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SUMMARY

Following proposals by Persimmon Homes (Planning Reference 1/04/0617) for a residential development on the site of the former Sutton and Son Longtown Depot, Albert Street, Longtown, Cumbria (NGR NY 3823 6853; Fig 1), Cumbria County Council Historic Environment Service (CCCHES) compiled a brief requesting that a programme of archaeological investigation, comprising a desk-based assessment and trial-trench evaluation, should be undertaken to further inform the planning process. Oxford Archaeology undertook this work in February and March 2006 at the request of Persimmon Homes, and identified that the site had formerly been occupied by the Longtown Bobbin Mill, built in 1851 (OA North 2006). The evaluation revealed the well-preserved structural remains of the bobbin mill within the western part of the development site.

Based on the results of this preliminary work, and due to the fact that the remains could not be preserved *in situ*, CCCHES issued an instruction for a programme of archaeological excavation and recording of the extant features of the bobbin mill, to provide mitigation for their eventual destruction. Following the compilation of a project design, OA North were commissioned by Persimmon Homes to undertake the excavation in September and October 2006, the results of which are briefly outlined in this interim document. The excavation covered an area roughly 25m square, within which it was possible to identify the surviving outline of the mill, although this had suffered some damage as a result of the recent demolition and decontamination of the site. The majority of the steam power plant, the focus of the detailed investigation, remained relatively unscathed, and it was possible to identify structural remains of the engine house, boiler house, flue and chimney. The design of these structures show that a Lancashire Boiler was employed at the site to power a beam engine. No economiser, or water feed heater, which would have used hot air from the furnace to pre-heat water entering the boiler, was located, although it is possible that this structure was lost due to later disturbance of the site.

It is intended that the illustrated results of the recent fieldwork will be published in the *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society*.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) would like to thank Paul Townsend and Peter Hart of Persimmon Homes for commissioning the project and for their assistance. Thanks are also due to Andy Bourne, of Duncton Contractors, for his assistance onsite, and to Jeremy Parsons of Cumbria County Council Historic Environment Service (CCCHES) for his assistance and advice.

The archaeological excavation was carried out by Andy Bates, Jeremy Bradley, Kelly Clapperton, Pascal Eloy and Tom Mace, with advice from Ian Miller. The drawings were produced by Marie Rowland. Andy Bates compiled this report, for which Ian Miller provided a great deal of technical advice and information. The project was managed by Stephen Rowland, who also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

- 1.1.1 Following proposals by Persimmon Homes (Planning Reference 1/04/0617) for a residential development on the site of the former Sutton and Son Longtown Depot, Albert Street, Longtown, Cumbria (NGR NY 3823 6853; Fig 1), Cumbria County Council Historic Environment Service (CCCHES) compiled a brief, requesting that a programme of archaeological investigation be undertaken to further inform the planning process. Oxford Archaeology North (OA North) was commissioned by Persimmon Homes to undertake this work, comprising a desk-based assessment and trial trench evaluation, in February and March 2006 (OA North 2006). This provisional programme sought to provide a detailed assessment of the significance of the known archaeological resource within the development area and of the subsequent impact of the proposed development on this resource. The desk-based assessment revealed that, prior to the construction of the Longtown Depot, the site had been occupied by the Longtown Bobbin Mill, built in 1851.
- 1.1.2 The evaluation comprised the excavation of two linear trial trenches within locations of high archaeological potential as indicated by regression of the historic cartographic sources. Trench 1 was placed along the likely axis of the bobbin mill within the western part of the site, whilst Trench 2 was placed more centrally to investigate the location of a group of ancillary structures. Although truncated in places by subsequent activity, well-preserved structural remains of the mill were encountered in Trench 1. Findings within Trench 2 suggested that the ancillary buildings had been built either with shallow foundations, or without foundations at all, as no trace of these structures was found beneath layers of made ground and disturbance. Based on the results of this preliminary investigative work, CCCHES requested that a programme of archaeological excavation and recording of the main bobbin mill building should be undertaken in order to mitigate any damage to the archaeological resource associated with the development. Following submission of a project design (*Appendix 1*) to meet the requirements of the CCCHES verbal communication, Oxford Archaeology was commissioned to undertake the archaeological excavation, which took place in October 2006.

1.2 AIMS AND OBJECTIVES

- 1.2.1 The aim of the excavation was to reveal and record the surviving extent of the principal structure of the bobbin mill, as indicated on the historic maps; there was no requirement to examine any of the ancillary buildings, largely because remains of these more temporary structures were unlikely to survive within the archaeological record. Of primary importance was the identification and detailed recording of the steam power plant in order to better understand the technology used at the mill. Since the plan of the mill could be reconstructed from cartographic sources, investigation and recording of structures outside of

this area was to be limited to providing a better understanding of the date and phasing of any structural changes, and of the function of any particular areas.

