Eastgate Street, Bury St Edmunds: a palaeoenvironmental assessment of deposits encountered during ground investigations

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By

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1. INTRODUCTION

Planning consent has been granted for the construction of residential properties on Eastgate Street, Bury St Edmunds (GR 585910 264503; Figure 1). An archaeological evaluation of the application area was however required before development is to commence. Palaeoenvironmental assessment was included as part of the archaeological monitoring. This was due to the site being located on the floodplain of the River Lark, which is an area known to have considerable potential for the preservation of deposits of palaeoenvironmental significance. As a consequence, Birmingham Archaeo-Environmental were sub-contracted to undertake the coring and subsequent stratigraphic and palaeoenvironmental assessments.

This report presents the results of palaeoenvironmental investigations (manual coring, stratigraphic recording, sampling and palaeoenvironmental assessment) associated with this scheme of work.

The aim of the work was twofold:

- To identify, record, characterise and sample organic deposits and where applicable, assess this material for biological preservation and if applicable, identify suitable samples for radiocarbon dating.

- To provide an understanding of the subsurface stratigraphy of the deposits encountered to aid in the development of future archaeological prospection strategies.

2. FIELDWORK METHODOLOGY

At the time of ground investigations, the site was used for parking and contained possible storage units. There was a *c*. 0.10m cap of concrete across the site. Fieldwork took place on Thursday 12th April. A single trial trench, approximately 18m in length and varying in depth from 0.30m to 1.70m, traversed the site (Figure 2). During the assessment of the exposed deposits within the trial trench, no peat units or organic-rich units with palaeoenvironmental potential were encountered. Coring however was also undertaken using a manual gauge 'Eijkelcamp' corer along the floor of the trial trench. Coring was continued until basal gravels were encountered. A total of four cores were extracted, at *c*. 5m intervals, to assess the palaeoenvironmental potential of the underlying stratigraphic archive.

Sediments were recorded using the Troels-Smith (1955) classification scheme. The scheme breaks down a sediment sample into four main components and allows the inclusion of extra components that are also present, but that are not dominant. Key physical properties of the sediment layers are also identified according to darkness (Da), stratification (St), elasticity (El), dryness of the sediment (Dr) and the sharpness of the upper sediment boundary (UB). A summary of the sedimentary and physical properties classified by Troels-Smith (1955) and the nomenclature used is provided in Table 1.

3. PRELIMINARY RESULTS OF FIELDWORK

Whilst no deposits of palaeoenvironmental significance were encountered within the exposed trench sides, subsurface sediments extracted during coring along the base of the trench revealed organic deposits. Cores were taken along a single transect running along the length of the trial trench, with Core 1 positioned to the south of the trench (located furthest away from the River Lark). Core 4 was positioned towards the north within the deepest section of the trench (see Figure 4). All cores initially encountered yellow-brown clays and silts with occasional chalk clasts within. The silts and clays were commonly present to a depth of *c*. 1.40m, although the unit thickness increased northwards towards the River Lark (present at *c*. 2.00m depth in Core 4). Charcoal fragments were also occasionally encountered. Below the silts and clays, a layer of grey-brown organic gravelly sand is present, again increasing in thickness towards the River Lark. The gravel component comprised chalk, occasional quartz and fragments of charcoal. In Cores 1 and 3, orange-brown basal sands and gravels were encountered underlying the grey-brown gravelly sand unit. However, in Core 2, a 0.20m thick peat unit was present overlying the basal sands and gravels (at *c*. 2.22-2.42m depth). In addition, in Core 4, a slightly thicker peat unit was present, although encountered at a greater depth (2.92-3.55m depth). The depth at which basal sands and gravels were encountered therefore increased with distance towards the River Lark.

Due to the presence of peat within Cores 2 and 4, material suitable for further palaeoenvironmental assessment has been identified at the Eastgate Street site. The greater abundance of peat within Core 4 suggested that this core location contained the greater palaeoenvironmental potential of the two core sites. Consequently, a sample core was taken proximal to the original location of Core 4.

