

Marches Archaeology

**The former Eagle Pottery site
Hanley,
Stoke on Trent**

A Report on a programme of Archaeological Works

February 2006

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**The former Eagle Pottery site
Hanley
Stoke-on-Trent**

NGR SJ 892 473

A report on a programme of archaeological works

Report by Nick Tavener

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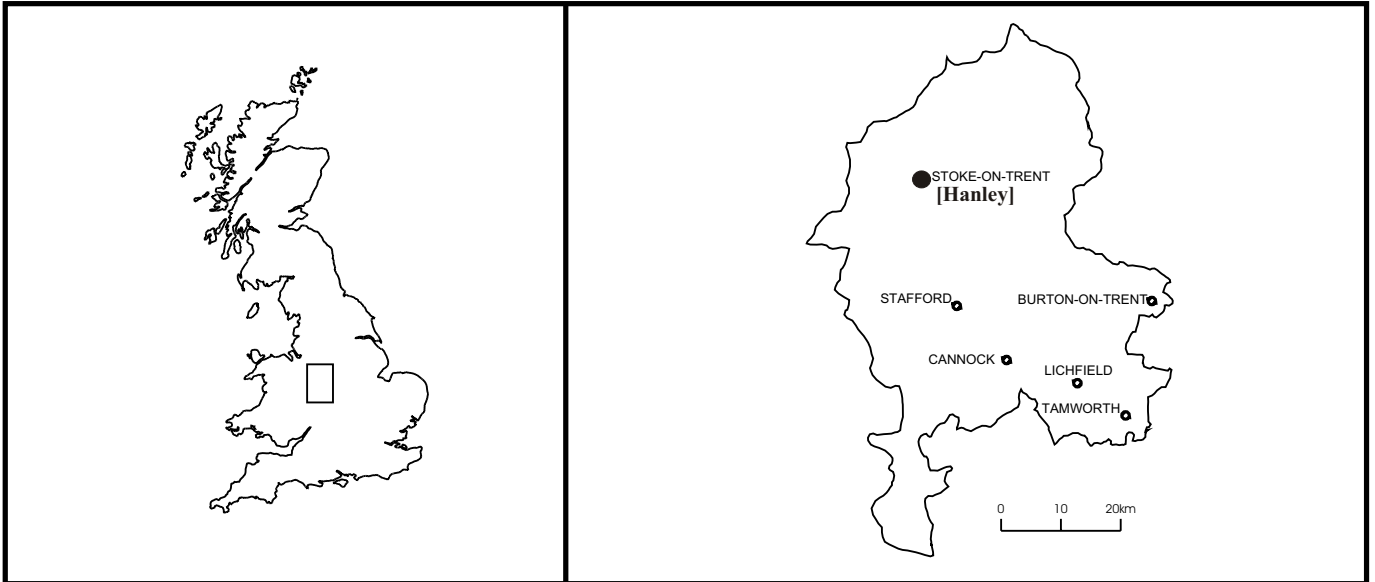
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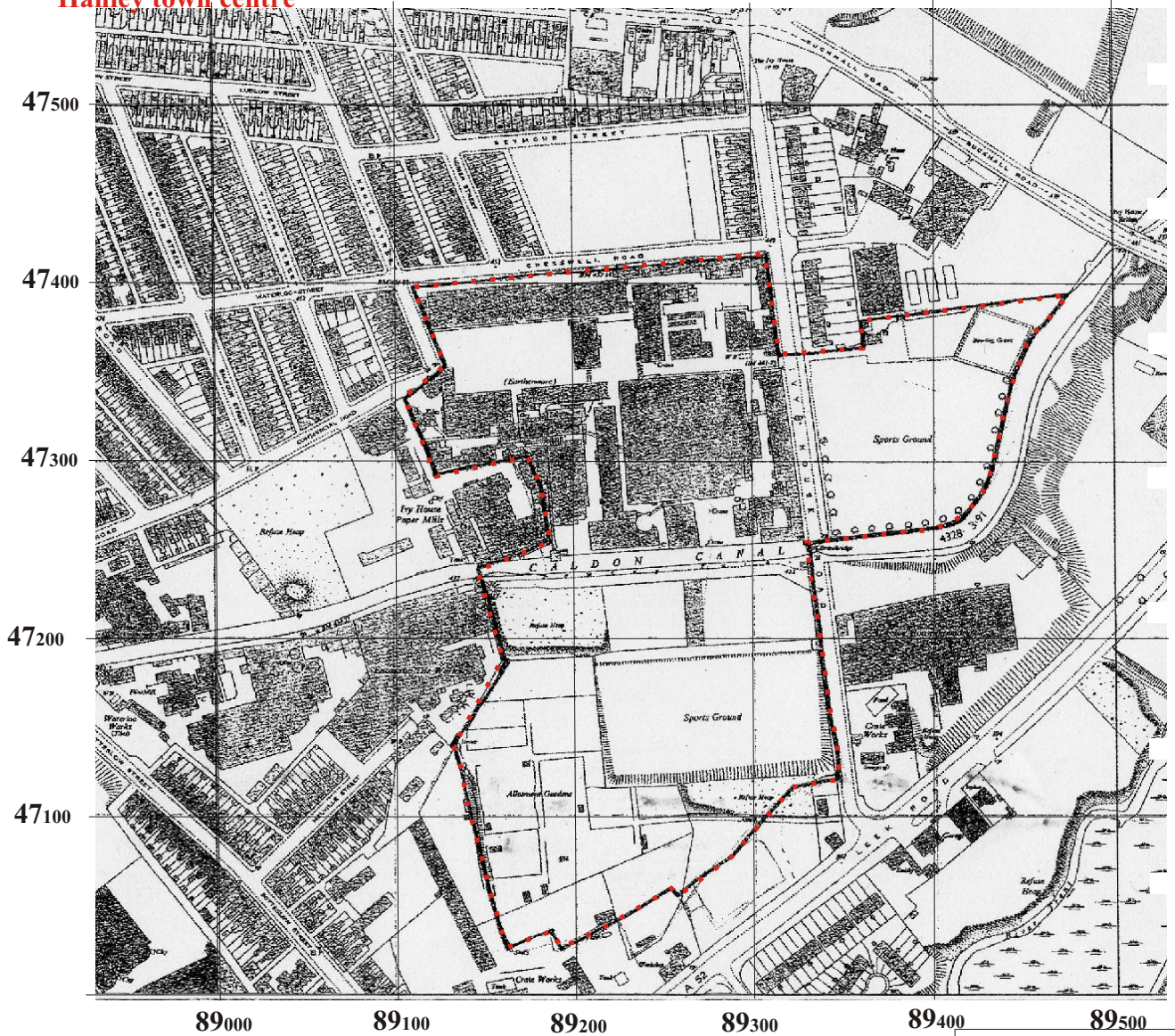
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Hanley town centre



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Fig. 1: Location of site

**The former Eagle Pottery site
Hanley
Stoke-on-Trent**

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A report on a programme of archaeological works

Summary

Wardell Armstrong undertook a desk-based assessment of the former Eagle Pottery at Ivy House Road, Stoke-on-Trent. The desk-based assessment concluded that a pot-bank was established in the eastern part of the site by the firm of J & G Meakin in 1859 and expanded in 1868. Wardell-Armstrong also undertook building recording on five standing structures dating to the early years of the potworks.

Marches Archaeology undertook an evaluation of two of the older potbanks on the eastern side of the site followed by full excavation of the location of three bottle ovens shown on Ordnance Survey maps of 1879.

The programme of archaeological works has allowed detailed investigation of bottle ovens from the second half of the 19th century, an important period in the history of the Staffordshire potteries. The investigations have revealed three fairly sophisticated down-draft structures of a relatively early date for the local industry, confirming that the Meakin's family operation was at the forefront of development.

1. Introduction

Wardell Armstrong, acting on behalf of Redrow Homes, undertook a desk-based assessment of the former Eagle Pottery at Ivy House Road, Stoke-on-Trent along with building recording on five of the standing structures that dated to the early years of the potworks (Edmonson & Hodgkinson, 2005). That study was undertaken as part of an outline planning application for the reclamation of the land for residential development (Fig. 1). The study area was expanded out to approximately a 250m radius from the centre of the application area in order to place the application area into a wider context.

Essentially, the desk-based assessment concluded that a pot-bank was established in the eastern part of the site by the firm of J & G Meakin in 1859 (see Fig 2). Whilst a summary of the results of that report are included in section 2 (below), the current study should be viewed in conjunction with that desk-based assessment.

In the light of the findings of the desk-based assessment, the Stoke City Archaeologist (the local planning authority's archaeological advisor) requested an archaeological evaluation of the old pot-bank in the eastern area of the site and issued a formal brief and specification (Barker, 2005 – Ref : SOT/42494). Wardell Armstrong commissioned Marches Archaeology to undertake the evaluation.

The development site comprised three parcels of land straddling Ivy House Road (see Fig. 3):-

- 1) The main part of the former Eagle Pottery site, defined by Cresswell Road to the north, Ivy House Road to the east, the Caldon Canal to the south and Ivy House Paper Mill and terraced housing to the west.
- 2) A sports ground to the east of Ivy House Road.
- 3) An area of waste ground to the south of the Caldon Canal.

The evaluation was concerned only with the eastern part of the main site (i.e., the first area above). It quickly established that the bases of four pottery ovens had survived truncation by 20th century construction works. The scope of further archaeological works intended to elucidate the nature and full extent of these ovens was developed through discussions between the City Archaeologist and Wardell Armstrong. The scope of the works was expanded to more detailed excavation of the kilns (area shown on Fig. 2). The remainder of the development site was made subject to a limited watching brief.

2. Archaeological and historical background

The geology immediately below the site comprises glacial till deposits of Quaternary date. These overlie Lower Coal Measures of the Westphalian 'A' series. Although the topography of the site has been modified by development, the area generally slopes gently but steadily to the south-east. The demolition crew exposed occasional coal measures in 2005 at less than 4m below ground level alongside Ivy House Road.

There is no evidence for prehistoric or Romano-British activity either within or near the development area. Hanley was a *vill* by the early 13th century and remained a small settlement until the 18th century. The production of pottery in the area increased in the 18th century, boosted firstly by the arrival of the Trent and Mersey Canal in the general area in the 1760s and then its Caldon Branch in the immediate area in the late 1770s. Many pot works were constructed along the canal banks and wharves. Hanley (and the Potteries as a whole) grew and prospered from this period onwards.

No previous archaeological work is known to have taken place within the application area or immediate vicinity.

Stoke-on-Trent Sites and Monuments Record (SSMR) holds one entry for an historical site adjacent to the development site and three further sites in the immediate vicinity. All date to the post-medieval or modern period. In the wider vicinity of the study area there are a further eleven SSMR entries. One is the find spot of a Bronze Age axe hammer, the rest were all post-medieval. A Grade II listed building (the Infant Building of St Luke's Church of England Aided Primary School, on Wellington Road in Hanley).

The sports ground in the eastern section of the development area lay within the former grounds of Ivy House. The Ivy House Estate lay entirely to the east of Hanley and was first documented in 1716 when it was owned by Elizabeth and Mary Vyse. Ivy House itself was located to the north-east of the Eagle Pottery site and underwent many changes in occupancy and ownership until 1800 when it was re-built by Ralph Baddeley (VCH, p 153). The house was shown on Ordnance Survey maps until 1924 but nothing remains today.