1.3 METHODOLOGY

- 1.3.1 As far as possible, the CCCHES-approved project design (*Appendix 1*) was adhered to throughout the excavation, and the work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists, and generally accepted best practice. However, practical and/or health and safety considerations did lead to one or two variations from the original project design; all were made in consultation with CCCHES. The excavation area was originally to encompass 720m² around the body of the main mill building, but it was soon evident that the recent decontamination groundworks had completely removed the southern end of the mill buildings previously identified by the evaluation. Following discussions with CCCHES, the excavation area was reduced to include only the preserved northern end and the western wing of the mill buildings (Fig 2).
- 1.3.2 The overburden of the area was removed using a 13 ton 360° mechanical excavator. All further excavation was conducted by hand, and all features and structures identified were excavated and recorded stratigraphically. Recording was by means of OA North's standard context recording system, based on that used by the English Heritage Centre for Archaeology, using context record, photographic record, and object record *pro-forma* sheets, with supporting registers and indices. A photographic record in colour transparency (slides) and monochrome formats was compiled. All features were planned using a total station and pen computer in a CAD system and subsequently located with reference to the National Grid.

1.4 LOCATION, TOPOGRAPHY AND GEOLOGY

- 1.4.1 Longtown lies in the Esk Valley, 13km north of Carlisle and 4km south of the Scottish border. The underlying geology of the coastal area around Longtown is made up of Triassic red and grey sandstones with partings of grey mudstone (Institute of Geological Sciences 1976). The Countryside Commission (1998) places the area of Longtown within the Solway Basin, an area of relatively flat lowland bounded by the Cumbria High Fells to the south and by the hills of the Scottish borders to the north.

1.5 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

- 1.5.1 **Introduction:** the following section is intended to be only the briefest of introductions to the history and archaeology of the area of the development site; it is not intended to be an exhaustive survey and a more detailed summary can be found in the desk-based assessment and evaluation report (OA North 2006).
- 1.5.2 **Preshistoric - medieval:** although there is evidence of prehistoric, Roman and early medieval activity within the wider area (including the projected route of

a Roman road that runs very close to the town and the site of the sixth-century Battle of Arthuret, just to the south), the only such remains from Longtown comprise a fourth-century Roman coin (CCC 2002). It is not until the medieval period that there is any real evidence of settlement, when Longtown, then focused on St Michael's Church, about 1km to the south of the modern town, is mentioned within the Calendar of Charter Rolls in 1267 (Armstrong *et al* 1971). Around 1306, when a charter for a market and a fair was granted, settlement shifted closer to the site of the modern town, although the exact location is still unknown (CCC 2002). Lying within the debatable lands contested by England and Scotland meant that the area had an often violent history, exemplified in 1542 by the English victory at the Battle of Solway Moss, the registered site of which skirts the southern edge of the town (English Heritage 2002).

- 1.5.3 **Post-medieval:** post-medieval Longtown was an important cattle market, despite in 1688 comprising only a dozen clay-built houses (Bulman and Frith 1959; Routledge 2000, 3). In 1757 the Graham family inherited the nearby Netherby Estate, and proceeded to entirely reconstruct Longtown with formal terraces of two-storied, three-bay, cobble and rubble-constructed, lime-rendered houses built within in a formal grid pattern of four wide principal streets running east/west off the main arterial spine (CCC 2002, 5).
- 1.5.4 **The Longtown Bobbin Mill:** in 1851 Sir James Graham was planning the erection of a bobbin mill at Longtown for the principal reason of increasing the value of his woodland (Marshall 1971), but that same year the Longtown Bobbin Mill was built on Albert Street by J & E Waters, sewing manufacturers of Manchester. It is likely that the mill used wood from the Graham's Netherby estate and was built to provide bobbins to Talbot Mills, situated in the Cornbrook area of Manchester (OA North 2005). The Lancashire textile trade was at its peak at this time, and 49 bobbin mills were at work in the Lakeland region (Marshall and Davies-Shiel 1977). Bobbins of all descriptions were made for both the cotton industry of Lancashire and Yorkshire and for the numerous handloom weavers operating in Longtown, Carlisle and almost every village and hamlet in the region (Routledge 2000). Ninety workers were employed in the Longtown Mill, although the introduction of new machinery in the later nineteenth century brought about the loss of many jobs and, by 1893, the number of employees had fallen by almost fifty per cent (*ibid*).
- 1.5.5 Unlike the majority of Lakeland bobbin mills, which were generally water-powered and of which only a few received steam power in the later nineteenth century (LUAU 1995), it seems that the Longtown Mill was a purpose-built steam-powered mill. Water for the steam-driven machinery came via aqueducts from the weir at Brisco Hill, 1km to the south-east of the mill (Fig 1), but by 1868 was piped underground and stored in two large ponds near the mill. With a brief hiatus in 1900 the mill operated until 1936 and it is thought that the building later briefly opened as a sawmill; by 1969 the building was ruinous (comments by Miss ABG recorded in Cumbria HER).
- 1.5.6 The majority of the purpose-built Lakeland bobbin mill buildings were fairly small two-floored structures, and photographic evidence from *c* 1900 suggests that the Longtown Mill was similarly-constructed. The upper floors would

have housed lathes, powered by drive belts connected to a line-shaft built within the roof space whilst the basement or lower floor in many mills housed tubular saws used for cutting out the raw bobbin blocks (Marshall and Davies-Shiel 1977). Cartographic evidence shows a number of ancillary structures to the east of the main Longtown Mill building, which are likely to have functioned as drying sheds, stores and additional workshops. The fact that the configuration of these structures changed between 1868 and 1901 implies that they neither were robustly built nor housed significant machinery.

