WEST OF DUDDON SANDS OFFSHORE WINDFARM: ONSHORE SUBSTATION AND CABLE ROUTES, HEYSHAM LANCASHIRE

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SUMMARY

RSK Environment Ltd, on behalf of their client Dong Energy Power (UK) Ltd, commissioned Oxford Archaeology North (OA North) to undertake an archaeological watching brief during the groundworks for the installation of an onshore cable (Cable Route 1) from the offshore windfarm, west of Duddon Sands, from Middleton Sands to the existing substation at Heysham, Lancashire (NGR SD 41097 57860 to SD 41747 59472). The watching brief was requested as a condition of the planning permission, agreed as a result of consultation between RSK Environment Ltd and the Lancashire Council Archaeology Service (LCAS). It was carried out over 37 days between July and October 2012.

Two separate lengths of Cable Route 1 were subject to watching brief during excavation; referred to as the Carr Lane site and the Middleton Road site. The Carr Lane site ran between Middleton Sands (NGR SD 41142 57863) and Carr Lane (NGR SD 41543 58090). The Middleton Road site ran through fields between the junction of Middleton Road and Main Avenue (NGR SD 42022 59184 and NGR SD 41896 59462).

Both sites were excavated using 360° mechanical excavators fitted with appropriately-sized toothless buckets. At Carr Lane, the excavation (approximately 520m long) consisted of two phases; an initial 4m wide topsoil strip down to approximately 0.5m carried out along short lengths; this was followed by the excavation of a 2m wide by 2m deep cable trench. At Middleton Road, the topsoil for the whole length of the route (approximately 270m long) was removed in an approximately 8m wide strip before the cable trench was excavated. The cable trench at Middleton Road had to be stepped in profile due to height restrictions from overhead power lines, resulting in a 4m wide by 2m deep excavated trench.

At the Carr Lane site, the topsoil was approximately 0.4m thick and consisted of a dark brown loamy soil. Below this was a layer of yellow/orange sandy-clay subsoil, which extended down to approximately 1.75m. Below this layer was the natural geology of rounded and sub-rounded cobbles measuring 0.1m to 0.3m in size. The topsoil at Middleton Road was approximately 0.4m thick, below which there was between 0.75m and 1m of yellow/orange sandy-clay subsoil. Numerous sandstone inclusions were visible, most being angular or sub-angular, measuring between 0.25m and 0.4m in size. Below this layer was the natural geology, which consisted of fragmented sandstone bedrock.

Other than two animal bones and modern debris, no finds or features were revealed during the watching brief at the Carr Lane site. During the work at the Middleton Road site, a spread of demolition rubble was revealed comprising bricks and building debris. Many of the bricks were marked ‘CLAUGHTON MANOR BRICK Co CATON’. Beneath this, a short length of brick wall was revealed that ran parallel with the trench section. The wall was of similar appearance and construction to structures (pillboxes) adjacent to the site which appear to be of World War Two (WWII) origin. The wall was not recorded in detail due to the presence of asbestos in the trench. Topsoil finds at Middleton Road were limited to fragments of modern pottery and three broken pieces of clay pipe stem.
ACKNOWLEDGEMENTS

OA North would like to thank Owen Raybould of RSK Environment Ltd for commissioning the project, and Mick Creagh of Dong Energy Power (UK) Ltd for his on-site assistance. OA North would also like to thank the site teams from Morrison Utility Services for their valued help. The fieldwork was undertaken by Kelly Clapperton and Karl Taylor. Karl Taylor also wrote the report and produced the illustrations. The project was managed by Emily Mercer, who also edited the report.
1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 RSK Environment Ltd, on behalf of their client Dong Energy Power (UK) Ltd, commissioned Oxford Archaeology North (OA North) to undertake an archaeological watching brief during groundworks for the installation of an onshore cable (Cable Route 2, Fig 1) serving the West of Duddon Sands Offshore Windfarm, from Middleton Sands to the south of the Heysham electricity substation, Heysham, Lancashire.

1.1.2 As a result of an Environmental Statement (ES) that accompanied the planning application, a watching brief was required as a planning condition, as agreed between the Lancashire County Archaeology Service (LCAS) and RSK Environment Ltd; two areas that, it appeared, had been undisturbed were identified as being of possible archaeological potential. Consequently, a Written Scheme of Investigation (WSI; Appendix 1), was prepared and approved by LCAS. The following report summarises the results of the fieldwork which was undertaken over 37 days between July and October 2012.