The Eagle Pottery was founded on the current site in 1859 by James and George Meakin. Lynam's earlier map of the Parish of Stoke-on-Trent (dated 1848) recorded eight buildings within the site set around what appears to be a single circular bottle oven. These may have belonged to a previous pot-works although the circular building may have been some other structure such as a lime kiln; the Caldon Canal was built to carry limestone. Whatever it was, it was probably demolished prior to construction of the Eagle Works, for that works was purpose built as a new business venture.

The Meakins brothers had been in business since 1851. The business grew rapidly, producing pottery for export, especially to America after George had travelled there to set up a sales operation. The first record dates to the 1860s when the works was producing earthenware. The works was extended in 1868. It was a bold and visionary creation. The equipment and buildings were constantly upgraded to keep abreast of technological developments right up until the 1950s. The business remained a family concern until it amalgamated with the firm of Midwinters in 1968. At peak, there were 17 bottle ovens in the early twentieth century and the works could produce over 1 million pieces per week (see web sources //meakin.htm). In 1970 the works were taken over by the Wedgwood Group and were in production until 2003.

An early Ordnance Survey 50 inch to the mile map, unpublished but believed to date to c. 1870 (Edmonson & Hodgkinson, 2005) shows that the main part of the Eagle Pottery works was a large linear building along the Ivy House Lane frontage. To the rear of this were a number of structures, including six substantial ovens, arranged in two banks of three ovens. The southern trio of ovens was regularly arranged in a line and appear to have been constructed as a group; the northern trio are irregularly arranged and appear to be of varying sizes. The works were served by their own canal arm or 'siding' by this time.

The site was more extensively developed by the time of survey of the Ordnance Survey 1st (published) Edition 1:2500 map of 1879 (see Fig. 4 and 5). The pot ovens and associated buildings recorded on the earlier unpublished map were still present, but an extensive range of structures, including a system of seven further kilns had been constructed to the west. A long building range with prominent ornamentation and an entrance had been constructed to the north and a Flint Mill was recorded for the first time in the far west of the site. To the east, a large new structure on Ivy House Lane apparently corresponded to the office standing on the south side of the main gate until demolition in 2005. A square reservoir was depicted to the north of the main pottery structures, although this area was not yet fully developed. The section of the development area lying to the south of the Caldon Canal was still open

fields in 1879, although one featured an air shaft for a nearby coal mine. The eastern part of the site was still simply part of the grounds of Ivy House.

Subsequent Ordnance Survey maps show increasing encroachment by terraced housing around the margins of the site. The 1900 Edition showed that a new single bottle oven was added to the lower, more regular trio of bottle ovens and the private canal wharf had been filled in or covered over by that date. Three further kilns had been added by 1924 as well as additional buildings in the northern section.

The bottle ovens had been notorious polluters. They were finally put out of business when the local authority introduced a Clean Air Act in 1958 (Shire). The works were further enlarged and modernised in 1958 (Barker 2005 citing Godden, 1968). The Ordnance Survey map of 1966 shows that the old bottle ovens at the Eagle Pottery were dismantled and replaced by a large square structure. This incorporated some of the original buildings (Edmonson & Hodgkinson, 2005, Drawing NL06566/25). The pottery structures were later remodelled again to form two large sub-rectangular blocks and now form uniform fronts along Cresswell Road to the North, Ivy House Road to the east, and the Caldon Canal to the south. These fronts appear to date to the 1970s. The works were eventually acquired by Josiah Wedgwood & Sons and the Tunnel kiln that overlay the excavation area was used until c. 2003 for the production of pottery for Laura Ashley. All buildings were demolished in the summer of 2005.

3. Scope and aims of the project

It was deemed that any surviving remains of the 19th century bottle kilns might reveal technological developments in the firing process that would be of particular archaeological and historical significance to the study of pottery production within the locality and also within the wider area. Thus, it was agreed that an initial archaeological evaluation comprising four trenches (each measuring approximately 8m x 6m, i.e., 192m²) would be undertaken at the location of these kilns (Fig. 2).

It was known at the outset that the logistics of the ground works for the development would entail not just the demolition of all existing pottery structures, but also comprehensive ground remediation works too clear the site of all possible obstructions to the digging of footings. The reality of this statement was that the site was probed or 'ploughed' in a herring bone pattern to a depth of c. 1m at spaces or intervals of less than 1m by a 32 ton tracked excavator using a single claw-tooth ripping blade. This was undertaken across the whole site in an operation lasting several weeks. Any obstructions encountered by the claw such as old footings or floor surfaces were simply ripped out with the claw or by a machine of similar size with toothed bucket or broken out with a hydraulic breaker.

Site specific constraints and predicted contamination issues precluded investigations in this area adjacent to the canal. It was deemed that investigations in these additional areas would only be possible by watching brief during the controlled remediation of the site.

The project brief prepared by the Stoke City Archaeologist stipulated the excavation of 192m² in the area of the early ovens. The evaluation was intended to sample ovens from different periods of the factory's operation.

The brief defined a field evaluation as:-

'...a limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site'

and

'defines their character, date, integrity, state of preservation, extent and relative quality and also enables an assessment of their worth in a local regional, national or international context as appropriate'

leading to...

- the formulation of a strategy for the preservation or management of the remains, and/or:-
- the formulation of an appropriate response or mitigation strategy to planning applications or other proposals which may affect adversely such archaeological remains, or enhance them
- the formulation of a proposal for further archaeological investigation within a programme of research.

In summary. the specific purpose of the investigations was to establish the presence or absence of kilns, and if present, to examine the relationship between the earlier kilns and later kilns to the immediate west. It was intended that the investigation should seek to examine any chronological and technological developments that might be present.

4. Methodology

No trace of any of the 17 bottle ovens remained above ground in 2004. Instead, the area was occupied by a modern structure dating apparently to the 1970s. The floor of this lay c. 1.3m lower than the land immediately to the north, suggesting that the original ground surface had been modified following the demolition of the old bottle ovens. The desk-based study hypothesized that this lowering of the ground may have removed the old bottle ovens. The 1970s building also covered the site of the Canal spur or wharf recorded on the 1879 1st Edition map. There was no indication of the Canal Spur within the 1970s building (but see the watching brief below).

The brief stated that rubble and topsoil layers could be removed by mechanical excavator. Significant archaeological layers were to be cleaned and recorded to an appropriate level and further deposits excavated as necessary to record the sequence

of events on site and to enable interpretation of structures and features. It also stipulated that if the evaluation confirmed the existence of significant archaeological deposits or structural remains, it might be necessary to extend one or more of the evaluation trenches to enable a full picture of the remains to be obtained through excavation. That need to extend would be determined by the City Council's Senior Archaeologist and the maximum area of excavation would be no more than 980m².

Individual deposits and structures were recorded on Context sheets allocated in unique serial order. Plans were made of significant features and deposits (normally scale 1:20) and sections drawn as appropriate (normally scale 1:10). The photographic record was made using black and white and colour slide film along with digital photographs.

No contexts suitable for sampling for environmental or technological purposes were encountered. No samples were taken. All artefactual material was kept. The artefact assemblage comprised entirely ceramic materials such as potsherds, saggar fragments and kiln furniture. These have all been catalogued and analysed in a commissioned specialist report, included herein as Appendix 1.

5. The results of the evaluation, excavation and watching brief

The tunnel kiln that overlay the evaluation and excavation area was removed in 2003. At the start of the evaluation, the concrete floor slab of the building housing that tunnel kiln was broken out with a hydraulic breaker and removed along with the underlying scalplings and brick rubble hardcore. These, along with the slab, amounted to a depth of c. 0.5m.

The removal of the floor slab found only natural yellow glacial clay under the eastern half of the slab. There was absolutely no survival of any elements of the early oven nearest the main gate (oven 'A' on Fig. 2). The remains of four bottle ovens were found under the western half of the building along with an old boiler base and the footings of a small muffle kiln or chimney (Fig. 8).

It should be understood at the outset that the floor surface for the newly demolished building was cut as a level surface into what had previously been a gently sloping site. At its north end, the floor slab was set nearly 1.3m lower than the ground surface immediately outside the building to the north, decreasing to c. 0.2m at the south end of the building. Thus, the degree of survival of the remains described below increased markedly towards the south. A fourth and fifth (southernmost) bottle oven lay beyond the excavation area near an area of ground contaminated with asbestos. These ovens were left unexcavated on safety grounds, indeed, oven 5 was never seen, the area being virtually devastated by mid-late 20th century disturbance.

Bottle Oven 1

This was the northernmost surviving kiln. Because of the natural slope, it was also the most truncated. All that survived was a roughly circular large patch of heat affected natural and a down-draft flue. The heat affected red clay [05] contained occasional building debris. This burnt zone, which was 6.2 m across, had originally been below the main hot area of the kiln. This had reasonably sharp edges to the unburnt yellow clay subsoil around it and was quite a good indicator of where the main body of the kiln had stood. In the other two excavated kilns (see below) this burnt zone was contained within a ring-drain around the north half of those ovens, but there was no sign that a ring-drain had ever cut the natural in oven 1.

To the west of centre of the burnt zone, an underground flue [01] led south-eastwards from a semi-circular terminus. The flue was brick lined, 0.5m wide and 0.3m high under its brick ceiling. This was undoubtedly the start of an under-kiln exhaust flue, i.e., part of a down draft flue. The cut was lined with a primary fill of dirty clay [08] that, unfortunately, contained no datable artifacts. The flue structure [01] was deliberately backfilled with demolition materials, ash and pottery waste of late 19th or early 20th century date (c. 1890-1910 see Goodwin below) indicating that the kiln was abandoned at that date.

A Boiler or Tank Base [02]

The south-eastern quadrant of bottle oven 1 was destroyed by the large near-square construction trench [06] for a deep concrete slab [03]. The slab was roughly 3.9m square with irregular edges. When this was ripped out by machine, it proved to be 1.1m deep.

The concrete featured inclusions of brick fragments up to 0.05m in size. The top of the base was capped with a large concave surface [02] formed in brick. This was either for a large round tank or was a steam boiler base. The bricks had frogs and bore the stamp 'Hewitt'. The potbank of three ovens to the immediate west (Fig. 2) was almost entirely formed from identical frogged bricks also stamped Hewitt. That potbank was first shown by the Ordnance Survey in 1924.

Upon demolition, the base had been covered with the same reinforced concrete as kilns 2 and 3 (contexts [09] & [41] below), i.e., the boiler base postdates the abandonment of kilns 1 and 2 but also pre-dates the reinforced concrete used to bury most of the kilns. That concrete has become heavily degraded, probably due to heat action from the recent tunnel kiln that overlay all of these bottle ovens. The base [02] formed the only coherent excavated structure from the building phase that stood between c. 1910 and c. 1970.

Bottle Oven 2

The boiler or tank base [02]/[03] also cut the north-eastern part of the outer brick oven wall [35] of oven 2. Only a short part of the basal course of brickwork of the northern part of the wall survived to the west of base [02]. A longer run of the southern wall survived, being cut at the east end by very recent machine disturbance. Wall [35] was two brick lengths wide (20 inch or 0.49m) and two courses survived, i.e., the base of the wall foundation was one brick deeper than the northern part of the

same wall, i.e., the foundation cut was not the same depth around the circuit. The total diameter of the oven was 11.1m.