2. SUMMARY OF RESULTS

2.1 INTRODUCTION:

2.1.1 The excavation removed various deposits of demolition debris to successfully identify and record the foundations of the western wing of the mill buildings and structural remains at the northern end of the mill (Fig 3), as well as the steam power plant, comprising the boiler room, engine house, fly-wheel pit, flue and the chimney (Fig 4). Of features found during the evaluation (OA orth 2006), only those thought to be associated with the chimney, at the north-west end of Trench 1, had survived the recent decontamination works.

2.2 THE BOILER HOUSE (STRUCTURES 109, 121, 127 AND 207)

2.2.1 The main body of the boiler house, structure **109**, measured 9.3m east/west by 3.7m wide, with the internal floor located 1.45m below the level of the natural clay. The feature was bound by walls **131**, **135** and **156** to the south, north and east respectively, the lower courses of which were constructed of sandstone blocks and the upper in red brick. Internally, the northern and southern sides of the boiler house were benched, to a maximum surviving height of 0.65m above the brick floor, **144**, creating a stepped profile. These benches were formed from *in-situ* glacial till, **196**, faced with brick, **139** and **147**, and would have supported the now-missing structure upon which the metal boiler would have sat. The benches do not extend the full length of the boiler housing to the west, leaving a small area of floorspace within which a semi-hexagonal masonry feature, **133**, is likely to have housed the blowdown pipe, from which waste would have been extracted following cleaning of the pipes within the boiler. Feature **133**, together with adjoining cast iron beam **132**, would have formed part of a structure supporting a removable floor between the boiler and charging platform, allowing the removal of any products emanating from the blowdown pipe.

2.2.2 To the west of the boiler housing were found the remains of the rectangular charging platform, Structure **125**, which measured 3.4m north/south by 2.55m. This comprised concrete floor **127** laid on brick steps **128** and **141**, lying 0.56m above boiler housing floor **144** and bound to the north and south by red brick walls **142** and **126**, which ran contiguous with walls **135** and **131** of the boiler housing. Moving westward, the floor level dropped down step **141** 0.81m into the coal store (Structure **121**), the base of which lay 1.54m below the level of the surrounding natural boulder clay. No floor was located in the coal store, and it was speculated that stone flags may have been robbed from the structure during demolition. The coal store, internally measuring about 3.2m square, was bound to the north, south and west by 0.55m thick sandstone wall **122**. A short northward projection of wall **122** with an eastward return appeared to enclose Structure **207**, a small room barely 2m east/west by 1m, adjoining the north-west corner of the boiler housing. As with the coal store, the original flooring, which would have lain 1.5m below the level of the surrounding glacial till, appeared to have been robbed-out. Structure **207**

seems most likely to have housed a cistern to supply water to the boiler from the header tank, a premise supported by the presence of a 0.1m diameter cast iron pipe, **136**, passing between the cistern house and boiler house beneath the concrete floor of the charging platform.

2.3 THE FLUE (STRUCTURE **110**)

2.3.1 The twin flues of the boiler originally exited via separate apertures to flue **110**, but subsequently were blocked. On either side of these apertures, on the boiler room side, iron fittings were present, which may relate to some means of controlling gas flow. Flue **110** itself was constructed of heat-resistant bricks to the north (**162** and **164**), changing to red brick to the south (**170** and **168**), with a floor, **163**, composed of a mixture of red, moulded and engineering bricks. The economiser, or water feed heater, saved fuel by using the hot waste gases to preheat water entering the boiler (Jones 1996, 122-123); if present, it would have been located at the south-east end of the flue, an area which has suffered quite badly from disturbance.

2.4 ENGINE HOUSE (STRUCTURE **107**)

2.4.1 The engine house, located to the south of the boiler house, was bound to the south by sandstone walls **182** and **206** and to the north by wall **181**, composed of engineering bricks and which supported a later wall (**146**) relating to the depot. It seems likely that the engine house contained the structures associated with a vertical beam engine. Elements of this beam engine would have been supported by large engine bases of sandstone ashlar, over 2m across, represented *in situ* by **204** and **193** and numerous of which had been pushed into the deeper pits during demolition. Superheated and pressurised dry steam would have fed from the boiler into the condenser located in the condenser pit, **205**. The condensation of steam back to water created a partial vacuum in cylinders, located on engine bases **204**, thereby drawing the piston connected to the eastern end of the east/west aligned beam downwards to provide the power stroke (Giles and Goodall 1992, 154-155).

