

# ARCHAEOLOGICAL MONITORING REPORT

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## Leiston Substation 132kV Cable Route

Oasis ID No. suffolkc1-32740

A REPORT ON THE ARCHAEOLOGICAL MONITORING, 2007



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Suffolk C.C. Archaeological Service

© October 2007

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SCCAS Report No. 2007/190

## SMR information

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### Planning application

**SMR No.** LCS 148

**Date of fieldwork:** 16/17-10-2007

**Grid Reference:** TM 4719 6316 (north) to TM 4693 6272 (south)

**Funding body:**

**Oasis reference** Suffolkc1-32740

### Summary

*Archaeological monitoring of a series of geological test-pits was carried out along the route of a proposed 132kV underground electricity cable. All of the test-pits proved negative, in terms of revealing archaeological features or datable finds material.*

*The route is around one kilometre long and designed to link the proposed substation for Greater Gabbard Wind Farm with Sizewell Power Station. The proposal is situated within an extensive multi-period archaeological landscape which has previously produced artefactual material dating to the prehistoric, Roman and medieval periods. Aerial photographs have revealed a wide range of, as yet undated, potentially archaeological features located within the fields through which the proposed cable route runs. A total of twelve test-pits were located at regular intervals along the route, ten were excavated under the supervision of the monitoring archaeologist, while the remaining two, which lie in made ground adjacent to the power station, are to be dug at a later date. These two pits are unlikely to contain any preserved archaeological evidence and probably lie in an area containing imported soil. Nine of the ten monitored test-pits revealed agriculturally conditioned topsoil overlying intermittent sandy subsoil and natural sand and gravel. One test-pit was located in a low lying position at the eastern edge of an area of agricultural fields. This test-pit contained deposits which suggest the location once formed part of the marshland which still survives in areas around the site. Darkly stained, organically rich silts lay immediately below the topsoil and pockets of peat occurred at much lower levels in the test pit.*

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# Contents

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1.0 Introduction

2.0 Methodology

3.0 Results

4.0 Conclusions

5.0 Acknowledgements

6.0 Bibliography

7.0 Appendices

Appendix 1 Brief and Specification

## List of Figures

Fig. 1 Site location

Fig. 2 Site in the context of The County Historic Environment Record

Fig. 3 First Edition of The Ordnance Survey Map (c.1880s)

Fig. 4 Plan of areas of ground disturbance

## List of Tables

Table 1 Test pit data: Depth of deposits



Figure 1. Site location

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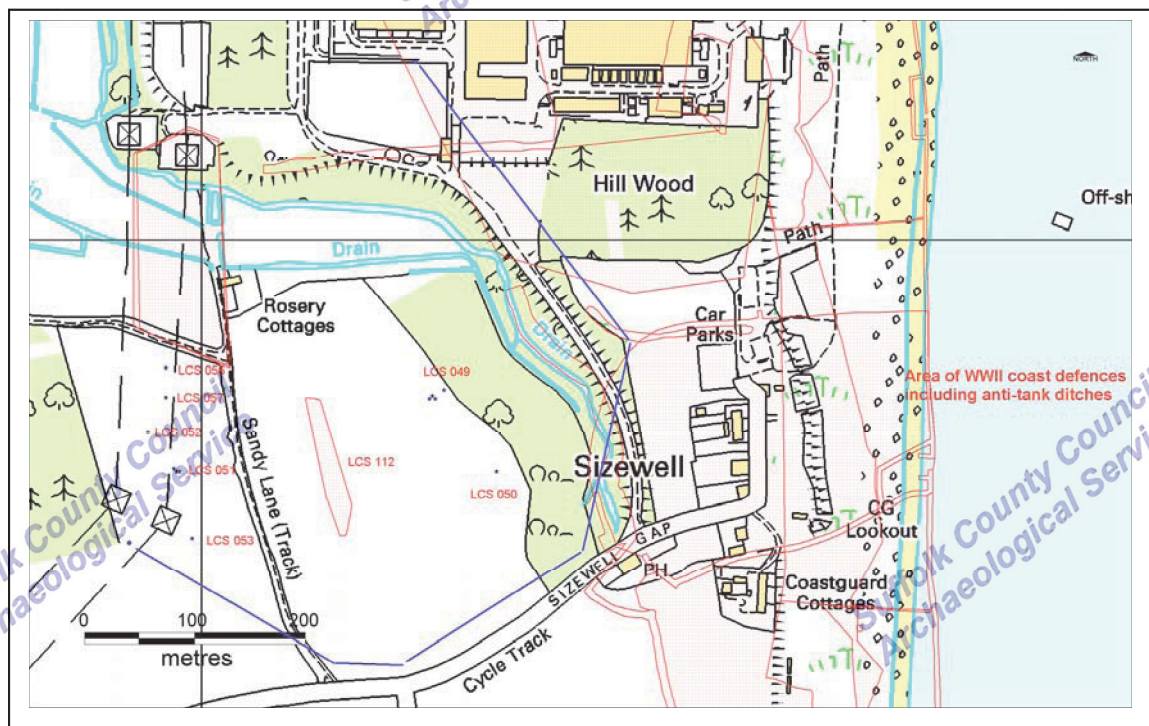


