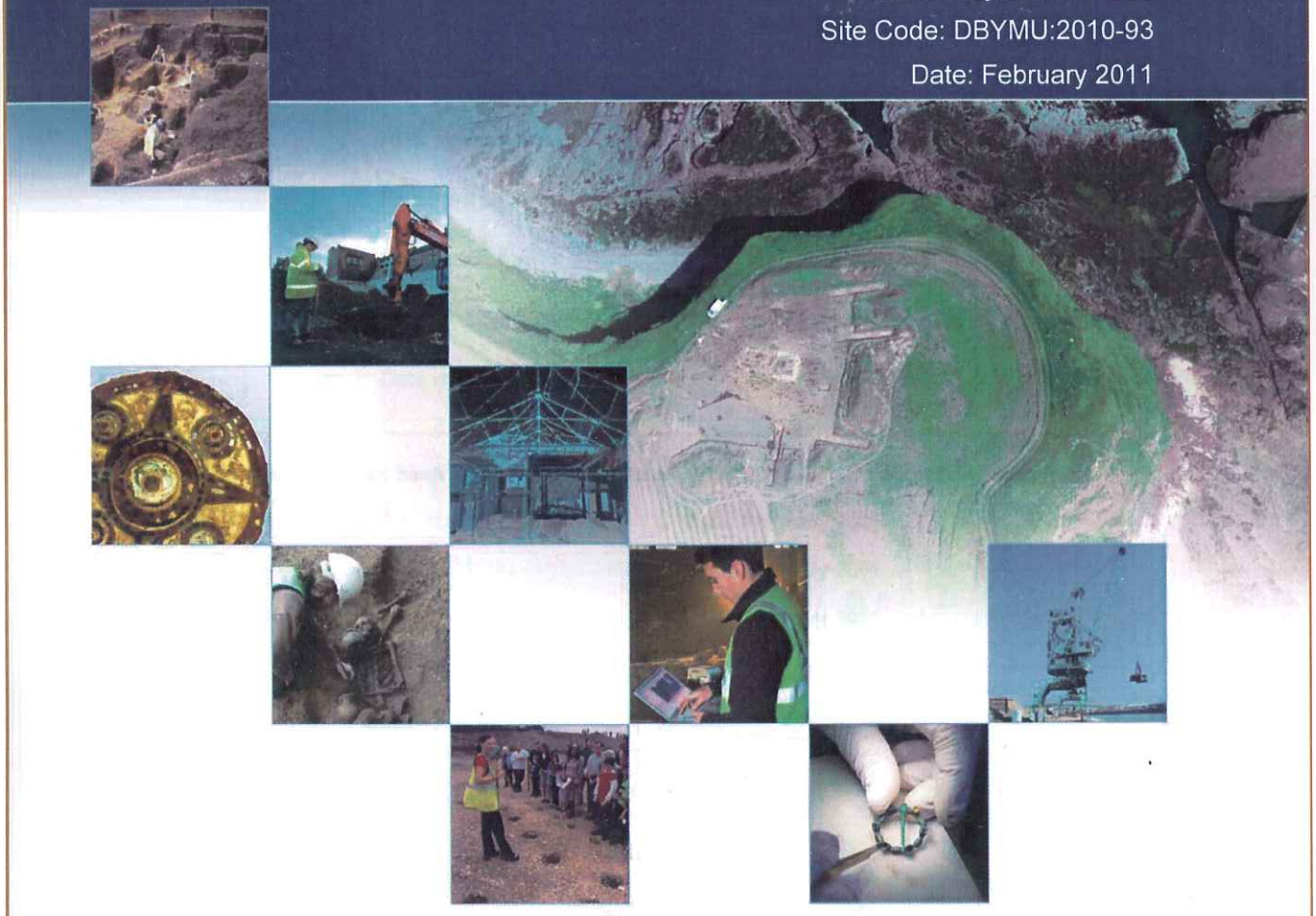
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Former Hepworths Factory, Swadlincote Retail Park, Swadlincote, Derbyshire

Results of an Archaeological Strip, Map and Record

Planning Reference: 9/2006/1430
National Grid Reference Number: SK 3144 1908
AOC Project no: 30853
Site Code: DBYMU:2010-93
Date: February 2011



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Former Hepworths Factory, Swadlincote Retail Park, Swadlincote, Derbyshire:

Results of an Archaeological Strip, Map and Record

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Date of Site Work:	29th November 2010 to 6th January 2011
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This document has been prepared in accordance with AOC standard operating procedures.

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Non-Technical Summary

An archaeological investigation consisting of an archaeological Strip, Map and Record was undertaken at the former Hepworths site at Swadlincote Retail Park in Swadlincote. The work revealed the bases of two 'Beehive' Kilns, one dating to around 1900, the other to 1961. The kiln bases had been heavily truncated by demolition during the 1970s and before.

Part of the floor and foundations of a drying shed or warehouse were also recorded. This may have had some heating, suggested by fragmentary brick foundations.

Some bricks manufactured at the site were collected from the demolition horizon, including bricks with coloured glazes, and bricks stamped with a Woodward stamp. A selection of this material has been kept as part of the site archive.

1. Introduction

1.1 This document presents the results of an Archaeological Strip, Map and Sample at the site of the former Hepworths Factory at Swadlincote, Derbyshire. A Historic Building Record was carried out prior to the groundwork. (AOC 2010b) on four industrial buildings.

Site Location

1.2 The site was centred on National Grid Reference (NGR) SK 3144 1908 (Figure 1), south of the main Centre of Swadlincote. The site is bound to the north by Morrisons Superstore, Coppice Road to the east, car parking to the west, and a residential development to the south. The site is roughly rectangular in shape measuring an area of approximately 2.82ha (Figure 2).

1.3 The site is currently partly occupied by buildings formerly in use by the Hepworth Works (Figure 2, Buildings A-D); these buildings are due for consolidation and refurbishment as part of the ongoing scheme for the retail park.

Planning Background

1.4 The local planning authority is South Derbyshire District Council. Archaeological advice to the council is provided by Steve Baker, Development Control Archaeologist for Derbyshire County Council. The development consists of the refurbishment of the existing buildings (Buildings A-D) on site and the construction of new retail units with associated parking and infrastructure (Figure 2).

1.5 An archaeological condition was attached to planning consent (Planning Ref. 9/2006/1430) under Planning Policy Guideline 16 (PPG 16), in order that the archaeological implications of the development could be fully considered. The condition stated:

'No development shall take place, until the developer has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted to and approved by the Local Planning Authority in writing.'

'Reason: To enable items of archaeological interest to be recorded/and or preserved where possible.'

1.6 The next stage in the planning process was creation of a Written Scheme of Investigation, detailing the methodology for recording, and including some background history of the site (AOC 2010a). This methodology was approved by Steve Baker prior to the start of any site work. The WSI conformed to the requirements of Planning Policy Statement 5: Planning for the Historic Environment (PPS 5) issued by the Department for Communities and Local Government (DCLG 2010); which superseded PPG 16 in March 2010.

1.7 A history of the site was published by South Derbyshire District Council in 2003, and this has been drawn on to understand the history of the site, the function of the standing buildings, and used to target areas which may contain surviving archaeological remains relating to the industrial use of the site (SDDC 2003).

2. Geology and Topography

2.1 The British Geological Survey indicates the site is located upon a solid geology of Triassic Mudstone. This is sealed by layers of fire clay strata, ideal for the production of firebricks and sanitary ware.

2.2 The site is located on ground sloping south to north, from a height of approximately 116mOD in the south of the site, to 108mOD in the north.

3. Archaeological And Historical Background

3.1 The following background is drawn from the Written Scheme of Investigation and other sources as listed (AOC 2010).

The Prehistoric Period to Industrial (c. 500,000 BP – AD 1790)

3.2 Very little archaeological activity from the medieval period and earlier has been noted close to Swadlincote. A single upper quern stone of Iron Age date was found to the north of the site.

3.3 The name of Swadlincote derives from the Anglo Saxon for 'Swartling's Cottages. In the Domesday Book of 1086, Swadlincote is recorded as a small village in the more important parish of Church Gresley. The earliest written reference to the town's mineral deposits is found in a document dated 1294. This document recorded the granting of mineral extraction rights. However, throughout the medieval period, although some coalmining and pottery making was carried out, the area remained essentially rural. The real growth of Swadlincote took place after the late 18th century with the development of the local coal and clay extraction industries on a commercial basis. This was a direct result of the rapidly rising demand for coal and clay during the Industrial Revolution (SDDC 2010).

Industrial History (1790-1990)

3.4 The first works on the site at Coppice Side were founded by John Hunt in 1790, manufacturing firebricks. Occasional firebricks stamped "Hunt, Swadlincoat" have been recorded from the local area (SDDC 2003). Diversification into sanitary and sewerage products took advantage of the stimulus brought by the Public Health Acts of 1845 and 1875 and the Sanitary Act of 1866. The factory was supplied with coal from the Granville Colliery Company, on the hill above. The coal fired the kilns and powered the steam engines.

3.5 An early reference to manufacture in Swadlincote comes from John Farey (Farey 1811), and is quoted in the SDDC report (SDDC 2003) as referring to this site:

> *"At Swadlincote, Arch-bricks, proper for the tops of Reverbatory Furnaces are made, vulgarly called Velvetory Bricks; here are also made round tiles, for the use of Bar-Iron makers, to heat their lumps or Balls of scraps upon, instead of using the Pot or Pye-stones made of Firestone…"*

3.6 Glover's Derbyshire Directory of 1827-29 lists John Hunt as a farmer and brickmaker, but by 1838 he was a farmer only. A valuation of Church Gresley dating to 1838 lists him as the owner of a property occupied by Thomas Woodward: *"Brick-yard, Kilns Sheds & Buildings, a House and Garden occupying 12 perches, and a Croft containing 2 acres, 1 rood and 20 perches"*. It seems likely that Hunt had retired and rented out his premises. He died in 1839, and Thomas Woodward bought the works from his widow Susannah Hunt in 1848.

3.7 On Thomas Woodward's death, the business passed to his son James (1828 to 1886). White's Derbyshire Directory of 1857 records that "Mr Woodward's" was the largest in Swadlincote. The firm

produced bricks, tiles, firebricks and fireclay until 1859, when he added sewage pipes, terracotta chimneypots and vases. James Woodward called his factory the "Swadlincote Fire Brick and Terra Cotta Works".

3.8 Advertisements still exist for the company's products, including one (1881) in Kelly's Directory which extols the virtues of Woodward's patent wash-out closet. This was patented by Samuel Hunt Rowley in 1875 and won three awards at the International Medical Sanitary Exhibition at South Kensington in 1881. By 1887, Rowley and Woodward set up the separate firm of James Woodward and Rowley, to manage the sanitary branch of the business. The name 'The Anchor Works eventually became the name of the whole site, derived from the firm's trademark, the monogram of JW in the form of an anchor.

