

The Lake Lothing (Lowestoft) Third Crossing Order 201[*]



Lake Lothing
**THIRD
CROSSING**

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Written Scheme of Investigation for Future Evaluation and Mitigation – Clean Revision 1

Planning Act 2008

**The Infrastructure Planning (Applications: Prescribed Forms and Procedure)
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Suffolk County Council

WRITTEN SCHEME OF INVESTIGATION FOR FUTURE EVALUATION AND MITIGATION





Suffolk County **Council**

WRITTEN SCHEME OF INVESTIGATION FOR FUTURE EVALUATION AND MITIGATION

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WRITTEN SCHEME OF INVESTIGATION FOR FUTURE EVALUATION AND MITIGATION

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1. INTRODUCTION

1.1. THE SCHEME

- 1.1.1. The scheme involves the construction, operation and maintenance of a new bascule bridge highway crossing linking the areas north and south of Lake Lothing in Lowestoft, hereafter referred to as the Lake Lothing Third Crossing ("the Scheme").
- 1.1.2. The Scheme would provide a new single-carriageway road crossing of Lake Lothing, consisting of a multi-span bridge with associated approach roads, and would comprise:
- an opening bascule bridge over the Port of Lowestoft, in Lake Lothing;
 - on the north side of Lake Lothing, a bridge over Network Rail's East Suffolk Line, and a reinforced earth embankment joining that bridge, via a new roundabout junction, to the C970 Peto Way, between Rotterdam Road and Barnards Way; and
 - on the south side of Lake Lothing, a bridge over the northern end of Riverside Road including the existing access to commercial property (Nexen Lift Trucks) and a reinforced earth embankment (following the alignment of Riverside Road) joining this bridge to a new roundabout junction with the B1531 Waveney Drive.
- 1.1.3. The Scheme would be approximately 1 kilometre long and would be able to accommodate all types of vehicular traffic as well as non-motorised users, such as cyclists and pedestrians.
- 1.1.4. The opening bascule bridge design would allow large vessels to continue to use the Port of Lowestoft.
- 1.1.5. A new control tower building would be located immediately to the south of Lake Lothing, on the west side of the new highway crossing, to facilitate the operation of the opening section of the new bascule bridge.
- 1.1.6. The Scheme would also entail the following changes to the existing highway network
- the closure of Durban Road to vehicular traffic at its junction with Waveney Drive;
 - the closure of Canning Road at its junction with Riverside Road, and the construction of a replacement road between Riverside Road and Canning Road to the west of the Registry Office; and
 - a new access road from Waveney Drive west of Riverside Road, to provide access to property at Riverside Business Park;
 - improvements to Kimberley Road at its junction with Kirkley Run; and
 - part-signalisation of the junction of the B1531 Victoria Road / B1531 Waveney Drive with Kirkley Run;
 - the provision of a pontoon for use by recreational vessels, located to the east of the new highway crossing, within the Inner Harbour of Lake Lothing; and
 - works to facilitate the construction, operation and maintenance of the Scheme, including the installation of road drainage systems; landscaping and lighting; accommodation works for accesses to premises; the diversion and installation of utility services; and temporary construction sites and access routes.
- 1.1.7. The works required for the delivery of the Scheme are set out in Schedule 1 to the draft DCO (application document reference 3.1), where they are referred to as "the authorised development",

with their key component parts being allocated reference numbers, which correspond to the layout of the numbered works as shown on the Works Plans (application document reference 2.4). The General Arrangement Plans (application document reference 2.2) illustrate the key features of the Scheme.

1.1.8. Plate 1 provides a diagrammatic representation of the Scheme:

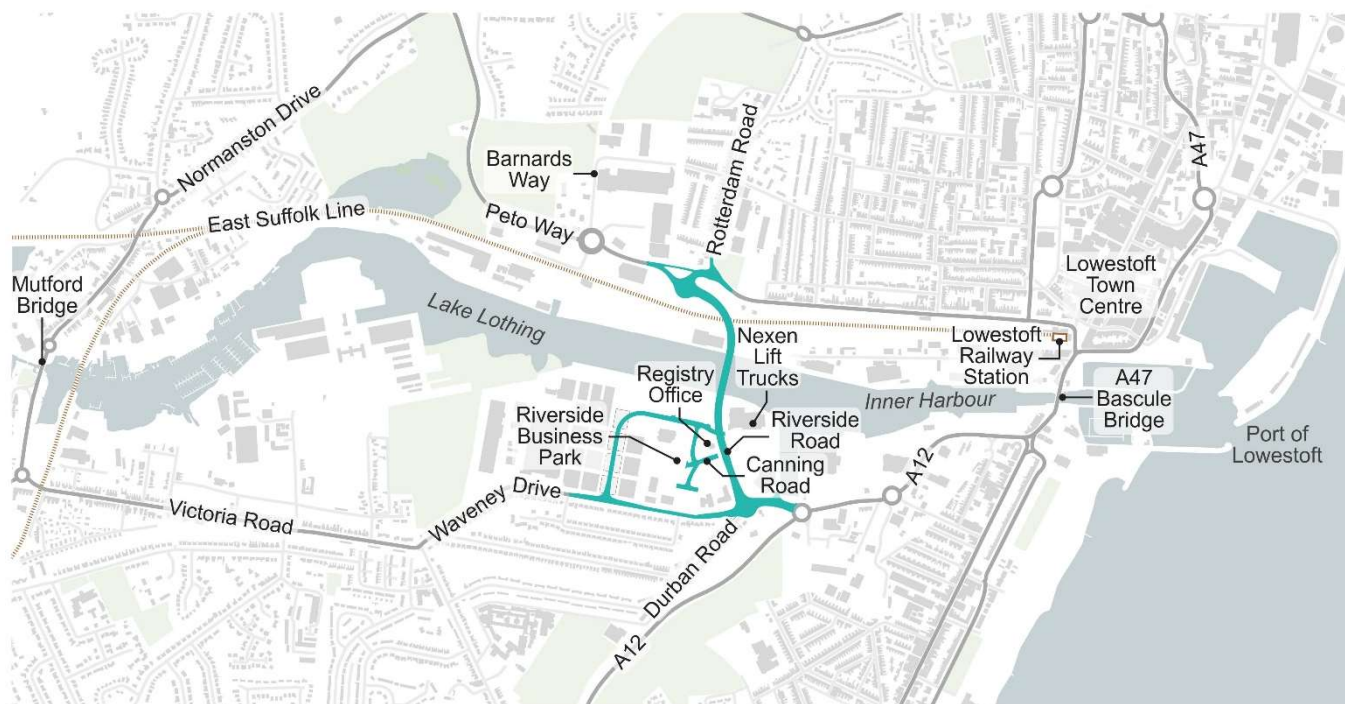


Plate 1: Location of the Scheme in Lowestoft

2. ARCHAEOLOGICAL BACKGROUND

2.1. PRECIS

- 2.1.1. This section provides a brief outline of the archaeological and historic background of the area of the Scheme. Information is summarised from a more detailed Archaeological and Historical background produced as part of Environmental Statement. Preparation of the baseline evidence has involved consultation of information held by the Suffolk Historic Environment Record (HER) and the National Heritage List for England (NHLE).

