



INDEX DATA	RPS INFORMATION
Scheme Title A13:m25 to Lakeside Widening	Details DMRB Stage II Assess. Archaeological Assessment
Road Number A13:m25	Date April 2001
Contractor RPS	
County Essex	
OS Reference TQ 5780	
Single sided ✓ Double sided A3 10 Colour 2 (1x A3)	

A13: M25 to Lakeside Widening

DMRB Stage II Assessment

Archaeological Assessment

Draft

Prepared by:
RPS Consultants, Oxford

April 2001

RPS Consultants

The Old Barn
Deanes Close
Steventon
Abingdon
Oxon
OX13 6SY

Tel 01235 821888
Fax 01235 820351
Email rpsox@rpsplc.co.uk

Contents

	Page No
S	
Non-Technical Summary	i-ii
1	
Introduction	1
2	
Aims and Objectives	2
3	
Methodology	3
4	
National and Local Planning Policy Background	5
5	
Geological and Topographical Background	8
6	
Historical and Archaeological Background	9
7	
Evaluation of Archaeological Importance	18

8

Assessment of the Impact and Effect of the Proposed Road Improvement upon the Archaeology	22
---	----

9

Conclusions and Recommendations	26
---------------------------------	----

10

Bibliography	29
--------------	----

Appendices & Figures

Appendices

- Appendix 1** Results of the Map Research
- Appendix 2** Results of the Aerial Photographic Research
- Appendix 3** County Council and District Council Policies
- Appendix 4** Aerial Photographs Consulted
- Appendix 5** Cultural Heritage Sites
- Appendix 6** Results of the Archaeological Site Walkover Survey
- Appendix 7** Review of the Preliminary Geotechnical Report for the M25 Junctions 30-31 and the A13 Widening Prepared by Mott MacDonald for the Highways Agency of October 1994

Figures

- RPSC 1 Site Location
- RPSC 2 Cultural Heritage Sites
- RPSC 3 Extracts from O.S. map Surveyor's Drawings from Essex Sheet Nos. 133 & 134 of 1805 (NMR Archive Refs. AO 1133 & AO 1134)
- RPSC 4 Extract from 6 inch-1 mile Scale O.S. Maps of 1873
- RPSC 5 Extract from 6 inch-1 mile Scale O.S. Maps of 1897-8
- RPSC 6 Extract from 6 inch-1 mile Scale O.S. Maps of 1921-23
- RPSC 7 Extract from 6 inch-1 mile Scale O.S. maps of 1938
- RPSC 8 Extract from 1:10,000 Scale O.S. Maps of 1961
- RPSC 9 Extract from 1:10,000 Scale O.S. maps of 1967-8
- RPSC 10 Extract from 1:10,000 Scale O.S. Maps of 1967-8

S Non-Technical Summary

- S.1 RPS Consultants have been commissioned by Parkman to undertake a Stage II Cultural Heritage Study of the proposed expansion and upgrading of the existing A13 trunk road from its interchange with the M25 motorway to Lakeside. The study is modelled on the recommendations for cultural heritage assessment in the Highways Agency *Design Manual for Roads and Bridges, Vol.11*. The study has included a review of the Essex County Sites and Monuments Record, the National Monuments Record and listed building and scheduled monument information held by English Heritage.
- S.2 This report provides an assessment of the **known** archaeology drawn from various research sources that are discussed in more detail in the Methodology section of this report. It provides the background for an assessment of the risk of unknown archaeology, the possibility of which should not be excluded. A total of six sites have been identified that may be affected.
- S.3 The aerial photographic research has identified two possible cropmark complexes within the area of this proposal. The first of these - RPS 21 - may be slightly affected by the proposal to expand the existing slip road from the A13/M25 interchange to the Stifford Road within an enhanced cutting. This feature was not noted on the ground by the walkover survey. Nearly all of the second complex - RPS 22 - may have already been removed by the construction of this interchange in the late 1970's. The potential impact of the slight expansion of the north western access road within this interchange on this site would be neutral.
- S.4 The proposed expansion of the viaduct over the Mar Dyke within an expanded and enhanced earthen embankment may have a slight adverse impact upon important known underlying environmental archaeological deposits (RPS 14-17) and upon at least two undated drainage ditches perhaps associated with former water meadows within the valley floor of the Mar Dyke (RPS 3). This impact may be derived from possible topsoil stripping and mounding associated with their construction and from the subsequent compaction upon these underlying deposits.
- S.5 The remains of at least forty deneholes or chalk extraction pits were located as the result of gravel quarrying in the mid 20th century (RPS 11) within the line of the present A13 trunk road. Although no further deneholes were encountered during the construction of this road, it is still possible that further such features may be encountered during the expansion and upgrading of the route corridor with a potentially uncertain impact.

- S.6 The Essex Sites and Monuments Record also notes the findspot of a mesolithic flint axe (RPS 7). The four figure national grid reference places this findspot to the immediate north of the existing A13 trunk road. However, the accompanying descriptive text would place the location of this findspot (from the "Mar Dyke Riverbank") closer to the Mar Dyke. Although of minor importance in itself, this findspot could indicate potential for further mesolithic activity within the area of the route corridor.
- S.7 Sites RPS 1, RPS 2, RPS 29 and RPS 30 identified by this study, although located in close proximity to this proposal, would remain unaffected by it.

1 Introduction

- 1.1 This Stage II cultural heritage desk based assessment report was commissioned by Parkman as part of an Environmental Assessment produced by RPS Consultants. It is based upon the recommendations in the *Design Manual for Roads and Bridges Vol.11* produced by the Highways Agency.
- 1.2 This report has been produced in order to assess the archaeological potential of the corridor of the proposed widening of the A13 trunk road between the M25 and Lakeside in the county of Essex.
- 1.3 The study is an assessment of the known and potential cultural heritage resource of the proposed road-widening corridor of the A13 trunk road between the M25 motorway and Lakeside, using existing written and graphic information. It is based upon the *Standard and Guidance for Archaeological Desk Based Assessments* (Institute of Field Archaeologists September 1999). It outlines the results of the desk top assessment and survey, and identifies the aims and objectives of the study. Information on the planning, geological, topographical, archaeological and historical background is used to assess the potential for cultural heritage in the area of the proposal.
- 1.4 This project is managed by David Freke MA FSA MIFA and the research and report writing were undertaken by Neville Hall BA (Hons) DipArch AIFA.

2 Aims and Objectives

- 2.1 The general aim of the desk based assessment is to gain information about the known or potential cultural heritage resource within the route corridor, including its presence or absence, character and extent, date, integrity, state of preservation and relative quality, in order to make an assessment of its worth.
- 2.2 This will provide sufficient information for highway planning purposes to enable:
- the formulation of a strategy to ensure the recording, preservation and management of any significant cultural heritage material, or
 - the formulation of a strategy for further investigation, whether intrusive or not, where the character and value of the resource is not sufficiently defined to permit a mitigation strategy or other response to be devised.
- 2.3 The specific aims of this desk-based assessment are to identify any cultural heritage sites within the area of the proposed road-widening corridor of the A13 trunk road between the M25 motorway and Lakeside.

3 Methodology

- 3.1 This Stage II desk based assessment uses cultural heritage information obtained from a variety of sources, as recommended in the *DMRB Vol. 11*. These comprise:
- the Essex County Sites and Monuments Record;
 - the National Monuments Record;
 - listed buildings information from the National Monuments Record Centre and English Heritage;
 - Registers of Historic Parks and Gardens published by English Heritage;
 - early edition O.S. maps from Landmark Information Group Ltd.;
 - a site walkover survey by an RPS Consultants archaeologist;
 - a preliminary geotechnical report produced by Mott MacDonald for the Highways Agency; and
 - scheduled monument data from English Heritage.
- 3.2 Cultural heritage data was obtained from the Essex County Sites and Monuments Record (SMR) for cultural heritage sites located in the vicinity of the proposed scheme. The extent of this Study Area is shown on figure RPSC 2 and comprises a minimum 0.5-kilometre area around the line of the proposed A13 trunk road widening. The SMR sites are summarised in Appendix 5 of this report and are shown on figure RPSC 2. They have been assigned unique RPS numbers from 1 onwards.
- 3.3 Cultural heritage information was also obtained from the National Monuments Record (NMR) using the same Study Area. Each NMR entry has also been assigned a unique RPS number. This information is also summarised in Appendix 5 of this report and is shown on figure RPSC 2. A search of the NMR archives also produced extracts from early O.S. 3"-1 mile scale maps for the relevant parts of Essex. These extracts comprise figure RPSC 3.
- 3.4 Information on Listed Buildings for the Borough of Thurrock, Essex, was obtained from the Department of the Environment greenbacks and the Listed Buildings Database held at the National Monuments Record Centre at Swindon. Accompanying Listed Building Record map information was obtained from English Heritage. This information is summarised in Appendix 5 of this report and is shown on figure RPSC 2. Each of the listed buildings has also been assigned a unique RPS number.

- 3.5 A search of the Register of Historic Parks and Gardens for Essex, published by English Heritage, revealed that the nearest such site comprises Belhus Park. This Grade II Registered Historic Park and Garden is located some 600 metres to the north of the Study Area and would remain unaffected by the proposal.
- 3.6 The published lists of scheduled monuments for the Borough of Thurrock were also consulted. This identified no scheduled monuments within the Study Area. However, the site of a medieval moated manor house at Aveley is situated some 100 metres to the west of the Study Area. This site would not be affected by this proposal.
- 3.7 Early edition Ordnance Survey map data was also obtained from Landmark Information Group Ltd. Copies were obtained of the following maps:
- Extract from 6 inch-1 mile Scale O.S. Maps of 1873 - Figure RPSC 4;
 - Extract from 6 inch- 1 mile Scale O.S. Maps of 1897-8 - Figure RPSC 5;
 - Extract from 6 inch-1 mile Scale O.S. maps of 1921-23 - Figure RPSC 6;
 - Extract from 6 inch- 1 mile Scale O.S. maps of 1938 - Figure RPSC 7;
 - Extract from 1:10,000 Scale O.S. Maps of 1961 - Figure RPSC 8;
 - Extract from 1:10,000 Scale O.S. Maps of 1967-8 - Figure RPSC 9; and
 - Extract from 1:10,000 Scale O.S. Maps of 1975-7 - Figure RPSC 10.
- 3.8 An archaeological walkover survey of the Study Area was undertaken by an RPS Consultants archaeologist on Tuesday the 9th of April 2001. However, this survey was limited in that it was undertaken from public rights of way. These rights of way were in turn limited by the restrictions placed on access to certain areas of the Study Area by the current (April 2001) Foot and Mouth Regulations relating to public footpaths.
- 3.9 A review was undertaken of a preliminary geotechnical report produced by Mott MacDonald in October 1994 for the Highways Agency in respect of the proposed upgrading of Junctions 30-31 of the M25 and of the proposed widening of the A13 trunk road. This report provides an overall analysis in general terms of the nature of the underlying solid and drift geology that was likely to be encountered by these road construction proposals. It provides useful geological background information, but does not affect the conclusions reached by this study.

4 National and Local Planning Policy Background

Scheduled Monuments

- 4.1 Statutory protection for archaeology is principally enshrined in the *Ancient Monuments and Archaeological Areas Act* (1979) amended by the *National Heritage Act* (1983). Nationally important sites are listed in a Schedule of Monuments which is maintained by the Secretary of State for Culture, Media and Sport. Scheduled Monument consent is required for any work that would affect the fabric of a scheduled monument. There are no scheduled monuments within the Study Area for the proposal. The nearest scheduled monument is the site of a medieval moated manor house at Aveley. This is situated some 100 metres to the west of the Study Area, and would not be affected by this proposal.

Listed Buildings

- 4.2 Listed buildings are protected under the provisions of 54(i) of the *Town and Country Planning Act* (1971), as amended by the *Planning (Listed Buildings and Conservation Areas) Act* (1990) which empowers the Secretary of State to maintain a list of built structures of historic or architectural significance. There are two listed buildings within the Study Area. Neither the buildings nor their settings would be affected by this proposal.

English Heritage

- 4.3 English Heritage (the working title of the Historic Buildings and Monuments Commission for England) is consulted by the Secretary of State for Culture, Media and Sport on SM consent applications and may be asked to advise on other archaeological matters as it is mandated in the *National Heritage Act* (1983) "so far as is practicable, to secure the preservation of ancient monuments and historic buildings in England". As well as carrying out a general archaeological advisory role, it also monitors the situation of archaeology in the planning process, based on the *Planning Policy Guidance on Archaeology and Planning* (PPG 16) and *Planning Policy Guidance on Planning and the Historic Environment* (PPG 15).

DoE Planning Policy Guidance

- 4.4 The *Planning Policy Guidance on Archaeology and Planning* (PPG 16), published in November 1990 consolidates advice to planning authorities concerning the safeguarding of archaeology within the planning process. The guidance emphasises the irreplaceability of the archaeological resource, details the role of records kept in County Sites and Monuments

Records (SMRs), encourages early consultation with county archaeological officers, and sets out the requirements for applicants to furnish sufficient information about the impact of their proposals for reasonable planning decisions to be made. The document also indicates the circumstances in which further archaeological evaluation to provide this information would be necessary, and outlines the use of agreements and conditions to protect the archaeology if appropriate. The Essex County Sites and Monuments Record and the National Monuments Record were consulted. The results of these consultations are detailed on figure RPSC 2.

- 4.5 The Highways Agency's *Design Manual for Roads and Bridges (DMRB) Vol. 11* (August 1994), incorporates the principles of *PPG 16* and the procedures adopted for the proposed A13:M25 to Lakeside Widening scheme are in accordance with this advice.
- 4.6 *Planning and Policy Guidance on Planning and this Historic Environment (PPG 15)* published in September 1994 deals with Conservation Areas, Listed Buildings, World Heritage Sites, Historic Parks and Gardens, Historic Battlefields and the wider historic landscape. The nearest Historic Park and Garden is Belhus Park. This is a Grade II Registered site situated some 600 metres to the north of the Study Area. This site would remain unaffected by this proposal. Two listed buildings are located within the Study Area. Neither the buildings nor their settings would be affected by this proposal. No other type of site referred to in PPG 15 will be affected by the proposal.

The Highways Agency

- 4.7 The requirement to carry out an environmental assessment in relation to road schemes and the composition of Environmental Statements published with Draft Orders is contained in the *Highways Act* (1980 Section 105A). The Highways Agency has published in 2000, an environmental strategy document *Towards a Balance with Nature* which defines the Agency's heritage objective as "to ensure that in the planning and resourcing of trunk road projects there is an appropriate response to any adverse effects on the historic environment and that the fabric of our landscape is respected".
- 4.8 In 1993, the Department of Transport revised the guidelines for the treatment of environmental issues in the preparation of new roads and published *The Design Manual for Roads and Bridges (DMRB)*. Volume 11, Section 3 considers the treatment of cultural heritage evaluation issues.
- 4.9 This report constitutes a Stage II assessment as recommended by the *DMRB, Vol. 11*.

