery of suitable sample material from any future intervention in the floodplain.

The floodplain of the river Granta has seen few other archaeological investigations, making cross-comparison between sites problematic. River-related deposits were found in a trench close to the Granta during trial trenching at Trumpington Meadows, although these were not recorded or investigated in detail (Brudenell and Dickens 2007, trench 68).

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The fieldwork was carried out by Mark Germany, Andy Lewsey and John Hewitt. The plant macrofossils were assessed by V. Fryer. The lithostratigraphy and pollen were assessed by C.R. Batchelor and D. Young of the Quaternary Scientific (QUEST) School of Human and Environmental Sciences, University of Reading. The project was managed by Adrian Scruby. Figures 1 to 5 were drawn by Andy Lewsey, and figure 6 by QUEST. The colour plates were taken by Mark Germany.

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Stace, C.	1997	*New Flora of the British Isles*. Second edition. Cambridge: Cambridge University Press
Troels-Smith. J.	1955	'Characterisation of unconsolidated sediments'. *Danmarks Geologiske Undersøgelse*. Raekka **IV**(3), 38-73

APPENDIX 1: TRENCH DATA

Dimensions in metres

Tr.	Len.	Wid.	Dep.	Coordinates
1	10.6	1.8	1.97	TL 543104.6 253283.8 TL 543100.2 253274.2
2	7.6	1.8	1.05	TL 543115.7 253267.0 TL 543122.4 253270.7
3	15.8	1.8	1.02	TL 543258.3 253603.1 TL 543264.7 253588.6
4	12.2	1.8	0.80	TL 543266.7 253617.5 TL 543278.2 253621.7
5	18.4	1.8	0.87	TL 543272.4 253613.6 TL 543277.7 253595.9

APPENDIX 2: CONTEXT DATA

No.	Tr.	Category	Description
1	2	Topsoil	Dark greyish brown silt clay with infrequent small stones. 0.22m thick. Above 2
2	2	Alluvium	Pale brown silt clay with no very infrequent small stones. 0.35m thick. Above 3. Below 1
3	2	Layer	Brownish grey friable silt sand with infrequent small stones. 0.48m thick. Above 4. Below 2
4	2	Layer	Brownish yellow loose sand with abundant small stones. Below 3
5	1	Topsoil	Dark greyish brown silt clay with infrequent small stones. 0.37m thick. Above 6
6	1	Alluvium	Pale brown silt clay. 0.53m thick. Above 7. Below 5. Above 31
7	1	Layer	Very dark greyish brown silt clay. 0.85m thick. Above 14. Below 6
8	3	Topsoil	Dark greyish brown silt clay with infrequent small stones. 0.23m thick. Above 9
9	3	Alluvium	Pale brown silt clay. 0.15m thick. Above 10. Below 8
10	3	Layer	Peat. 0.16m thick. Above 11. Below 9. Probably same deposit as layers 18 and 23 in trenches 4 and 5
11	3	Layer	Very dark brown silt. 0.23m thick. Above 12. Below 10. Probably same deposit as layers 19 and 24 in trenches 4 and 5
12	3	Layer	Black silt sand with gravel inclusions. 0.23m thick. Above 13. Below 11. Probably same deposit as layers 20 and 25 in trenches 4 and 5
13	3	Layer	Brownish yellow soft silt sand with no inclusions. Below 12. Probably same deposit as layers 27 and 26 in trenches 4 and 5
14	1	Layer	Peat. 0.32m thick. Above 15. Below 7
15	1	Layer	Pale brownish grey loose silt sand with abundant small stones. Below 14

No.	Tr.	Category	Description
16	4	Topsoil	Dark greyish brown silt clay with infrequent small stones. 0.13m thick. Above 17
17	4	Alluvium	Pale brown silt clay. 0.22m thick. Above 18. Below 16
18	4	Layer	Peat. 0.25m thick. Above 19. Below 17. Probably same deposit as layers 10 and 23 in trenches 3 and 5
19	4	Layer	Very dark brown silt. 0.12m thick. Above 19. Below 18. Probably same deposit as layers 11 and 24 in trenches 3 and 5
20	4	Layer	Black silt sand with gravel inclusions. 0.06m thick. Above 13. Below 11. Probably same deposit as layers 12 and 25 in trenches 3 and 5
21	5	Topsoil	Dark greyish brown silt clay with infrequent small stones. 0.16m thick. Above 22
22	5	Alluvium	Pale brown silt clay. 0.22m thick. Above 23. Below 21
23	5	Layer	Peat. 0.15m thick. Above 24. Below 22. Probably same deposit as layers 10 and 18 in trenches 3 and 4
24	5	Layer	Very dark brown silt. 0.20m thick. Above 25. Below 23. Probably same deposit as layers 11 and 19 in trenches 3 and 4
25	5	Layer	Black silt sand with gravel inclusions. 0.15m thick. Above 26. Below 24. Probably same deposit as layers 12 and 20 in trenches 3 and 4
26	5	Layer	Brownish yellow soft silt sand with no inclusions. Below 25. Probably same deposit as layers 13 and 27 in trenches 3 and 4
27	4	Layer	Brownish yellow soft silt sand with no inclusions. Below 20. Probably same deposit as layers 13 and 26 in trenches 3 and 5
28	Site A	Layer	Pale brownish yellow soft silt. Below 30
29	Site A	Bank	Brownish white loose sand. Runs running parallel to river. Below 31. Above 32
30	Site A	Layer	Dark brownish grey soft sand silt. *c*. 0.2m thick. Possibly same as 7. Merges with 3. Below 32. Above 28
31	Site A	Layer	Yellowish brown soft clay silt. Below 6. Above 29
32	Site A	Layer	Pale brown soft clay silt. Below 29. Above 30