2.2. HISTORY AND ARCHAEOLOGY

- 2.2.1. Heritage assets within a 500m study area surrounding the Scheme are described in the context of a timeline of archaeological periods from prehistoric through to modern. Selected heritage assets beyond the 500m study area are included in the text where they add context to the baseline heritage information. The time periods discussed can be broadly divided as follows:
- Prehistoric:
 - Palaeolithic c.800,000 – 10,000 BC
 - Mesolithic 10,000 – 4,000 BC
 - Neolithic 4,000 – 2,500 BC
 - Bronze Age 2,500 – 700 BC
 - Iron Age 800 BC – AD 43
 - Roman AD 43 – 410
 - Early Medieval AD 410 – 1066
 - Medieval AD 1066 – 1540
 - Post-Medieval AD 1540 – 1900
 - Modern AD 1900 – present
- 2.2.2. A single find spot of Palaeolithic archaeological remains is recorded locally; in the 19th century five early Palaeolithic flints, including one possible handaxe, were recovered from 'Cannon-shot' gravels at Normanston c.300m to the north east of the Scheme. Further afield, well preserved evidence, comprising Lower Palaeolithic worked flints, associated palaeoenvironmental material and animal bone dated to c.700,000 BP, has been discovered within the Cromer Forest Bed Formation at Pakefield, c.2.5km to the south. This geological formation includes evidence of the earliest known presence of pre-modern humans in northern Europe, comprising footprints dated to c.800,000 BP discovered in 2013 at Happisburgh Beach, Norfolk. The Cromer Forest Bed Formation may be present beneath the Scheme, but will be deeply buried beneath later alluvial, marine and glacial deposits.
- 2.2.3. Evidence for activity of the Mesolithic and Neolithic periods is restricted to an isolated Neolithic pit found at Walton Road, Lowestoft, and find spots of Neolithic flint tools at Victoria Road, Lowestoft and Heath Road, Oulton. Evidence of the Bronze Age and Iron Age is restricted to undated cropmarks located at an area of playing fields situated to the north west of the Scheme (Barnard's Meadow), and at an area situated to the south west of the Scheme that was developed for housing during the 1960s. Episodes of marine transgression affected the study area during the latter part of the Neolithic, the early part of the Bronze Age, and the late Iron Age and evidence of these periods

situated at lower lying parts of the study area may have been buried by marine, alluvial and peat deposits.

- 2.2.4. Evidence for the Roman period situated close to the Scheme comprises two find spots of Roman coins. In the wider area it has been suggested that a Roman road from Colchester to Burgh Castle passed through Lowestoft and evidence interpreted as forming part of this road, or an associated bridge, is reputed to have been found during the 19th century at the mouth of Lake Lothing in the vicinity of the current Bascule Bridge. The closest settlement evidence, including a coin hoard, a possible cremation urn and the skeletons of a number of horses is located approximately 700m to the north east of the Scheme at a part of Lowestoft now known as “Roman Hill”. The lower lying parts of the area continued to be affected by a marine transgression and its use may have been limited to exploitation of marine and estuarine resources.
- 2.2.5. There is no recorded evidence for activity of the Early Medieval period in the study area although the nearby villages of Lowestoft and Kirkley are mentioned in the Domesday Book and consequently had been founded by the latter part of this period. The early focus of Lowestoft is thought to have been located some distance away from the present town centre, perhaps in the vicinity of St Margaret’s church, c.1km north of the Scheme. It is probable that the majority of study area remained as marginal land exploited for estuarine and wetland resources
- 2.2.6. For much of the medieval period the core of Lowestoft may have retained its earlier focus around, or slightly to the south of St Margaret’s church. Lake Lothing is a remnant of a turbary, an extensive area of medieval peat cutting, the speed with which the peat was cut is currently uncertain. The Domesday Survey of 1086 records rent for land being partly paid in herrings, which suggests that fishing formed a significant part of the village economy.
- 2.2.7. Kirkley may have been the most important port at this part of the coast for a brief part of the 14th century. It has been suggested that Lake Lothing was open to the sea for some of the medieval period and that the area surrounding Kirkley Ham inlet may have seen activity associated with the medieval port of Kirkley, but this interpretation is not supported by results of archaeological investigations completed around the inlet, which have not discovered any evidence of medieval activity. An alternative interpretation is that during the medieval period Lake Lothing may have been a small freshwater mere separated from the sea by a sand bar.
- 2.2.8. In the wider area Lowestoft was granted markets in 1308 and 1445 and was a significant fishing port and the most important settlement in the area by the end of the medieval period. Until the latter part of this period the core of Lowestoft may have retained its focus around St Margaret’s church.
- 2.2.9. In the post medieval period the port and town of Lowestoft continued to expand and in 1679 the town was granted port status with certain specified rights of export and import. By the beginning of the 18th century up to 25% of men were involved in the fishing industry. The main catch of the fishing fleet comprised herring.
- 2.2.10. At the end of the 18th century Lowestoft was a moderately sized market town and fishing port with a population of about 2,300. Lowestoft had doubled in size by 1841 and by 1871 the population was over 13,000. Until the mid-19th century the majority of the study area was situated to the west and south of the town and port; it comprised a landscape of dispersed farms, enclosed fields and marginal land located along the shores of Lake Lothing.

- 2.2.11. The focus of the port was the north shore until the 19th century, with Lake Lothing separated from the sea by a sand bar until harbour works, including construction of lock gates and a customs office known as The Port House, were completed alongside the Inner Harbour in 1832.
- 2.2.12. This first phase of harbour works included land reclamation at both north and south sides of the eastern end of Lake Lothing. This work involved the importation of large amounts of material to raise the ground level behind quay walls in order to establish the Inner Harbour. Historic cartographic evidence shows that much of the land behind the current quaysides was low-lying and prone to flooding prior to this first episode of reclamation.
- 2.2.13. The government forced the sale of the harbour in 1842 after the harbour works proved ineffective and a loan could not be repaid. The harbour was eventually sold to Sir Samuel Morton Peto in 1844 and further harbour works were then carried out. Mooring for 1000 boats was provided at the outer harbour and permanent access was established to the Inner Harbour with boat and ship building yards, fish processing, ancillary marine and manufacturing industries constructed along each side.
- 2.2.14. In the second half of the 19th century Sir Samuel Morton Peto played a leading role in the expansion of the town. He opened a rail link between Lowestoft and Norwich in 1847, with the station located just to the north of the Bascule Bridge. He subsequently built several other railways linking Norwich and Lowestoft to Ipswich and is credited with establishing Lowestoft as a holiday resort. The investment in the town stimulated the expansion of the town to the south of Lake Lothing and resulted in the construction of many grand Victorian buildings including the Grade II* listed Royal Norfolk and Suffolk Yacht Club.
- 2.2.15. Lowestoft continued to expand into the early part of the 20th century with the fishing fleet, boat building and associated trades forming the mainstay of its economy. The quayside and marine industries at the north and south sides of Lake Lothing expanded westward during these years and the population had reached 37,886 by 1911, which reflects the peak in production for the British fishing industry.
- 2.2.16. The First World War saw some of the more capable local boats requisitioned by the Admiralty for patrolling and minesweeping. The town was bombed on a number of occasions, and on 25th April 1916, the German High Seas Fleet shelled the town and harbour leaving forty houses destroyed, two hundred damaged and four people killed.
- 2.2.17. During the inter war period the fishing industry and the town suffered a decline, but the start of the Second World War saw Lowestoft transformed into an important naval base with an all-round defensive perimeter of trenches, pillboxes and dense belts of barbed wire. None of the defences now survive but many of their locations have been recorded by the HER and the Defence of Britain project. The town was extensively bombed during the Second World War and much redevelopment was necessary during the post war period.
- 2.2.18. During the latter part of the 20th century the port remained a focus of shipbuilding and developed as a focal point for operations of the oil and gas industries in the southern North Sea.

