

JUNCTION OF HINDPOOL ROAD AND CORNMILL CROSSING, BARROW-IN- FURNESS, CUMBRIA

Archaeological Watching Brief



Client: Positive Location
Properties Ltd
Planning Ap. Ref.: 6/05/1530
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Non-Technical Summary

Following a planning application for the construction of a warehouse and retail unit with associated car parking and landscaping a programme of archaeological investigation was requested by the Cumbria County Council Historic Environment Service (CCCHES). The first phase of this comprised a desk-based assessment and site visit, which was completed in March 2006. This revealed a number of sites of archaeological interest within the proposed development area relating to the post-medieval and industrial development of the town. Further archaeological work was recommended and a programme of evaluation was requested by CCCHES. A series of geotechnical test pits and boreholes were scheduled to be excavated across the site with some having already been excavated, so it was agreed that these would be monitored by an archaeologist in lieu of evaluation.

In total 16 test pits and borehole launch pits were excavated under archaeological supervision. In most cases deposits and features relating to the use of the site during the post-medieval period were identified, the majority of which were considered to relate to buildings identified on early maps of the area. Structures such as brick walls and surfaces and concrete floors were discovered in many areas, particularly around the former corn mill and iron foundry. An examination of the logs for the boreholes and test pits that were not excavated under archaeological supervision revealed broadly similar features, and that a considerable depth of material was present over the remains of the former gasworks and patent slip.

The results of the watching brief demonstrate that the remains of many of the sites identified during the desk-based assessment are well preserved. In the case of the former steam corn mill there is a minimal amount of overburden, although in other areas the structures are at a considerable depth.

Acknowledgements

Greenlane Archaeology would like to thank Positive Locations Properties Ltd for commissioning and supporting the project, and Tony Clowes in particular for providing information about the site. Further thanks are also due to the Daniel Cox of Celtic Technologies and the staff of Hewden Hire for their help, patience and co-operation on site, and to Derek Murphy at Transco for the information from the previous investigation of the gasworks site. Additional thanks are due to Daniel Cox for providing copies of the borehole and test pit logs and plans for the site.

The watching brief was carried out by Daniel Elsworth, who also wrote the report and produced the illustrations, with assistance from Sam Whitehead. The project was managed by Jo Dawson, who also edited the report and assessed the finds.

1. Introduction

1.1 Circumstances of the Project

1.1.1 A planning application (6/05/1530) was made by Positive Location Properties Ltd to construct a warehouse and retail unit with associated car parking and landscaping on land at the junction of Hindpool Road and Cornmill Crossing, Barrow-in-Furness (SD 1955 6905). After a recommendation by Cumbria County Council Historic Environment Service (CCCHES), Barrow Borough Council placed a condition on the planning consent requiring a scheme of archaeological investigation to be undertaken. The first phase of this work was an archaeological desk-based assessment, which was completed in March 2006 (Greenlane Archaeology 2006). This identified the presence of several sites of archaeological interest within the proposed development area including a gasworks, iron foundry, steam corn mill and patent slip. Following the desk-based assessment a request was made by CCCHES for further work including the recording of standing buildings that had formed part of the foundry, and archaeological evaluation of other parts of the site. As geotechnical test pits were to be excavated on the site it was agreed that these would be monitored by an archaeologist to facilitate the investigation of the site, and perhaps negate the need for evaluation. A brief for the work was produced by CCCHES (*Appendix 1*), in response to which a project design was produced by Greenlane Archaeology (*Appendix 2*). Following the acceptance of this the watching brief was undertaken over the period 21st–22nd September 2006.

1.2 Location, Geology, and Topography

1.2.1 The proposed development area is situated on the north-east edge of Barrow-in-Furness' industrial area and docklands (Fig 1). It is positioned between the north-east side of the Devonshire Dock and Hindpool Road (part of the A5087) and is less than 10m above sea level (Ordnance Survey 2002). The landscape has been extensively altered by continuous building since at least the mid 19th century and part of the proposed development area is land that was reclaimed during the construction of the docks (Latham 1991, 26). The solid geology of the area is likely to comprise a mix of Mercia mudstones and red sandstones of the Triassic period (Moseley (ed) 1978, plate 1). This is likely to be covered by a thick glacially-derived till (Countryside Commission 1998, 27), which will have been affected by alluvial activity and in places layers of peat and marine clay have been recorded at a significant depth below the surface (Kendall 1900). The later industrial development of the area will, however, have significantly affected these deposits.

1.3 Site History

1.3.1 The background history of the site is intended to place the results of the watching brief in their local and regional context. This enables not only the significance of any sites of archaeological interest identified within the study area to be assessed, but also enables comparisons with similar structures to be made and conclusions regarding the form, function and scale of the sites to be drawn. More specific information regarding structures, buildings and sites within the proposed development area is also presented in order to understand them in more detail. The information used to produce the site history is taken from the previous desk-based assessment report (Greenlane Archaeology 2006).

1.3.2 Several early maps of the site were examined as part of the original desk-based assessment (Greenlane Archaeology 2006), ranging from a county plan of the late 18th century to Ordnance Survey maps of the 20th century. These revealed that,

as with much of Barrow, the area was not developed until the mid to late 19th century. Prior to this date it was situated between the villages of Barrow and Hindpool, and there were only a few farm buildings in the general vicinity. A large part of the site was directly on the shore and part was initially used as a patent slip. The whole area was, however, gradually reclaimed from the sea during the late 1850s by the tipping of ballast to form part of the docks that were developing alongside the growing town of Barrow-in-Furness. By the 1870s the site had been transformed and was home to a number of industries including an iron and brass foundry, a rope walk, a gasworks and a steam corn mill. The majority of these businesses remained in operation into the early to mid 20th century.

1.3.3 The map regression demonstrated that five separate businesses are known to have been situated within the proposed development area, a shipyard, a gasworks, a foundry, a steam corn mill, and a rope walk. The first four of these are discussed individually and in more detail below, as they relate most directly to the watching brief.

1.3.4 **Patent Slip:** a small part of the south-west corner of the proposed development area is situated on the site of the first shipyard established in Barrow-in-Furness. It was known as the Barrow Patent Slip and was established by William Ashburner in 1847 (Latham 1991, 20), who was later joined by his brother Richard. Initially the yard may have only been used for repairs, but in 1852 Ashburner was commissioned to build four schooners for the iron mining firm Harrison, Ainslie and Co (*op cit*, 21). Others soon followed, mainly for use in the iron ore trade, but by 1864 the development of the Barrow docks meant that the Ashburners had to relocate their shipyard *'and they agreed to its sale to the Furness Railway Company, who were responsible for the dock developments'* (*op cit*, 26). Melville considers the slip to have been in the approximate position of the later corn mill (Melville 1956, 15), although this is probably unlikely. He describes the patent slip as operating as *'a cradle, which was lowered down the slope into the water. The vessel was floated on to it and then the cradle was hauled up with the boat on it so that the bottom was clear for examination or repairs'* (*ibid*).

1.3.5 **Steam Corn Mill:** contemporary accounts state that the steam corn mill was established by a limited liability company in 1870 and considerably enlarged in 1874 (Mannex and Co 1882, 35). The original company wound up in 1880 and the mill was taken over by Walmsley and Smith, corn merchants based in Lancaster (*ibid*). The directories show the change in owners of the mill during the late 19th and early 20th century, and that it was apparently still in operation as late as 1939. It is not certain when the building was demolished, but by the 1960s at least part of the site was being used by a coal merchant (Myers 2006, 46) and this continued until relatively recently.

1.3.6 **Foundry:** the foundry, known as the 'Hindpool Foundry', was one of a number of such complexes that sprung up during the industrialisation of Hindpool in the late 19th century (Melville 1956, 21). The company was established in 1860 by Waddington and Longbottom (The Acme Tone Engraving Company Limited 1900, 45), although the foundry was apparently not operational until 1863 (Richardson 1881, 94). There are several contemporary accounts of the foundry from various stages in its history; the company began as iron founders but soon expanded into engineering (particularly for shipping), brass founding and a variety of related activities (*ibid*).

1.3.7 It is evident that by 1900 the site had undergone several changes (The Acme Tone Engraving Company Limited 1900, 45). On 21st November of 1909 (although Myers (2000, 32) states that it was 1906) the foundry was severely damaged by a fire, which gutted the fitting and pattern mills (Trescaheric and Barker 1990, 22)

although the business seems to have survived. A brief examination of the directories demonstrates that it remained in existence until at least 1935. It is not clear exactly what date it closed, although it is claimed that it only continued to operate until the recession of the early 1920s (Myers 2000, 32). Most recently the remaining buildings have been used for a variety of storage and business purposes.

1.3.8 **Gasworks:** the gasworks were established by a limited liability company in 1862 (Mannex and Co 1882, 22) or possibly 1861 (Baker 2005, 16; Baker 2006, 48), and according to a contemporary source were '*supplied with the most recent and improved appliances for the manufacture of gas*' (Mannex and Co 1882, 22). Whether the works were built at this date is not certain, and this would conflict to some degree with the date that the dock was developed and the nearby shipyard went out of use (Latham 1991, 26). By 1869 they had been purchased by the Corporation of Barrow-in-Furness and despite having a large capacity the increase in the town's population meant that in 1879 an additional gas holder was constructed at Ormsgill (Mannex and Co 1882, 22).

1.3.9 The gasworks were apparently built using bricks from the North Lancashire Brick and Tile Works, also in Hindpool (Leach c1980, 8), but contemporary details supply little further information about the site. A brief examination of the directories also provides little information prior to the 20th century. The information in the directories stops in the 1920s, although it is not clear whether the site went out of use at this time. There are also references to a 'Gasworks House' during the 1920s and 1930s, which is also situated on the same part of Hindpool Road, although it is not clear what relationship, if any, this had to the gasworks themselves. The site has most recently been used by Transco (Envirocheck 2005).

1.4 Archaeological Interventions and Geotechnical Investigations

1.4.1 No previous archaeological assessments area recorded has having been carried out in close proximity to or within the proposed development area. The closest is perhaps the assessment of the Barrow Harbour area carried out in 2003 (OA North 2003), although this only came within c200m of the study area for the desk-based assessment of the proposed development area. The subsequent evaluation (OA North 2005) identified a number of well-preserved features, beneath considerable amounts of overburden, relating to industrial activity within this study area, but no areas in close proximity to the present study area were examined as part of this.

1.4.2 A series of geotechnical test pits and boreholes had been excavated across the entire site prior to the watching brief without archaeological supervision. The results of these investigations are still useful in establishing the presence of archaeological remains on site and are discussed in *Section 3.2*. In addition, further boreholes were carried out following the watching brief, also without archaeological supervision, although the launch pits had been monitored. The results of these investigations, where relevant, are also presented in *Section 3.2*.

2. Methodology

2.1 Watching Brief

2.1.1 The following methodology applies to all those geotechnical investigations that were subject to an archaeological watching brief. The excavation of all of the test pits and borehole launch pits was continuously monitored by an archaeologist, although the speed of the excavation meant that in some cases the recording of one trench meant that the removal of the concrete and the upper deposits was not all monitored. In each trench a stratigraphical record of all of the deposits and structures encountered was made, and any finds recovered. The depth and size of the trenches meant that in many cases it was not possible on safety grounds to enter the trench and examine in detail the lower deposits or collect finds.

2.1.2 Written records were made for each trench using Greenlane Archaeology *pro forma* record sheets, and measured sketch plans and sections were made of each trench as considered necessary. Typically, if any structural remains such as walls, floors, or surfaces were encountered, a section and/or plan would be drawn.

2.1.3 Photographs were taken of each trench. Where specific features of interest or structures were encountered photographs showing any detail of these were taken, but general shots of sections and plans of trenches that had no deposits of particular interest were also taken. While the watching brief was carried out the sunlight was very low but very strong, which caused strong contrasting shadows in most or all photographs and led to considerable glare in those photographs taken within the area of the concreted former coal yard (which made up the vast majority).

2.1.4 The locations of the test pits and boreholes were taken from AutoCAD plans provided by Celtic Technologies of all the geotechnical investigations for the site. The watching brief was carried out according to the standards and guidance of the Institute of Field Archaeologists (IFA 2001).

2.2 Archive

2.2.1 A comprehensive archive of the project has been produced in accordance with the project design, and current IFA and English Heritage guidelines (Ferguson and Murray n.d.; English Heritage 1991). Copies of the test pit and borehole logs have been included in the archive. The paper and digital archive and a copy of this report will be deposited in the Cumbria Record Office in Barrow-in-Furness (CRO(B)) on completion of the project. Three copies of this report will be deposited with the Cumbria Historic Environment Record, one with the client, one with Celtic Technologies, and one will be retained by Greenlane Archaeology. In addition, a digital copy will be offered to the NMR and a record of the project will be made on the OASIS scheme.

