

**An Historic Environment Assessment
(with Ecological Statement)
of the Soho Foundry, Foundry Lane,
Smethwick, West Midlands**

October 2003

by

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Historic Environment Assessment (with Ecological Statement): Soho Foundry, Foundry Lane, Smethwick, West Midlands

Summary

In March 2003, a team from Birmingham University Field Archaeology Unit and Ironbridge Archaeology in association with George Demidowicz, undertook an Historic Environment Assessment of the Soho Foundry complex, Smethwick, West Midlands (NGR SP03638883), the ground breaking venture founded by Boulton and Watt in 1795 that brought together for the first time all the processes involved in the manufacture of steam engines. The work, which was undertaken for Sandwell Metropolitan Borough Council, and funded by a Heritage Lottery grant, represents Phases III and IV of the preparation of a Conservation Plan and Archaeological Assessment of the Soho Foundry, Phases I (Documentary Assessment) and II (Desk Top Assessment) of which were completed by George Demidowicz in 2002. The purpose of the Conservation Plan is to evaluate the historical and archaeological importance of the site, assess the vulnerability of the significant remains, and identify the measures that need to be taken in order to protect those remains in the future.

The study covered the whole of the site that is now occupied by the Avery Berkel weighing scale manufactory, and identified three principal historic building periods: Boulton and Watt (1795-1848), James Watt and Company (1848-1895) and W. & T. Avery (now Avery-Berkel)(1895-present). It is advised that whilst the buildings of the first two periods are extremely significant, the Avery period structures that contribute to the complex of redundant buildings at the west end of the site, are of lesser architectural or historic importance, and are replicated by buildings within other parts of the Avery Berkel site. Therefore, where their removal might facilitate the preservation of the earlier buildings, and contribute to a greater understanding of the Soho Foundry, demolition should be considered. Recommendations were also made for a programme of archaeological evaluation, building recording and structural analysis.

1.0 Introduction

In March 2003, a team from Birmingham University Field Archaeology Unit and Ironbridge Archaeology, in association with George Demidowicz, undertook an historic environment assessment at the Soho Foundry complex in Smethwick, West Midlands. This project is a scaled down version of Phases III (Archaeological Evaluation) and IV (Historic Building Survey) of the preparation of the *Conservation Plan and Archaeological Assessment of the Soho Foundry*. Phases I (Documentary Assessment) and II (Desk-top assessment) of the Conservation Plan were completed in 2002 (Demidowicz 2002).

The Soho Foundry was founded by Boulton, Watt and Sons (subsequently Boulton and Watt for convenience) in 1795 in a ground breaking venture that brought together for the first time all the processes involved in the manufacture of steam engines. It is therefore a site of international importance, and the results of this historic building, archaeological, and ecological assessment will be used to inform discussions on the future of the site.

The comparatively recent discovery that a substantial part of the Soho Foundry had survived, and the subsequent listing of the upstanding remains as Buildings of Special Architectural or Historic Interest, prompted the successful application for a Heritage Lottery Fund grant with which to finance the production of a Conservation Plan, the purpose of which is to evaluate

the historical and archaeological importance of the site, assess the vulnerability of the significant remains, and identify the measures that need to be taken in order to protect those remains in the future.

Phases III (Historic Buildings Survey) and IV (Archaeological Evaluation) of the *Conservation Plan* were originally scheduled to be undertaken in 2002 in accordance with a Brief issued by Sandwell Council (Sandwell MBC 2002), but were deferred until the results of a Structural Condition Survey, undertaken as part of the Phase V programme, were known. The report of this survey, which was issued in January 2003, concluded that large areas of the buildings posed significant hazards to anyone working in them (Joyce and Haywood 2003). As a result the measured survey and archaeological evaluation that were to be carried out in Phases III and IV, were postponed until such time as the dangers posed by the site could be mitigated.

In order to overcome these difficulties the programme was revised, the Historic Environment Assessment (with Ecological Statement) being undertaken largely from outside the buildings and from existing sources of information, in particular, the Phase I/II report (Demidowicz 2002). The project was undertaken in accordance with a Written Scheme of Investigation prepared by Birmingham University Field Archaeology Unit (BUFAU 2003), based on a brief issued by Sandwell MBC (Sandwell MBC 2003, reproduced here as Appendix 3).