3.9 In 1882, a railway branch line was constructed, connecting the site to Swadlincote Railway Station. This was for bringing in coal and taking out of finished products. . The line no longer exists. The manufactured products included glazed bricks after 1899, and many such bricks are apparent in the site buildings, stamped with the Woodward stamp.

3.10 Four buildings survive on the site from the historic factory. These have been subject to a Historic Building Record (AOC 2010b). These are **'Building A'**, first depicted on the 1882 Ordnance Survey Map, which was a blacksmiths and joiners shop. **Building B** was the Fitting Shop and dates from 1882-1900. **Building C** was built in the 1890s for the manufacture of glazed bricks and sinks, and partly as a drying hovel later used as a laboratory.

3.11 Area 1 of the Strip, Map and Record Area lay southwest of Building C, while Area 2 lay to the northwest of Buildings B and C. Further buildings, extensions of Building C are shown on the 1901 Ordnance Survey Map in the location of Area 1. A kiln and another covered building are shown in the location of Area 2. **Building D** was built between 1882 and 1900, as stores and offices.

3.12 Woodward was not the only manufacturer in Swadlincote: other factories in the area made drain pipes, including Thomas Wragg & Sons, working from 1873, adjacent to the site. Wragg took over Woodward's in 1904 by which time Rowley had left, and the sanitaryware branch of the business had disappeared altogether. Glazed bricks are first advertised in 1899. Hepworths bought the company in 1978. The northern part of the site was devoted to the manufacture of pipes, the southern part made sinks and glazed bricks.

On Clay

3.12 The local natural clay was found to be of a superior quality ideal for manufacture of firebricks, and later the sanitary products that typified Woodward's ownership. This is known as the Derby Fireclay and the Deep Derby Fireclay. This clay, with high alumina content, was particularly suitable for salt-glazing.

On Salt-glazing

3.13 Salt glaze was produced by throwing common salt onto the kiln fires: the vaporised salt reacted with the clay, producing the glaze. This fused glaze had the advantage of being resistant to corrosion and virtually indestructible. The firm of Ensor & Co is thought to have been the first local producer in the area beginning in 1845 at their works established in 1830. James Woodward, successor to John Hunt, began making them in 1859, thirteen years after Doulton in Lambeth.

4. Aims of the Investigation

4.1.1 The aims of the Strip, Map and Sample were defined as follows:

- To establish the presence/absence of archaeological remains within the site.
- To determine the extent, condition, nature, character, quality and date of any archaeological remains encountered.
- To map any archaeological remains encountered and sample excavate targeted features.
- To assess the ecofactual and environmental potential of excavated archaeological features and deposits.
- To determine the extent of previous truncations of the archaeological deposits.
- To enable Steve Baker, archaeology advisor to South Derbyshire District Council, to make an informed decision to satisfy that condition.
- To make available to interested parties the results of the investigation. subject to any confidentiality restrictions.

5. Methodology

5.1 Site procedures were defined in the Written Scheme of Investigation (AOC 2010b).

5.2 An accession number (DBYMU:2010-93) has been obtained from Derby City Museum and Art Gallery and was used as the site identifier for all records produced.

5.3 As part of the construction programme, the concrete slab covering much of the area south of Building C was removed. This was carried out under archaeological supervision, with up to 0.5m of ground reduction required.

5.4 The programme of ground reduction associated with strip, map and record, was focused on the area of previous industrial activity in the centre of the site in the area of the 1901 ceramic works (Figure 2). Two areas (Areas 1 and 2) were stripped and reduced under archaeological supervision to enable identification and recording of archaeological structures and horizons, prior to construction.

5.5 The excavation, recording and reporting conformed with current best archaeological practice and local and national standards and guidelines:

- English Heritage – Management of Archaeological Projects (EH 1991).
- English Heritage – Archaeological Guidance Paper 3: Standards and Practices in Archaeological Fieldwork (EH 1998a).
- English Heritage – Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation (EH 2002).
- Institute for Archaeologists – Standards and Guidance and Guidelines for Finds Work (IfA 2008).
- Institute for Archaeologists – Standard and Guidance for Archaeological Field Evaluations (IfA 2008).
- Institute for Archaeologists – Code of Conduct (IfA 2010).
- Museum of London – Archaeological Site Manual (MoLAS 1994)
- RESCUE & ICON – First Aid for Finds (RESCUE & ICON 2001).
- United Kingdom Institute for Conservation – Conservation Guidelines No.2 (UKIC 1983).
- United Kingdom Institute for Conservation – Guidance for Archaeological Conservation Practice (UKIC 1990).

5.6 The works were monitored by Steve Baker, on behalf of South Derbyshire District Council and by Alan Ford for AOC Archaeology.

6. Results of the Archaeological Strip, Map and Sample

Area 1

6.1 Naturally-lain sandy clay was the lowest deposit revealed (121). No subsoil was identified, so it is unclear whether the revealed topography displays the original lie of the land or is the result of quarrying and terracing. The natural clay lay at 108.74mOD in the southern edge of Area 1, dropping gently to the east to 108.67, generally flat across the centre of the area, but dipping sharply in the northern corner to 107.53mOD.

6.2 The earliest features were two pits, probably clay pits for the extraction of fireclay. These were located in the centre of the area. One was an oval pit visible for 5m north-south and 5m east-west [108], and had steep sides, breaking gradually to a flat base 0.75m deep. The fill was loose black ashy coal (107), very regular throughout, and may represent a dump of burnt industrial waste disposed of in a handy quarry pit.

6.3 The second pit [112] was also oval in plan, exposed for 3m by 1.6m. This had slightly concave sides over 45°, breaking gradually to a flattish base. The fill was a loosely compacted black ashy material (111). This pit was sealed by a layer of dark brown sandy clay (122/ 123) which spread for 14.5m north-south and 6.5m east west, laid down after the pit was filled. This general spread contained frequent small rounded stones and fragments of building material and was up to 0.26m deep; this layer may have been deposited to form a level surface for the building phase that followed.

6.4 The made ground was sealed by structural elements of a large building that lies southwest of Building C, and consisted of a brick floor and wall footings. One building, or division thereof, was represented in Area 1 by a brick floor measuring 24m by 6.5m [117], which was truncated by demolition activities.,. The bricks measured 240mm by 120mm by 75mm. The brick floor was bordered by a brick footing for a wall running at 90° from Building C, suggesting contemporaneity, the building oriented on the same plan. This northwestern wall [120] was built of red brick in English bond, 0.49m wide and held by a sand and cement mortar. Occasional patches on the floor had been resurfaced, by the simple addition of skims of concrete [118]

6.5 A second wall footing on the southeastern edge of Area 1 is parallel with this [106], and may therefore be part of the same structure. No associated flooring or surface survived. Possibly, a wooden floor was present, or there may just have been deeper truncation at demolition. This footing was also constructed of red bricks [106], of the same size as the first [120].

6.6 One small brick structure [110] measured 0.97m by 0.43m and was made of red brick. This formed a rectangular chamber that was infilled with loose black sand and ash, that resembled the typical fill of an ash pit. If this were an ash pit, it may represent a small heating system associated with the function of the building. If there were heated floors, as indicated in the SDDC document (SDDC 2003), this may represent the remains of one such furnace. A small extra part of the structure may be the base of a flue [109].

6.7 A second red brick feature measured 1.62m by 0.50m and was a single brick thick [119]; this may be the base of a brick pier or other structural feature such as a doorway, or even base of support for plant.

6.8 A third wall footing oriented roughly northeast-southwest ran through the centre of Area 1, and was heavily truncated and disturbed, but was probably a sleeper wall forming, part of the group of

buildings represented by the brick foundations and brick floor. This foundation [104] was built of red brick of similar size as the other two walls, but thicker, at 80mm. It was set in a tight trench cut [105] backfilled with dark brown sandy clay with inclusions of red brick (103).

6.9 A 0.12m deep concrete slab oriented northwest-southeast 2.6m wide and [116] and associated cast iron pipe (115) housed in a brick channel [114] were laid across the brick floor and wall footings, and may represent a modification to the standing building or a later structure.

6.10 The building remains were sealed by a layer of compacted dark greyish brown silty clay (102) with a high proportion of brick, tile and drain pipe rubble, with some wooden debris up to 0.40m deep. This represents the demolition horizon of the buildings represented by the archaeological structures. The timbers probably derived from rafters and purlins, suggesting a building not dissimilar to the northwestern portion of Building C. This rubble horizon was sealed by a concrete slab forming the latest surface of the site (101), and was 0.1m deep. A square concrete base [124] may be contemporary.



Plate 1: Area 1 Under Excavation

Area 2

6.11 The archaeological record of the Area 2 is dominated by the fragmentary remains of two kilns of the type known as 'Beehive kilns'. These were typically dome-shaped brick structures of the 'downdraught kiln' type. Heat was provided from furnaces around the outside of the firing chamber and drawn through a series of flues by an external chimney.