2.3. PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS FOR THE SCHEME

- 2.3.1. A preliminary deposit model (Mouchel 2017) has been prepared to examine surviving Holocene deposits and the potential presence of the Cromer Forest Bed Formation. Results show that:

- Holocene alluvium is present and localised deposits of peat survive toward the southern end of the Scheme, but peat appears to be absent from the area situated in closer proximity to the southern side of Lake Lothing;
- Extensive deposits of Holocene alluvium are present and localised areas of peat survive to the north of Lake Lothing. The deepest sequence of the Holocene deposits was identified adjacent to the north quay wall; and
- The Cromer Forest Bed Formation may be absent. However, the density of existing geotechnical investigations and the level of detail recorded was not deemed sufficient to enable definitive interpretation.

2.3.2. A programme of archaeological monitoring of geotechnical investigations, which comprised one test trench located in close proximity to the south quay wall (APS 2017), and fifteen trial pits (AOC 2018) located to the north and south of Lake Lothing showed that:

- The made ground forming the south quay is c.2.0m deep;
- Peat deposits were not present beneath the made ground near the south quay;
- The made ground close to the south quay directly overlay an undetermined depth of grey silty alluvium; and
- At the north near Denmark Road the natural soil profile appears to have been significantly truncated prior to the introduction of levelling deposits.

3. AIMS, OBJECTIVES AND STANDARDS

3.1. AIMS

3.1.1. The aims of the evaluation and mitigation work are as follows:

- To evaluate select areas with trial trenching to examine the presence or absence of unknown sub-surface archaeological heritage assets;
- To inform mitigation of the impact of the Scheme on currently unknown heritage assets, if present, through preservation by record or in-situ, as appropriate;
- To mitigate the impact of the Scheme through a programme of geoarchaeological work which will examine the character, extent, significance, condition, quality, depth and chronological framework of the sedimentary sequence;
- To mitigate impact of the Scheme through production of a written and photographic record of one building of local historic interest (42 Waveney Drive), including examination of its historic background through archive research, prior to its demolition; and
- To enable delivery of the development.

3.2. OBJECTIVES

3.2.1. The objectives of the evaluation and mitigation work are as follows:

- To enable implementation of agreed schemes of mitigation, if required, where the presence of significant sub-surface archaeological heritage assets is confirmed by trenching;
- To enable implementation of agreed schemes of mitigation where there are proposed impacts that deposit modelling suggests may impact deposits, with high archaeological potential, but evaluation is not appropriate, e.g. allowing for archaeological monitoring of elements of the project, subject to review of detailed design;
- To enhance understanding of the sub-surface stratigraphy, through refinement of the preliminary deposit model and subsequent targeting of two locations for collection of continuous undisturbed core samples for assessment and analysis;
- To provide a permanent record of 42 Waveney Drive in its current condition;
- To examine and if possible establish the extent of past post depositional impacts on archaeological heritage assets;
- To place the results of these investigations into their local, regional and national context;
- To disseminate results through reporting and publication of results as appropriate; and
- To prepare and deposit the project archive.

3.3. UPDATING AIMS AND OBJECTIVES

3.3.1. The aims and objectives will be updated to respond to evidence as it is uncovered in accordance with Research and Archaeology Revisited: A Revised Framework for the East of England (Medleycott 2011) and in consultation with SCCAS and Historic England.

3.4. STANDARDS

3.4.1. The project will be carried out with reference to Standards for Field Archaeology in the East of England (Gurney 2003) the Chartered Institute for Archaeologists Code of Conduct (CIfA 2014a) and other CIfA Standards and Guidance documents, Historic England guidelines, including those for

environmental archaeology (HE 2011) and geoarchaeology (HE 2015), SCCAS Guidelines for Palaeoenvironmental Assessment (2011) and requirements for field investigations (2017).

4. METHODOLOGY

4.1. METHOD STATEMENTS

- 4.1.1. Method statements, including RAMS, for trial trenching, geoarchaeology, building recording and other appropriate future mitigation, which would comprise programmes of watching brief or excavation, will be prepared for approval by SCCAS and, where necessary, Historic England where they are most appropriate to comment. It is anticipated that SCCAS will consult Historic England as part of the process of approving the method statement. Both bodies, including Historic England's Senior Science Advisor, will be consulted as necessary during preparation of method statements.
- 4.1.2. Method statements must include a summary of heritage assets likely to be encountered; aims and methods tailored to the character and significance of potential or known heritage assets; and provide detail of the intrusive investigation, programme, contingencies and appointed specialists.
- 4.1.3. Site work set out in a method statement will not commence until the method statement has been approved by SCCAS.
- 4.1.4. The appointed archaeological contractor ('archaeological contractor') for the Scheme must also provide SCCAS with a minimum of 14 days notification before commencement of site work.

4.2. GENERAL REQUIREMENTS

- 4.2.1. The archaeological contractor(s) will have demonstrable experience of working on similar projects and with comparable heritage assets and it is anticipated that fieldwork will be overseen by a managing archaeological consultant who will maintain regular dialogue with SCCAS during the course of the works, anticipated to include a written weekly progress report.
- 4.2.2. In the event that archaeological deposits, features, or finds are exposed during future evaluation and mitigation, the managing archaeological consultant will be informed on the day of discovery.
- 4.2.3. The appointed managing archaeological consultant ('managing archaeological consultant') will manage all consultation and discuss and agree any significant variations to the scope of evaluation and mitigation with SCCAS. The archaeological contractor will engage directly with SCCAS as necessary, in liaison with the managing archaeological consultant.

4.3. TRIAL TRENCHING

- 4.3.1. The trial trenching strategy for a site located to the south of Denmark Road, which encompasses c.1.2Ha of land, will likely examine between 2 and 5% of the area, informed by depths of proposed impacts and the logistics of evaluation. A contingency of 1% trenching will enable further investigation of the nature and significance of any sub-surface heritage assets present, should these factors remain unresolved after initial investigation.

SOIL STRIPPING

- 4.3.2. The site is mostly surfaced with concrete slab and the archaeological contractor will provide plant to break and remove it from trench locations prior to soil stripping. All soil stripping will be undertaken using mechanical excavators equipped with a ditching bucket under the supervision of a suitably qualified archaeologist. The machine excavation will proceed in level spits of no more than 0.20m, until either the top of the first archaeological horizon or undisturbed natural deposits are encountered. If present topsoil shall be stored separately from subsoil and at a suitable location.