A narrow channel [04] ran around the inner edge of wall [35]. The channel was c. 0.4m deep and 0.2m wide with vertical sides. It had been deliberately backfilled with c. 70% large saggar fragments in a matrix of loamy ash [33a] & [33b]. This material also contained pottery of probable 1860s / 1870s date. It should be noted that the ring drain [04] was not present around the inner edge of the southern part of wall [35]; here, the natural clay was simply overlain by a deeper dump of saggar fragments. These, like [50] and [53] in oven 3 (below), had probably covered the entire area within wall [35] before truncation of the whole kiln in more recent times.

The clay subsoil below the central zone of the kiln was a roughly circular area of heavily heat affected red clay [25]. The area had a diameter of 7.1m and was identical in nature to red clay [05] within oven 1. The edges of clay [25] were reasonably sharp and fairly concentric with the oven wall [35], being about 2m closer to the centre of the kiln. Between the red clay and wall [35], the subsoil was unaltered natural yellow clay.

About 0.6m to the west of centre of clay zone [25] was a semi-circular terminus for a down draft flue [27] identical in size and nature to flue [01] in oven 1. The deliberate backfill [28] was mostly demolition materials or pottery waste in the form of saggar fragments. Several sherds of pottery were recovered. All date to the late 19th or early 20th centuries (c. 1890-1910 – see Goodwin below) indicating that the oven was demolished at that date.

Flue [27] led north-westwards out of the kiln. The semi-circular terminus sat completely astride the brickwork of an older semi-circular linear down draft flue [29] leading due eastwards from the same terminus position, i.e., to a completely different chimney position. The brick lining of this flue was partly robbed, but the base and terminus brickwork were fairly complete. Towards its east end, flue [29] was cut by the ring-drain [04] that was evidently associated with flue [27] rather than a survival from an oven predating wall [35]. The ashy back fill [34] within the brick channel of [29] contained no datable finds, but the deliberate loamy backfills [30a], [30b] and [30c] over the roof of flue [29] were probably placed before the construction of the overlying (now destroyed) kiln floor. These fills contained pottery of mid-late 19th century date (1860s / 1870s – see Goodwin below). Flue [29] cut a pit [31] of unknown function. The deliberate backfill [32], a mixed loam and ash with saggar fragments, also contained several potsherds dating to the 1860s (Goodwin below) and form probably the earliest pottery found during the excavation.

Whilst the excavation was underway, the potbank of three ovens to the immediate to the west (Fig. 2) was rapidly removed by a 32 ton excavator using a toothed bucket as part of the remedial groundworks. This potbank was first shown by the Ordnance Survey in 1924. The area was virtually solid with brickwork, although this was largely unmortared. Where it was bonded, the bond was clay. The kilns were almost largely formed from identical frogged bricks stamped Hewitt. Little sense could be made of the plethora of damaged brick structures that were exposed, usually only for

moments. This operation led to a section being created along the western margin of ovens 2 and 3 (Fig. 9).

In this section, a brick wall [17] was probably part of the same building as wall [16], i.e., something such as a hovel attached to the west side of oven 2 and would appear to correspond with the building shown on the west side of oven 2 1870s 50 inch map (Fig. 5). To the south, the area between kiln wall [17] and the outer wall [18] of oven 3 to the south was packed with redeposited natural clay [24].

The higher part of the section was covered intermittently with areas of a degraded concrete floor [09] reinforced with 20cm steel grid. This was identical to the concrete floor found intermittently across ovens 1, 2 and 3 and was cut by a recent service trench [10] that was backfilled with ash and loam [11]. The concrete was also cut by a large, deep demolition cut [14]. This had removed much of walls [16] and [17] and was filled with filled with dirty loamy soil with bricks [15]. Unfortunately, these two cuts had taken out most of the stratigraphy within the structure represented by walls [16] / [17].

Muffle kiln or ?chimney base [36]

The footing for a small rectangular structure [36] lay to the east of the junction between ovens 2 and 3. The footing was surmounted by a level floor that was bisected by five east-west channels c. 0.2m wide but only 0.1m deep. These appear to have been sub-floor flues. This often involved days of work on individual slabs and subterranean concrete structures, especially in the west part of the site.

The ashy backfill [39] over part of the middle flue must have post-dated the destruction of the structure and contained pottery of probable late 19th century date. Another layer of destruction fill [40] within one of the sub-floor flues contained pottery of mid-late 19th century date. The structure was heavily cut about on its east and south sides by modern disturbance and it was not possible to establish its true size. It probably was not much larger than the portion shown on Fig. 8. To the west, two damaged areas of brick floor or path (features [37] and [38]) led from oven 3 towards the muffle kiln.

Bottle Oven 3

This oven was by far the best preserved of the three excavated examples. Even so, groundworks associated with either the construction or demolition of the last tunnel kiln on this area of the site had destroyed most of the floor surface of the western half of the oven, leaving merely badly disturbed fragments. The kiln was cleaned and planned (Fig. 8) and then a 2m wide sondage was excavated through the centre to give a half-section of the kiln (Fig. 9).

To the west of kilns 2 and 3, a straight run of brick wall [57] (Fig. 8) almost certainly represented the foundation western wall of the linear structure shown on the east side of the ovens on the 50 inch map of 1879.

The outer wall [18] was 0.3m thick, defining an oven with an internal diameter of 9.7m. The outer wall survived to a height of 0.3m following demolition in the early 20th century. Wall [18] was much thinner than kiln wall [35], being only two bricks wide (0.25m) and set on a foundation three or less bricks deep by 2.5 stretchers wide (0.4m). The area within wall [18] was subsequently filled with a capping of concrete [41] reinforced with 20cm gridded steel rods. This had become badly affected by heat from the tunnel kiln that had overlain this location until 2003 and had started to break up; the reinforcing rods had almost rusted away. Concrete [41] was removed, immediately revealing the kiln floor as an annular ring 2.8m wide around the inner edge of the kiln floor. The inner area was simply floored with a mixed clay and mortar 'floor' [49].

A semi-circular brick terminus [47] near the centre of the oven floor was part of a sub-floor down draft flue 0.5m across and 0.25m deep leading hot gases southwards towards oven 4. It was not established how this arrangement had worked originally, i.e., whether it was blocked by the construction of kiln 4 to the south or had joined some form of common flue shared by the two ovens. The deliberate ashy backfill [48] of downdraft flue [47] contained pottery of late 19th century date, possibly slightly earlier than the pottery recovered from the fills of the surrounding ash pits [43] etc.

The section placed through the middle of the kiln revealed part of a brick wall [56] below the outer kiln wall [18] on the south side that seems to have been part of an earlier kiln structure completely buried below oven 3 but possibly with the same footprint.

The section also revealed that the outer annular zone of floor [42] (extending for 1.2m inwards from wall [18]) was slightly higher (40mm at most) than the inner floor zone [68], the difference being marked by a drop [69]. This higher outer zone [42] was set on top of the fills of a channel [72] 1.2m wide. Floor [42] sat on ash make-up layers [55] that in turn overlay a compact mortar floor [54]. This, in turn, overlay deliberately laid ash and saggar fragments [53] that extended downwards some 0.2m to the natural subsoil.

Floor [42] was made of a mixture of heat resistant oven bricks. Inside the position of the bag wall, the bricks [68] were unfroged, uniformly pale yellow orange and stamped E.J & C (?G) Pearson, Delph, Stourbridge. These were all laid on their flats. The slightly higher annular area [42] outside the bag wall was floored with concentric rings utilizing individual rings made up of red bricks or purple engineering bricks of either standard 3 inch or thin 2 inch. All bricks in these rings were set on edge. Within the bag wall, the floor [68] featured evenly spaced ash pits [60], [62], [43], [58] and [45] that went below the bag wall. The outer edges of these ash pits sloped upwards to help air flow. All were c. 0.2m deep and filled with coal ash with some loam. Pottery recovered from the fills [44] and [46] of two of these ash pits contained pottery dating to the late 19th or early 20th century, indicating contemporary abandonment with ovens 1 and 2.

There was no foundation for the bag wall; indeed, there was no clear indication of the position of that wall. It presumably sat by the edge of the raised part of floor [42]. On the north side of the kiln, a ring-drain [51] ran concentrically with the outer wall [18]

below ash [53]. The drain was 0.25m wide and cut c. 0.25m into the natural. It was filled with a deliberate packing of broken saggars, slate fragments, voids and some ash. The central zone of the subsoil [26] within the ring-drain [51] was fired red, just like the clay below ovens 1 and 2

Within the bag wall, i.e., the area inside channel [53], the floor [49] simply overlay a deep deposit of broken saggard fragments [50] and kiln furniture. Flue [47] was set on a bank of clay [22] that protruded up through dump [50] and also mingled with the brickwork to form its bonding. Perhaps the most important piece of information revealed was that channel [53] cut the down draft flue [47], i.e., had completely stopped that flue from working. Thus, the arrangement of floor [42] and ashpits [44] etc shown on Fig. 8 belong to a kiln arrangement that did not use the central down draft flue [47]. It is no known how this kiln vented its gasses.

The section to the west (Fig. 10) created by the remedial groundworks clipped into the west edge of the oven and largely confirmed the findings of the more central half-section (Fig. 9).

The upper part of the section comprised a deep layer of mid 20th century destruction and demolition debris [19] that had removed all trace of the kiln floor surfaces. Layer [19] was cut by a fairly recent service trench [12] that was backfilled with loam and bricks [13]. This was probably the same as service trench [10] which cut through oven 2.

Below the destruction layer [19], the layers all represent anti-damp layers. Because the section was across the outer edge of the oven, the layers would all have been below the outer floor zone [42]. The uppermost layer was ash [20], overlying a deeper spread of broken saggard fragments and kiln furniture [21], redeposited brown clay [22] and a widespread dump of dark greenish grey sandy ash and clay [23]. The outer wall [18] was clearly set in a construction trench [77] c. 0.5m wide and cut c. 0.4m into the natural clay [26]

Bottle Oven 4

Another oven c. 15m in diameter was contiguous with the south side of oven 3. Upon excavation, it was found that the two shared wall [18] at the point where they met. This fourth oven was also filled with reinforced concrete and was probably also abandoned at the same time as ovens 1-3, i.e., c. 1890-1910. Despite being probably better preserved than kiln 3, it lay too close to the asbestos contamination and was not further investigated.

The Watching Brief

The base of a bottle oven [70] on the later western potbank was seen briefly some 45m to the south-west of oven 2 during the watching brief (plates 7 & 8). The oven was c. 10m in diameter and featured an outer brick wall foundation standing to a height of c. 1.2m enclosing an inner wall foundation, the gap between the two being c. 0.6m and filled with ash. Within the inner wall, the brick kiln floor was founded on a thin layer of ash set on top of a deep dump of saggard fragments [71] c. 0.7m deep.