Figure 2. The site in the context of the County Historic Environment Record

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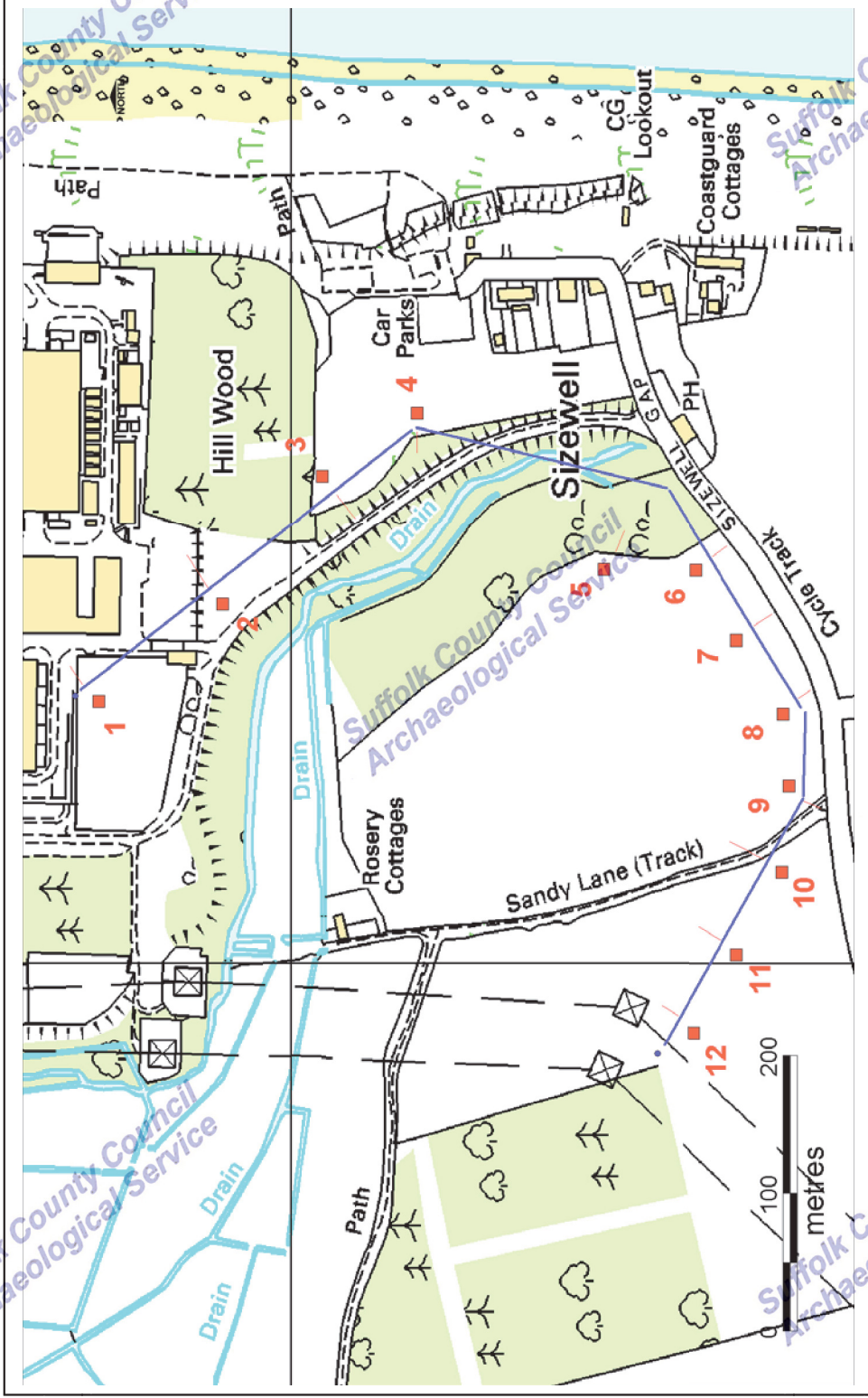