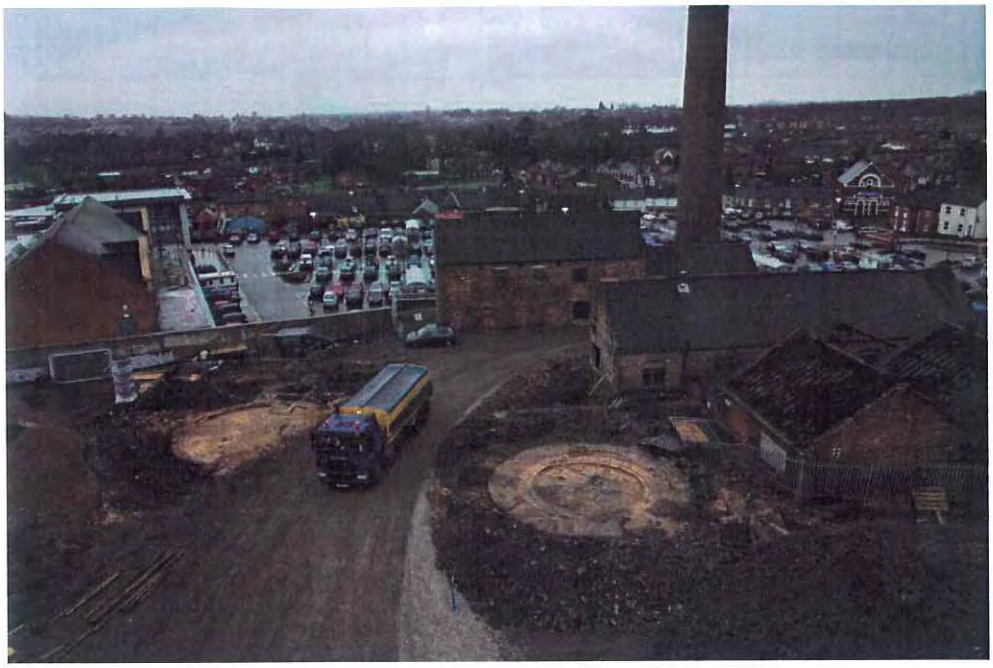


Plate 2: Kilns 201 and 202 Under Excavation



Plate 3: Kiln 201



Plate 4: Kiln 201 Section

6.12 The remains of one kiln base, in the southwest of the site [**Kiln 201**] had been quite heavily truncated in the horizontal plane, with very fragmentary remains of its finished floor surface remaining, but most of the sub-structure intact. This kiln is first depicted on the 1901 Ordnance Survey Map. The base of the kiln (Figure 5, Section 2) was formed of a brick wall 0.36m wide in English bond [259] with cement mortar; forming a ring with a diameter of 9.16m. The brick ring was infilled with a 1.20m deep dump of compacted brick rubble and crushed kiln waste (260). After this was laid down, the foundation courses were widened to 1.26m [235]; this represents the width of the outside wall of the beehive shape, forming a building with an internal diameter of 6.40m. It is thought that the wall would have held the furnaces supplying the heat to the kilns. One area of flooring remained [246] (Figure 4), which may be evidence for a doorway; this was a soot-blackened area on the southwest edge of the kiln and had no mortar upon it. This was the highest surviving element of the structure, at 108.36mOD.

6.13 Within the outer ring of the kiln was an inner ring of brickwork [236] 0.48m wide and probably also structural. In the centre of the kiln was a block of brickwork 0.60m deep [263], truncated to around 108.15m OD. This formed the substructure to the kiln floor and was transected by six radial flues [239, 240, 241, 242, 244 and 245] and one cross-flue [243]. The flues were solidly built with firebrick sides, and were generally 0.36m wide and 0.50m deep below the surviving brickwork; a single course of brick forming the bases. Each of the transecting flues was linked to an annular flue around the inner perimeter [237] (Figure 5, Section 2). This flue was lined with very hard-fired firebricks [262], and a small area of brick coping survived in the south, sealing the flue. Each transecting flue also led to a larger brick flue which led to an external chimney, providing the draught for the kiln. This internal flue [238] was 0.66m wide, and 1.28m high with a vaulted brick roof. A mixture of soot and demolition material (261) lay in the base, to a depth of 0.25m. The radial flues and outer ring were filled with crushed powdery brick rubble (264), deriving from disintegration of the brick walls of the beehive kiln as it was demolished.

6.14 The demolished kiln (201) had a scatter of bricks across the top, and many probably derive from the upper levels of the beehive form itself. Two examples have cement-rich mortar, and one an oily, sooty sheen. These probably derive from the dome of the kiln and are in a reddish orange fabric. The brick assemblage also includes examples with three different stamps: one with a sharp, incised letter 'W', one with a 'W' in relief, and one stamped with J. WOODWARD SWADLINCOTE. Two of these are salt-glazed, and are probably general rubble rather than deriving from the kiln.

6.15 North of the kiln and running westwards from the southern wall of Building B for 8m was a brick footing for a wall. This was constructed of red bricks laid in English Bond, bonded with cement mortar, and was 0.48m wide. Its orientation and proximity to Building b suggests that it may represent a curtain wall or similar, defining an area of kilns from workshops. This wall is not shown on any historic maps.

6.16 In the northwest of Area 2 was a series of fragmentary foundations which probably represent the truncated remains of a building shown on the earliest Ordnance Survey Maps, superseded by a circular kiln. These fragmentary foundations comprise a footing of red bricks [268] running east-west for 1m, laid in header bond. To the north is a second wall footing of similar form, running north-south [269]. These two walls form the corner of a room, and a scatter of rubble within (270) may be either tumble or a very irregular floor. Two other fragmentary foundations of red brick oriented east-west were too fragmentary to determine their exact function [271]. The larger [271] was 1.32m long and 0.25m wide, clearly a wall footing. The other may be a floor remnant or threshold. Two other foundations were irregular and are probably contemporary with the other sections [206 and 207].

6.17 A second kiln **[Kiln 202]**, some 10m northwest of Kiln [201] was revealed during the excavations. Approximately 1/3 of this kiln had been lost to truncation, but enough survived to show a similar arrangement to Kiln [201]. In places, this kiln-base survived to a higher level, with firebricks from the tops of flues still in situ. The kiln was built on top of a layer of compact pinkish red cemented clay and gravel (272), continuing beyond the kiln structure. This kiln is described as a 'Temco' kiln with underfeed stokers and was probably erected in 1961, according to the document recording the history of the site (SDDC 2003);



Plate 5: Kiln 202



Plate 6: Kiln 202 Section

6.18 The beehive shape of this kiln had an external diameter of 8.80m, the exterior wall having foundations 1.16m deep and 0.38m wide [222]. Standing three courses high above the surviving floor level. At the base of the construction horizon, at 107.19, was a flue running southwest [271], fed from above, which would have led to a chimney that provided the draught. In the centre of the kiln was a bed of bluish grey clay (274), with a block of brickwork four courses high forming a rectangular foundation 1.5m by 1.2m [273] built upon it. A dump of lenses of red and grey clay (275) 0.55m deep was laid down between the outer walls and the inner brickwork. This provided the bed for the brickwork of radiating flues laid above, of which six survived. It is presumed that there were two more in the south, now lost to truncation. The flues appear to be in two groups: four to the north [227, 228, 229 and 230] fed into the northern part of a central chamber built above the central rectangular foundation [225]. The two surviving southern flues [226 and 231] fed into the southern half of this rectangular chamber. The central chamber was 0.40m deep. The six flues were set into a brick floor constructed of yellow firebricks stamped with an Elephant Brand stamp [276], the floor was at 107.90mOD. Each flue was 0.40m wide and a single brick deep: 0.08m. The flues were all sealed by a row of unmortared firebrick slabs each 2' by 9" by 3". Each of the flues had an outer hole for ingress of heat, and may have once held a small grid. This allowed heat from the chamber to be passed into each flue. The central chamber had firebrick slabs set on edge over its void [225], laid with narrow spaces between, giving a grid-like finish.

6.19 Within the perimeter of the oven and 0.10m distant was the remnant of a secondary wall [221], just one brick wide at the top – 0.10m –, wider at the base with a lump of pinkish grey proto-concrete providing a firm foundation. This was the base of an inner wall that carried heat upwards into the kiln before returning via the downdraught into the kiln proper. The space between the walls was filled with degraded brick powder (256). The inner wall was constructed of bricks with the Elephant Brand stamp, indicating contemporaneity with the general floor surface.

6.20 The well-preserved structure of one associated stoke pit and furnace survived, plus the remains of two others in very fragmentary form [223 and 267]. The well preserved stoke pit [203] was located in

the northeast of the kiln, the stoke pit external, the furnace internal, and a fuel chute [204] further to the northeast.

6.21 The stoking pit / working area had internal dimensions of 2.40m and was almost square, with an irregular northern corner. The walls [215, 219, 257 and 252] were constructed of red bricks in English Bond, and stood for a depth of 0.70m below the curve of the kiln wall. The floor was brick with a skim of concrete over the surface [216/ 217] and lay at 107.31mOD. Access to this stoking chamber was down a set of three stairs in the northwest of the room, constructed of brick, with occasional repairs using cement [218]. The room was bisected by a later wall built of breezeblocks [205] that also cut into the stair.

6.22 On the northeastern wall of the chamber was an opening 0.40m wide, with a chamber beyond 1.48m long and 0.70m deep. This was filled with rubble and coal fragments, suggesting that this was the coal store, or at least a coal-hole for loading the furnace.

6.23 The furnace lay within the curve of the kiln, and measured 1.60m long and 0.80m wide. The bricks from which it was constructed had the Elephant Brand stamp and the inner faces were heavily vitrified despite being firebricks. The ash pit below the location of the fire bars had a brick lintel. There did not appear to be any ironwork surviving. It was apparent that the ash-pit could be cleared from the stoke hole, whereas the furnace would have been located at or above floor level.

6.24 Part of a second stoke pit [212] survived in the southeastern edge of the kiln, although most was lost to truncation for a later wall. Two other fragmentary areas of brick represent two mostly truncated stoke pit structures that indicate that this kiln was furnished with four furnaces. One to the northwest [223] is represented by a deep truncation, a roughly square pit 1. 80m across marked the removal of the ash-pit in its entirety [232], the infill was rubble and mid brown sandy clay. The surviving walls belonged to the stoke pit, being the wall against the kiln [224] and the northeast wall [257]. The third remnant of a stoke pit and furnace was in the southwest of the kiln [266], represented by part of one edge of the stoke pit, the rest was lost to truncation [233].

6.25 After the kiln was built, the ground was made up. First, with a layer of moderately compact yellowish brown sandy clay with chalky inclusions (278) up to 0.48m deep. This resembled the natural fireclay of the district. This was sealed by 0.58m depth of black sandy clinker (277) with inclusions of stone, brick rubble and lenses of clay. A length of red brick foundation, extending for 8m, was built upon this, and may be part of an extension or curtain wall of Building B [210].

6.26 Between the two kilns were two brick drain inspection chambers [211 and 213]. These serve drains that were not exposed during the works. One concrete-bound drain ran along the northern limit of excavation (209)

6.27 A second service [208] for electricity ran roughly north-east/south-west set within a linear cut. This contained a blue plastic sheathed cable.

7. Finds

Ceramic Building Material

7.1 The ceramic building material from the site comprises fire bricks, stock bricks, kiln furniture and drain products. These largely come from foundations and kiln structures, although occasional pieces derive from general overburden deposits, and give a view of the general types of rubble present on site among the demolition deposits.

7.2 Some of the bricks in the assemblage are stamped, and most clearly derive from the site, the stamps including 'Woodward Swadlincote' and several with just the letter W. Of interest from Kiln 202 are stamped bricks with an image of an elephant, and marked as 'Made in England'. The kiln is quite modern in date, being 20th century, but indicate the continuing tradition of brick manufacture on the site.

7.3 The glazed bricks are probably manufactured on site too, the works being noted for their colour-glazed bricks as well as their salt-glazed products. The glazes represented in the assemblage are blue, green and white.