1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

1.2.1 The onshore cable route commences at Middleton Sands (NGR SD 41159 57852; Fig 1) and runs eastward to Carr Lane, where it turns north to run parallel with Carr Lane, before finally following the road towards Middleton village. The route then mainly follows Middleton Road, deviating slightly to run through adjacent fields close to Middleton Business Park. The route finally reaches the electricity substation (NGR SD 34173 46014; Fig 1).

1.2.2 The southern part of the route passes through an area of low, gently undulating relief that does not exceed approximately 15m AOD. The northern part of the route passes through a more industrialised landscape. The surrounding area includes extensive salt marshes, reclaimed mosses and marshland. There is a small area of remnant mossland at Heysham, and sand and shingle beaches around the Lune estuary (Countryside Commission 1998).

1.2.3 The underlying bedrock geology of the area consists of limited outcrops of carboniferous Millstone Grit Group sandstones whilst the superficial deposits consists of Till (http://mapapps.bgs.ac.uk/geologyofbritain/home.html). The soils differ across the site and consist primarily of freely draining sand dune soils close to the shore, freely draining, slightly acid, loamy soils and naturally wet, peaty, loamy and sandy soils further inland (https://www.landis.org.uk/soilscales/).
1.3 **HISTORICAL AND ARCHAEOLOGICAL POTENTIAL**

1.3.1 Evidence for archaeological activity dates from the Neolithic through to the modern day. A comprehensive précis of the archaeological potential of the area has been provided in the WSI (*Appendix 1*) provided by RSK Environment Ltd, taken from the ES that accompanied the planning application. Specifically, the only potential direct impact on heritage assets identified in the ES for this cable route, was on the possible below ground remains of a dwelling known as Thurshouse, observed on nineteenth-century mapping. Two areas of the route identified during the ES that appeared to have been relatively undisturbed were outlined, therefore, as possibly having the potential for, as yet unknown, buried archaeological remains.
2. METHODOLOGY

2.1 WRITTEN SCHEME OF INVESTIGATION

2.1.1 A WSI was issued by RSK Environment Ltd (Appendix 1), the methodology of which was adhered to in full. The work was consistent with the current standards and procedures of the Institute for Archaeologists (2008a), English Heritage guidelines (English Heritage 1991) and generally accepted best practice.

2.2 FIELDWORK

2.2.1 The cable trench at both the Carr Lane and Middleton Road sites was excavated by 360° mechanical excavators (21 ton at Carr Lane, 8 and 13 ton at Middleton Road) fitted with various appropriately-sized toothless buckets under the constant supervision of an archaeologist.

2.2.2 At Carr Lane, the cable trench excavation consisted of two phases; an initial 4m wide topsoil strip, down to approximately 0.5m depth for short lengths (Plate 1), followed by the excavation of the cable trench measuring 2m wide by 2m deep (Plate 2). This methodology was used due to the very wet ground conditions. Steel trench box shoring was installed prior to the laying of cable ducts in 6m sections. The area around and immediately above the ducts was backfilled with imported sand, and the trench was then finally backfilled with the previously excavated material and levelled. On average, 30m of trench was excavated and backfilled per day.

Plate 1: General view of the topsoil strip at the Carr Lane site
2.2.3 At Middleton Road, the topsoil for the whole length of the route (approximately 300m) was removed in an approximately 8m wide strip before the cable trench was excavated (Plate 3). The cable trench at Middleton road was excavated in a stepped profile due to height restrictions from overhead power lines preventing the lifting and insertion of trench boxes. This resulted in a 4m wide by 2m deep trench being excavated (Plate 4).
A daily log was compiled during the watching brief and observations were recorded on pro forma site record sheets produced by OA North. Any archaeological features discovered were recorded in accordance with Section 3 of the WSI (Appendix 1).

2.3 ARCHIVE

2.3.1 A full and professional archive has been compiled in accordance with the WSI (Appendix 1) and current IfA (2008b) and English Heritage guidelines (1991). The original record and material archives will be deposited with the Museum of Lancashire in Preston, while a copy of the report will be submitted to the Lancashire Historic Environment Record (HER), also in Preston.
3. FIELDWORK RESULTS

3.1 INTRODUCTION

3.1.1 The following section provides a detailed summary of the deposits and results of the archaeological watching brief. A full list of the context numbers used is detailed in Appendix 2. The watching brief was carried out on the following dates; 27 July; 30-31 August; 03-07, 10, 18-19, 21, 24-28 September; 01-05, 08-12, 15-19, 22-26 October 2012. The full length of excavation at Carr Lane was 520m, and at Middleton Road was 274m.