Figure 4. Approximate location of test pits (red) along cable route (blue)  
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## 2.0 Methodology

A mechanical mini-digger equipped with a 1.50m toothless ditching bucket dug all of the test pits. All machining was carried out while under the constant supervision of an archaeologist. The soil was gradually removed in shallow spits so that any alteration in deposits, or the occurrence of any features could be examined. When required, mechanical excavation was suspended while potential archaeological features were examined, hand excavated and recorded. Good co-operation with the other specialists and contractors working on site meant that ample time was available to closely examine and record all of the characteristics of each test pit.

A continuous numbering system using *pro forma* observable phenomena recording sheets was used for recording all features and site deposits. Digital colour 7.1mp photographs were taken of all stages of the fieldwork, and are included in the archive. All of the test pits were also recorded on trench record forms with details of specific depths, location, area and soil profiles. Unstratified finds were collected during the machining and recorded as 0001 (eastern area) and 0002 (western area).

Site data has been input onto an MS Access database and recorded using the County Historic Environment Record number LCS 148. Bulk finds were washed, quantified and identified, but were not of sufficient significance to justify a full individual report.

An OASIS form has been completed for the project (suffolkc1-32740)

## 3.0 Results

A total of ten test pits were monitored during the fieldwork (Test Pits 3 to 12), two of the original twelve were omitted after an inspection was made of the location of Test Pits 1 and 2. These test pits were within the previously developed southern area of the power station complex and considered to lie within areas of heavily disturbed and made ground (Test Pits 1 and 2). Test Pit 1 is on the northern edge of a car park and Test Pit 2 is situated next to a deep access cutting to the south-east; both lie within extensively modified segments of the compound.

The monitored test pits were dug slightly out of sequence, starting with TP 6, then TP 5 and continuing on numerically from TP 7 to TP 12, finally TP 4 and TP 3 were completed. All of the test pits measured 1.50m by 2.00m in area, with variable depths of between 1.00m to 1.50m. All depths are based on measurements taken from the presently existing surface.

Descriptions of the characteristics of the deposits, seen in each of the test pits are detailed below, together with a table listing the depths of the overburden down to undisturbed natural geological levels. This gives some indication of the levels at which archaeological features could be expected to become apparent, with the exception of TP 5, where a deep marsh deposit may represent an archaeologically and geologically significant resource or horizon. Test Pits 5 and 6 were excavated at different locations to those specified in the original scheme (around 50m further west), in order to avoid disturbing a recently planted wooded area.

Test Pit	Topsoil Depth	Subsoil Depth	Combined Overburden Depth
TP 1	Not monitored	-	-
TP 2	Not monitored	-	-
TP 3	0.15m	0.10	0.25
TP 4	0.65	0.40	1.05
TP 5	0.35	1.65 (marsh deposit)	2.00
TP 6	0.25	0.30	0.55
TP 7	0.30	0.20	0.50
TP 8	0.35	0.35	0.70
TP 9	0.45	No intermediate subsoil	0.45
TP 10	0.50	No intermediate subsoil	0.50
TP 11	0.30	No intermediate subsoil	0.30
TP 12	0.38	No intermediate subsoil	0.38

Table 1. Summary of deposit depths (measurements in metres)

### Test Pit Descriptions

Test Pit 3 was dug within part of an area of elevated heath land, situated at a height of 10m OD. The location lies close to the site of a sand extraction pit shown on the early Ordnance Survey map (see Figure 3); however, the deposits did not appear to have been subjected to any deep disturbance. A very thin mid-pale brown sandy topsoil, only 40mm deep covered a subsoil of pale grey sand of around 0.10m in depth. Orange –yellow natural sandy gravel lay below this to a depth of at least 1.00m. It is likely that this exposed location has been susceptible to considerable erosion. No archaeological features or finds were located.