3. Results

3.1 Introduction

3.1.1 Prior to the watching brief a total of 16 test pits were excavated without archaeological supervision, in addition 11 boreholes (two of which were re-started) were excavated without archaeological supervision, some before the watching brief and some after, although in the case of the latter the launch pits were monitored. The results of this work are discussed below (*section 3.2.1-3.2.5*). In addition, 11 test pits and five borehole launch pits were excavated under archaeological supervision. These were positioned in various places across the site (Fig 2), the majority within Area A of the original desk-based assessment (Greenlane Archaeology 2006; Plate 10) and excavated to various depths. On average the test pits and borehole launch pits were 2m long and 0.9m wide (one machine bucket width). All of them were excavated using a toothed ditching bucket (Plate 11), in most cases following the removal of concrete or tarmac using a hydraulic pecker (Plate 10).

3.1.2 During the watching brief the test pits and borehole launch pits were allocated numbers in sequence for the purposes of recording contexts and other information (*Appendices 3 and 4*). These numbers do not therefore correspond to those allocated by the geotechnical teams on site. The location of all of the test pits and boreholes is shown in Figure 2, each with their original log number. Those that were subject to a watching brief are indicated and the correlating numbers given in *Section 3.3* below and shown on Figures 2, 5, and 6.

3.2 Unmonitored Geotechnical Investigations

3.2.1 The borehole and test pit logs for geotechnical and contamination investigations carried out prior to the watching brief, and therefore not under archaeological supervision, were examined in order to assess whether they revealed any additional information about buried archaeological deposits on the site. The logs revealed that in many cases there were unlikely to be any particular deposits of archaeological interest, with the majority of the layers comprising sands and clays, often at considerable depth below the surface. Some of the boreholes and test pits did reveal layers likely to relate to archaeological features, and in some cases structures were encountered. The results are divided into groups according to the company that carried out the work and the date on which it was undertaken. All depths referred to are depths below the present ground surface.

3.2.2 **Amec Earth and Environmental UK Ltd, 13th July 2006:** a total of 16 test pits was excavated across the area of the former iron foundry and around the steam corn mill (Areas 1 and 4 in the original desk-based assessment (Greenlane Archaeology 2006, fig 11)), of which ten encountered deposits of possible archaeological interest.

- **TP4:** at a depth of approximately 0.5m a deposit containing clinker blocks and wood was recorded, beneath a layer of gravel hard core. Beneath this was a further deposit containing cemented clinker blocks at a depth of between 0.8m and 0.9m;
- **TP5:** at a depth of 0.8m a solid brick structure was encountered, considered to be the remains of a wall, which lay beneath a layer of gravel hard core;
- **TP6:** although no obvious structures were encountered, deposits defined as 'made ground' were present to a depth of 2.6m. The upper part of this included cobbles and possible backfilled mudstone, and wood fragments were present at depths of between 2.3m and 2.6m;

- **TP7:** again, no particular structures were encountered, but a railway sleeper was discovered at a depth of 0.6m;
- **TP8:** a layer of ash with blocks of clinker was discovered at a depth of 0.4m to 0.6m, beneath which was a metal pipe;
- **TP10:** a concrete base with incorporated drainage was discovered at a depth of 0.6m;
- **TP12:** made ground, comprising ashy sand, gravel, clinker, and brick was found to extend to a depth of 2.3m. A cast iron pipe was present within this at a depth of 1.6m;
- **TP13:** again, the same made ground deposits extend to a depth of 2.5m. Iron pipes were encountered at depths of 0.7m and 2.5m;
- **TP14:** the same made ground deposit was present to a depth of 1.2m, at which point a flat metal surface was encountered;
- **TP15:** again, ashy made ground was present to a depth of 2.4m, which included possible fragments of burnt limestone and lumps of clay in the lowest deposit. A brick surface was also identified at a depth of 1.3m;

3.2.3 **H.B. Boring and Company Ltd, 17th July 2006:** a total of five boreholes were excavated across the area of the former iron foundry and around the steam corn mill (Areas 1 and 4 in the original desk-based assessment (Greenlane Archaeology 2006, fig 11)), of which two encountered deposits of possible archaeological interest.

- **BH2:** suspected demolition deposits containing brick, clinker and other material were present to a depth of 1m. Beneath this deposits containing brick, ash, and clinker were present to a depth of approximately 3m;
- **BH3:** deposits of concrete, brick, clinker blocks, and large boulders were present to a depth of 1.3m.

3.2.4 **Van Elle, 25th-26th September 2006:** a total of three boreholes were excavated across the area of the former gasworks (Area 3 in the original desk-based assessment (Greenlane Archaeology 2006, fig 11)), of which two encountered deposits of possible archaeological interest.

- **CBH01:** stone and rubble fill were encountered between a depth of 0.1-1.2m;
- **CBH03:** made ground deposits containing brick fragments, ash, clay, and gravel were found to a depth of 4m.

3.2.5 **Van Elle, 8th and 11th November 2006:** a total of five boreholes were excavated (although two of these were re-started after refusing due to hitting solid objects) across the area of the former iron foundry and around the steam corn mill (Areas 1 and 4 from the original desk-based assessment (Greenlane Archaeology 2006, fig 11)), of which two encountered deposits of possible archaeological interest.

- **CBH4:** concrete was discovered at a depth of 0.6m, which prevented any further excavation;
- **CBH5:** loose rubble comprising brick fragments, gravels, and ash were encountered to a depth of 1.2m. Beneath these was a soft clay-silt with wood fragments.

3.3 Watching Brief Results

3.3.1 **Test Pit 1 (TP17)**: this was orientated east/west, measured 4.25m (with a shallower step 1.4m long added at the west end) by 0.9m and was 1.9m deep. The overburden (**101**) comprised a loose dark brown sandy clay containing 10% medium to large stones (some of which were apparently granite setts), and occasional fragments of brick, plastic, glass, concrete, and slag to a depth of 1.1m. Beneath this was a compacted deposit of mid brownish orange clay with occasional medium to large rounded stones, which continued to the base of the trench.

3.3.2 **Test Pit 2 (TP18)**: this was orientated north/south, measured 3m by 0.9m, and was 0.9m deep (Fig 3). The upper layer of reinforced concrete (**201**), which was 0.25m thick, was laid on a single sheet of blue plastic on top of a bed of loose mid orange gravel bedding (**202**) 0.3m thick. This lay on top of a loose black sandy gravel containing some brick, slag, concrete, and ash (**203**), up to 0.35m thick. This butted against a brick wall orientated east/west positioned at the south end of the trench (**205**), which comprised at least four courses of frogged red bricks and was 0.26m thick. This wall was sat on firm mid orange brown clay containing 10% small rounded stones (**204**), which had an iron pipe orientated east/west cut through it.

3.3.3 **Test Pit 3 (TP19)**: this was orientated north/south, measured 3.8m by 0.9m, and was only excavated to a depth of approximately 0.3m (Fig 3). The upper layer of reinforced concrete (**301**), which was 0.2m thick, was laid on a single sheet of blue plastic on top of a bed of loose mid orange gravel c0.1m thick (**302**). Beneath this was a surface (**303**) constructed from red bricks, at least some of which were frogged, with patches of concrete surfacing and iron brackets attached (Plate 1). A small hole in the brick surface on the east side was filled with a loose dark brown sandy soil with some brick fragments (**304**).

3.3.4 **Test Pit 4 (TP20)**: this was orientated north/south, measured 3.6m by 0.9m, and was excavated to a depth of 1.3m (Fig 3). The upper layer of reinforced concrete (**401**) was 0.2m thick and laid on a single sheet of blue plastic on top of a bed of mid orange gravel 0.1m thick (**402**). This was deposited on a thin layer of loose mid orange sand (**403**) at the north end and on top of a reinforced concrete surface (**404**) in most of the trench (Plate 2). Beneath sand **402** was a layer of loose black gravelly material (**405**) up to 0.5m thick, cut through by two cables. Beneath this layer was a possible brick wall (**406**), which was sat on top of a firm mid brown silty clay (**407**).

3.3.5 **Test Pit 5 (TP21)**: this was orientated north/south, measured 3.4m by 0.9m, and was excavated to a depth of 1.9m. The upper layer of reinforced concrete (**501**) was 0.2m thick and laid on a single sheet of blue plastic on top of a bed of mid orange loose gravel (**502**) 0.15m thick, within which was a disused plastic water pipe. Beneath this was a layer of orange brown sandy clay containing 15% mould-made brick and some slate (**503**), to a depth of 0.7m. This was deposited on top of a firm mid-orange clay containing 1% small rounded stones (**504**), which extended to the base of the trench. A ceramic pipe orientated east/west was cut through **504**, beneath which there was another larger iron pipe.

3.3.6 **Test Pit 6 (TP22)**: this was orientated north/west, measured 3m by 0.9m and was excavated to a depth of almost 2m (Fig 4). The upper layer of reinforced concrete (**601**) was 0.3m thick and laid on a single sheet of blue plastic on top of a bed of mid-light orange yellow gravel (**602**) 0.12m thick. Beneath this was a layer of dark brown-black sandy clay (**603**) 0.05m thick, beneath which was a reinforced concrete surface (**604**) covering all but the north end of the trench (Plate 3). This was bounded at its north end by a red brick wall (**605**) one brick thick, butted on the north side by a layer of granite setts (**606**). Beneath **606** was a layer of mid orange iron concreted material (**607**) 0.05m thick, on top of a loose dark brown-black sandy clay

with ash and other inclusions (**608**) 0.1m thick on top of a concrete slab (**609**) at least 0.25m thick (Plate 4).

3.3.7 Test Pit 7 (TP23): this was orientated east/west, measured 2.6m by 0.9m, and was excavated to a depth of 1.6m. The upper layer of reinforced concrete (**701**) was 0.2m thick and laid on a single sheet of blue plastic on top of a bed of mid orange gravel (**702**) 0.2m thick. This was laid on a loose dark brown-black sandy clay containing a small amount of small stones (**703**), which was 0.2m thick. This in turn was laid on a mid brown loose sandy clay containing 85% medium rounded cobbles (**704**) 0.3m thick. Beneath this was a mid grey silty clay containing small fragments of shell (**705**) up to 0.05m thick, which was deposited on top of a layer of firm mid-brown clay (**706**) containing 2% small rounded stones, extending to the base of the trench.

3.3.8 Test Pit 8 (TP24): this was orientated north/south, measured 2.5m by 0.9m, and was excavated to a depth of 1.7m. The upper layer of reinforced concrete (**801**) was 0.2m thick and laid on a single sheet of blue plastic on top of a bed of mid orange gravel (**802**) 0.2m thick. This was laid on a dark brown to blackish orange layer of ash and sand (**803**) up to 0.02m thick, on top of a loose dark brown sand (**804**) 0.15m thick. Beneath this was a firm pink sandy clay (**805**) 0.02m thick, which was on top of a soft mid orange brown sandy clay containing 75% medium rounded stones (**806**) up to 0.25m thick (Plate 5). Beneath this was a mid grey silty clay (**807**) containing small fragments of shell and 2% small rounded stones, which was on top of a firm mid orange brown clay (**808**) 0.3m thick (Plate 5), beneath which was another layer of mid grey clay the same as **807** (**809**), which extended to the base of the trench.

3.3.9 Test Pit 9 (TP25): this was orientated north/south, measured 2.4m by 0.9m, and was excavated to a depth of 1.4m. The upper layer of reinforced concrete (**901**) was 0.2m thick and laid on a single sheet of blue plastic on top of a bed of loose orange gravel (**902**) 0.2m thick. This was laid over a loose black silty clay containing ash, clinker, and gravel (**903**), 0.1m thick, beneath which was a firm mid orange-brown clay containing 75-80% medium to large rounded cobbles, angular pieces of sandstone, and lumps of glassy slag (**904**) up to 0.4m thick. Beneath this was a grey silty clay (**905**) containing small fragments of wood, which extended to the base of the trench.

3.3.10 Test Pit 10 (CBH1): this was orientated east/west, measured 1.6m by 0.9m, and was excavated to a depth of 1.15m. The upper layer of reinforced concrete (**1001**) was 0.2m thick and laid on a single sheet of blue plastic on top of a bed of loose mid orange gravel (**1002**) 0.2m to 0.3m thick. Beneath this was a loose dark brown-black sandy clay containing ash and clinker (**1003**) 0.4m thick and with a railway sleeper orientated east/west at the base (Plate 6). This was laid on top of a loose mid orange sand (**1004**), which extended to the base of the trench.