APPENDIX 3: LITHOSTRATIGRAPHY AND POLLEN

Depth (m OD)	Unit number	Context number	Description
8.38 to 8.31	4	(7)	10YR 3/2; As2, Ag1, Sh1, Th+; Humo 4; Very dark grayish brown well humified organic-rich silty clay with wood peat inclusions; diffuse contact into:
8.31 to 8.20	3	(7)/(14)?	10YR 2/1; Sh2, Ag1, $Th^{2}1$; Humo 3; Black well humified very organic-rich wood peat with silt; sharp contact into:
8.20 to 8.05	2	(14)	2.5Y 2.5/1; Sh3, $Th^{3}1$, Ga+, Mollusca+; Humo 4; Black very well humified herbaceous peat with sand and Mollusca inclusions; diffuse contact into:
8.05 to 7.88	1	(14)	10YR 2/1; Sh2, Ag1, Ga1, Th+; Humo 4; Black very well humified organic-rich silty sand with herbaceous peat inclusions

Table 1: Lithostratigraphic descriptions of column sample <3> River Cam Habitat and Access Enhancement Project, Trumpington Meadows, Haslingfield, Cambridgeshire (site code: ECB 3199)

Depth (m OD)	Unit number	Context number	Description
9.02 to 8.88	4	(10)	2.5Y 2.5/1; Sh3, $Th^{3}1$; Humo 4; Black very well humified herbaceous peat; diffuse contact into:
8.88 to 8.70	3	(11)	10YR 3/2; Ag3, Dh1, Mollusca+; Very dark brown silt and detrital plant material with Mollusca inclusions; sharp contact into:
8.70 to 8.55	2	(12)	5Y 2.5/2; Ag2, Ga2, Gg+; Black silty sand with gravel inclusions; diffuse contact into:
8.55 to 8.49	1	(12)	5Y 3/2; Ga3, Ag1, Gg+; Dark olive grey silty sand with gravel inclusions

Table 2: Lithostratigraphic descriptions of column sample <5> River Cam Habitat and Access Enhancement Project, Trumpington Meadows, Haslingfield, Cambridgeshire (site code: ECB 3199)

Depth (m OD)	Context	Concentration	Preservation	Main taxa	
				Latin name	**Common name**
8.37 to 8.36	(7)	1	2-3	*Pinus* Poaceae Lactuceae Cyperaceae *Dryopteris* type	Pine Grass family Daisy family Sedge family Buckler fern
8.29 to 8.30	(7)	1	2-3	*Corylus* type *Chenopodium* type Lactuceae Cyperaceae	e.g. Hazel e.g. Fat hen Daisy family Sedge family
8.21 to 8.22	(7)	1	2-3	*Pinus* *Alnus* *Corylus* type Cyperaceae *Chenopodium* type *Typha latifolia*	Pine Alder e.g. Hazel Sedge family e.g. Fat hen bulrush
8.13 to 8.12	(7)/(14)	1	1	*Pinus* *Corylus type*	Pine e.g. Hazel
8.05 to 8.04	(14)	1	2	*Alnus* *Betula* *Cyperaceae*	Alder Birch Sedge family
7.97 to 7.96	(14)	2	3	*Pinus* *Betula* *Quercus* *Corylus* type Cyperaceae Poaceae *Polypodium vulgare*	Pine Birch Oak e.g. Hazel Sedge family Grass family Polypody
7.89 to 7.88	(14)	2	2-3	*Alnus* *Pinus* *Corylus* type Cyperaceae Cf *Sinapis* type Cf *Circaea*	Alder Pine e.g. Hazel Sedge family e.g. White mustard Nightshade

Key: 0 = 0 estimated grains per slide; 1 = 1 to 75; 2 = 76 to 150; 3 = 151 to 225; 4 = 226-300; 5 = 300+. Estimated number based on assessment of 10% of total number of slide transects (4 of 40 transects)

Table 3: Pollen-stratigraphic assessment of column sample <3> River Cam Habitat and Access Enhancement Project, Trumpington Meadows, Haslingfield, Cambridgeshire (site code (ECB 3199)