2.0 Site Location (Figs 1 and 2)

The Soho Foundry is situated at NGR SP03638883, in the Soho Victoria Ward of Sandwell Metropolitan Borough Council, West Midlands. The site lies to the north of the Birmingham – Wolverhampton Railway line and is bounded by Foundry Lane to the north and east, by the Birmingham Canal to the south, and by a scrap yard to the west. It is currently occupied by the weighing machine manufacturers, Avery Berkel. The remains of the foundry complex itself are situated on the west side of the site and are currently unoccupied.

3.0 Objectives

- To inform the preparation of the Phase VI Conservation Plan.
- To provide further information on the origins, development, condition and significance of the surviving historic buildings and associated below-ground archaeology.
- To produce an inventory of the upstanding fabric.
- To summarise areas of below-ground archaeological potential (detailed analysis in Demidowicz 2002).
- To provide an initial statement of the on-site ecology.
- To place the remains within their local, national and international context.
- To enable a full review to be undertaken of the statutory designations.
- To identify the need for additional survey works and formulate a long-term research strategy for the investigation of the site based on current national and regional initiatives.

4.0 Methods

4.1 Buildings Assessment

Using an existing plan obtained from Avery Berkel as a basis, a large scale block plan (Fig.2) was produced as a key to the study area (the entire Avery Berkel site) each building being

given a unique number. The phasing of the buildings is based on the physical evidence but takes into consideration the seven key periods identified by Demidowicz (2002).

Written observations were made on *pro forma* recording sheets for all buildings depicted on the survey plan, including those currently occupied by Avery Berkel. The principal aims of the information on the sheets were to establish the significance of the historic fabric, fixtures and fittings and distinguish between those that should be retained from those that could be removed, to record the key factors that need to be considered in order to ensure the significance is retained during reuse, and to recommend a research strategy.

4.2 Ecological Survey

The ecological constraints assessment, which was carried out by Wardell Armstrong, focused on three main sources of potential constraints: a) important habitats or rare species present on site; b) species with legal protection under the Wildlife & Countryside Act 1981 and the Conservation (Natural Habitats etc) Regulations 1994; and c) nature conservation designations on or immediately adjacent to the site.

A rapid walk-over of the site was undertaken in order to provide basic information on habitat types, key features (the canal, ponds, hedgerows, mature trees) and the presence of any protected species (badger setts, potential bat roosts, potential breeding sites for great crested newts, potential nesting sites for swallows and house martins under the caves of buildings).

A data gathering exercise was undertaken in order to provide information that would allow the appraisal to be as comprehensive as possible. Information on species, habitats and site designations was obtained from EcoRecord, the biological records centre for Birmingham and the Black Country, based at Edgbaston, Birmingham. Information was obtained for species recorded from the site, but which were not observed during the initial ecological survey because the time of year is not appropriate for flowering, breeding, etc.

4.3 Background Research

The findings of the Phase III and Phase IV work were placed in their regional, national and international contexts through research into the history of the iron and engineering industry, especially the specific processes and technology pertaining to the Soho works. Comparative analysis was made with contemporary sites, notably the Round Foundry, Leeds.

5.0 The Historical Significance of the Soho Foundry

5.1 The first purpose-built steam engine manufactory in the world

The Soho Foundry was conceived and founded by the Boulton and Watt Partnership in 1795 as an integrated engineering works dedicated to the manufacture of steam engines. This was a pioneering venture of fundamental importance for in this period the engineering industry had barely developed. Before 1795 the various stages that can be identified in the production of a steam engine e.g. melting, casting, boring, turning and drilling, fitting/assembly/erecing were carried out, if at all, at a small scale in furnaces, foundries, forges and workshops scattered around the country. Locational factors such as sources of fuel, raw materials and power, usually water, caused this dispersion and, not surprisingly, fragmented ownership. Where larger scale operations managed to develop, they made a variety of products. Steam engines

had only been powering machines from about 1783 and had very rarely been applied to boring rods, lathes and drills. Engines were normally erected for the first time at the allotted site, using parts of variable quality made in any number of places. The Boulton and Watt solution to this expensive and time consuming process was to make all the engine parts in their own manufactory, assemble as many as possible there and deliver the engine to the purchaser, who was then required to organise relatively little for its reception on site. Many products were already made this way, certainly at the Soho Manufactory, Handsworth, Birmingham; the novelty (and the necessity of circumstances) was to apply such techniques to the making of a complex engineered artefact such as a steam engine. Fortunately the conjunction of events that precipitated the creation of the Soho Foundry was matched by a combination of technological and engineering advances that made the whole venture at least feasible. Matthew Boulton would have wished to have done it this way in 1769 just after he first met James Watt, but his idea was far ahead of the technological capability of that time. Even twenty-five years later some of the best engineers in the country struggled to perfect the new Soho Foundry machinery.