3.2 CARR LANE

3.2.1 Prior to the commencement of the main phase of installation of the cable ducts, a short section of Carr Lane, close to Middleton Towers retirement village, was diverted through adjacent fields (NGR 41519 58146). This was subject to archaeological watching brief on 27 July 2012 when a 4m wide strip of topsoil, approximately 0.4m thick, was removed for a length of 40m. From north to south, demolition rubble 1 was observed for the first 10m of topsoil stripping. Beyond this, the next 10m length revealed subsoil 2, and the remaining 20m length of the stripped area was natural deposits 3 (Fig 2), within which two ditches/gullies were encountered. Ditch 4 was 0.62m wide by 0.28m deep, whilst ditch 6 was 0.8m wide and 0.28m deep. No finds were recovered and both ditches were interpreted as being drainage gullies of at least post-medieval date.

Plate 5: Waterlogged conditions at the Carr Lane site
3.2.2 The cable duct excavation began to the east of the landfall of the cable at Middleton Sands, close to Shorefields House (NGR 41142 57863, Fig 1). The ground was waterlogged which necessitated stripping of the topsoil in short sections of between 15m and 20m (Plate 5).

3.2.3 For the first 350m of the total length of the excavation (520m), the topsoil was approximately 0.4m thick and consisted of a dark brown loamy soil (9), which overlay a layer of yellow/orange sandy-clay subsoil (10), which extended down to approximately 1.75m. Below this layer was the natural geology (11) that consisted of rounded and sub-rounded cobbles of approximately 0.1m to 0.3m in size (Plate 6). The sides of the trench were unstable due to the wet conditions. No significant finds or archaeological features were encountered. The only finds recovered were from the topsoil (9) and were small fragmented sherds of post-medieval and industrial period pottery, which were not retained due to their poor condition.

3.2.4 The cable route crossed the line of a field boundary in the form of a bank with hedge (NGR 41360 57888; Fig 3) that once extended to the edge of the field. However, no below ground evidence of the boundary was encountered during the trench excavation. Two fragments of animal bone were recovered from the topsoil (9) in the approximate location of the boundary.

3.2.5 The last section, the eastern part, of the Carr Lane site (approximately 170m) comprised level, waterlogged fields. A drainage ditch was crossed at NGR 41473 57953 (Fig 3). The topsoil (12) in this area was approximately 0.2m thick and comprised a dark brown loamy soil, below which was approximately 0.25m – 0.3m of brown clay subsoil, 13. Beneath this was the natural geology,
3.3 MIDDLETON ROAD

3.3.1 Topsoil stripping at Middleton Road commenced at the southern end of the site, near to the junction of Middleton Road and Main Avenue (NGR 41993 59214; Fig 4). A small area (approximately 20m by 10m) had already been stripped in order to provide a site compound for the site cabins prior to the watching brief commencing. The topsoil strip consisted of a 12m wide area running parallel with Middleton Road. The topsoil, consisting of grey, homogenous, wet clay. No archaeological features or finds were encountered.

3.3.2 Following the topsoil strip, the cable excavation commenced at the northern end of the site (Plate 4) to reveal between 0.75m and 1m of yellow/orange sandy-clay subsoil. Numerous sandstone inclusions were visible, most of which were angular or sub-angular, and between 0.25m and 0.4m in size. Below this layer was the natural geology, which consisted of fragmented sandstone bedrock.

3.3.3 Excavation of the cable trench through the initial demolition rubble identified encountered further bricks and building debris. Many of the bricks were marked ‘CLAUGHTON MANOR BRICK Co CATON’, which is approximately 19.5 km away, and operated between 1898 and 2010 (www.penmorfa.com/bricks/england5.html). Most of the bricks were approximately 235mm long by 110mm wide by 70mm deep. Below the rubble on the east side of the trench a short length of brick wall was revealed (Plate 7), which ran parallel to the trench section, and was 2.36m long by 0.39m thick. The bricks were laid in stretcher bond with two rows of headers seven courses down from the top. The mortar was light-coloured and appeared to be of gauged lime or cement. The wall was excavated-out by machine to a depth of approximately 1.08m where further excavation was halted due to health and safety reasons. The wall appeared to be of similar appearance and construction to structures (pillboxes and other structures) adjacent to the site that appear to be of World War 2 (WWII) origin. Consultation of the HER showed these structures to have not yet been recorded on the database.
3.3.4 The presence of asbestos meant that detailed recording of the wall was restricted to it being photographed and its position surveyed by Morrison Utility Services using RTK GPS (Fig 4). Following installation of the cable ducts, the trench was backfilled with the wall remaining in situ. No further archaeological features or finds were revealed during the remainder of the cable trench excavation.