Depth (m OD)	Context	Concentration	Preservation	Main taxa	
				Latin name	Common name
8.98 to 8.97	(10)	2	2-3	Pinus Corylus type Cyperaceae Anthemis type	Pine e.g. Hazel Sedge family Mugwort
8.90 to 8.89	(10)	1	2	Cyperaceae	Sedge family
8.82 to 8.81	(11)	0	-	-	-
8.74 to 8.73	(11)	1	1	*Betula* *Cf Cyperaceae* *Pteridium aquilinum*	Birch Sedge family Bracken
8.66 to 8.65	(11)	1	1	*Lactuceae*	Daisy family
8.58 to 8.57	(12)	0	-	-	
8.50 to 8.49	(12)	0	-	-	

Key: 0 = 0 estimated grains per slide; 1 = 1 to 75; 2 = 76 to 150; 3 = 151 to 225; 4 = 226-300; 5 = 300+. Estimated number based on assessment of 10% of total number of slide transects (4 of 40 transects)

Table 4: Pollen-stratigraphic assessment of column sample <5> River Cam Habitat and Access Enhancement Project, Trumpington Meadows, Haslingfield, Cambridgeshire (site code (ECB 3199)

APPENDIX 4: PLANT MACROFOSSILS AND OTHER REMAINS

Nomenclature within the table below follows Stace (1997) for the plant macrofossils and Kerney and Cameron (1979) and Macan (1977) for the mollusc shells. All plant remains were waterlogged unless otherwise stated.

x = 1-10 specimens xx = 11-50 specimens xxx=51-100 specimens xxxx= 100+specimens
cf= compare c=charred

Sample No.	**1**	**2**	**4**	**6**	**7**	**8**	**9**	**11**	**14**	**15**	**16**
Context No.	**3**	**7**	**14**	**10**	**11**	**12**	**18**	**20**	**23**	**24**	**25**
Dry land plants/shrubs											
Cereal indet. (grain frag)	xcfc										
Apiaceae indet.		x			x		x				
Atriplex sp.					x						
Carduus sp.					xx						
Chenopodium album L.							x				
Polygonum aviculare L.		x									
Potentilla sp.										x	
P. anserina L.			xcf								
Ranunculus acris/repens/bulbosus		x	x		x				x	x	
Rumex sp.	x										
Sambucus nigra L.			x								
Thalictrum flavum L.		xcf									
Wetland plants											
Ajuga sp.										x	x
Apium graveolens L.									xcf		
Carex sp.		xx	x		xx	x	x		x	xxx	x
Eleocharis sp.					x					x	
Hydrocotyle vulgaris L.									x	x	
Mentha sp.									x		
Menyanthes trifoliata L.		xcf		x		x	x		x		
Oenanthe sp.										x	
O. aquatica (L.)Poiret		xcf									
Other plant macrofossils											
Charcoal <2mm	x		x					x			
Charcoal >2mm	x							x			x
Charred root/stem	x										
Waterlogged root/stem	xx	xxxx	xx	xxxx	xxx	xxxx	xxxx	xxxx	xxxx	xxx	xxx
Indet.moss				x	x				x		
Indet.seeds		x								x	

Sample No.	**1**	**2**	**4**	**6**	**7**	**8**	**9**	**11**	**14**	**15**	**16**
Context No.	**3**	**7**	**14**	**10**	**11**	**12**	**18**	**20**	**23**	**24**	**25**
Catholic species											
Molluscs - terrestrial species											
Open country species											
Helicidae indet.		x			x						
Vallonia sp.		x	x		x						
V. costata		x	x		x						
Vertigo pygmaea					x					x	
Cochlicopa sp.	x				x					x	x
Nesovitrea hammonis					x					x	
Trichia hispida group	x	xx	x		xx			x		x	x
Marsh/freshwater obligate species											
Anisus leucostoma		x			x		x				
Bathyomphalus contortus		x									
Bithynia sp.		xx									
(operculi)		x	x							x	
B. tentaculata		x			x					x	
Carychium sp.					x		x				
Lymnaea sp.					x					x	x
Pisidium sp.		x	x		x						
Planorbarius corneus		x									
Planorbis planorbis		x			x						x
Succinea sp.	x	x			xx					x	x
Valvata cristata		x			x						
Other remains											
Black tarry material		x									
Caddis larval cases		x									
Characeae indet.							x		x		
Cladoceran ephippia							x				
Waterlogged arthropods		xxx		x	x		x	x	x		
Small coal frags.	x										
White calcareous concretions			x								
Sample volume (litres)											
Volume of flot (litres)	**<0.1**	**<0.1**	**0.3**	**0.4**	**0.2**	**0.2**	**0.1**	**<0.1**	**0.4**	**0.1**	**<0.1**
% flot sorted	**100 %**	**100 %**	**50 %**	**25%**	**50%**	**50%**	**100 %**	**100 %**	**25%**	**100 %**	**100 %**