4.10 In July 1998 the Department of the Environment, Transport and the Regions (DETR) published *A New Deal for Trunk Roads in England: Guidance on the New Approach to Appraisal*. This document provides a staged approach to an assessment of the overall impact and effect of a proposal on the historic environment. This overall assessment is provided in a tabulated format.

5 Geological and Topographical Background

- 5.1 The Study Area for the proposed road corridor expansion is located on a geological boundary in terms of both drift and solid geology. Coarse loamy and sandy soils that usually overlie river terrace drift occur to the south while deep fine loamy and fine loamy over sandy soils that in turn overlie river terrace drifts are located to the north. Similarly, Oldhaven, Blackheath, Woolwich, Reading and Thanet Beds of the Palaeocene are situated to the south and London Clay of the Eocene occurs to the north.
- 5.2 The proposed road expansion corridor extends from a river terrace at the A13/M25 interchange to the west at heights of between 10-12 metres AOD. It then traverses the valley or flood plain of the Mar Dyke across a bridge prior to extending across the river terrace to the south of the Mar Dyke at heights of between 15-20 metres AOD.

6 Historical and Archaeological Background

- 6.1 The **palaeolithic** period (500,000-9000BC) represents the earliest period of human activity. This was the period when nomadic hunter-gatherers followed migratory animal herds. Evidence for their settlement is very rare and little evidence for their existence remains apart from individual finds of their flint implements such as hand axes, flint cores and flint flakes. Such stone tools are often derived from the River Thames gravels, but no such finds have been recovered from the Study Area.
- 6.2 The culture of the hunter-gatherer continued during the **mesolithic** period (9000-4500BC) in a still largely forested environment. More sophisticated flint implements were produced which reflected improvements in tool technology. Evidence of mesolithic settlement is also very rare. Exploitation of river resources was an important factor in the mesolithic economy. RPS 7 (see figure RPSC 2) relates to a stray find of a 'Thames Pick' of mesolithic date which was found on the bank of the Mardyke. In this case the proximity of a stream is likely to have been an attraction.
- 6.3 In approximately 4500BC, the first farms began to appear as large-scale clearance of the postglacial forests took place to make way for the first **neolithic** agricultural settlements (4500-2000BC). A mixture of crop growing and animal husbandry took place. Identifiable neolithic finds recorded in the Essex Sites and Monuments Record includes a neolithic polished flint axe knife (RPS 13) which was found near Stifford Bridge. Axes such as these may suggest the existence of clearances adjacent to the Mar Dyke at this time. Further evidence of neolithic activity on the line of the A13 trunk road is a flint knife (RPS 15) which was found close to the base of five metres of prehistoric peat (woody and marsh peat) deposits in the ancient Mar Dyke. The find was recovered during environmental work on the peat (RPS 14). The exposed peat produced further prehistoric finds including a perforated circular stone, which may have been used as a macehead (RPS 16 and 17).
- 6.4 During the **bronze age** (2000-650BC) agricultural activity intensified with more extensive woodland clearance. Agricultural settlement extended to the heavier soils as farming technology improved. The first metalworking took place with the use of bronze becoming well established for weapons and fine tools. Flint continued in use for everyday disposable items such as knives and arrowheads. Burial rites changed with the dead being buried in round barrows. There are no certain bronze age sites within the Study Area, although it is possible that some of the undated prehistoric sites and finds could belong to this period.
- 6.5 During the **iron age** (650BC-AD43) iron replace bronze as the utilitarian metal industry. Agricultural activity became more intensified. Increased social tensions may have led to the

proliferation of communal defensive structures, such as hillforts and fortified settlements that were based upon a tribal system. There are no certain sites of iron age date within the Study Area. A rectangular enclosure with associated pits is recorded to the immediate east of the Study Area at North Stifford-Ardale School (Essex SMR No.5019). It is possible that this site could date to either the bronze age or iron age periods. Similarly undated finds of a prehistoric pit and rubbing stone were recovered to the south of the junction of the A13 trunk road with the A126 road (RPS 10).

- 6.6 During the **Roman** period, a road network was constructed and more organised rural settlement and intensive agricultural activity began with the establishment of the villa system. These were farmstead estates with a variety of agricultural activities that included crop rotation and animal husbandry. There are no Roman sites or finds currently known within the Study Area. However, two cremation burials, each in an amphora, and presumably indicative of nearby settlement, are recorded to the immediate west of the Study Area at West Thurrock Home Farm (Essex SMR No.5017 and NMR No. TQ 57 NE 29). Roman sites are also known just to the east of the Study Area at North Ardale School, where in addition a prehistoric enclosure, a Roman period enclosure with rectilinear features and pits has also been identified (Essex SMR No.5020). A further cremation is also recorded in this vicinity (Essex SMR No.5023).
- 6.7 During the **Anglo-Saxon** period, (AD410-AD1066) the basis of the later medieval settlement pattern was established. The place names of many of the villages and parishes have their origin in this period. The place names of the later medieval settlements of Aveley, South Ockendon and West Thurrock may have had their origins in the late Saxon period. These place names are topographical in origin and none of them bear any direct reference to a settlement. The place name of Aveley is derived from the *leah*, or forest, glade or wood of *Aelgyo*, that of South Ockendon is derived from *Wokendune* or *Wocca's dune* or hill and West Thurrock from *Turroc* or *purroc* which may refer to a bend in the nearby River Thames or from a drain which may have flowed into the Thames. Although there are no entries on the Essex Sites and Monuments Record for the Saxon period within the Study Area, the North Stifford-Ardale School site to the immediate north east of the Study Area has produced Saxon occupation evidence. This includes sunken-floored buildings of early Saxon date, pits and rectilinear settlement features, a barrow and cremation and inhumation burials, (Essex SMR No. 5021).
- 6.8 The feudal society of the Normans after the invasion of 1066 set the pattern for the **medieval** period (AD1066-AD1530). The feudal system comprised manorial centres and open field systems based on nucleated villages. The settlement pattern that was established in the Anglo-Saxon period continued after the Norman Conquest of 1066. Although there are no

sites of this period within the Study Area, the scheduled moated medieval manorial site of Aveley Manor at Aveley is located to the immediate west of the Study Area.

- 6.9 The main evidence for medieval settlement activity within the Study Area would appear to come from place name evidence. All of the main medieval settlements within or in the vicinity of the Study Area were located in the Hundred of Chafford. The earliest evidence for the medieval settlement of Aveley comes from the Domesday Survey of 1086 with *Aluithelam*, *Aluieles* or *Auileiam* and refers to the *leah* forest, glade, clearing or wood of *Aelfgyo*. From the 11th century onwards Aveley was a large and flourishing village. Later medieval documentary references variously refer to *Alviukeia* (1157); *Alvithelæ* (1202); *Alvidelega* (1258); *Alvele* (1292); *Avithelē(gh)* (1316); *Awelay*, *Hawelay* and *Aulay* (1480) and *Albithley*, *Aveley* or *Aveley* by 1535. The medieval manor of Aveley comprised most of the southern part of the ancient parish. The manor of Belhus, Nortons, Manywares or Coppins Crouch was situated in the centre of the parish. The first three names were derived from 14th century tenants of the manor. While Coppins Crouch was the former crossroads at the south eastern corner of Belhus Park. Other medieval manors in the parish of Aveley included Bretts or Bretts Place, Kenningtons to the north –west and Bumpstead to the north east of the parish.
- 6.10 The earliest reference to the medieval settlement of South Ockendon also comes from the Domesday Survey of 1086 and refers to *Wokendune* and meaning *Wocca's dun* or hill. Other medieval documentary references variously refer to *Wukedone* (1206); *Wokedone* (1286); *Southwokyngton* (1407); *Woketon* (1427) and *Southokyngdon* by 1505. The Domesday manor of South Ockendon is thought to have occupied much the same area as that of the former parish.
- 6.11 Similarly, the Domesday survey provides the earliest documentary evidence for the medieval settlement of West Thurrock variously referring to *Turroc*, *Turocha*, *Thurrucca* and *Turrucca*. Later medieval documentary references detail *Thurroc*, *Thurroch*, *Thurrok*, or *Thurrock* (1195); *Thorrock* (1247); *West Thorruk* (1310); *West Hurrock* (1408) and to *Westthorke* by 1535. Etymologically, the place name of Thurrock may have derived from *purruc* meaning a small ship or the bottom part of a ship. Ekwall notes that The Thurrocks are a bend of the Thames and this bend may have been called *purruc* owing to a fancied similarity to a ship's bottom. Thurrock was also used to denote a drain, which may have flowed into the nearby River Thames.
- 6.12 At Domesday, West Thurrock was the most populous settlement in the Chafford Hundred. The medieval manor of West Thurrock or West Hall extended over most of the ancient parish, but was gradually reduced in size by the formation of later manors such as Michaelsand or Mitchells and Tendrings. The manor of Michaelsand or Mitchells was located in the north eastern corner of the ancient parish and included Mitchells Wood near the boundary with the

former parish of Aveley. The manor of Tendrings was situated in the north eastern corner of the ancient parish, to the east of Coombe Wood and extended eastwards into Stifford.

- 6.13 The medieval road pattern within the ancient parish of West Thurrock remained relatively unchanged until the 1920's. Mill Lane, which extended to Stifford Bridge formed the eastern boundary of the ancient parish for most of its length. While Stonehouse Lane, which crossed the Mardyke at Causeway Bridge was the main thoroughfare to London until the late 19th century.
- 6.14 The Causeway Bridge or Aveley Bridge which crosses the Mardyke in the south western corner of the Study Area was first mentioned in 1364, when it was said to have been built by William Brinson in order to improve communications between his manors of Aveley and west Thurrock. In the 14th century there was a ferry across the Thames from Aveley and thence to London. It was last mentioned in 1374. Coombe Wood is featured on the 6 inch-1 mile scale O.S. maps (see figures RPSC 4-7). Its name is probably derived from the home of Hugh de *Cumbe*, which may have been situated nearby and to which there is a documentary reference of 1324. The earliest documentary reference to Combe Wood itself dates from 1539.
- 6.15 The Grade II listed Courts Farmhouse at Aveley (RPS 18) is a late 14th or early 15th century house. This building is located to the immediate west of the Study Area.
- 6.16 During the construction of the M25 motorway in 1979, a chalk extraction pit or denehole was encountered and excavated at Mitchell's Wood (RPS 12). A further forty such features were exposed during the quarrying of gravel between Oak Wood and Brickbarn Wood in the mid 20th century (RPS 11). There is a direct relationship between the location of these sites and the underlying geology. The Mitchell's Wood denehole was a chalk extraction pit, and it is likely that this would have been the case for the Oak Wood features. Although the Mitchell's Wood denehole (RPS 12) was fully excavated, no datable artefacts were recovered from it. No further features of this nature were encountered during the construction of the A13 trunk road in the late 1970's-early 1980's between Oak Wood and Brick Barn Wood. Similar sites have yielded artefacts varying in date from the Roman period to the 13th century, but it is likely that a medieval date is more attributable to the Mitchell's Wood and Oak Wood deneholes. The marks of metal tool working indicate that they were dug when metal tools for such work were commonly in use.
- 6.17 The **post medieval** period has seen substantial changes to the landscape including the transformation from the feudal three-field system following the agrarian revolution and the accompanying enclosure of lands that took place during the 18th and 19th centuries. Accompanying technical change and innovation came with the industrial revolution and a further revolution in the means of transportation. The London, Tilbury and Southend Railway was opened in 1854 as far as Tilbury and passed through the parish of Aveley with a station at

Purfleet. A branch line from Grays was opened as far as Upminster in 1892 and included a station at South Ockendon (RPS 29).

- 6.18 The Grade II listed Davydowns at Black Lane, Stifford (RPS 9) is a late 17th century cottage. The Grade II listed Courts Farmhouse at Aveley (RPS 18) has 17th century and later additions at the rear of this 14th-15th century house.
- 6.19 The former parishes of Aveley, South Ockendon and West Thurrock from the medieval period onwards had been an area of mixed arable and pastoral agriculture. The Belhus Estate (located to the north of the Study Area) was an important component in the local farming economy of the parish of Aveley in the 16th and early 17th centuries. The local soils were ideally suited to vegetable cultivation and fruit growing, and market gardening to supply the nearby and ever-growing market of London took place from the late 18th century onwards.
- 6.20 Early industrial growth was based on locally accessible chalk deposits. Factors that favoured local industrial development included proximity to London and easy access to the River Thames, on which wharves and jetties could be constructed for the export of chalk and lime. From the 18th century onwards, chalk extraction became an important local industry and from this time onwards increasingly displaced agriculture as the main economic activity. This trend continued until the mid 20th century and chalk quarrying became very extensive. The chalk was originally used as an agricultural fertiliser and later used for the manufacture of lime, bricks and cement. In 1839 there were 85 acres of chalk pits documented in the parish of West Thurrock alone and by 1848 employed some 400 people in the parish. In Aveley parish, there is a reference on the 1842 tithe map to Chalk Pit Field. Chalk quarrying here was first mentioned in 1768, when chalk was widely used as a fertiliser and was probably quarried near the Mardyke. The historical map research for this study demonstrates the longevity and importance of this industry by the number of former chalk quarries and pits within the Study Area or in close proximity to it that are shown detailed on the early edition and later Ordnance Survey maps from 1897 onwards (see figures RPSC 5-10). This includes sites RPS 31 and 40 within the Study Area.
- 6.21 Gravel and clay extraction were also important local industries, particularly in the former parish of Aveley. Brickmaking was an important local manufacture. In 1619 there were brickfields in Belhus Park. Brickkiln Wood, field and mead were named on the tithe map of 1842. There are documentary references to a gravel pit at Gallowsheath Common as early as 1593. Gravel extraction continued in Aveley until relatively recently. Until recently also, the only industries in South Ockendon were the quarrying of gravel and the extraction of clay. The tithe map for the parish of 1839 details five "Gravel Pit Fields", a "Pits", a "Great White Pits" and a "Brick Clamps". The historical map research for this study has clearly demonstrated the importance of gravel and sand extraction. This study identified a large number of such extraction sites

from the late 1890's onwards (see figure RPSC 5-10) including sites RPS 30, RPS 32-39 and RPS 41-43.