In addition, a brick tunnel was found some 20m to the east-south-east of oven [70]. The tunnel was c. 8m across (Plates 9-12). It was partly filled with mud and the domed roof was c. 2m above the mud (Plates 9 and 10). The brickwork would be compatible with late 19th or early 20th century date and a blocking wall (plate 10) appeared to be an early 20th century addition. It seems that the old canal wharf or dock running into the site (see Fig. 2) was retained initially by covering over with this brick tunnel that could still allow for loading of barges, but that the tunnel was blocked off, i.e., the canal wharf abandoned, in the early 20th century.

6 Discussion

The four bottle ovens found under the western half of the building clearly accord with the detail shown on the Ordnance Survey 50 inch map of the 1870s (Fig. 5). The smaller rectangular footing [36] may have been a small muffle kiln or chimney; this remains unresolved, but detail on the 1870s 50 inch map indicates a small structure at about the right location.

The Eagle Pottery was founded in 1859 and extended in 1868. The earliest feature found on site was a small irregular pit [31] below the east edge of kiln 2. The purpose of this pit remains unknown but it contained pottery of c. 1860s date, i.e., could either have related to groundworks for the original foundation or perhaps demolition for alterations for the 1868 extension.

The down draft flue [27] of oven 2 cut an earlier down draft flue [29]. The destruction phase fills of the channel of flue [29] contained pottery of 1860s/1870s date. The ring-drain [04] a construction phase feature of oven 2, also contained pottery of the same date. These are fairly early dates for down-draft flues (Jon Goodwin, pers comm.). Down draft kilns are far more efficient than updraft kilns (Cardew, 2002) and designs that improve efficiency can be fairly complex (Cardew, 2002). The down draft ovens used in the Staffordshire Potteries tended to be fairly simple (Jon Goodwin, pers comm).

The flue [27] of oven 2 was obviously backfilled, i.e, abandoned c. 1890-1910, as were the nearly identical down draft flues [01] in oven 1 and [47] in oven 3. This ostensibly means that the three excavated bottle ovens were built in the 1860s / 1870s and abandoned c. 1890-1910. Within the lifetime of oven 3, its central down-draft flue [47] was abandoned and structure was refloored (floor [42]). The arrangement that replaced remains unknown but it is difficult to see how it could have been a down-draft system.

These bottle ovens were subject to extreme thermal shock. They were virtually held together by a system of iron bands and these had to be constantly released or tightened during firing to retain the kiln's shape. This alone was a fairly skilled operation (Cardew, 2002). The most surprising aspect of the kilns was their rather flimsy outer walls and floors and shallow footings and the utter lack of a footing for the bag walls.

The deep spreads of ash and saggar fragments below ovens 2, 3 and [70] to the south-west were a drainage feature. The ring drains around the north half were likewise intended to stop moisture. Moisture in kilns was a disaster for two reasons, firstly because the constant cycle wetting and drying under extreme temperature would cause swelling and shrinkage leading to disastrous subsidence. Secondly, considerable extra thermal energy, i.e., heat and thus coal, would be wasted in bringing a damp kiln back to operating temperature (Cardew, 2002).

The boiler or tank base [02] used the same bricks as the potbank of three kilns immediately to the west. That potbank dates to some time between 1900 and 1924. It would thus seem to date to the phase of operations that post-dated the destruction of ovens 1-3 c. 1890-1910 and that had used the earlier oven bases almost as footings (a fairly common occurrence – Jon Goodwin, pers comm). Unfortunately, later groundworks had truncated all other traces of the structures associated with bas [02].

7. Conclusions

The programme of archaeological works has allowed detailed investigation of three bottle ovens from the second half of the 19th century, an important period in the history of the Staffordshire potteries. These have revealed relatively sophisticated down-draft structures at a relatively early date for the local industry, confirming that the Meakin's family operation was at the forefront of development.

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APPENDIX 1 – Pot Report

**Post-Medieval Pottery from Excavations at
The Eagle Pottery
Hanley
Stoke-on-Trent**

Produced for

Marches Archaeology

by

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Non-technical summary

Stoke-on-Trent Archaeology undertook, on behalf of Marches Archaeology, the analysis of a small assemblage of post-medieval ceramics excavated from the Eagle Pottery, Hanley, Stoke-on-Trent, Staffordshire. The material was divided into ware types and vessel forms and quantified by means of sherd count and weight. The wares were dated to the mid 19th to early 20th centuries and comprised a typical selection of material produced by north-Staffordshire manufacturers during the period.

1.0 Introduction

1.1 In October 2005, Marches Archaeology commissioned Stoke-on-Trent Archaeology to undertake the analysis of an assemblage of post-medieval pottery recovered during excavations at the former Eagle Pottery, Hanley, Stoke-on-Trent.

2.0 The Pottery

2.1 An assemblage of 453 sherds (15853g by weight) of post-medieval pottery was collected from a total of eighteen contexts during excavations at the Eagle Pottery. This material was divided into ware types and vessel forms and quantified by means of sherd count and weight. A full catalogue of the pottery is provided in appendix 1.

2.2 The assemblage clearly represents industrial pottery waste and is typical of north-Staffordshire products of the mid to late 19th and early 20th centuries, featuring a limited range of ware types, decorative techniques and vessel forms. White earthenware vessel sherds are predominant within the assemblage (63.8% by sherd count) supplemented by ironstone types (12.6%), coloured earthenware (0.9%), kiln furniture (16.1%) and saggars (6.6%).

2.3 Vessel forms include plates, platters, bowls, dishes, jugs, tureens, cups, saucers, ewers and wash basins. There is no evidence to suggest that any particular form is restricted to either ironstone or white earthenware, as both wares feature a similar range of vessel types. Similarly, moulded decoration occurs in both ware types, although embellishments such as shell-edged decoration appear only on white earthenwares, with examples from contexts [7], [30a], [30c] and [33c]. Under-glaze decoration is present in the form of transfer-printed (including willow pattern), painted, sponged and slip-decorated designs. The majority of decoration appears on white earthenwares, with only two examples of transfer-printed ironstone bodies (from contexts [30c] and [71]) within the assemblage.

2.4 A handful of contexts contain sherds which bear manufacturers' marks. Contexts [30a] and [33c] contain examples of printed or impressed marks of J & G Meakin, occupants of the Eagle Pottery from 1859 to 1968 (Godden 1991, 427). Context [71] contains one sherd with the mark of Charles Meakin of the nearby Eastwood Pottery, Lichfield Street, Hanley.

2.5 The ceramic assemblage dates from the mid 19th to early 20th century. A table of spot dates for each context follows:

Context	Context description*	Date
7	Fill of flue [01], oven 1	late 19 th century-early 20 th century (c.1890-1910)
28	Fill of flue [27], oven 2	late 19 th century-early 20 th century (c.1890-1910)
30a, b, c	Fills of flue [29], oven 2	mid-late 19 th century (c.1860s/70s)
32	Fill of pit [31], oven 2	mid-late 19 th century (c.1860s)
33a, b, c	Fills of cut [04], oven 2	mid-late 19 th century (c.1860s/70s)
39	Fill of structure [36]	late 19 th century (?)
40	Fill of structure [36]	mid-late 19 th century (?)
44	Fill of ash pit [43], oven 3	late 19 th century
46	Fill of ash pit [45], oven 3	late 19 th century-early 20 th century (c.1890-1910)
48	Fill of flue [47], oven 3	late 19 th century
50	Fill of flue [47], oven 3	late 19 th century-early 20 th century
52	Fill of cut [51], oven 3	mid-late 19 th century (?)
70	Layer beneath oven seen in WB	late 19 th -early 20 th century (c.1890-1910)
71	Layer beneath oven seen in WB	late 19 th -early 20 th century (c.1890-1910)

* all context descriptions featured are based upon information provided by Marches Archaeology

3.0 Discussion

3.1 The earliest pottery within the assemblage comes from context [32], the fill of pit [31] in oven 2. The group contains a small number of badly wasted sherds, most of which are biscuit, with a few glazed examples of sponge-decorated, banded and transfer-printed earthenwares which date to the c.1860s. This would suggest that pit [31] was back filled no later than c.1870. Pit [31] was subsequently cut by flue [29], containing fills [30a], [30b] and [30c]. A more varied collection of pottery waste was recovered from these contexts, including examples of undecorated ironstones and slip-decorated, transfer-printed (including flow blue) and shell-edged earthenwares. Each context's material belongs to the period c.1865-1875. The filling of flue [29], therefore, appears to have

taken place no earlier than the mid 1870s. The material deposited into cut [04], fills [33a], [33b] and [33c], demonstrates a similar range of material to that found in [30a], [30b] and [30c], suggesting that the creation of [04] belongs to the same phase of activity as the back-filling of flue [29]. The only other mid to late 19th-sherd appears within context [40] and is almost certainly residual.

3.2 The remaining context groups from the site can be comfortably placed within the period *c.*1890 to 1910. Contexts [30a] and [33c] feature printed marks of J & G Meakin which post-date 1890 (Godden *ibid.*) whereas [71] features one marked ironstone sherd of Charles Meakin, dating to *c.*1883-89 (Godden 1991, 426). Contexts [07], [28], [50] and [48] (the fills of the three brick-lined flues), the oven 3 ash-pit fills ([44] and [45]), and [52] (the fill of cut [51]), belong to a single phase, which saw the three excavated ovens cease operation around the turn of the 19th and 20th centuries. As historic maps for the site show the locations and configuration of these ovens unchanged beyond this date, it can be concluded that this activity represented a complete rebuild of at least some of the extant ovens on site, but within the existing factory layout. Such a conclusion is strengthened by the presence in contexts [70] and [71] of ceramic deposits of exactly the same type and date as those beneath another oven observed to the south-west of the excavated examples. This again formed part of a row of ovens which remain unchanged on historic maps from 1880 to 1937. The use of existing ovens in the foundations of replacement structures is quite common in north Staffordshire. All trace of these later ovens has presumably been lost.

4.0 Conclusions

4.1 The composition of the Eagle Pottery ceramic assemblage is in-keeping with the known repertoire of the firm of John and George Meakin, resident at the factory from the mid 19th to early 20th century. J & G Meakin specialised in the production of durable ‘white granite’ ironstones, principally for the export markets (Godden 1972, 75). J & G Meakin were not alone in the manufacture of such wares, as most other north Staffordshire factories of the late 19th and early 20th centuries produced a similar array of cheap ceramics for diverse markets, both domestic and international (Goodwin 2000).

4.2 The vast majority of the assemblage was deposited within the site of its manufacture, seemingly as part of two phases of oven rebuilding. The first of these involved oven 2, sometime after the mid 1870s, while the second involved all three excavated ovens, between the years c.1890 and 1910.

5.0 Acknowledgements

5.1 This report was written and illustrated by Jonathan Goodwin of Stoke-on-Trent Archaeology. Valuable assistance was provided by Nick Tavener of Marches Archaeology and Dave Hodgkinson of Wardell Armstrong.

