

CAMBRIAN ARCHAEOLOGICAL PROJECTS LTD.

Ansell Road Gasworks, Saltisford, Warwick

Archaeological Excavation
&
Watching Brief



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ARCHAEOLOGICAL EXCAVATION & WATCHING BRIEF

**Ansell Road Gasworks,
Saltisford, Warwick**

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Non Technical Summary

This report results from work undertaken by Cambrian Archaeological Projects Ltd (CAP) for George Wimpey West Midlands Ltd at Ansell Road gasworks, Warwick. The site was used for gas production from 1822 to 1953 and as a depot and distribution centre after 1953. This report includes both the investigative element of an excavation which took place in June 2004 prior to development on the site and a watching brief of the work undertaken by Churngold Remediation in order to remove contaminated ground fill, down to natural geology, prior to development work by George Wimpey West Midlands Ltd. The large scale remediation obviously completely removed the sub-surface archaeology and the purpose of this watching brief was to record as much of the archaeology as possible before its destruction.

Introduction

Location

The site of the former gasworks at Ansell Road, Saltisford, Warwick is situated to the north-east of the A425 Saltisford Road, NGR SP278 653 (Fig 1).

Scope of works undertaken

In July 2003 Cambrian Archaeological Projects (CAP) carried out an archaeological desk based assessment of a proposed development site on land at Ansell road gasworks, Saltisford, for George Wimpey West Midlands Ltd. This was then followed by a field evaluation in August 2003 and excavation of an area within the gasworks site in June 2004. Commencing the 9th December 2004 an archaeological watching brief, which continued through till March 2005, was also undertaken.

The proposed development on the site of the former Ansell Road gasworks concerns the construction of 82 flats, bin and cycle stores and relocation of an electricity sub station at Warwick and District Council depot, Warwick.

In 2003 the planning archaeologist for Warwick County council had originally requested a desk-based assessment and evaluation trenching prior to determining the planning conditions for the proposed development. Subject to the results of the previous archaeological work the planning consent was granted subject to various conditions, one of which was an archaeological excavation (Planning permission guideline 16) (fig 2).

PPG16 was for a programme of archaeological work to a written specification. A brief was prepared by Edward Wilson (Warwickshire County Council) with a plan showing the area requiring excavation and recording prior to development.

The specification for excavation was prepared by Kevin Blockley, Director of Cambrian Archaeological Projects Ltd, against a brief (dated April 2004) drawn up by Edward Wilson.

The specification for the archaeological watching brief was prepared by Kevin Blockley, Director of Cambrian Archaeological Projects Ltd, against a brief (dated November 2004) drawn up by Edward Wilson.

Geology and topography

The site of the proposed development is located within the former Warwick Gasworks, a complex of standing and buried buildings. During the time of the evaluation in 2003 the former gasworks was covered by a tarmac yard with some standing industrial buildings. These buildings had been levelled by the time of the excavation in June 2004 and only the concrete foundation of the most recent buildings remained. By the time of the watching brief in December 2004 most of the area of archaeological interest had been levelled and was being used for stockpiling of excavated material.

The geology of Warwickshire is one of the most varied to be found in any English county. The Ansell Road gasworks, Saltisford lies on the boundary of several different underlying geological strata. Warwick itself is situated on an area of Triassic mudstones. Immediately to the north is an area of Permian and Triassic sandstone with small areas of Westphalian carboniferous measures. Running immediately north along this geological boundary is a major fault (BGS, 1979).

The oldest rocks of the Precambrian, Cambrian and Ordovician periods (see Appendix III) are confined to the north of Warwickshire where huge quarries have exploited them for aggregate. Silurian rocks are essentially absent, and Devonian rocks are confined to a narrow strip to the north-west of Nuneaton. The economically important rocks of the Carboniferous period, which contain the coal of the Warwickshire Coalfield, are found north of Coventry.

The Permian and Triassic periods are represented by sandstones and red clays. These rocks underlie a vast U-shaped area through the centre of the county forming the valleys of the rivers Arrow and Avon.

The Jurassic rocks are mainly clays, sands, limestones and ironstones and form all the higher land in the south east of the country.

The Quaternary, commonly called the Ice Age, is represented by extensive deposits of clay, sand and gravel. Once again, these are important economically and a number of gravel pits have been opened

Archaeological and historical background

The town of Warwick was founded on the banks of the River Avon in 914 AD (See Appendix II) by Ethelfleda, sister of Edward the Elder, as a defense against the Danish invaders, on a site overlooking earlier riverside settlements. It is built on a small hill which controlled not only the river valley but also the river crossing on the road to London and the roads to Stratford, Coventry and the salt way to Droitwich.

The medieval core of the town was prevented from expansion by the open spaces that surround it: the Common and Racecourse, the grounds of the Priory, St Nicholas Meadow, the River Avon, and later, Warwick Castle. Within a relatively small area there are many buildings of historic interest, of which the Castle is the most important.

Many of the central streets of the town were destroyed by the Great Fire of 1694. The buildings which were burnt, and many which were not, were re-built in the late 17th and early 18th centuries.

One of the most important inventions of the late 18th century was gas lighting. It was developed by William Murdock, who was the son of an Ayrshire millwright. He was born in 1754 and initially worked with his father before joining Boulton and Watt in Birmingham. His best known invention was the use of coal gas for lighting. In 1792 he heated coal in a closed iron retort with a hollow pipe attached. The gas produced from the heated coal flowed through the pipe and was burnt at the end to produce a steady

flame. In 1794 he heated coal in a closed iron vessel in his garden at Cross Street, Redruth and piped the resulting gas into the house, where he lit a series of burners attached to the other end of the pipe. This was the first practical system of gas lighting to be used anywhere in the world. This invention was opposed by Boulton and Watt and so Murdock left the company in 1797 and moved back to Scotland.

In 1801 Philippe Lebon demonstrated gas lighting publicly in Paris and in 1802 Boulton and Watt agreed to the installation of two gas lamps outside the Soho factory. This was the first installation of gas lighting in the country. The following year the whole works was illuminated by gas. In 1806 the cotton spinning mill at Manchester that was owned by Phillips and Lee was illuminated by Murdock's gas lights and his invention was soon in demand. It was not long before all large factories were using gas lights. He was awarded the Gold Medal by the Royal Society in recognition of his achievement. The introduction of gas mains would allow for the lighting of many buildings, whole streets and even complete towns rather than each building having its own light making equipment.

People soon became aware of the benefits of gas lighting, when it was installed in a prominent part of London. It began in 1805 when George IV, who was Prince of Wales at the time, had gas lighting installed in Carlton House, his London home. This was followed two years later by the installation of gas lamps in Pall Mall, which was the first street to be lit by gas.

The first gas works in the U.K. were built for the Gas Light and Coke Company, which was established in 1812 to light the City of Westminster. The company was formed by Frederick Winsor from Germany, who had previously worked in France for Philippe Lebon. By 1819, 288 miles of pipes had been laid in London to supply 51,000 burners. Within ten years most of the country's larger towns and cities were lit by gas.

Early gas retorts were made of iron in the form of a horizontal tube about 12" in diameter. Each tube was filled with coal and emptied, after producing the gas, through an iron door called the mouthpiece. Retorts were often housed in a specially designed 'retort house'. After prolonged use, the retorts would often distort badly and so in about 1822 clay retorts with iron lids were introduced.

The Saltisford site was chosen for ease of transportation of raw materials – mainly coal – because it was opposite the canal basin and terminus of the Warwick & Birmingham Canal. Later there was also a rail siding (Wilkinson, 2003)

The development is located on the site of the former Warwick Gas works, a complex of buried and standing buildings. The earliest remains include a pair of octagonal brick gasholder houses dating to 1822 (plate 1) and are considered to be of international importance. Expansion of the gas works took place by 1851 on the site of the proposed development. By 1900 three large gasometers had been built. By the 20th century only the early octagonal gas holders remained. Today these remains are considered the best surviving example of an early 19th century gas works in the world.

The Regional Sites and Monuments Record list the gasworks as SMR number MWA1936 and it is a grade II listed building. No other archaeological sites are documented in the proposed development area.

Aims and Objectives (Excavation)

Excavation

To recover archaeological information which will otherwise be destroyed by the proposed development scheme and prepare a report on the results. To determine the extent, condition, nature, character, quality and date of any archaeological remains present.

To establish the ecofactual and environmental potential of archaeological deposits and features

The excavation consisted of one trench measuring 15.5m x 22m. A mechanical excavator fitted with a toothless bucket removed the overburden under close archaeological supervision.

The site was under the overall direction of Kevin Blockley (MIFA). The trench was cleaned by hand with sample sections being recorded at a scale of 1:10 and plans at 1:20 and 1:50. All trenches were photographed using colour slide, black and white print film and digital photography.

All works were undertaken in accordance with both the IFA's *Standards and Guidance: for an archaeological field excavation* and current Health and Safety legislation.

Finds

Finds were recovered by hand during the course of the excavation and bagged by context.

Palaeo-environmental evidence

No deposits suited to environmental sampling were located during the excavation.

Excavation Results

Soils and Ground Conditions

The conditions of the excavation were hampered due to potential contamination of the site by harmful materials retained therein. Geotechnical bore hole evidence as highlighted in Evans (2004) shows high levels of contaminants such as arsenic, lead, benzene and 2,4 dimethylphenol to name but a few. As a result decontamination suits and respirators had to be worn at all times. Weather conditions were generally bright, clear and warm.

Distribution of Deposits

Owing to the recent nature of the archaeology in question deposits of archaeological interest were very close to the surface. The main deposits were floor layers either made up of interlocking bricks from the 19th century buildings or concrete floors from the 20th century buildings (plate 2).

Excavation (fig 3, plates 2&3)

Excavation began with a mechanical excavator fitted with a toothless grading bucket removing the rubble overburden (001) under close archaeological supervision. Owing to the amount of industrial activity on the site and the presence of building foundations so close to the surface, excavation of the area stayed at a relatively shallow level. Removal of the overburden revealed 6 redbrick and reinforced concrete pillar bases (002) which would have formed internal structural supports for the 20th century building on the site (plate 4). During the pillar bases construction it was clear they had been driven through the floor layer (005) of the previous building thus providing a *terminus post quem* for the structure and floor level. (005) was made up of interlocking grey-blue bricks and spread over most of the site (plate 5). This interlocked brick floor is thought to overlay the earlier 1850's buildings (fig 4) and hence relate to the next phase of building expansion in the 1880's (fig 5). This idea was supported by the finding of an earlier laid brick floor beneath floor layer (005) (plate 6). This is likely to have belonged to the earliest phase of gaswork buildings on the site, the 1822 structures. As the 1887 buildings directly overlay those from the 1820's it seems likely they would have been constructed directly on top in this manner. The eastern edge of the excavation is likely to have been the surface of a yard surrounded by buildings as depicted on the 1887 and 1962 plans (figs 5&6). This yard would have extended out beyond the excavation boundaries, covering most of the area where the retort house once stood. Very little else was gleaned from the excavation owing to the spread of brick and concrete floor levels over the majority of the excavation area. Figure 7 shows a plan of the site with all the main building phases overlain in relation to each other.

Finds

The finds assemblage recovered from the excavation at Warwick gasworks was relatively small with few objects offering any firm dating evidence. The assemblage consisted of fragments of clay pipe, pottery, some metalwork and pieces of tile.

Pottery

The pottery recovered from the excavation consisted mainly (22 sherds) of industrially produced developed white wares which date to between c1790 and the early 20th century. These dates are consistent with the industrial occupation of the site. Also recovered were 4 sherds of locally produced post medieval earthenwares and 1 sherd of Coal measures ware.

Pipes

The clay pipe assemblage recovered from the excavation consisted of 7 bowls (complete or fragmentary) and 26 pieces of stem. Although stem pieces are not hugely reliable for dating the bowls can be dated to the mid to later part of the 19th century, again consistent with the dates for the industrial activity on the site.

Tile

fragments of floor and wall tile were recovered from the excavations of which 8 were industrially produced developed white wares (c.1790 – c.20). Other pieces included modern earthenware tile fragments and a complete quarry tile.

Miscellaneous

Amongst the remainder of the finds assemblage were other objects such as pieces of glass, shell and metalwork which all seemingly date to the same period, consistent with the excavated structural remains.

Aims and Objectives (Watching brief)

Watching Brief

The remit of the watching brief was to establish the presence/absence of archaeological structures or other significant features within the works area, paying particular attention to an area adjacent to the 1822 standing structure of the gasworks frontage. It was in this vicinity that it was hoped parts of the retort building may have survived.

Watching Brief Methodology

Scope of Fieldwork

The watching brief consisted of an archaeological fieldworker being present during the excavation of approximately 70 m² of land to the north of the 1822 building which comprises the frontage of the former gasworks.

The high contamination of the ground dictated that close contact with the archaeology was to be avoided as a Health and Safety issue. The contamination further necessitated the need for vapour masks and disposable clothing to be worn at all times whilst on site. At certain hot-spots of contamination, mechanical excavation machines were fitted with gas detectors to ensure the levels of fumes were not above acceptable limits.

Due to the contamination of the area, neither cleaning of surfaces by hand nor scaled drawings were undertaken. Recording was reliant on high-resolution digital photography, where possible scales were included; however, this was not always possible.

Illustrations included below have been compiled from annotated sketches made on site and digital photographs. Where illustrations have been included their use is to clarify points which are difficult to see.

All works were undertaken in accordance with both the IFA's *Standards and Guidance: for an archaeological watching brief* and current Health and Safety legislation.

Finds

The only artefacts recovered during the course of the excavation were some clay pipe fragments. (These were discarded due to contamination)

Structural finds included:

- A sub-surface set of arched brick chambers.
- Part of a chimney, possibly associated with the arched brick chambers.
- A narrow building with a possible tar room including a tar barrel (not retrieved due to contamination)

- A cast iron lamppost (left in situ).
- A tiled floor and wall foundations of small building along the west perimeter.
- Part of a tram line which was inside the later coal building.
- The lower brickwork of three gas holders.
- A metal liquor tank.
- A possible early water well.