7.4 A sample of the bricks, kiln furniture and drain products were kept and form part of the site archive.

8. Conclusions and Interpretation

8.1 The investigation achieved its aims in establishing the presence of below-ground remains relating to the industrial history of the site.

8.2 The programme of revealing and recording buried archaeological features at the former Anchor Works exposed three distinct structures belonging to the works that were demolished piecemeal during the 20th century. The remains include two bases of 'beehive' kilns and the floor and foundations of workshops. In tandem with the recorded history of the site and the report from SDDC (SDDC 2003), the function and date of the buildings is known. Although large industrial buildings generally leave a good footprint in the archaeological record, it can be difficult to recover dating evidence from a site such as this factory at Swadlincote, since manufactured items were despatched from the premises.

8.3 The earliest building appears to be the Kiln [201] at the northeastern end of Building C, a downdraft beehive kiln which had been truncated below the level of its floor and furnaces, leaving only the base of the under-floor flues. Although this limits the understanding of the industrial process, enough is understood generally to propose a cross section of the kiln to understand heat flow, (Figure 6). None of the bricks from this structure had manufacturers stamps, suggesting that the practice of identifying Woodward's products was not carried out when the kiln was built. The first depiction of the kiln is on the 1901 Ordnance Survey Map, so the structure most likely dates to shortly before this.

8.4 The second kiln [202] is in the location of an irregular building on the same map of 1901, and is not depicted on plans until after the Second World War. The clearly stamped firebricks of its manufacture point to a considerably later date. This Kiln is clearly visible in an aerial photograph of the site taken c. 1970 which can be seen in the adjacent Morrisons. This kiln survived to floor level within the oven, and despite more irregular and deep truncation, enough remains to suggest that it was served by four equi-spaced underfeed stokers, each with their own stoking pit, furnace and coal store. A proposed cross section indicating how heat flow was managed in this kiln is again shown on Figure 6.

8.5 The building represented in the archaeological record by the brick floor and brick foundations is probably the remains of a drying shed or warehouse building of late Victorian date, part of a range of buildings of which the northwestern end of Building C is a remnant. Like the kilns, truncation to the remains had occurred at demolition, but a fragmentary brick structure which may have been an ashpit hints at internal heating.

9. Further Work and Publication

9.1 Copies of the report will be issued to Steve Baker, the SMR, the local museum and the Local Studies Library on the understanding that it will become a public document after an appropriate period of time.

9.2 A short summary of the results of the fieldwork will be published with a short summary submitted to the local fieldwork roundup, and grey literature added to the online ADS OASIS project (Appendix C).

10. Archive Deposition

10.1 The archive will be prepared in accordance with local and national guidance (UKIC 1990, Brown & AAF 2007). On completion of the project, AOC will discuss arrangements for the archive to be deposited with Derby City Museum and Art Gallery. The archive will be deposited in November 2011.

11. Bibliography

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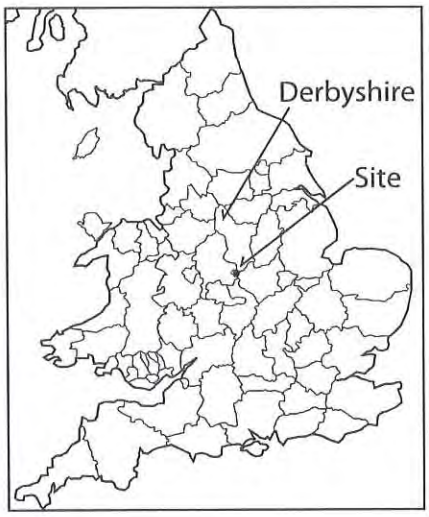
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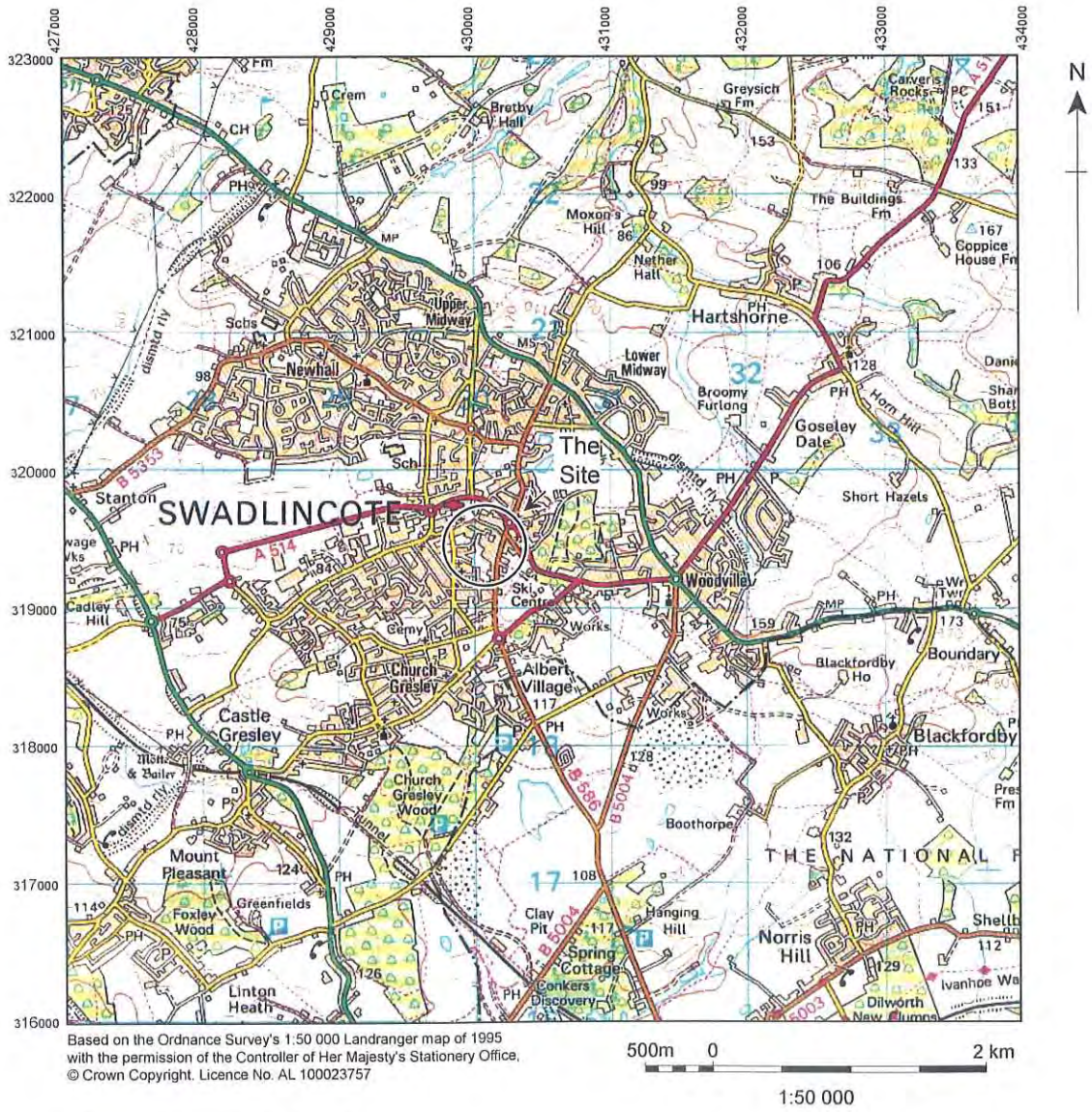
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Approximate Site Location
Within England & Wales



Based on the Ordnance Survey's 1:50 000 Landranger map of 1995
with the permission of the Controller of Her Majesty's Stationery Office,
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Figure 1: Site Location

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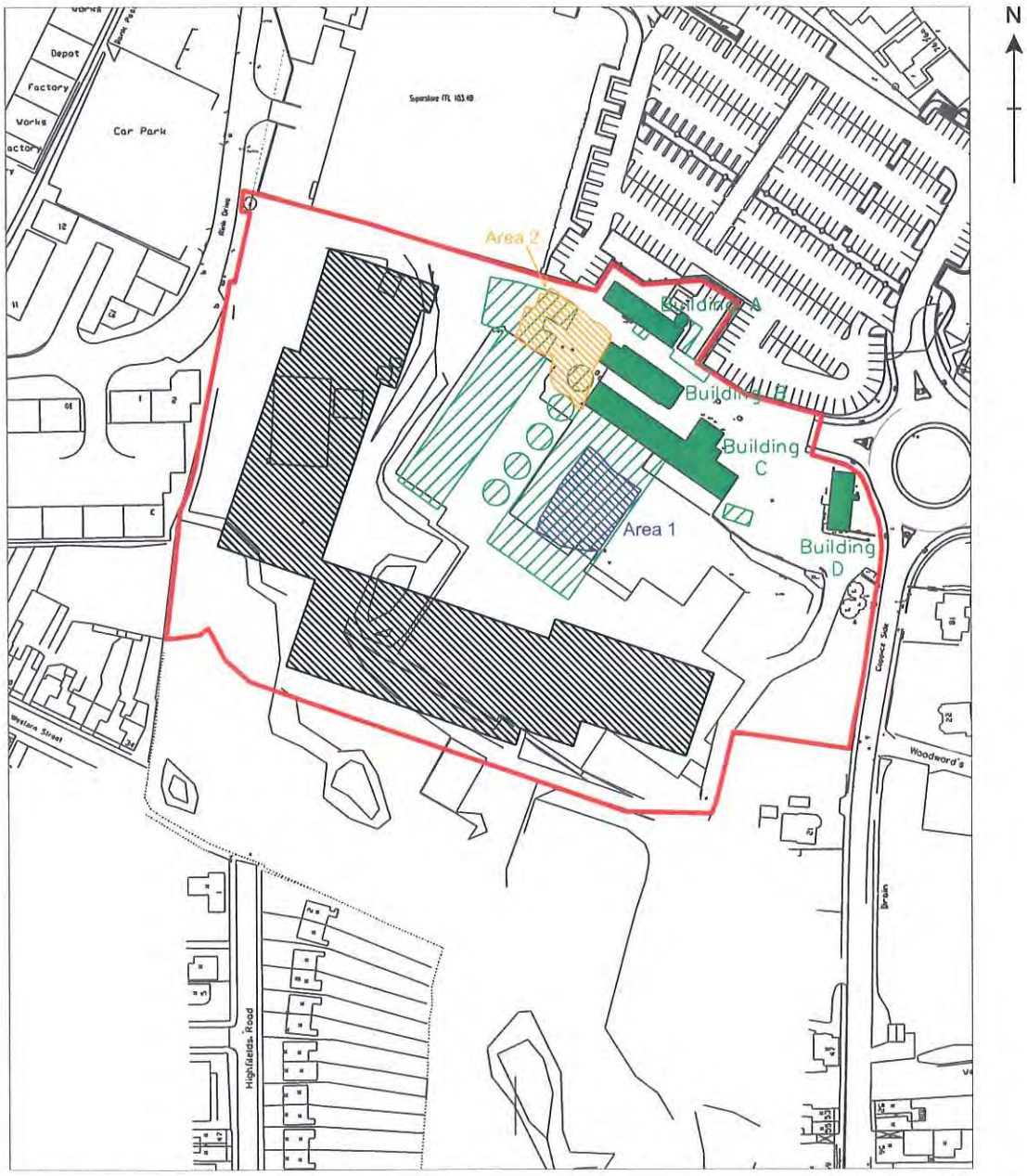