APPENDIX 5: CONTENTS OF ARCHIVE

Reports

1 Client report

1 Archaeological brief

2 Written Schemes of Investigation

1 Plant macrofossil and other remains assessment and tables

1 Lithostratigraphy and pollen assessment and tables

Fieldwork data

32 Context sheets

1 Environmental sample register

16 Bulk sample record sheets

1 Photo register

2 Pages of matrices

53 Digital photos

3 Large sheets of site plans and sections

Computer disk

Digital photos, client report, Written Schemes of Investigation, Specialists' reports and tables, Archive List

APPENDIX 6: OASIS SUMMARY

OASIS ID: essexcou1-61063

Project details

Project name	River Cam Habitat and Access Enhancement Project
Short description of the project	Archaeological trial trenching and monitoring took place prior to and during the construction of a large drainage ditch and a flood storage area alongside the Granta branch of the river Cam at Haslingfield, Cambridgeshire. The archaeological work detected palaeoenvironmental remains and river-related features but no archaeological features or finds. The palaeoenvironmental remains were only poorly to moderately preserved and have not been dated.
Project dates	Start: 04-06-2009 End: 05-06-2009
Previous/future work	No / Not known
Any associated project reference codes	ECB 3199 - HER event no.
Any associated project reference codes	ECB 3327 - HER event no.
Type of project	Field evaluation
Site status	None
Current Land use	Other 15 - Other
Monument type	PALAEOENVIRONMENTAL Uncertain
Significant Finds	NONE None
Significant Finds	NONE None
Methods & techniques	'Sample Trenches'
Development type	Amenity area (e.g. public open space)

Prompt	Direction from Local Planning Authority - PPG16
Position in the planning process	After full determination (eg. As a condition)

Project location

Country	England
Site location	CAMBRIDGESHIRE SOUTH CAMBRIDGESHIRE HASLINGFIELD Trumpington Meadows, Haslingfield
Study area	1550.00 Square metres
Site coordinates	TL 543100 253274 51.9046178088 0.243351103718 51 54 16 N 000 14 36 E Point

Project creators

Name of Organisation	Essex County Council Field Archaeology Unit
Project brief originator	Cambridgeshire County Archaeology Office
Project design originator	Essex County Council Field Archaeology Unit
Project director/manager	Adrian Scruby
Project supervisor	Mark Germany
Type of sponsor/funding body	District Council

Project archives

Physical Archive Exists?	No
Physical Archive recipient	Cambridgeshire County Store
Digital Archive recipient	Cambridgeshire County Store

Digital Contents	'Environmental','Stratigraphic','Survey'
Digital Media available	'Images raster / digital photography','Text'
Paper Archive recipient	Cambridgeshire County Store
Paper Contents	'Environmental','Stratigraphic','Survey'
Paper Media available	'Context sheet','Matrices','Photograph','Plan','Report','Section','Survey '

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	River Cam Habitat and Access Enhancement Project, Trumpington Meadows, Haslingfield. Archaeological Evaluation by Trial Trenching
Author(s)/Editor(s)	Germany, M.
Other bibliographic details	2069
Date	2010
Issuer or publisher	Essex County Council Field Archaeology Unit
Place of issue or publication	Fairfield Court, Fairfield Road, Braintree, Essex
Description	A4. 25 pages of text and tables. 6 figures. 7 colour plates