- 6.22 A rural landscape with predominantly agricultural and mineral extractive industries is reflected in a relatively slow increase in the local population. Between 1801, the date of the first population census and 1931, the population of Aveley increased from 543 to 2003. A similar population growth occurred with South Ockendon, which grew from 466 in 1801 to only 1355 by 1931. The exception to these trends was West Thurrock. In the later 18th century, the population of West Thurrock was increased to 819 by the garrisoning of Purfleet during the Napoleonic War and by chalk quarrying activity inhabitants. Later population growth slowed until the 1870's. With the coming of modern industries the population of West Thurrock rose rapidly between 1871 and 1931 from 1165 to 5153.
- 6.23 With the coming of the Second World War, the proximity of this area to Nazi-occupied Europe and the threat of invasion during the early part of the war necessitated the urgent construction of static defences. The Essex County Sites and Monuments Record notes two such defensive sites from the last war within the Study Area. These include a pillbox (RPS 1), a road barrier and tank trap (RPS 2) to the west of the railway line. Both of these sites have since been destroyed. An air raid shelter is recorded at Ardale School (RPS 8).
- 6.24 After the Second World War the London County Council bought a large area of land in Aveley and South Ockendon and constructed the Belhus Estate to rehouse Londoners and to provide labour for the nearby riverside factories at Purfleet and West Thurrock. The building of the Belhus Estate and the Kennington Estate in the early 1960's to the north of the Study Area brought a rapid increase in the population of the area.
- 6.25 The former parish of Aveley remained part of the Rural District of Orsett until 1929 when it was joined with the parishes of West Thurrock and South Ockendon to form Purfleet Urban District. In 1936, the Purfleet Urban District was merged with that of Thurrock Urban District which in 1974 became the present Borough of Thurrock.
- 6.26 The Essex Sites and Monuments Record also notes the site of Davy Down Pumping Station (RPS 6) and the site of a complex including a school, workshop, swimming pool, water tower, infirmary and cottage home (RPS 5). This complex was constructed in 1901 by the Stepney Board of Poor Law Guardians to the design of a Mr. Frank Baggallay. During investigations at the site of the former Ardale School (RPS 8), only modern features such as the remains of a pit and a posthole were recorded during these investigations. All of these sites are situated at the eastern end of the Study Area.
- 6.27 The Essex Sites and Monuments Record also notes a series of drainage ditches across the flood plain of the Mar Dyke (RPS 3). These are apparent on both the early maps and on the early edition Ordnance Survey maps. These are thought to be drainage ditches reflecting the

possible use of the flood plain as water meadows perhaps from an early date. The extent of these features, as indicated from the Essex Sites and Monuments Record, is shown on figure RPSC 2, though the early map information from the early 19th century onwards shows these drainage features extending along the whole of the flood plain of the Mar Dyke within the Study Area (see figures RPSC 3-10).

- 6.28 There are a large number of archaeological sites within the Study Area for this scheme that have been plotted from aerial photographs, but which cannot be ascribed to any particular period or function with any degree of certainty. The Essex Sites and Monuments Record notes the cropmarks of possible extraction pits (RPS 4a) to the south of the Mar Dyke. The aerial photographic research for this project noted similar features on the northern side of the Mar Dyke (RPS 4b).
- 6.29 A possible cropmark complex consisting of at least two linear features and other irregularly shaped features were located to the north of Hangman's Wood (RPS 19). However, it is highly likely that nearly all of this complex has been removed by gravel extraction which took place in the 1960's (RPS 39) (see figure RPSC 9).
- 6.30 The construction of the B1335 road to the north east of Aveley may have already removed much of the second complex (RPS 20). This comprised a series of small irregular and circular shaped features. The cropmark site RPS 21, consisting of a number of circular and rectangular shaped features may have survived destruction from the recent construction of the M25 motorway to the west. However, the M25 motorway has removed nearly all of a further cropmark complex RPS 22. This similarly consisted of a series of small circular and rectangular shaped features.
- 6.31 The cropmarks of a linear feature which traverses two post-enclosure field boundaries, and several small circular shaped features, are located to the south of Aveley at the western edge of the Study Area (RPS 23). Two further cropmark complexes are located at the northern edge of the Study Area and to the north and north west of Brannett's Wood – RPS 24 and 25 respectively. Both complexes have been removed by modern housing development in the late 1950s and early 1960s. RPS 24 comprised linear, circular and other irregularly shaped features, while RPS 25 consisted of a series of irregularly shaped features.
- 6.32 The parchmarks of a series of small circular and other irregularly shaped features (RPS 26) were located in a field to the east of the railway line. It is likely that the eastern portion of this possible site has already been removed by the recent construction of a coach park. A second linear parchmark feature was noted to the south of the Mar Dyke and to the east of the railway (RPS 28). This may represent a trackway.

- 6.33 Many of the aerial photographs consulted feature a very large cropmark and parchmark complex that was located to the south of the Mar Dyke (RPS 27). This appeared to have been an extensive and complex site that may have reflected multi-period settlement activity and which appeared to extend into several fields. This complex appeared to comprise linear features, circular features of varying sizes; other irregular shaped features and other very small pit-like features. Unfortunately none of this complex has survived the very extensive gravel and chalk extraction that took place to the south of the Mar Dyke (RPS 35, 36 and 40), which can be traced on the historical maps.
- 6.34 The potential multi-period nature of these cropmark sites is illustrated by archaeological fieldwork that was undertaken during the construction of the M25 and of the A13 trunk road in the late 1970's. Two archaeological sites that were investigated and excavated during these works, though not located within the Study Area, are close to it. The first of these sites was situated on the line of the future M25 motorway through Belhus Park 0.5 kilometres to the north of the Study Area. These archaeological excavations recorded early iron age settlement features, a middle iron age enclosure and Roman enclosures and pits. The second site was situated at the Ardale School c0.5 kilometres to the east of the Study Area and on the line of the new A13 trunk road. This located an unenclosed middle to late iron age settlement with round houses, enclosures and pits which continued on into the early Roman period. A group of 3rd-4th century inhumation burials and an early Anglo-Saxon settlement with an associated cemetery were also recorded.
- 6.35 Perhaps the most significant effect of the construction of the M25 motorway and of the A13 trunk road was that it presented a unique opportunity to examine an environmental sequence of the Mar Dyke alluvial deposits. Where the A13 trunk road crossed the Mar Dyke on a viaduct, three deep sections were exposed within these alluvial deposits. Environmental samples provided a complete chronological sequence of vegetational and land usage change from the mesolithic to the post medieval (RPS 14). During the mesolithic period, the Mar Dyke was fully estuarine without a flood plain. During the early neolithic the lower valley floor of the Mar Dyke was partially covered by deciduous woodland, but flooding during the later neolithic blanketed this woodland and the valley floor with extensive silt deposits. By the early bronze age there would appear to have been a slow but progressive decline in woodland cover in the vicinity of the Mar Dyke which may indicate the first traces of woodland clearance and possible settlement. The Mar Dyke was probably still estuarine at this time providing an important and convenient transport artery between the Thames and its hinterland. From the mid bronze age onwards, a rapid rise in human settlement activity, probably concentrated into small settlements, is suggested by a correspondingly rapid decline in tree cover. By the iron age there is an increased rate of woodland clearance indicating increased settlement activity which reached a peak during the Roman period, when tree cover was at a minimum. However, from the end of the Roman period onwards, the valley floor of the Mar Dyke developed peat beds

and the stream became freshwater. This would correspond with the beginning of the Dark Ages and the collapse of the villa agricultural systems as this land was abandoned. This situation persisted during the early Saxon period with the Mar Dyke valley floor becoming fenland. By the medieval period, the fenland was overlooked by small agricultural settlements such as Aveley and South Ockendon.

7 Evaluation of Archaeological Importance

7.1 The assessment of the EFFECT of the proposal and the archaeological resource will depend upon the assessment of the IMPORTANCE of the features and sites affected and the degree of IMPACT of the proposals. There are occasions when insufficient is known to make informed judgements and an assessment of RISK is all that can be offered. The definitions of these terms and their categories are set out below. The overall effect of a scheme is termed the *significance of effect*.

IMPORTANCE: the criteria set out in Annexe 4 of PPG 16, modified to take account of the whole range of site values, not just scheduled monuments, are used as guides for judgements of importance used in cultural heritage studies. The DMRB Vol. 10 endorses these criteria (DMRB 10.3.2 Annex II). The DMRB defines 4 categories of importance:

National:	the highest status of site e.g. scheduled monuments, Listed Buildings Grade I & II*, well preserved historic landscapes;
Regional or county:	the bulk of sites with reasonable evidence of occupation, ritual, industry etc., Listed Buildings Grade II, reasonably preserved historic landscapes;
District or local:	sites with some evidence of human activity, but in a fragmentary or poor state, buildings of local importance, dispersed elements of historic landscapes;
Unimportant:	destroyed sites, non-antiquities, random stray finds, buildings of no merit.

A further category is included here:

Uncertain:	insufficient evidence available to judge importance.
-------------------	--

These categories are implicitly endorsed by the *New Approach to Appraisal* (DETR 1998) with a further and highest category of **International**.

7.2 Under the above-defined criteria of importance, there are a number of sites that may be affected by the A13: M25 to Lakeside Widening proposal. Only an appraisal of the potential importance can be made with the available data and this is set out below:

Sites of **National** importance include:

There are no sites in this category of importance within the Study Area.

Sites of regional or county importance include:

- RPS 9 – Grade II listed 17th century cottage at Davydowns, Back Lane, Stifford;
- RPS 10 – prehistoric pit and rubbing stone found at Tunnel Cement Pits, south of the A13 trunk road;
- RPS 11 – site of the Mar Dyke deneholes, possible medieval extractive pit with well;
- RPS 12 – possible medieval extractive pit or denehole found along the M25 to the south of the Mar Dyke;
- RPS 14 – extensive prehistoric peat deposits encountered during construction of foundations for the Mar Dyke viaduct;
- RPS 16 – prehistoric finds recovered from environmental sections at the Mar Dyke;
- RPS 18 – Grade II listed Courts Farmhouse, Park Lane, Aveley, late 14th-early 15th century house with 17th century and later extensions at the rear; and
- RPS 29 – Romford and Grays branch line of the London, Tilbury and Southend Railway.

Sites of District or Local importance consist of:

- RPS 5 – complex comprising school, workshop, water tower, infirmary etc. constructed by the Stepney Board of Guardians in 1901;
- RPS 6 – Davy Down Pumping Station;
- RPS 7 – findspot of a mesolithic flint pick;
- RPS 8 – site of former Ardale School, associated air-raid shelter, pit and post hole found during site investigations;
- RPS 13 – findspot of a polished flint axe;
- RPS 15 – findspot of a neolithic flint knife found within the lower peat deposits of the Mar Dyke;
- RPS 17 – findspot of a prehistoric perforated circular stone or possible macehead;
- RPS 30 – map reference of 1897-8 to site of a former gravel pit on the western side of the railway line RPS 29;
- RPS 31 – map reference of 1897-8 to the site of old chalk quarries;
- RPS 32 – map reference of 1921-3 to site of old gravel pit to the south east of Hangman's Wood;

RPS 33 – map reference of 1961 to the site of a former gravel pit to the south east of Hangman’s Wood;

RPS 34 – map reference of 1961 to the site of a former gravel extraction area to the south of the Mar Dyke;

RPS 35 – map reference of 1961 to the site of a former gravel extraction area to the south of the Mar Dyke;

RPS 36 – map reference of 1961 to the site of a former gravel extraction area to the south of the Mar Dyke;

RPS 37 – map reference of 1961 to the site of a former sandpit to the north of Aveley;

RPS 38 – map reference of 1967-8 to the site of a former gravel extraction pit to the south east of Hangman’s Wood;

RPS 39 – map reference of 1967-8 to the site of a former gravel extraction pit to the north of the Stifford Road;

RPS 40 – map reference of 1975-7 to the site of a former chalk extraction area to the south of the Mar Dyke;

RPS 41 – map reference of 1975-7 to the site of a former gravel extraction pit to the east of the railway;

RPS 42 – map reference of 1975-7 to the site of a former gravel extraction pit to the south east of Aveley; and

RPS 43 – map reference of 1975-7 to the site of former gravel pits to the north of the Mar Dyke.

Sites that are **unimportant** comprise:

RPS 1 – site of now destroyed pillbox; and

RPS 2 – site of now destroyed road barrier tank trap.

Sites of **uncertain** importance include:

RPS 3 – undated drainage ditches, possibly of water meadows along the Mar Dyke;

RPS 4a, 4b – aerial photographic references to the cropmarks of undated extraction to the north and south of the Mar Dyke;

RPS 19 – cropmark complex to the north of Hangman’s Wood;

RPS 20 – cropmark complex to the north east of Aveley;

RPS 21 – cropmark complex to the west of Hangman's Wood;

RPS 22 – cropmark complex to the west of Hangman's Wood;

RPS 23 – cropmark complex to the south of Aveley;

RPS 24 – cropmark complex to the north of Brannett's Wood;

RPS 25 – cropmark complex to the north east of Brannett's Wood;

RPS 26 – parchmark complex to the east of the railway line;

RPS 27 – large cropmark and parchmark complex comprising a possible settlement site to the south of the Mar Dyke; and

RPS 28 – linear parchmark feature representing a possible trackway.

- 7.3 Using these criteria of importance, it is possible to assess the **impact** of a particular proposal upon each cultural heritage site. To achieve this, it is necessary to define "impact". The impact upon a cultural heritage site is dependent upon the scale of importance attached to that particular site and the amount of anticipated damage to it. For example, a small degree of damage to a site of national importance such as a scheduled monument could have a larger impact than a large amount of damage to a site of District or Local importance. A scale of impact is illustrated in the following section 8 of this report.
- 7.4 Using this definition of impact and applying the scales of importance it is possible to accurately gauge the relative degree of **effect** that a particular proposal would have upon the cultural heritage resource as a whole. To arrive at this point, it is necessary to assess the accumulated impacts that a particular proposal as a whole would have upon the whole cultural heritage resource. A scale of effect is illustrated in the following section 8 of this report.

8 Assessment of the Impact and Effect of the Proposed Road Improvement upon the Archaeology

8.1 The impact and effect of proposed road scheme upon the cultural heritage can be assessed using a scale that takes into account the degree of encroachment, the relative importance of the cultural heritage sites and other factors. This assessment of impact and effect with any potential mitigation measures may be presented in tabular form for the proposed road scheme as follows:

Scale of Importance	1	National
	2	Regional or County
	3	District or Local
	4	Unimportant
	5	Uncertain
Scale of Impact (Adverse)	1	Large
	2	Moderate
	3	Slight
	4	Neutral
	5	Uncertain
Scale of Effect	1	Large beneficial (positive)
	2	Moderate beneficial (positive)
	3	Slight beneficial (positive)
	4	Neutral
	5	Slight adverse (negative)
	6	Moderate adverse (negative)
	7	Large adverse (negative)
	8	Uncertain

A13: M25 to Lakeside Widening

The overall effect of the proposed road-widening corridor between the A13/M25 interchange and Lakeside would be **slight adverse**.

Reference	Impact	5	4	3	2	1
22	575 802 Cropmark complex of a series of rectangular and circular shaped features			5	4	
21	576 804 Cropmark complex of a series of circular & rectangular shaped features to the west of Hangman's Wood			5	3	
3	Linear Undated drainage ditches or boundaries of possible water meadows along the valley floor or flood plain of the Mar Dyke			5	3	

Nearly all of this complex would have already been removed by the construction of the existing A13/M25 junction interchange. This proposal would involve some slight expansion to the east of the north western sliproad involving additional land take. Given the high probability of the destruction of much of this possible site already, impact may be neutral.

Portion of the proposed widening of the existing sliproad from the A13/M25 interchange to the Stifford Road would be contained within a cutting. This would involve additional land take to the east, which may have a slight adverse impact upon this site. Extent & nature of this site would need to be verified by evaluation involving geophysical survey & trenching to be followed by further mitigation if necessary.