Figure 2: Detailed Site Location Plan

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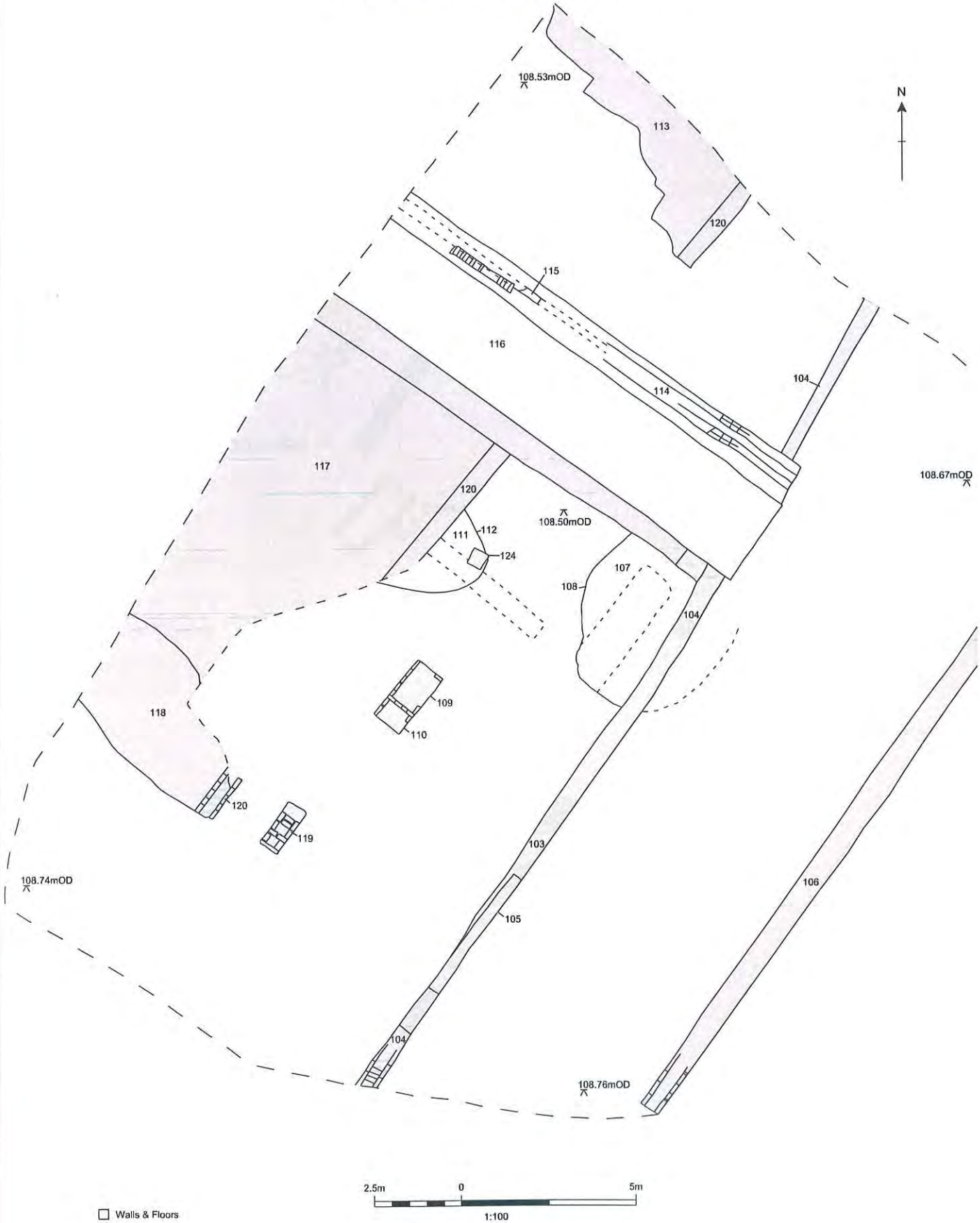


Figure 3: Area 1: Plan

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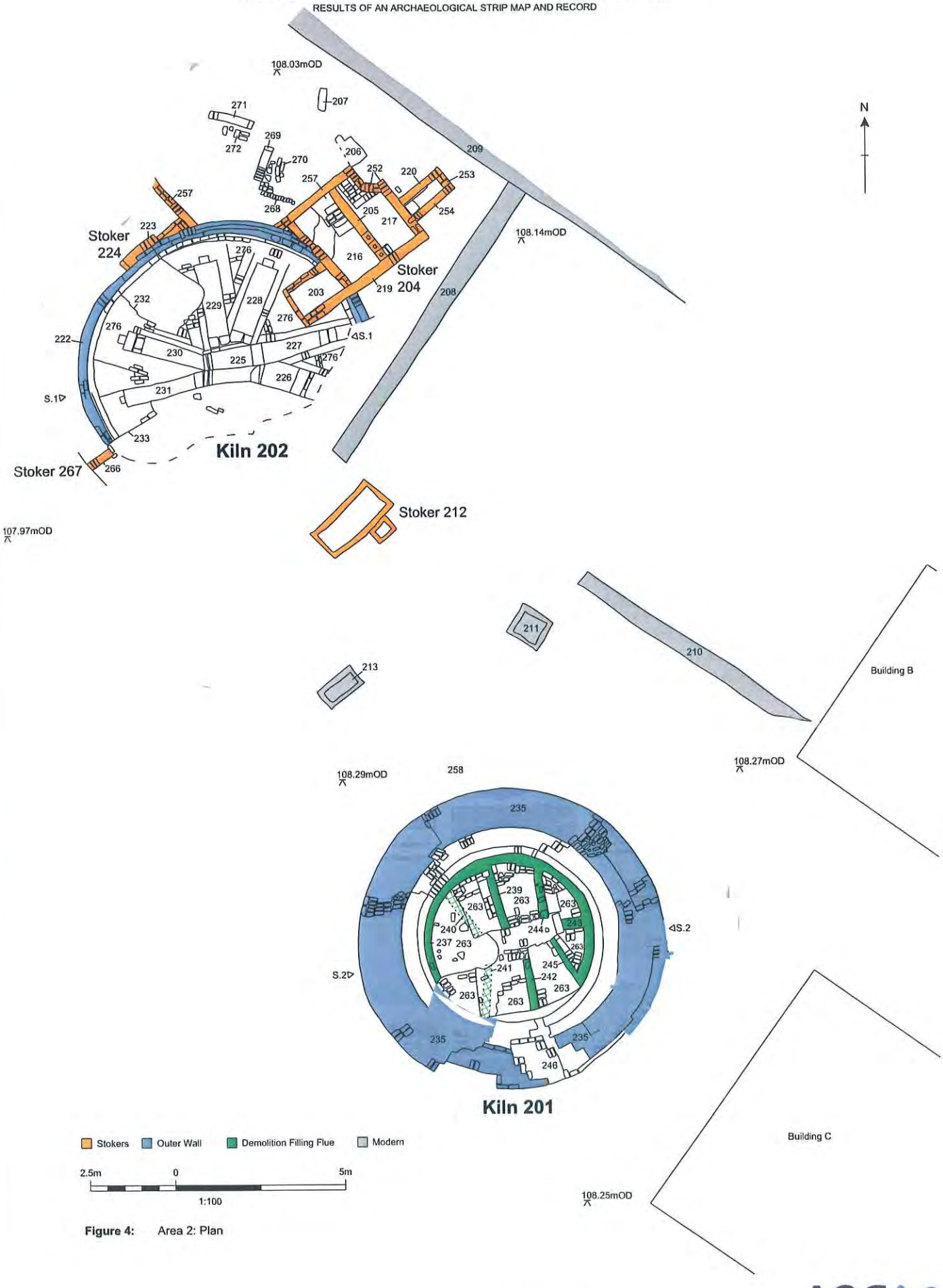
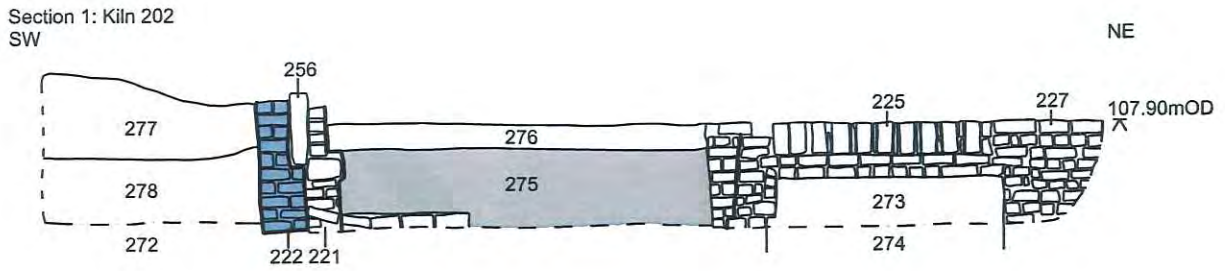