Entered by	Mark Germany (mark.germany@essexcc.gov.uk)
Entered on	6 January 2010

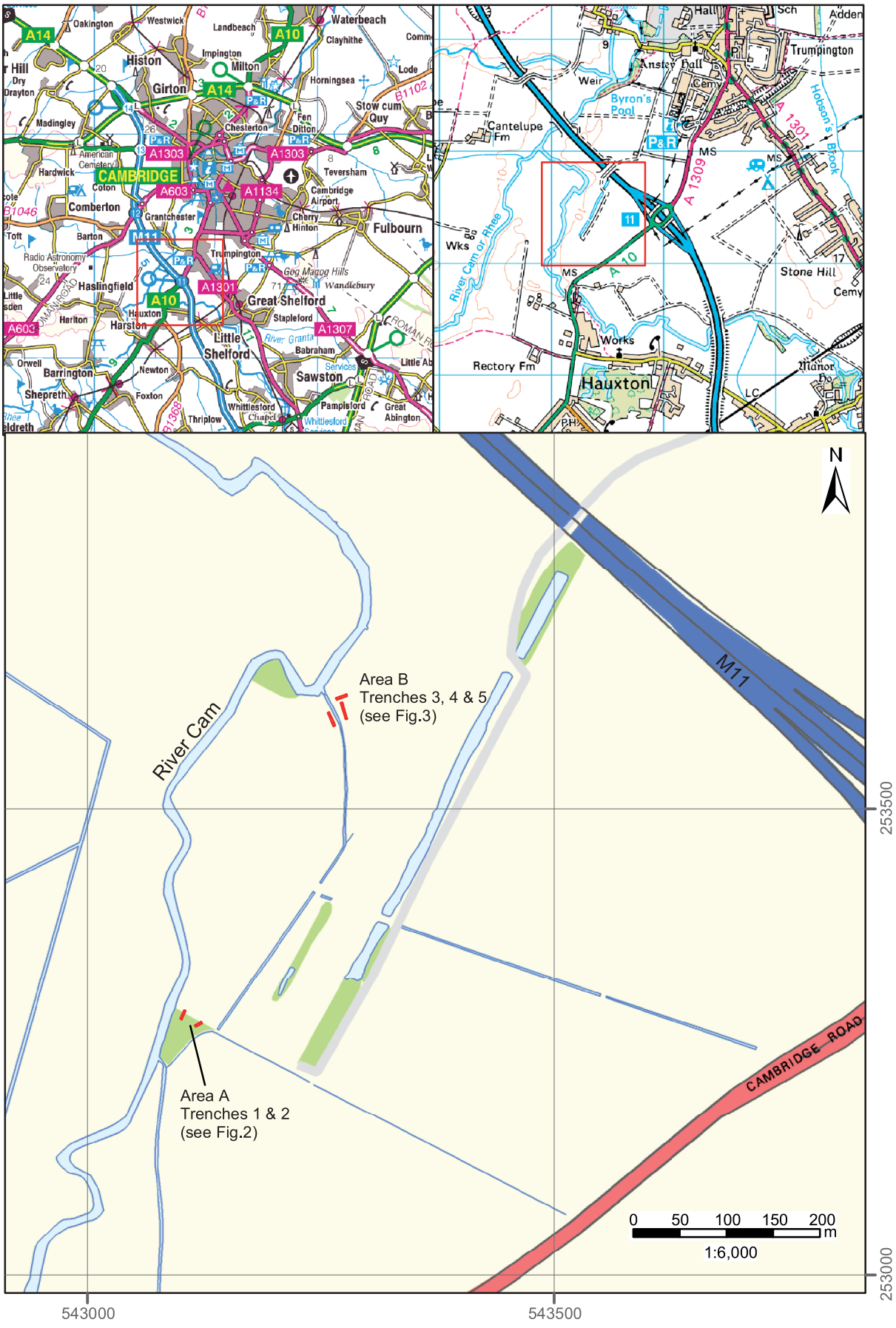


Fig.1. Site location

Essex County Council
Field Archaeology Unit