Plate 7: Length of wall (20) at the Middleton Road site, facing east
4. CONCLUSIONS

4.1 DISCUSSION

4.1.1 The topsoil stripping and excavation of the cable trench at both the Carr Lane and Middleton Road sites revealed fragments of degraded post-medieval or industrial period pottery, three clay pipe stems, and two animal bones, as well a post-medieval or industrial period drainage gullies. Also found were spreads of clinker and demolition rubble, below which was a short length of brick wall. For the most part though, both sites were devoid of features or finds of archaeological significance. The route ran through open fields to the south of the main foci of settlement and development around Heysham, and attests to a low or negligible potential for archaeological remains.

4.1.2 The only archaeological find was the brick wall revealed at the Middleton Road site, 20. This may be of WWII date as it lies adjacent, and is similar, to upstanding structures probably of this era. None of these structures are presently recorded on the HER. The area, within which the wall was discovered, had formed part of a larger development known as the ‘Trimpell’ oil refinery, known to be operating during WWII and produced high-octane fuel for aviation (www.heyshamheritage.co.uk/html/trimpell). In 1941, the site was bombed and would have obviously required subsequent defensive structures, such as pillboxes. This wall may have been part of those defences.
5. ILLUSTRATIONS

5.1 FIGURES

Figure 1: Site locations
Figure 2: Plan of drainage ditch and gully at the Carr Lane site
Figure 3: Location plan of field boundary and drainage ditch at the Carr Lane site
Figure 4: Location plan of wall and field boundaries at the Middleton Road Site

5.2 PLATES

Plate 1: General view of the topsoil strip at the Carr Lane site
Plate 2: View of the cable trench excavation at the Carr Lane site
Plate 3: General view of the topsoil strip at the Middleton Road site
Plate 4: View of the cable trench excavation at the Middleton Road site
Plate 5: Waterlogged conditions at the Carr Lane site
Plate 6: Example of a trench section at the Carr Lane site
Plate 7: Length of wall (20) at the Middleton Road site, facing east
Figure 2: Plan of drainage ditch and gully at the Carr Lane site
Figure 3: Location plan of the field boundary and drainage ditch at the Carr Lane site.
6. BIBLIOGRAPHY

6.1 SECONDARY SOURCES

Countryside Commission, 1998 *Countryside Character Volume 2: North West, Chapter 31, Morecambe Bay and The Lune Estuary*


IfA, 2008a *Standard and Guidance for an Archaeological Watching Brief*, Reading

IfA, 2008 *Standard and Guidance for the Creation, Preparation, Transfer and Deposition of Archaeological Archives*, Reading


6.2 WEB RESOURCES

www.heyshamheritage.co.uk/html/trimpell

https://www.landis.org.uk/soilscapes/

http://mapapps.bgs.ac.uk/geologyofbritain/home.html
APPENDIX 1: WRITTEN SCHEME OF INVESTIGATION
DONG Energy Power (UK) Ltd

Application Number: 10/01203/FUL

Condition 22: Written Scheme of Investigation for an Archaeological Watching Brief

41315

OCTOBER 2011
RSK Environment Ltd (RSK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and RSK. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by RSK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK Environment Ltd.
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1 INTRODUCTION

1.1 Project Background

RSK Environment Ltd have been commissioned by DONG Power (UK) Ltd to devise a methodology for archaeological monitoring works during groundworks for the construction of a substation and associated cable routes (Routes 1 or 2) near Heysham, Morcambe.

Cable Route 1 runs from Mean Low Water Mark (MLWM) to the south of Heysham Harbour to south of the existing Heysham electricity substation; and Cable Route 2 from MLWM at Middleton Sands to the south of the Heysham existing substation.

An Environmental Statement (ES) concluded, through consultation with Lancashire County Archaeology Service (LCAS), previously undisturbed plots along the Cable Routes and the substation site should be subject to an archaeological watching brief during the contractor-led groundworks.

Stripping of topsoil and subsoil will be monitored by one or more qualified archaeologists in order to examine the archaeological (previously undisturbed) horizon.

Condition 22 of Planning Permission 10/01203/FUL requires:

No works shall take place on the site until the applicant, or their agent or successors in title, has secured the implementation of a programme of archaeological work. This must be carried out in accordance with a written scheme of investigation, which shall first have been submitted to and agreed in writing by the Local Planning Authority. Reason: To ensure and safeguard

All fieldwork and reporting will be undertaken under RSK’s technical management on behalf of DONG Energy Power (UK) Ltd., either by in-house archaeologists, or by a suitably qualified archaeological subcontractor (hereafter referred to as the ‘Archaeological Contractor’).

1.2 Topography and Geology

The superficial deposits comprise tidal flat deposits, which are fine to medium-grained sands. Underlying the sands are the red brown sandstones of the Sherwood Sandstone Group.