Figure 4: Area 2: Plan

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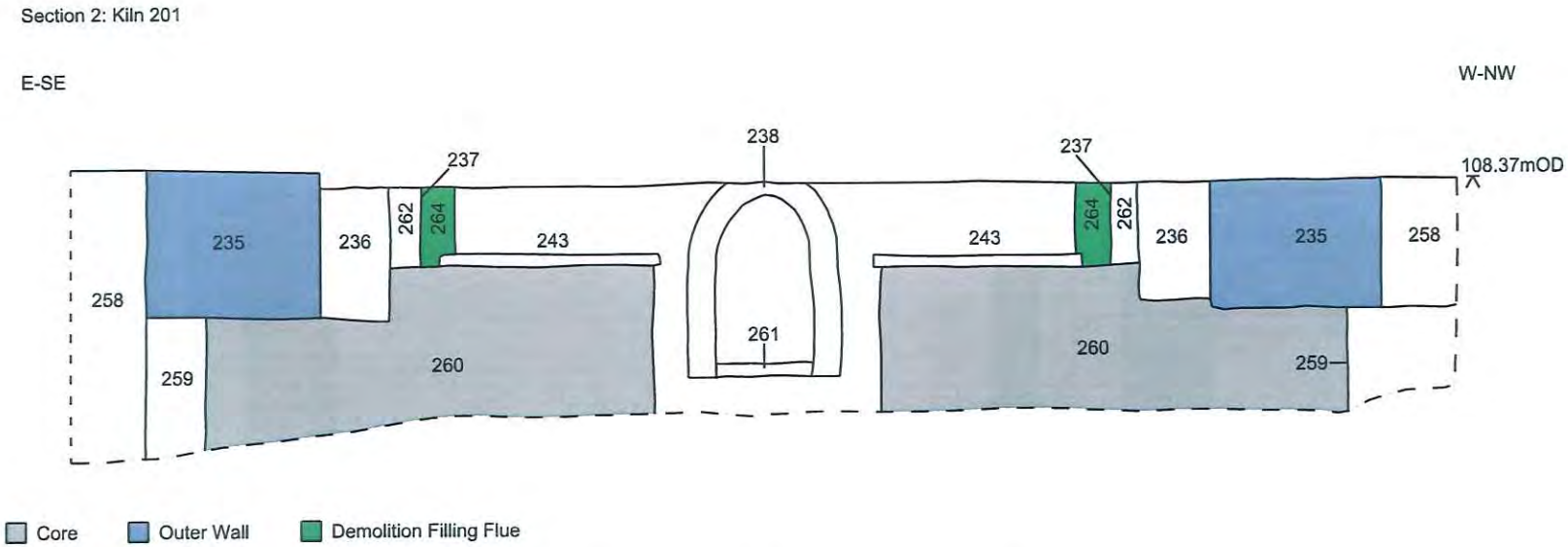
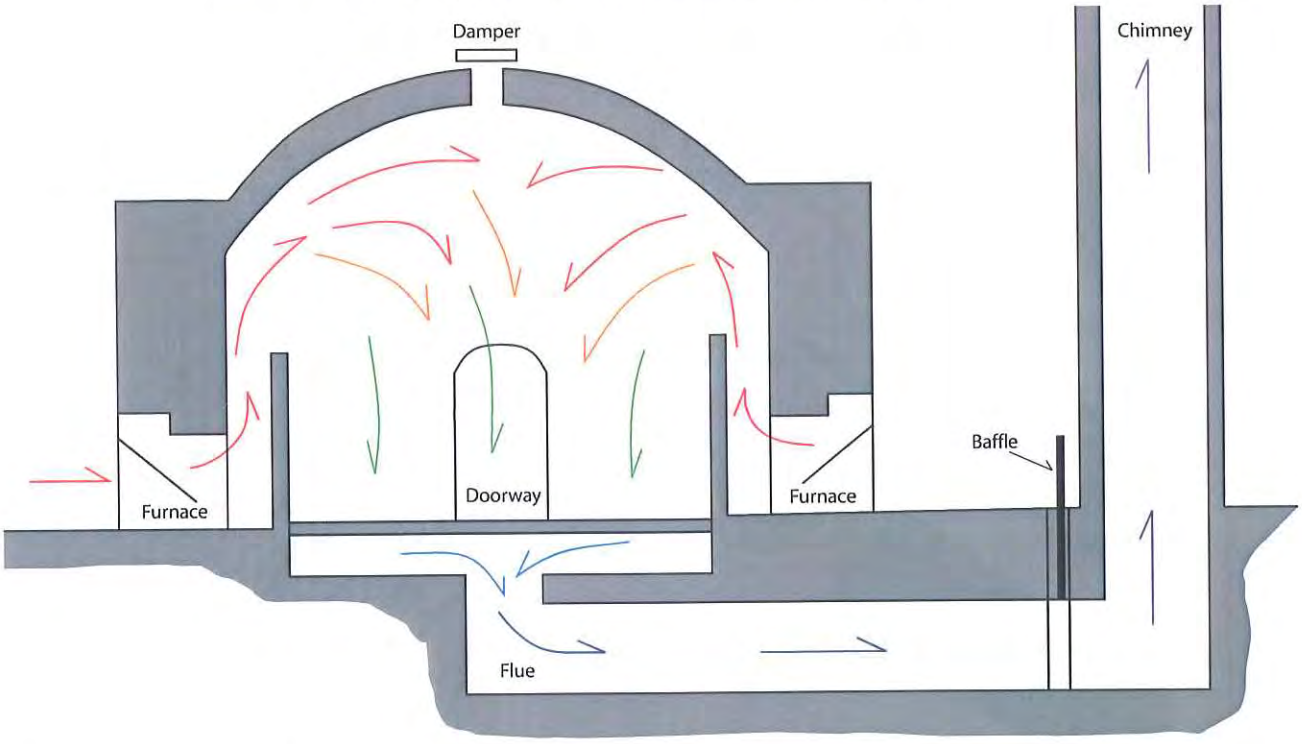


Figure 5: Sections Through Kilns

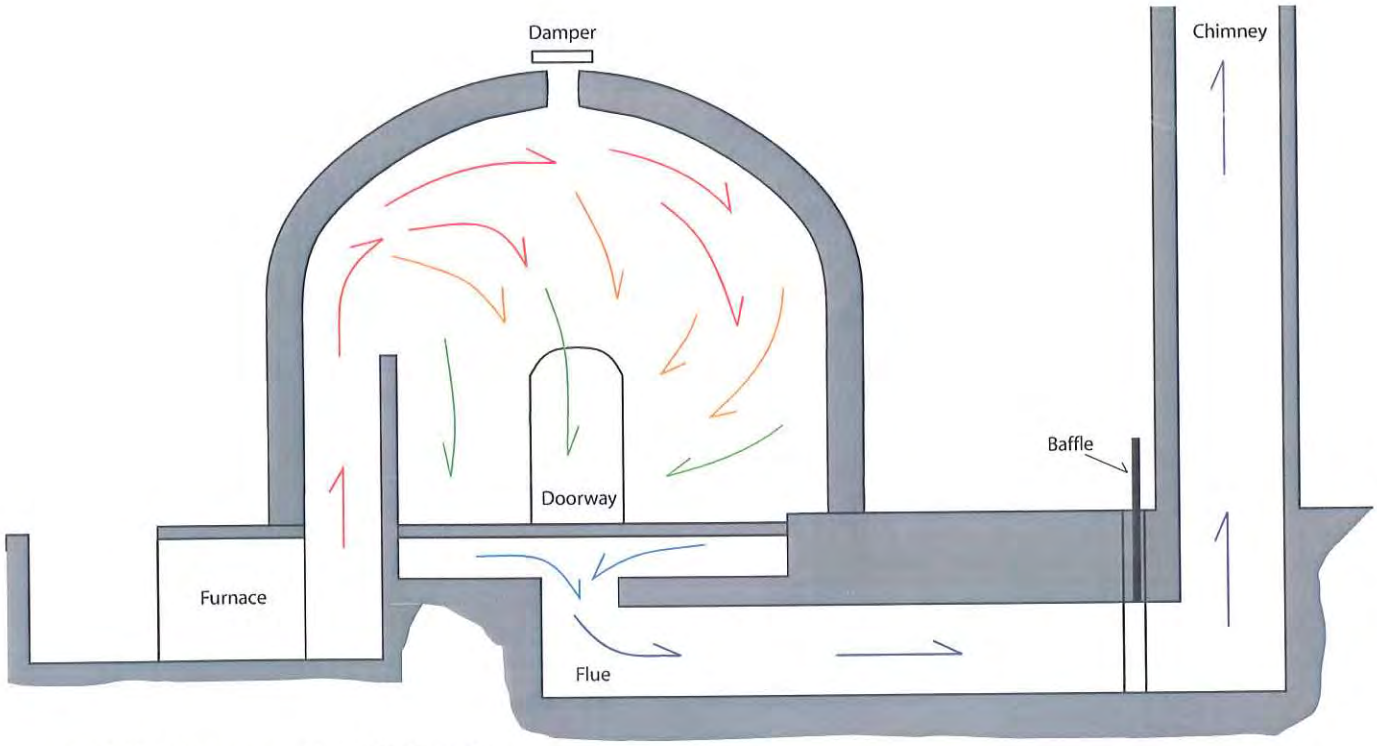


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Possible Reconstruction of Kiln 201



Possible Reconstruction of Kiln 202

Not To Scale

Figure 6: Projected Kiln Reconstructions

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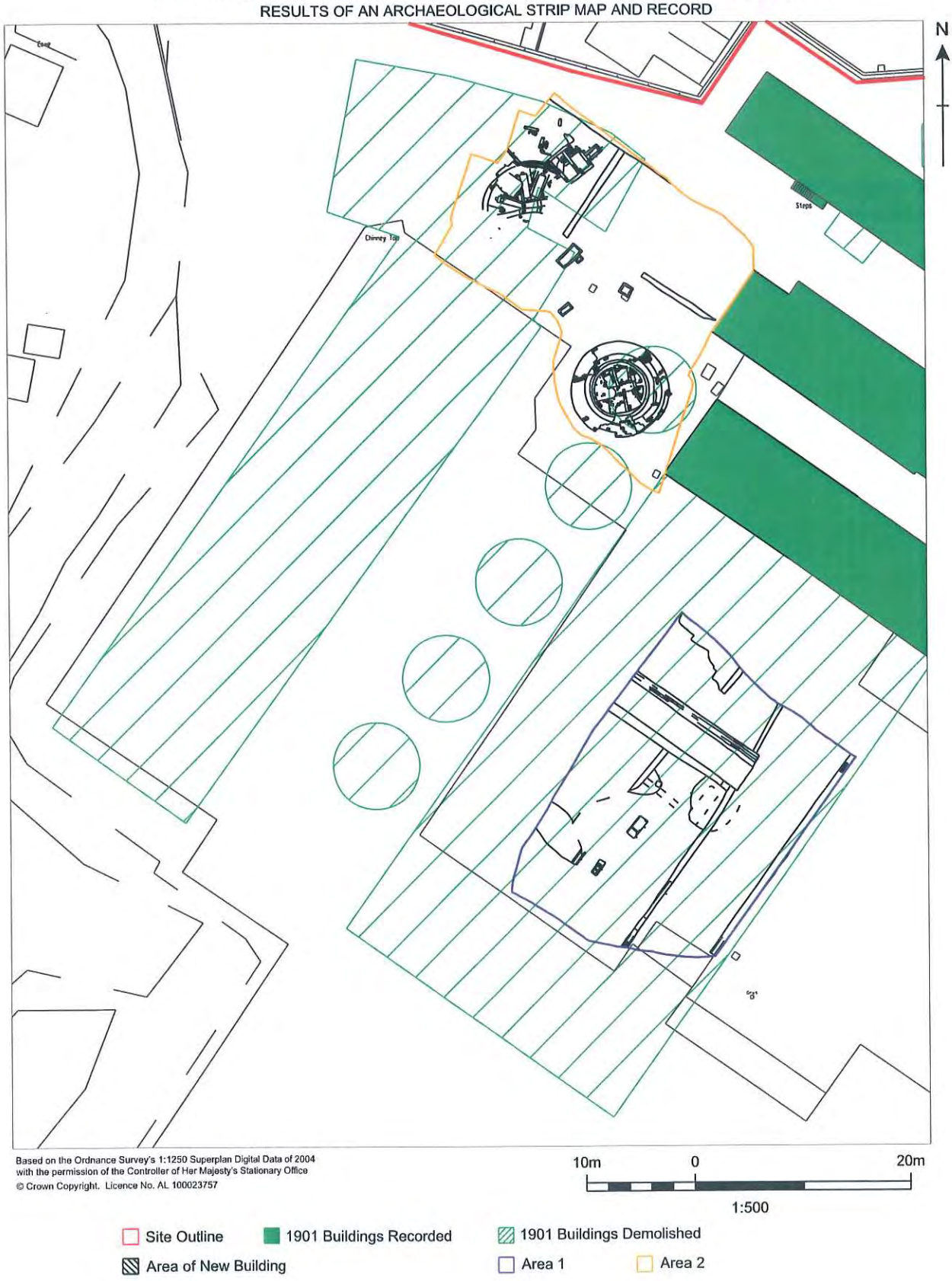