The maps of 1805 (see figure RPSC 3) show many more of these boundaries than those noted by the Essex SMR. They are seen to extend along the whole flood plain of the Mar Dyke. The proposed road widening to four lanes and the upgrading & expansion of the existing bridge over the Mar Dyke would be raised within an enhanced and expanded embankment with greater land take. The remains of at least two of these former boundaries (detailed on the 1805 map, but since removed) could be affected by possible compaction, topsoil stripping & mounding associated with the construction of the embankment. Nature of these features would need to be investigated by evaluation.

14	5800 8000	Environmental sampling of three exposed sections of the Mar Dyke alluvial deposits during the construction of the A13 viaduct over the Mar Dyke. This revealed an archaeological sequence of vegetational change and land usage from the mesolithic to the post medieval period.	2	3	<p>The proposed expansion of the existing A13 trunk road to accommodate four lanes would necessitate a corresponding expansion of the road viaduct over the Mar Dyke. This expansion of the viaduct would require an expansion of the existing embankments to the N & S with a new access road to the N. This would also require a greater land take to the N & S. The construction of these enhanced embankments may require topsoil stripping and mounding. These activities together with compaction may impact upon known underlying environmental archaeological deposits. Examination & sampling of sections of the alluvial deposits would be required prior to construction.</p> <p>These small extractive pits are of uncertain origin but in this context were probably used for chalk extraction. It is thought in this context also that they may be of medieval origin for early chalk extraction as noted in this study. Although no such features were recorded during the original construction of the A13 trunk road in the late 1970's, it is possible that additional features of this nature may be encountered. The proposal to enhance the existing road to 4 lanes within a larger cutting and greater land take may thus have a potential, though uncertain impact. Should further such features exist within this boundary, archaeological evaluation may be required, followed by further mitigation if necessary.</p>
11	5860 7980	"Mardyke Deneholes". c40 extractive pit sites found during quarrying of local gravel in the mid 20 th century between Oak Wood and Brick Barn Wood	2	5	<p>Four figure NGR given by the Essex SMR places this findspot some 80 metres to the N of the existing A13 trunk road. Its locational data is more likely to place this findspot further to the north towards the Mar Dyke. Although not important in itself, this findspot could indicate potential for further mesolithic activity within the area of the route corridor.</p>
7	5900 8000	Findspot of a mesolithic flint pick recovered from the "Mar Dyke Riverbank".	3	4	

29	Linear	The Romford and Grays Branch of the London, Tilbury and Southend Railway. Opened in 1892.	2	4	The eastern end of this proposal would be located between 80-150 metres to the west of this railway line, which would remain unaffected.
----	--------	---	---	---	--

30	590 795	O.S. map reference of 1897-8 (figure RPSC 5) to site of former gravel extraction pit	3	4	This gravel pit was located on the western side of the railway line (opened in 1892) and therefore would postdate the railway construction. The outline of this pit can be traced as far as the O.S. map of 1961 (see figure RPSC 8). By this time, this feature would have been long backfilled. This proposal is located well to the north of this former site and would not affect it.
1,2	5892 7947 5892 7945	Second World War pillbox and road barrier tank trap. Both sites are noted by the Essex SMR as being destroyed	4	4	Both of these former sites are located well to the south of this proposal and would not be affected by it.

9 Conclusions and Recommendations

- 9.1 This report provides an assessment of the known archaeological potential of the area of the A13/M25 to Lakeside road widening proposal. It should be recognised that there is always the potential for previously unknown archaeological sites and deposits to be encountered particularly from large schemes such as this. The possibility that unknown archaeological sites could be encountered during the implementation of this road improvement scheme should always be considered.
- 9.2 This desk based study has included a review of information on cultural heritage sites in the Study Area held by the Essex County Sites and Monuments Record, the National Monuments Record and English Heritage. It has also included extensive map and aerial photographic research and a site walkover survey. It is recommended that in order to provide a more complete archaeological assessment of the road expansion corridor, that earlier historical and pre-Ordnance Survey map research should be undertaken at the Essex County Record Office. This should be undertaken as part of the Stage III archaeological assessment process.
- 9.3 The aerial photographic research for this project identified two possible cropmark complexes at the north western portion of the Study Area. These both comprise circular and rectangular shaped features, which may indicate possible multi-period settlement activity (RPS 21 and RPS 22). The site RPS 21 was not observed on the ground during the walkover survey. It is likely that nearly all of the complex RPS 22 would have already been removed by the construction of the M25/A13 junction interchange in the late 1970's-early 1980's. The proposed expansion of the north western slip road to this interchange would involve a small amount of additional land take. Given the probability that much of this site may have already been removed, the potential impact upon this site from this proposal could be neutral. The second complex RPS 21 may be affected by the proposed widening of an existing slip road from the interchange to the Stifford Road. This would involve the widening of the existing cutting with some additional land take. There may be a slight adverse impact upon the western portion of this site. The extent and nature of this site would need to be verified by archaeological evaluation involving detailed geophysical survey and trial trenching. Further mitigation measures in advance of construction may also need to be considered.
- 9.4 The potential multi-period nature of these cropmark sites was illustrated by the archaeological excavations which took place during the construction of the M25 motorway through the Belhus Park, some 0.5 kilometres to the north of the Study Area. These excavations encountered early iron age to Roman settlement activity.

- 9.5 The Essex Sites and Monuments Record makes note of an area of some 40 deneholes or chalk extraction pits that were encountered during gravel extraction between Oak Wood and Brick Barn Wood in the mid 20th century (RPS 11). Although the construction of the A13 trunk road in the late 1970's did not encounter any of these sites, it is always possible that additional deneholes may be encountered by the proposal to expand the trunk road to four lanes. This would be achieved within a larger cutting involving additional land take. Although potential impact is uncertain, should further deneholes be encountered, they would need to be archaeologically excavated prior to construction works.
- 9.6 The environmental sampling of three deep exposed sections during the construction of the A13 viaduct over the Mar Dyke in the late 1970's produced an invaluable archaeological stratigraphical sequence illustrating changing patterns of land use and of vegetational change from the mesolithic to the post medieval periods (RPS 14). The upgrading of the A13 trunk road to four lanes would necessitate a corresponding expansion of the width of the viaduct and other associated access roads. This expansion is to be accommodated within enhanced earthen embankments which would further encroach upon the valley of the Mar Dyke with additional land take. Topsoil stripping and mounding associated with the construction of these embankments and later compaction from the completed earthworks could have a slight adverse impact upon the known underlying archaeological environmental deposits contained within the alluvial deposits of the Mar Dyke. It is recommended that further environmental sampling of these important archaeological deposits should take place prior to construction works.
- 9.7 Related to this, the Essex Sites and Monuments Record and the historical map research undertaken for this study has identified a large number of undated drainage ditches that occur along the valley of the Mar Dyke (RPS 3). Many of these landscape features associated with pastoral water meadows are no longer detailed on the modern maps, though the walkover survey noted the remains of several of these features on the ground. The remains of at least two such features identified on the maps of 1805 (see figure RPSC 3) may be affected by the upgrading and expansion of the Mar Dyke viaduct through the construction of the raised embankments and from subsequent compaction. The nature and origin of these undated features would need to be investigated by archaeological evaluation. In addition, further mitigation measures may need to be considered prior to construction works.
- 9.8 The Essex Sites and Monuments Record also notes the findspot of a mesolithic flint pick that was recovered from the "Mar Dyke Riverbank". Its imprecise location is likely to place this findspot further northwards and towards the Mar Dyke. Although of minor importance in itself, this findspot could indicate potential for further mesolithic activity within the area of the route corridor.

9.9 Four further cultural heritage sites located at the eastern end of the Study Area – RPS 29, RPS 30, RPS 1 and RPS 2 would remain unaffected by this proposal.

10 Bibliography

Register of Historic Parks and Gardens, Part 15, Essex, English Heritage

Place Names in the Landscape, Margaret Gelling, (1993)

The Place Names of Essex, English Place Name Society, Vol.12, (1935), pp122-131

Oxford Dictionary of English Place Names, E.Ekwall, Fourth Edition, (1964), pp 19, 347 & 472

Victoria County History of Essex, Vol.7, (1978), pp1-13, 57-73 & 117-123

The Monuments of South East Essex, Vol.IV, RCHME, (1923), pp4-10, 140-143 & 167

Archaeology and Environment in South Essex: Rescue Archaeology Along the Grays By-pass, 1979-80, T.J.Wilkinson, East Anglian Archaeology, Vol.42 (1988)

M25 Junctions 30-31 & A13 Widening, Preliminary Geotechnical Sources Study Report, Mott MacDonald, (October 1994)

Appendices

Appendix 1

Results of the Map Research

Appendix 1: Results of the Map Research

- A1.1 A search of the early Ordnance Survey map archives of the National Monuments Record produced the extracts from the early Ordnance Surveyor's drawings of 1805 at a scale of 3 inches to the mile. This forms figure RPSC 3 and were the earliest maps looked at. These maps clearly demonstrate a rural landscape with woodland and the early post enclosure field systems. The main turnpike roads linking the main settlement so Aveley, West Thurrock and Stifford Bridge are also all detailed.
- A1.2 The remainder of the early edition Ordnance Survey maps was obtained from Landmark Information Group Ltd. The earliest map from this search was the 6 inch-1 mile scale map of 1873 forming figure RPSC 4. This predominantly shows the Study Area and its immediate environs. This map shows more details than the maps of 1805. The 1873 map similarly details a predominantly rural landscape with woodland and turnpike roads such as Back Lane. The only major changes to the landscape of the Study Area between 1805 and 1873 would appear to be changes to the post enclosure field patterns with amalgamations of smaller fields into larger units.
- A1.3 Figure RPSC 5 comprises the 6-inch to one-mile scale maps of 1897-8. This map shows no change to the rural landscape between 1873 and 1898 apart from the construction of the Romford and Grays branch line of the London, Tilbury and Southend railway (RPS 29) and a gravel extraction pit (RPS 30) on the western side of the railway. A series of old chalk pits are featured within the Study Area (RPS 31) and to the south of the Study Area reflecting the former importance of the chalk extraction industry. These pits are also featured on the 1878 map and may have been in production at that time.
- A1.4 The 6-inch to one-mile scale maps of 1921-23 comprise figure RPSC 6. This map similarly shows that little change took place to the landscape of the Study Area between 1898-1923. The only additional cultural heritage site would appear to be an old gravel pit (RPS 32) to the east of Hangman's Wood. This is not featured on the 1897-8 maps, but must presumably have been in production either at or before that date. The majority of the chalk pits to the south of the Study Area have been converted to woodland areas. A large gravel pit is featured for the first time to the south of Back Lane and to the south of the Study Area.
- A1.5 The 6 inch to one mile scale map of 1938 (see figure RPSC 7) again shows very little change to the rural landscape of the Study Area between 1923 and 1938. The only major change was the construction of the London to Southend Arterial Road along much of the former line of Back Lane. This was opened in 1925 and incorporated sections of Back Lane. The chalk quarries here detailed as *old chalk quarries* (RPS 31) and the gravel pit RPS 32 are also featured. The gravel pit formerly located to the south of Back Lane is now traversed by the Arterial Road.

- A1.6 By contrast, the 1:10,000 scale maps of 1961 (see figure RPSC 8) show major changes to the landscape of the Study Area that first took place after the Second World War. To the north of Hangman's Wood, Millard's Garden and Brannet's Wood are the housing estates constructed by the London County Council which encroach into the northern portions of the Study Area for the first time. Extensive gravel extraction is also evident from the large number and size of various gravel extractions pits that are also featured for the first time to the north and south of the Mar Dyke. This has replaced the formerly predominant agricultural activity reflecting the radical changes to the post war landscape. The old gravel pit – RPS 32- to the south east of Hangman's Wood is featured. These additional gravel pits are shown plotted onto figure RPSC 2 and comprise a second and more extensive gravel pit to the south east of Hangman's Wood (RPS 33) and three large gravel extractions pits to the south of the Mar Dyke (RPS 34-36 respectively). Chalk extraction is represented by a large quarry complex that also includes further gravel extractions areas to the south of the Arterial Road, though these are located to the south of the Study Area. The former chalk quarries RPS 31 are no longer featured on this map. A sandpit is also shown to the north of Aveley (RPS 37).
- A1.7 The radical transformation of the former rural landscape into a predominantly industrial landscape is more pronounced on the 1:10,000 scale O.S. maps of 1967-8 (see figure RPSC 9). Much of the gravel quarrying activity to the south of the Mar Dyke (RPS 34-36) has ceased and has been replaced by rough grassland or scrub. The chalk and gravel quarrying activity to the south of the Arterial Road and to the south of the Study Area appears to be still in production. Similarly, the large gravel extraction pit to the south east of Hangman's Wood (RPS 33) has also become disused to be replaced by a large body of water. However, this has subsequently been replaced by further quarrying activity (RPS 38) situated between the former quarry and Hangman's Wood. Further new gravel quarrying activity (RPS 39) is also apparent to the north of the Stifford Road. The early post war urban growth around South Ockendon has not advanced beyond its limits reached by 1961. By 1968, the sand pit (RPS 37) had become disused to be replaced by an area of rough grassland or scrub.
- A1.8 The 1:10,000 scale O.S. maps of 1975-77 (see figure RPSC 10) shows that the area devoted to contemporary or former chalk or gravel extraction has reached its height. Former gravel quarrying activity to the south of the Mar Dyke (RPS 34-36) and to the south of the Arterial Road has been replaced by a very extensive chalk quarrying activity (RPS 40). New gravel quarrying is featured to the east of the railway (RPS 41) and to the south east of Aveley (RPS 42). The former sandpit to the north of Aveley (RPS 37) is marked as disused and further disused gravel pits are shown to the immediate north of the Mar Dyke for the first time (RPS 43).