2.4.2 The beam would have pivoted on two uprights fixed to the eastern end of engine bases **193**. The western end of the beam drove the flywheel, the shape of the lower part of which can be seen in the northern elevation of the flywheel pit, **106**. A smaller pinion wheel, driven by the flywheel, would have been located between the condenser pit and flywheel pit, opposite the fixings for the bevel wheels, **189**. A motion shaft between the pinion wheel and bevel wheel drives the latter, which transfers the power in a vertical direction to the separate floors of the mill (Giles and Goodall 1992, 154-155). Although attempts were made to empty the flywheel and condenser pits of as much water and debris as possible, the inflow of water and the presence of hydrocarbon contamination meant that they could not be completely emptied to reveal the full extent of their inner features.

2.4.3 Further elements of the engine house lay between flue **110** and the southward return of wall **182**; sandstone walls **173** and **174** and engineering brick wall

178 defined a roughly 2m square pit, the upper-most fill of which, **176**, produced several pieces of old leather shoes but was observed to be heavily contaminated with hydrocarbons and not investigated further. To the south of this pit and defined to the north and west by a mixture of sandstone and heat-resistant brick walls, **184 - 188**, was an area of concrete floor, **175**.

2.5 OTHER STRUCTURES

- 2.5.1 Although the state of preservation outside of the steam power plant was very poor, it was possible to locate the external foundations of the western wing of the mill, **108**, running contiguous with wall **206** of the engine house; no internal features survived within this area, however. Masonry **100** comprised foundations of the north-western corner of the mill building. The fabric of both of these foundations comprised roughly-squared sandstone blocks. As with the western wing, very few internal features were preserved to the north of the steam power plant. Structure **208** comprised a drop barrel toilet within a red-brick structure, which may have been the base of a tower allowing access to the toilet from several levels. The fill of this feature was heavily-contaminated with hydrocarbons, and could not be closely-investigated.
- 2.5.2 A north/south aligned red brick foundation, **112**, which ran from the toilet to the boiler room, seems most likely to relate to an internal division within the mill, as does east/west aligned abutting red brick and sandstone wall foundation **119/102**. To the immediate east of the boiler house were sandstone blocks, **104**, thought to be those of the chimney base, but the chimney foundations first located during the evaluation had been grubbed-out by recent groundworks. Some clues to the nature of the onsite water management had survived, including a 0.1m diameter cast iron pipe, **197** which appeared to head towards the boiler house just to the north of the chimney. This could have brought cold water to the mill from the northerly pond, entering the mill via the chimney to aid in pre-heating the water and, therefore, saving fuel. A second pipe, **209**, was 0.25m in diameter and ran in the direction of the engine house on an east/west alignment, just to the south of the chimney; it may have supplied cold water to the condensers or removed hot water to the southern pond.

2.6 FINDS

- 2.6.1 Very few finds were made during the course of the excavation, of which the majority were observed as being extremely late in date and originating from demolition deposits. As such, with the possible exception of the shoe parts found in pit fill **176**, there is no evidence of *de facto* refuse, nor of any finds that would help to more accurately date the various elements of the mill. A number of brick samples were taken, the analysis of which is more likely to be informative of the functional requirements of the structural features from which they derived than to any particularly close dating.

3. CONCLUSION

3.1 DISCUSSION

- 3.1.1 Despite the fact that much of the mill has suffered from disturbance, the more deeply-founded and substantially-built elements of the steam power plant survived in reasonable condition. Although the degree of hydrocarbon contamination (likely to be associated with the twentieth century Longtown Depot) was high, it has been possible to investigate these features to a level that is sufficient to understand the workings of this particular part of the mill. Firstly, there was no evidence for the presence of a wheel pit or leat that might suggest the use of water power on the site and it would appear that, as suspected, the mill was a purpose-built steam-powered installation. The extant remains indicate that a twin-flued Lancashire boiler was the heart of the power plant, which, if it does indeed represent the original boiler installed in 1851, would then have been considered state of the art, since these boilers had only been patented in 1844 (Cossons 1993). Establishing whether there was any change to the power plant machinery during the main phase of the mill's use during the second half of the nineteenth century, however, is more difficult. The documentary evidence suggests that more efficient machinery was introduced into the mill in the later nineteenth century (OA North 2006), but whether this relates to the steam power plant is unclear. The amount of contamination, waterlogging and the sheer size of many of the individual elements (for example, the huge engine blocks) precluded excavation in the conventional sense, which, added to the probability that existing fixtures were reused whenever possible, makes it extremely difficult to recognise, let alone date, any phasing of this part of the site.
- 3.1.2 The issue is made more problematic by the fact that the use of materials within many features was not always consistent (for example the floor of the flue), creating the impression that the original builders were willing to use whatever materials were close at hand, or equally, that later additions may have reused a mixture of existing materials. Several features, notably boiler house walls **135** and **126**, have lower courses of sandstone and upper courses of brick; it seems most likely that sandstone was used for the foundation footings for brick walls, rather than that two phases of construction are represented. Indeed, from the cartographic evidence this part of the mill seems to be consistent between the 1868 and 1901 editions of the Ordnance Survey maps, with the only changes occurring at the eastern end of the northern block. Although the 1868 OS map show a small projection in this area, thought to relate to a chimney, that on the 1901 edition is much larger and mirrored by a similar extension to the southern block. Typically, this area falls largely within a disturbed part of the site, but it is apparent that the twin flues of the Lancashire boilers feed into this area, with the site of the putative economiser to the south. Conversely, the excavated remains of the chimney seem to lie well outside of this area. It is tempting to postulate that this area was redeveloped to allow the insertion of a larger chimney and economiser for the installation of a Lancashire boiler, perhaps in place of a single-flued Cornish-type, but there was no extant evidence for the changing or rebuilding of plant fixtures to accommodate new