Substantial remains of the Soho Foundry survive, the main buildings being the Foundry itself, the Erecting Shop, the 14H Shop and the Pattern Stores. The survival of Boulton and Watt buildings at the site was not suspected until a few years ago and are now listed Grade II*. Below the ground there are remains that extend below and far beyond the footprint of these buildings. It is in the nature of engineering works with their deep and robust foundations that these will be well preserved. At the Soho Foundry they include steam engine and machine bases/pits, wall foundations, drive shaft tunnels, drainage culverts and wells, storage vaults, casting pits, air furnace and cupola foundations, blowing tunnels, gasometers and gas retort foundations, the waste from air furnaces and cupolas making the vast tip of foundry ash, the remains of water bodies such as the canal and canal arm and the pool known as the Casson.

5.2 Association with Boulton and Watt and other pioneering engineers

It is no coincidence that the first purpose built steam engine manufactory in the world was founded by the leading steam engine firm, Boulton and Watt. The company attracted many engineers, who, in devoting their working lives to the firm, made a name for themselves, for example, William Murdoch, John Southern and Peter Swart. The buildings were not merely workshops, places for the manufacture of products, but also laboratories for innovation and experiment. Great minds endow places with greatness and conversely celebrated places can inspire ingenuity and creativity.

The sons of Matthew Boulton and James Watt are less well known and their contribution has often been dismissed, but it is clear that James Watt Jr masterminded the creation of the Soho Foundry, no mean achievement. He was ably assisted by his partner, Matthew Robinson Boulton, who in turn, completely rebuilt and extended the engine works at the Soho Manufactory between 1802 and 1804.

Both partners were heavily dependent on William Murdoch, whose supposed inability to compose a fine phrase in correspondence, and his straightforward and unsophisticated manner meant he remained backstage, and willingly so, in the commercial, social and political milieu that the senior partners needed to frequent and foster. These apparent social deficiencies were easily overcome by an engineering genius and inventiveness. On many occasions William Murdoch was begged to return from his work at other engines in the country in order to solve a technological problem at the Soho Foundry, which remained at a standstill awaiting his

appearance. These engineers benefited from the cross-fertilisation of ideas. It is little known that it was John Southern, no slouch as an inventor, who first suggested the use of permanent tanks for the storage of gas.

5.3 The site of the earliest experiments in gas lighting, and the production of gas lighting equipment on a commercial basis

In 1798 the Soho Foundry was the first factory in the world to be lit with gas from a fixed retort. Gas lighting was one of William Murdoch's best-known achievements. He had begun experiments in Cornwall in the 1790s and transferred them to the Soho Foundry on his return in 1798, lighting part of the Foundry. The Laboratory where he conducted these experiments has possibly been identified and its survival will need to be established by archaeological excavation. A little later in 1802 the Peace of Amiens was celebrated at the Soho Manufactory by the illumination of the front of the principal building. A myth has arisen that all the illumination was produced from coal gas, but the truth is that only two lights, called Bengal lights, were produced from small retorts such as those tried in the Foundry Laboratory. In contrast to the Soho Foundry, the Soho Manufactory was not known to have been lit by gas. William Murdoch was beaten by a whisker in lighting the first industrial premises outside Soho. His supposed assistant in the Soho experiments, Samuel Clegg, set up on his own in 1805 and in the same year installed a gas making plant at the cotton mill of Henry Lodge at Sowerby Bridge, near Halifax. Two weeks later Boulton and Watt illuminated the larger cotton mill of Phillips and Lee at Salford.

Thereafter until 1814 Boulton and Watt produced gas making plant from the Soho Foundry for about twenty firms. Here they were front runners with Samuel Clegg, by no coincidence another son of Soho, in the production and installation of gas making equipment.

5.4 The Soho Foundry was associated with the well-known Soho Manufactory

The association of the Soho Foundry with the Soho Manufactory endowed the site with an instant celebrity but unfortunately brought about much confusion. After the demolition of the last Manufactory building in 1863 the Soho Foundry stood alone as a monument to the Boulton and Watt achievement. It is important to stress that the survival of buildings at the Soho Foundry is made doubly significant in view of the loss of the all the buildings above ground at the earlier enterprise.

The Soho Foundry and Engine Works at the Manufactory were inextricably linked in production and organisation. This relationship is yet to be satisfactorily analysed. The closure of the Manufactory Engine Works in the early 1850s heralded a major expansion at the Soho Foundry where room was made for many of Manufactory engines and machinery, with relatively little being abandoned.