Watching Brief Results

Soils and ground conditions

The ground conditions at the site were extremely poor; the majority of the fill consisted of heavily contaminated soil derived from gas production at the site. The entire area has seen many building phases each one contributing to the build up of toxic waste as well as building debris. Although many differing stratigraphic layers could be seen during the excavation, each existed as isolated areas of dumping or redevelopment. It was not possible to interpret or even record these stratigraphic events because of the hazardous nature of the ground fills.

A further problem in recording the site was the nature of the water logging in various areas. Most of the barrier trenches took weeks to drain and were subject to collapse if left open for more than a short period.

The bulk removal of soil during phase II also suffered with heavy contamination and water logging however, a further problem arose from the barrier itself. The bulk excavation was planned as the removal of 15m² sections to a depth of up to 6m. The piles and the surrounding clay barrier proved to be unstable when the enclosed fill was removed again limiting the availability of the archaeology to be inspected.

In order to present the record of the archaeology that was discovered during the watching brief the area will be described in relation to the site grid was provided by Churngold Remediation, the principle contractor involved in the excavation work at the site, (fig 8).

Descriptions

Grid 8B

There was one feature of interest in grid square 8B, a gas holder which was dated as a two phase construction (fig 7), 1887 or 1905. The gas holder is centred on grid square 8B although as can be seen in (fig 8) it actually occurs in six of the grids.

The gasholder had an outer diameter of 19.69m, an inner diameter of 18.88m and survived to a depth below the present surface of 5.19m. As can be seen (plate 7) the rim at the top was one and a half bricks in width, changing to two bricks width at a depth of 1.8m beneath ground level. The step out in the brickwork is towards the outside of the wall. The brick size used in construction was width $4\frac{3}{8}$ ", height $2\frac{7}{8}$ ", length 9".

The entire wall of the gasholder was surrounded with a barrier of heavy red clay measuring on average 1.10m in thickness.

Also in the photograph can be seen the inner base of the gasholder which stood on a stepped brick base. Plate 8 shows a close up of the stepping which can be seen as three courses of brick beneath which was a layer of wooden planking.

The entire structure stood on a heavy natural clay base and the clay had been formed into a dome towards the centre of the gasholder (plate 9).

Grid 9A

Grid square 9A had two features of interest; the two phase gasholder which has been dated in (fig 7) to 1887 or 1905, and a small section of tram rail possibly relating to the coal shed shown on the 1851 map (fig 9).

The gasholder was revealed during the excavation of the barrier as two sections through the rim. From this it was possible to see the form of its construction and also ascertain its overall diameter 18.44m (inside). Fig 10 shows a schematic illustration of the section through the gasholder. The brickwork and stratigraphy at the edges of the wall are accurate representations whereas the intervening fills have been estimated from photographs.

The barrier at this point (grid 9A) reached a depth of over three metres at which the wall was still present. Unfortunately contaminated ground water flooded the trench and it had to be pilled and filled with some haste.

The wall of the gas holder was one and a half bricks in width. The brick size used was width $4\frac{3}{8}$ ", height $2\frac{7}{8}$ " and length 9". The thickness of the wall was uniform to a depth of 1.3m beneath present ground surface, after which it stepped outwards giving new wall width of 2 bricks (fig 10).

In (plate 10) the rim of the holder and its construction pattern can be clearly seen. The brick pattern of construction was length-ways on the inside and offset at 90° on the outside. The pattern was alternated with each course.

The outer rim of the gas holder was sheathed in a red clay barrier just under a 0.5m thick, (fig 10).

Along the outer rim of the gasholder, brick buttresses could be found as shown in (plate 11). These buttresses measured 1m by 0.4m and had two iron rods imbedded vertically within their structure.

The section of tramway (plate 12) consisted of two lengths of pierced rail with a central join in each. The rails were bolted to the concrete base by pairs of hexagonal bolts and have an inner width of 0.37m. Within the pieced sections of each rail were two metal rods; bent over so that they leant towards the ends of the rails. Their purpose is unknown.

The north-east end of both rails had been broken off which suggests that they continued in that direction. The south-east ends of the rails had rectangular insets which may have held a stop mechanism at this the terminal end of the track.

Grid 9E

There were four features of interest in grid square 9E; the gasholder which had four phases of rebuilding 1851, 1887, 1905 and 1962, (fig 7), a partial gasholder wall, a riveted metal tank and a well which probably pre-dated gas production at the site.

The gasholder was revealed during the excavation of the barrier as a partial arc of the rim. The final excavation of the site revealed that the gasholder remains actually covered nine of the site grid squares.

Plate 13 shows part of the outer wall of the structure between the piles. The inside of the gasholder, with an internal diameter of 25.46m, can be seen in (plate 14) showing a view south across the site.

The base of the holder survived to a depth of 6.4m beneath the present ground level.

The construction detail of the gasholder can be seen in (plate 15). The brickwork at this level having been laid lengthways at a width of two bricks thick, 0.45m. The brick size was width $4\frac{3}{8}$ ", height $2\frac{7}{8}$ ", length 9".

It was not possible to date the main remains to any of the building phases mentioned above, however, a second phase, possibly earlier, partially exists in the extreme north-east of 8D and 9E. Plate 16 shows the view north-east adjacent to the east rim of the main gasholder. At the right of the photograph can be seen a low curved wall. Projecting the wall as a full circle, reveals a smaller gasholder with a diameter of 25.37m, around a centre offset to the north-east of that of the larger gasholder. Its depth remains unknown at this time.

As the barrier trench was being excavated, a large metal tank (plate 17), was removed from just below the present ground surface. The tank measured some 2m in length, 0.5m in height and 0.8m in width. The internal structure was separated twice along the width to form three compartments. The top of the tank was open. Underneath the tank was a closed sump 0.4m in diameter and 0.3m deep.

The tank was made of sheet metal that had been riveted together. Unfortunately due to the contaminated nature of the tank it was not possible to examine it in detail. It is possible that the tank may have been a liquor collector.

The well structure was unearthed during the excavation of the barrier across 9E. The top of the well was discovered at an approximate depth of 2m beneath the present land surface. Its remains survived a further 2m at least; however, the bottom was not discovered during the watching brief.

The construction of the well consisted of a single layer of brick laid in a circle to produce a round vertical shaft with an approximate diameter of 1m. The brick size used for construction was width $4\frac{1}{2}$ ", height $3\frac{1}{8}$ ", length $9\frac{1}{2}$ ".

Plate 18 shows the well in situ at the bottom of the barrier trench. The north-west edge of the well was still standing and the dome of bricks in front of it was part of the west edge, dislodged by the excavator bucket.

Grid 10A

The features revealed in grid square 10A were a tiled floor of a small room. The tiled area was surrounded by the base of a brick wall on three sides, the fourth having been truncated by the trench. Running off towards the south-west of the tiled area was a later wall, Plate 19.

The tiled area measured 2.02m in length and was surrounded by a double skin of brick with an intervening gully, 0.3m thick, of soft bonding material. The tile layout formed a chequered pattern of red and black tiles, each tile measuring 9" square with a thickness of 1 $\frac{3}{8}$ ".

The orientation of the building differed from that of any other surviving structure on the site, however, the surviving north and east walls do align with the north and east walls of a building recorded on the 1887 map (fig 5 or 7).

The join between the floored structure and the south-west extension wall can be seen in (plate 20). It can be seen that the southern wall abutted the south-east wall of the tiled building and so can therefore be interpreted as a later addition. This is supported by the 1905 map (fig 7) which shows the addition of the wall.

Grid 11A

Only two small features were noted in grid square 11A. They consisted of a pair of concrete bases approximately 0.7m by 0.75m by 0.6m deep. The top edge of the bases had bevelled edges and mould marks could be detected on the side suggesting that they were probably modern factory manufacture (plate 21).

Moulded into each of the two bases were a pair of steel rods approximately 0.25m in diameter. The rods obviously formed part of a vertical support for something stood on the bases. The pair of bases were set at roughly 1.8m apart (plate 22).

Grid 11B

Grid 11B contained the majority of the archaeological features for the site; a sub-surface structure of brick arched chambers as well as some of the remains from the floor above and to the south.

The layout of the remains can be seen on (fig 11) which shows a rectangle arranged roughly north-south along its length. The building is therefore on the same alignment as the surviving 1822 gasholder building and fits within the floor plan of the coal sheds noted on the 1851 Public Health Map (Figs 4&7).

The main concentration of surviving structures measured 19.35m in length and 9.91m in width. The first indication of their presence was not noted until a depth of 1.2m beneath the present surface had been removed. After that point, their remains continued to a further 2.2m before ending in a brick floor (plate 23).

To the east of the main concentration of features were two further lengths of wall and the base of a chimney, possibly related to the arched brick chambers.

Plate 24 shows the stratigraphy of the fill above the surviving archaeology. The contamination at the site again prevented any accurate measurements or section

cleaning to be undertaken and so it was necessary to work from digital photographs in order to record information. Fig 12 shows an interpretation of the various fill events that arose after the retort building had gone out of use.

At the top there was an overburden of rubble and clay from the current work at the site. Beneath the overburden was a single course of brick comprising the courtyard recorded during evaluation work see (fig 3 & plates 2&3). The bricks, from which the courtyard was constructed at this point, were blue/black in colour and measured: width $4\frac{7}{8}$ ", length $8\frac{5}{8}$ " and height 3". The undulating profile of the brick course has been affected, possibly by subsidence, but certainly by the passage of heavy machinery during the current work.

Underlying the brick course was a fairly uniform layer of heavily compacted soil which had obviously leached materials from the courtyard surface during the later period of gas manufacture at the site. The resultant material had become almost brittle in nature.

Beneath the compacted layer of fill could be seen a section of concrete with large inclusions of stone. The layer of concrete appeared to have been bonded on top of hardcore to the north and a partial layer of brick material to the south. The event appeared to have been created in order to achieve a horizontal surface.

The layer under the levelling event was a tightly compacted area of contamination; highly concentrated with tars.

The next layer down can be seen at the centre of the exposed section. The fill was a thin lens of red clay; which actually occurs naturally at the site, but not in this instance as it overlays archaeology. Although the clay appears as a lens it is possible that the localised effect may be a result of excavation problems. Unfortunately, circumstances did not allow for any further investigation into this matter.

Similarly the next layer down was localised to the centre of the trench where a lower layer of white/light grey clay can be seen. The white/light grey clay overlaid, and vertically enveloped the next layer down which consisted of a dark brown clay, which does not seem to occur naturally at this site.

The final layer of stratigraphy in the photograph can be seen as a thick layer of very heavily compacted, contaminated fill.

It was under the layers described above, at an average depth of 1.25m, that the first of the structures associated with the arched brick chambers were revealed (plate 25). It was not possible to clean the area of interest nor was there a good vantage point available from which to take photographs therefore the main features have been highlighted in red to aid interpretation. Fig 8 shows the features in plan view, the dashed lines revealing the position of the underlying structures (arched brick chambers).

The more identifiable features in (plate 25) are as follows:

The wall along the right of (plate 25); annotated in (fig 8) as wall 1. The wall forms the western side of the building and measured 19.35m long, 0.23m in width and survived to a depth of 2.2m. The wall matches the position of the west wall of the 1851 coal shed (figs 4 & 7).

The parallel wall base to the left of (plate 25), (fig 8) wall 2, was identical in length, width and depth. At its southern end an extra line of bricks had been added to the west face of the wall forming a strengthened terminal end. 1.85m to the south and on the same alignment was an identical section of wall base (wall 12, grid 12B). The possibility is that this area used to serve as a doorway. The wall matches the position of the east wall of the 1851 coal shed (figs 4 & 7).

The three horizontal walls bases and one curved wall base in (plate 25) relate to wall bases 5, 6, 7 and 8 (fig 8). Both 5 and 6 were 0.23m wide, 4.3m long and survived to a depth of 0.2m. Wall base 8 was a partial length, parallel with 5 and 6 but only 1.2m long. Wall base 8 appeared to have been butted into an earlier wall, 7, which formed an arc of a circle (plate 26). Wall base 7 was unusual because it did not seem to be part of the rectangular layout and possibly represents an earlier construction at the site. As there was a white/light grey barrier along the outside of its surviving length it is possible that it may have been an early gasholder. Other gasholders on the site exhibited similar clay barriers.

Three other sections of wall base 9, 10 and 11, were found in 11B, wall base 9, (fig 8), formed a 1m continuation of wall base 6 and wall base 10, which joined it at right angles, running parallel with wall base 2 for about 0.6m. There was not enough of either to form an interpretation of their purpose.

Wall base 11 (plate 27) was one of the few surface features above the courtyard to be found at the site. Its length was 5m with a width of 0.23m but unfortunately it had no associated features to help with its interpretation. It is however, probable that it related to one of the later buildings at the site.

The most structurally complete features at the site were found beneath the level of wall bases 1 – 10. The remains consisted of four arched chambers, 4.3m long, approximately 1.3m wide and 1.7m high. The chambers were entirely of brick construction. Plate 28 shows a view of chambers 1 & 2 with the arched roofs removed. Chambers 1 & 2 were intact whilst 3 & 4 were missing their arches and had been filled in with rubble. Chamber 3 had a cast iron pipe running through it which was linked to an old gas main with a junction fitting dated 1955 (plate 29). This could point to a date of when modifications were done to the chamber building, which involved demolishing some of the sub-surface levels. Chamber 4 was also full of rubble and missing its arched roof.

All four of the arched chambers were originally connected to each other by two cross arches in adjoining walls. Plate 30 shows the western connection between chambers 1 & 2 and (plate 31) the eastern connection. It was not possible to record internal connections between 2 & 3 and 3 & 4 due to their demolished states. Plate 32 shows the interior of chamber 2 through a breach in the roof. As can be seen the structure was intact enough to hold over 1.5m of liquid.

Chamber 4; unlike the other three, was open to the west side (plate 33). The opening was an access tunnel to facilitate the removal of ashes. Plate 34 gives a view looking north-east along the west wall of the building's outer wall. In the foreground is the portal arch and just beyond can be seen the later gas pipe which ran through chamber 3. It is possible to see that chambers 1, 2 and 3 did not penetrate the western wall as was the case with chamber 4.