Appendix 2

Results of the Aerial Photographic Research

Appendix 2: Results of the Aerial Photographic Research

- A2.1 A search was commissioned of the oblique and vertical aerial photographic collections of the National Library of Air Photographs held at the National Monuments Record Centre, Swindon for the whole of the Study Area. The extent of this Study Area is featured on figure RPSC 2.
- A2.2 A further cropmark complex (RPS 22) consisting of a series of circular and rectangular shaped features was located to the west of Hangman's Wood. These features are detailed on aerial photograph ref. 82/1230, frame 43, (July 1955). Nearly all of this complex would have been removed by the construction of the Junction 30 interchange of the M25 Motorway.
- A2.3 The Essex Sites and Monuments Record notes the cropmarks of extraction pits of uncertain date (RPS 4) situated to the immediate south of the Mar Dyke. These features are shown on aerial photograph refs. 540/1543, frame 53, (March 1955) and 106G/UK/1447, frame 3096, (May 1944). Further similar features are shown to the immediate north and on the northern side of the Mar Dyke.
- A2.4 Aerial photograph ref. 82/1315, frame 45, (October 1955) details a very large cropmark and parchmark complex (RPS 27) that may represent the remains of a possible settlement. This complex was situated to the south of the Mar Dyke, but has been removed by extensive chalk extraction. This complex extends into the adjoining field to the east and north as a series of linears, circular shaped features of varying sizes, irregularly shaped features and other very small pit-like features on aerial photograph refs. 106G/LA21, frame 3107, (July 1944), 106G/LA/236, frames 3161-3162; 106G/LA/23, frame 4144, (July 1944); 58/1017, frame 0044, (February 1953); 58/1019. Frame 0168, (February 1953); 82/711, frames 0327-0328, (February 1953) and 540/1075 frame 0138, February 1953.
- A2.5 A cropmark complex consisting of a series of irregularly shaped features (RPS 25) was located in a field to the immediate west of the railway and to the north east of Brannet's Wood. This complex is detailed on aerial photograph refs. 106G/LA21 frames 3106-3107 (July 1944). This complex was removed by housing development in the 1950's-early 1960's. In the adjacent field to the west is a further cropmark complex of circular, linear and other irregularly shaped features (RPS 24). These are shown on the same aerial photographs.
- A2.6 One further complex is featured on aerial photograph refs. 106G/LA21, frame 3107, (July 1944), 106G/LA/236, frames 3161-3162, (July 1944), 106G/LA/23, frames 4145-4146, (July 1944) 106G/LA26, frame 3026, (August 1944) and 106G/LA31, frame 3022, (August 1944). This is located to the immediate north of Hangman's Wood and consists of two linear, small circular features and other irregularly shaped features (RPS 19). Much of this complex may have been removed by gravel quarrying in the 1960's (RPS 39) (see figure RPSC 9).

- A.2.7 Two further cropmark sites are also featured on aerial photograph ref. 106G/LA/236, frame 3161, (July 1944), 106G/LA/23, frames 4145-4146, (July 1944) and 106G/LA26, frame 3026, (August 1944). The first of these is sandwiched between Hangman's Wood to the east and the M25 motorway to the west (RPS 21). This site may have survived destruction and appears to consist of circular and rectangular shaped features. On the same aerial photographs is a second site in a field to the north east of Aveley (RPS 20). This comprises a series of small and irregularly shaped and circular shaped features. However, a portion of this site may have already been removed by the construction of the B1335 road.
- A.2.8 A complex is shown on aerial photograph ref. 540/720, frame 3134, (April 1952) to the south of Aveley (RPS 23) and which is bisected by the western boundary of the Study Area. This comprises a linear which traverses the boundary of two fields and several small circular shaped features. These features may have survived and located to the south of the scheduled moated site at Aveley.
- A.2.9 On oblique aerial photograph ref. TQ 5979/2/82 (August 1979) occurs a parchmark which a series of small circular and other irregularly shaped features (RPS 26). This site is located in a field to the immediate east of the railway line. The eastern part of this site may have already been removed by the construction of a coach park.
- A.2.10 Aerial photograph ref. 58/1017, frame 0041, (February 1953) shows a north east-south west linear parchmark feature (RPS 28) that extends across a field to the south of the Mar Dyke and to the east of the railway line. This may represent a possible trackway.

Appendix 3

County Council and District Council Policies

Appendix 3: County Council and District Council Policies

Essex County Council

- A3.1 Essex County Council has policies to protect Archaeology and Listed Buildings in the *Essex Replacement County Structure Plan, Draft Deposit Plan, February 1998*):

Listed Buildings

Policy HC3: Buildings, structures and features of special architectural, historic, archaeological or townscape importance, and their settings, will be protected from demolition, damage, and unsympathetic change.

Policy HC4: In areas where development would not otherwise be allowed, the conversion to new use of an existing building of special architectural or historic interest, may exceptionally be permitted in appropriate circumstances where this would preserve the building, its setting, and its special character or architectural qualities.

Archaeology

Policy HC5: Development which would damage or destroy a Scheduled Ancient Monument or other nationally important archaeological sites, its character or its setting, will not be permitted. Other archaeological areas and sites, together with their settings, will be protected and conserved wherever possible.

Policy HC6: Development proposals which would materially affect a site of archaeological importance will be considered against the following requirements:-

- (1) Where important archaeological sites and monuments, whether scheduled or not, and their settings, are affected by a proposed development they should be preserved in situ.**
- (2) Where there are grounds for believing that a proposed development would affect important archaeological sites and monuments, developers will be required to arrange for an archaeological field evaluation to be carried out before the planning application can be determined, to assess the character and extent of the archaeological remains, and to allow an informed and reasonable planning decision to be made.**

- (3) In circumstances where preservation is not possible or merited, then development will not be permitted until the developer has ensured that satisfactory provision has been made for a programme of archaeological investigations and recording prior to the commencement of the development, commensurate with the archaeological significance of the site.

A3.2 This study conforms to the relevant policies HC3, HC4, HC5 and HC6 in the County Structure Plan.

Thurrock Borough Council Policies

A3.3 Thurrock Borough Council have policies to protect Archaeology and Listed Buildings in the *Thurrock Borough Local Plan, Written Statement and Annexe Adopted September 1997*.

Listed Buildings

Policy BE16 re Demolition of Listed Buildings

The Council will not grant consent for the total or substantial demolition of any listed building unless it can be shown to their satisfaction that:

- (i) There is clear and convincing evidence that all reasonable efforts have been made to sustain existing uses or find viable new uses, and these have failed;
- (ii) Preservation in some form of charitable or community ownership is not possible or suitable;
- (iii) Redevelopment would produce substantial benefits for the community which would outweigh the loss resulting from demolition.

Policy BE17 re: Listed Buildings – Alterations, Extensions and Setting

The Council will only permit alterations or extensions to listed buildings that will not detract from the character or setting of the building. All proposals must be sympathetic to the listed building in terms of scale, appearance and materials.

Development proposals which would adversely affect the setting of a listed building will not be permitted.

Policy BE18 re Listed Buildings – Alternative Uses

The Council will seek to ensure that listed buildings are used, or reinstated, for their originally designed purpose. Any alternative use must be compatible with the identified special historic and architectural interest of the building, and must not detract from the character, appearance or setting of the building and its immediate surroundings.

Archaeological Sites

Policy BE25 re Sites of Archaeological Importance

Where important archaeological sites and monuments, whether scheduled or not, and their settings are affected by a proposed development, there will be a presumption in favour of their preservation in situ.

If there is evidence that archaeological remains may exist in the Local Plan area whose extent and importance are unknown, the Council may require developers to arrange for an archaeological field evaluation to be carried out before the planning application can be determined, thus enabling an informed and reasonable planning decision to be made.

Where preservation is not possible or feasible, then the Council will not allow development to take place until satisfactory provision has been made for a programme of archaeological investigation and recording prior to the commencement of the development.

- A3.4 This study takes into account the relevant policies BE16, BE17, BE18 and BE265 in the current Borough Local Plan.

Appendix 4

Aerial Photographs Consulted

Appendix 4: Aerial Photographs Consulted

Vertical Aerial Photographs, National Library of Air Photographs

106G/UK/1447, frames 3094-3099, May 1946, scale 1:10,250
106G/UK/1447, frames 6098-6102, May 1946, scale 1:9750
540/731, frame 4023, May 1952, scale 1:11,000
540/720, frames 3133-3136, April 1952, scale 1:10,000
58/1017, frames 41-47, February 1953, scale 1:4680
58/1017, frames 94-95, February 1953, scale 1:4680
58/1019, frames 166-171, February 1953, scale 1:5,000
82/711, frames 327-329, February 1953, scale 1:5,000
82/711, frame 360, February 1953, scale 1:5,000
540/1075, frames 143-150, February 1953, scale 1:5,000
540/1075, frames 195-198, February 1953, scale 1:5,000
540/1075, frames 171-178, February 1953, scale 1:5,000
540/1543, frames 51-54, March 1955, scale 1:10,000
82/1230, frames 41-44, July 1955, scale 1:10,000
82/1315, frames 43-46, October 1955, scale 1:10,000
58/4646, frames 300-301, August 1961, scale 1:12,000
58/4646, frames 368-370, August 1961, scale 1:12,000
HSL/UK/70/1079, frames 4036-4037, October 1970, scale 1:12,000
HSL/UK/70/1080, frames 4202-4204, October 1970, scale 1:12,000
58/715, frames 5068-5070, June 1951, scale 1:8,000
58/715, frames 5124-5126, June 1951, scale 1:8,000
58/720, frames 5012-5014, June 1951, scale 1:2880
58/720, frames 5053-5055, June 1951, scale 1:2880
MAL/70086, frames 9-12, November 1970, scale 1:10,000
MAL/76055, frame 58, June 1976, scale 1:10,000
MAL/76055, frames 63-65, June 1976, scale 1:10,000
MAL/81004, frames 58-60, March 1981, scale 1:12,000
106G/LA2, frames 3002-3004, April 1944, scale 1:10,000
106G/LA2, frames 3029-3032, April 1944, scale 1:10,000
106G/LA21, frames 3106-3109, July 1944, scale 1:9,600
106G/LA23, frames 3161-3164, July 1944, scale 1:11,000
106G/LA23, frames 4144-4146, July 1944, scale 1:11,000
106G/LA26, frame 3026, August 1944, scale 1:10,500
106G/LA26, frame 4028, August 1944, scale 1:10,500
106G/LA30, frame 3210, August 1944, scale 1:11,000
106G/LA31, frames 3022-3023, August 1944, scale 1:11,000
HLA/686, frame 51, May 1980, scale 1:9,800

Oblique Aerial Photographs, National Library of Air Photographs

TQ5780/1, frames 6-7, June 1976
TQ5878/1, frame 02, July 1991
TQ5878/49, frame 27, July 1999
TQ5878/50, frame 28, July 1999
TQ5878/52, frame 30, July 1999
TQ5878/53, frame 15, July 1999
TQ5878/54, frame 18, July 1999
TQ5878/55, frame 17, July 1999
TQ5878/56, frame 18, July 1999
TQ5878/57, frame 13, July 1999
TQ5878/58, frame 14, July 1999
TQ5878/59, frame 18, July 1999
TQ5879/1, frame 67, June 1994
TQ5879/2, frame 68, June 1994

TQ5879/3, frame 69, June 1994
TQ5879/4, frame 70, June 1994
TQ5879/5, frame 16, July 1999
TQ 5879/6, frame 17, July 1999
TQ5879/7, frame 19, July 1999
TQ5879/8, frame 20, July 1999
TQ5879/9, frame 15, July 1999
TQ5879/10, frame 16, July 1999
TQ5879/11, frame 17, July 1999
TQ5879/12, frame 19, July 1999
TQ5979/2, frames 84-85, July 1979
TQ5979/7, frame 26, June 1970
TQ5980/1, frame 28, September 1987
TQ5980/2, frame 29, September 1987
TQ5980/3, frame 30, September 1987
TQ5980/4, frame 31, September 1987
TQ5980/5, frame 32, September 1987
TQ5980/6, frame 33, September 1987
TQ5980/7, frame 34, September 1987
TQ5980/8, frame 35, September 1987
TQ5980/9, frame 36, September 1987
TQ5980/10, frame 37, September 1987
TQ5980/11, frame 38, September 1987
TQ5980/12, frame 39, September 1987
TQ5980/13, frame 40, September 1987

Appendix 5

Cultural Heritage Sites

Appendix 5: Cultural Heritage Sites

Abbreviations:

PA – palaeolithic
 NE – neolithic
 ME – mesolithic
 BA – bronze age
 IA – iron age
 PR – prehistoric
 RO – Romano-British
 EM – Anglo-Saxon

MD – medieval
 PM – post medieval
 MO – modern
 ESMR – Essex County Sites & Monuments Record
 NMR – National Monuments Record
 EH – English Heritage
 AP – aerial photograph

1	ESMR No. 10254	5892 7947	Pillbox. Now destroyed. A1306		MO	Unimportant
2	ESMR No. 10255	5892 7945	Road Barrier tank trap. Now destroyed. A1306		MO	Unimportant
3	ESMR No. 14565	5730 7930	Undated drainage ditches. Possibly of water meadows along the Mar Dyke.		UN	Uncertain
4a 4b	ESMR No. 14566	5730 7930	AP refs. to cropmarks of extraction pits to N (RPS 4b) & S (RPS 4b) of Mar Dyke		UN	Uncertain
5	ESMR No. 15398	5970 8000 (centre)	School, workshop, swimming pool, water tower, infirmary, cottage home. Porters lodge and Receiving block. Erected by the Stepney Board of Guardians in 1901 to the designs of Mr. Frank Baggally.		MO	Local
6	ESMR No. 15575	5925 8006	Day Down Pumping Station. Bore hole-pumping station.		PM	Local
7	ESMR No. 1637	5900 8000	Flint Thames Pick from Mardyke Riverbank		ME	Local
8	ESMR No. 19213	5950 8000	Former Ardale School. Air raid shelter, pit and post hole found during site investigation		MO	Local
9	ESMR No. 35152	5944 8032	Davydowns, Back Lane, Stifford. Late 17 th century cottage	II	PM	County/ Regional
10	ESMR No. 5017 EH	5890 7940	Tunnel Cement Pits South of the A13. Prehistoric pit and rubbing stone.		PR	County/ Regional
11	ESMR No. 5035	5860 7980	'Mardyke Deneholes'. Extractive pit sites.		MD?	County/ Regional
12	ESMR No. 5052	5760 7955	Extractive pit or denehole found along the M25 to the south of Mar Dyke		MD?	County/ Regional
13	ESMR No. 5075	5940 8040	Polished flint axe		NE	Local

14	ESMR No. 5113	5800 8000	Foundations for the Mar Dyke viaduct were dug through 5m of prehistoric peaty deposits in the floor of the Mar Dyke.		PR	County/ Regional
15	ESMR No. 5114	5800 8000	Neolithic flint knife found within the lower peat deposits of the Mar Dyke.		NE	Local
16	ESMR No. 5115	5800 8000	Prehistoric finds recovered from the environmental sections at Mar Dyke.		PR	County/ Regional
17	ESMR No. 5117	5900 8000	Perforated circular stone. ? macehead (7.5cm diameter).		PR	Local
18	EH	569 805	Courts Farmhouse, Park Lane, Aveley. Late 14 th or early 15 th century house with 17 th century & later extensions at rear	II	MD/PM	County/ Regional
19	AP research	577 806	Cropmark complex to N of Hangman's Wood comprising 2 linears, small circular features & other irregularly shaped features		UN	Uncertain
20	AP research	573 805	Cropmark complex of a series of small & irregularly shaped & circular features to NE of Aveley		UN	Uncertain
21	AP research	576 804	Cropmark complex of a series of circular & rectangular shaped features to the W of Hangman's Wood		UN	Uncertain
22	AP research	575 802	Cropmark complex of a series of small & irregularly shaped features to the W of Hangman's Wood		UN	Uncertain
23	AP research	570 800	Cropmark complex of a linear & several small circular shaped features to the S of Aveley		UN	Uncertain
24	AP research	587 806	Cropmark complex of circular, linear & other irregularly shaped features to the N of Brannett's Wood		UN	Uncertain
25	AP research	590 805	Cropmark complex of a series of irregularly shaped features to the NE of Brannett's Wood		UN	Uncertain
26	AP research	593 797	Parchmarks of a series of small circular & other irregularly shaped features to E of railway line		UN	Uncertain
27	AP research	582 797	Large cropmark & parchmark complex of circular shaped features, linears & very small pit-like features to S of Mar Dyke. Possible settlement site. Site has been removed by extensive chalk extraction		UN	Uncertain