4. CONCLUSIONS

The light yellow-brown silts and clays encountered across the base of the trial trench are likely to be reworked natural floodplain deposits, into which chalk had been added possibly for agricultural purposes. As commonly encountered in lowland river environs, the thickness of the floodplain deposits as well as the depth at which basal sands and gravels are encountered, increases with distance towards the River Lark. The grey-brown gravelly sand present under the clay and silt unit is suggested to be a possible (anthropogenic) ditch fill. This is supported by the unit's poorly sorted nature, the presence of humified organic remains and the relative abundance of charcoal fragments. The thickness of this unit is also shown to increase with distance north towards the River Lark, which may be indicative of a drainage ditch that has become infilled over time.

The peat encountered within Cores 2 and 4 was very well humified with varying minerogenic content. The peat unit is therefore suggested to be indicative of *in-situ* organic accumulation on the floodplain of the River Lark. The saturated nature of the floodplain environment would have enabled the accumulation of organic remains on the waterlogged palaeolandsurface. Although it cannot be discounted that the organic unit may in fact be a relict infilled palaeochannel, the well humified nature of the deposit, combined with the relative abundance of silts and sands is suggestive of the influence of both floodplain minerogenic sedimentation and *in-situ* organic floodplain accumulation.

The basal sands and gravels are likely to be relict river terrace gravels dating to between the end of the last Ice Age (the Late Devensian, *c*. 18-13,000 yrs BP) and the early Holocene period (c. 13,000-8,000 yrs BP). Due to poor sample extraction during coring however, it was not possible to determine whether these sands and gravels are of Devensian or early Holocene age.

5. RECOMMENDATIONS FOR FURTHER ANALYSIS

The peat unit identified within Core 4 should be considered for palaeoenvironmental analysis. To obtain an understanding of the palaeoenvironmental conditions responsible for the development of the peat unit, the following assessment is suggested:

- Pollen analysis of four samples from the peat unit, in order to assess the palaeoecological conditions present at the time of deposition. It is recommended that samples from within the peat unit at 2.93m (top), 3.13m, 3.33m and 3.54m depth (bottom) are assessed.
- Pollen analysis of two samples from within the overlying gravelly sand to assess the changing environmental conditions responsible for the shift in depositional regime. Samples to be assessed from 2.68m and 2.91m depth.

REFERENCES

Troels-Smith, J. (1955). Karakterisering af lose jordater (characterisation of unconsolidated sediments). *Denmarks Geologiske Undersogelse*, Series IV/3, 10, 73.

Degree of Darkness	
nig.4	black
nig.3	
nig.2	
nig.1	
nig.0	white

Degree of Stratification	
strf.4	well stratified
strf.3	
strf.2	
strf.1	
strf.0	no stratification

Degree of Elasticity	
elas.4	very elastic
elas.3	
elas.2	
elas.1	
elas.0	no elasticity

Degree of Dryness	
sicc.4	very dry
sicc.3	
sicc.2	
sicc.1	
sicc.0	water

	Sharpness of Upper Boundary
lim.4	< 0.5mm
lim.3	< 1.0 & > 0.5mm
lim.2	< 2.0 & > 1.0mm
lim.1	< 10.0 & > 2.0mm
lim.0	> 10.0mm

	Sh	*Substantia humosa*	Humous substance, homogeneous microscopic structure
I Turfa	*Tb*	*T. bryophytica*	Mosses +/- humous substance
	Tl	*T. lignosa*	Stumps, roots, intertwined rootlets, of ligneous plants
	Th	*T. herbacea*	Roots, intertwined rootlets, rhizomes of herbaceous plants
II Detritus	*Dl*	*D. lignosus*	Fragments of ligneous plants >2mm
	Dh	*D. herbosus*	Fragments of herbaceous plants >2mm
	Dg	*D. granosus*	Fragments of ligneous and herbaceous plants <2mm >0.1mm
III Limus	*Lf*	*L. ferrugineus*	Rust, non-hardened. Particles <0.1mm
IV Argilla	*As*	*A.steatodes*	Particles of clay
	Ag	*A. granosa*	Particles of silt
V Grana	*Ga*	*G. arenosa*	Mineral particles 0.6 to 0.2mm
	Gs	*G. saburralia*	Mineral particles 2.0 to 0.6mm
	Gg(min)	*G. glareosa minora*	Mineral particles 6.0 to 2.0mm
	Gg(maj)	*G. glareosa majora*	Mineral particles 20.0 to 6.0mm
	Ptm	*Particulae testae molloscorum*	Fragments of calcareous shells