The inside of chamber 4 had two arches which originally connected to chamber 3 but these had both been bricked up (plate 35).

The final feature in grid 11B was a circular structure to the east of chamber 1. Plate 36 records its position in the foreground with chambers, 2 & 3, at the top of the photograph. The structure was constructed from a double layer of shaped bricks into the form a shaft. Plate 37 shows one of the bricks from the outer rim. The brick measured: inside length 7½", outside length 8⅞" width 4½" and height 2⅞". The diameter of the brick ring measured 1.42m outside and 0.8m inside (plate 38).

Unfortunately adverse weather conditions, contamination and site instability prevented any further information to be obtained about this feature. The interpretation of the feature as a chimney associated to the arched brick chambers was inferred from its proximity to the latter.

Grid 12B

Grid 12B was relatively free of any archaeological features although it did include wall base 4, the end of wall base 2, and wall base 12 (fig 8). Wall bases 2 and 12 were already described above in grid 11B for ease of interpretation. Wall base 4 (fig 8) forms a south edge to the floor plan of grid 11B.

Three other sections of wall were noticed briefly during the excavation of the barrier trench, however, as has been noted above the instability of the ground led to their exposure being brief.

Plate 39 shows the eastern section of wall as a single brick width just below the courtyard surface. The alignment of the wall was not picked up beyond the barrier trench therefore its function is unknown. The position of this wall relates to that of the western edge of the retort building (figs 4 & 7). If this is the case then it could be dated to pre-1851.

Plate 40 shows a similar section of wall with a horizontal layer of brick just below the courtyard surface. This corresponds to the stratigraphy shown in section drawing (fig 12) based on (plate 24). There appears to have been a rectangular area to the right of the wall which has a very noticeable fill event, possibly indicative of an internal room structure when the area was filled in. The wall is aligned to wall 12, (fig 8) and its position relates to that of the eastern edge of the coal shed (figs 4 & 7). If this is the case then it could also be dated to pre-1851.

Plate 41 shows the third section of wall, this time one and a half bricks wide. The alignment of this wall would tend to suggest that it is an extension of wall 1, (fig 8) and its position relates to that of the western edge of the coal shed (figs 4 & 7). If this is the case then it could also be dated to pre-1851.

Grid 12C

The archaeological features found in 12C, were also uncovered during the excavation of the barrier trench, but in this instance the trench was approximately 5m wide which, allowed for a more clear view of the underlying structures.

The remains in 12C were first uncovered at just 0.2m below the courtyard surface which at this point was constructed of a different brick than elsewhere. Plate 42 shows

one of the bricks types which were laid with the pattern on the side. The bricks measured width $3\frac{1}{2}$ ", length 9" and height $2\frac{7}{8}$ ". A non pattern variety of brick had also been used in the same area measuring width 3", length $8\frac{7}{8}$ " and height 3".

Beneath the courtyard were the remains of a narrow room measuring 1.8m in width and extending through both sides of the trench; therefore over 5m long. The standing structure consisted of two walls, the northern wall which remained to a height of 0.48m and the southern wall which remained to a height of 0.6m Plate 43. At this depth there appeared to be a compacted surface between the walls and there were a few pieces of tile present which may have indicated a floor level. None of these were recovered because of contamination.

At the proposed floor level, the northern wall was a single brick construction giving it a width of 0.23m whereas the southern wall was two and a half brick construction giving it a width of 0.58m. Plate 44 shows a later view of the same area. The 1.8m room is self contained in a brick wall some 0.23m wide with a possible brick floor two courses high. The southern wall (right) was not bonded to the thicker northern wall.

Beneath the floor level, the southern wall continued down for a further 2m, becoming wider as the wall stepped out on both sides. Plate 44 shows the stepping on the inside of the wall and (plate 45) shows the same stepping on the outside. It was not possible to examine the wall due to the contamination.

Plate 46 shows a view of the same area after it had been cleaned off by a 30 ton excavator bucket. The above room was clearly visible and had been filled in with fairly sterile rubble. The outside of the building to the left however, was firmly entrenched in contaminated fill. To the right of the building was a fill of red clay; other examples of such barriers on the site have located outsides of structures.

The upper room corresponds to a structure shown on the 1851 Public Health Map (figs 4 & 7) as an annex to the north of the retort building. The thickness at the base of the southern wall, and the barrier, would tend to suggest that the southern wall was probably the northern extent of the retort building.

Beneath the floor of the room mentioned above can be seen an area of intensely contaminated fill including a wooden tar barrel. It is possible that lower structure shown in the photograph is the remains of a storage cellar for tar barrels. However, to the right of the barrel is a large block of stone which appears to have been deposited as a back fill. The photograph may therefore show not a purpose built sub-surface room but just an event of demolition and backfill.

At the extreme south-east corner of the site stood a cast iron gas lamppost (plate 47). Given the history of the site, the lamppost was recorded by digital photograph and reported to the SMR. The gas lamp was intact with the exception of the lamp apparatus at the top. Plate 48 gives a close-up of the decoration around the base of the lamppost and shows the maker's stamp which was difficult to read because of layers of paint. However, the bottom word either reads "DERBY, DARBY, DERDY or DARDY".

As the lamp stands within the area of the retort building (figs 4 & 7) it can be argued that its erection must post date the demolition of the building: post 1851.

Outside the grid area

As the work progressed on the site, other service contractors were undertaking various operations outside of the immediate area. One such operation was undertaken by TRANSCO adjacent to the west of the 1822 gasholders. Their work involving capping off gas service mains resulted in the excavation of the ground close to the building. With the permission of the TRANSCO staff some opportune archaeological recording was made of some the sub-surface structures in the area.

Plate 49 shows the view across the service trench looking towards the south. The west corner of the 1822 octagonal gasholder is to the left of the photograph. To the right of the photograph, smaller diameter gas pipe can be seen the curved 19th century culvert over the Saltisford brook (CR3091/13) (fig 8). To the left of the photograph are two brick lined tunnels that go under the 1822 gas holder.

Plate 50 shows the north view of the same section after further excavation had taken place. Between the two gas pipes are the remains of a building that was destroyed when the pipes were laid (fig 8). The building seemed to be associated with the tunnels mentioned above.

Plate 51 shows the two tunnels; one corbelled and one arched. The corbelled tunnel was full of debris which made it difficult to assess but it appeared to have a water filled sump. Its alignment took it along the northern edge of the building. The arched tunnel however, led under the 1822 octagonal gasholder (fig 8) and was constructed in a similar way to the 19th century culvert mentioned above. It is probable that the arched tunnel was part of the 1822 construction although its purpose could not be identified.

Discussion and Interpretation

Reliability of field investigation

The excavation was hampered slightly by the large concentrations of tarmac and rubble overburden left by the demolition of buildings on the site. Rubble was removed both by closely supervised machine and by hand. Proceedings were also hampered by the potentially dangerous chemicals present on site.

The watching brief was restricted by the nature of the site and the job at hand. The contaminated fill made close examination impossible within the guidelines of health and safety. The unpredictable instability of the ground allowed for only brief glimpses of features in some cases; safety taking precedence over recording. Within these limiting parameters, it was unlikely that any significant record could be made. No dating evidence that could be examined was available and therefore the only insight remains with the limited written records. Understanding of building and demolition sequences was also extremely limited due to restricted access.

Overall interpretation

The earliest standing remains on the gasworks site are the pair of octagonal brick gasholder towers dating to 1822 (plate 1). These are considered to be examples of the best preserved gasholder towers in the world and are thus of international importance. The overall findings of the excavation were consistent with the features highlighted by the 2003 investigations (Evans, 2003). The sites use was clear owing to its passing out of use within living memory and the substantial remains uncovered and recorded by the excavation. No activity earlier than 1822 was recorded during the excavation, indeed 1822 is the earliest date given for the site by the regional sites and monuments record

(Evans, 2003). Good parallels can be drawn between this and various other gasworks sites around the country such as Sutton gasworks built in 1856, Granton (Edinburgh) gasworks which developed from 1898 and Hayfield built in 1836.

The overall findings of the watching brief showed that evidence of surviving structure at the site was for the most part limited to grid square 11B. The only immediately recognisable structure was that of the arched brick chambers. The purpose of the arched brick chambers is unknown but their form and configuration closely relate to the structure expected for the furnace of a retort building; that would have lain under the retort beds.

This can be illustrated with comparative evidence from other gasworks such as at Gas Street Birmingham (Litherland 2001). The generic diagram (fig 13) shows the basic workings and layout of a retort house. At the Ansell Road site there is a difference in the layout of the arched brick chambers to the retort beds. The arched brick chambers ran parallel to the retort beds rather than at right angles; if the position of the access tunnel in the drawing is to be relied on. Another difference is that the associated chimney at Ansell Road was round and not square as in (fig 13). If the arched brick chamber was indeed a retort building then the retort beds and any associated structures or fittings had not survived. Fig 14 shows an example of the retort beds at the gasworks at Gas Street Birmingham, West Midlands. At Ansell Road, Warwick all that survived was from the brick arches down.

A problem exists interpreting the arched brick chambers as a retort building in that its position does not correspond to its location on the relevant map (figs 4 and 7). The surveyed position places the remains accurately beneath the floor of the coal shed (figs 4 and 7), at least 5m north of the recorded position for the retort building. Other than the coal shed, there are no other structures recorded on the plans, either pre or post 1851 that relate to the arched brick structure. This omission can be easily dismissed as there are no sub-surface structures recorded on any of the plans.

The conclusion therefore must be that the building represents an earlier or independent retort house or that it served another function.

One further piece of archaeological evidence that was uncovered concerns the possible well located in grid 9E. Its exact nature or age could not be ascertained from the brief glimpse that was available however; it is possible that it was the remains of a well. If this is the case then it would pre-date the gasworks and therefore the earliest date for the site in the regional sites and monuments record. Yardley's Almshouses belonging to the parish of St Mary's used to back onto the position of the well and may therefore be associated. A lease for the Almshouse was transferred in 1856. CR556/828/4.

Acknowledgements

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Thanks are also due to the excavation crews who kept their eyes open.

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Cartographic Sources

Board of Health Map, 1851 sheet 6. OS 1st Edition map 1887. 25" to 1 mile

British Geological Service. 1979. *Geological Survey Ten Mile Map*. BGS

OS 1st Edition map 1889. 6" to 1 mile

OS 2nd Edition map 1905. 6" to 1 mile

1962 Gasworks plan, Warwick 6/37/4B

ARCHIVE COVER SHEET

Former Gas Works, Ansell Way, Warwick. Warwickshire

Site Name:	GAS WORKS, ANSELL ROAD, WARWICK
Site Code:	WAR/04-5/EX/WB
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NPRN :	-
SAM:	-
Project No:	556 (EX) & 622 (WB)
Other Ref No:	CAP Report No. 325
NGR:	SO 5890 7405
Site Type:	Industrial
Project Type:	Excavation and Watching Brief
Project Officer:	Chris E Smith & Dr. Neil Phillips
Project Dates:	August 2004 (EX) December 2004–March 2005 (WB)
Categories Present:	N/A
Location of Original Archive:	Warwickshire SMR
Location of duplicate Archives:	N/A
Number of Finds Boxes:	1
Location of Finds:	N/A
Museum Reference:	N/A
Copyright:	CAP Ltd
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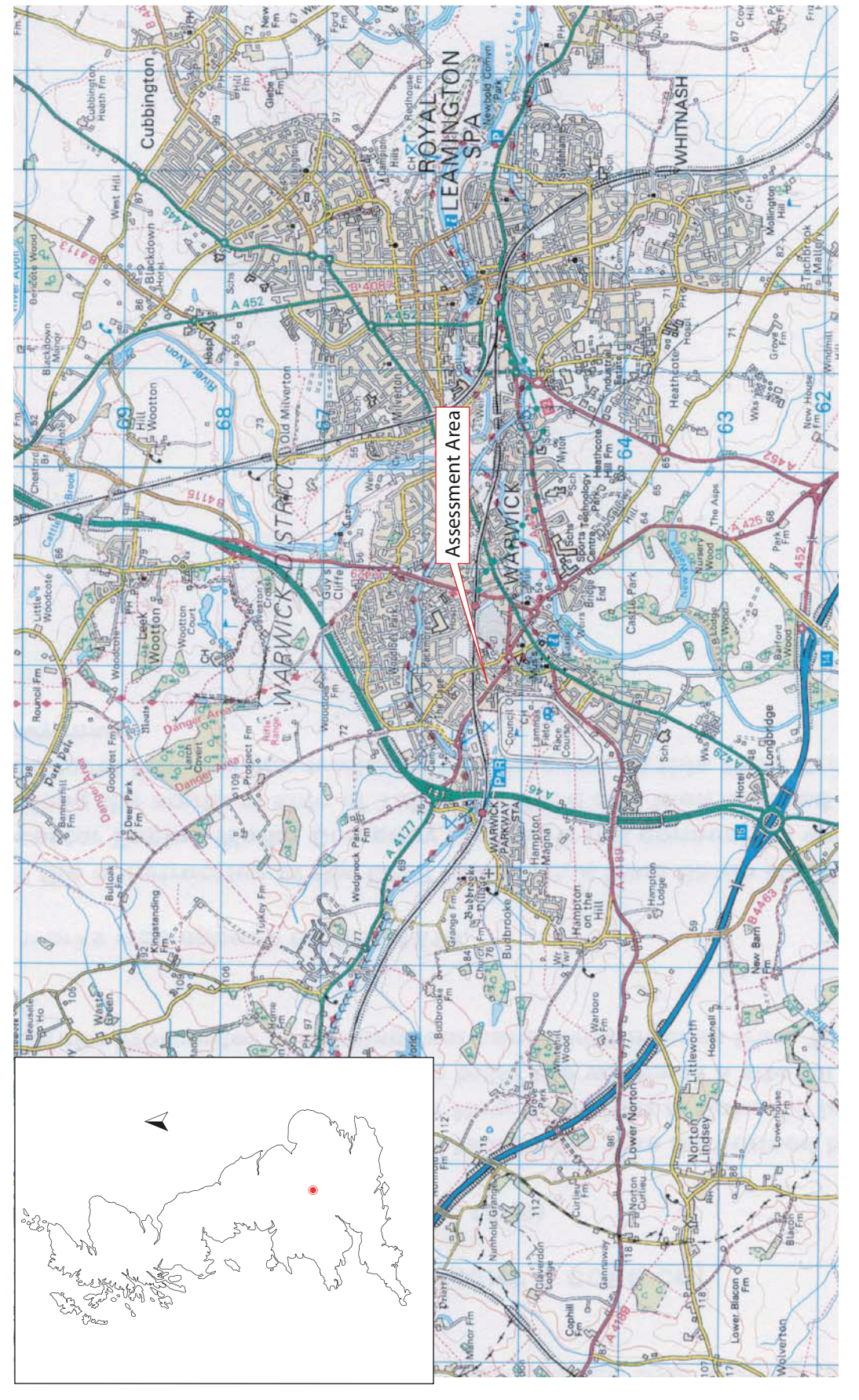