3.3.11 Test Pit 11 (c3m north of CBH1): this was orientated east/west, measured 1.6m by 0.9m, and was excavated to a depth of 0.9m. The upper layer of reinforced concrete (**1101**) was 0.2m thick and laid on a single sheet of blue plastic on top of a bed of loose mid-orange gravel 0.3m thick (**1102**). This was laid over another concrete surface 0.25m-0.3m thick (**1103**), beneath which was a layer of loose mid greyish brown sandy clay and gravel (**1104**) containing some iron, glass, and brick and 0.15m-0.2m thick. Beneath this was a loose mid orange sand (**1105**), which extended to the base of the trench.

3.3.12 Test Pit 12 (CBH2): this was orientated east/west, measured 1.55m by 0.9m, and was excavated to a depth of 0.9m. The upper layer of reinforced concrete (**1201**) was 0.2m–0.25m thick and laid on a single sheet of blue plastic on top of a bed of

loose mid-orange gravel (**1202**) 0.2m thick. Beneath this was a loose dark brown-black sandy clay with clinker and large lumps of slag and foundry waste (**1203**) up to 0.4m thick, and this was laid on top of a firm mid orange-brown clay (**1204**) extending to the base of the trench.

3.3.13 **Test Pit 13 (c6m south-east of CBH2)**: this was orientated east/west, measured 1.8m by 0.9m, and was excavated to a depth of 0.46m. The upper layer of reinforced concrete (**1301**) was 0.22m thick and lay on a single sheet of blue plastic on top of a bed of loose mid orange gravel (**1302**) up to 0.2m thick. Beneath this was a red brick surface set in a thick concrete mortar (**1303**) extending across the trench (Plate 7).

3.3.14 **Test Pit 14 (TP26)**: this was orientated east/west, measured 2.2m by 0.9m, and was excavated to a depth of 1.5m. The upper layer of reinforced concrete (**1401**) was 0.3m thick and laid on a single sheet of blue plastic on top of a bed of loose mid orange gravel (**1402**) 0.13m thick. This was laid on a firm dark-brown sandy clay containing 10% small red brick fragments, timber, and some lenses of mid orange sand (**1403**) up to 0.1m–0.15m thick. Beneath this was a compacted dark orange brown sand and foundry slag (**1404**) up to 0.2m thick, which lay on top of a loose mid orange sand (**1405**) up to 0.25m thick, on top of a soft mid grey silty clay (**1406**) c0.4m thick and a firm mid orange brown sandy clay (**1406**) extending to the base of the trench.

3.3.15 **Test Pit 15 (TP27)**: this was orientated east/west, measured 2.2m by 0.9m, and was excavated to a depth of 1.2m (Fig 4). The upper layer of reinforced concrete (**1501**) was 0.2m thick and lay on a layer of loose mid orange gravel (**1502**) up to 0.1m thick. Beneath this was a dark brown-black loose sandy silt with foundry and blast furnace slag (**1503**), which sealed a brick wall or culvert (**1504**) built of red brick and orientated north/south (Plate 8). Between four and five courses remained and it was at least 0.65m wide, apparently forming a curved profile suggestive of a culvert, with an iron pipe along the west edge. This structure seemed to be sat on or possibly filled with a mid orange firm clay (**1505**), which extended to the base of the trench.

3.3.16 **Test Pit 16 (CBH5)**: this was orientated north/south, measured 1.9m by 0.9m, and was excavated to a depth of 1m (Fig 4). The upper deposit comprised a layer of tarmac (**1601**) up to 0.1m thick, which lay on a loose layer of mid orange gravel (**1602**) up to 0.2m thick. Beneath this was a loose dark brownish black sandy clay containing ash, clinker, slag, and brick (**1603**), up to 0.75m thick, which sealed a brick wall orientated east/west (**1604**), which was two bricks thick and had at least four or five courses remaining (**1605**). This sat on a firm mid-brownish orange clay (**1606**), which extended to the base of the trench.

3.3.17 **Additional Observations**: a number of features of interest were observed in the spoil of the previous test pits. Test pit TP12 had uncovered a large amount of brick including several that were vitrified, and at least one narrow yellow brick marked 'F & L' (Plate 9). Pottery was recovered from the spoil of TP3 which is considered to be of broadly 19th to 20th century date (see *Appendix 5*).

4. Discussion

4.1 Introduction

4.1.1 The results of the watching brief have broadly confirmed the findings of the desk-based assessment and revealed the presence of well-preserved remains relating to several of the structures known to have been situated on the site. Many of these remains are identifiable on the early maps of the site (Figs 5 and 6). In addition, it has recorded deposits relating to and pre-dating the development of the site.

4.2 Unmonitored Geotechnical Investigations

4.2.1 The logs for the test pits and boreholes that were not monitored by the watching brief revealed a number of deposits and structures of potential archaeological interest. Many of these can be related to structures known to have existed on the site.

4.2.2 **TP3:** although no deposits of archaeological interest were apparently encountered and this test pit was not archaeologically monitored, fragments of pottery and glass, generally of 19th to 20th century date, were discovered in the spoil. The reason for their presence is uncertain; they may represent material dumped with ballast, or are possibly the remains of rubbish dumped on the site at a later date. The quantity of material is too small to draw any meaningful conclusions.

4.2.3 **TP4:** the early maps of the site show that deposits located in this test pit are likely to relate to extensions to the east end of the corn mill, where there is a small ancillary structure (Fig 6). This appears to have been built between 1873 and 1889 (Greenlane Archaeology 2006, figs 7-8) and remained in existence until at least 1933 (Fig 6).

4.2.4 **TP5:** the early maps of the site show that this test pit is located on the north side of the original corn mill (Greenlane Archaeology 2006, fig 7). This area continued to be part of the centre of the corn mill until at least 1933 (Fig 6), and it is likely that the wall encountered forms part of this building.

4.2.5 **TP6:** the early maps of the site show that this test pit was located on the site of the patent slip (Fig 5), and the deposits encountered are considered likely to relate to this. It is clear from the later maps that they have been buried under a great depth of material prior to the construction and expansion of the corn mill (Fig 6).

4.2.6 **TP7:** the discovery of a railway sleeper fits well with the cartographic evidence, which shows an extensive rail network in this area from at least 1873 (Greenlane Archaeology 2006, fig 7; Fig 6).

4.2.7 **TP8:** the discovery of blocks and an iron pipe does not appear to relate to any structures known on this site, although these may represent demolition.

4.2.8 **TP10:** the concrete base discovered in this location undoubtedly relates to the early phase of the iron foundry as shown on maps of the site from 1873 to 1891 (Greenlane Archaeology 2006, figs 7-8). These buildings were removed during alterations carried out after this date (Fig 6).

4.2.9 **TP12:** the 'made ground' deposits including large amounts of clinker and brick extending to over 2m below the surface are indicative of a large amount of demolition material in this area. Early maps of the site show that this point is within a large building that probably formed part of the gasworks (Greenlane Archaeology 2006, fig 7-10; Fig 6) and these remains plus the iron pipe almost certainly relate to this

structure. The discovery of vitrified bricks in the spoil suggests that this area may have been where the retort house for the gasworks was situated, or that material from the furnaces used in the foundry was dumped here.

4.2.10 **TP13**: similar deposits to TP12 were discovered in this location, as well as two iron pipes. The early maps indicate that this spot was between two of the gasworks buildings (Greenlane Archaeology 2006, figs 7-10; Fig 6), and it is likely that these deposits and the pipes relate to their use and demolition.

4.2.11 **TP14**: similar deposits were also discovered in this location, and at the base of the trench there was a metal plate. The early maps again show that this spot was on the edge of a large building within the gasworks (Greenlane Archaeology 2006, fig 7-10; Fig 6) and these features are likely to relate to this.

4.2.12 **TP15**: again, the same type of deposits and a brick surface were encountered. This spot is on the north-east end of the large building within the gasworks on the early maps (Greenlane Archaeology 2006, fig 7-10; Fig 6) and it is likely that these features relate to it.

4.2.13 **BH2**: the deep demolition deposits and made ground in this area undoubtedly relate to the former gasworks building shown here on the early maps of the site (Greenlane Archaeology 2006, figs 7-10).

4.2.14 **BH3**: the early maps suggest that the mix of clinker and boulders recorded in this area relate not only to use and demolition of the iron foundry and gasworks present in this location, but also to the earlier shore-line track (Greenlane Archaeology 2006; figs 4 and 7-10; Figs 5-6). Indeed the position of this borehole in relation to the 1850 map might even suggest that the boulders may possibly relate to the field boundary shown in this location.

4.2.15 **CBH01**: the early maps show that this borehole is located amongst buildings on the north-east side of the gasworks (Greenlane Archaeology 2006, figs 7-10; Fig 6) and the deposits encountered here are likely to relate to these. The apparent presence of stone rather than brick might indicate that they were of a different build to those elsewhere on the site.

4.2.16 **CBH03**: the extremely deep deposits in this area may relate to the demolition of buildings that stood in the west corner of the gasworks (Greenlane Archaeology 2006, figs 7-10; Fig 6). It is possible that this area was used as a store for materials such as coke or coal, which might account for the depth of deposits.

4.2.17 **CBH4**: the discovery of concrete in this area does not appear to correlate to structures shown on the majority of the early maps of the site (Greenlane Archaeology 2006, figs 7-10), and all that is shown in this location is railway lines (Fig 6). It is noticeable, however, that the map of 1856 does mark the edge of the quay as being in this location at that stage (Greenlane Archaeology 2006, fig 6), and the concrete surface may relate to that.

4.2.18 **CBH5**: the deep deposits of rubble in this area presumably relate to the large gasworks building shown on the early maps of the site (Greenlane Archaeology 2006, figs 7-10; Fig 6). The soft clay with wood fragments sounds very similar to the grey marine clay identified elsewhere on the site (see *Section 4.4.2* below).

4.3 Watching Brief

4.3.1 All of the test pits monitored by watching brief encountered archaeological remains, with the exception of Test Pit 1, which revealed only modern overburden over natural clay and is perhaps indicative of considerable truncation or disturbance in this area. Most of the test pits only encountered dumped deposits relating to the

use of the site such as layers of ash and clinker, which was perhaps used in initially levelling the area, providing bedding for structures such as railways, or it perhaps represents demolition. Those test pits that encountered more substantial deposits or structural remains are discussed below.

4.3.2 Test Pit 2 (TP18): the brick wall identified in this trench does not appear to relate to any structures shown on early maps of the site. It is, however, close to a small T-shaped building shown on the Ordnance Survey maps for 1913 and 1938 and may relate to this (Greenlane Archaeology 2006, figs 9-10; Fig 6). It is not certain what this structure is, but its position amongst the railway lines might suggest that it is a signal box or similar structure.

4.3.3 Test Pit 3 (TP19): the early maps of the site demonstrate that this trench is situated on the edge of the enlarged corn mill, which had been extended into this area by at least 1913, and perhaps before 1891 (Greenlane Archaeology 2006, figs 8-9; Fig 6). The brick surface identified within this trench clearly formed part of the corn mill and the iron brackets suggest that some form of machinery was located in this area.

4.3.4 Test Pit 4 (TP20): the early maps of the site show that this trench is located close to the south-west edge of the original corn mill, an area that remained part of the core of the building throughout its operation (Greenlane Archaeology 2006, fig 7; Fig 6). Given that the trench is located outside of the building it is not certain what the concrete surface represents, as there were apparently never any structures in this area. The wall encountered in the test pit may be the outer wall of the corn mill.

4.3.5 Test Pit 6 (TP22): the early maps of the site show that this trench is located within an extension to the corn mill added between 1873 and 1889-90 (Greenlane Archaeology 2006, figs 7-8), which was still present in 1933 (Fig 6). The concrete surface and brick structures in this area undoubtedly relate to these later additions to the building. A number of finds, mainly of 20th century date, were recovered from context **603** (*Appendix 5*), a layer that probably represents the final demolition of the corn mill.

4.3.6 Test Pit 7 (TP23): the layer of cobbles revealed at some depth in this trench appears to relate to a track or surface. This corresponds to an area depicted on Bintely's map of 1850 (Fig 5), which appears to be depicting a track along the edge of a field. The underlying grey silty-clay is likely to be of marine origin, and probably represents the original high water mark, which is again shown on the map of 1850.