The shoreline at Heysham/ Middleton has seen a continuous subsidence for several thousand years, with a loss of land continuing throughout the historic period. In addition to this, the coastline is a very dynamic environment and the coastal contours are constantly changing as a result of both erosion and accretion.

Both Cable Routes are gently undulating. The landscape around the Cable Routes includes extensive salt marshes, reclaimed mosses and marshland but is predominantly industrial in character to the north and agricultural to the south.
1.3 **Archaeological Potential**

Prehistoric activity is attested to in the wider area, in terms of findspots of prehistoric flint tools dated from the Neolithic and Bronze Age. The evidence is, however, scant in the immediate area of the proposed Cable Route, although at Heysham Head a late Mesolithic site was excavated in the 1990s. There is some reputed placename evidence for ‘Barrows’ in Heysham (to the north of the harbour) which could indicate the presence of later-prehistoric burial monuments, but the area has been developed for 20th century housing and no physical remains of the barrows survive.

Given this lack of evidence for the prehistoric period, there is considered to be a low potential for identifying previously unrecorded sites from this period. Any potential is, in addition, limited to areas not impacted on by the later 19th century/early 20th century development.

Roman activity does not appear to have been widespread in this area, possibly due to the marginality of this area as a wetland environment during that period. The potential for remains of this period is therefore considered to be low, and again would be limited to areas not impacted on by later development.

St Patrick’s Chapel at Heysham (to the north of the harbour) dates from the 8th/9th century and a rock cut grave found at Heysham Rectory could possibly be of Saxon date. While this attests to Early Medieval activity within the wider area, it appears that the area of High Heysham to the north of the harbour was the focus of this activity, rather than the area of the proposed Cable Routes. The potential for early medieval remains within the area of the proposed development is therefore considered to be low.

St Patrick’s Chapel at Lower Heysham is likely to have been a focal point for settlement activity, rather than the area of the proposed development. The potential for remains of this period is therefore considered to be low.

Medieval activity is documented at Heysham and within the surrounding area, but again the marginality of the study area may have prevented significant exploitation.

Middleton is a very common placename, of Old English (Anglo-Saxon) origin and this indicates that the village of Middleton predates the Norman conquest. Medieval activity is well evidenced in and around Middleton, again suggesting that there was early medieval activity in the area. The potential for early medieval remains within the area of the proposed development is nonetheless considered to be low.

As referenced above, medieval activity is known within and around Middleton and the potential for remains of this period within the area of the development is expected to be low to moderate.

During the post medieval period it appears that the area was improved for agricultural purposes and enclosed. The area was also used for small scale industrial activities such as quarrying. No significant settlement patterns appear on the early Ordnance Survey mapping, however, suggesting that settlement was still focused around Lower Heysham to the north, Middleton and Overton to the south.
The potential for archaeologically significant remains of this period is therefore considered to be low.

During the early modern period the area is significantly altered by the construction of Heysham Harbour and the Heysham Branch railway, which created a new settlement focus and introduced an increased industrial presence. However, as the sites listed from this period survive as above ground features, previously unrecorded remains are not expected and the archaeological potential for this period is considered to be low.

A number of wreck sites are recorded as ‘off Heysham’. One to the north of the harbour is recorded as ‘The Vanadis’ and is believed to lie just offshore, while a further, unnamed wreck lies within the intertidal zone to the south of Red Nab. While this indicates that wrecks could potentially survive within the intertidal zone, the potential for the discovery of a previously unidentified wreck within the foreshore zone crossed by the proposed Cable Route 1 is considered to be low.

Peat deposits survive within Heysham, which are described in the North West Wetlands project. Any such deposits have the potential to contain surviving indicators of past land use, climate and environment.

The development of the caravan park, sewage works, industrial estate and the electricity substation will have already had an impact on any previously unrecorded buried archaeology within the study area.

The foreshore area is a dynamic environment and only deeply buried deposits of archaeological interest such as palaeo-environmental remains could be expected to survive in this area.

The roads within the study area are shown from the 1846 Ordnance Mapping, and are still in use today, so can be expected to have been resurfaced throughout the modern period, as well as realigned in places. Impacts from other services using the course of these lanes could also be expected.

1.3.1 Substation Site

The proposed substation will not impact on any known sites (see Figure 1). The watching brief will be maintained in this area since there is potential for the identification of unrecorded buried archaeological remains.

1.3.2 Cable Route 1

The proposed Cable Route 1 has a potential direct impact on one known site:

Site 9 Thurshouse, a dwelling, is shown on historic mapping from the 19th to early 20th century. Although the house no longer survives with any above ground evidence, buried archaeology could survive associated with this site.