Fig 01: General Site Location Map

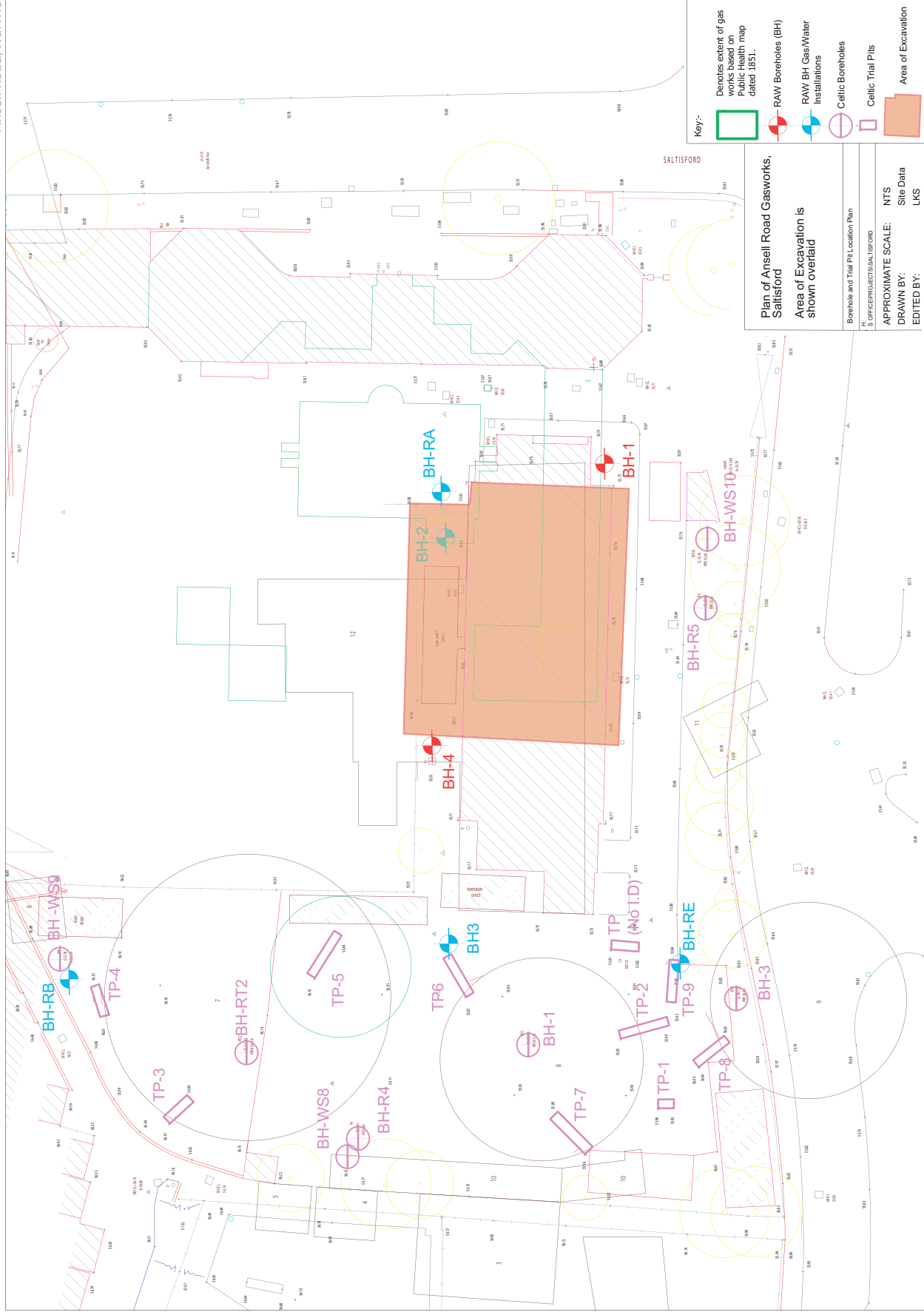
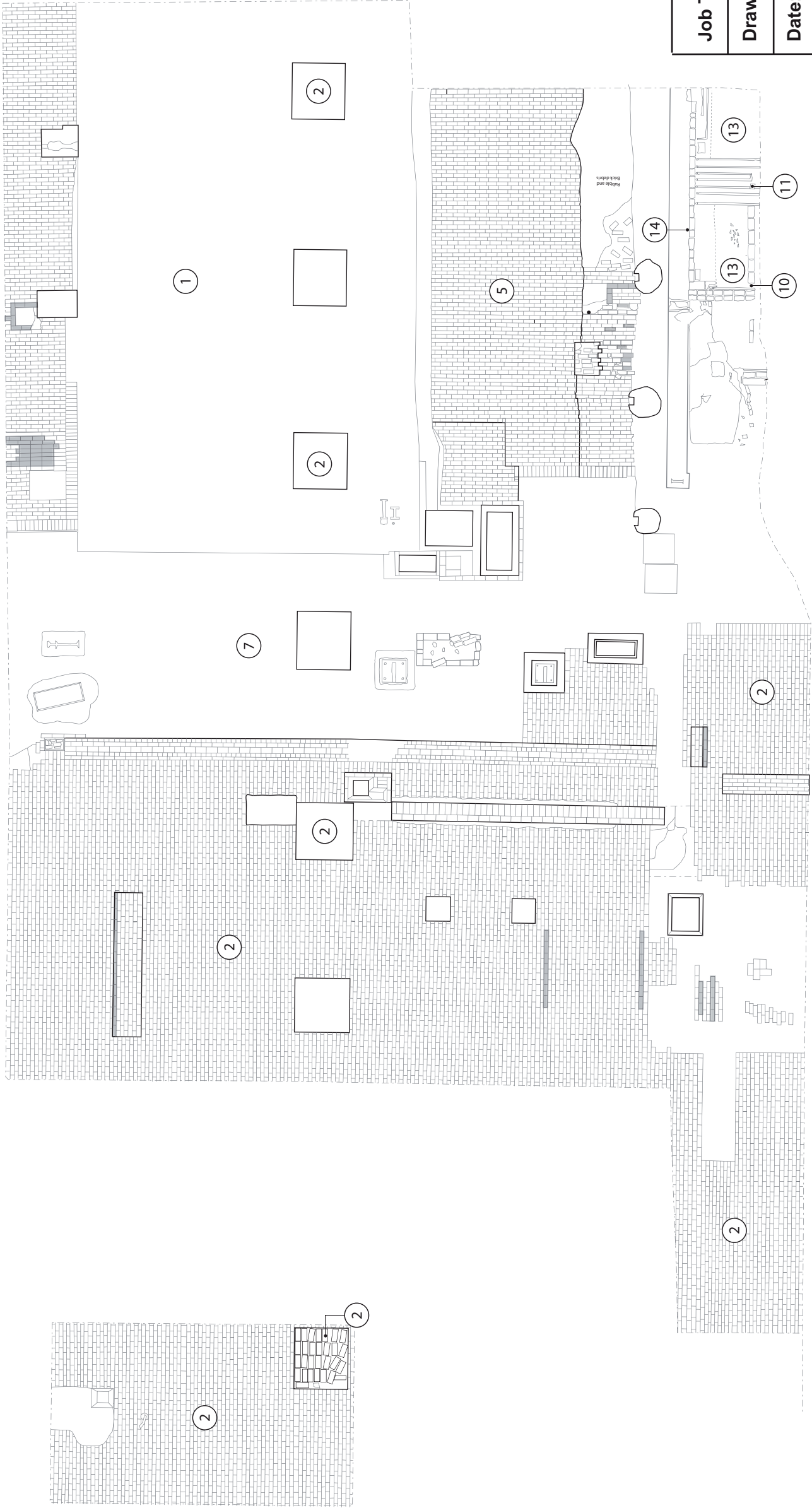


Fig 02: Location of excavation area proposed by Edward Wilson



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Drawing Title:	Detailed plan of excavation area
Date:	March 2005
Drawn By:	Chris E Smith
Scale:	N/A
Figure 03:	