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Appendix 1:
**Catalogue of post-medieval pottery from excavations at the Eagle Pottery, Hanley,
Stoke-on-Trent**

Catalogue of post-medieval ceramics from the Eagle Pottery, Hanley, Stoke-on-Trent

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
7	white e'ware/ ironstone	-	moulded facetted body	*	jug			1				1	4	late 19th – early 20 th century		
		-	-	*	saucer			1				1	6	late 19th – early 20 th century		
		-	-	*	plate?		1					1	12	late 19th – early 20 th century		
		-	-	*	plate?		1					1	2	late 19th – early 20 th century		
	white e'ware	-	-	*	bowl	1							1	12	late 19th – early 20 th century	illegible impressed mark
		-	-	*	dish			1					1	24	late 19th – early 20 th century	
		-	-	*	industrial vessel?	1		1					2	32	19th century	
		-	-		plate	12		3					15	126	late 19th – early 20 th century	
		-	moulded shell- edged decoration		plate			1		1			2	38	late 19th – early 20 th century	
		-	-		plate/platter	2							2	16	late 19th – early 20 th century	both have partial impressed marks - one is illegible, the other includes the word 'IMPROV[ED]'
		-	-		undiagnostic flatware	24							24	130	late 19th century	
-	-		bowl	3		1					4	38	late 19th – early 20 th century			

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
7 (cont.)	white e'ware	-	-		large bowl	2						2	94	late 19th – early 20 th century		
		-	-		tureen/teapot	1						1	26	late 19th – early 20 th century		
		-	-		undiagnostic holloware		3						8	16	late 19th century	
		-	-		kiln furniture - stilt (small)		1						1	<1	mid-late 19th century	moulded form, 'CF PATENT 3'
		-	-		kiln furniture - saddle						1		1	20	late 19th century	
		-	-		rolled strips		10						8	78	19th century	hollow centre
	buff saggar marl	-	-		saggar	2						2	124	19th century		
28	ironstone	-	moulded flutes	*	coffe pot cover			1				1	26	late 19th – early 20 th century		
		-	moulded foliate decoration	*	holloware/cover		1					1	14	late 19th – early 20 th century		
		-	-	*	plate	3						3	28	late 19th – early 20 th century		
		-	-	*	saucer			1				1	6	late 19th – early 20 th century		
		-	-	*	tureen?	1						1	90	late 19th – early 20 th century		
		-	-	*	bowl			1				1	8	late 19th – early 20 th century		

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
28 (cont.)	Ironstone	-	-	*	dish			1				1	50	late 19th – early 20 th century		
	white e'ware	-	-	*	undiagnostic holloware		1						1	6	late 19th – early 20 th century	
		under-glaze polychrome painted	-	*	bowl			1					1	4	late 19th – early 20 th century	
		under-glaze painted - green	-	*	saucer			1					1	10	late 19th – early 20 th century	painted horizontal bands on interior
		under-glaze transfer-printed - blue	-	*	plate			1					1	10	late 19th – early 20 th century	willow pattern
		-	-		plate	2		3					5	62	late 19th – early 20 th century	illegible impressed mark
		-	-		platter	3		2					5	254	late 19th – early 20 th century	
		-	-		saucer	1							1	12	late 19th – early 20 th century	
		-	-		wash basin	2							2	88	late 19th – early 20 th century	
		-	-		dish		2						2	72	late 19th – early 20 th century	

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
28 (cont.)	white e'ware	-	-		mug - straight sided	1						1	32	late 19th – early 20 th century		
		-	-		undiganostic holloware		6					6	22	late 19th – early 20 th century		
		-	-		undignostic flatware	3							3	16	late 19th – early 20 th century	
		slip decorated	-		bowl		1						1	68	late 19th – early 20 th century	applied horizontal bands of blue slip
			-		large bowl			1					1	12	late 19th – early 20 th century	blue slip ground
			-		undiagnostic			1					1	10	late 19th century	blue slip ground
		-	-	*	kiln furniture - spurs (large)						5		5	96	mid-late 19th century	moulded forms, 'CF 8'
		-	-	*	kiln furniture - spurs (small)						2		2	<1	mid-late 19th century	moulded forms, 'CF 2'
		-	-	*	kiln furniture - stilt (large)		1						1	8	mid-late 19th century	moulded form, 'CF PATENT 8'

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
28 (cont.)	white e'ware	-	-	*	kiln furniture - stilt (large)						1	1	8	mid-late 19th century	moulded form	
		-	-		kiln furniture - stilts (med)		6					7	18	mid-late 19th century	moulded forms, 'CF PATENT 3'	
		-	-		kiln furniture - stilts (small)		1					1	4	mid-late 19th century	moulded form	
		-	-	*	kiln furniture - ring stilt						1		1	16	mid-late 19th century	thrown ring with applied points on upper and lower edges
		-	-	*	kiln furniture - saddle						1		1	10	mid-late 19th century	moulded form
	pinkish-buff e'ware	-	-		extruded strip					1		1	12	19th century		
	buff saggar marl	-	-		saggar	3	6					9	1874	19th century		
buff saggar marl	-	-		saggar		2					2	396	19th century	fragments are fused		
30a	ironstone	-	-	*	plate/dish		1					1	10	mid-late 19th century	bluish-grey cast	
		-	-	*	bowl		1					1	24	mid-late 19th century		
		-	moulded body?	*	holloware/ cover?		1					1		mid-late 19 th century		
	white e'ware	-	moulded panels	*	plate					1		1	98	mid-late 19th century		

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes
30a (cont.)	white e'ware	-	-	*	jug				1			1	36	mid-late 19th century	
		-	-	*	cup/bowl			1				1	22	mid-late 19th century	
		under-glaze painted on edge - blue	shell-edged moulded decoration	*	plate			3		1		1	140	mid-late 19th century	
		under-glaze painted on edge - green	shell-edged moulded decoration	*	plate			1				1	20	mid-late 19th century	
		under-glaze polychrome painted	-	*	saucer			1				1	12	mid-late 19th century	floral design
		under-glaze painted - green	-	*	saucer			1				1	12	mid-late 19th century	horizontal painted bands on interior
		under-glaze sponge decorated - blue	-	*	saucer			1				1	8	mid-late 19th century	
		under-glaze sponge decorated - red	-	*	bowl			1				1	2	mid-late 19th century	
		under-glaze sponged and painted	-	*	saucer			1				1	4	mid-late 19th century	

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes
30a (cont.)	white e'ware	under-glaze transfer printed - flow blue	-	*	plate	1						1	22	mid-late 19th century	
		under-glaze transfer printed - flow blue	-	*	dish/compote			1				1	74	mid-late 19th century	
		under-glaze transfer printed - flow blue	-	*	plate	1						1	32	mid-late 19th century	
		under-glaze transfer-printed - blue	-	*	plate	1						1	36	mid-late 19th century	willow pattern
		under-glaze transfer printed - pink	-	*	plate			2				2	38	mid-late 19th century	
		slip decorated	-	*	jug		1					1	14	mid-late 19th century	blue slip ground
		-	-		plate	1		3				4	96	mid-late 19th century	
		-	-		plate	1						1	36	mid-late 19th century	impressed mark 'J & G MEAKIN'
		-	-		saucer			1				1	4	mid-late 19th century	

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
30a (cont.)	white e'ware	-	-		bowl	2	3					5	146	mid-late 19th century		
		-	-		bowl	1						1	42	mid-late 19th century		
		-	moulded flutes		bowl			1					1	26	mid-late 19th century	
		-	-		dish			1					1	26	mid-late 19th century	
		-	-		large jug/ewer		1						1	30	mid-late 19th century	
		-	-		undiagnostic		1						1	24	mid-late 19th century	
		sponge decorated	-		saucer			1					1	6	mid-late 19th century	
		slip decorated	-		bowl	1	1						2	94	mid-late 19th century	applied horizontal bands of blue slip
		-	-	*	kiln furniture - stilt						1		1	6	mid-late 19th century	extruded form
		-	-		kiln furniture - stilt (large)		1						1	16	mid-late 19th century	moulded form
-	-		kiln furniture - pin						1		1	4	mid-late 19th century	pentagonal in section		
	buff saggar marl	-	-		saggar	2	2	3				7	2990	19th century	bitstone on base	
30b	ironstone	-	-	*	saucer			1				1	8	mid-late 19th century		

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes
30b (cont.)	white e'ware	under-glaze transfer-printed - blue	-	*	wash basin		1					1	38	mid-late 19th century	
		under-glaze transfer-printed - blue	-	*	bowl?		1					1	4	mid-late 19th century	
		under-glaze transfer-printed - pink	-	*	plate			1				1	20	mid-late 19th century	
		under-glaze polychrome printed	-	*	bowl/cup	1						1	22	mid-late 19th century	floral design
		under-glaze sponge decorated - red	-	*	saucer?		2					1	<1	mid-late 19th century	
		-	-		plate	1		2				3	50	mid-late 19th century	
		-	-		bowl	4						4	126	mid-late 19th century	
		-	-		cup			1				1	20	mid-late 19th century	
		-	-		wash basin	1						1	20	mid-late 19th century	
		-	-		large jug/ewer	1						1	46	mid-late 19th century	

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
30b (cont.)	white e'ware	-	-		large jug/ewer				1			1	22	mid-late 19th century		
		-	-		jar			1				1	74	mid-late 19th century		
		-	-		undiagnostic				1				1	20	mid-late 19th century	
30c	ironstone	-	-	*	plate	4	1					5	64	mid-late 19th century		
		-	moulded panels	*	plate			1				1	24	mid-late 19th century		
		-	-	*	dish			2				1	10	mid-late 19th century		
		under-glaze transfer-printed - pink	-	*	plate			1				1	10	mid-late 19th century		
	white e'ware	under-glaze transfer-printed - flow blue	-	*	saucer	1							1	6	mid-late 19th century	
		sponge decorated - blue	-	*	bowl/cup			1					1	<1	mid-late 19th century	
		sponge decorated - blue	-	*	undiagnostic holloware		1						1	<1	mid-late 19th century	
		slip-decorated	-	*	jug			1					1	6	mid-late 19th century	blue slip ground

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
30c (cont.)		slip-decorated	-	*	jug/mug			1				1	6	mid-late 19th century	blue slip ground	
	white e'ware	-	moulded shell-edged decoration		plate/platter			3					3	28	mid-late 19th century	
		-	moulded edge		plate			1					1	16	mid-late 19th century	
		-	-		plate	4	1	2					7	58	mid-late 19th century	
		-	-		bowl	2							2	58	mid-late 19 th century	
		-	moulded body		bowl		2						2	8	mid-late 19 th century	
		-	moulded body		bowl		1						1	4	mid-late 19 th century	
		-	-		large bowl		1						1	16	mid-late 19 th century	
		-	-		saucer			2					1	16	mid-late 19 th century	
		-	-		saucer?		1						1	6	mid-late 19 th century	
		-	moulded base		jug?	1							1	48	mid-late 19 th century	
		-	-		jar			1					1	<1	mid-late 19 th century	
		-	-		undiagnostic holloware		9						9	28	19 th century	
		-	slip decorated		bowl		2						2	14	mid-late 19 th century	applied horizontal bands of blue slip