28	AP research	592 801	Linear parchmark features representing possible trackway to the S of the Mar Dyke		UN	Uncertain
29	Map research	Linear	Romford & Grays branch line of the London, Tilbury & Southend Railway		MO	County/ Regional
30	Map research	590 795	Map ref. of 1897-8 to site of a gravel pit on the western side of the Romford & Grays branch line (RPS 29)		MO	Local
31	Map research	595 796	Map ref. of 1897-8 to site of old chalk quarries		MO	Local
32	Map research	580 804	Map ref. of 1921-3 to site of old gravel pit to SE of Hangman's Wood		MO	Local
33	Map research	580 803	Map ref. of 1961 to site of gravel pit to SE of Hangman's Wood		MO	Local
34	Map research	577 794	Map ref. of 1961 to site of former gravel extraction area to S of Mar Dyke		MO	Local
35	Map research	582 798	Map. Ref. of 1961 to site of former gravel extraction area to S of Mar Dyke		MO	Local
36	Map research	586 796	Map ref. of 1961 to site of former gravel extraction area to S of Mar Dyke		MO	Local
37	Map research	570 806	Map ref. of 1961 to a sand pit to the No of Aveley		MO	Local
38	Map research	579 804	Map ref. of 1967-8 to site of former gravel extraction pit to SE of Hangman's Wood		MO	Local
39	Map research	577 806	Map ref. of 1967-8 to site of former gravel extraction pit to N of the Stifford Rd		MO	Local
40	Map research	580 796	Map ref. of 1975-7 to site of former chalk extraction area to S of the Mar Dyke		MO	Local
41	Map research	591 794	Map ref. of 1975-7 to site of former gravel extraction pit to E of railway		MO	Local
42	Map research	572 798	Map ref. of 1975-7 to site of former gravel extraction pit to SE of Aveley		MO	Local
43	Map research	581 802	Map ref. of 1975-7 to site of former gravel pits to N of the Mar Dyke		MO	Local

Results of the Archaeological Walkover Survey

Appendix 6: Results of the Archaeological Walkover Survey

- A6.1 A limited walkover survey of the Study Area was undertaken by an RPS Consultants archaeologist on Wednesday the 9th of April 2001. The weather conditions were mostly overcast interspersed with periods of rain. However, the extent of the survey was limited by being conducted from public rights of way such as footpaths and from trunk roads. Restrictions were placed on access to public footpaths in the eastern portion of the Study Area due to the current (April 2001) Foot and Mouth Regulations.
- A6.2 The survey commenced from the Thurrock Motorway Services beside Junction 30 of the M25 Motorway. An initial vantage point was gained from the Service Area which overlooked a large portion of the Study Area from the former chalk quarry site RPS 40 eastward to the Speedway Circuit. The large earthwork to the north of RPS 40 was a large mound or bund probably formed from spoil from the nearby extensive chalk and gravel extraction. This was lightly wooded. To the south east of this earthwork and to the east of RPS 40 was a large open area of reclaimed land comprising short grassed pasture. This area had been reclaimed from an extensive area of gravel extraction (RPS 35). All potential archaeological features in this area including the cropmark complex RPS 27 would have been completely removed by this process.
- A6.3 Access to a portion of the valley of the Mar Dyke was gained via a road bridge of the northbound slip road to Junction 30 of the M25 Motorway over this valley. From this vantage point it was possible to observe a portion of the flood plain to the west and east of the road bridge. The flood plain was flat and partially flooded and was bounded to the north and south by terraces containing dense mature woodland. Where accessible the flood plain comprised short grassland or pasture. No archaeological features on the flood plain were observed from this vantage point.
- A6.4 Access to the northern side of the valley of the Mar Dyke was gained via a trackway that extended along the northern edge of the flood plain. This trackway extended from Junction 30 of the motorway eastwards to the railway viaduct over the Mar Dyke. From this trackway it was possible to observe the whole of the flood plain. The wooded terraces to the north and south of the flood plain extended along the whole of this corridor. The flood plain itself was flat, partially flooded and contained short grassland or pasture. Several remnants of former drainage ditches or former field boundaries (RPS 3) were noted on the ground on the northern side of the flood plain. No other features were observed. The wooded area to the north of the flood plain was in turn bounded to the north by the A13 trunk road. This trackway formed a fairly compacted surface around the embankment and area of the A13 road bridge. This trackway was walked as far eastwards as the railway viaduct where further public access towards the Stifford Bridge was restricted by the current Foot and Mouth Regulations.

- A6.5 From the railway viaduct, a further area of the Mar Dyke flood plain was observed to the east as far as the Davy Down Pumping Station (RPS 6). This similarly comprised an area of short grassed pasture. No features were observed on the ground in this area, apart from a small levee on the northern side of the Mar Dyke.
- A6.6 The eastern end of the Study Area was observed westwards along the B186 road. An area to the west of the Grade II listed Davydowns cottages (RPS 9) and to the south of the Mar Dyke was an area of tall grassland. Nothing was observed on the ground in this area. Further south along the B186 road, access to a further public footpath – Back Lane – was not possible owing to the current foot and mouth restrictions. Further observation of the Davy Down area from the roadside was restricted by the road being contained within a cutting. The south eastern corner of the Study Area was occupied by a coach park to the north of the A1306 trunk road and by a large supermarket complex to the south of this road.
- A6.7 The northern side of the A1306 trunk road was lined with a dense tree cover. However, an area of playing fields was observed to the west of the coach park and to the east of the railway from the roadside. Nothing was visible on the ground within this area. Dense tree cover restricted further observation northwards from this roadside into the study area.
- A6.8 A portion of the north western corner of the Study Area was observable southwards from the B1335 Stifford Road. Millard's Wood, an adjoining industrial works and Hangman's Wood obscured any observations to the south of this road. The two wooded areas comprised very dense and mature woodland. Two further open areas to either side of the M25 motorway were observed from this roadside. These both comprised sloping short grassland or pasture. Nothing was observed on the ground within either area.

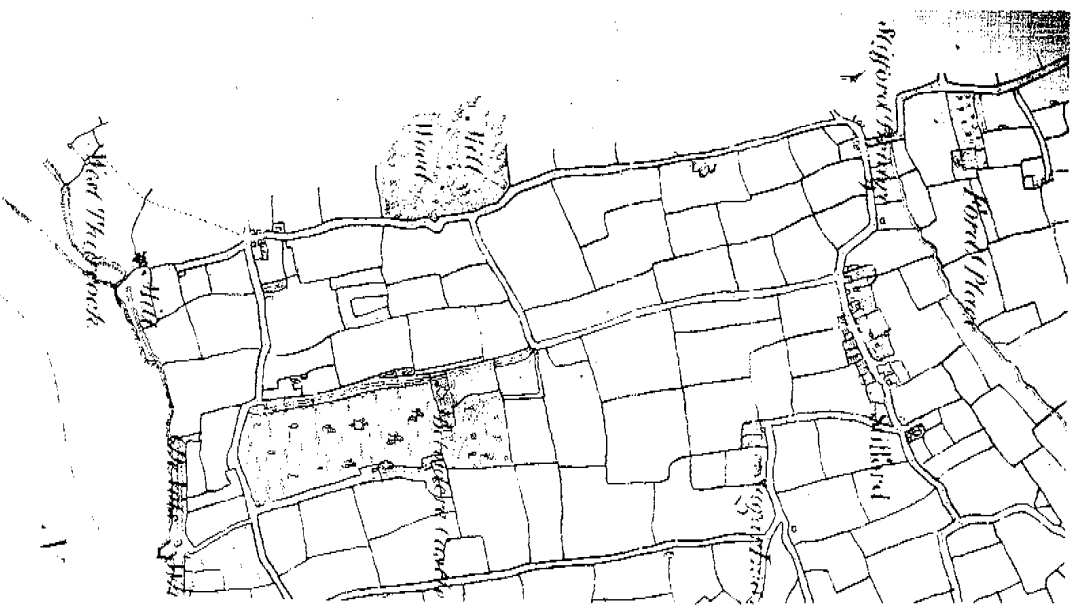
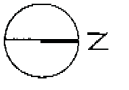
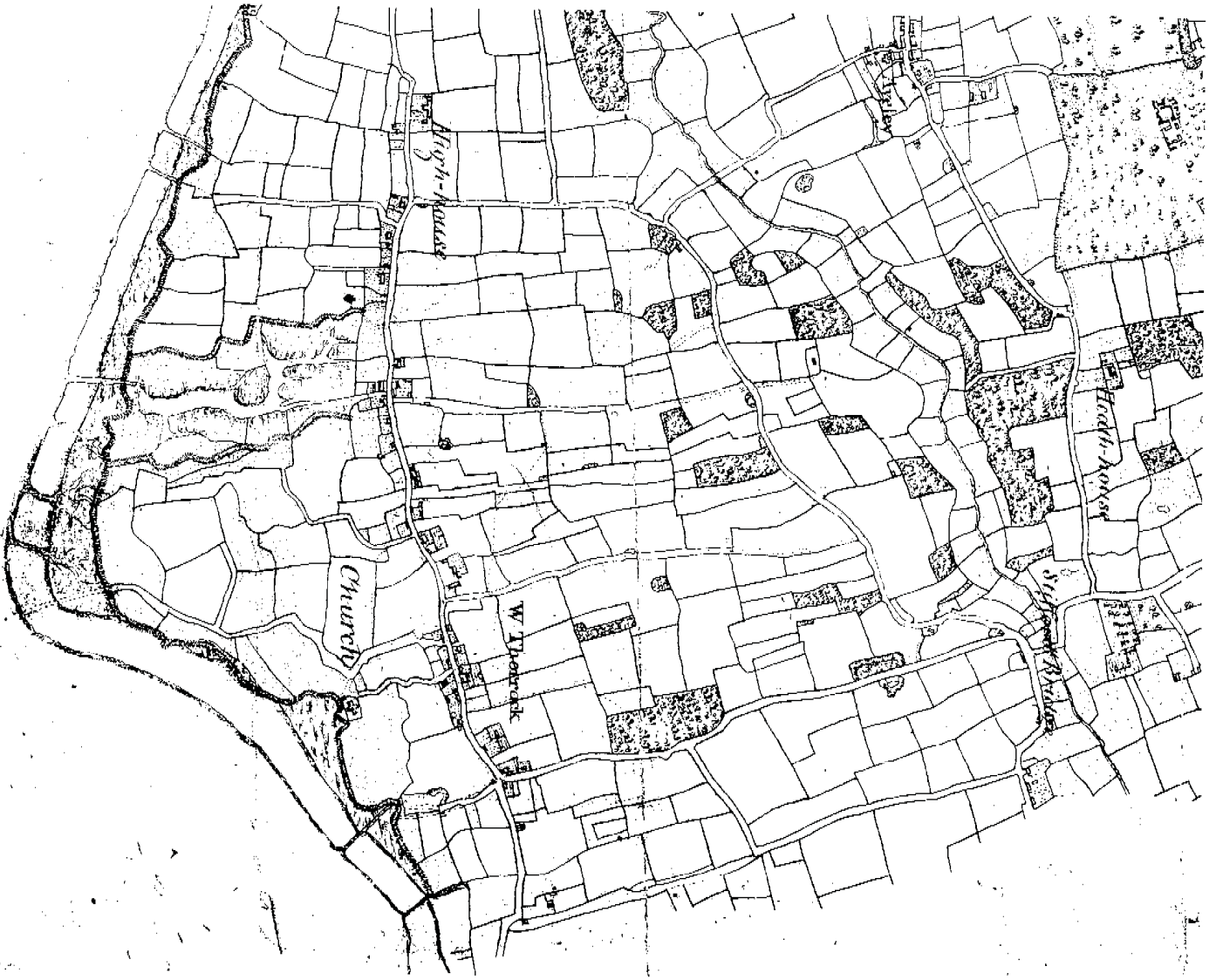
Appendix 7

**Review of the Preliminary Geotechnical Report for the M25 Junctions
30-31 and the A13 Widening Prepared by Mott MacDonald for
the Highways Agency of October 1994**

Appendix 7: Review of the Preliminary Geotechnical Report for the M25 Junctions 30-31 and the A13 Widening Prepared by Mott MacDonald for the Highways Agency of October 1994

- A7.1 A preliminary geotechnical report prepared by Mott MacDonald for the Highways Agency provided an overall analysis in general terms of the nature of the underlying solid and drift geology likely to be encountered by road construction works from earlier borehole and other geotechnical ground investigations. This report identified large areas of Worked Ground deposits formed by the backfilling and reclamation of the very extensive areas of chalk, sand and gravel extraction already identified within the Study Area. In addition, the Mar Dyke valley sides were found to be comprised of river terrace and head deposits of sandy gravel with lenses of dense sand and of Thanet Beds. These latter deposits comprised silty and occasionally clayey fine sand. Within the flood plain of the Mar Dyke, fluvial alluvial deposits were identified. These consisted of soft clayey peat or clayey sandy silt with occasional bands of very silty laminated clay.
- A7.2 The mounded earthwork noted during the walkover survey (see Appendix 6) is described in this report as Made Ground deposits. The report provides no analysis as to its likely nature or origin. However the walkover survey noted that it was very likely to have been derived from spoil accumulated as a result of the nearby and very extensive chalk and gravel extraction and to be subsequently re-used as an artificial man-made landscape feature or bund. A second deposit of Made Ground was also identified along the northern edge of the Mar Dyke. This was interpreted as a slight raising of the north bank of the Mar Dyke by 1-2 metres of inert fill to prevent flooding. This feature was not noted during the walkover survey. However, a similar formation or levee was noted by the walkover survey further eastwards along this valley.
- A7.3 This report also notes the existence of deneholes in general terms within the area as early chalk extraction sites and as risk features likely to be encountered, but does not provide any precise data as to their possible location.