or updated technology, nor for the deep foundations of the large chimney shown on early twentieth-century photographs.

3.2 RECOMMENDATIONS

- 3.2.1 A full collation and appraisal of the fieldwork archive should take place, together with a programme of further documentary research that may help to provide further information concerning the history and use of the mill. The results of this analysis should be presented as an illustrated publication draft for submission to the *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society* (TCWAAS).

4. BIBLIOGRAPHY

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5. ILLUSTRATIONS

5.1 LIST OF FIGURES

Figure 1: Site Location

Figure 2: Excavation Trench Location Plan

Figure 3: Excavation Plan

Figure 4: Detail of Structures *121, 125, 107, 109* and *110*

APPENDIX 1: PROJECT DESIGN

**SUTTON AND
SON LONGTOWN
DEPOT,
ALBERT STREET,
LONGTOWN,
CUMBRIA**

**ARCHAEOLOGICAL
EXCAVATION: PROJECT
DESIGN**



Oxford Archaeology North

May 2006

Persimmon Homes Ltd

Grid Reference: NY 3823 6853

OA North Tender No: t2743

Planning Reference: 1/04/0617

1. INTRODUCTION

1.2 PROJECT BACKGROUND

1.2.1 Persimmon Homes Ltd (hereafter the 'client') have requested that Oxford Archaeology North (OA North) submit proposals for an archaeological excavation ahead of a residential development on the site of the former Sutton and Son Longtown Depot, Longtown, Cumbria. The results of a desk-based assessment and field evaluation of the site indicated that the proposed development affects an area of high archaeological potential. Accordingly, Cumbria County Council Historic Environment Section (CCCHES) requested, in a letter to the Carlisle City Council Development Control Officer, that the site should be the subject of a programme of archaeological recording and, where appropriate, post-excavation assessment and analysis. The following project design is based upon a verbal communication with CCCHES. Longtown lies in the Esk Valley, about 15km north of Carlisle and close to the English/Scottish border. The development site covers approximately 0.67 ha of former industrial land towards the centre of Longtown.

1.2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

1.2.1 A recent desk-based assessment indicated the potential for the remains of a former bobbin mill, built *c* 1851, to survive on the site (CHER10686). An archaeological evaluation was then undertaken, with one trial trench (Trench 1) excavated within the western part of the site, across the location of what was thought to be the main bobbin mill building, and another (Trench 2) within the central area of the site, across the location of several phases of ancillary buildings associated with the bobbin mill. Although no significant features were encountered within Trench 2, moderately well-preserved structural elements relating to several phases of activity were located within Trench 1 and included internal and external wall foundations as well as a probable chimney base. The northern part of the main mill building was tentatively identified as the most likely location for the engine and boiler houses. The exposed remains lay at a shallow depth and would be damaged by groundworks associated with any proposed development in the area.

1.3 OXFORD ARCHAEOLOGY NORTH

1.3.1 Oxford Archaeology North has considerable experience of sites of all periods, having undertaken a great number of small and large scale projects throughout Northern England during the past 25 years. Evaluations, assessments, watching briefs and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. OA North has particular experience of industrial archaeology in the North West, having undertaken in recent years excavation, survey, building recording and post-excavation projects in both urban and rural environments.

1.3.2 OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an Institute of Field Archaeologists (IFA) **registered organisation, registration number 17**, and all its members of staff operate subject to the IFA Code of Conduct.

2. AIMS AND OBJECTIVES

2.1 ACADEMIC AIMS

2.1.1 The main research aim of the investigation will be to expose and record the remains of the engine and boiler houses within the main building of the bobbin mill, to confirm the presence or absence of a water wheel onsite and, to characterise any water management features

relating to the supply of steam- or water-powered machinery. The secondary aim of the investigation will be to expose and record the plan of the main mill building itself, along with any extensions and internal features.