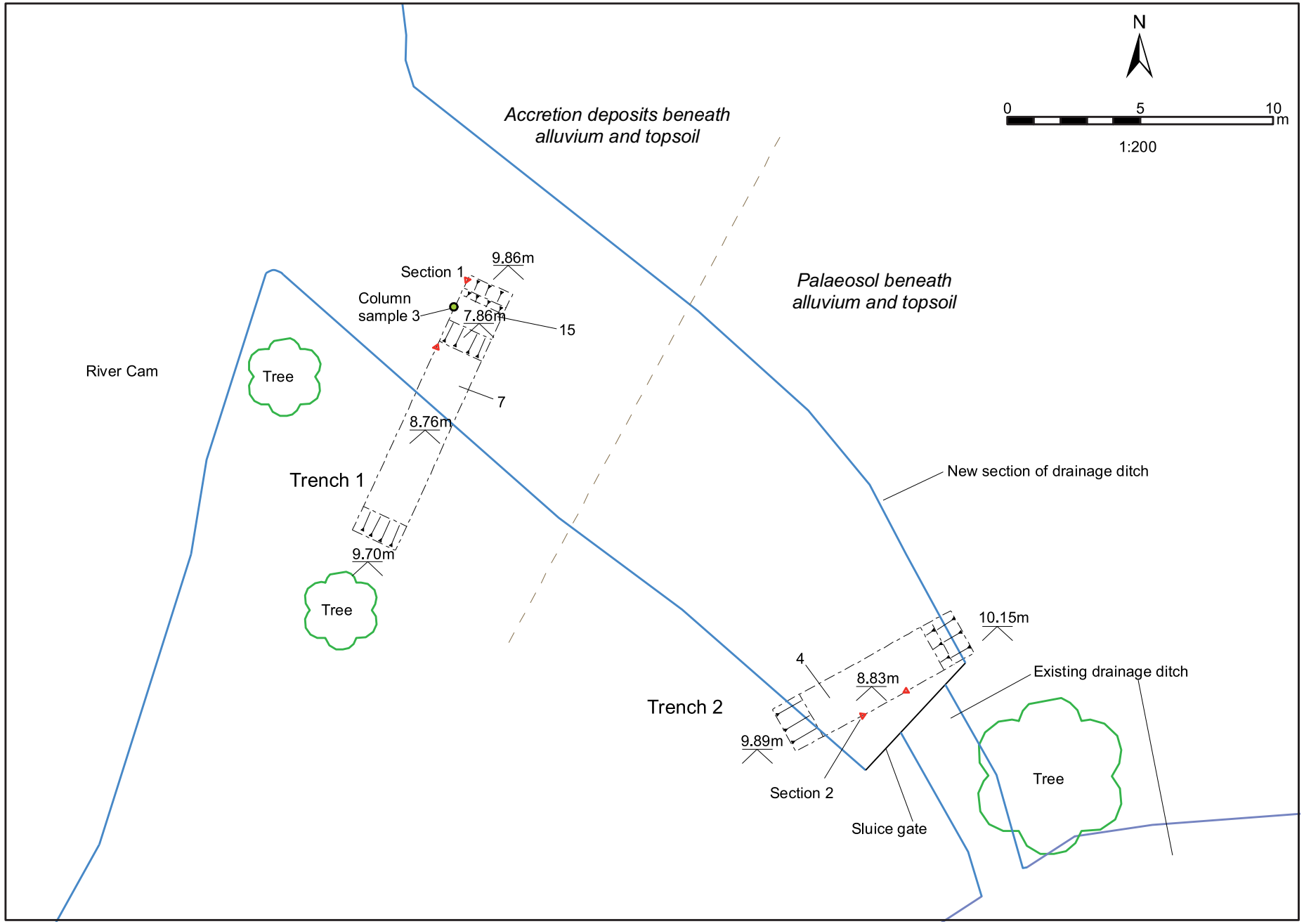


Fig.2. Location of trenches 1 & 2

Essex County Council
Field Archaeology Unit

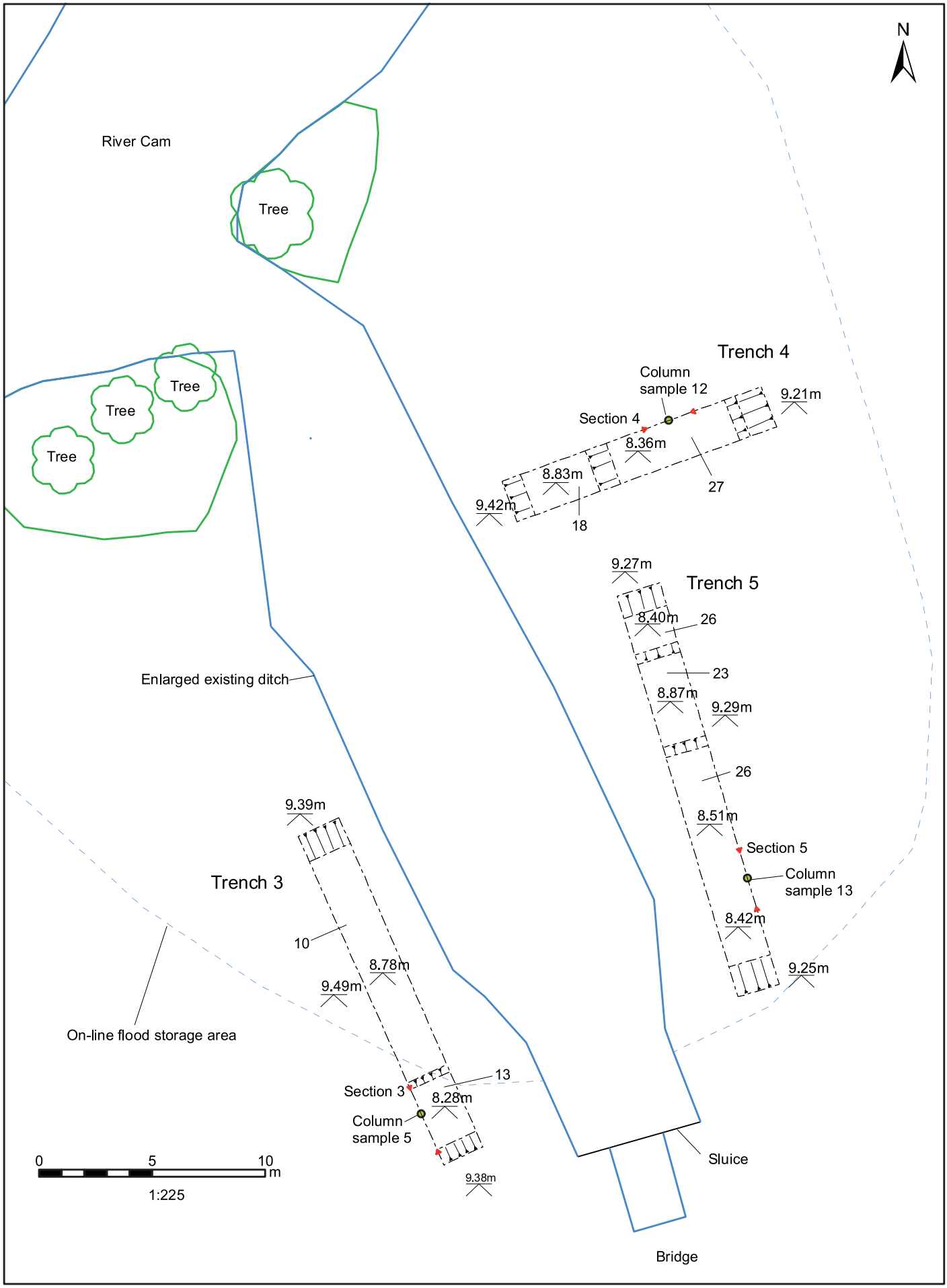
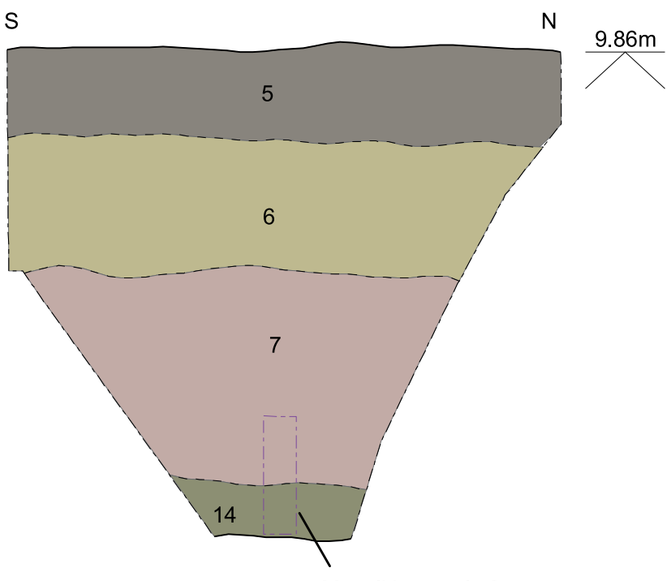