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
30c (cont.)	white e'ware	-	-	*	kiln furniture - spurs (large)					2		2	34	mid-late 19th century	moulded form, 'CF PATENT 8'	
		-	-		kiln furniture - stilt (large)		1					1	14	mid-late 19th century	moulded form, 'CF PATENT 8'	
32	white e'ware	-	-	*	saucer		1					1	6	mid-late 19 th century		
		-	-	*	coffee pot cover			1				1	54	mid-late 19 th century		
		-	-	*	undiagnostic holloware		1						1	2	mid-late 19 th century	
		-	-	*	jar?	1							1	8	mid-late 19 th century	
		under-glaze painted - green	-	*	saucer			1					1	<1	mid-late 19 th century	horizontal painted bands on interior
		under-glaze transfer-printed - blue	-	*	plate	1							1	12	mid-late 19 th century	
		under-glaze polychrome painted	-	*	saucer?		1						1	4	mid-late 19 th century	
under-glaze sponge decorated - blue	-	*	saucer	1		2					3	32	mid-late 19 th century			

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
32 (cont.)	white e'ware	-	-		plate	2		3				5	60	mid-late 19 th century		
		-	-		saucer			1				1	12	mid-late 19 th century		
		-	-		dish		1						1	30	mid-late 19 th century	
		-	-		bowl	1							1	114	mid-late 19 th century	
		-	-		jug				1				1	8	mid-late 19 th century	
		-	moulded panels		coffee pot cover			1					1	146	mid-late 19 th century	
		-	-		undiagnostic		1						1	<1	mid-late 19 th century	
		under-glaze transfer-printed	-		bowl?		1						1	10	mid-late 19 th century	
		under-glaze transfer-printed	-		cup?		1						1	4	mid-late 19 th century	
		slip decorated	-		bowl		2						2	14	mid-late 19 th century	applied horizontal bands of blue slip
		-	-		kiln furniture - stilts (large)		2					1	3	28	mid-late 19 th century	
-	-		rolled strips		4						4	162	19 th century	hollow centre		

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes
32 (cont.)	pinkish-buff e'ware	-	-		extruded strip		2					2	22	19th century	
33	white e'ware	-	-		plate		1					1	10	mid-late 19th century	
		-	-		bowl		3	2				5	20	mid-late 19th century	
		-	moulded body		bowl		1					1	6	mid-late 19th century	
		-	-		saucer			2				2	12	mid-late 19th century	
33b	white e'ware	-	moulded panels	*	plate			2				2	28	mid-late 19th century	
		-	-	*	industrial vessel?	1						1	40	19th century	
		-	-		bowl	1	1					2	8	mid-late 19th century	
		-	foliate moulding		cup	1	1					2	42	mid-late 19th century	
		-	-		undiagnostic holloware		1					1	<1	19th century	
33c	ironstone	-	-	*	bowl?		1					1	26	mid-late 19th century	
	white e'ware	-	moulded panels	*	plate	1		2				3	54	mid-late 19th century	
		under-glaze painted - blue edge	moulded shell-edge decoration	*	plate			1				1	26	mid-late 19th century	

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes
33c (cont.)	white e'ware	under-glaze transfer-printed - flow blue	-	*	plate	1						1	16	mid-late 19th century	
		under-glaze transfer-printed - pink	-	*	plate			1				1	20	mid-late 19th century	
		under-glaze sponge decorated - blue	-	*	bowl/cup			1				1	6	mid-late 19th century	
		under-glaze sponge decorated - black	-	*	saucer			1				1	4	mid-late 19th century	
		-	-		plate	3		1				4	83	mid-late 19th century	
		-	-		plate	1						1	34	mid-late 19th century	partial impressed mark - '[J & G M]EAKIN'
		-	moulded shell-edge decoration		plate			1				1	14	mid-late 19th century	
		-	-		ewer			1				1	62	mid-late 19th century	
		slip decorated	-		bowl		1					1	12	mid-late 19th century	applied horizontal bands of blue and green slip on exterior

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes
33c (cont.)	white e'ware	slip decorated	-		bowl			1				1	8	mid-late 19th century	applied horizontal bands of blue slip on exterior
		-	-	*	kiln furniture - spur (small)					1		1	<1	mid-late 19th century	moulded form, 'CF 2'
	buff e'ware	-	-		extruded strip		1					1	8	19th century	
39	ironstone	-	-		large platter?	3		1				4	320	late 19th century	
40	white e'ware	under-glaze transfer-printed - blue	moulded beading on rim	*	dish			1				1	6	mid-late 19th century	willow pattern
44	white e'ware	-	-		bowl			1				1	4	late 19th century	
		-	-		undiagnostic		2	1				3	6	late 19th century	
		-	-		kiln furniture - stilt						1	1	<1	mid-late 19th century	moulded form, 'C 11'
46	ironstone	-	moulded foliate design	*	saucer			2				2	6	late 19th-early 20th century	
	white e'ware	-	moulded foliate design on edge	*	plate	1		3				4	40	late 19th-early 20th century	partial printed mark, '[M]ADE IN [E]NGLAND
	-	-			plate			1				1	2	late 19th-early 20th century	

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
46 (cont.)	white e'ware	-	-		undiagnostic		1					1	<1	late 19th-early 20th century		
48	ironstone	-	-	*	dish			1				1	16	late 19th century		
		-	-	*	undiagnostic holloware		2					2	10	late 19th century		
	white e'ware	slip decorated	-	*	bowl			1					1	8	late 19th century	applied horizontal bands of blue slip on exterior
		-	-		undiagnostic holloware			1					1	2	late 19th century	
		-	-	*	kiln furniture - stilt (large)							1	1	4	mid-late 19th century	
		-	-	*	kiln furniture - stilt							2	2	6	mid-late 19th century	extruded form
	buff e'ware	-	-		extruded strips		2					2	20	19th century		
50	ironstone	-	-	*	plate	2						2	24	late 19th century		
		-	-	*	plate/platter	1						1	14	late 19th century		
		-	-	*	tureen			1					1	66	late 19th century	
		-	-	*	basin				1				1	72	late 19th century	
		-	-	*	cup				1				1	<1	late 19th century	

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
50 (cont.)	ironstone	-	-	*	cup/bowl		1					1	8	late 19th century		
		-	moulded lobes	*	bowl	1						1	42	late 19th century		
		-	moulded flutes	*	coffee pot cover			1					1	16	late 19th century	
		-	-		bowl	1		2					1	96	late 19th century	
	white e'ware	-	-		plate	2		2					4	122	late 19th century	
		-	moulded rim - panels and laurel leaves		plate			1					1	42	late 19th century	
		-	-		plate/platter	1							1	68	late 19th century	
		-	-		bowl	3	1						3	94	late 19th century	
		-	-		dish			1					1	62	late 19th century	
		-	-		undiagnostic	1							1	<1	late 19th century	
		under-glaze painted - green	-		bowl			1					1	6	late 19th century	horizontal painted bands on interior and exterior
		-	-	*	kiln furniture - spurs (large)						5		5	96	mid-late 19th century	moulded form, 'CF PATENT 8'

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes
50 (cont.)	white e'ware	-	-	*	kiln furniture - spur (med)					1		1	<1	mid-late 19th century	moulded form, 'CF PATENT 7'
		-	-	*	kiln furniture - spurs (small)					2		2	2	mid-late 19th century	moulded form, 'CF 2'
		-	-	*	kiln furniture - stilt (large)						1	1	6	mid-late 19th century	moulded form
		-	-	*	kiln furniture - stilt (large)						2	2		mid-late 19th century	extruded form
	buff e'ware	-	-		extruded strips		7					7	114	19th century	
	buff saggar marl	-	-		saggar	4	3	2				9	2770	19th century	bitstone on base
52	white e'ware	-	-	*	kiln furniture - spur (small)					1		1	<1	mid-late 19th century	moulded form, 'CF 2'
		-	-		kiln furniture - stilt						1	1	12	mid-late 19th century	extruded form
		-	-		kiln furniture - pin						1	1	<1	mid-late 19th century	pentagonal in section
	buff saggar marl	-	-		saggar			1				1	166	mid-late 19th century	
70	ironstone	-	-		sauce?	1					1	88	late 19th-early 20th century		

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
70 (cont.)	ironstone	-	-		plate			2				2	46	late 19th-early 20th century		
		-	Moulded panels and barleycorn pattern		plate			1				1	44	late 19th-early 20th century		
	white e'ware	-	-		cup	1	1						2	72	late 19th-early 20th century	
		-	-		plate	2							2	78	late 19th-early 20th century	
		-	-		platter/plate	1							1	96	late 19th-early 20th century	
		-	-		dish			1					1	64	late 19th-early 20th century	
		-	-		undiagnostic hollow ware	1							1	4	19 th century	
		-	-		undiagnostic	1							1	<1	19 th century	
71	ironstone	-	-	*	bowl	1						1	34	1883-9	partial printed mark – 'CHARLES MEAKIN HANLEY ENGLAND'	
		-	-	*	cup			2				2	54	late 19th-early 20th century		
		-	-	*	saucer	2		1		1		4	90	late 19th-early 20th century	partial printed mark - 'IRONSTONE CHINA'	
		under-glaze transfer-printed - green	-	*	plate	1						1	22	late 19th-early 20th century	partial printed mark - 'IRON[STONE CHINA]'	

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes	
71 (cont.)	white e'ware	-	moulded beads on rim	*	plate			3				3	52	late 19th-early 20th century		
		-	-	*	plate			2		1		3	90	late 19th-early 20th century		
		-	-	*	cup			1					1	38	late 19th-early 20th century	
		-	-	*	dish			1					1	14	late 19th-early 20th century	
		under-glaze transfer-printed - flow blue	-	*	saucer			1					1	14	late 19th-early 20th century	
		under-glaze transfer-printed - flow blue	-	*	cup								1	10	late 19th-early 20th century	
	white e'ware	under-glaze transfer-printed - green with over-glaze gilding	-	*	cup			1					1	14	late 19th-early 20th century	
		under-glaze transfer-printed - green	-	*	saucer						1		1	12	late 19th-early 20th century	

context	description of ware	surface dec	dec in/on body	glzd	vessel form/ description	base	body	rim/edge	handle	profile	arm	total no. shds	wt. (g)	date	notes
71 (cont.)	coloured e'ware - green		moulded flutes	*	jar/bowl?	3	1					4	52	late 19th-early 20th century	
Totals												453	15853		