- 4.3.3. Machine excavation will not proceed beyond a safe working depth unless suitable measures such as stepping, battering or shoring of trench edges have been taken. The archaeological contractor will backfill all excavations after site operations are complete.

METAL DETECTING

- 4.3.4. The spoil from the trenches will be inspected by the archaeologist to recover artefacts, or ecofacts of archaeological interest and if practicable any removed spoil will be scanned using a metal detector.

QUALITY ASSURANCE

It is envisaged that trenching field work will be complete within ten working days, and as a minimum the archaeological contractor will provide a mid-week verbal progress report and a weekly summary site report to the appointed managing archaeological consultant. At least one site meeting will take place during the trial trenching and SCCAS will be informed of the dates of site meetings in advance and will attend at their discretion. Additional site meetings will be arranged as required to discuss any significant developments.

4.4. MITIGATION

- 4.4.1. Results of trial trenching and review of the deposit model against Scheme detailed design will inform the need for archaeological mitigation. Mitigation will be agreed with SCCAS in further Method Statements and will examine areas where significant archaeological remains have been identified by trenching, or, where construction impact may adversely affect deeply buried archaeological remains or deposits, in particular buried structural archaeological remains associated with estuarine or foreshore type activity. The methods of mitigation will comprise archaeological monitoring and targeted excavation.

MONITORING

- 4.4.2. Archaeological monitoring will follow *Standard and guidance for an archaeological watching brief* (ClfA 2014b). Any variation to, or departure from, this guidance will be agreed in advance with SCCAS.

EXCAVATION

- 4.4.3. Archaeological excavation will follow the standards detailed in *Requirements for Excavation* (SCCAS 2017). Any variation to, or departure from, this guidance will be agreed in advance with SCCAS.

4.5. MAPPING, SAMPLING, RECORDING

- 4.5.1. All features, deposits and finds will be recorded by the archaeological contractor according to accepted professional standards (see references section) and in line with established recording systems.
- 4.5.2. The archaeological contractor shall record on pro-forma record sheets discovered features, deposits and finds and a site diary, including a description and discussion of any archaeological heritage assets, is to be maintained on a daily basis.

MAPPING

- 4.5.3. If necessary the archaeological contractor will hand-clean the surface of deposits and features and will plan their distribution and extent by instrument survey. Dependent on the character and potential

significance of deposits and features a site meeting will be arranged to review the pre-excavation plan and agree subsequent sampling strategies with the archaeological contractor, and SCCAS will be invited to attend.

- 4.5.4. All instrument survey will be completed relative to Ordnance Survey National Grid in 3D at a resolution sufficient to fulfil the requirements of SCCAS. Deposits and features shall be recorded in plan at least 1:20 scale and in section at least 1:10 scale. Site plan and section drawings will be completed on plastic drafting film. A 'Harris Matrix' stratification diagram will be used to record all stratigraphic relationships on the site and spot dating will be incorporated where applicable.

SAMPLING STRATEGY

- 4.5.5. Final sampling percentages for any archaeological deposits and features will be agreed with SCCAS. However, the following sampling levels will form the usual minimum standard to be applied to archaeological features and deposits.
- Pits - 50% minimum of fill;
 - Post-holes - 100% of fill;
 - Ring ditches or roundhouse gullies - 50% minimum of fill;
 - Ditches and gullies will have all relationships and terminals defined, investigated and recorded;
 - Linear features associated with structural remains - 20% minimum of fill;
 - Linear features not associated with structural remains - 10% minimum of fill; and
 - Features/layers/deposits/horizontal stratigraphy relating to significant industrial activity - 100% of deposit;

PHOTOGRAPHY

- 4.5.6. A photographic record of the work shall be made and incorporated into the site archive. This will consist of high quality, colour digital photographs taken in approved formats as directed by the digital archive policies of the relevant archive repository.

ARTEFACTS

- 4.5.7. All artefacts recovered during site operations are the property of the Landowner. On completion of the archaeological works the Landowner(s) will be contacted to approve deposition of the archive, including all artefacts, with the relevant archive depository.
- 4.5.8. Artefacts will be carefully recovered by hand and initial conservation and storage will follow guidance included in First Aid for Finds (Watkinson and Neal 1998). Bulk artefacts will be collected and bagged according to their archaeological context. The location of registered finds, including in situ worked flint will be recorded three dimensionally. If necessary, an appropriately qualified and experienced archaeological conservator will be appointed to advise and assist in the lifting of fragile finds of significance, or value and to arrange for the X-raying and investigative conservation of objects as may be necessary. Where appropriate to address the aims of the evaluation, sieving of deposits will be undertaken to maximise the recovery of small artefacts.
- 4.5.9. All pottery (excluding sherds with organic residues adhering to the surface), bone and worked flint recovered during the fieldwork will be washed and then marked in accordance with the archive depository guidelines to identify the site and context. Pot sherds with organic residues shall be treated in accordance with Historic England Centre for Archaeology Guidelines "Organic Residue Analysis and Archaeology – Guidance for Good Practice" (2017). Most building material and burnt

flint (not including significant diagnostic material) will be identified, counted, weighed and discarded, although representative samples will be retained as appropriate. The finds identification and specialist work will be undertaken by specialists agreed with SCCAS and will use relevant county or region-specific type series, where available.

- 4.5.10. Records of artefact assemblages will clearly state how they have been recovered, sub-sampled and processed. Sub-sampling procedures will be agreed with the managing archaeological consultant and SCCAS and will follow the guidance and advice of the depository which will receive the Site archive.

ENVIRONMENTAL SAMPLING

- 4.5.11. The archaeological contractor will set out in their method statement environmental sampling strategies appropriate to the aims, objectives, character and significance of potential archaeological remains present.
- 4.5.12. The strategies, methodologies and programmes for the sampling, recording, processing, assessment, analysis and reporting of deposits with environmental archaeology potential will be agreed with SCCAS.
- 4.5.13. Environmental sampling strategies will follow Historic England Centre for Archaeology Guidelines “Environmental Archaeology – A guide to the theory and practice of methods, from sampling and recovery to post-excavation” (HE 2011). Any variation to, or departure from, this guidance will be agreed in advance with SCCAS.
- 4.5.14. The following environmental sampling procedures and levels shall usually be a minimum, unless otherwise agreed by SCCAS.
 - Where deposits are dry, bulk samples will be taken from secure contexts in dateable features. The size of the sample is expected to be in the range of 40-60 litres per context or 100% of smaller contexts;
 - Where deposits are wet, waterlogged or peaty, monoliths will be taken along cleaned vertical surfaces for the retrieval of pollen, diatoms, ostracods and foraminifera. Bulk samples of 20 litres will also be taken for the retrieval of plant macro-remains and insects; and
 - Environmental samples will be taken, processed and assessed while each excavation is in progress. The results of the assessment will be fed back to site at no more than weekly intervals to inform site interpretation, and enable refinement of the sampling strategy to maximise recovery of environmental information. The programmes and mechanism for processing, assessment and feedback will be agreed with SCCAS.