Figure 7: Results Overlain by the Buildings Present on the 1901 Ordnance Survey Map

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Appendices

Appendix A- Context Register

Context	Description	Length	Width	Depth
101	Concrete slab	30.00m	21m	0.10m
102	Compacted made ground	30.00m	21m	0.40m
103	Fill of 105	24m	0.35m	0/10m
104	Wall	24m	0.35m	0.10m
105	Cut for 104	24m	0.35m	0.10m
106	Eastern wall	22m	0.50m	0.20m
107	Fill of 108	4.35m	2.80m	0.75m
108	quarry? Pit	4.35m	2.80m	0.75m
109	Square brick area	1.18m	0.85m	NFE
110	Part of 109	0.97m	0.43m	NFE
111	Fill of 112	2.9m	1.6m	0.85m
112	quarry? Pit	2.9m	1.6m	0.85m
113	Brick floor	7.8m	3.5m	0.10m
114	Brick Drain	13.7m	0.65m	0.50m
115	Pipe in 114	13.7m	0.09m	0.09m
116	Concrete repairs to 117	13.7m	2.6m	0.12m
117	Extensive brick surface	12.4m	11m	0.08m
118	Concrete and brick area	5m	2.4m	0.07m
119	Brick structure	1.62m	0.50m	0.07m
120	Brick edge	1.45m	0.12m	0.08m
121	Natural clay	30m	21m	NFE
122	Layer below 114	30m	21m	0.90m
123	Made ground for 117	14.5m	6.4m	0.26m
124	Pier base	0.5m	0.5m	0.5m
201	Kiln Group No.	9.16m	9.16m	2m
202	Kiln Group No.	8.80m	8.80m	1.16m
203	Structure associated with 202	1.50m	1.10m	0.70m
204	Structure associated with 202	1.50m	0.90m	0.70m
205	Inserted wall, in 204	1.00m	0.20m	0.70m
206	Structure	1.00m	0.30m	0.10m
207	Structure	0.50m	0.25m	0.08m
208	Service	17.00m	0.60m	0.50m
209	Service	17.00m	0.60m	0.50m
210	Wall	8.00m	0.50m	0.25m
211	Man hole	1.00m	0.80m	>0.60m
212	Stoke structure,	2.20m	1.00m	0.70m
213	Man hole	1.00m	0.60m	>0.60m
214	Wall of flue chamber	1.00m	0.25m	0.70m
215	Stoke wall	3.20m	0.25m	0.70m
216	Stoke Chamber	3.00m	1.50m	0.70m
217	Stoke Chamber	3.00m	1.50m	0.70m

Context	Description	Length	Width	Depth
218	Stairs	0.86m	0.78m	0.70m
219	Wall of stoke chamber	2.85m	0.22m	0.70m
220	Wall of 204 west	1.50m	0.77m	0.90m
221	Inner wall, kiln 202	12.5m	0.10m	1.00m
222	Outer wall, kiln 202	14.5m	0.40m	1.00m
223	Wall of 224	2.00m	0.25m	>0.30m
224	Stoke Chamber	2.00m	1.50m	>0.30m
225	Central Flue, 202	1.50m	1.20m	0.35m
226	Radial flue E, 202	1.90m	0.60m	0.08m
227	Radial Flue NE, 202	1.90m	0.60m	0.08m
228	Radial Flue N, 202	1.90m	0.60m	0.08m
229	Radial Flue NW, 202	1.90m	0.60m	0.08m
230	Radial Flue W, 202	1.90m	0.60m	0.08m
231	Radial Flue SW, 202	1.90m	0.60m	0.08m
232	Cut into NW quadrant, 202	17m	1.00m	>1.00m
233	Cut on E. side, 202	1.80m	1.80m	0.80m
234	Inserted brick wall	3.00m	0.25m	0.70m
235	Outer brickwork, 201	9.16m	1.26m	2m
236	Inner brickwork, 201	6.40m	0.52m	1m
237	Flue ring, 201	15m	0.24m	0.55m
238	Central flue, 201	5.00m	1.20m	1.37m
239	Flue N, 201	1.80m	0.28m	0.52m
240	Flue NW, 201	1.80m	0.28m	0.52m
241	Flue W, 201	1.80m	0.28m	0.52m
242	Flue SW, 201	5.00m	0.28n	0.52m
243	Flue WE, 201	1.80m	0.44m	0.52m
244	Flue NE, 201	1.80m	0.28m	0.52m
245	Flue SE, 201	1.80m	0.28m	0.52m
246	Floor remnant 201	1.28m	1.42m	0.08m
247	Coping over flue ring, 201	0.60m	0.25m	0.08m
248	Same as 205	-	-	-
249	Floor, 217	3.00m	1.50m	0.70m
250	Floor, 217	3.00m	1.50m	0.70m
251	Wall, E side 217	2.70m	0.25m	0.70m
252	Wall, N side 216 and 217	2.00m	0.25m	0.70m
253	Wall of 204	1.50m	0.25m	0.70m
254	Wall of 204	0.90m	0.25m	0.70m
255	Wall of 204	1.50m	0.25m	0.70m
256	Red powdery demo fills, 202	13.50m	0.10m	0.22m
257	N wall, 223	1.50m	0.25m	>0.30m
258	Made ground around 201	16m	12m	2m
259	Foundation of kiln 201	9.16m	9.16m	NFE
260	Rubble below 201 structure	8.25m	8.25m	1.30m
261	Fill of 238	5.00m	0.70m	0.30m

Context	Description	Length	Width	Depth
262	Flue wall of 237	15.7m	0.24m	0.25m
263	Sub-floor structure, 201	4.6m	4.6m	0.56m
264	Red powdery demo fills, 201	5.2m	0.45m	0.55m
265	Cut for 205	1.00m	0.20m	0.20m
266	Part of 267	0.90m	0.25m	>0.30m
267	Structure group with 202	0.90m	0.25m	>0.30m
268	Wall footing, 202	1.20m	0.25m	0.08m
269	Wall footing to N	1.10m	0.25m	0.08m
270	Collapse of 269	0.90m	0.50m	0.08m
271	Brick strip	1.32m	0.25m	0.08m
272	Layer of gravelly clay	5.00m	1.00m	NFE
273	Central block, 202	1.50m	0.50m	0.30m
274	Bluish grey clay	1.50m	0.50m	NFE
275	Made ground within 202	2.52m	2.00m	0.55m
276	Floor of kiln 202	7.20m	4.10m	0.16m

Appendix B: Finds Assessment

An Assessment of the Ceramic Building Mateiral.

Les Capon

Quantification

The Ceramic Building Material assemblage from the archaeological work consists mostly of bricks, with fewer pieces of kiln brick, drain and kiln furniture. Firebricks and stock bricks are both present. The assemblage comprises 45 pieces or whole bricks from seventeen contexts.

Description

Bricks

The bricks fall into three categories: red bricks, glazed bricks and fire bricks. The red bricks were largely collected from Area 1, where they formed wall foundations and a floor of a factory building of the Woodward Works of the late 19th and early 20th centuries. The bricks appear to be machine cut and are generally hard-fired. Stack scars on the stretchers show the bricks to have been stacked along their length rather than cross wise. One brick, from Context [120] has a hand-smoothed upper surface but this is among other bricks showing the machine-cut, sharp edges. The sizes of the red bricks vary from 3" to 3¼" within the same contexts, and the length of these red bricks from 9¼ to 9¾". It is notable that the red bricks have no manufacturers stamps.

One thinner brick from made ground (278) may be earlier than the late 19th century, being 2⅞" thick and having a soft, clayey fabric and a rubbed surface.

Three glazed bricks have the same context number as a concrete drain and must have come from the fill of its intrusive cut [206]. The glazes are variously salt, green, white and blue, and are all building bricks with glaze only on the stretchers. A fourth house brick has a salt glaze. Three have stamps, one reading J. WOODWARD SWADLINCOTE (201), another, with salt and blue glazes, WOODWARD SWADLINCOTE (206). The third just has the letter W in relief (206). All of these examples were likely to have been manufcatured at the Woodward Works, and represent either discards or parts of demolished buidlings in the vicinty.

The firbricks from the structures in Area 2 are typically in yellow fabric, and manufactured from the local firecaly. Of note are the bricks from the floor of Kiln [202], which have a circular stamp with Made in England around the edge, and an image of an Elephant and the word Brand. The same bricks are present in the kiln's walls [219 and 221] This kiln appears from the map evidence to post-date WWII, so is quite late in the history of the site. A firebrick from the demolition horizon over Kiln [201] has an incised letter W.

Other building materials present are a ceramic block pierced with regular 2" diameter holes (201), a firebrick slab (229) from kiln [202] which is from the top of a flue, and a concrete-like slab used in the foundation of kiln [202] (256).

Pieces of drain in the overburden over kiln [202] are from a pipe with an internal diameter of 140mm, and there are also pieces of fired clay with profiles 4½" square which may be flue blocks (201).