Together with the site of Soho Manufactory and Soho House (the former home of Matthew Boulton), the Soho Foundry is a possible World Heritage site.

5.5 Association with extensive and uniquely comprehensive archive collections

On their own, the points made above would place the Soho Foundry in an eminent position in world industrial history. In the two-hundred year history of the site, however, fortune has been kind to the buildings and the business records. Indeed their survival confers an

additional layer of significance on the site. The Soho Archives in Birmingham Central Library constitute one of the most important international collections on the industrial revolution and its aftermath. Without the Boulton and Watt Collection little of this report could have been written. Future work on this site must therefore adopt an holistic approach, utilising historical documentation, archaeological fieldwork, building recording and analysis, and an understanding of engineering issues, in order to gain the maximum understanding of the history, development, function and meaning of the Soho Foundry complex. This site ably demonstrates how the combination of archaeological investigation and documentary research is a potent and effective approach to the study of the material past.

5.6 Important associations with the development of steam ships

Although Boulton and Watt were not the first to install a steam engine in a boat in order to power it, they adapted a bell crank engine in 1804 and sent it to Robert Fulton in America to be used on a boat on the Hudson River, which first 'sailed' in 1807. Production of marine engines began in earnest in 1817 with the purchase of the *Caledonia*, which was used for trials with a side lever engine. The success of a voyage across the North Sea and up the River Rhine provided good publicity and generated a large number of orders. The Boulton and Watt marine engine business was one of the most important in the country during the nineteenth century and its most celebrated contract was for the screw engines of Brunel's *Great Eastern*, for which an extension onto the Boring Mill was built in 1854-5 for vertical boring machinery. The *Great Eastern* did not become the greatest passenger ship as planned, but it successfully laid the first transatlantic cable.

5.7 Association with the development of steam powered minting

In 1788 Matthew Boulton established the first steam powered mint in the world at the Soho Manufactory. In 1798-9 this was radically redesigned with the help of John Southern and mint machinery based on these new principles was then exported in the following decades across the whole world to Mexico, Russia and India for example. The firm of Boulton and Watt acted as sub-contractors to the Mint Company (an independent concern owned by Matthew Boulton, his son and grandson in turn) in the production of parts for the mint machinery, such as coining and cutting out presses and milling machines, and most were made at the Soho Foundry. It was not unusual for any foundry to take on general work. The patterns for the mint machinery were stored in the Foundry Pattern Stores, which were inherited by James Watt and Co in 1848 after the demise of Boulton and Watt and enabled them to continue in this trade.

Matthew Boulton's grandson, Matthew Piers Watt Boulton, closed the Soho Mint in 1850 and all the contents were sold. One press and its attendant parts was purchased by James Watt & Co, owners of the Soho Foundry, though it was not immediately used. In 1860 James Watt & Co built a new mint at the Soho Foundry based on the Boulton model. The fact that they called it the Soho Mint has contributed to the confusion between the two Soho sites. Further study is needed to reveal whether this is the only standing building in the world that contained Boulton and Watt minting machinery.

5.8 Regional National and International Significance

Given the number of ironmaking sites and engineering works in the West Midlands in the eighteenth and nineteenth centuries, remarkably few have survived to the present day. The last

twenty years have been particularly destructive and without a systematic survey more sites will disappear. There are some general surveys of industrial remains in the Stour Valley where it is contained in Dudley and Sandwell Borough Councils (Paul Collins and Nicola Smith 1990; Demidowicz forthcoming). There is only one early site comparable to the Soho Foundry in the region, the Grade II* listed Stourbridge Ironworks of Foster, Rastrick and Co. It dates from 1820-21 and is famous for producing in 1828 the first locomotives to run on a commercial railway in America and in the Midlands. This is a rare surviving, second-generation engineering works in the region, helping to emphasise the uniqueness of the pioneering venture of the Soho Foundry

The Soho Foundry was followed by competitors with no greater immediate rival than Matthew Murray of the Round Foundry, Holbeck, Leeds. He established his engineering works a matter of months after Soho to make flax spinning machinery and general castings, but was soon producing steam engines. Recent work on the Round Foundry claimed it was the 'sole significant survival of the first generation of specialist engineering foundries' since the Soho Foundry retained 'almost no original features above ground' (West Yorkshire Archaeology Service 1996). This is patently not the case but this view is not surprising given the present state of understanding of the industrial archaeology of early engineering works. Both the Soho and Round Foundries were dismissed or ignored not so long ago.