4.3.7 Test Pit 8 (TP24): a layer of cobbles was also identified in this trench, and these probably represent the same surface present in Test Pit 7. Once again, they are underlain by a grey marine silty clay, although in this case there are two layers of this type, separated by a mid orange brown clay. These are likely to represent periods of sea-level change and/or flooding that took place following the end of the last Ice Age and continued into the medieval period (see *Section 4.4.2* below).

4.3.8 Test Pit 9 (TP25): a similar sequence of deposits to those seen in Test Pits 7 and 8 was also revealed. The cobbled surface also included pieces of sandstone and lumps of slag of a type produced in a blast furnace. This suggests that, unless the slag had been transported some distance or perhaps dumped as ballast, this surface was still developing in 1859 when the first blast furnaces were established at Hindpool (Barnes 1968, 96). The same underlying grey marine silty clay revealed in Test Pits 7 and 8 was also present. A fragment of creamware dating from the late 18th to early 19th century and part of a large iron hook were discovered in context **904**, the cobbled surface (*Appendix 4 and 5*). This fits remarkably well with the cartographic evidence, which suggests that the surface was created prior to 1850.

4.3.9 **Test Pit 11 (c3m north of CBH1):** a concrete surface was identified in this trench, which does not appear to relate to any of the structures shown on the early maps of the site (Fig 6). This trench is close to Test Pit 4 (TP20), where a similar surface was revealed, which would suggest that it relates to the same structure.

4.3.10 **Test Pit 13 (c6m south-east of CBH2):** a brick surface was revealed in this trench, which does not appear to relate to anything shown on the early maps. The proximity of this trench to Test Pit 2 suggests that this is the same structure revealed here - the T-shaped building shown on the Ordnance Survey maps for 1913 and 1938.

4.3.11 **Test Pit 15 (TP27):** the early maps of the site show that the wall or culvert revealed in this trench clearly relates to an early part of the iron and brass foundry. A large block of buildings is shown in this location between 1873 and 1891 before the site was substantially rebuilt (Greenlane Archaeology 2006, figs 7-8; Fig 6).

4.3.12 **Test Pit 16 (CBH5):** the early maps show that this trench is located on the site of buildings forming part of the early phase of the iron foundry (Greenlane Archaeology 2006, fig 7) but subsequently outside of buildings belonging to later phases (Fig 6). The wall revealed in this trench undoubtedly therefore corresponds to the earlier buildings. Several fragments of pottery, relating to two individual vessels, were recovered from context **1603**, all of which are considered to date from the late 19th to early 20th century (*Appendix 5*; Plate 12). This fits broadly with the date of the iron foundry although the presence of domestic pottery in this particular location is difficult to explain. It may have originated from the gasworks house, which may have been situated nearby, or from a canteen or similar building within the foundry.

4.4 Conclusion

4.4.1 The results of the watching brief and examination of the logs for the boreholes and other test pits reveals that buried archaeological remains are preserved in a number of locations across the site. These typically relate to structures shown on the early maps, principally the iron and brass foundry and steam corn mill, but a layer of cobbles, thought to relate to a shore-line track depicted on the map of 1850, was also present in several of the trenches. No certain structural remains of the patent slip were recorded, although the Test Pit in this area (TP6, which was not monitored during the watching brief; Fig 5) did reveal layers of cobbles, infilling stone and fragments of timber at some depth, which are likely to relate to it.

4.4.2 In addition, several of the test pits encountered a mid grey soft silty clay at considerable depth (Test Pits 7-9 and 14 and possibly CBH5). In one, Test Pit 8, there were apparently two layers of this type (**807** and **809**) either side of a layer of brownish-orange clay (**808**). All of these grey silt layers probably represent marine clays that were deposited on the original shore prior to the development of the site, and so probably pre-date the early 19th century. Marine clays of this type left as a result of changing sea levels since the last Ice Age have been recorded in a number of locations in the immediate and general area (Elsworth 1998, 40-42). Excavations carried out on the beach near Bardsea as part of the North West Wetlands Survey revealed two layers of grey silt, the earlier of which is thought to correspond to the Lytham VI transgression of the mid to late 4th century BC (Hodgkinson *et al* 2000, 37-38), and it is likely that the silts discovered during the watching brief relate to marine transgressions and deposits that formed from the Mesolithic through to the post-medieval period.

4.4.3 The good level of preservation of the remains of the iron foundry and steam corn mill suggest that further excavation in these areas would be very productive, although the foundry is likely to have suffered from considerable disturbance. The

shore-line track is of minimal archaeological significance and, like the patent slip, is buried at some depth below the surface and so unlikely to be affected. Structures relating to the gasworks are also likely to be present on the site, but in almost all cases these appear to be buried by a considerable depth of material, typically over 1m thick. A previous investigation also identified concrete basements within the standing buildings on the gasworks site, electrical cables, piping ducts and considerable contamination comprising sulphates, arsenic, and hydrocarbons (Komex 2002).

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6. Illustrations

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Figure 1: Site location in relation to Barrow-in-Furness

Figure 2: Location of test pits and boreholes

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Figure 4: Plans and sections of Test Pits 6, 15 and 16

Figure 5: Borehole locations in relation to Bintley's plan of the Hindpool estate dated 1850 (after Leach c1980)

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Plate 11: Working shot adjacent to the foundry buildings

Plate 12: Late 19th to early 20th century pottery from context **1603**

Appendix 1: Project Brief

BRIEF FOR AN ARCHAEOLOGICAL WATCHING BRIEF

AT THE JUNCTION OF HINDPOOL ROAD & CORNMILL CROSSING

BARROW-IN-FURNESS, CUMBRIA

Issued by the

County Historic Environment Service

Environment Unit, Economy, Culture and Environment



Date of Brief: 12 September 2006

This Design Brief is only valid for 1 year after the above date. After this period the County Historic Environment Service should be contacted. Any specification resulting from this Brief will only be considered for the same period.

1. SITE DESCRIPTION AND SUMMARY

Site: Land at the junction of Hindpool Road and Cornmill Crossing, Barrow-in-Furness

Grid Reference: SD 1955 6905

Planning Application No.: 6/06/0711

Detailed proposals and tenders are invited from appropriately resourced, qualified and experienced archaeological contractors to undertake the archaeological project outlined by this Brief and to produce a report on that work. The work should be under the direct management of either an Associate or Member of the Institute of Field Archaeologists, or equivalent. No fieldwork may commence until approval of a specification has been issued by the County Historic Environment Service.

2. PLANNING BACKGROUND

2.1 Cumbria County Council's County Historic Environment Service (CCCHES) has been consulted by Barrow Borough Council regarding a planning application for a retail unit, leisure club, car parking and landscaping on 2.5 hectares of land at the junction of Hindpool Road and Cornmill Crossing, Barrow-in-Furness.

2.2 A desk-based assessment of the site (Greenlane Archaeology Ltd, 2006, *Junction of Hindpool Road and Cornmill Crossing, Barrow-in-Furness, Cumbria Archaeological Desk-Based Assessment*, unpublished report) has highlighted that the scheme will affect an area of archaeological potential. In order to provide information concerning the impact of the proposed development on archaeological remains a watching brief on the excavation of up to 20 geotechnical test pits is required.

2.3 This advice is given in accordance with guidance given in Planning Policy Guidance note 16 (Archaeology and Planning) and with policy D29 of the Barrow Local Plan.

3. ARCHAEOLOGICAL BACKGROUND

3.1 The site has been the focus for industrial use from at least the mid 19th century. OS maps dating from this period and the early 20th century show a corn mill, the Hindpool Foundry, a ropewalk, a shipyard and a gasworks located on the site.

4. SCOPE OF THE PROJECT

4.1 Objectives

4.1.1 To identify any surviving archaeological remains within the geotechnical test pits and to investigate and record any revealed archaeological remains or deposits.

4.2 *Work Required*

4.2.1 The excavation of the geotechnical test pits must be carried out under archaeological supervision. Any putative archaeological features must then be cleaned by hand and if possible a stratigraphic record made. Finds should be retrieved as appropriate. A reasonable period of uninterrupted access should be allowed to the archaeologist for all necessary archaeological recording.

5. SPECIFICATION

5.1 Before the project commences a specification must be submitted to and approved by the County Historic Environment Service.

5.2 Proposals to meet this Brief should take the form of a detailed specification prepared in accordance with the recommendations of *The Management of Archaeological Projects*, 2nd ed. 1991, and must include:

- ❖ A description of the methods of observation and recording system to be used
- ❖ A description of the finds and environmental sampling strategies to be used
- ❖ A description of the post excavation and reporting work that will be undertaken
- ❖ Details of key project staff, including the names of the project manager, site supervisor, finds and environmental specialists and any other specialist sub-contractors to be employed
- ❖ Details of on site staffing, e.g. the number of people to be employed on site per day
- ❖ A projected timetable for all site work and post excavation work

5.3 Any significant variations to the proposal must be agreed by the County Historic Environment Service in advance.

6. REPORTING AND PUBLICATION

6.1 The archaeological work should result in a report, this should include as a minimum:

- ❖ A site location plan, related to the national grid
- ❖ A front cover/frontispiece which includes the planning application number and the national grid reference of the site
- ❖ A concise, non-technical summary of the results
- ❖ A date when the project was undertaken and by whom
- ❖ A description of the methodology employed, work undertaken, and the results obtained
- ❖ Plans and sections at an appropriate scale showing the location and position of deposits and finds located
- ❖ A brief photographic record of the site must be included, showing any features of archaeological interest. Where the results of the project revealed no significant archaeological remains a single photograph showing an indicative section of trench will suffice.
- ❖ A list of, and dates for, any finds recovered and a description and interpretation of the deposits identified

6.2 Three copies of the report should be deposited with the County Historic Environment Record within six months of completion of fieldwork. This will be on the understanding that the report will be made available as a public document through the County Historic Environment Record.

6.3 Cumbria HER is taking part in the pilot study for the Online Access to Index of Archaeological Investigations (OASIS) project. The online OASIS form at <http://ads.ahds.ac.uk/project/oasis> must therefore also be completed as part of the project. Information on projects undertaken in Cumbria will be made available through the above website, unless otherwise agreed.

7. THE ARCHIVE

7.1 An archive must be prepared in accordance with the recommendations of *The Management of Archaeological Projects*, 2nd ed. 1991, and arrangements made for its deposit with an appropriate repository. A copy shall also be offered to the National Monuments Record.

7.2 The landowner should be encouraged to transfer the ownership of finds to a local or relevant specialist museum. The museum's requirements for the transfer and storage of finds should be discussed before the project commences.

7.3 The County Historic Environment Service must be notified of the arrangements made.

8. PROJECT MONITORING

8.1 One weeks notice must be given to the County Historic Environment Service prior to the commencement of fieldwork.

9. FURTHER REQUIREMENTS

- 9.1 It is the archaeological contractor's responsibility to establish safe working practices in terms of current health and safety legislation, to ensure site access and to obtain notification of hazards (eg. services, contaminated ground, etc.). **The County Historic Environment Service bears no responsibility for the inclusion or exclusion of such information within this brief or subsequent specification.**
- 9.2 The Code of Conduct of the Institute of Field Archaeologists must be followed.
- 9.3 The involvement of the County Historic Environment Service should be acknowledged in any report or publication generated by this project.

10. FURTHER INFORMATION

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As part of our desire to provide a quality service to all our clients we would welcome any comments you may have on the content or presentation of this design brief. Please address them to the Assistant Archaeologist at the above address.

Appendix 2: Project Design

JUNCTION OF HINDPOOL ROAD AND CORNMILL CROSSING, BARROW-IN-FURNESS, CUMBRIA

Archaeological Watching Brief Project Design



Client: Positive Location Properties Ltd

September 2006

Planning Application Ref. 6/05/1530

1. Introduction

1.1 Project Background

1.1.1 A planning application was submitted by Positive Location Properties Ltd (hereafter 'the client') for the construction of a warehouse, retail unit, car parking and landscaping on land at the junction of Hindpool Road and Cornmill Crossing, Barrow-in-Furness, Cumbria (Planning Application No. 6/05/1530; NGR SD 1955 6905). After a recommendation by Cumbria County Council Historic Environment Service (CCCHES), Barrow Borough Council placed a condition on the planning consent requiring a scheme of archaeological investigation to be undertaken. A brief for the investigation was produced by CCCHES, the first stage of which was to comprise a desk-based assessment, with the possibility of further work, particularly evaluation, being required following this. The desk-based assessment was carried out by Greenlane Archaeology (Greenlane Archaeology 2006a), and it established that several industries were present on the site from the mid-19th century until the early 20th century, including a ship yard, steam corn mill, rope walk, gasworks and iron and brass foundry.