ANIMAL BONE

- 4.5.15. The archaeological contractor will provide detailed sampling strategies for recovery of animal bone which are appropriate to the aims and objectives set out in the method statement and the character and significance of the expected archaeological remains.
- 4.5.16. Strategies and methodologies for the recovery, sampling, recording, processing, assessment, analysis, reporting and archiving of animal bone assemblages will be agreed by the archaeological contractor’s Zooarchaeologist with SCCAS.

- 4.5.17. The strategy will follow Historic England Centre for Archaeology Guidelines “Animal Bones and Archaeology – Guidelines for Best Practice” (2014). Any variation to this guidance will be agreed in advance with SCCAS.
- 4.5.18. The following sampling procedures and levels shall usually be a minimum, unless otherwise agreed by SCCAS.
- Deposits containing assemblages of animal bone will be bulk sampled to ensure collection of a representative sample and avoid the bias which may be introduced into assemblages through hand collection;
 - Bulk samples will be collected only from secure, well stratified deposits. Samples will not be collected from mixed deposits unless the retrieved information will answer specific questions;
 - Unusual assemblages of animal bone, such as those from feasting or structured deposition, will ideally be 100% sampled;
 - Assemblages of animal bone will be assessed by the Zooarchaeologist while each excavation is in progress; and
 - If necessary, the results of assessment will be fed back to site at no more than weekly intervals to inform site interpretation, to enable refinement of the sampling strategy and to maximise recovery of zooarchaeological information.

WATERLOGGED WOOD

- 4.5.19. The archaeological contractor will provide a detailed sampling strategy for excavation, sampling, recovery and conservation of waterlogged wood which is appropriate to the detailed aims and objectives set out in the method statement and the character and significance of the expected archaeological remains.
- 4.5.20. The strategies and methodology for the recovery, sampling, recording, processing, conservation, assessment, analysis, reporting, and archiving of waterlogged wood will be agreed by the archaeological contractor with SCCAS.
- 4.5.21. Artefactual waterlogged wood may require complete excavation, recording, analysis and conservation dependent on its character and date.
- 4.5.22. The strategy and method will follow Historic England Centre for Archaeology Guidelines “Waterlogged Wood – Guidelines for Recording, Sampling, Conservation and Curation” (2010). Any variation to this guidance will be agreed in advance with SCCAS.

ARCHAEOMETALLURGY

- 4.5.23. The archaeological contractor will provide detailed strategies for discovery and recovery of evidence of metalworking which are appropriate to the aims and objectives set out in the method statement and the character and significance of the expected archaeological remains.
- 4.5.24. Strategies and methodologies for the discovery, recovery, sampling, recording, processing, assessment, analysis and archiving of metalworking evidence will be agreed by the archaeological contractor with SCCAS.
- 4.5.25. All bulk samples will be scanned for evidence of metalworking as they are processed. If necessary, the results of this assessment will be fed back to site at no more than weekly intervals to enable better site interpretation and refinement of excavation strategies to maximise recovery of metalworking evidence.

- 4.5.26. The strategy and methods will follow Historic England Centre for Archaeology Guidelines “Archaeometallurgy – Guidelines for Best Practice” (2015). Any variation to this guidance will be agreed in advance with SCCAS.

HUMAN REMAINS

- 4.5.27. In the event that human burials are discovered these will initially be left in situ and their treatment agreed with SCCAS.
- 4.5.28. It may be necessary to fully excavate human remains following Historic England guidance “The Role of Human Osteoarchaeologists in an Archaeological Fieldwork Project” (2018) and “Guidance for Best Practice for the Treatment of Human Remains Excavated from Christian Burial Grounds in England” (APABE 2017).
- 4.5.29. Should their excavation and removal from the site be required, the archaeological contractor shall obtain a Ministry of Justice Exhumation Licence in accordance with Section 25 of the Burial Act 1857 before the remains are disturbed.

TREASURE

- 4.5.30. The archaeological contractor will report artefacts that fall under the statutory definition of Treasure (as defined by the Treasure Act of 1996 and its revision of 2002) to the relevant Coroner’s Office, the Suffolk Finds Liaison Officer (FLO), the landowner and SCCAS.
- 4.5.31. The archaeological contractor must complete and submit a treasure receipt and a report to the Coroner’s Office and the FLO within 14 days of understanding the find is Treasure. Failure to report within 14 days is a criminal offence.

ARCHAEOLOGICAL SCIENCE

- 4.5.32. Where necessary the archaeological contractor will seek the advice of the Senior Science Advisor for Historic England regarding specialist sampling requirements and any scientific applications relevant to the archaeological excavation of features, deposits and artefacts.
- 4.5.33. The archaeological contractor will make appropriate provision for the application of scientific dating techniques such as radiocarbon, dendrochronology, archaeomagnetic, optically stimulated luminescence and thermoluminescence. The advice of the Senior Science Advisor for Historic England will be sought in advance of the application of these techniques.

4.6. GEOARCHAEOLOGY

UPDATED DEPOSIT MODEL

- 4.6.1. The archaeological contractors geoarchaeologists will re-examine the preliminary deposit model (Appendix 9B of the Environmental Statement) as a preliminary desk based study. If it is demonstrated that extant geotechnical data necessitates reinterpretation of the preliminary deposit model they will produce an updated site-wide model of the stratigraphic sequence, which would involve the creation of a series of computer generated deposit models using software capable of producing 2D and 3D display of the recorded stratigraphic information, and in particular the contoured surfaces and thicknesses of the main sedimentary units, which are interpolated between known data points. If examination of the preliminary deposit model shows that updating it will not add any information to inform the targeting of areas for retrieval of dedicated geoarchaeological cores (Sections 6.6.7 – 6.6.21) then the preliminary deposit model will be used for this purpose.

Where the dedicated geoarchaeological cores contain deposits suitable for assessment and analysis then the geoarchaeologists will update the deposit model to aid reconstruction of site formation and transformation processes, such as alluvial sedimentation and peat formation,.