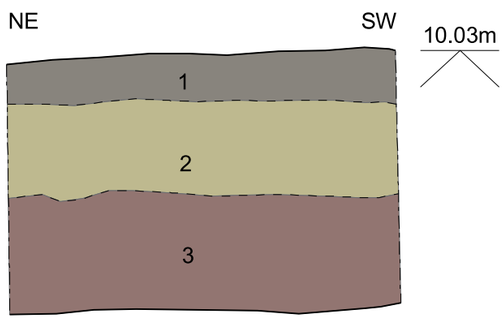
Fig.3. Location of trenches 3, 4 & 5

Essex County Council
Field Archaeology Unit

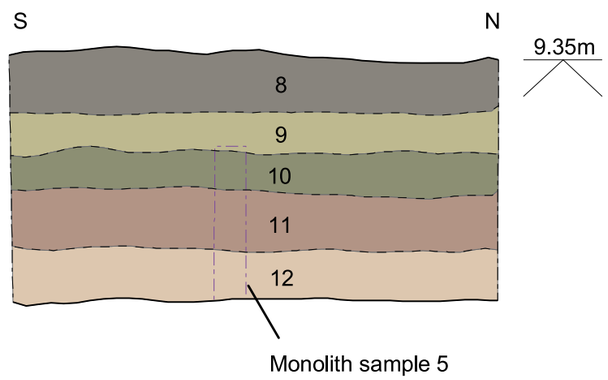
Section 1, Trench 1



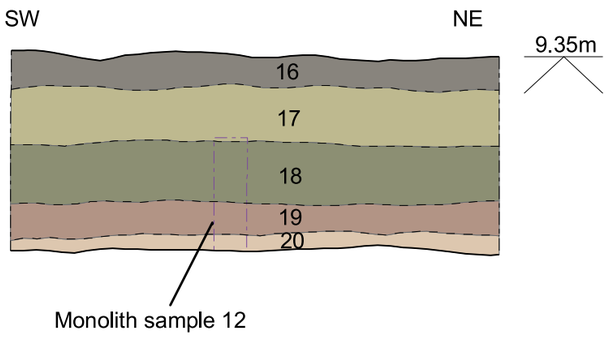
Section 2, Trench 2



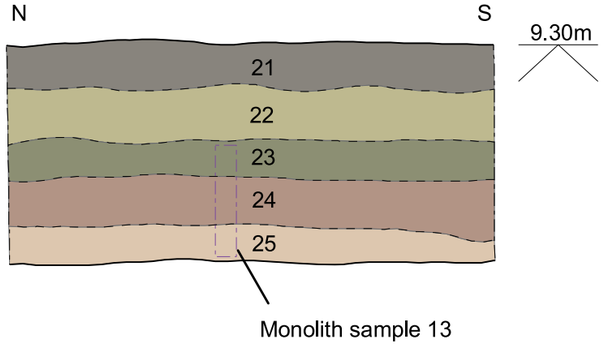
Section 3, Trench 3



Section 4, Trench 4



Section 5, Trench 5



Key

- dark greyish brown silt clay topsoil
- pale brown silt clay alluvium
- very dark greyish brown silt clay
- peat
- brownish grey silt sand
- very dark brown silt
- black silt sand with gravel inclusions

0 1 2 m

1:25

Fig.4. Sections

Essex County Council
Field Archaeology Unit

Fig.5. Site A. North - facing section. (The section lies at an oblique angle).