2.2 OBJECTIVES

2.2.1 The objectives of the project may be summarised as follows:

- to expose and record the extent and character of the surviving structures of the main mill buildings as well as the location of any water management interfaces with the main mill building;
- to assess the state of preservation of features and structures within the engine and boiler houses, in order to determine and conduct a suitable recording procedure which, in optimal circumstances, will provide an understanding of the nature and phasing of power features within the mill
- to generate a foundation plan of the components of the main mill structure and establish their intended function.

3 METHOD STATEMENT

3.1 The following work programme is submitted in line with the aims and objectives summarised above, and in accordance with a verbal communication with CCCHES.

3.2 FIELDWORK

3.2.1 **Excavation Trench:** it is proposed that the site be investigated via a single trench, which will follow, as closely as possible, the known location of the main building of the former bobbin mill, including a suitable margin for the determination of the presence of any adjoining water management features. The trench will, therefore, measure 38m north/south by 15m east/west, with a westward projection measuring 15m east/west by 10m north/south, a total of 720m². The stripping of the entire area will make it possible to determine the exact locations of the steam power plant and of any detached chimneys, and focus upon them for any detailed recording.

3.2.2 **Methodology:** excavation of the uppermost levels of modern overburden/demolition material will be undertaken by a 13 ton machine fitted with a toothless ditching bucket to the top of the first significant archaeological level. The work will be supervised by a suitably experienced archaeologist. Spoil from the excavation will be stored at a safe distance from the trench and, if required, will be backfilled upon completion of the archaeological works.

3.2.3 Machine excavation will then be used to define carefully the extent of any surviving walls, foundations, and other remains. Thereafter, structural remains will be cleaned manually to define their extent, nature, form and, where possible, date, although a machine would also be used to lift any heavy blocks or to excavate large negative features (such as the wheel pit, for example). If there is a requirement for the excavation to proceed below a depth of 1.2m, the trench sides will be battered back to a safe angle of repose.

3.2.4 **Site Meeting:** it has been requested by CCCHES that a site meeting will be held immediately following the stripping of the excavation trench down to the uppermost archaeological horizon. The purpose of this meeting is to determine the state of preservation of structural and mechanical features within those areas identified as the bobbin mill engine and boiler houses and to then establish an appropriate programme of recording. Although the recording strategy detailed below is likely to be followed, it is possible that subsequent to the site meeting, CCCHES may request or advise modifications. Any variation, however, will not be undertaken without the agreement of CCCHES and the Client.

- 3.2.5 **Recording Strategy:** all information identified in the course of the site works will be recorded stratigraphically, using a system adapted from that used by the Centre for Archaeology Service of English Heritage. Results of the excavation of the steam power plant will be recorded on *pro-forma* context sheets, and will be accompanied with sufficient pictorial record (plans, sections and both black and white and colour photographs) to identify and illustrate individual features. Primary records will be available for inspection at all times.
- 3.2.6 A full and detailed photographic record of individual contexts will be maintained and similarly general views from standard view points of the overall site at all stages of the excavation will be generated. Photography will be undertaken using 35mm cameras on archivable black and white print film as well as colour transparency, and all frames will include a visible, graduated metric scale. Extensive use of digital photography will also be undertaken throughout the course of the fieldwork for presentation purposes. Photographic records will be maintained on special *pro-forma* sheets.
- 3.2.7 The precise location of the trench, and the position of all archaeological structures encountered, will be surveyed by EDM tacheometry using a total station linked to a pen computer data logger. This process will generate scaled plans within AutoCAD 2004, which will then be subject to manual survey enhancement. The drawings will be generated at an accuracy appropriate for 1:20 scale, but can be output at any scale required. Sections will be manually drafted as appropriate at a scale of 1:10. All information will be tied in to Ordnance Datum.
- 3.2.8 Any features of the bobbin mill that survive outside of the area of the steam power plant, especially the flues and chimney, will be surveyed and photographically recorded as described above. Brief written records, sufficient to characterise the features, will be made and hand investigation will be restricted to the determination of structural relationships between later-phase walls etc. Negative features would be investigated and characterised through half-sectioning or, if linear, by the removal of sufficient samples at strategic points (minimum 0.5m wide to a maximum of 10%).
- 3.2.9 Human remains are not expected to be present, but if they are found they will, if possible, be left *in situ* covered and protected. If removal is necessary, then the relevant Home Office permission will be sought, and the removal of such remains will be carried out with due care and sensitivity as required by the *Burials Act 1857*.
- 3.2.10 Any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996.
- 3.2.11 **Finds policy:** finds recovery and sampling programmes will be in accordance with best practice (following current Institute of Field Archaeologists guidelines) and subject to expert advice in order to minimise deterioration. OA North has close contact with Ancient Monuments Laboratory staff at the University of Durham and, in addition, employs in-house artefact and palaeoecology specialists, with considerable expertise in the investigation, excavation, and finds management of sites of all periods and types, who are readily available for consultation.
- 3.2.12 Finds storage during fieldwork and any site archive preparation will follow professional guidelines (UKIC). Emergency access to conservation facilities is maintained by OA North with the Department of Archaeology, the University of Durham. Samples will also be collected for technological, pedological and chronological analysis as appropriate.
- 3.2.13 **Reinstatement:** the cost for basic reinstatement of the ground has been included as a contingency; if the client would like OA North to undertake this work, the trenches will be backfilled so that the topsoil is laid on the top, and the ground will be roughly graded with the machine. It would be preferable for the landowner to agree to the finished reinstated

trenches prior to leaving site. Should there be a requirement by the client other than that stated, this will involve recosting for an agreed variation.