- 4.6.2. If geotechnical samples have been recovered to inform Scheme design and are stored off-site the geoarchaeologist may wish to visit the geotechnical sample store to examine and record them in order to provide information to enhance the deposit model. If practicable this will be programmed to coincide with extrusion of the samples for geotechnical examination and all geoarchaeological work will be carried out in the presence of a geotechnical engineer. The archaeological contractor will liaise closely with the geotechnical contractor to avoid any delays in work flow or programme.
- 4.6.3. Prior to visiting the sample store the geoarchaeologists will be provided with the drillers field logs so that they can determine which samples are likely to be of interest. Locations (NGR co-ordinates) and ground level (mAOD) will also be provided to the geoarchaeologists. The geoarchaeological examination and recording will prioritise undisturbed cores and larger bulk samples from superficial deposits and “made ground”. The interface of glaciofluvial deposits and Crag Group deposits will be examined if relevant geotechnical samples are available, but any samples purely from the Crag Group deposits do not need to be examined.
- 4.6.4. Sediments will be recorded with reference to Historic England guidelines for geoarchaeology (HE 2015). The sediments will be described on summary proforma recording sheets, including a description of colour, compaction, texture, sorting, structure and inclusions (noting abundance, shape and material). The nature of observable contacts/boundaries (abrupt, irregular, diffuse) and the presence of any archaeological artefacts (description of any obviously modern material will be brief) will also be recorded. Samples will be cleaned, as necessary, to remove any smearing and to reveal laminations. All recorded samples will be photographed with a digital camera.
- 4.6.5. Any dateable artefactual material present may be recovered from geotechnical samples for specialist assessment providing this does not compromise the samples for geotechnical purposes and only with the permission of the geotechnical engineer. The sample number and depth below ground level (BGL) of recovered artefacts will be recorded in permanent marker on finds bags.
- 4.6.6. Sub-sampling of geotechnical samples for assessment of palaeoenvironmental remains will be carried out only with the permission of the geotechnical engineer to ensure the integrity of cores for geotechnical purposes. If sub-sampling for geoarchaeological purposes cannot be achieved because of geotechnical requirements, it may be necessary to collect dedicated geoarchaeological samples where significant palaeoenvironmental evidence has been identified. The sub-sampling would target a small representative selection of sediment sequences and would mainly focus on organic deposits, although minerogenic deposits may also be considered. The size of samples for macro remains such as plants and molluscs will be c.50g-100g and for micro remains such as pollen and diatoms sample size will be c.5g-10g. In the main sub-sampling would only be applicable if collected from undisturbed cores although the geoarchaeologists could consider sub-sampling bulk samples if they contain evidence of particular significance.

DEDICATED GEOARCHAEOLOGICAL CORES

- 4.6.7. The geoarchaeologists will use the existing or updated deposit model to identify locations on land to the south and north of Lake Lothing for recovery of a total of two dedicated undisturbed core samples including deposits suitable for geoarchaeological assessment and analysis. The locations targeted will be where the updated deposit model has identified survival of the deepest organic

deposits. If initial targeted cores at the south and north of Lake Lothing contain limited, or no organic deposits a maximum of four additional cores will be completed at alternative locations to facilitate retrieval of two cores with the best deposit sequence. If the total of six cores do not contain deposits suitable for assessment and analysis then the geoarchaeological work will be discontinued. The locations of the dedicated core samples will be provided in a method statement to be agreed with SCCAS and HE.

- 4.6.8. When retrieving dedicated geoarchaeological cores the archaeological contractor/geoarchaeologist shall take precautions to minimise the potential for downward migration of contaminants during drilling from made ground into the underlying natural strata. This can include measures such as clean drilling i.e. reduction in casing diameter once natural ground is encountered and installation of a bentonite seal between the two. To minimise the risk of downward migration of contaminants following completion of drilling, the borehole shall be backfilled with a bentonite slurry. Should gross contamination be encountered during the works, drilling shall cease and the location of the dedicated borehole shall be moved.
- 4.6.9. The dedicated boreholes will most likely be recovered using cable percussion coring. Cable percussion coring is widely regarded as one of the most suitable methods for the recovery of continuous, undisturbed core samples. The cores should be a minimum of 10cm in diameter and 45/50cm in length, and provide sub-samples suitable for not only sedimentary and microfossil assessment and analysis, but also macrofossil analysis.
- 4.6.10. The core samples will be recovered in plastic or steel down pipe, will be wrapped in clear plastic to prevent moisture loss, labelled with the depth (metres from ground surface), orientation (top and base) and will be stored at 20C or below. This temperature prevents fungal growth on the core surface, which may lead to anomalous radiocarbon dates, and moisture loss.
- 4.6.11. Each dedicated borehole location will be recorded using a Differential Global Positioning System with an accuracy of ± 1 cm and the data will be fixed to the National Grid using an Ordnance Survey base map. The spatial data, together with sedimentary and geo-referenced information obtained from geoarchaeological and geotechnical work, will form the basis for refinement of a previously completed deposit model (Mouchel 2017).
- 4.6.12. The collected core samples will be described in the laboratory, noting colour, compaction, texture, sorting, structure and inclusions (noting abundance, shape and material). The nature of observable contacts/boundaries (abrupt, irregular, and diffuse) and the presence of any archaeological artefacts (although description of any obviously modern material will be brief) will also be recorded. Samples will be cleaned, as necessary, to remove any smearing and to reveal laminations. All recorded samples will be photographed with a digital camera.
- 4.6.13. Any dateable artefactual material will be recovered from samples for specialist assessment. The sample number and depth below ground level (BGL) of recovered artefacts will be recorded in permanent marker on finds bags
- 4.6.14. The results will be used to produce a preliminary interpretation of the site formation processes and depositional environment. Description of the sedimentary sequence recovered in the core samples will provide important, primary information on the nature of the depositional environment through time. Sand and gravel indicates deposition with a high energy fluvial environment, such as braided river system, during cold climatic conditions. Fine-grained mineral sediment, such as silt or clay indicates deposition within or on the margins of a lake, pond or river. Soil and peat formation

indicates the formation of semi-terrestrial or fully terrestrial conditions resulting in the colonisation of vegetation adapted to the specific local conditions.

- 4.6.15. The recovered core samples will be subject to laboratory-based multi-proxy palaeoenvironmental rapid assessment and, if warranted, analysis. The laboratory based investigations that may be undertaken, will be set out in a method statement, following consultation and discussion with SCCAS; as a minimum the following analytical techniques will be considered:

ORGANIC MATTER DETERMINATIONS

- 4.6.16. Quantification of the organic matter content by Loss-on-Ignition will permit identification of sedimentary units indicating more terrestrial conditions e.g. peat, soil, and aid the recognition of units having a higher organic matter that may be suitable for radiocarbon dating. Each of the main sedimentary units recovered in the borehole core samples will be assessed for their organic matter content, and the results tabulated and presented diagrammatically.

POLLEN ANALYSIS

- 4.6.17. The analysis of pollen grains and spores (palynology) is widely used in environmental archaeology since they frequently provide valuable information on vegetation composition, structure and succession (palaeoecology), plant migration (biogeography), climate change, human modification of the natural vegetation cover and land-use (anthropogenic activity), and diet. They enable us to record vegetation succession due to natural processes, such as competition and climate change, and human activities, such as woodland clearance and cultivation. Quantification of the pollen assemblages in each sub-sample will be based upon a pollen sum of 300 total land pollen (trees, shrubs and herbs) with aquatic and spore taxa counted in addition. The results will be presented diagrammatically as percentages.

DIATOM ANALYSIS

- 4.6.18. Diatoms are unicellular algae and comprise a silicified (opaline silica) cell wall (frustule) with two overlapping valves (epivalve and hypovalve). Their taxonomy and ecology are well known, with different species occupying the bottom of (benthic), or floating within (planktonic), water bodies (e.g. oceans, lakes, ponds, rivers, salt marshes, ditches), and living in soil and on trees (epiphytic). They will be a valuable part of the assessment because species are indicative of a wide variety of environmental conditions (e.g. marine, brackish or freshwater) that reflect temperature, salinity (level of common salt in solution), pH (potential hydrogen), oxygen and mineral content (e.g. silica, phosphate, nitrate and iron). Marine transgressive phases are indicated by the dominance of marine diatoms, whereas the transition to marine regressive phases (reduction or stabilisation in relative sea level) shows a progressive increase in freshwater and brackish water taxa. Quantification of the diatom assemblages in each sub-sample will be based upon diatom counts (diatom sum to be determined by the concentration in each sub-sample) and identification of all taxa. The results will be presented diagrammatically as percentages.