Test Pit 4 lay in the north-west corner of a grassed area, close to a wildlife zone, to the east of the southern power station access road. The topsoil was of mid-brown loamy sand, around 0.65m deep (including the turf layer) containing occasional charcoal flecks and some tree root disturbance. The subsoil was a distinctive pale grey sand, virtually stone free and measuring 0.40m deep. The underlying deposits were also unusual in terms of colour and consisted of dark grey sand, again virtually devoid of stones and at least 0.50m deep. This deposit is probably natural sand, which has been permeated by fine organic material accumulating in this low lying waterlogged location. No archaeological features or finds were seen.

Test Pit 5 was situated within the lowest terrain of all the test pits, only fractionally above sea level, the location is within an area of potential floodplain. The location is currently part of an arable agricultural field that



would probably have been marshland until relatively recent drainage allowed cultivation. A topsoil of mid-brown loamy sand reached a depth of 0.35m before a dramatic change in colour signalled the start of a very dark brown silty sand marsh deposit. This homogeneous layer continued to a depth of 1.45m before peat and coarser preserved tree bark fragments began to appear. The test pit was extended to a depth of 2.00m when natural sand was observed.

Test Pit 6 was situated in the south-east corner of the field to the east of Sandy Lane (south of Test Pit 5). The test pit was 1.55m deep. A mid brown loamy sand (virtually free of stones) reached a depth of 0.25m and below this was a subsoil of pale brown sand to a depth of at least 0.30m. Some plough marks were observed at the interface of the topsoil and subsoil, orientated in a north to south direction. The underlying natural deposits consisted of pale orange-yellow, stone free sand.

Test Pit 7 was located along the southern edge of the field to the east of Sandy Lane. The pit was excavated to a depth of 1.50m, revealing topsoil identical to that recorded in TP6, but slightly deeper at 0.30m. A similar subsoil of pale brown sand reached a depth of 0.20m, above pale orange-yellow natural sand extending beyond the depth of the trench.

Test Pit 8 lay further south-west from TP7, nearer the corner of the field to the east of Sandy Lane. The pit was excavated to an overall depth of 1.00m. The topsoil was again of loamy mid brown sand, but did contain some fine charcoal fragments and was 0.35m deep. The subsoil was of very pale brown (beige) slightly mottled sand to a depth of 0.35m. The underlying natural deposits were of pale orange sand.

Test Pit 9 was positioned in the south-west corner of the field, immediately east of the entrance to Sandy Lane. Excavated to a depth of 1.50m, the topsoil had deepened to 0.45m of mid brown sand and continued to show fine charcoal and very occasional chalk flecks. No intermediate subsoil existed within this test pit, with bright orange stone free natural sand occurring immediately below the topsoil. Some weathered sherds of probable medieval pottery were recovered from the field surface near to this test pit.

Test Pit 10 was located in the south-east corner of Rosary Field, adjacent to the west side of Sandy Lane. Dug to an overall depth of 1.20m, the pit showed that the topsoil had again increased in depth, measuring 0.50m. Although slightly paler than in the previous field, the topsoil remained as mid to pale brown loamy sand with few stones. The lack of an intermediate subsoil continued and the topsoil abruptly stopped above the bright orange natural sand seen in the previous field.

Test Pit 11 was situated within the central area of the Rosary Field on the slope which rises towards the north. The test pit reached 1.20m in depth and showed a decrease in topsoil depth to 0.30m, but continuing as mid to pale brown sand. No intermediate subsoil was evident; the underlying natural deposits consisting of pale orange-pale brown, stone free sand.

Test Pit 12 was dug north-west of TP11, close to the south-east corner of Sizewell Wents woods. The pit was excavated to a depth of 1.00m. Pale brown, loamy topsoil formed the upper 0.38m of the deposits. This abruptly ceased to reveal natural deposits of stone free yellow sand.