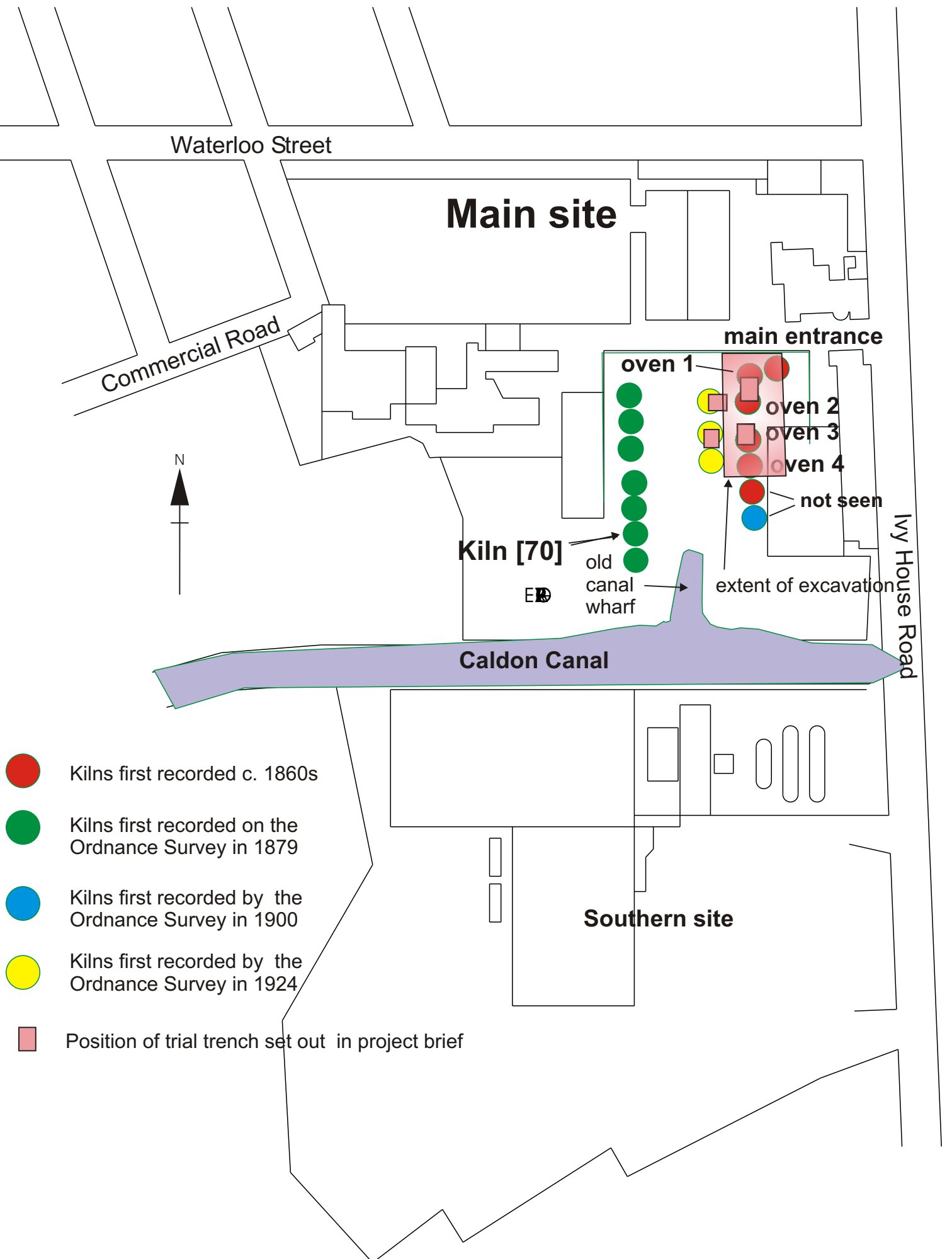


Fig. 2 detail of the site in 2004 showing the buildings with the older kilns superimposed

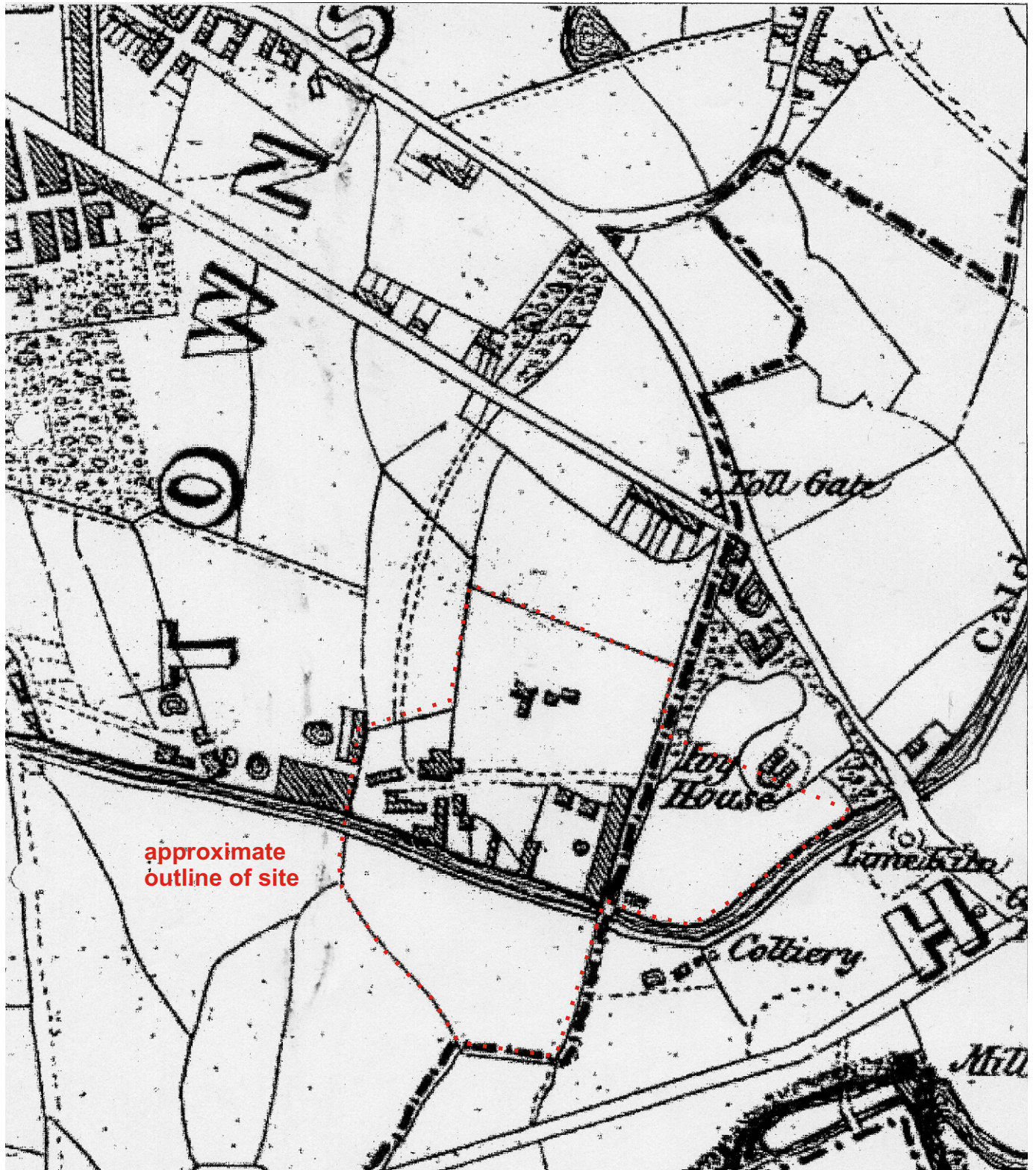
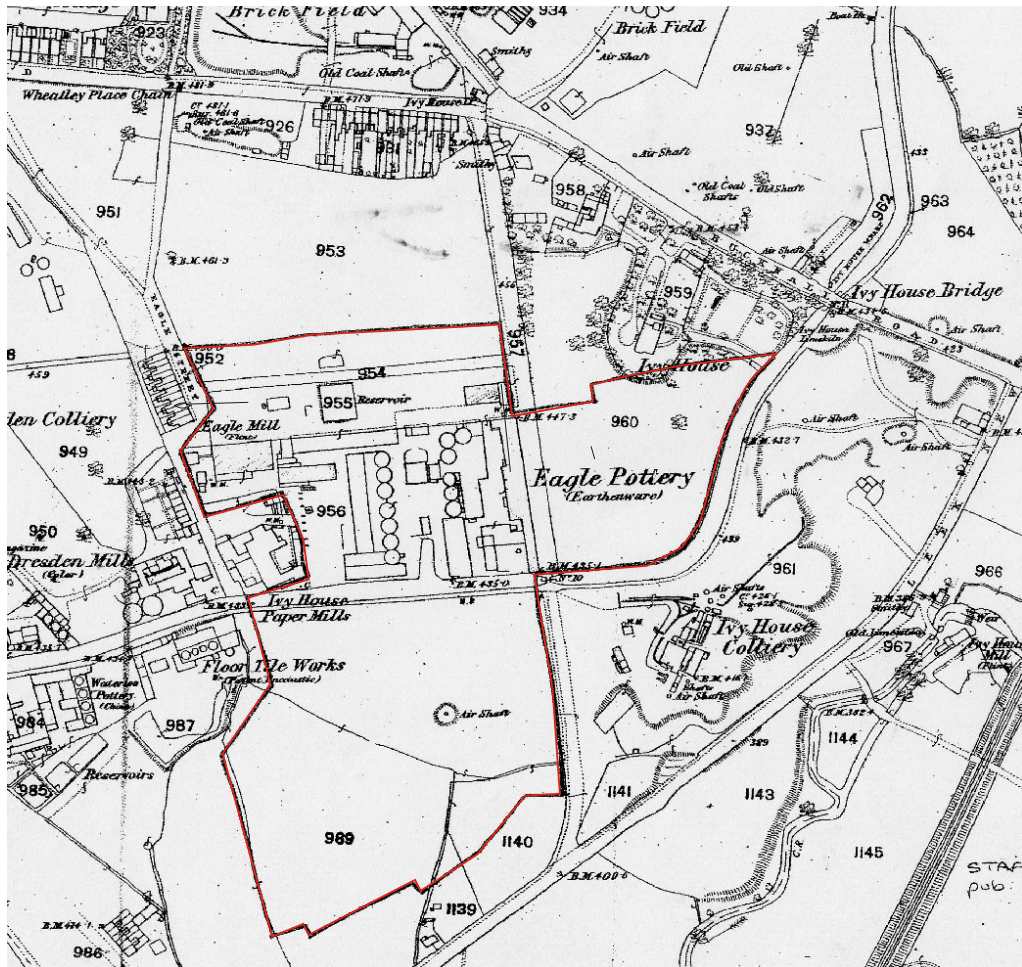


Fig 3 Detail of the site from Lynam's map of 1848



Detail of the site from the 1:2500 Ordnance Survey map of 1879



Detail of the site from the 50 inch Ordnance Survey map [1870s]