WATERLOGGED PLANT MACROFOSSIL ANALYSIS

- 4.6.19. Waterlogged seeds are one of the most common plant remains found within organic-rich palaeoenvironmental sequences. Preservation by waterlogging occurs in anoxic conditions, which retards the decay process and results in the loss of internal anatomical structures. In peat and alluvium, seeds are almost exclusively preserved in a waterlogged state. The seeds and their components (e.g. stems, leaves, buds) in peat and alluvium will represent either plants growing

locally (autochthonous) or plants growing at an uncertain distance from the point of deposition (allochthonous). Analysed in conjunction with other proxies (e.g. pollen, insects), they may provide valuable information on climate change or vegetation history. Small bulk samples from will be processed by standard laboratory procedures involving wet sieving. Quantification of the plant macrofossil assemblages in each bulk sample will be based on the identification of the entire assemblage. The results will be tabulated and presented diagrammatically as raw counts and percentages.

WATERLOGGED WOOD ANALYSIS

- 4.6.20. Wood preserved by anaerobic, waterlogged conditions is often found in both geological deposits, such as peat, and archaeological archives (e.g. trackways, platforms, hurdles, ditches, pits). It provides primary data on woodland composition, and hence vegetation history, woodland management, agricultural practices (e.g. fodder and bedding for animals), woodland exploitation for domestic fires (fuel), human impact on the natural environment, catastrophic, natural wild fires, material culture (wooden artefacts), time of woodland exploitation, local environmental conditions, preservation and bias in wood assemblages and technological sophistication. Small bulk samples will be processed by standard laboratory procedures involving wet sieving. Quantification of the wood and charcoal assemblages in each bulk sample will be based on the identification of 100 specimens for both classes. The results will be tabulated and presented diagrammatically as raw counts and percentages.

INSECT ANALYSIS

- 4.6.21. Insect remains are found in a range of wet and dry environments. Their robust chitinous exoskeletons are often found as well-preserved fragments. Insects provide valuable information on regional and local environmental conditions, the local human environment, human and animal diet, and the function of archaeological features, condition of human and animal mummified remains, and the contents of offerings. These applications require detailed records of modern groups of insect species and their ecological preferences, and the ability to differentiate between those species indicative of the general environment (allochthonous species) and local area (autochthonous species). Small bulk samples will be processed by standard laboratory procedures involving paraffin flotation. Quantification of the insect assemblages in each bulk sample will be based on the identification of the entire assemblage. The results will be tabulated and presented diagrammatically as raw counts and percentages.

RADIOCARBON DATING

- 4.6.22. Radiocarbon dating has almost single-handedly transformed understanding of the timing of events and rates of change in archaeological records (Branch et al., 2005). Careful consideration will be given to the selection of materials for radiocarbon dating to avoid recent or geological contamination e.g. percolating humic acids, rootlets and bacterial deposits. The objective will be to select terrestrial plant macrofossils (e.g. seeds and wood) for plants formerly growing in-situ, rather than bulk organic samples or organic detritus. To test and correct for potential isotopic fractionation, the stable isotopic ratio of ^{13}C to ^{12}C will be measured in all samples submitted. Ages will be reported as an age from year zero, which is taken as A.D. 1950, when the ^{14}C content of the atmosphere was approximately in equilibrium, prior to nuclear bomb testing. This age will be given as Before Present (or B.P.) and can be then converted to A.D. or B.C. To avoid any confusion between calibrated and un-calibrated dates, ' ^{14}C ' will be used prior to the nomenclature used (i.e. ^{14}C B.P., ^{14}C A.D. and ^{14}C B.C.) if

the ages are un-calibrated, and use 'cal' prior to the term if calibrated (i.e. cal. B.P., cal. A.D. and cal. B.C.). Ages will be quoted with the measurement error only, and is typically given at 2 standard deviation (i.e. 95%) confidence limits. Calibration of radiocarbon dates, due to cosmic ray flux, solar intensity and changes in the carbon cycle will be conducted on radiocarbon ages to 11,857 dendro (tree ring) years B.P (see Stuiver et al., quoted in Branch et al., 2005).

4.7. BUILDING RECORDING

- 4.7.1. A level 2 historic building survey of 42 Waveney Drive, with reference to Historic England guidelines for understanding historic buildings (HE 2016), will be completed.
- 4.7.2. Limited archive research will be undertaken in order to understand the historical background of the built heritage asset. As a minimum the research will involve an examination of available historic maps, photographs, plans and other records held by Suffolk Archives.
- 4.7.3. A photographic record of the building will be made and incorporated into the site archive in accordance with Historic England's Digital Image Capture & File Storage: Guidelines for Best Practice (HE 2015). This will consist of high quality digital photographs. All photographs will be taken in approved formats as directed by the archive policies of the archive repository. An appropriately-sized graduated scale will be used in all shots where access and health and safety allows. A full photographic register detailing the film, frame, description, direction of view and date, will be made to accompany this record. The location and direction of photographs will be shown on a site plan and will be cross referenced with a gazetteer.
- 4.7.4. A written record will be made of the building using pro forma building recording sheets. Comment will be made on condition, construction, architectural features and evidence for phasing and function.
- 4.7.5. Plans and elevations of the building will accompany the photographic and written record. Plans and elevations will be verified and annotated to mark all significant features and evidence for phasing and function (including all openings, blocked openings, phase breaks etc).
- 4.7.6. Following the site survey, drawings will be produced in an appropriate digital drafting programme. Drawings will be at 1:50 or 1:100 as appropriate and will use conventions to show features in line with Historic England 2016 Understanding Historic Buildings: A guide to good recording practice. All plans must include a north arrow, scale, key and appropriate labelling of features.
- 4.7.7. The written, photographic and drawn record will be compiled into a fully illustrated report.

5. REPORTING

5.1. GENERAL REQUIREMENTS

- 5.1.1. A draft report following SCCAS requirements, will be completed for each category of work by the archaeological contractor. The draft reports will be submitted in .docx format to the managing archaeological consultant for review within six weeks of completion of fieldwork.
- 5.1.2. Once any amendments are made and no later than three months after the completion of fieldwork a .pdf copy of the report/s will be submitted to SCCAS, and in the case of the geoarchaeological report also to Historic England.
- 5.1.3. After any SCCAS and Historic England comment has been addressed, the final report/s will be submitted to the Suffolk Historic Environment Record.
- 5.1.4. The results of each category of work will be recorded on the OASIS database. All parts of the OASIS online form <http://ads.ahds.ac.uk/project/oasis/> will be completed and a copy will be included in the final report and also with the site archive. A digital copy of the approved report will be uploaded to the OASIS website.
- 5.1.5. The reports will become public documents after an appropriate period of time (usually not exceeding six months).