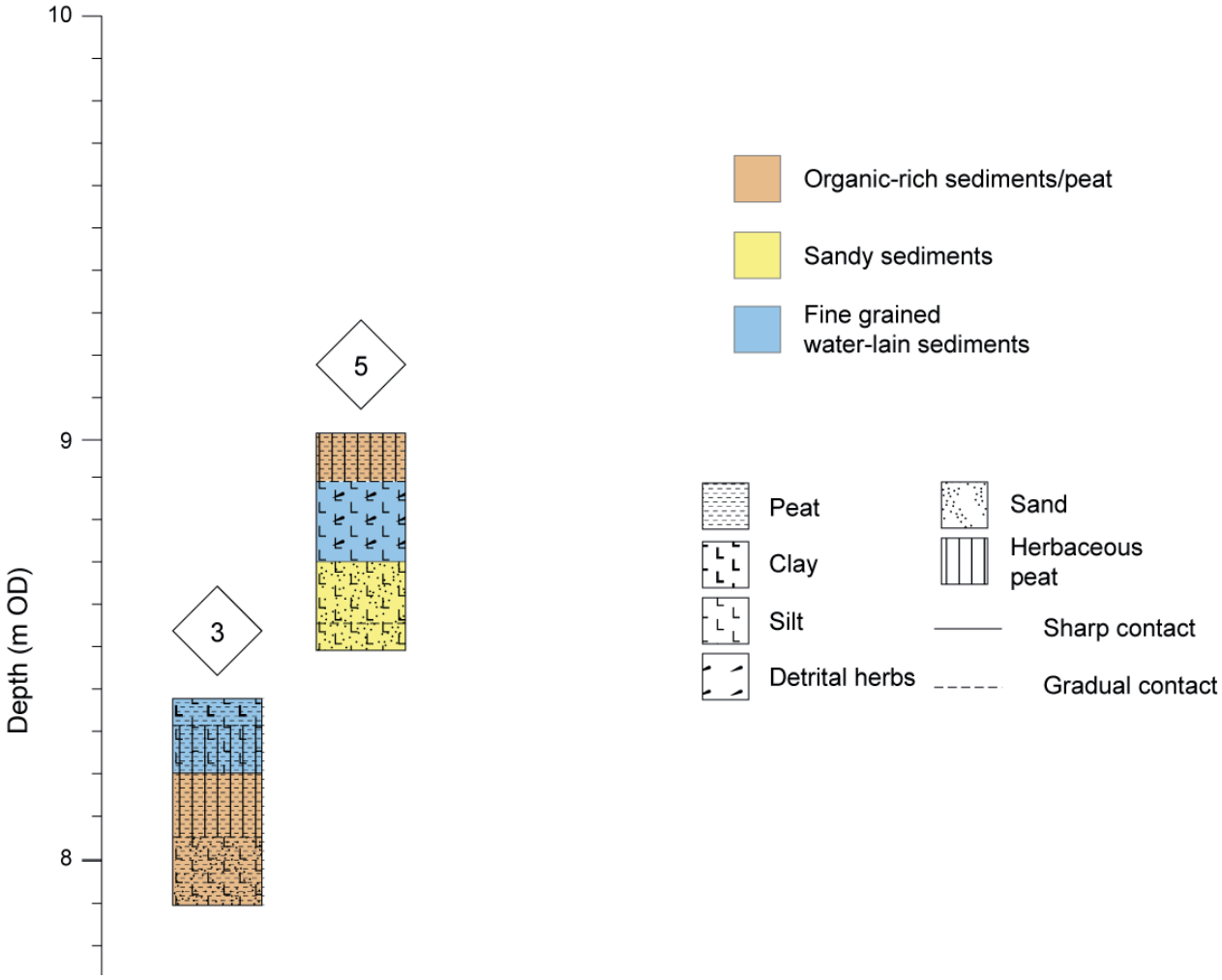


Fig. 6: Lithostratigraphy of column samples <3> and <5> River Cam Habitat and Access Enhancement Project, Trumpington Meadows, Haslingfield, Cambridgeshire (site code: ECB 3199)

Plate 1: Trench 1 (section). Area A. Looking west

Plate 2. Trench 2. Area A. Looking west

Plate 3: Trench 5 (section). Area B. Looking north-east

Plate 4. Drainage ditch. Area A. Looking north-west

Plate 5. Flood plain extension. Area B. Looking south-east

Plate 6. Flood plain extension. Area B. Looking north-west