1.1.2 Following the desk-based assessment, a further programme of archaeological investigation and recording was recommended by CCCHES. This was to include examination of below-ground remains on the site and recording of standing buildings. It is the first phase of below-ground recording that this project design deals with. The background to the programme of below-ground recording is given below.

1.1.3 Information from the client's architects, Craig and Green Architects, indicated that the whole of areas 1, 2 and 4 would be reduced in height by 1m (area numbers referred to are those indicated on Figure 11 of the desk-based assessment report). CCCHES judged that this may affect archaeological remains identified in the desk-based assessment (DBA), and therefore an archaeological evaluation of the northern sections of areas 1 and 2, and the whole of area 4 would be required. The evaluation trenches would need to be targeted on the structures identified in the DBA; the patent slip, corn mill, foundry and rope walk. A 250 square metre trenching sample was proposed by CCCHES for such an evaluation area, although this figure may be revised once a scaled trench location plan has been worked out. CCCHES went on to say that if the ground disturbance of the intended car parking area could be kept to a minimum then only the area of the intended store would need to be evaluated. Again, the evaluation trenches would need to be targeted, in this instance on the site of the corn mill. A 50 square metres of trenching would be required in this area.

1.1.4 Celtic Technologies proposed to undertake a programme of remediation works on the site, with initial investigative work including the excavation of up to 20 trial pits approximately 2m by 2m in plan. CCCHES recommended that a watching brief be carried out on the trial pits. The archaeological observations could add to the knowledge regarding the location and survival of remains below-ground, and inform the requirement for evaluation trenching initially outlined above.

1.2 Greenlane Archaeology

1.2.1 Greenlane Archaeology is a private limited company based in Ulverston, Cumbria, and was established in 2005 (Company No. 05580819). Although a new company, its directors, Jo Dawson and Daniel Elsworth, have a combined total of 13 years continuous professional experience working in commercial archaeology, principally in the north of England and Scotland. Greenlane Archaeology is committed to a high standard of work, and abides by the Institute of Field Archaeologists' (IFA) Code of Conduct. The watching brief will be carried out according to the Standards and Guidance of the Institute of Field Archaeologists (IFA 2001).

1.3 Project Staffing

1.3.1 The project will be managed by **Jo Dawson (MA (Hons), AIFA)**. Since graduating from the University of Glasgow in 2000 with a joint honours degree in Archaeology and Mathematics, Jo has worked continuously in commercial archaeology. Her professional career started at Glasgow University Archaeological Research Division (GUARD), for whom she worked for six months, following which she worked for Headland Archaeology, in

Edinburgh, for two years, and for Oxford Archaeology North, in Lancaster, for three years. During this time she has been involved in a range of different archaeological projects, and, over the past few years, has concentrated on desk-based assessments and environmental impact assessments, as well as finds reports. She has extensive experience of both planning and pre-planning projects, and has undertaken assessments of all sizes. She has managed several relevant recent projects, including a watching brief in Lancashire (Greenlane Archaeology 2006b).

1.3.2 The watching brief will be carried out by **Daniel Elsworth (MA (Hons), AIFA)**. Daniel graduated from the University of Edinburgh in 1998 with an honours degree in Archaeology, and began working for the Lancaster University Archaeological Unit, which became Oxford Archaeology North (OA North) in 2001. Daniel ultimately became a project officer, and for over six and a half years worked on excavations and surveys, building investigations, desk-based assessments, and conservation and management plans. These have principally taken place in the North West, and Daniel has a particular interest in the archaeology of the area. Relevant recent projects include several evaluations of medieval and post-medieval remains in Cumbria, carried out in 2006, and watching briefs carried out in previous years for OA North.

1.3.3 All artefacts will be processed by Greenlane Archaeology, and it is envisaged that they will initially be assessed by Jo Dawson, who will fully assess any of post-medieval date. Finds of earlier date will be assessed by specialist sub-contractors as appropriate. CCCHES will be notified of any specialists who Greenlane Archaeology wishes to engage, before any specialist contracts are awarded, and the approval of CCCHES will be sought.

1.3.4 Environmental samples and faunal remains (with the exception of waterlogged deposits) will be processed by Greenlane Archaeology. It is envisaged that charred plant remains will be assessed by Scott Timpany of Headland Archaeology Ltd, and faunal remains by Steve Rowland or Andy Bates, both at Oxford Archaeology North. CCCHES will be informed and their approval will be sought for these arrangements.

2. Objectives

2.1 Watching brief

2.1.1 To identify any surviving archaeological remains within the trial pits and to investigate and record any revealed archaeological remains or deposits.

2.2 Report

2.2.1 To produce a report detailing the results of the watching brief, that will provide information concerning the impact of the proposed development on the archaeological remains observed.

2.3 Archive

2.3.1 Produce a full archive of the results of the watching brief.

3. Methodology

3.1 Watching brief

3.1.1 The trial pits are to be monitored, with one archaeologist on site.

3.1.2 The watching brief methodology will be as follows:

- The overburden will be removed by machine under supervision by staff from Greenlane Archaeology;
- All deposits of archaeological significance will be examined by hand if possible in a stratigraphic manner, using shovels, mattocks, or trowels as appropriate for the scale;
- The position of any features, such as ditches, pits, or walls, will be recorded and where necessary these will be investigated in order to establish their full extent, date, and relationship to any other features. If possible, negative features such as ditches or pits will be examined by sample excavation, typically half of a pit or similar feature and approximately 10% of a linear feature;

- All recording of features will include sketch plans and sections, and photographs in both 35mm black and white print and digital format;
- All deposits, drawings and photographs will be recorded on Greenlane Archaeology *pro forma* record sheets, which are based on systems commonly used during archaeological excavations and derived from MoLAS (1994);
- All finds will be recovered during the watching brief for further assessment as far as is practically and safely possible. Should significant amounts of finds be encountered an appropriate sampling strategy will be devised;
- All faunal remains will also be recovered by hand during the watching brief as far as is practically and safely possible, but where it is considered likely that there is potential for the bones of fish or small mammals to be present appropriate volumes of samples will be taken for sieving;
- Deposits that are considered likely to have preserved environmental remains will be sampled. Bulk samples of between 10 and 40 litres in volume, depending on the size and potential of the deposit, will be collected from stratified undisturbed deposits and will particularly target negative features (gullies, pits and ditches) and occupation deposits such as hearths and floors. An assessment of the environmental potential of the site will be undertaken through the examination of samples of suitable deposits by specialist sub-contractors (see *Section 1.3.4* above), who will examine the potential for further analysis. All samples will be processed using methods appropriate to the preservation conditions and the remains present;
- Any human remains discovered during the watching brief will be left *in situ*, and, if possible, covered. The CCCHES will be immediately informed as will the local coroner. Should it be considered necessary to remove the remains this will require a Home Office licence, under Section 25 of the Burial Act of 1857, which will be applied for should the need arise;
- Any objects defined as 'treasure' by the Treasure Act of 1996 (HMSO 1996) will be immediately reported to the local coroner and secured stored off-site, or covered and protected on site if immediate removal is not possible;

3.1.2 Should any significant archaeological deposits be encountered during the watching brief these will immediately be brought to the attention of the CCCHES so that the need for further work can be confirmed. Any additional work and ensuing costs will be agreed with the client and according to the requirements of the CCCHES, and subject to a variation to this project design.

3.2 Report

3.2.1 The results of the watching brief will be compiled into a report, which will include the following sections:

- A front cover including the appropriate national grid reference (NGR);
- A concise non-technical summary of results, including the date the project was undertaken and by whom;
- Acknowledgements;
- Project Background;
- Methodology, including a description of the work undertaken;
- Results of the watching brief including descriptions of any deposits identified, their extent, form and potential date, and an assessment of any finds or environmental remains recovered during the watching brief;
- Discussion of the results including an assessment of the significance of any archaeological remains present within the study area;
- Bibliography, including both primary and secondary sources;

- Illustrations at appropriate scales including:
 - a site location plan related to the national grid;
 - a plan showing the location of the site in relation to nearby structures and the local landscape;
 - a plan showing the location of the trial pits monitored;
 - plans and sections of the watching brief groundworks, as appropriate, showing any features of archaeological interest;
 - photographs of the watching brief, including both detailed and general shots of features of archaeological interest and the groundworks;
 - illustrations of individual artefacts as appropriate.

3.3 *Archive*

3.3.1 The archive, comprising the drawn, written, and photographic record of the watching brief, formed during the project, will be stored by Greenlane Archaeology until it is completed. Upon completion it will be deposited with the Cumbria Record Office in Barrow-in-Furness (CRO(B)). A copy will also be offered to the National Monuments Record (NMR). The archive will be compiled according to the standards and guidelines of the IFA (Ferguson and Murray n.d.), and in accordance with English Heritage guidelines (English Heritage 1991). In addition details of the project will be submitted to the Online Access to the Index of archaeological investigationS (OASIS) scheme. This is an internet-based project intended to improve the flow of information between contractors, local authority heritage managers and the general public.

3.3.2 A copy of the report will be deposited with the archive at the Cumbria Record Office in Barrow-in-Furness, one will be supplied to the client, one to the client's architect, and one to the client's remediation contractor, and within two months of the completion of fieldwork, three copies will be provided for the Cumbria Historic Environment Record (HER). In addition, Greenlane Archaeology Ltd will retain one copy, and digital copies will be deposited with the NMR and OASIS scheme as required.

3.3.3 The client will be encouraged to transfer ownership of the finds to a suitable museum. Any finds recovered during the watching brief will be offered to the Dock Museum in Barrow-in-Furness. If no suitable repository can be found the finds may have to be discarded, and in this case as full a record as possible would be made of them beforehand.

4. **Work timetable**

4.1 Greenlane Archaeology will be available to commence the project on **21st September 2006**. It is envisaged that the project will take 8 person days to complete (excluding all post-excavation time and time on site), spread over the following tasks and including any necessary management time:

- **Task 1:** archaeological watching brief – one person on site for as many days as necessary;
- **Task 2:** post-excavation work on archaeological watching brief, including processing of finds and production of draft report and illustrations – 6 person days (excluding post-excavation finds and sample work as specified in costing document);
- **Task 3:** feedback, editing and production of final report, completion of archive - 2 person days.

5. **Other matters**

5.1 *Access*

5.1.1 Access to the site will be organised through co-ordination with the client and/or their agent(s).

5.2 *Health and Safety*

5.2.1 Greenlane Archaeology carries out risk assessments for all of its projects and abides by its internal health and safety policy and relevant legislation. Health and safety is always the foremost consideration in any decision-making process.

5.3 Insurance

5.3.1 Greenlane Archaeology has professional indemnity insurance to the value of **£250,000**. Details of this can be supplied if requested.

5.4 Environmental and Ethical Policy

5.4.1 Greenlane Archaeology has a strong commitment to environmentally- and ethically-sound working practices. Its office is supplied with 100% renewable energy by Good Energy, uses ethical telephone and internet services supplied by the Phone Co-op, is even decorated with organic paint, and has floors finished with recycled vinyl tiles. In addition, the company uses the services of The Co-operative Bank for ethical banking, Naturesave for environmentally-conscious insurance, and utilises public transport wherever possible. Greenlane Archaeology is also committed to using local businesses for services and materials, thus benefiting the local economy, reducing unnecessary transportation, and improving the sustainability of small and rural businesses.