## Supplementary Test Pits

Six additional test pits were excavated within the tree plantation of Sizewell Wents woods. These were situated along the north edge and central areas. The test pits ranged from 1.00m to 1.70m deep and all revealed a shallow topsoil of mid to dark brown loamy sand with high leaf-mould content. The topsoil depths ranged from as little as 0.10m up to 0.20m, all areas showed heavy root disturbance. The subsoil was more variable, most commonly, it was pale to mid brown sand, but mixed orange sand with gravel also occurred. Subsoil depths were extremely varied from 0.10m to 0.90m. The underlying natural continued to be of bright orange and yellow sand with occasional gravel, but for the first time across the site, clay was encountered in the pits near to the northern limit of the area. The clay varied from pale to dark brown in colour, occasionally with chalk and flint inclusions. No indications of archaeological features were observed in any of the test pits.

## 4.0 Conclusions

Surface finds of pottery have indicated probable medieval occupation and this may also be the source of the charcoal particles seen in the topsoil. The majority of the pottery (nine out of fourteen fragments) dated to the 12<sup>th</sup>-14<sup>th</sup> centuries, with the remaining fragments dating to within the post-medieval period. The marsh type deposits revealed by Test Pit 5 show that there is the potential for preservation of organic remains within the waterlogged conditions at the eastern area of the site. The deposits in general showed few signs of deep disturbance. Agricultural activity has primarily disturbed the topsoil, representing an average depth of 0.36m. Therefore, the potential for well preserved archaeological features is good. Although none of the test pits revealed any traces of archaeological features or finds, it is often difficult to identify archaeological remains within the very small areas which were exposed. Therefore, it is not possible to draw any firm conclusions regarding the significance of this monitoring project. Small interventions, dispersed over such a large area will not reliably indicate the density of any potential archaeological features even if revealed within numerous pits.

## 5.0 Bibliography

Richmond, A.D.W., 1994 'An Archaeological Evaluation for the Proposed Sizewell 'C' PWR Power Station Site' SCC Field Archaeology Section, Report No. 94/31, Ipswich.

Richmond, A.D.W., 1995 'An Archaeological Evaluation for the Proposed Sizewell 'C' PWR Power Station Site: Appendices' SCC Field Archaeology Section, Report No. 95/46, Ipswich.

## 6.0 Appendices

### Appendix 1. Brief and Specification

SUFFOLK COUNTY COUNCIL

ARCHAEOLOGICAL SERVICE - CONSERVATION TEAM

#### *Brief and Specification for Archaeological Monitoring of Development*

##### LEISTON SUBSTATION 132kV CABLE ROUTE

*Although this document is fundamental to the work of the specialist archaeological contractor the developer should be aware that certain of its requirements are likely to impinge upon the working practices of a general building contractor and may have financial implications.*

#### 1. Background

- 1.1 The Leiston Substation 132kV cable route is situated between TM 4719 6316 (north) and TM 4693 6272 (south), c. 1.00km in length
- 1.2 **(Please contact the developer for a map of the route including the location of the trial pits).**
- 1.2 The route of the proposed pipeline is orientated north to south and curving westwards, between Sizewell Power station and the proposed Substation for Great Gabbard Wind Farm, crossing the floodplain at the southern end of Sizewell Belts for c. 700m. The scheme will require a stripped easement for the cable.
- 1.3 A desk-based assessment of the Greater Gabbard Wind Farm application site has been undertaken as part of the Environmental Statement (November 2006). The proposal is situated within an extensive multi-period archaeological landscape, recorded in the County Historic Environment Record (formerly County Sites and Monuments Record), with evidence of Bronze Age barrows (LCS 050, LCS 052, LCS 053), undated enclosures, field boundaries and trackways (LCS 050 and LCS 056) in the immediate vicinity. There is evidence of prehistoric, Roman and Medieval sherd scatters within the immediate area (LCS 049 and LCS 051).
- 1.4 The underlying drift geology comprises unconsolidated sand from the Red Crag formation with fen peat and river alluvium in the floodplain. The height of the proposed cable route varies between c. 0 - 10.00m AOD.
- 1.5 The proposed route as it crosses the edge of Sizewell Belts for c. 700m. This area provides considerable potential for the recovery of palaeo-environmental and geoarchaeological deposits, and has the potential for former land surfaces buried by later sedimentation.
- 1.6 A series of 12 test-pits, and also bore-holes and hand-dug test pits, will be undertaken along the line of the proposed route as part of the ground investigations prior to construction. South East Electricity SubStation Alliance

has been advised that archaeological monitoring of this ground disturbance should take place.