1.3.3 Cable Route 2

The proposed Cable Route 2 appears to have potential direct impacts on three known sites:
Site 2 is the find spot of a 14th century axehead, reported as found near Middleton Sands.

Site 6 is a post medieval boundary stone.

Site 30 Alpha Terrace, is the site of a modern house shown on the 3rd edition Ordnance Survey mapping. Although the house no longer survives with any above ground evidence, buried archaeology could survive associated with this site.

In addition, there is some potential for the identification of unrecorded buried archaeological remains within the areas not previously impacted on. This is particularly relevant for the post medieval period in relation to the buildings shown on the early historic mapping within close proximity to the proposed Cable Route 2.
2 AIMS AND OBJECTIVES

The general aims of the watching brief are to:

- Identify and determine the extent, condition, character, importance and date of any archaeological remains present within the subject area;
- Preserve, by record, low level archaeological remains on the Cable Routes and proposed substation site; and
- Provide an assessment of the importance of the identified archaeological and heritage resources, so enabling the remains to be placed within their local, regional, national and historical contexts.
3 METHODOLOGY

The Archaeological Contractor will implement a watching brief in order to deal with any unanticipated archaeological remains and to safeguard extant historic features. Any activities of topsoil stripping, trench excavations, benching, temporary compounds and track-ways have the potential to impact on buried archaeological remains.

All groundworks within plots along the Cable Route highlighted on Figure 1 should be carried out under the supervision of a monitoring archaeologist. Monitoring archaeologists will not define the depth of excavation, but only observe works being carried out according to the project specification. The aim of the watching brief is to identify and record unanticipated archaeological remains and/or to safeguard extant historic and archaeological features.

The impact on any significant archaeological remains encountered during the watching brief shall be minimised wherever possible. Archaeological remains that cannot be preserved in situ shall be archaeologically excavated and recorded. The watching brief will be undertaken by an appropriately qualified archaeologist.

A protocol will be agreed between the archaeological watching brief archaeologists, the Archaeological Contractor, the Main Works Contractor, the Client, RSK and LCAS in the event of significant archaeological findings. Any finds that cannot be adequately dealt with by the watching brief archaeologist will be fenced, signed and excavated under archaeological conditions as soon as sufficient resources are available to do so. Sufficient resources should normally be supplied by the Archaeological Contractor within 48 hours of the findings being made. All archaeological watching brief staff will be expected to work construction hours.

Historic landscape features shall be recorded (former field boundaries, ponds, quarries etc) as part of the watching brief.

3.1 Survey

The features will be located on the ground using measurements from features present on OS maps (e.g. boundaries or buildings), or by the use of temporary local survey grids. The coordinates of the latter will be recorded via GPS or TST by means of survey support from the Main Works Contractor (MWC) or by the Archaeological Contractor. Methods will be chosen in accordance with what is judged as the most appropriate to the circumstances of the Site to provide the necessary accuracy.

3.2 Hand-Excavation and Recording

Generally, for features that are not of a structural, highly fragile or significant nature, the following broad sampling strategy will be applied:

- Small discrete features will be fully excavated;
- Larger discrete features will be half-sectioned (50% excavated);
• Linear features will be excavated to sample 20% of their length with interventions distributed along the length of the feature; and
• Burials will be 100% recovered.

Any variation to this methodology will be agreed in advance with LCAS.

All archaeological features will be recorded using the Archaeological Contractor’s pro forma recording system. A complete drawn record of excavated archaeological features and deposits will be compiled. This will include both plans and sections, drawn to appropriate scales (1:20 for plans, 1:10 for sections), and with reference to a site grid tied to the Ordnance Survey National Grid. The Ordnance Datum (OD) height of all principal features and levels will be calculated and plans/sections will be annotated with OD heights.

A full photographic record will be maintained using both colour transparencies and black and white negatives (on 35mm film), as well as high resolution digital images. The photographic record will illustrate both the detail and the general context of the principal features, finds excavated, and the Site as a whole.

3.3 Artefact Sampling Strategy

Finds will be treated in accordance with the relevant guidance given in the Institute for Archaeologist’s Standard and Guidance for Archaeological Excavation, (revised 2008) and the UK Institute of Conservation’s Guidelines for the Treatment of Finds from Archaeological Sites, excepting where they are superseded by statements made below. Any significant artefacts, clusters or in situ artefacts will be three dimensionally recorded.

A suitable metal detector will be used to enhance artefact recovery where appropriate.

Where appropriate, sieving of bulk environmental samples will be undertaken to enhance levels of artefact recovery. Where appropriate, bulk soil samples will be taken specifically for artefact recovery.