6. Bibliography

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HMSO, 1996 *Treasure Act*, <http://www.opsi.gov.uk/acts/acts1996/1996024.htm>

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Appendix 3: Test Pit Cross-Reference Table

<i>Greenlane Test Pit Number</i>	<i>Celtic Reference</i>	<i>Date Excavated</i>
1	TP17	21/09/06
2	TP18	21/09/06
3	TP19	21/09/06
4	TP20	21/09/06
5	TP21	21/09/06
6	TP22	21/09/06
7	TP23	21/09/06
8	TP24	21/09/06
9	TP25	21/09/06
10	CBH1	22/09/06
11	North of CBH1	22/09/06
12	CBH2	22/09/06
13	South-east of CBH2	22/09/06
14	TP26	22/09/06
15	TP27	22/09/06
16	CBH5	22/09/06

Appendix 4: Summary Context List

Context	Type	Test Pit	Description	Interpretation
101	Deposit	1	Dark brown loose sandy clay	Overburden
102	Deposit	1	Compacted mid-brown orange clay	Natural?
201	Deposit	2	Reinforced concrete	Surface
202	Deposit	2	Mid orange gravel	Bedding for 201
203	Deposit	2	Black loose sandy gravel and clinker	Dumped layer
204	Deposit	2	Mid orange brown firm clay	Natural
205	Structure	2	Red brick wall orientated east/west	Wall
301	Deposit	3	Reinforced concrete	Surface
302	Deposit	3	Mid orange gravel	Bedding for 301
303	Structure	3	Red brick and concrete surface with iron fittings	Surface
304	Deposit	3	Dark brown loose sandy soil	Dumped deposit
401	Deposit	4	Reinforced concrete	Surface
402	Deposit	4	Mid orange gravel	Bedding for 401
403	Deposit	4	Mid orange loose sand	Dumped deposit
404	Structure	4	Concrete surface	Floor
405	Structure	4	Black loose gravel	Dumped deposit
406	Structure	4	Brick wall	Wall
407	Deposit	4	Mid brown firm silty clay	Natural
501	Deposit	5	Reinforced concrete	Surface
502	Deposit	5	Mid orange gravel	Bedding for 501
503	Deposit	5	Dark orange brown sandy clay	Dumped deposit
504	Deposit	5	Mid orange firm clay	Natural
601	Deposit	6	Reinforced concrete	Surface
602	Deposit	6	Mid-light orange yellow gravel	Bedding for 601
603	Deposit	6	Dark brown-black loose sandy clay	Dumped deposit
604	Deposit	6	Reinforced concrete	Surface
605	Structure	6	Red brick wall	Wall
606	Deposit	6	Granite setts	Surface
607	Deposit	6	Mid orange-red concreted and iron stained sandy clay	Dumped deposit
608	Deposit	6	Dark brown-black loose sandy ash	Dumped deposit
609	Deposit	6	Concrete slab	Surface
701	Deposit	7	Reinforced concrete	Surface
702	Deposit	7	Mid orange gravel	Bedding for 701
703	Deposit	7	Dark brown-black loose sandy clay	Dumped deposit
704	Deposit	7	Mid brown loose sandy clay	Dumped deposit
705	Deposit	7	Mid grey silty clay	Alluvial deposit
706	Deposit	7	Mid brown firm clay	Natural
801	Deposit	8	Reinforced concrete	Surface
802	Deposit	8	Mid orange gravel	Bedding for 801
803	Deposit	8	Dark brown-black ash and sand	Dumped deposit
804	Deposit	8	Dark brown loose sand	Dumped deposit
805	Deposit	8	Firm pink sandy clay	Dumped deposit
806	Deposit	8	Soft mid orange brown sandy clay with 75% cobbles and slag	Surface
807	Deposit	8	Mid grey silty clay	Alluvial deposit
808	Deposit	8	Mid orange brown firm clay	Alluvial deposit?
809	Deposit	8	Mid grey silty clay	Alluvial deposit
901	Deposit	9	Reinforced concrete	Surface
902	Deposit	9	Mid orange loose gravel	Bedding for 901
903	Deposit	9	Black loose silty clay gravel	Dumped deposit

Context	Type	Test Pit	Description	Interpretation
904	Deposit	9	Mid orange brown firm clay, 75-80% cobbles, sandstone and slag	Surface
905	Deposit	9	Grey silty clay	Alluvial deposit
1001	Deposit	10	Reinforced concrete	Surface
1002	Deposit	10	Mid orange gravel	Bedding for 1001
1003	Deposit	10	Dark brown-black loose sandy clay	Dumped deposit
1004	Deposit	10	Mid orange loose sand	Dumped deposit
1101	Deposit	11	Reinforced concrete	Surface
1102	Deposit	11	Mid orange gravel	Bedding for 1101
1103	Structure	11	Concrete	Surface
1104	Deposit	11	Mid greyish brown loose sand	Dumped deposit
1105	Deposit	11	Mid orange loose sand	Dumped deposit
1201	Deposit	12	Reinforced concrete	Surface
1202	Deposit	12	Mid orange gravel	Bedding for 1201
1203	Deposit	12	Dark brown-black loose sandy clay with slag	Dumped deposit
1204	Deposit	12	Mid orange brown firm clay	Natural
1301	Deposit	13	Reinforced concrete	Surface
1302	Deposit	13	Mid orange gravel	Bedding for 1301
1303	Structure	13	Red brick surface	Surface
1401	Deposit	14	Reinforced concrete	Surface
1402	Deposit	14	Mid orange gravel	Bedding for 1401
1403	Deposit	14	Mid brown-black firm sandy clay	Dumped deposit
1404	Deposit	14	Dark orange brown compacted sand with slag	Dumped deposit
1405	Deposit	14	Mid orange loose sand	Dumped deposit
1406	Deposit	14	Mid grey silty clay	Alluvial deposit
1407	Deposit	14	Mid orange brown firm sandy clay	Natural
1501	Deposit	15	Reinforced concrete	Surface
1502	Deposit	15	Mid orange gravel	Bedding for 1501
1503	Deposit	15	Dark brown-black loose silt with iron slag	Dumped deposit
1504	Structure	15	Brick wall or culvert	Wall or culvert
1505	Deposit	15	Mid orange firm clay	Natural
1601	Deposit	16	Tarmac	Surface
1602	Deposit	16	Mid orange gravel	Bedding for 1601
1603	Deposit	16	Dark brown-black loose sandy clay with ash, brick, clinker	Dumped deposit
1604	Structure	16	Brick wall	Wall
1605	Deposit	16	Mid brown-orange firm clay	Natural

Appendix 5: Finds Summary

OR	Context	Material	Qty	Description	Date range
1	503	Glass	1	Light green ridged tile fragment	Late 19 th – 20 th century
2	603	Glass	25	Colourless window pane fragments, one surface textured with small grid and hemispheres	20 th century
3	603	Composite	2	Green rubber-coated thin copper (?) wire fragments, one with looped ends	20 th century
3	603	Fe	1	Corroded bolt	Late 18 th – 20 th century
3	603	Fe	1	Corroded nail	Late 19 th – 20 th century
3	603	Fe	6	Wire fragments, possibly broken spring	Late 19 th – 20 th century
4	904	Ceramic	1	White salt-glazed creamware fragment	Mid 18 th – early 19 th century?
5	904	Fe	1	Very large corroded hook end	Post-medieval
6	1603	Ceramic	11	White earthenware saucer rim and base fragments with dark green transfer-printed pattern with polychrome enamels and lustre ('Pekin' or similar pattern by another manufacturer ¹), partly refitting, unmarked	Late 19 th – early 20 th century
6	1603	Ceramic	4	Refitting factory-produced red earthenware bowl rim and body fragments with blue slip band and rouletted rim	Late 19 th – early 20 th century
7	1603	Glass	12	Colourless window pane fragments	18 th – 20 th century
8	1603	Fe	1	Corroded bar fragment	Not closely dateable
8	1603	Graphite?	1	Fragment	20 th century?
9	Unstratified from spoil of Celtic TP3	Ceramic	1	Black-glazed red earthenware coarseware fragment	Late 17 th – early 20 th century
9	Unstratified from spoil of Celtic TP3	Ceramic	1	Bone china saucer base fragment	19 th – 20 th century
9	Unstratified from spoil of Celtic TP3	Glass	1	Colourless bottle fragment	19 th – 20 th century

¹ James Beech of the Swan Bank Pottery (c1878-1889) is recorded as having made this pattern (Kowalsky and Kowalsky 1999, 108). This firm was formerly Beech and Hancock (c1860-1876), also of the Swan Bank Pottery (*ibid*), and they also manufactured this pattern (Colin and Jill's Emporium 2005)

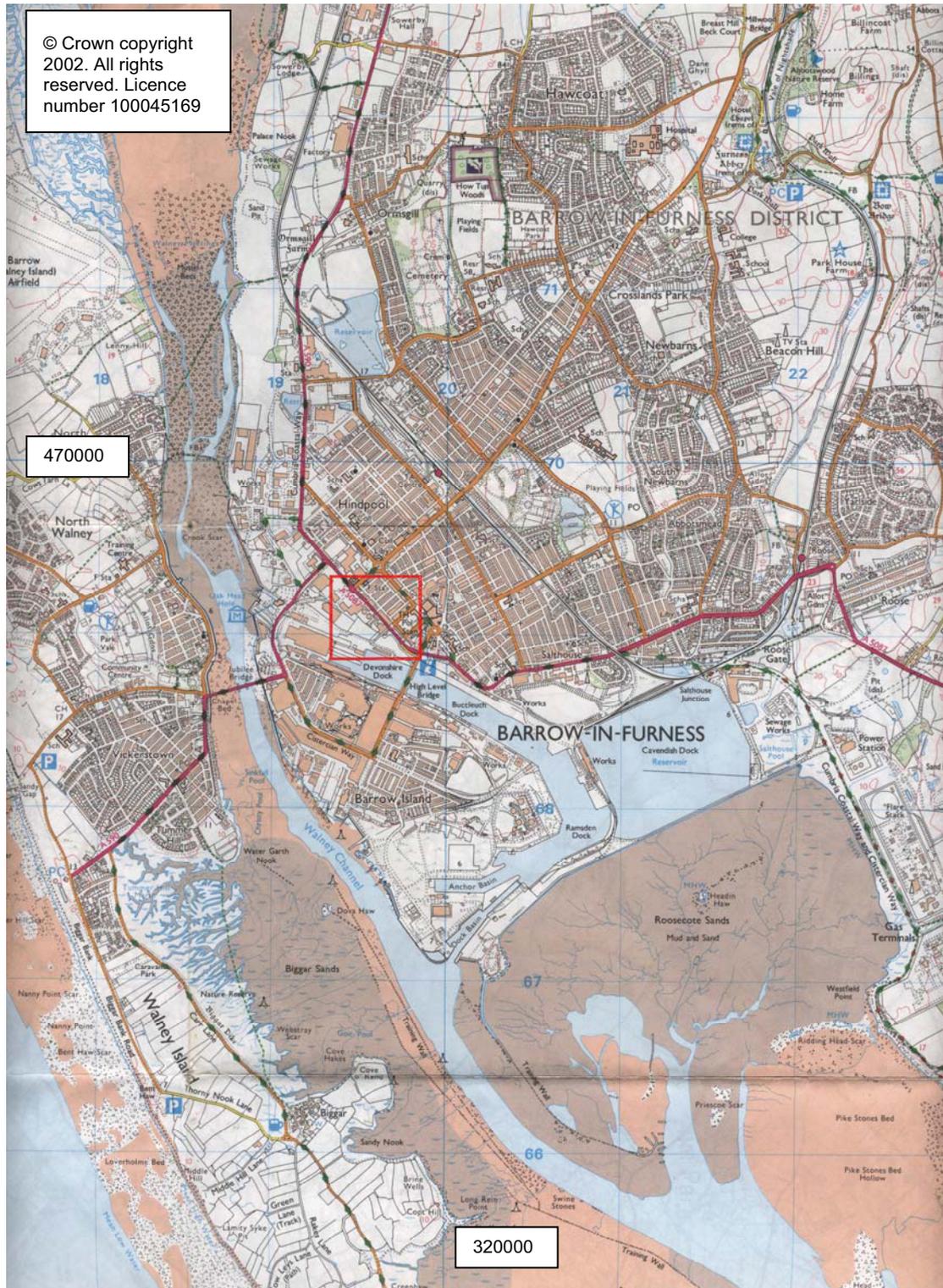
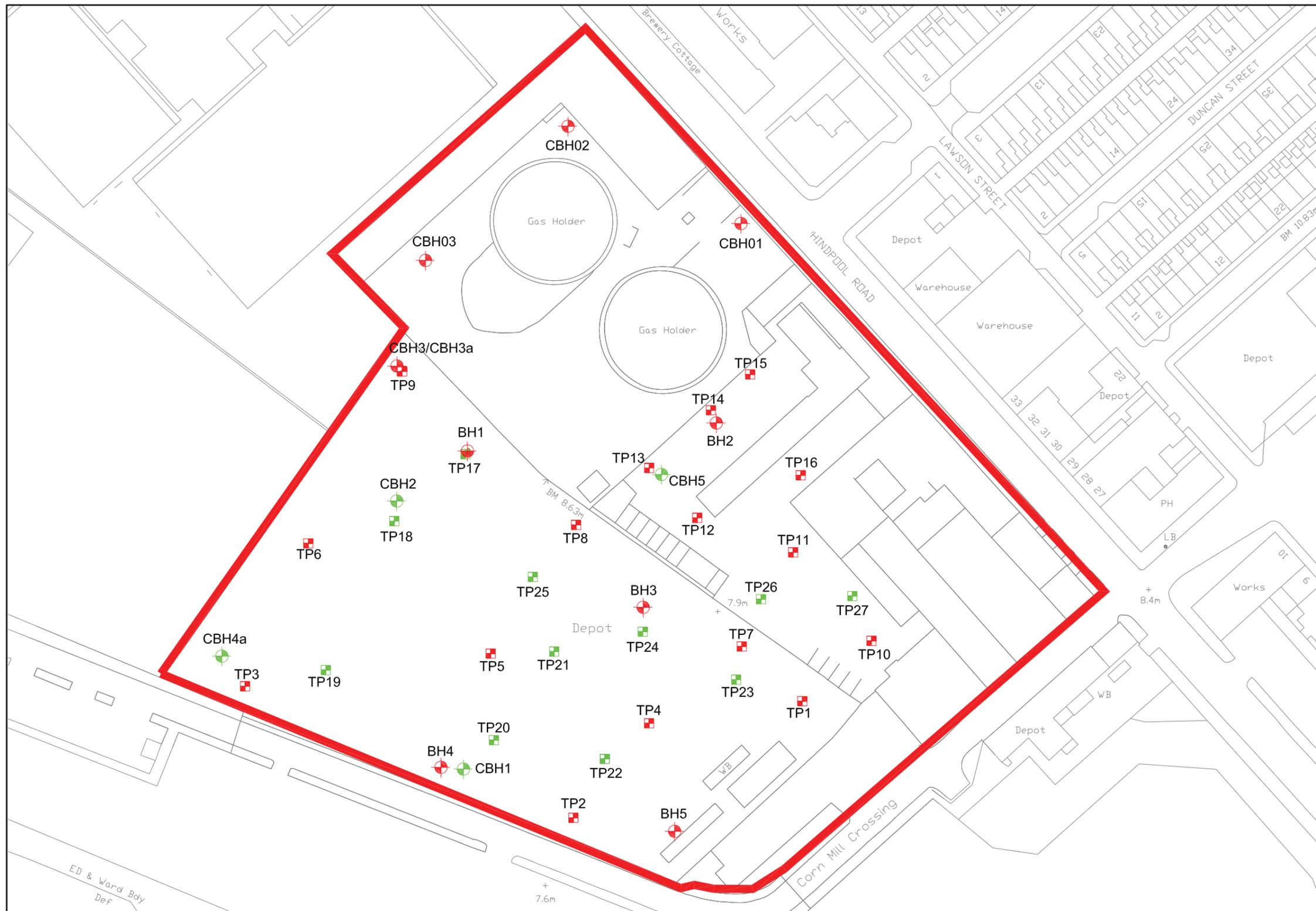