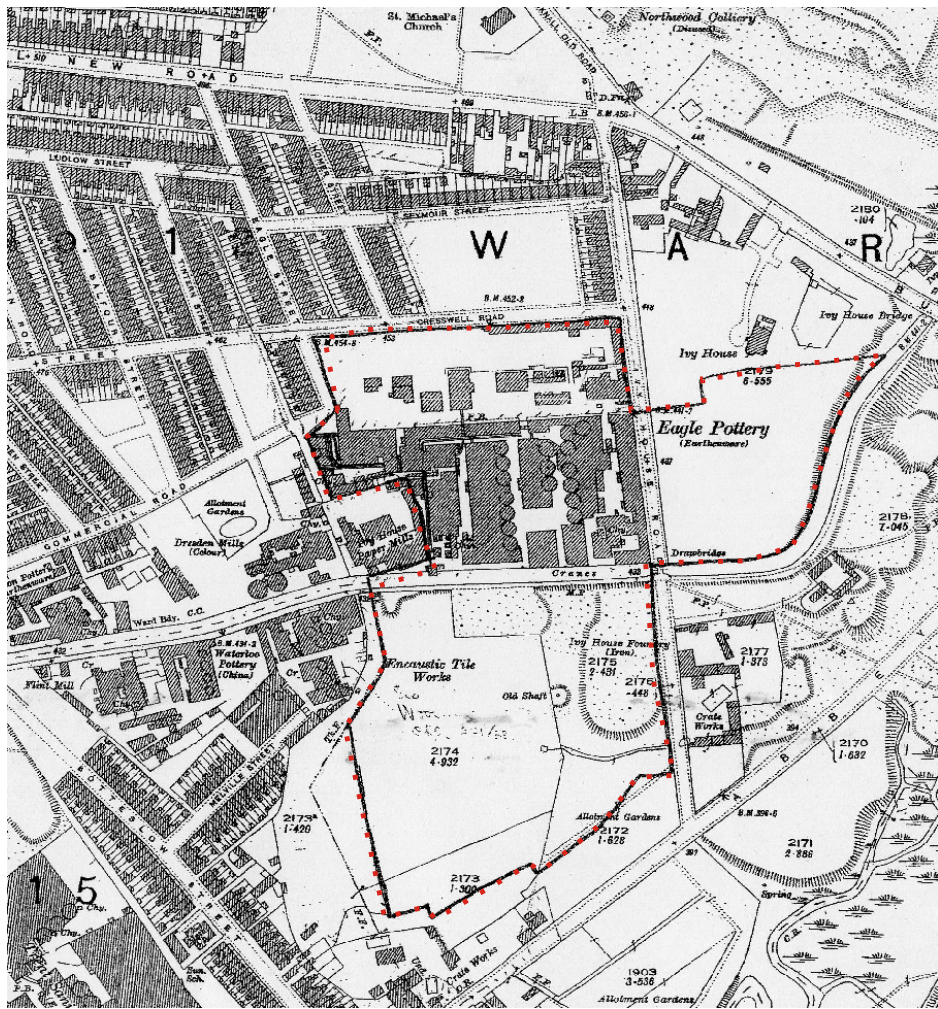


Fig. 6 Detail of the site from the 1:2500 Ordnance Survey map of 1924

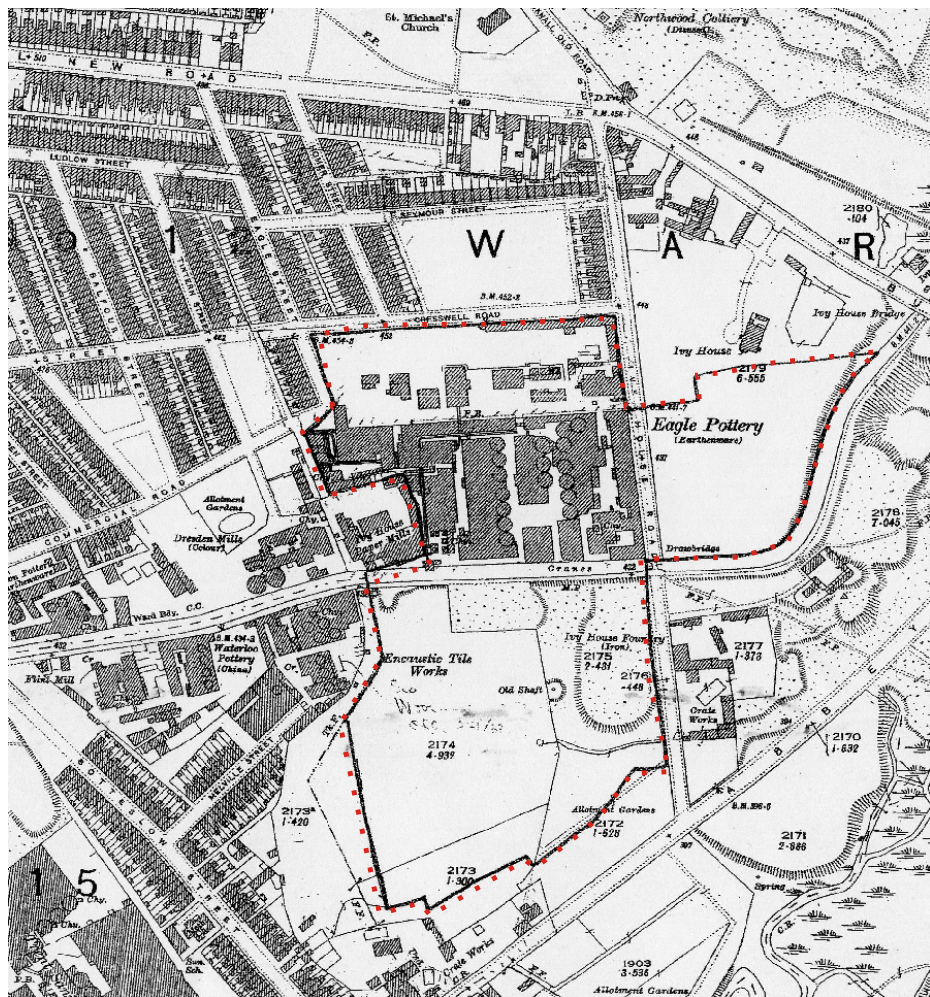


Fig. 7 Detail of the site from the 1:2500 Ordnance Survey map of 1966

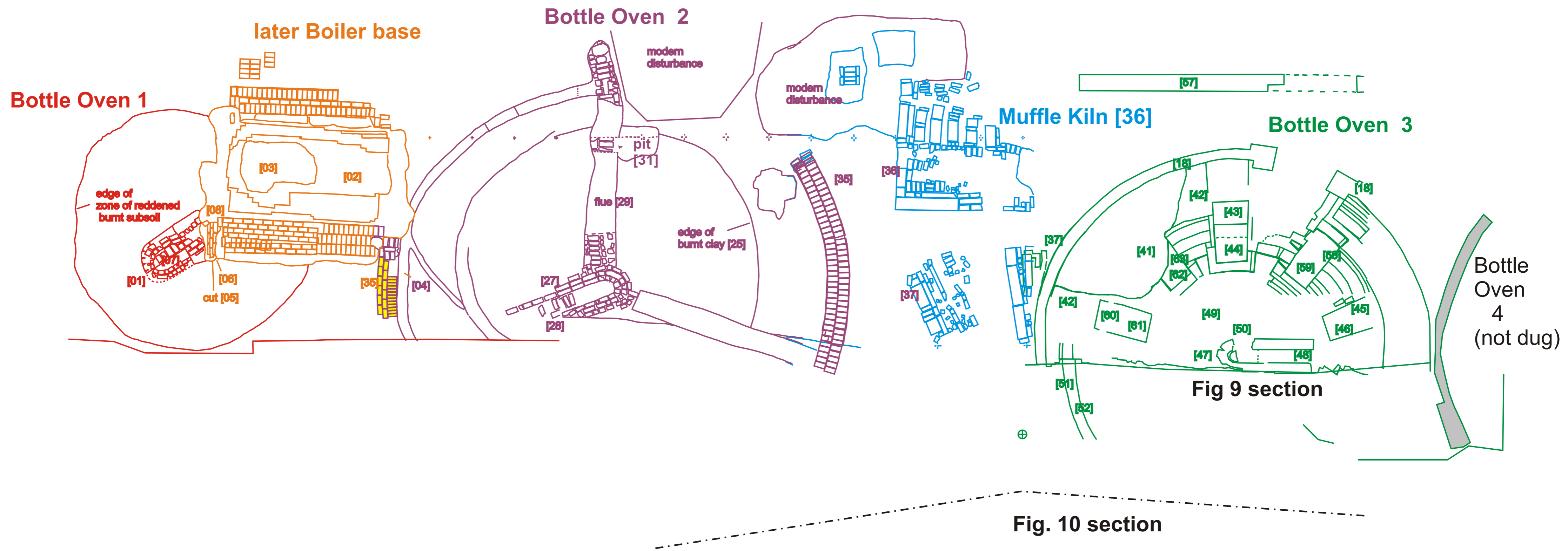


Fig. 8 Plans of the excavated ovens showing features discussed in the text

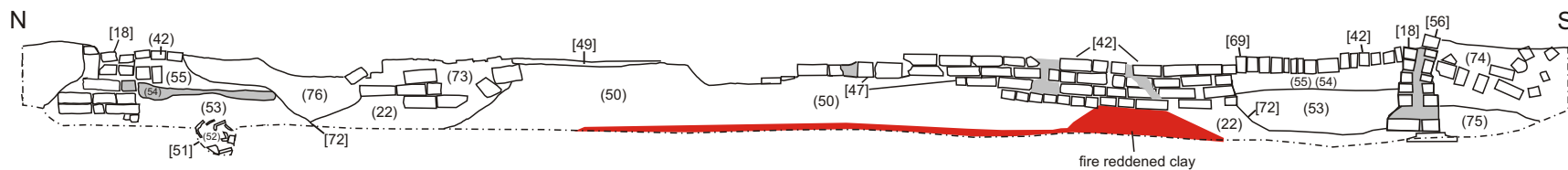


Fig. 9 Half Section of Sven 3

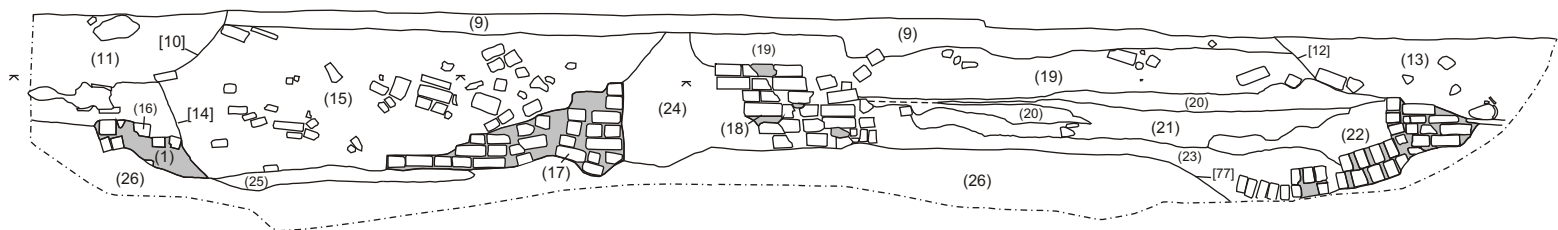


Fig. 10 Section of the western edge of Ovens 2 & 3

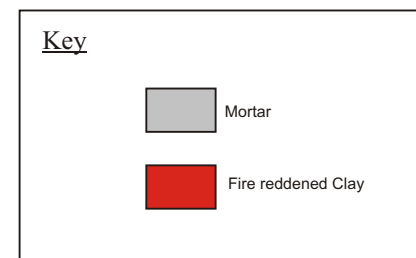




Plate 1 Boiler or tank base [02]
note reinforced concrete [09] in foreground and flue [01] to rear



Plate 2 Flue [27] looking SW
the water-filled channel is flue [29]



Plate 3 - machining the site - actually a very good tool



Plate 4 - Oven 3 - floor [42] and ash pit [43] - note ramped entry



Plate 5 - oven 3 :- floor [42] & [68] cut by ash pit [45] with flue [47] to rear



Plate 6 - oven 3 - Half section looking north-east



**Plate 7 - oven [70] (right)
with part of another oven (left)**



Plate 8 - oven [70] showing saggar & kiln waste [71]



Plate 9 - tunnel structure over old canal dock



Plate 10 - tunnel over dock showing blocking wall



**Plate 11 - tunnel over dock showing roof
(canal in background)**



**Plate 12 - view the other way showing
dock with roof removed**