- 1.7 In accordance with the standards and guidance produced by the Institute of Field Archaeologists this brief should not be considered sufficient to enable the total execution of the project. A Written Scheme of Investigation (WSI) based upon this brief and the accompanying outline specification of minimum requirements, is an essential requirement. This must be submitted by the developers, or their agent, to the Conservation Team of the Archaeological Service of Suffolk County Council (Shire Hall, Bury St Edmunds IP33 2AR; telephone/fax: 01284 352443) for approval. The work must not commence until this office has approved both the archaeological contractor as suitable to undertake the work, and the WSI as satisfactory. The WSI will *provide the basis for measurable standards* and will be used to establish whether the requirements of the planning condition will be adequately met.
- 1.8 Before any archaeological site work can commence it is the responsibility of the developer to provide the archaeological contractor with either the contaminated land report for the site or a written statement that there is no contamination. The developer should be aware that investigative sampling to test for contamination is likely to have an impact on any archaeological deposit which exists; proposals for sampling should be discussed with the Conservation Team of the Archaeological Service of Suffolk County Council (SCCAS/CT) before execution.
- 1.9 The responsibility for identifying any restraints on field-work (e.g. Scheduled Monument status, Listed Building status, public utilities or other services, tree preservation orders, SSSIs, wildlife sites &c.) rests with the commissioning body and its archaeological contractor. The existence and content of the archaeological brief does not over-ride such restraints or imply that the target area is freely available.
- 1.10 Any changes to the specifications that the project manager may wish to make after approval by this office should be communicated directly to SCCAS/CT for approval.

## 2. **Brief for Archaeological Monitoring**

- 2.1 To provide a record of archaeological deposits which are damaged or removed by any development [including services and landscaping] permitted by the current planning consent.
- 2.2 The significant archaeologically damaging activity in this proposal is the excavation of the test-pits (each measuring c. 1.50 x 1.00m in area) and bore-holes along the line of the proposed route. These, and the upcast soil, are to be closely monitored during and after they have been excavated by the building contractor.
- 2.3 The test pits must be excavated with a toothless ditching bucket down to the interface layer between topsoil and subsoil or other visible archaeological surface. All machine excavation is to be under the direct control and supervision of an archaeologist. The topsoil should be examined for archaeological material.

2.4 Adequate time is to be allowed for archaeological recording of archaeological deposits during excavation, and of soil sections following excavation (see 4.3).

### 3. Arrangements for Monitoring

3.1 To carry out the monitoring work the developer will appoint an archaeologist (the archaeological contractor) who must be approved by SCCAS/CT - see 1.3 above.

3.2 The developer or his archaeologist will give SCCAS/CT five working days notice of the commencement of ground works on the site, in order that the work of the archaeological contractor may be monitored. The method and form of development will also be monitored to ensure that it conforms to previously agreed locations and techniques upon which this brief is based.

3.3 Allowance must be made to cover archaeological costs incurred in monitoring the development works by the contract archaeologist. The size of the contingency should be estimated by the approved archaeological contractor, based upon the outline works in paragraph 2.2 of the Brief and Specification and the building contractor's programme of works and time-table.

3.4 If unexpected remains are encountered SCCAS/CT must be informed immediately. Amendments to this specification may be made to ensure adequate provision for archaeological recording.

### 4. Specification

4.1 The developer shall afford access at all reasonable times to both SCCAS/CT and the contracted archaeologist to allow archaeological monitoring of building and engineering operations which disturb the ground.

4.2 Opportunity must be given to the contracted archaeologist to hand excavate any discrete archaeological features which appear during earth moving operations, retrieve finds and make measured records as necessary. Where it is necessary to see archaeological detail one of the soil faces is to be trowelled clean.

4.3 All archaeological features exposed must be planned at a minimum scale of 1:50 on a plan showing the proposed layout of the development.

4.4 A photographic record of the work is to be made of any archaeological features, consisting of both monochrome photographs and colour transparencies/high resolution digital images.