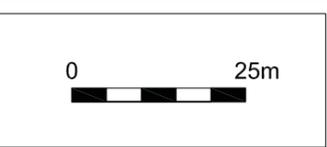
Figure 1: Site location in relation to Barrow-in-Furness



Project:
Hindpool Road - Cornmill Crossing,
Barrow-in-Furness, Cumbria
Archaeological Watching Brief

Project Code: G1038
Site Code: HC06

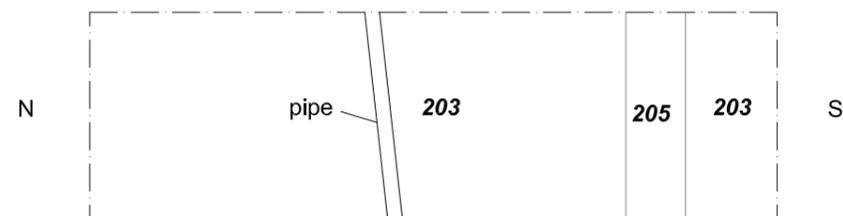
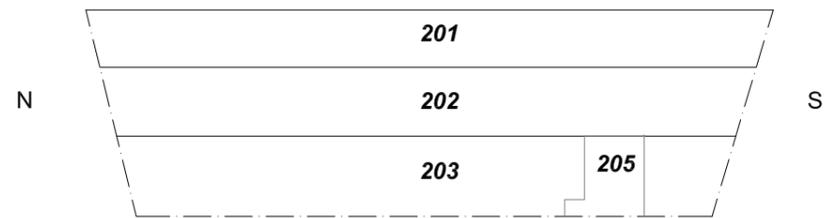
Key:
■ test pit ■ test pit monitored during watching brief
⊕ borehole ⊕ borehole monitored during watching brief



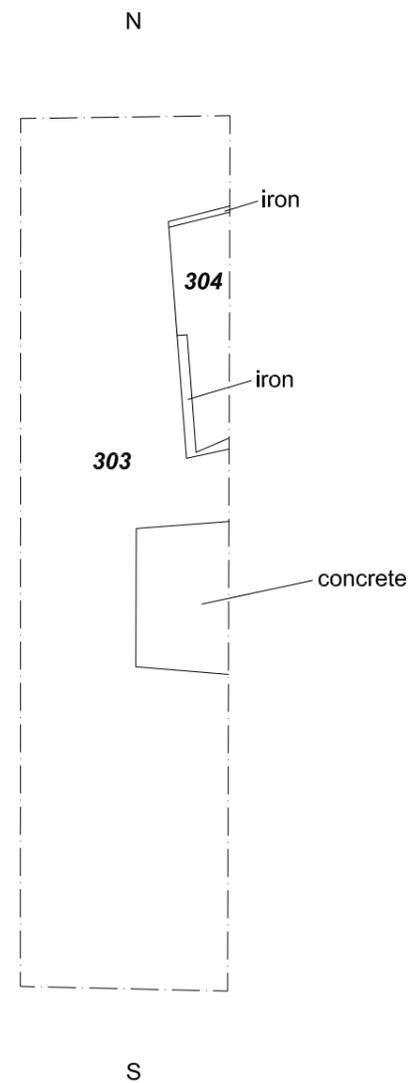
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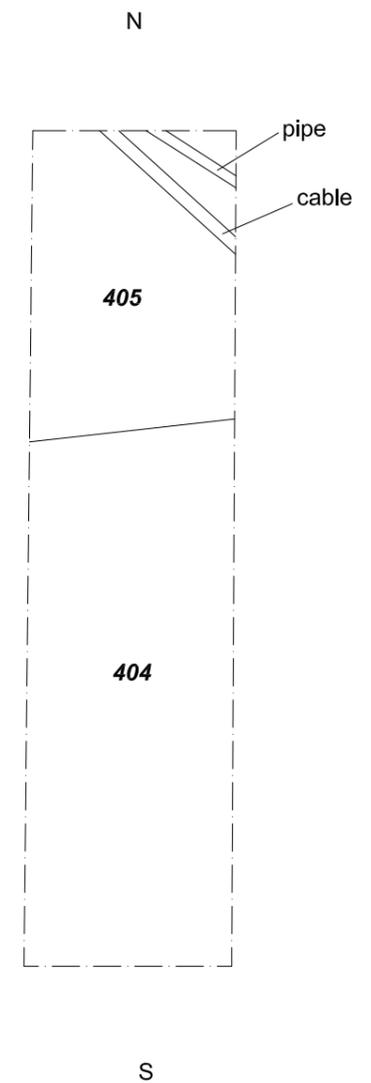
Figure 2: Location of test pits and boreholes



West-facing section and plan of Test Pit 2



Plan of Test Pit 3



Plan of Test Pit 4

Project:
Hindpool Road - Cornmill Crossing,
Barrow-in-Furness, Cumbria
Archaeological Watching Brief