Cambrian
Archaeological
Projects
Limited

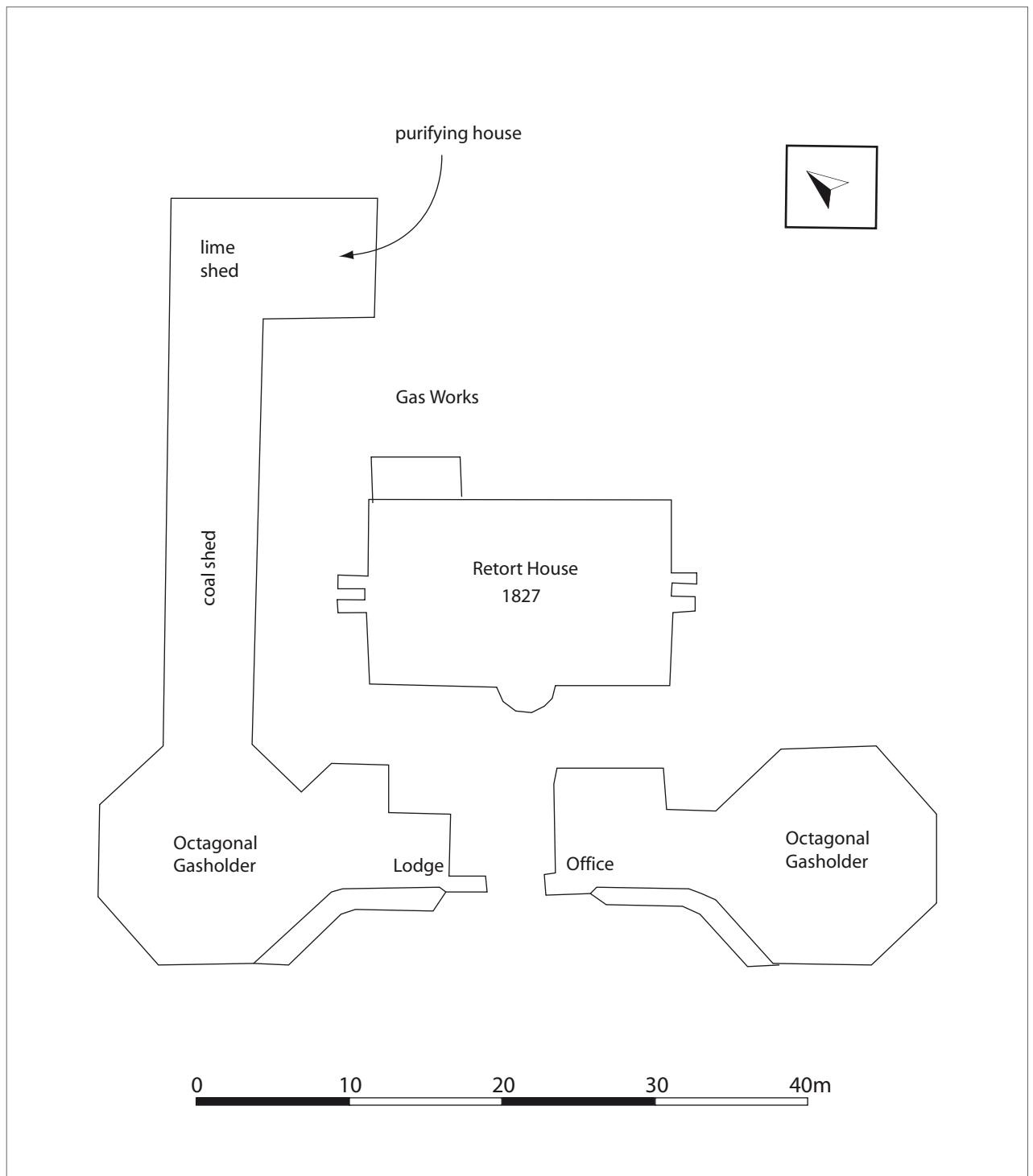


Fig 04: Plan showing structures present in 1851

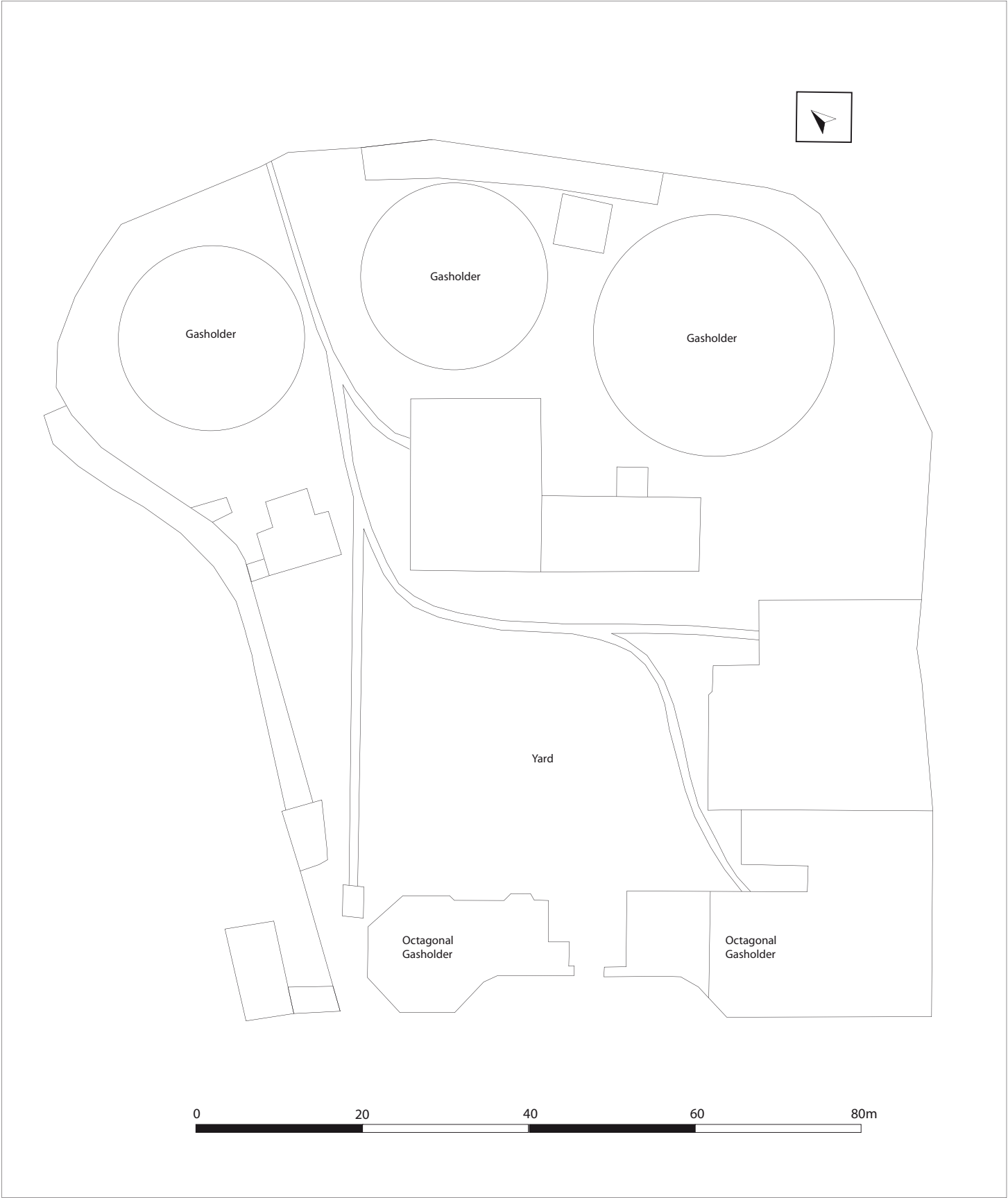
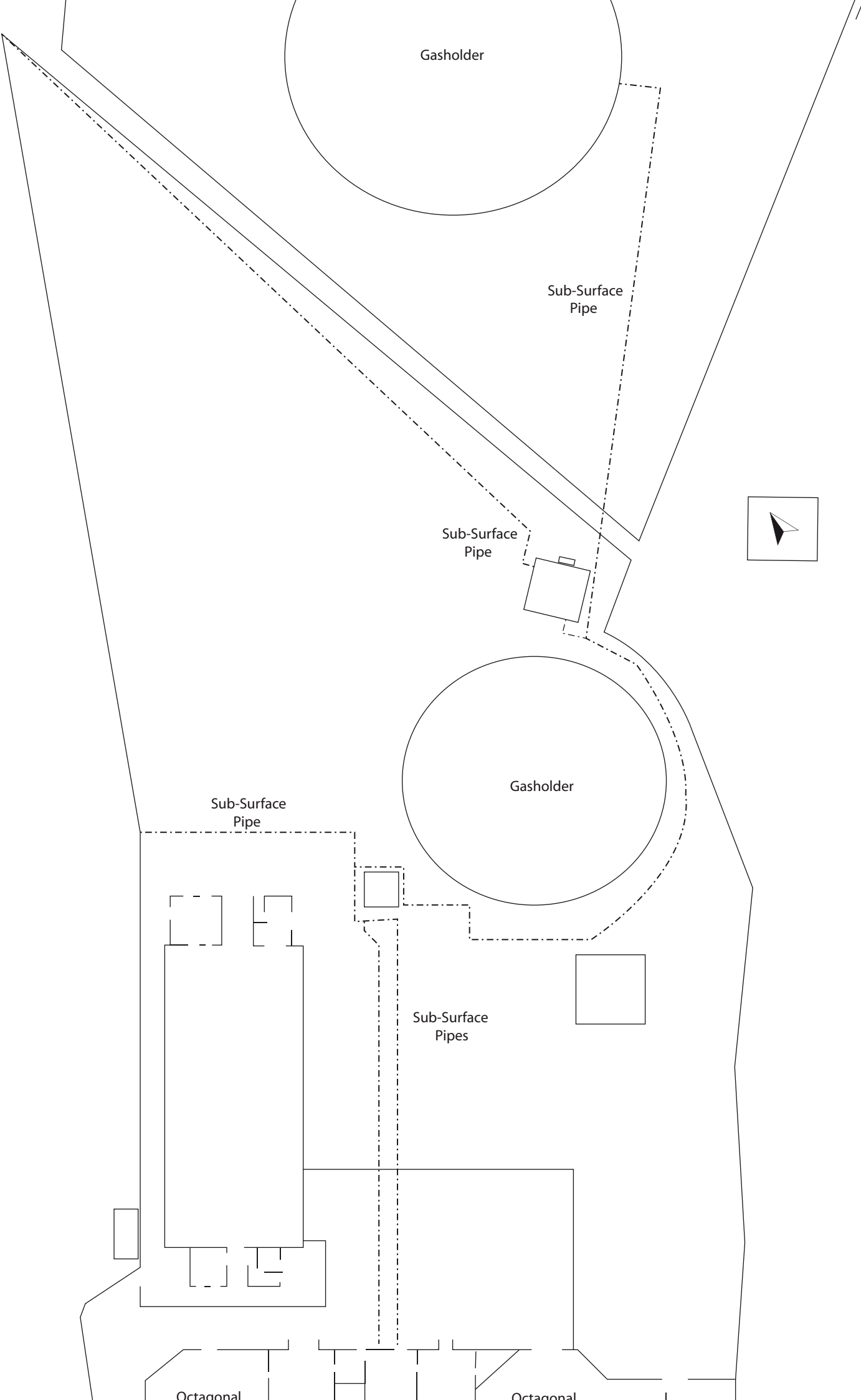
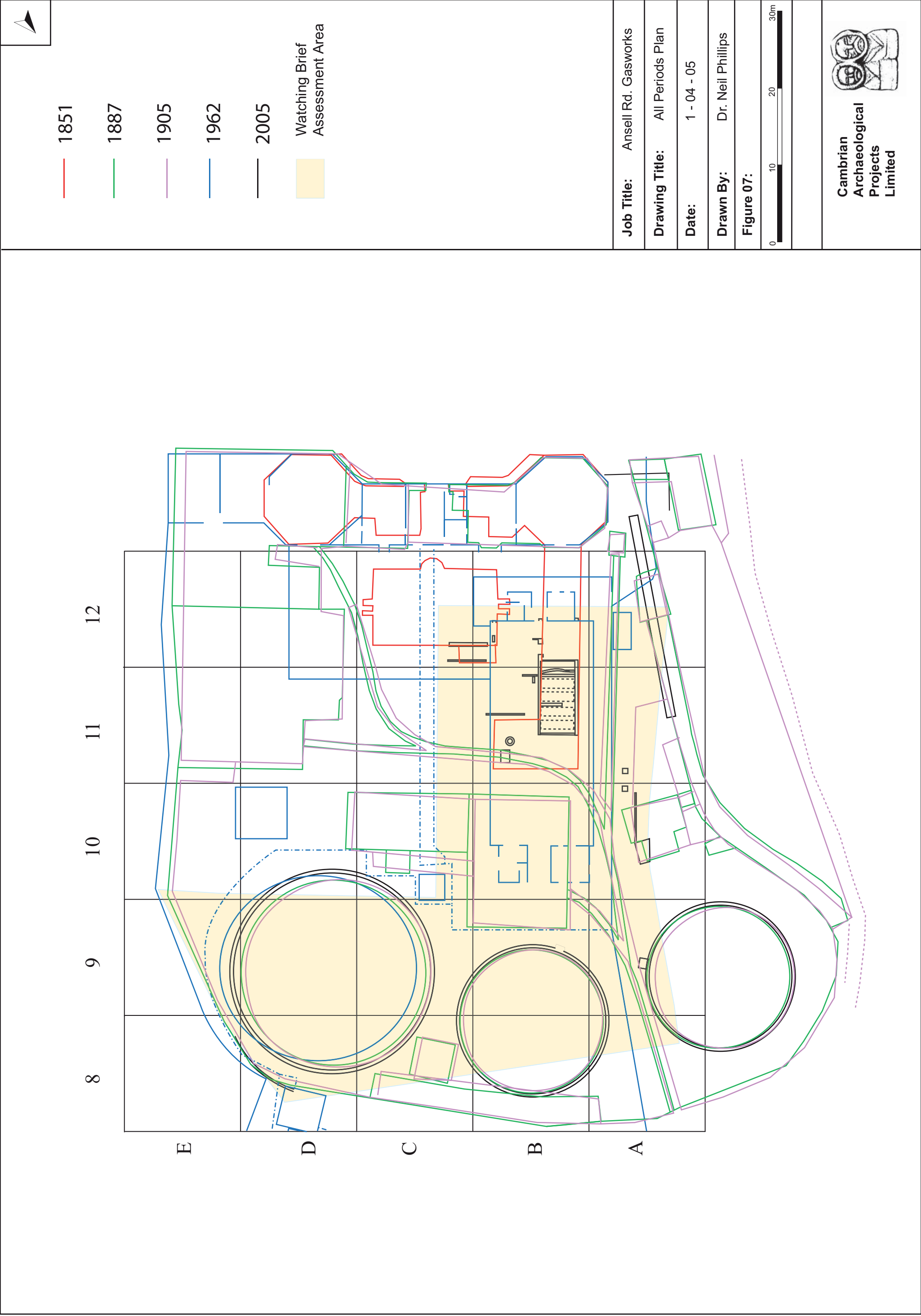