5.2. REPORTING MINIMUM STANDARDS

TRIAL TRENCHING

- 5.2.1. A fully illustrated report will be produced for the trial trenching, including baseline summary, topography and geology, archaeological potential and previous work(s) relevant to the archaeology of the site; detailed scope and methodology, dates of fieldwork, plans of the areas investigated; results and observations.

MITIGATION

- 5.2.2. A fully illustrated report will be produced for mitigation, including baseline summary, topography and geology, archaeological potential and previous work(s) relevant to the archaeology of the site; detailed scope and methodology, dates of fieldwork, plans of the areas investigated; results and observations.

GEOARCHAEOLOGY

- 5.2.3. Submission of sub-samples for palaeoenvironmental analysis and radiocarbon dating will follow an assessment of their distribution and of the quality and quantity of evidence contained. The archaeological contractor will collate results of the rapid assessment in a brief assessment report which will provide information on the degree of preservation, quantity of proxy evidence, brief taxonomic information, inferred depositional environment and identify appropriate further analyses.
- 5.2.4. Any significant finds recovered from samples will be submitted to an appropriate specialist for spot-dating.
- 5.2.5. Following completion of the analysis a final illustrated report will be produced. The final report will address each of the main aims set out in Section 3 as appropriate. It will present detailed sediment descriptions, results of the analysis of proxy evidence, radiocarbon dating certificates and will

integrate this information with the results of previous geotechnical logs and archaeological investigations. A deposit model and cross-section/s of stratigraphic sequence will be included in the report as appropriate and all figures will be annotated and labelled with interpretative information.

BUILDING RECORDING

- 5.2.6. The building recording report will be prepared in accordance with Historic England guidelines: (HE 2016) Understanding Historic Buildings: A guide to good recording practice.

5.3. REPORT CONTENT

- 5.3.1. The reports will include, as a minimum:

- 5.3.2. A summary sheet providing the following information:

- Site name and grid reference;
- Site activity (i.e. type of investigation);
- Suffolk HER Event Number;
- Date and duration of project;
- Contractor Site code;
- Area of site;
- Summary of results; and
- Location and reference of archive.

- 5.3.3. The following main sections, as appropriate to type of work and results:

- Executive summary;
- Site location;
- Methodology;
- Description of results (including stratigraphic description, if necessary);
- Interpretation of the results in the appropriate context;
- Summary of the archaeological potential of the Scheme site and its immediate surrounding area;
- Consideration of the significance of the findings on a local, regional and national basis;
- Critical review of the effectiveness of the methodology;
- References;
- Appropriate photographs in colour;
- Location Plan (no smaller than 1:10 000);
- Site layout plans on an OS base, with north point and scale with the location of trial pits/trenches;
- Other plans, sections, elevations and deposit models as necessary, including Cardinal Points, Ordnance Datum, vertical and horizontal scales;
- Specialist descriptions of artefacts and ecofacts as required;
- Summary of the contents of the project archive and its location (including summary catalogues of finds);
- Photographic Register; and
- OASIS record form.

5.4. ANALYSIS, PUBLICATION AND PUBLIC ENGAGEMENT

- 5.4.1. Should the results of the evaluation and mitigation works identify remains of a significance meriting further analysis and publication, a report on the results of the work, including any further analysis of the site archive will be prepared for publication in a suitable archaeological journal to a scope agreed with SCCAS.
- 5.4.2. The results of the investigations may have significant local interest. While the technical post-excavation reporting shall be released to the public, it may be appropriate to disseminate the results in a less technical manner such as public presentations, educational packs etc. The scope of any public engagement will be agreed with SCCAS.

6. ARCHIVE

- 6.1.1. The site archive will be assembled in accordance with Guidelines for Preparation and Deposition of Archaeological Archives in Suffolk (SCCAS Conservation Team 2014). MoRPHE (Historic England 2015), Guidelines for the Preparation of Excavation Archives for Long-term Storage (United Kingdom Institute for Conservation, 1990), Standards in the Museum Care of Archaeological Collections (Museums and Galleries Commission, 1994); and relevant ClfA standards and guidance will be used as good practice guidance.
- 6.1.2. The site archive will contain all the data collected during the fieldwork, including records and finds, and all reports. The archaeological contractor will ensure that the archive is quantified, ordered, indexed and internally consistent, and adequate resources will be provided to ensure that all records are checked. Archive consolidation will be undertaken immediately following the conclusion of fieldwork.
- 6.1.3. The archaeological contractor will contact the SCCAS Archaeological Collections Officer to determine costs and accession arrangements for the archive prior to deposition at Suffolk Archaeological Services Store.

7. OPERATIONAL FACTORS

7.1. PROJECT TIMETABLE AND MONITORING ARRANGEMENTS

- 7.1.1. A programme of archaeological works and access will be agreed as necessary between the archaeological contractor, the main contractor and SCCAS before the project commences.

7.2. HEALTH AND SAFETY

- 7.2.1. With specific regard to site hazards, the archaeological contractor will be responsible for ensuring that all works are conducted in a safe manner. The archaeological contractor will report immediately the nature and extent of any unexpected site hazards and the appropriate health and safety precautions required.
- 7.2.2. Dependent on the timing of work the archaeological contractor may be supplied with an overall site risk assessment by the main contractor and these documents and all relevant health and safety regulations will be adhered to throughout. The archaeological contractor field staff may have to attend site inductions.

7.3. INSURANCE

- 7.3.1. Full details of the insurance and copies of certificates covering the archaeological contractor shall be supplied to the managing archaeological consultant upon request by them.

PROJECT TEAM

- 7.3.2. The work will be undertaken by an archaeological contractor who is a Registered Organisation with the Chartered Institute for Archaeologists (CIfA), or by an archaeological contractor who will agree to abide by the standards and guidance documents of CIfA. The project will be managed by a fully qualified archaeologist with full membership of the CIfA.
- 7.3.3. Summary details of the proposed project team and specialist staff including post-excavation specialists will be provided with the archaeological contractor tender. CVs of the key members of staff will be available upon request.

7.4. COPYRIGHT

- 7.4.1. Copyright of reports will remain with the archaeological contractor under the Copyright, Designs and Patents Act 1988 with all rights reserved. An exclusive licence will be provided to the Applicant, and their appointed representative(s), for use of all project records and reports in all matters directly relating to the project. The archaeological contractor will retain the right to be identified as the author of all of their project documentation and reports.

8. REFERENCES

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- Historic England 2015 MoRPHE (Management of Research Projects in the Historic Environment)
- Historic England 2015 Geoarchaeology – Using earth sciences to understand the archaeological record
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- Mouchel 2016 Lake Lothing Third Crossing, Lowestoft, Suffolk: Written Scheme of Investigation for Watching Brief during Geotechnical Ground Investigation.
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- SCCAS 2017 Requirements for Archaeological Excavation
- Watkinson D and Neal V 1998 (3rd ed) First Aid for Finds
- United Kingdom Institute for Conservation 1990 Guidelines for the Preparation of Excavation Archives for Long-term Storage



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