Project Code: G1038
Site Code: HC06
Date: November 2006

Key:
302 context number — brick
— edge of context
- - - extent of excavation



Figure 3: Plans and sections of Test Pits 2, 3 and 4

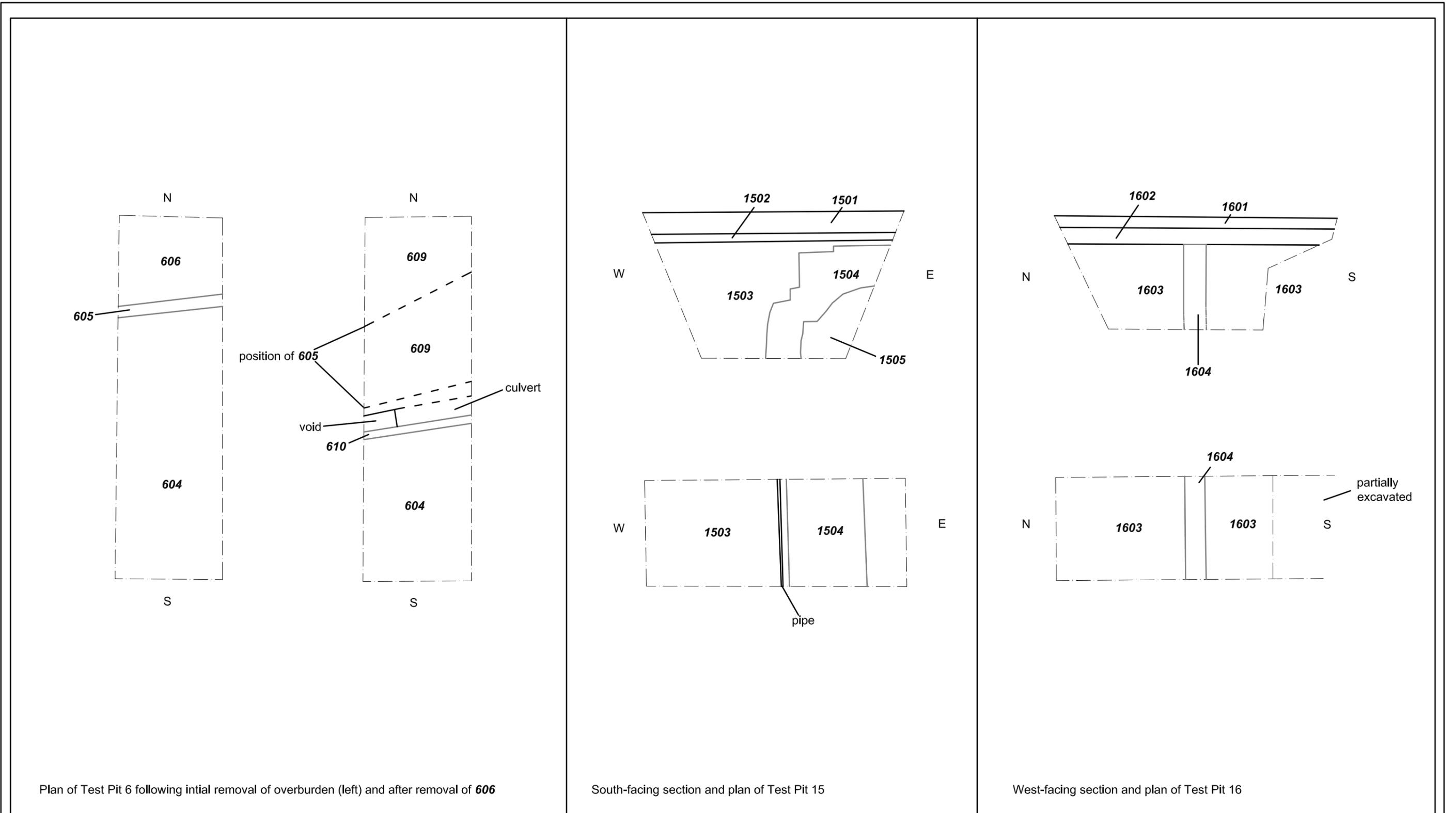
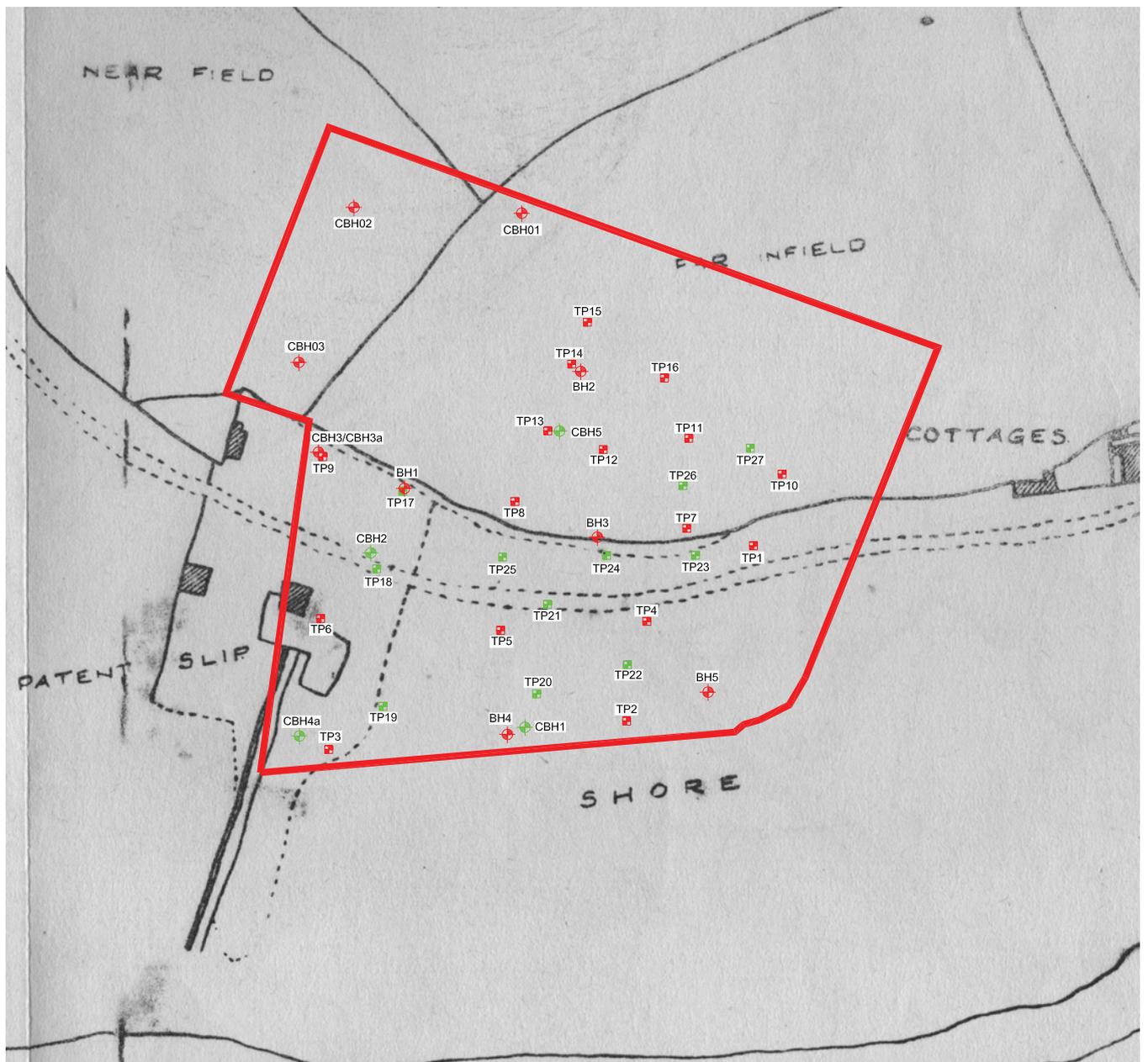
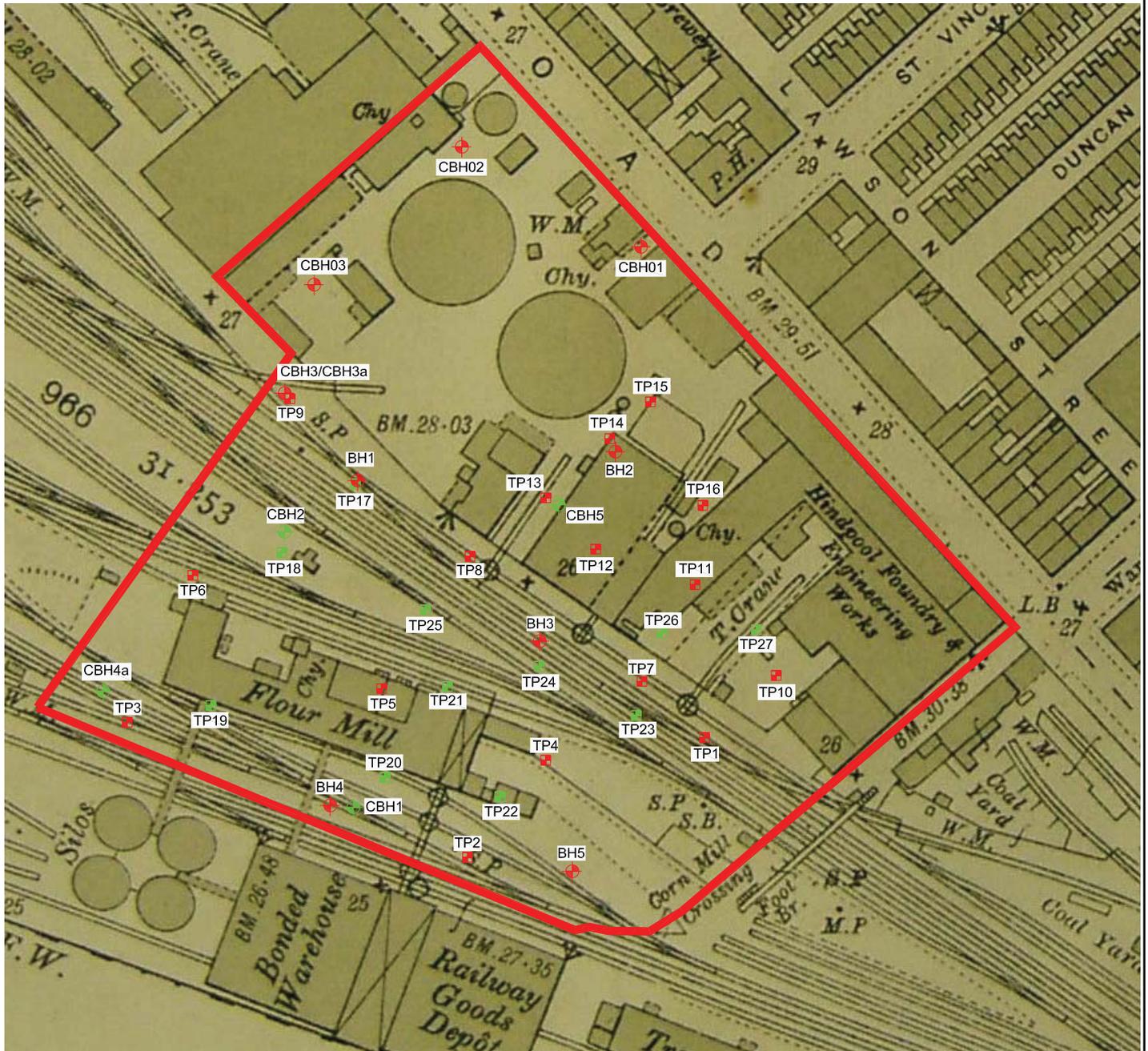


Figure 4: Plans and sections of Test Pits 6, 15 and 16



Project: Hindpool - Cornmill Crossing, Barrow-in-Furness, Cumbria Archaeological Watching Brief		N ↑	
Project Code: G1038 Site Code: HC06 Date: January 2007	Key: ■ test pit ■ test pit monitored during watching brief ◆ borehole ◆ borehole monitored during watching brief		

Figure 5: Test pit and borehole locations in relation to Bintley's plan of the Hindpool estate dated 1850 (after Leach c1980)



Project: Hindpool - Cornmill Crossing, Barrow-in-Furness, Cumbria Archaeological Watching Brief					
Project Code: G1038 Site Code: HC06 Date: January 2007	Key: <table border="0"> <tr> <td> test pit</td> <td> test pit monitored during watching brief</td> </tr> <tr> <td> borehole</td> <td> borehole monitored during watching brief</td> </tr> </table>			test pit	test pit monitored during watching brief
test pit	test pit monitored during watching brief				
borehole	borehole monitored during watching brief				

Figure 6: Test pit and borehole locations in relation to the 1938 Ordnance Survey map



Plate 1: Brick surface **303** with concrete patch and attached iron brackets within Test Pit 3



Plate 2: Concrete surface **404** in Test Pit 4



Plate 3: Concrete surface **604** and brick wall **605** in Test Pit 6

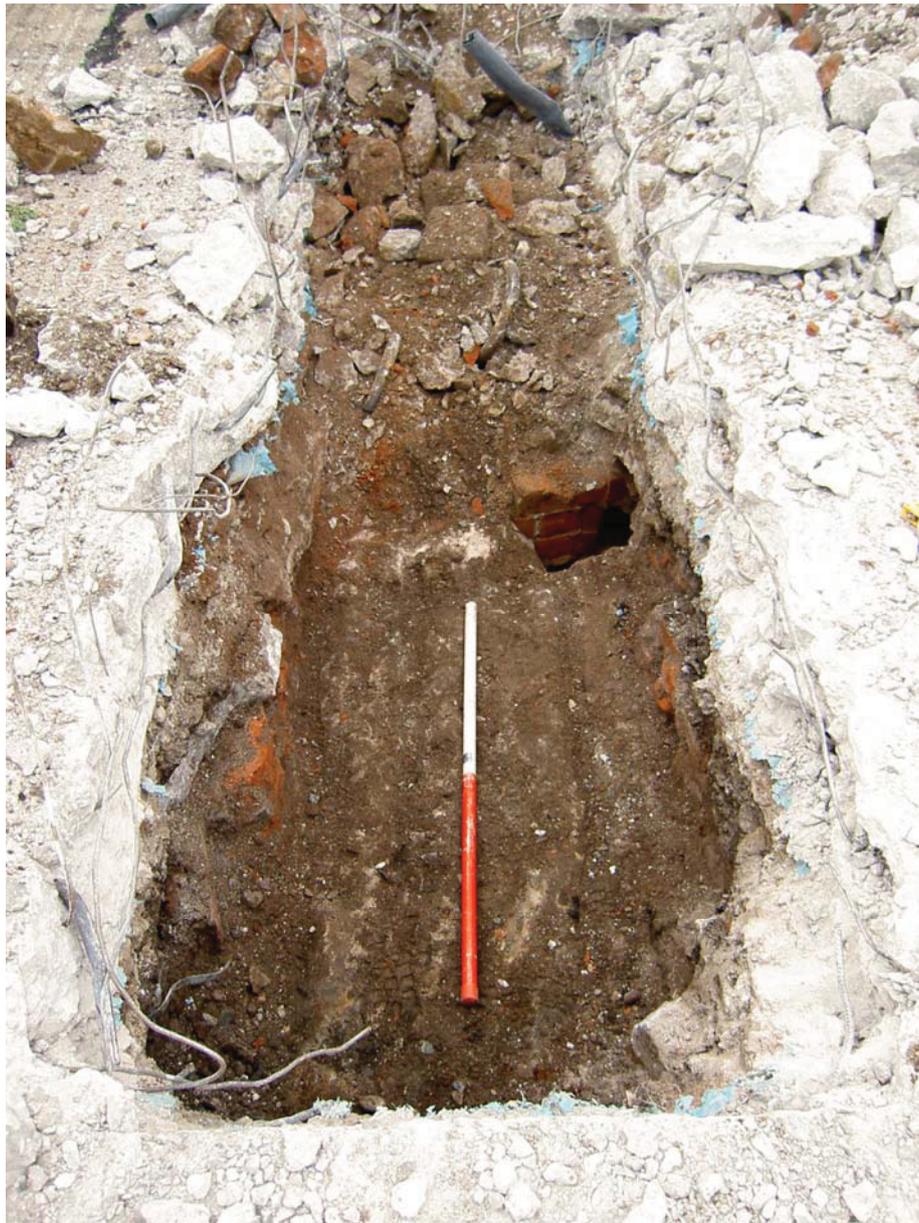


Plate 4: Lower concrete surface **609** and brick wall **610** in Test Pit 6



Plate 5: East-facing section of Test Pit 8 showing the cobbled surface (**805**) and layers of grey silty clay (**806** and **808**) and orange clay (**807**)



Plate 6: South-facing section of Test Pit 10 showing the clinker layer and remains of railway sleeper (**1003**) and underlying sand (**1004**)



Plate 7: Brick surface (**1303**) in Test Pit 13



Plate 8: Wall or culvert **1504** in the south-facing section of Test Pit 15



Plate 9: Vitrified foundry bricks from the spoil of CTP12



Plate 10: Working shot of the main area of excavation (Area 1)



Plate 11: Working shot adjacent to the foundry buildings



Plate 12: Late 19th to early 20th century pottery from context **1603**