Table 1 Physical and sedimentary properties of deposits according to Troels-Smith (1955)

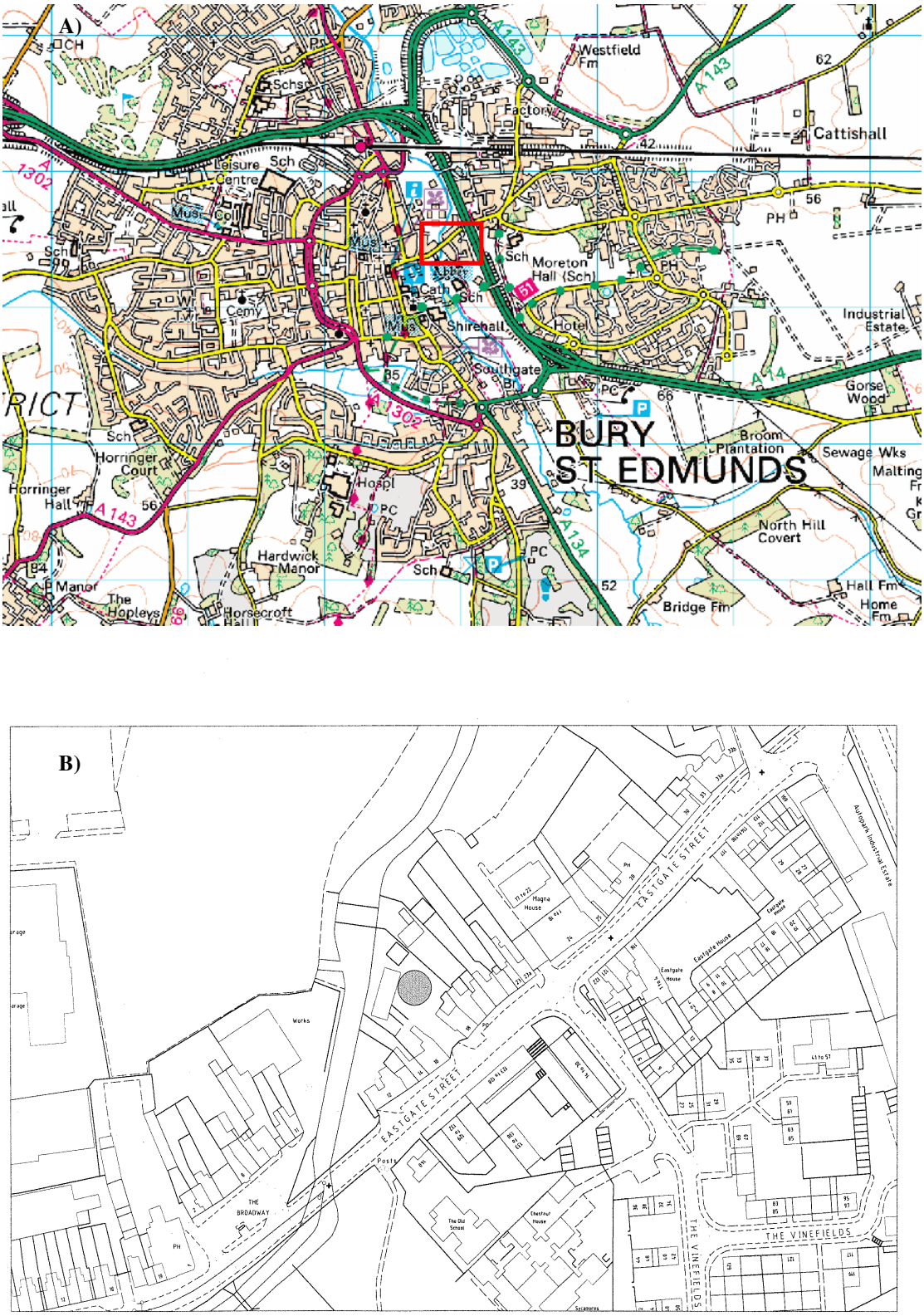

Figure 1: A) Map of Bury St Edmunds, Suffolk, with site location highlighted in red box and B) enlarged map of Eastgate Street site. Provided by Suffolk County Council Archaeological Service.