Figures



ORIGINAL AT A3

PROJECT

A13M25 to Lakeside Widening

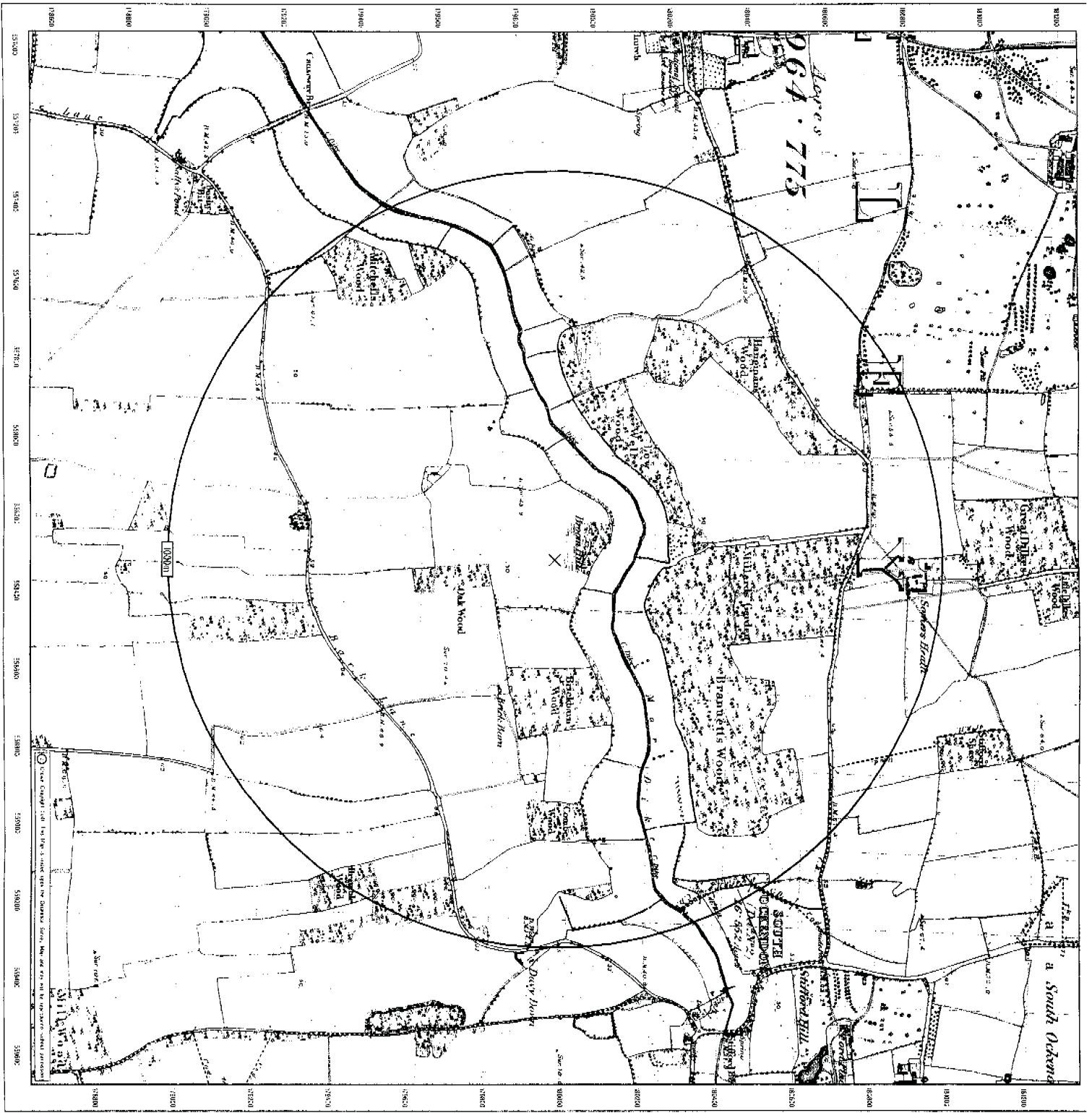
Title Extracts From O.S. Map Surveyor's Drawings
From Essex Sheet Nos. 133 & 134 of 1805 (NMR
Archive Refs. AO 1133 & AO 1134)

PROJECT NUMBER DRAWING NUMBER

B4285B RPSC 3

SCALE DATE

3" = 1 Mile March 2001



ORIGINAL AT A3

PROJECT A13W25 to Lakeside Widening

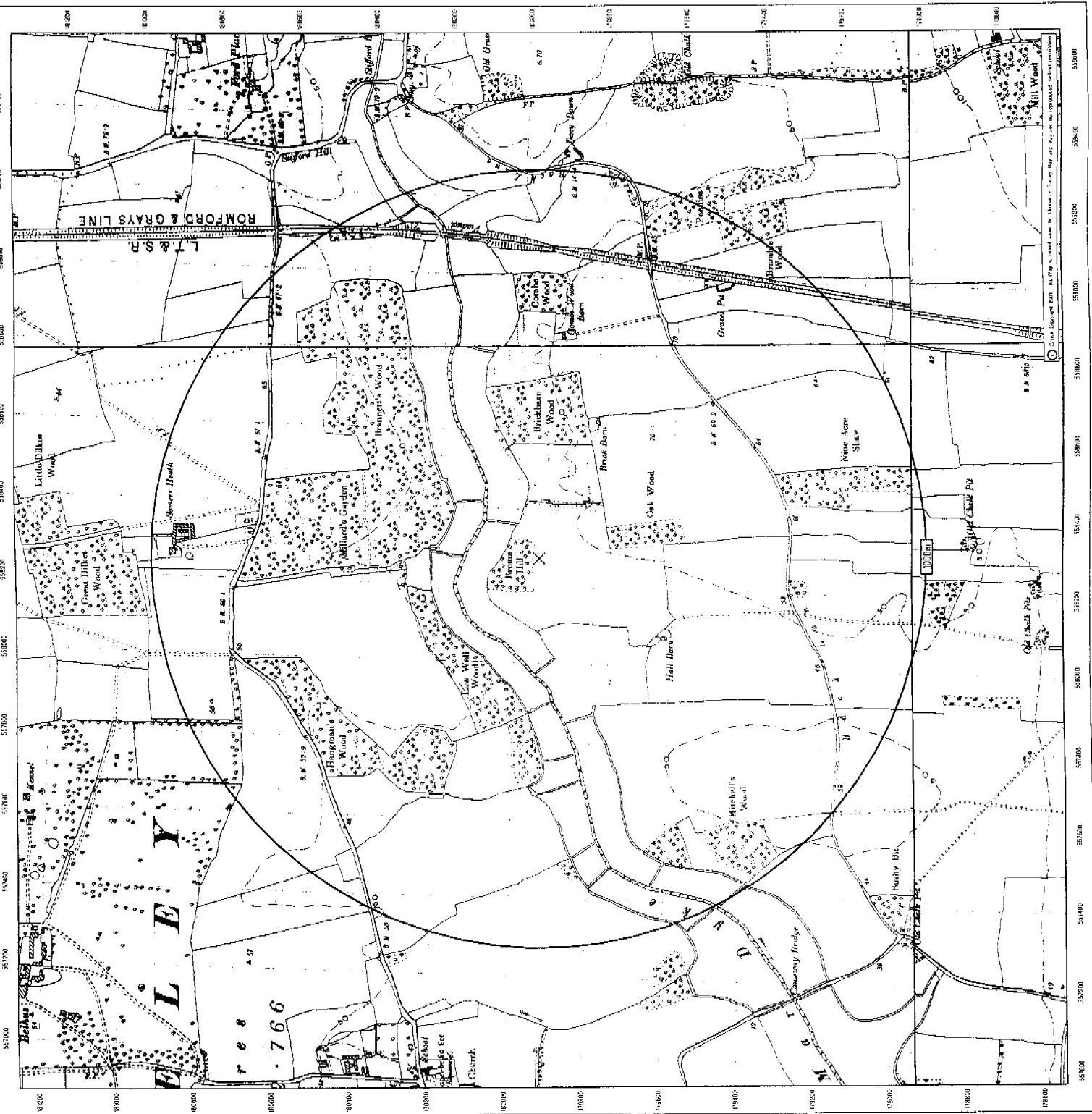
TITLE Extract From 6"=1 Mile Scale O.S. Maps of 1873

PROJECT NUMBER B4285B

DRAWING NUMBER BPSC 4

SCALE 1:10,000

DATE March 2001



ORIGINAL AT A3

PROJECT
A13:M25 to Lakeside Widening

TITLE

Extract From 6"=1 Mile Scale O.S. Maps of 1897-8
DRAWING NUMBER
R4265B

SCALE
1:10,000

DATE
March 2001

RPS CONSULTANTS
THE ENVIRONMENTAL CONSULTANCY



ORIGINAL AT A3

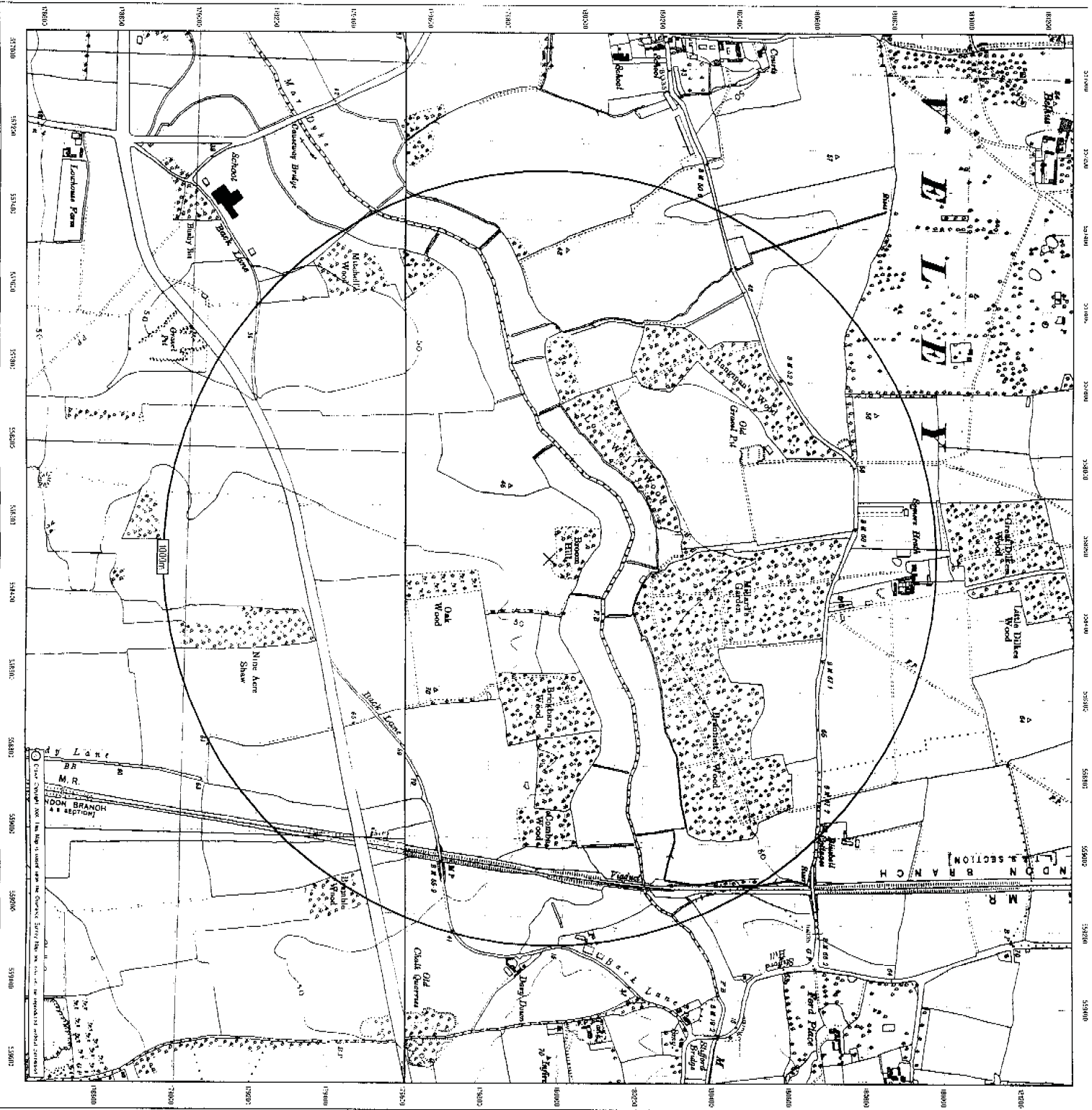
PROJECT
TITLE
A13W26 to Lakeside Widening

PROJECT NUMBER
DRAWING NUMBER
Extract From 6"-1 Mile Scale O.S. Maps of 1921-23

PROJECT NUMBER
DRAWING NUMBER
B4285B

SCALE
DATE
1:10,000
March 2001

R P S CONSULTANTS
THE ENVIRONMENTAL CONSULTANTS



ORIGINAL AT A3

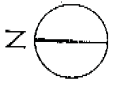
PROJECT
TITLE
A13M25 to Lakeside Widening

Extract From 6"-1 Mile Scale O.S. Maps of 1938

PROJECT NUMBER
DRAWING NUMBER
RA2665R
BPSC 7

SCALE
DATE
1:10,000
March 2001

R P S CONSULTANTS
THE ENVIRONMENTAL CONSULTANTS



ORIGINAL AT A3

PROJECT

A13-M25 to Lakeside Widening

TITLE

Extract From 1:10,000 Scale O.S. Maps of 1961

PROJECT NUMBER

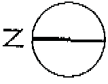
R4265B

DATE

March 2001

R P S CONSULTANTS

© Crown Copyright 1961. The Map is taken from the OS maps of 1961. The map is reproduced without modification.