3.2.14 **Fencing/hoarding requirements:** it is assumed that the client will advise on the arrangements/requirements for the site to be protected from public access. It is, however, assumed that the current fencing is sufficient to maintain the security of the development site. Should further heras fencing or similar be required, it can be included as a contingency item and will be invoiced at cost.

3.2.15 **Contingency plan:** a contingency costing may also be employed for unseen delays caused by prolonged periods of bad weather, vandalism, discovery of unforeseen complex deposits and/or artefacts which require specialist removal, use of shoring to excavate important features close to the excavation sections etc. This has been included in the Costings document and would be charged in agreement with the client.

3.3 HEALTH AND SAFETY

3.3.1 OA North provides a Health and Safety Statement for all projects and maintains a Safety Policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (3rd Edition, 1997). OA North will liaise with the Client/main contractor to ensure all current and relevant health and safety regulations are met.

3.3.2 OA North has professional indemnity to a value of £2,000,000, employer's liability cover to a value of £10,000,000 and public liability to a value of £15,000,000. Written details of insurance cover can be provided if required.

3.3.3 Normal OA North working hours are between 9.00 am and 5.00 pm, Monday to Friday, though adjustments to hours may be made to maximise daylight working time in winter and to meet travel requirements. It is not normal practice for OA North staff to be asked to work weekends or bank holidays and should the Client require such time to be worked during the course of a project a contract variation to cover additional costs will be necessary.

3.4 OTHER MATTERS

3.4.1 Access to the site will be arranged via the Client/main contractor.

3.4.2 The Client/main contractor will be responsible for the provision of a secure enclosed area for the archaeological work to take place within.

3.4.3 Unless informed otherwise (in which case, the appropriate contingency detailed in the costing document will be invoked), it is assumed that the Client/main contractor will provide adequate welfare facilities on site.

3.4.4 The Client/main contractor is asked to provide OA North with information relating to the position of live services on the site. OA North will use a cable detecting tool in advance of any machine excavation.

3.5 POST-EXCAVATION AND REPORT PRODUCTION

3.5.1 **Archive:** the results of the fieldwork will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (*The Management of Archaeological Projects, 2nd edition, 1991*) and the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. The deposition of a properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IFA in that organisation's code of conduct.

- 3.5.2 The paper and finds (if appropriate) archive for the archaeological work undertaken at the site will be deposited with the nearest museum which meets Museums' and Galleries' Commission criteria for the long term storage of archaeological material (MGC 1992). This archive can be provided in the English Heritage Centre for Archaeology format, both as a printed document and on computer disks as ASCII files (as appropriate). The archive will be deposited with the appropriate repository within six months of the completion of the fieldwork.
- 3.5.3 Except for items subject to the Treasure Act, all artefacts found during the course of the project will be donated to the receiving museum, where they meet that museum's retention policy.
- 3.5.4 A synthesis (in the form of the index to the archive and a copy of the publication report) will be deposited with the Cumbria Historic Environment Record. A copy of the index to the archive will also be available for deposition in the National Archaeological Record in London.
- 3.5.5 **Post-excavation assessment:** subsequent to the completion of the fieldwork, it is possible that, following CCCHES recommendations, it may be necessary to conduct a programme of post-excavation assessment in order to determine the size, complexity and potential of the site archive for further analysis. However, considering that the expected archaeological remains are restricted in terms of period and function and are unlikely to be associated with a large artefact assemblage from primary deposits, it is quite likely that CCCHES would allow the post-excavation programme to pass directly from fieldwork to final analysis. Should CCCHES require that OA North carry out a programme of post-excavation assessment, the excavation results will be collated and an assessment of the resource implications of the potential further analysis would be undertaken. The stratigraphic data and the finds assemblage would be quantified and assessed, and any environmental samples processed and a brief assessment of their potential for further analysis made. The assessment would, where appropriate, comprise:
- Quantification of all site records, including drawings
 - Assessment of the stratigraphic sequence, in terms of complexity and, where possible, provisional chronology
 - A summary description of the results of the excavation, including an identification of formation processes
 - An assessment of the significance of any deposits from which dating evidence has been taken and the selection of specific samples for submission for analysis
 - A quantification and preliminary classification of the artefact assemblage and assessment of the potential of the assemblage for further analysis in terms of function, origin and dating
- 3.5.6 **Post-excavation assessment report:** the assessment results would be presented within a post-excavation assessment report which would summarise the results of the excavation and any initial hypotheses that can be drawn from the assessment of the finds and environmental samples. Within the framework of these initial results, an attempt would be made to place the data from the excavation within a regional context both in terms of a chronological narrative and of significance. The assessment report would make recommendations for a schedule, timescale and programme of analysis in accordance with MAP2 Appendix 4.
- 3.5.7 **Post-excavation analysis:** following the completion of the fieldwork and of any required post-excavation assessment, a full analysis will be undertaken of all appropriate elements of the excavation archive. Particular attention will be paid to the structural phasing of the mill building, the identification of activities undertaken within particular areas and the

organisation of machinery and of working areas. The analysis would also focus upon the nature, size, origin and configuration of the machinery.