Fig 05: Plan showing structures present in 1887





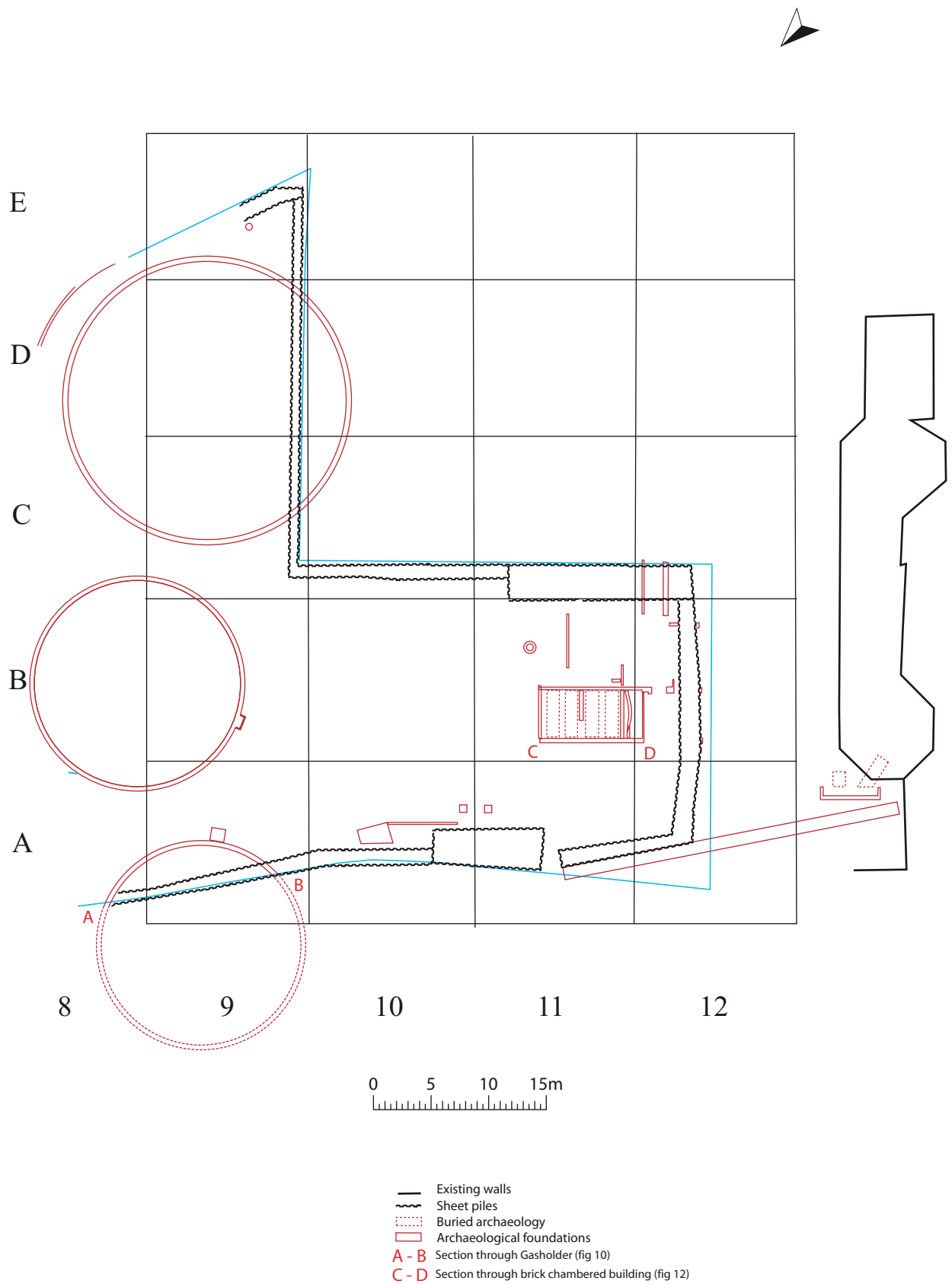


Fig 08: Site grid with archaeology

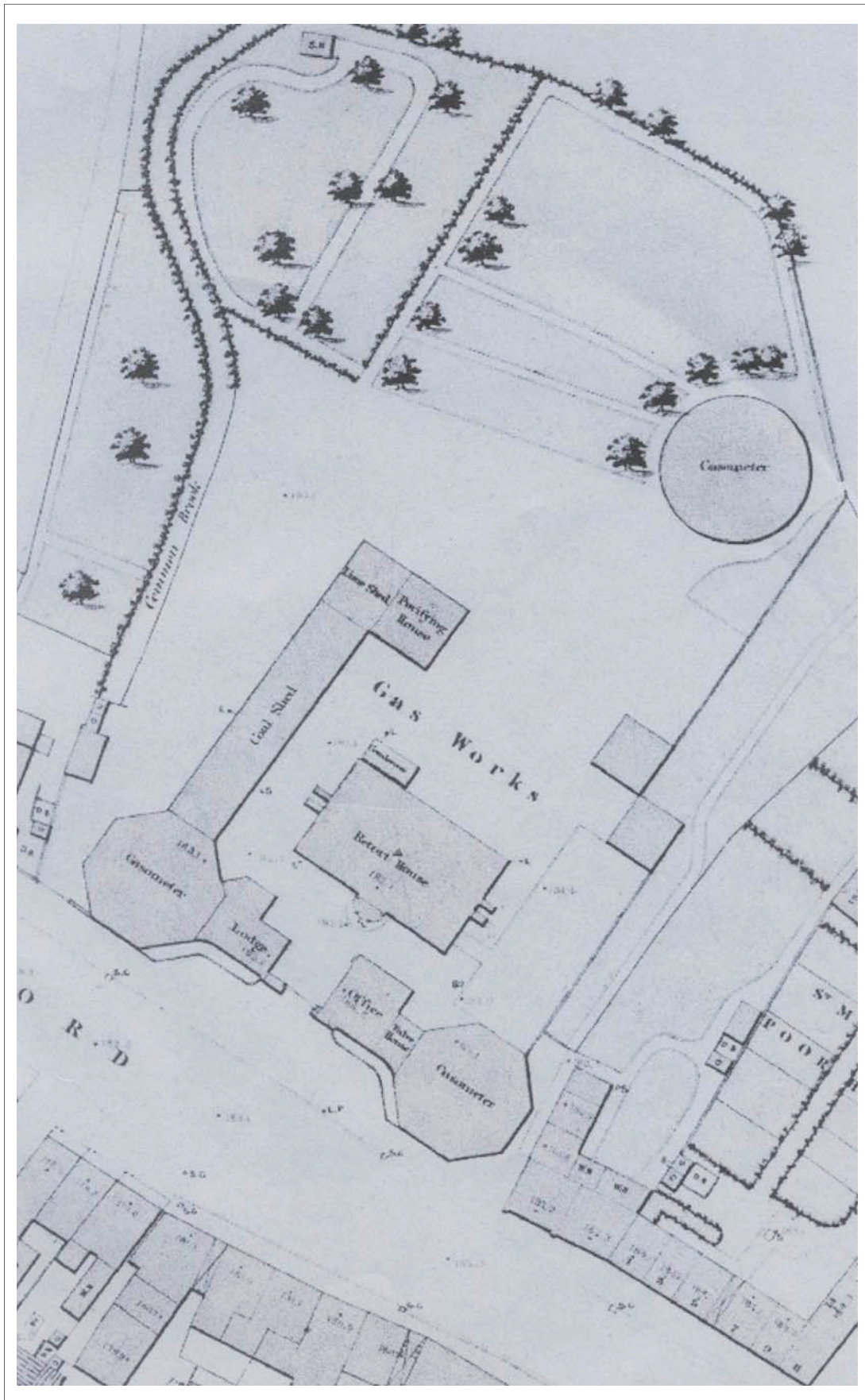


Fig 09: 1851 Public health map showing the Ansell Road gasworks

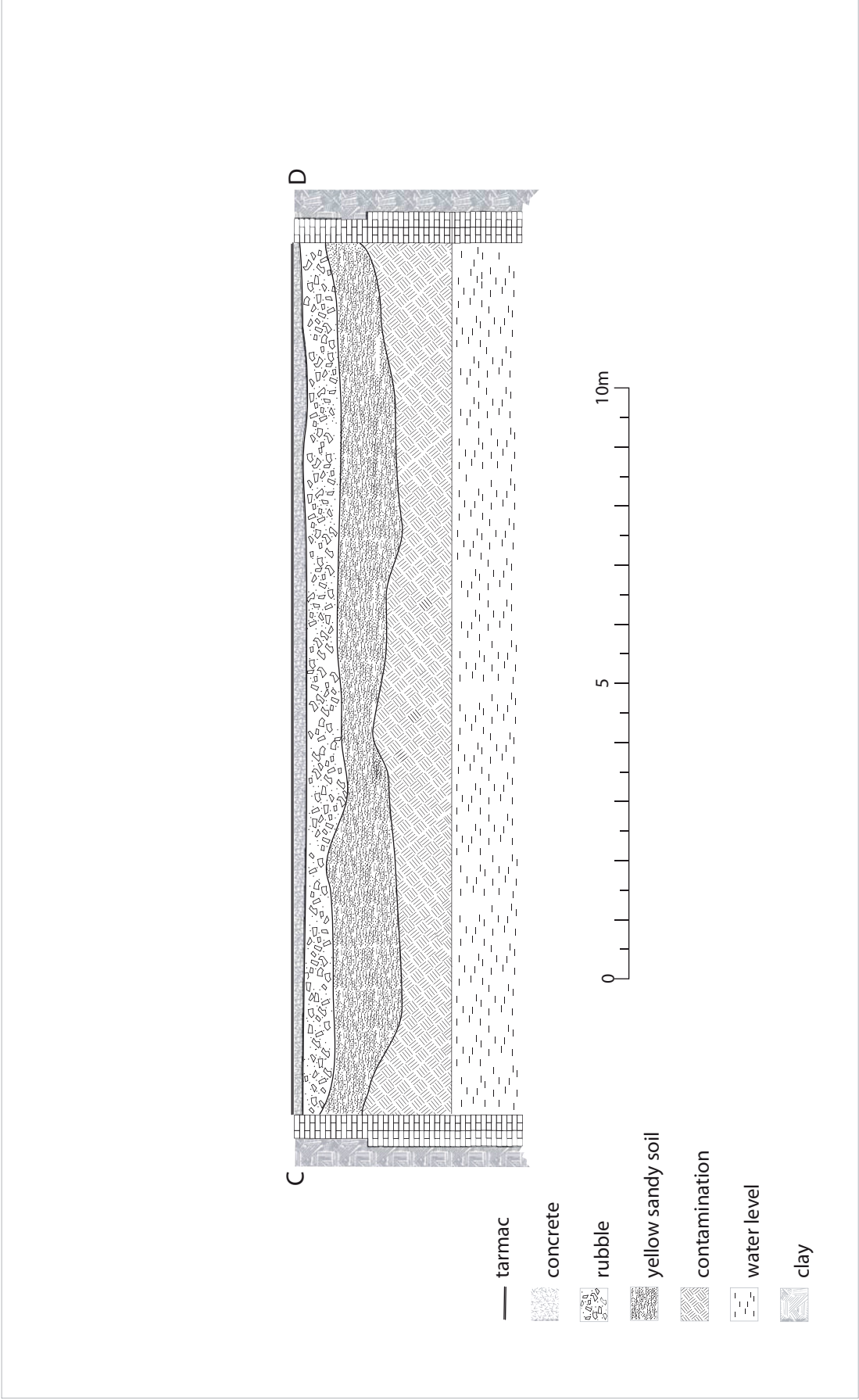
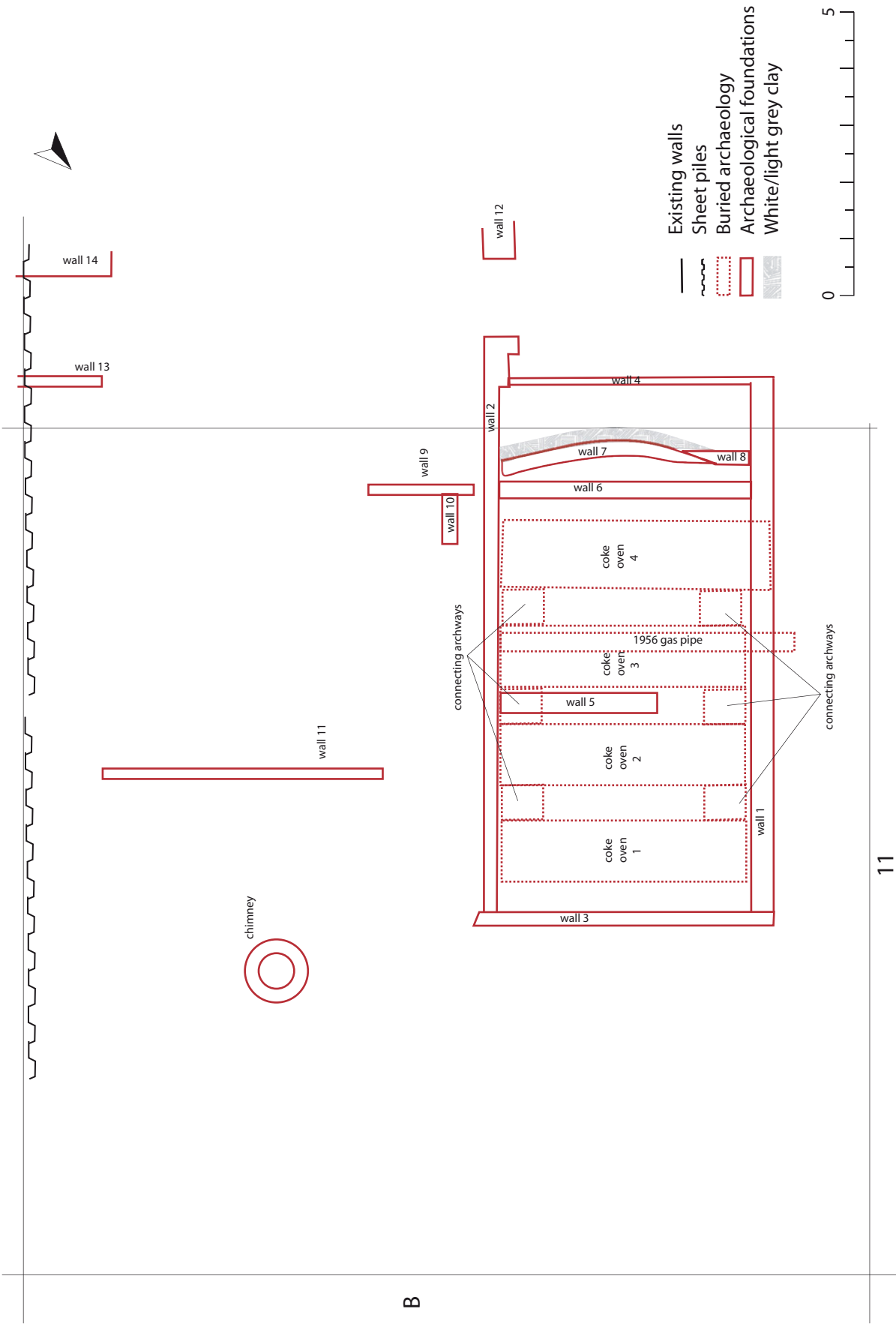