ORIGINAL AT A3

PROJECT

A13M25 to Lakeside Widening

Extract From 1:10,000 Scale O.S. Maps of 1967-8

PROJECT NUMBER

R4266B

SCALE

1:10,000

DRAWING NUMBER

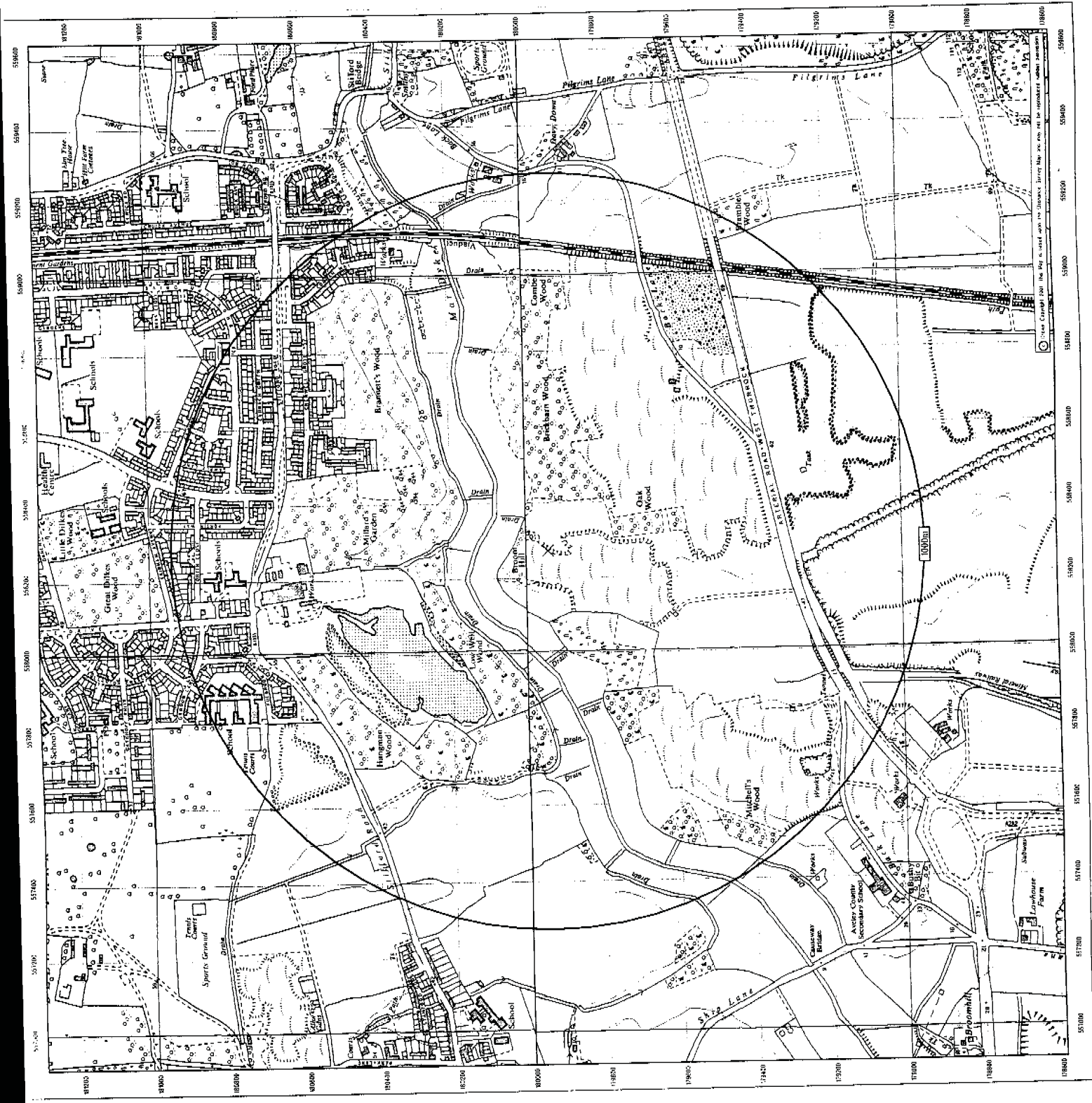
RPSC 9

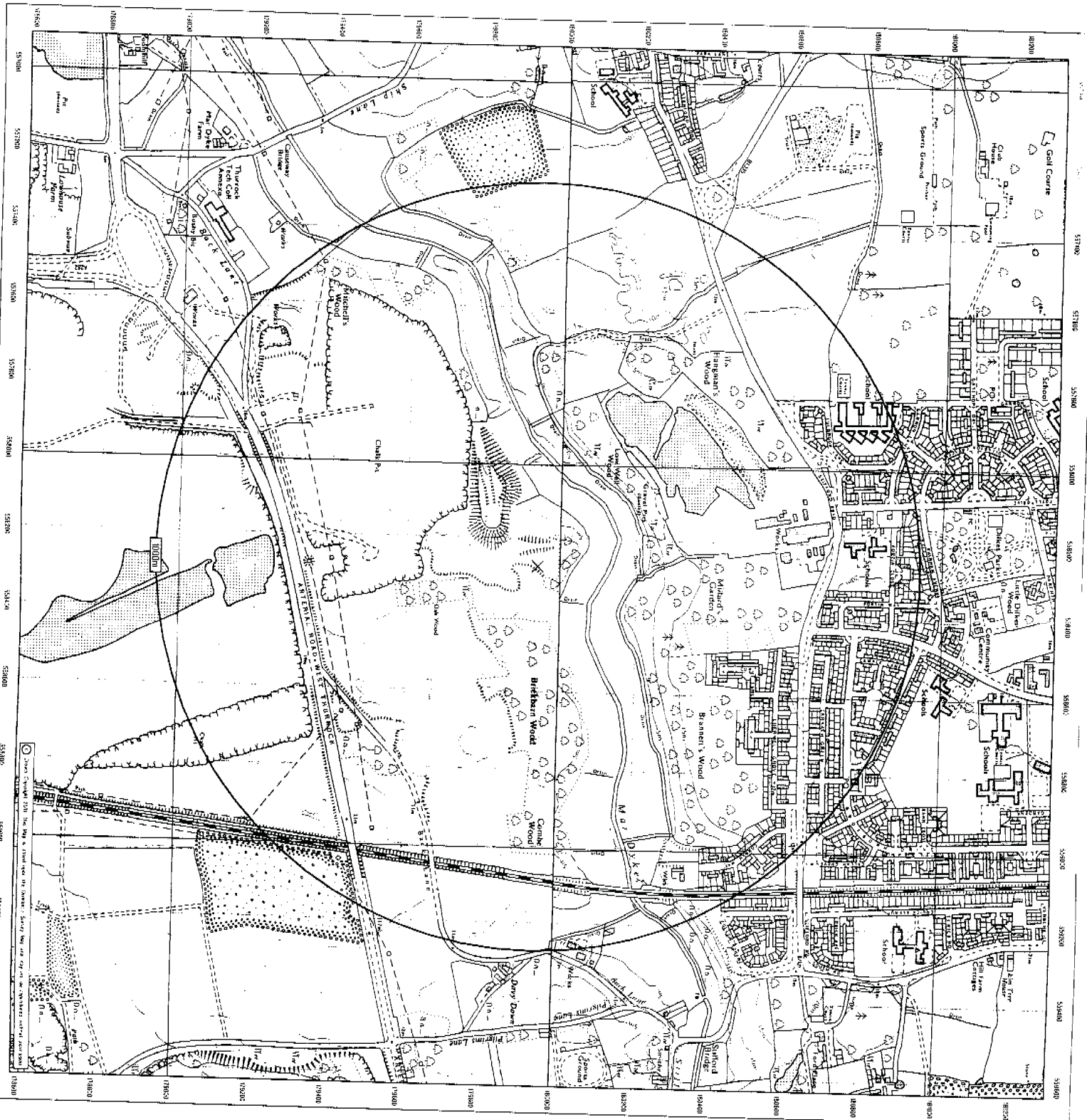
DATE

March 2001

R P 5 CONSULTANTS

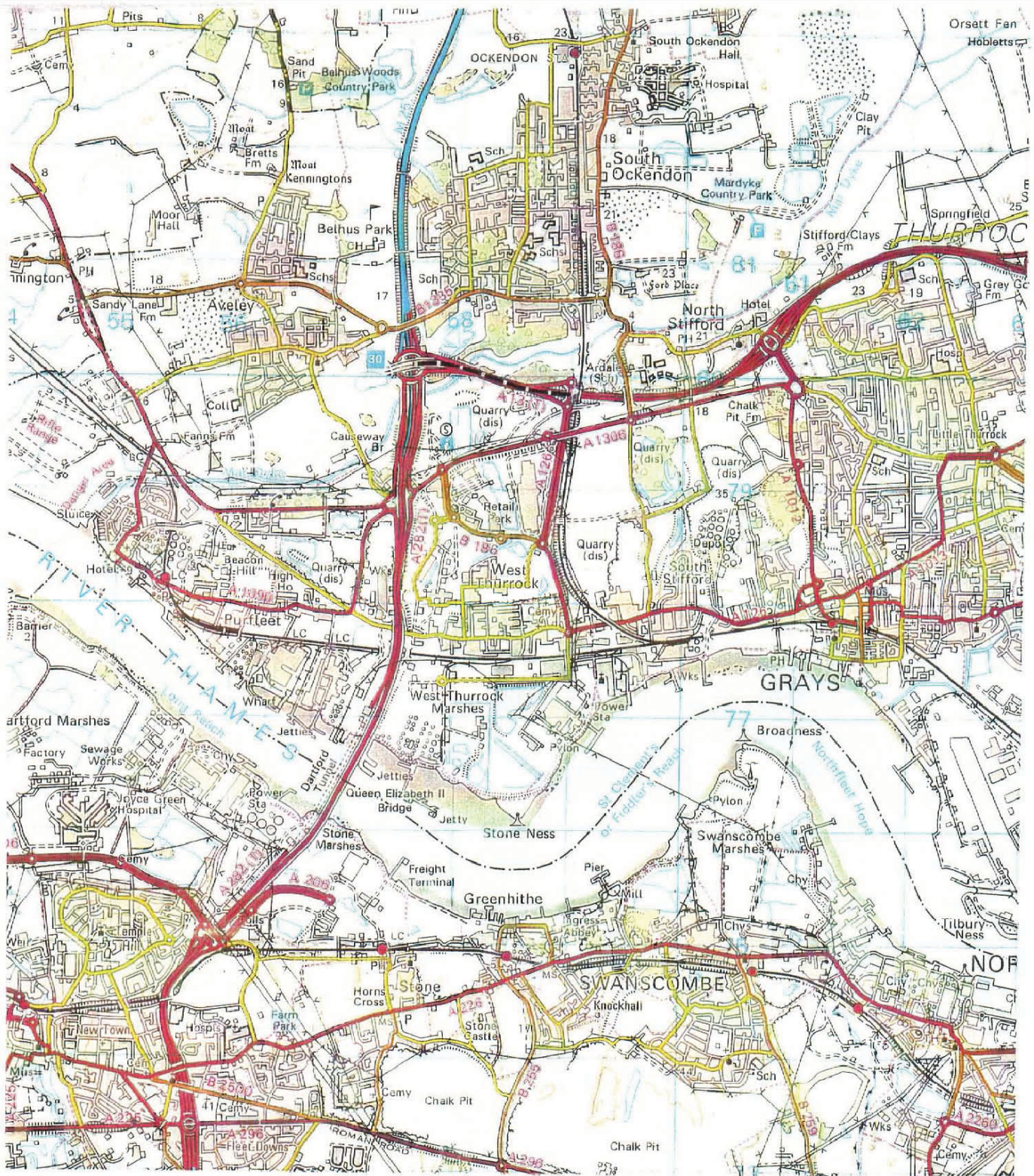
THE ENVIRONMENTAL CONSULTANCY





ORIGINAL AT A3

PROJECT
A13M25 to Lakeside Widening
 TITLE
Extract From 1:10,000 Scale O.S. Maps of 1975-7
 PROJECT NUMBER
R4265B
 DRAWING NUMBER
PPSC 10
 SCALE
1:10,000
 DATE
March 2001
R P S CONSULTANTS



Key:
 — Line of the A13:M25 to Lakeside Road Improvement Scheme



ORIGINAL IN COLOUR

PROJECT

A13:M25 to Lakeside Widening
 TITLE

Site Location

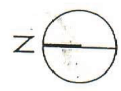
PROJECT NUMBER DRAWING NUMBER

R4265B **RPSC 1**

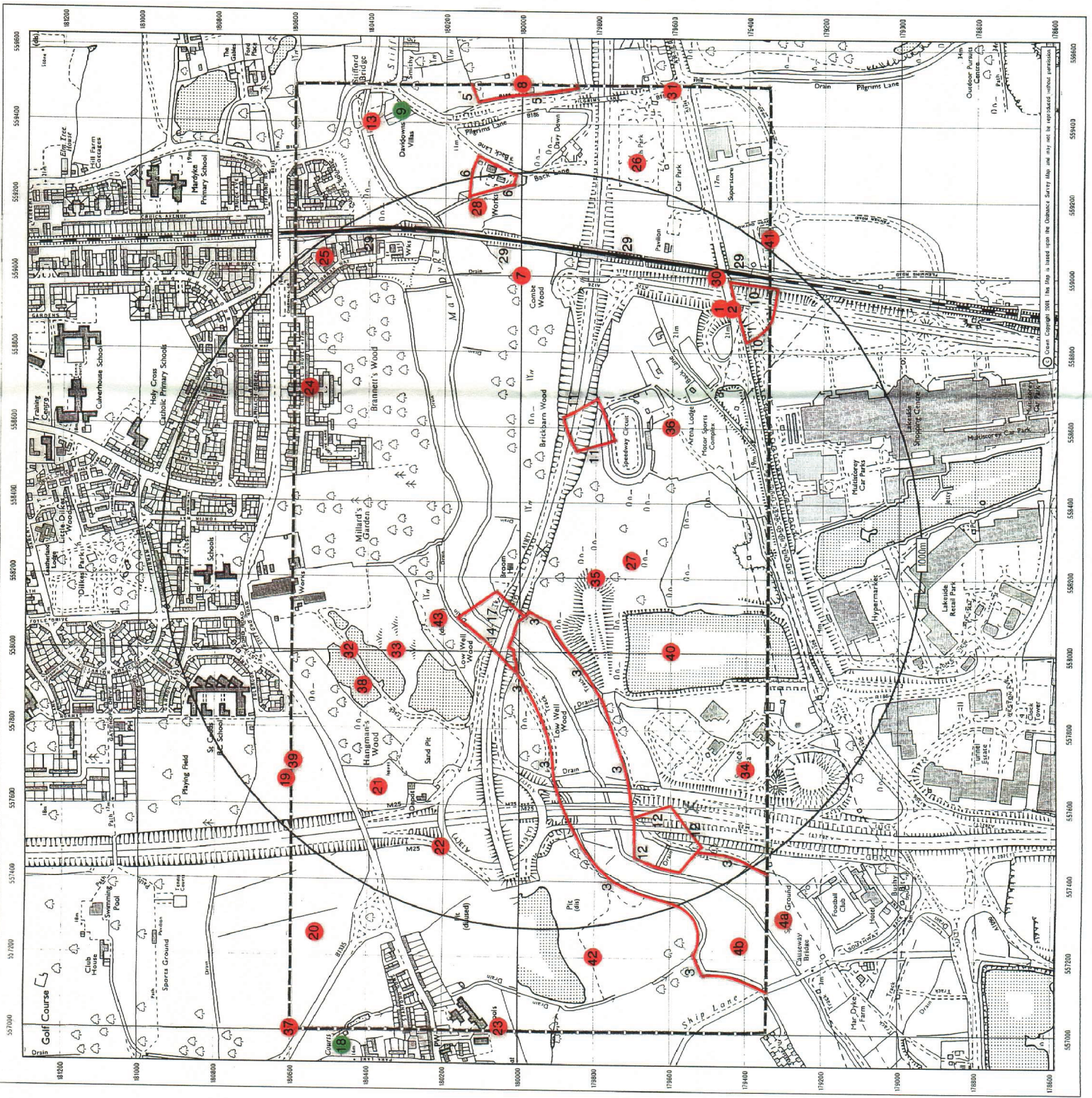
SCALE DATE

1:50,000 **March 2001**

RPS CONSULTANTS
 THE ENVIRONMENTAL CONSULTANT



- Key:**
- Archaeological Site
 - Listed Building
 - Boundaries of Other Archaeological Sites
 - Linear Site
 - - - Boundary of Study Area



ORIGINAL IN
COLOUR

ORIGINAL AT A3

PROJECT

A13M25 to Lakeside Widening

TITLE

Cultural Heritage Sites

PROJECT NUMBER

R4265B

SCALE

1:10,000

DRAWING NUMBER

RPSC.2

DATE

March 2001

R P S CONSULTANTS
THE PLANNING PRACTICE

© Crown Copyright 2001. This map is based upon the Ordnance Survey data and may not be reproduced without permission.