- 3.5.8 **Post-excavation analysis report:** four copies of a bound and collated final report will be submitted to the Client within eight weeks of the completion of the fieldwork. Three further copies will be sent to CCCHEs and the CHER and one copy will be submitted to the Cumbria Record Office, Carlisle. The final report will include a copy of this project design, and indications of any agreed departure from that design. It will include an historical and archaeological background to the study area, an outline methodology of the investigation, and present, summarise, assess, and interpret the results of the programme of archaeological works detailed above. It will also include an assessment of any finds recovered from the excavation. In addition, details of the final deposition of the project archive will also be made.
- 3.5.9 A summary of the results produced from the archaeological investigation will be published in an appropriate journal or magazine.
- 3.5.10 **Confidentiality:** the final report is designed as a document for the specific use of the Client, and should be treated as such; it is not suitable for publication as an academic report, or otherwise, without amendment or revision. Any requirement to revise or reorder the material for submission or presentation to third parties beyond the project brief and project design, or for any other explicit purpose, can be fulfilled, but will require separate discussion and funding.

4. WORK TIMETABLE

- 4.1 **Fieldwork:** it is estimated that three days will be required to excavate the trench, and that a further two to three days will be required to survey and rapidly record any elements of the bobbin mill peripheral to the engine and boiler houses. It is possible that the detailed recording of structural and mechanical features within the engine and boiler houses could take as much as nine or ten days, but a more accurate estimate will be possible following the site meeting subsequent to the initial excavation of the site.
- 4.2 **Interim report document:** an interim report on the findings from the excavation can be made available to the client and to CCCHEs in order to ensure that the required fieldwork is fulfilled and being completed in accordance with the planning conditions. This can be forwarded to the client within three working weeks of the completion of fieldwork. Should information be required sooner, an official letter summarising the results can be produced.
- 4.3 **Post-excavation assessment:** if required, the post-excavation assessment will be undertaken within eight weeks of completion of the fieldwork. Estimates for the cost of this element are included within the costing section, but the exact costs will be dependent upon the amount of data recovered from the site. The assessment report will present an overview of the results of the excavation and the scope of the post-excavation analysis required, a timetable for that analysis and the cost of further analysis.
- 4.4 **Post-excavation analysis:** whether or not a post-excavation assessment is undertaken, a revised project design will also be submitted for the post-excavation detailed analysis which will be implemented through to archive report within eight weeks of either the completion of fieldwork or the post-excavation assessment, as appropriate, and summary publication within two years of the completion of the fieldwork.
- 4.5 OA North can execute projects at very short notice once an agreement has been signed with the Client.

5. STAFFING PROPOSALS

- 5.1 The project will be under the overall charge of Stephen Rowland **BSc, MSc** (OA North Project Manager) to whom all correspondence should be addressed. The excavation is likely to be undertaken by **Sean McPhillips BA** (OA North Project Officer). Sean is an highly experienced field archaeologist, who has a particular interest in Industrial Archaeology. Sean recently directed the archaeological investigation of a complex of textile mills at the Torrs in New Mills, and played a key role in the excavations at the Calprina textile works, Stalybridge, and Macintosh Mill, Manchester. Sean also directed the evaluation and excavation of the Percival, Vickers and Co Ltd flint glass works in Manchester. Sean will be assisted by an appropriate sized team of technicians.
- 5.1.1 Assessment of any finds from the excavation will be undertaken by OA North's in-house finds specialist **Christine Howard-Davis BA** (OA North Finds Manager). Christine has extensive knowledge of all finds of all periods from archaeological sites in northern England, and is a recognised expert in the study of post-medieval artefacts.

6. MONITORING

- 6.1 Monitoring meetings will be established with the Client and the archaeological curator at the outset of the project. Monitoring of the project will be undertaken by CCCHES, who will be afforded access to the site at all times.

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English Heritage, 1991 *Management of Archaeological Projects*, 2nd edition, London

Museums' and Galleries' Commission, 1992 *Standards in the Museum Care of Archaeological Collections*, London

Standing Conference of Archaeological Unit Managers (SCAUM), 1997 *Health and Safety for Field Archaeologists Manual*, 3rd Edition, Southampton

United Kingdom Institute for Conservation (UKIC), 1990 Guidelines for the preparation of archives for long-term storage, London