Fig 10: Section through Gasholder



11

Figure11: Grid 11B showing archaeology

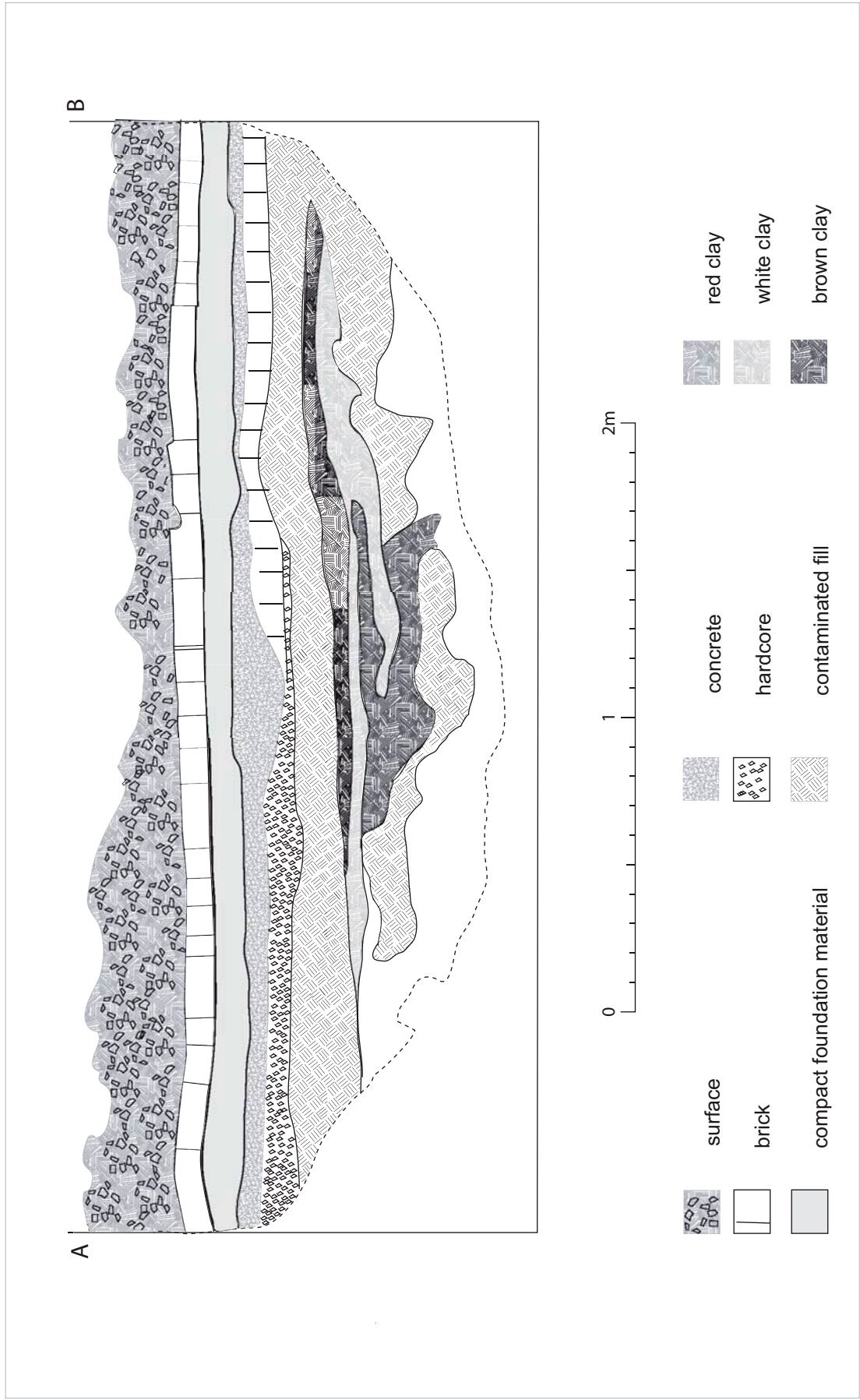


Fig 12: Stratigraphy above arched brick chambers

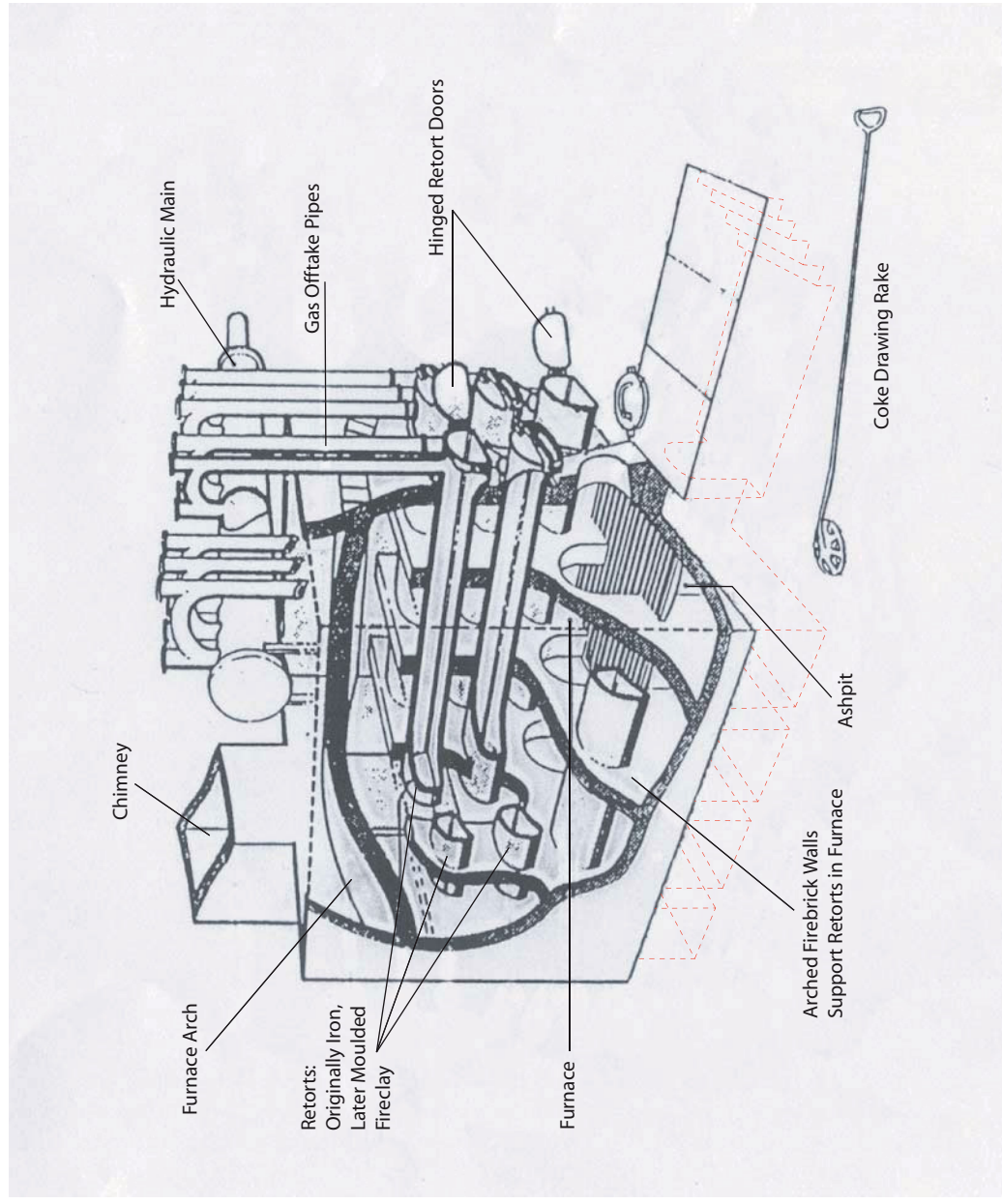


Fig 13: Generic Plan of Retort (After Cossons, 1987), Furnace Chamber Marked in Red

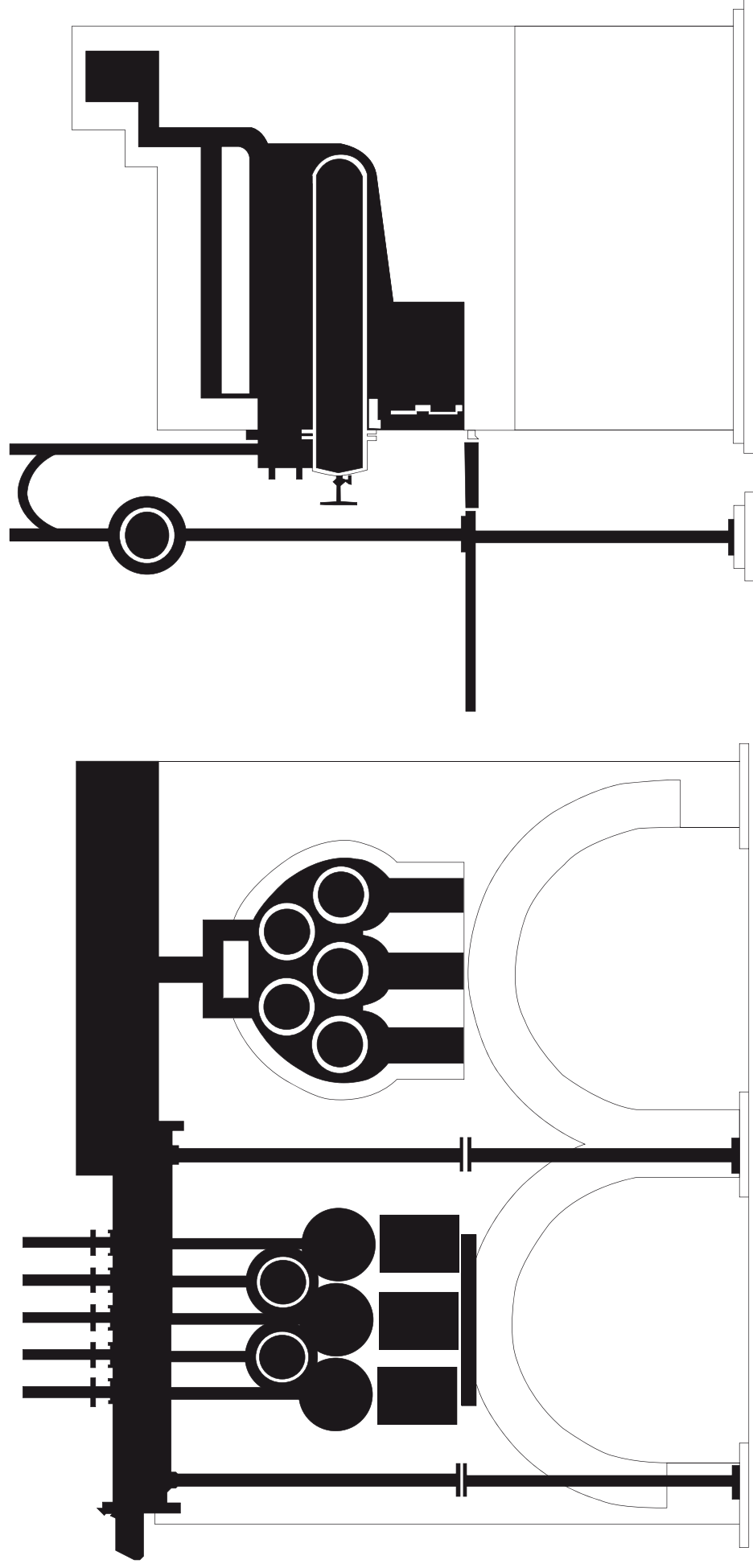


Fig 14: Example of the retort beds at Gas Street, Birmingham



Plate 01: 1822 Octagonal Towers



Plate 02: Site overview showing flooring expanses,
scale 1 x 2m



Plate 03: Site overview showing flooring expanses
and 1962 building pillars, scale 2 x 2m



Plate 04: 1962 building supports in relation to 1887 floor, scale 2m x 2m



Plate 05: Interlocking brick flooring, scale 1 metre.



Plate 06: Showing earlier flooring level beneath bricks, scale 1 metre.

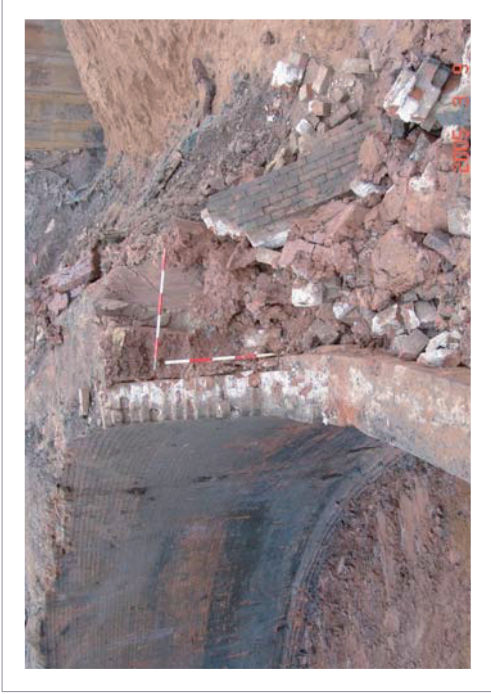


Plate 07: Gasholder rim (8B)



Plate 08: Gasholder inner base (8B)



Plate 09: Gasholder inner base, clay dome (8B)



Plate 10: Gasholder rim (9A)



Plate 11: Gasholder rim buttress (9A)



Plate 12: Tramway section (9A)



Plate 13: Gasholder outer wall (9E)



Plate 14: Gasholder inner wall & base (9E)



Plate 15: Gasholder rim (9E)



Plate 16: Double gasholder rims (9E)



Plate 17: Liquor tank (9E)



Plate 18: well (9E)



Plate 19: Offset building (10A & 11A)



Plate 20: Wall joint to offset building (10A)

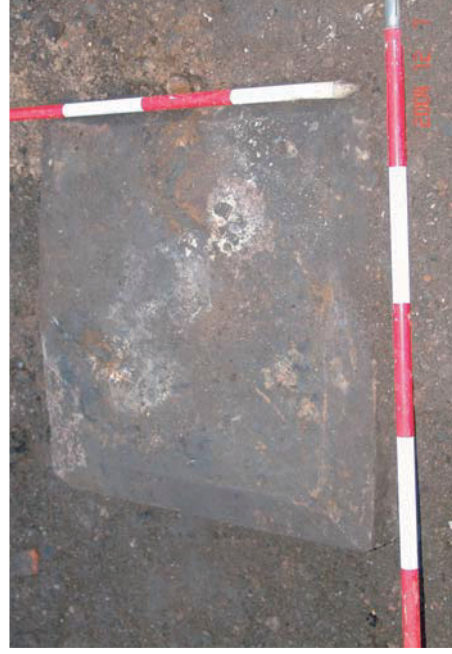


Plate 21: Concrete base(11A)



Plate 22: Pair of concrete bases (11A)



Plate 23: Arched brick chamber floor (11B)



Plate 24: Stratigraphy above arched brick chambers (11B)



Plate 25: Floor foundations above arched brick chambers (11B)

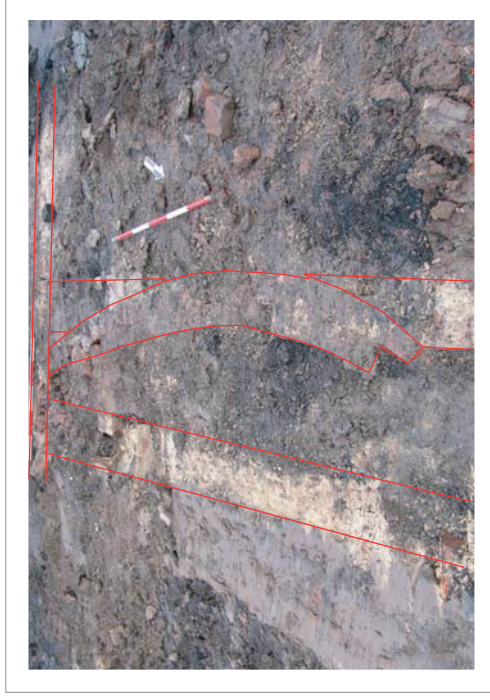


Plate 26: Close up of curved wall (11B)



Plate 27: wall base 11 (11B)



Plate 28: Brick chambers (11B)



Plate 29: Gas pipe junction dated 1955 (11A)



Plate 30: Internal arch connection (11B)