Contingency will be made for specialist advice and conservation needs on-site should unexpected, unusual or extremely fragile and delicate objects be recovered.

All artefacts will be retained from excavated contexts, except features or deposits of demonstrably modern date. In these circumstances sufficient artefacts will only be retained to elucidate the date and function of the feature or deposit. The excavated spoil will be examined for artefacts and these will be retained and recorded, except for material of a modern date, which will be noted but not retained.

All artefacts will, as a minimum, be washed, marked, counted, weighed and identified. The metalwork will be X-rayed and stored in a stable condition along with other fragile and delicate material by a suitable conservation specialist.

3.4 Environmental Sampling Strategy

Samples will be treated in accordance with the relevant guidance given in the Institute for Archaeologist’s Standard and Guidance for Archaeological Excavation,
Environmental Archaeology: A Guide to theory and Practice of Methods, from Sampling and Recovery to Post-Excavation, excepting where they are superseded by statements made below.

The detailed sampling policy will be agreed on site in consultation with LCAS. Bulk sampling will be principally directed towards the recovery of plant macrofossils, charcoal and land mollusca. Where appropriate, monolith and/or contiguous column samples will be taken to consider for sub-sampling for pollen and/or diatom assessment, and for consideration of soil micromorphological and soil chemical analyses.

3.5 **Treasure**

In the event of discovery of artefacts covered or potentially covered by The Treasure Act, their excavation and removal will be undertaken following notification of the Coroner and LCAS.

3.6 **Human Remains**

In the event of discovery of any human remains, they will initially be left in situ. Following discussions with the Coroner, LCAS and the Client, the need for and appropriateness of their excavation/removal as part of the excavation will be determined. Where deemed appropriate they will be fully recorded, excavated and removed from the Site subject to compliance with the relevant licence by the Ministry of Justice (MoJ) which will be obtained by the Archaeological Contractor.

Should human remains be excavated, all excavation and post-excavation will be in accordance with the standards set out in IfA Technical Paper 13 Excavation and Post-excavation Treatment of Cremated and Inhumed remains. If required, appropriate guidance/site visits will be obtained from a qualified specialist. The final placing of human remains following analysis will be subject to the requirements of the MoJ licence.
4 REPORTING

Following completion of the programme of archaeological recording, a detailed report of the investigation will be prepared. Sufficient documentary research will be undertaken to place the results of the evaluation in their historic context.

Unless extensive or highly significant remains are located which would necessitate a formal post-excavation assessment, it is envisaged that the compilation of the fieldwork report will represent the final reporting stage for the project.

The fieldwork report will, as a minimum, include the following elements:

- A non-technical summary;
- Fieldwork Aims and Methods;
- Results of the Fieldwork presented as:
  - A stratigraphic site narrative with regard to all features recorded
  - Plans and section of key features at appropriate scales;
  - Tabulation of all artefacts recovered from the trenches and listed by context and material type;
- Specialist reports; and
- A discussion of the findings in relation to regional research priorities.

It is intended that the fieldwork report be completed within six weeks of the completion of fieldwork, although the exact programme for the report preparation will be dependent on the nature of the findings and will be agreed with the Client at the time. Sufficient copies of the report will be supplied to allow distribution to LCAS as required.

The information will be deposited within the Lancashire Historic Environment Record where it can be freely copied for the purposes of archaeological research or Development Control within the planning process. One hardcopy as well as one electronic copy (in Acrobat Reader format) will be supplied to Lancashire HER for this purpose.

If considered appropriate, a short report on the results of the programme of archaeological recording will be prepared for publication in an appropriate national journal.
5 ARCHIVE

On completion of the report a cross-referenced and internally consistent archive will be produced. The primary archive, including copies of all photographs, will be deposited with the appropriate repository.

Details of the Site will be submitted online to the OASIS (Online Access to the Index of Archaeological Investigations) database.

The completed project archive will be prepared in accordance with the guidelines outlined in English Heritage’s Management of Research Projects in the Historic Environment (MoRPHE) and in accordance with the Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990).
6 STANDARDS

RSK is a Registered Organisation (RO) with the Institute for Archaeologists (IfA), and subcontracted services will be obtained from equally qualified organisations. All technical staff employed in the archaeological programme will be suitably qualified members of the IfA, with a level of experience commensurate with the work they are undertaking. Specialist and post-excavation work shall be undertaken by staff competent in the area of the specialism in question and with an adequate knowledge of regional archaeology and history.

All work will be undertaken in line with current best practice, and with guidelines and standards issued by the IfA, and in accordance with, but not limited to, the following standards and guidance documents:

- IfA Code of Conduct;
- IfA Standard and Guidance on Archaeological Watching Brief; and
- English Heritage’s Management of Research Projects in the Historic Environment (MoRPHE)
7 MONITORING

LCAS will be responsible for monitoring progress and standards throughout the project. Their representative will be notified at least three working days prior to the commencement of site work.