Figure 2: Trial trench running approximately north-south across the site. The River Lark, now channelised, is located behind the garages at the top of the picture (see Figure 3).

Figure 3: The River Lark, located immediately north of the Eastgate Street site.

Figure 4: Northern-most section of the trench (looking south). Core 4 was taken within this deepest section of the trench.

APPENDIX I

CORE STRATIGRAPHY

Core 1 (TL 85877 64491):

0.00-0.89m Depth to base of trial trench

0.89-1.44m

Da	St	El	Dr	UB
2	0	0	2	-

Ag2, As2, Ga+, Ggmin+, Ggmaj+
Light yellow-brown silts and clays with occasional chalk clasts

1.44-1.79m

Da	St	El	Dr	UB
3	0	0	2	2

Ga2, Ag2, As+, Ggmin+, Ggmaj+
Grey-brown sandy silt with occasional gravel of chalk, charcoal, quartz

1.79-1.90m

Da	St	El	Dr	UB
3	0	0	3	1

Ggmaj2, Ggmin1, Ga1, Ag+
Orange-brown sands and gravels of predominantly quartz and flint

Core terminated within gravels at 1.90m depth

Core 2 (TL 85876 64499):

0.00-0.82m Depth to base of trial trench

0.82-1.42m

Da	St	El	Dr	UB
2	0	0	2	-

Ag2, As1, Ggmin1, Ggmaj+, Ga+
Light yellow-brown clays and silts with chalk, charcoal and quartz clasts

1.42-2.22m

Da	St	El	Dr	UB
3	0	0	2	1

Ga2, Ag1, Ggmin1, Ggmaj+
Grey-brown gravely sand with charcoal and chalk clasts

2.22-2.42m

Da	St	El	Dr	UB
3+	0	1	2	1

Sh2, Ga1, Dg1, Ag+, Dh+
Dark brown slightly sandy well-humified peat

2.42-2.60m

Da	St	El	Dr	UB
2	0	0	2	2

Ggmin2, Ggmaj1, Ga1, Ag+
Orange brown sands and gravels

Core terminated within sands and gravels at 2.60m depth

Core 3 (TL 85872 64503):

0.00-0.71m	Depth to base of trial trench				
0.71-1.41m	Da	St	El	Dr	UB
	2+	0	0	2	-
	Ag2, As1, Ga1, Ggmin+, Ggmaj+				
	Light yellow-brown sandy clayey silts				
1.41-1.62m	Da	St	El	Dr	UB
	2	0	0	2	1
	Ag2, As2, Ga+, Ggmin+				
	Yellow brown clays and silts				
1.62-2.30m	Da	St	El	Dr	UB
	Ga2, Ag1, As1, Ggmin+				
	Grey-brown silty sand with gravel of chalk, flint and charcoal				
2.30-2.40m	Da	St	El	Dr	UB
	3	0	0	2	2
	Ag2, As1, Sh1, Ga+, Lf+				
	Grey-brown organic clayey silt				

Core terminated within sands and gravels at 2.40m depth

Core 4 (TL 85872 64503):

0.00-1.70m	Depth to base of trial trench				
1.70-1.98m	Da	St	El	Dr	UB
	2	0	0	2	-
	Ag2, As2, Ga+, Ggmin+				
	Light yellow-brown clays and silts with occasional chalk clasts				
1.98-2.70m	Da	St	El	Dr	UB
	2+	0	0	2	1
	Ga2, Ag1, Ggmin1, Ggmaj+, As+				
	Grey-brown silty pebbly sand with occasional organic mottling				
2.70-2.92m	Da	St	El	Dr	UB
	3	0	0	2	1
	Ga1, Ag1, Sh1, Ggmin1, Ggmaj+, As+				
	Dark grey-brown organic pebbly silts and sands				
2.92-3.35m	Da	St	El	Dr	UB
	3	0	1	2	2
	Sh3, Ag1, As+, Ga+				
	Dark brown very well humified silty peat				
3.35-3.55m	Da	St	El	Dr	UB
	3	0	1	2	1
	Sh2, Ag1, Ga1, As+				
	Dark brown sandy silty very well humified peat				

Core terminated within sands and gravels at 3.55m depth