Plate 31: Eastern internal connection, brick chamber 1 & 2

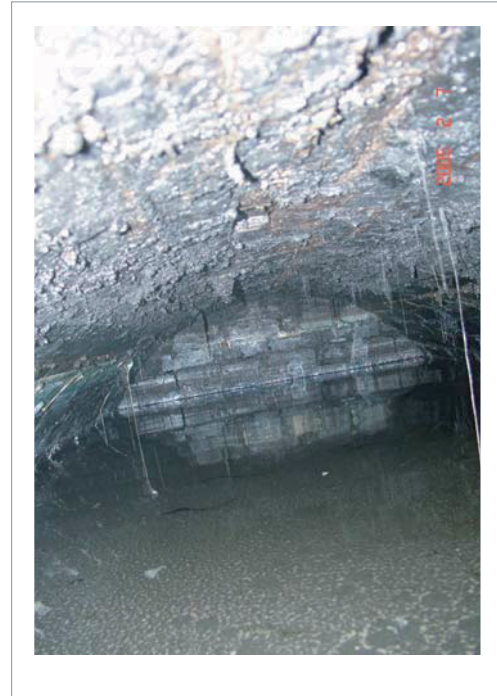


Plate 32: Inside brick chamber 2

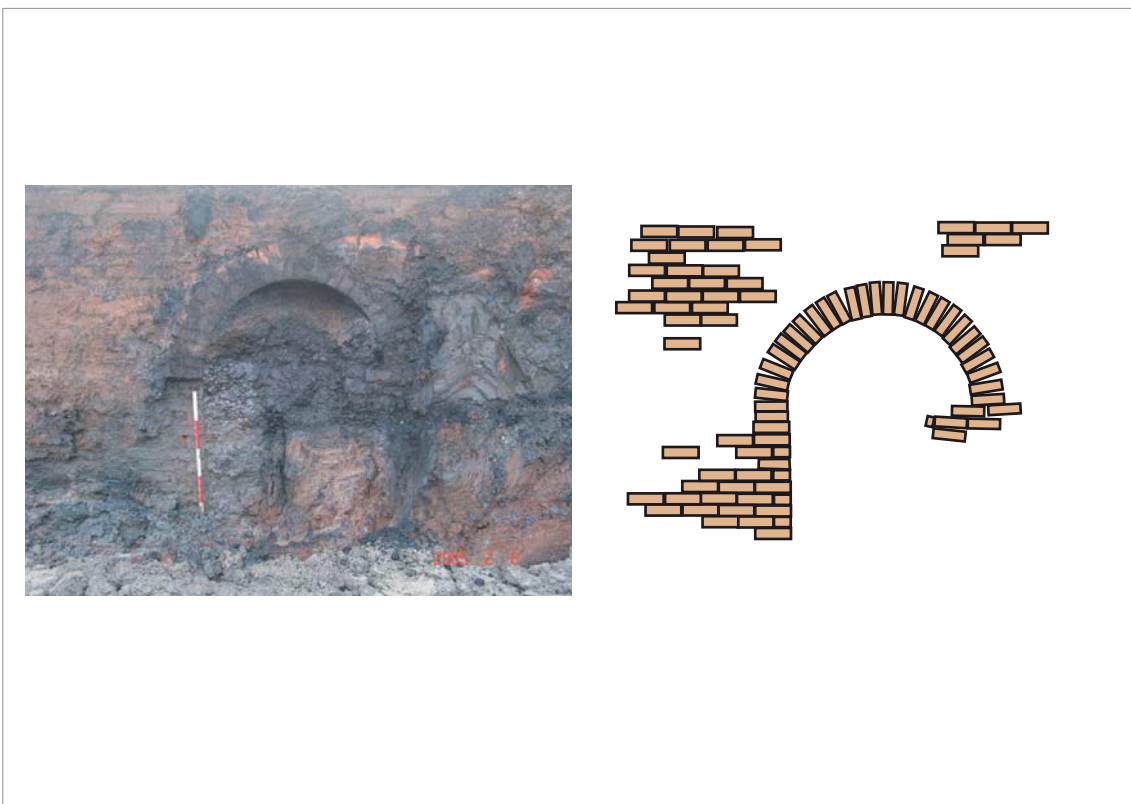


Plate 33: West portal to brick chamber 4 and schematic illustration



Plate 34: Western wall of arched brick chambers (11B)



Plate 35: Southern wall of arched brick chamber (11B)



Plate 36: Chimney base (11B)



Plate 37: Shaped chimney brick (11B)



Plate 38: Chimney base (11B)



Plate 40: South wall section (12B)



Plate 39: South-east wall section (12B)



Plate 41: South-west wall section (12B)



Plate 42: Courtyard brick from 12C



Plate 43: Narrow building(12C)



Plate 44: Narrow building and basement (12C)



Plate 45: Outside base of wall
for narrow building(12C)



Plate 46: Narrow building and sub-layer (12C)



Plate 47: Cast Iron lamppost (12C)



Plate 48: Cast Iron lamppost CAP Report No. 325 (detail) (12C)



Plate 49: West of 1822 building (view south)



Plate 50: West of 1822 building (view north)



Plate 51: West of 1822 building (view east)



APPENDIX I: **Archive Cover Sheet**

ARCHIVE COVER SHEET

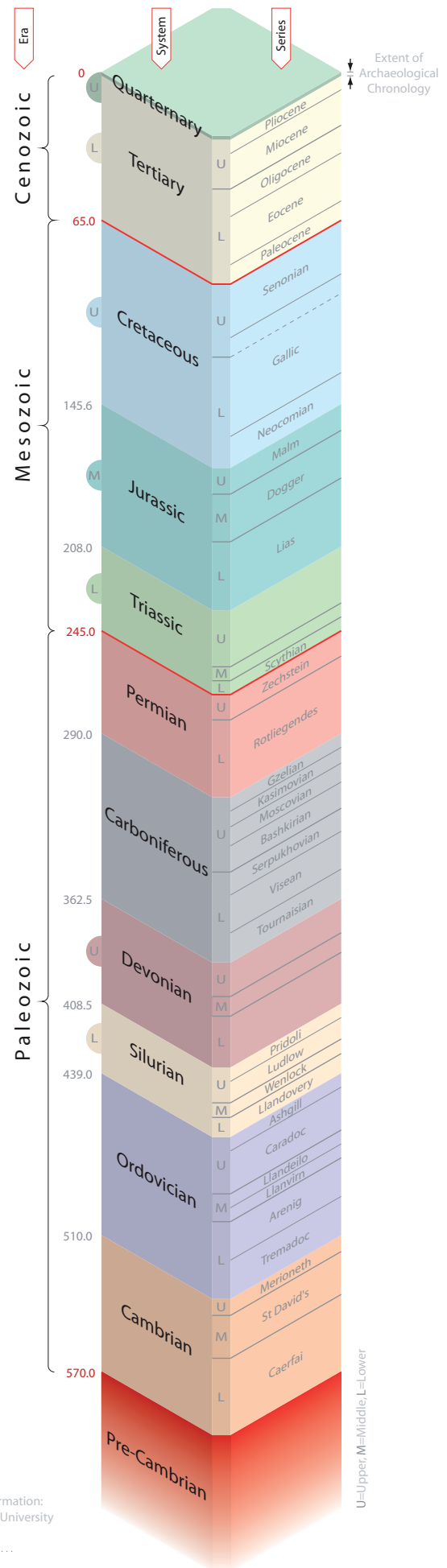
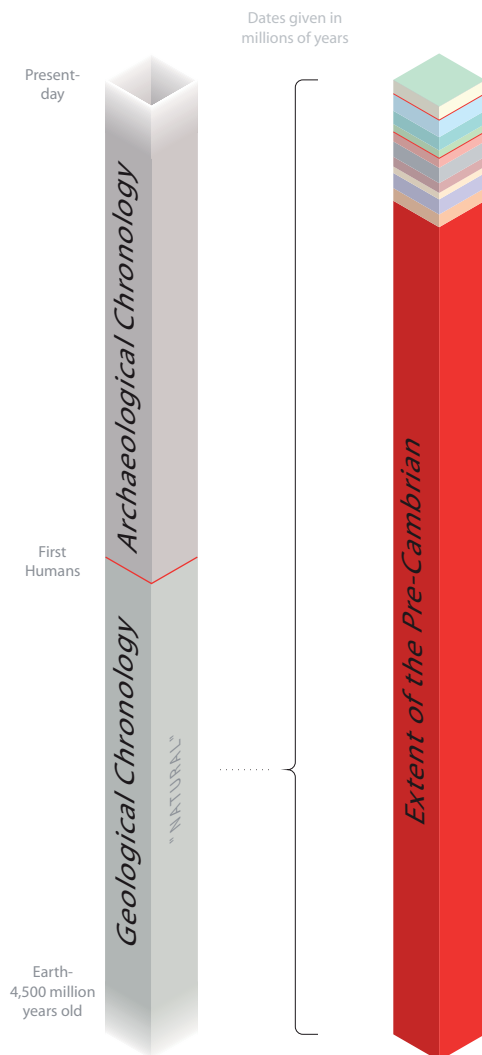
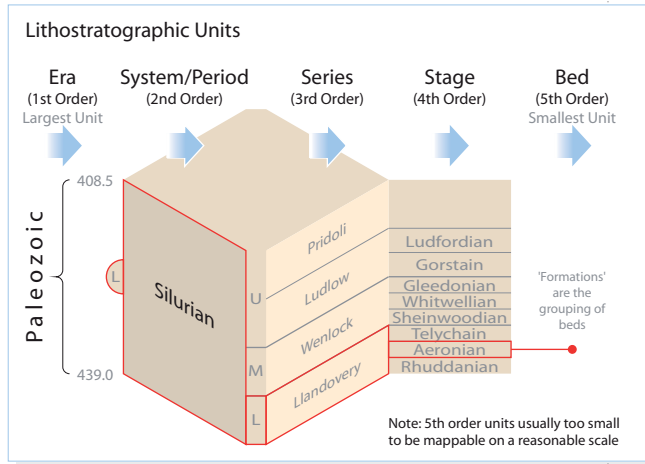
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SAM:	-
Project No:	556 (EX) & 622 (WB)
Other Ref No:	CAP Report No. 325
NGR:	SO 5890 7405
Site Type:	Industrial
Project Type:	Excavation and Watching Brief
Project Officer:	Chris E Smith & Dr. Neil Phillips
Project Dates:	August 2004 (EX) December 2004–March 2005 (WB)
Categories Present:	N/A
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Location of duplicate Archives:	N/A
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Location of Finds:	N/A
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APPENDIX II: **Geological Chronology**

Geological Chronology



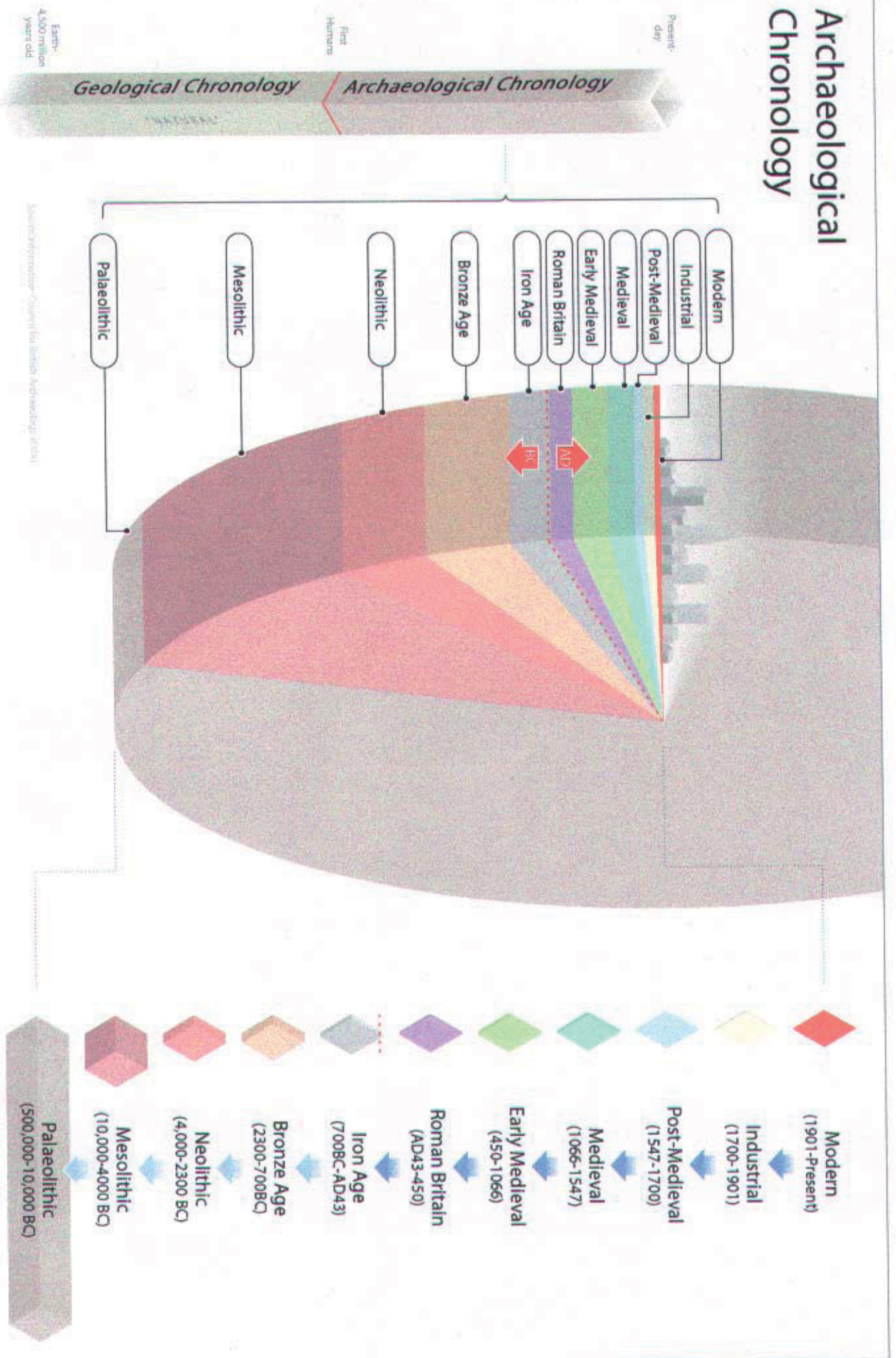
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APPENDIX III:

Archaeological Chronolgy

Archaeological Chronology





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Llanidloes
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SY18 6JR

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e-mail: info@cambrian-archaeology.co.uk