4.5 All contexts must be numbered and finds recorded by context. All levels should relate to Ordnance Datum.

4.6 Archaeological contexts should, where possible, be sampled for palaeoenvironmental remains. Best practice should allow for sampling of interpretable and datable archaeological deposits and provision should be made for this. Advice on the appropriateness of the proposed strategies will be sought from J. Heathcote, English Heritage Regional Adviser for Archaeological Science (East of England). A guide to sampling archaeological deposits (Murphy, P.L. and Wiltshire, P.E.J., 1994, *A guide to*

*sampling archaeological deposits for environmental analysis*) is available for viewing from SCCAS.

- 4.7 All finds will be collected and processed (unless variations in this principle are agreed with SCCAS/CT during the course of the monitoring).
- 4.8 The data recording methods and conventions used must be consistent with, and approved by, the County Historic Environment Record.

## 5. Report Requirements

- 5.1 An archive of all records and finds is to be prepared consistent with the principles of *Management of Archaeological Projects (MAP2)*, particularly Appendix 3. This must be deposited with the County Historic Environment Record within three months of the completion of work. It will then become publicly accessible.
- 5.2 The project manager must consult the County Historic Environment Record Officer (Dr Colin Pendleton) to obtain an event number for the work. This number will be unique for each project or site and must be clearly marked on any documentation relating to the work.
- 5.3 Finds must be appropriately conserved and stored in accordance with *UK Institute of Conservators Guidelines*. The finds, as an indissoluble part of the site archive, should be deposited with the County Historic Environment Record if the landowner can be persuaded to agree to this. If this is not possible for all or any part of the finds archive, then provision must be made for additional recording (e.g. photography, illustration, analysis) as appropriate. Account must be taken of any requirements the County Historic Environment Record may have regarding the conservation, ordering, organisation, labelling, marking and storage of excavated material and the archive.
- 5.4 A report on the fieldwork and archive, consistent with the principles of *MAP2*, particularly Appendix 4, must be provided. The report must summarise the methodology employed, the stratigraphic sequence, and give a period by period description of the contexts recorded, and an inventory of finds. The objective account of the archaeological evidence must be clearly distinguished from its interpretation. The Report must include a discussion and an assessment of the archaeological evidence, including palaeoenvironmental remains recovered from palaeosols and cut features. Its conclusions must include a clear statement of the archaeological value of the results, and their significance in the context of the Regional Research Framework (*East Anglian Archaeology*, Occasional Papers 3 & 8, 1997 and 2000).
- 5.5 An unbound copy of the report, clearly marked DRAFT, must be presented to SCCAS/CT for approval within six months of the completion of fieldwork unless other arrangements are negotiated with the project sponsor and SCCAS/CT.
- 5.6 Following acceptance, two copies of the report should be submitted to SCCAS/CT. A single hard copy should be presented to the County Historic Environment Record as well as a digital copy of the approved report.

- 5.7 A summary report, in the established format, suitable for inclusion in the annual 'Archaeology in Suffolk' section of the *Proceedings of the Suffolk Institute of Archaeology*, must be prepared and included in the project report.
- 5.8 Where appropriate, a digital vector trench plan should be included with the report, which must be compatible with MapInfo GIS software, for integration in the County Historic Environment Record. AutoCAD files should be also exported and saved into a format that can be imported into MapInfo (for example, as a Drawing Interchange File or .dxf) or already transferred to .TAB files.
- 5.9 At the start of work (immediately before fieldwork commences) an OASIS online record <http://ads.ahds.ac.uk/project/oasis/> must be initiated and key fields completed on Details, Location and Creators forms.
- 5.10 All parts of the OASIS online form must be completed for submission to the County Historic Environment Record. This should include an uploaded .pdf version of the entire report (a paper copy should also be included with the archive).

Specification by: Dr Jess Tipper

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Date: 28 September 2007                      Reference: /  
LeistonSubstation132kVCableRoute2007

**This brief and specification remains valid for six months from the above date. If work is not carried out in full within that time this document will lapse; the authority should be notified and a revised brief and specification may be issued.**

**If the work defined by this brief forms a part of a programme of archaeological work required by a Planning Condition, the results must be considered by the Conservation Team of the Archaeological Service of Suffolk County Council, who have the responsibility for advising the appropriate Planning Authority.**