Context	Type	Dimensions	Comments
104	Red brick	4½ x9½ x3"	Plain
	Red brick	4⅜ x 9¼ x 3"	Stack scar, sandy cement mortar
106	Red brick	4¾ x 9¾ x3"	Plain
	Red brick	4½ x 9⅝ x 3¼"	Machine cut, hard-fired
113	Red brick	4½ x9⅛ x 3"	Plain
	Red brick	4¾ x 9¾ x 3¼"	Machine cut
114	Red brick	4¾ x 9¾ x 3"	Plain

Context	Type	Dimensions	Comments
	Red Brick	4½ x 9⅝ x 3¼"	Machine cut, hard-fired
117	Red brick	4½ x 9½ x3"	Plain
119	Red brick	4½ x 9¼ x3"	Plain
	Red brick	4½ x 9¼ x 3¼"	Machine cut, hard-fired
120	Red brick	4¾ x 9¾ x 3"	Plain
	Red brick	4½ x 9⅞ x 3¼"	Machine cut, hand-smoothed upper. Stack scorched.
167	Red brick	4⅜ x 9½ x 3¼"	Machine cut
201	Brick	4⅜ x 9 x 3"	Brown, stack scar, incised W stamp
	Firebrick	4½ x 8½ x 2¾"	Salt glazed. W stamp in relief, squared frogs
	House brick	4⅜ x 8¾ x 3¼"	Salt glazed stamp of J. WOODWARD SWADLINCOTE, squared frogs
	Flue brick	4½" thick	Block pierced with 2" holes, vitrified side
	Red brick	4⅜ x 9⅜ x 3"	Sandy cement mortar
	Red brick	4⅜ x 3¼"	Oily grey deposit on surface. 1/2 brick
	Firebrick	4⅜ x 8½ x 2½"	
	Firebrick	4⅜ x 8 x 2½"	Vitrified end
	Flue block	4⅛" square	Square flue block with 76mm d interior
201 u/s	Flue block	4⅝" square	Square flue block with 76mm d interior
202	Drain	diameter 140mm	Fire clay drain pipe. Internal d of 140mm. Flange. x10
	Drain		Salt glazed drain pipe x 1
206	House brick	4⅜ x 9⅛ x 3"	Salt glazed one face, blue one face. Stamp of WOODWARD SWADLINCOTE, squared frogs
	Drain		2 drain frags
	House brick	4⅜ x 9⅛ x 3¼"	Concave corner, green glaze
	House Brick	4⅜ x 9⅛ x 3¼"	One white face. W stamp in relief, square frogs
214	Red Brick	4⅜ x 8½ x 2¾"	Scorched. Sandy clay mortar
219	Firebrick	4⅜ x 9¼ x 3"	Sharp stamp of Made in England Elephant Brand in circle
221	Firebrick	4⅜ x 8¾ x 2⅞"	1 face scorched purple. Made in England Elephant Brand in circle
229	Firebrick slab	9" x 3"	Firebrick slab.
256	Mortar		Proto-concrete pink clay with firebrick rubble
258	Red brick	4¼ x 8⅝ x 2⅞"	Rubbed. Very clayey

Conclusions

The assemblage of bricks from the site at Swadlincote dates from the late 19th to the mid 20th century, and is evidence for the manufacture of bricks on the site. Most bricks are clearly machine cut, probably in presses. The firebricks and glazed house bricks are initialled with the letter W, or actually contain a Woodward stamp. It may be recognised that the letter W stamp may also belong to the Wragg occupancy of the site.

The red bricks have no identifying marks, so it is unproven whether they are products of the Anchor Works, or whether the Swadlincote site specialised in fire bricks only. It seems unlikely that a brick manufacturing company would not use their own products.

Futher research may reveal the actual date of manufacture for the bricks based upon their stamps. Each different stamp merits a photograph to enhance the archive. A representative sample of the bricks, kiln furniture and drain products has been retained as part of the site archive.

Appendix C - OASIS Form

OASIS ID: aocarcha1-93541

Project details

Project name	A strip, Map and Record at Hepworths Factory, Swadlincote
Short description of the project	The work revealed the bases of two 'Beehive' Kilns, one dating to around 1900, the other to 1961. The kiln bases had been heavily truncated at demolition during the 1970s and before. Part of the floor and foundations of a drying shed or warehouse were also recorded. This may have had some heating, suggested by fragmentary brick foundations. Some bricks manufactured at the site were collected from the demolition horizon, including bricks with coloured glazes, and bricks stamped with a Woodward stamp.
Project dates	Start: 29-11-2010 End: 06-01-2011
Previous/future work	Yes / No
Any associated project reference codes	30853 - Contracting Unit No.
Any associated project reference codes	DBYMU:2010-93 - Museum accession ID
Type of project	Recording project
Site status	Conservation Area
Current Land use	Vacant Land 1 - Vacant land previously developed
Monument type	KILN Post Medieval
Monument type	KILN Post Medieval
Monument type	DRYING SHED Modern

Significant Finds	BRICK Post Medieval
Significant Finds	FIRE BRICK Modern
Investigation type	'Part Excavation'
Prompt	Direction from Local Planning Authority - PPG16

Project location

Country	England
Site location	DERBYSHIRE SOUTH DERBYSHIRE SWADLINCOTE Swadlincote Retail Park
Postcode	DE11
Study area	2.82 Hectares
Site coordinates	SK 3144 1908 52.7680644666 -1.533965079650 52 46 05 N 001 32 02 W Point
Height OD / Depth	Min: 107.53m Max: 108.74m

Project creators

Name of Organisation	AOC Archaeology
Project brief originator	Local Planning Authority (with/without advice from County/District Archaeologist)
Project design originator	AOC Archaeology
Project director/manager	Alan Ford
Project supervisor	Chris Clarke
Type of sponsor/funding body	Developer

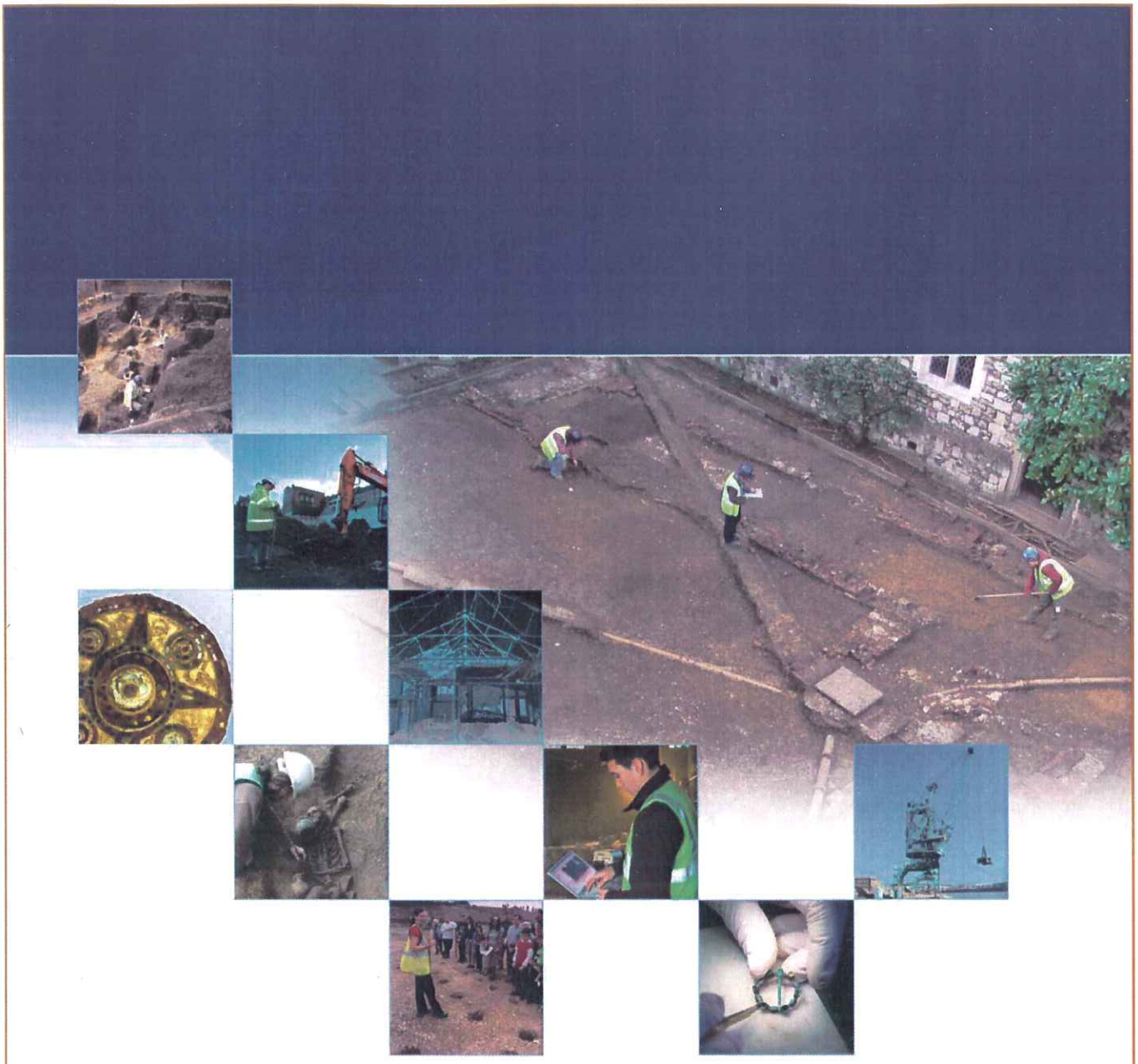
Project archives

Physical Archive recipient	Derby City Museum and Art Gallery
Physical Archive ID	DBYMU:2010-93
Physical Contents	'Ceramics'
Physical Archive notes	held at AOC until transfer
Digital Archive recipient	Derby City museum and Art Gallery
Digital Archive ID	DBYMU:2010-93
Digital Contents	'Ceramics'
Digital Media available	'Images raster / digital photography','Images vector','Text'
Digital Archive notes	held at AOC until transfer
Paper Archive recipient	Derby City Museum and Art Gallery
Paper Archive ID	DBYMU:2010-93
Paper Contents	'Ceramics'
Paper Media available	'Context sheet','Matrices','Photograph','Plan','Report','Section','Unpublished Text'
Paper Archive notes	held at AOC until transfer

Project

bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	FORMER HEPWORTHS FACTORY, SWADLINCOTE RETAIL PARK, SWADLINCOTE, DERBYSHIRE:
Author(s)/Editor(s)	Capon, L.
Date	2011
Issuer or publisher	AOC
Place of issue or publication	London
Description	A4, 33 pages, 9 figures
Entered by	les capon (les.capon@aocarchaeology.com)
Entered on	16 February 2011



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