LCAS will be allowed all reasonable access to the Site and site records.

Any variation to this Written Scheme of Investigation will be agreed with LCAS.
8 HEALTH AND SAFETY

The Archaeological Contractor is required to ensure the Health and Safety of all people engaged in the works and of the general public in proximity to the works, and will submit project-specific method statements and risk assessments for approval by RSK and the Client at least one week before fieldwork begins. These documents shall be updated as necessary during the works.

Appropriate PPE will be worn by all site staff and visitors and is to be provided by the archaeological subcontractor. As a minimum this will include high visibility vests/jackets, safety boots with ankle support, hard hats, and safety glasses/goggles and gloves as appropriate.

The Archaeological Contractor will produce a site-specific Risk Assessment.
9 REFERENCES

English Heritage 2006. Management of Research Projects in the Historic Environment (MoRPHE)
Institute for Archaeologists, 2010, Code of Conduct (revised)
Institute for Archaeologists 2008a. Standard and Guidance for Archaeological Excavation (revised)
Institute for Archaeologists 2008c. Standard and Guidance for Archaeological Watching Brief (revised)
APPENDIX 2: CONTEXT INDEX

<table>
<thead>
<tr>
<th>Context No</th>
<th>Site</th>
<th>Interpretation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Carr Lane</td>
<td>Rubble deposit</td>
<td>Red-brown silty-clay layer with tarmac, hardcore and gravel fragments</td>
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<tr>
<td>2</td>
<td>Carr Lane</td>
<td>Topsoil/subsoil mix</td>
<td>Mid grey-brown layer with angular stones &lt;40mm</td>
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<tr>
<td>3</td>
<td>Carr Lane</td>
<td>Natural</td>
<td>Orange-grey clay</td>
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<tr>
<td>4</td>
<td>Carr Lane</td>
<td>Ditch cut</td>
<td>Curvilinear V-shaped cut</td>
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<tr>
<td>5</td>
<td>Carr lane</td>
<td>Fill of 4</td>
<td>Mid red-brown clay-silt &lt;1% sub-rounded pebbles</td>
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<tr>
<td>6</td>
<td>Carr Lane</td>
<td>Gully cut</td>
<td>Linear V-shaped cut</td>
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<tr>
<td>7</td>
<td>Carr Lane</td>
<td>Upper fill of 6</td>
<td>Mid dark red-brown clay-silt &lt;1% sub-rounded pebbles</td>
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<tr>
<td>8</td>
<td>Carr Lane</td>
<td>Lower fill of 6</td>
<td>Mid orange-grey silty-clay &lt;1% sub-rounded pebbles</td>
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<td>9</td>
<td>Carr Lane</td>
<td>Topsoil</td>
<td>Dark brown loam</td>
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<tr>
<td>10</td>
<td>Carr Lane</td>
<td>Subsoil</td>
<td>Yellow-orange sandy-clay</td>
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<tr>
<td>11</td>
<td>Carr Lane</td>
<td>Natural</td>
<td>Rounded and sub rounded cobbles</td>
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<td>Carr Lane</td>
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<td>Very dark brown loam, thin</td>
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<tr>
<td>13</td>
<td>Carr Lane</td>
<td>Subsoil</td>
<td>Dark brown clay subsoil</td>
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<tr>
<td>14</td>
<td>Carr Lane</td>
<td>Natural</td>
<td>Grey homogenous grey clay, waterlogged</td>
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<td>Middleton Rd</td>
<td>Topsoil</td>
<td>Brown loam</td>
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<tr>
<td>16</td>
<td>Middleton Rd</td>
<td>Subsoil</td>
<td>Yellow-orange sandy clay &gt;25%</td>
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<td>17</td>
<td>Middleton Rd</td>
<td>Field drain</td>
<td>Terracotta land drains</td>
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<tr>
<td>18</td>
<td>Middleton Rd</td>
<td>Rubble deposit</td>
<td>Demolition rubble comprising bricks, ash, clinker, asbestos</td>
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<tr>
<td>19</td>
<td>Middleton Rd</td>
<td>Ash and clinker spread</td>
<td>Thin spread of ash and clinker</td>
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<tr>
<td>20</td>
<td>Middleton Rd</td>
<td>Wall</td>
<td>Red brick wall 2.36m long by 0.39m thick</td>
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<tr>
<td>21</td>
<td>Middleton Rd</td>
<td>Natural</td>
<td>Fragmented sandstone</td>
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