This is a warning that many more such sites, established after the Soho Foundry may await discovery as part of a systematic study of the remains of nineteenth-century engineering works. Unfortunately there is no prospect in the foreseeable future of the engineering industry being chosen for a national survey by English Heritage as part of its Monuments Protection Programme or a thematic listing survey. To gauge the breadth of this task there are records of 582 metal processing firms and 535 records of mechanical engineering businesses trading before 1914 listed in the Royal Commission (now English Heritage) guide (Royal Commission on Historical Manuscripts 1994). Obviously there is no direct relationship between the preservation of a firm's archive and the survival of its physical remains, but there is no doubt that the task ahead is huge.

In these circumstances, therefore, it is difficult to establish the relationship, particularly within the context of the physical form, layout of machinery and power systems, between the Soho Foundry and many later steam engine firms and general engineering concerns. Some of the most important include Maudslay Sons and Field (London), James Nasmyth (Eccles near Manchester), the Carron Works (Stirlingshire), the Neath Abbey Works (Glamorganshire) and its sister concern, The Perran Foundry (Cornwall). This list does not include the great locomotive works that do survive such as Robert Stephenson's factory in Newcastle and the Great Western Works in Swindon. Whatever the nature of the descent from the Soho Foundry, there is no doubting the significance of the site as the 'founder' of a great lineage in which Britain was pre-eminent in the world for much of the nineteenth century

The Soho Foundry is through the special combination of circumstances outlined above one of the most important sites of the industrial revolution in the country. It was the first purpose-built steam engine manufactory in the world, founded by the pioneering firm of Boulton and Watt. Matthew Boulton and James Watt, supported by the no lesser figure than William Murdoch, formed a triumvirate with few rivals, but a whole phalanx of great innovators and engineers was attracted to the firm. At the Foundry Murdoch was to light with gas the first factory building in the world and here steam-powered mint machinery was manufactured and shipped across the oceans. The protagonists fortunately understood the significance of their

actions and preserved a hugely important archive, now held in Birmingham Central Library. This material helps explain the surviving Boulton and Watt buildings and archaeological remains, making the Soho Foundry a unique site.

5.9 World Heritage Site

As Britain was the leading industrialising nation in the world in the eighteenth and early nineteenth century, then it follows that the Foundry joins a select group of sites of international significance, including the Darby furnace at Ironbridge, the Strutt and Arkwright mills of the Derwent valley in Derbyshire. Ironbridge and the Derwent Valley have already been declared World Heritage Sites. In combination with the site of the Soho Manufactory and Mint and Soho House, and the Galton Valley and the Smethwick Engine House (originally holding a Boulton and Watt engine, now in the Think Tank in Birmingham) the Soho Foundry must have the makings of a World Heritage Site.

The Department of Culture, Media and Sport is responsible for nominating sites in England, which are managed by the World Heritage Committee. These nominations are then subject to a rigorous assessment by UNESCO's advisors. In 1998 a consultation exercise was carried out resulting in the creation of a 'Tentative List', which now contains ten sites for England. This list is not due to be revised until 2006/7 at the earliest. From 2000, as a result of rule changes, countries are only able to submit one nomination per year. Although the nomination of industrial sites is welcomed, there are already four on the 'Tentative List' – Chatham Naval Dockyard, The Great Western Railway, the Cornish Mining Industry and Manchester and Salford (Ancoats Castlefield and Worsley). It appears that this combination of circumstances is not encouraging for an early nomination of Soho and related industrial heritage, even though a very strong case could be made.

The opportunity, however, should not be missed when the list is opened for new nominations in a few years time.

6.0 Process Flow (Fig. 3)

1. Pig iron/scrap iron and coal delivered by canal.
2. Iron melted in air furnaces or cupolas in foundry.
3. Patterns, made by carpenters and stored in Pattern Stores, delivered to foundry.
4. Sand moulds dried in stoves in foundry before use in casting to prevent explosions.
5. Iron cast in the foundry into moulds shaped by the patterns to produce parts for steam engine and in particular the engine cylinder; cranes to move heavy castings.
6. Ash from air furnaces and cupolas deposited on site to form spoil heap.
7. Wrought iron engine parts made in the Smithy and delivered to Boring Mill or Fitting Shop; blast for the hearth provided by steam engine; coal for hearths.

8. Engine cylinders and other similar parts such as pump cases delivered to Boring Mill to have precise internal diameter bored; steam engine required to provide power to turn boring machine(s).
9. Steam engine also used to provide a blast for the cupolas in the foundry.
10. Engine parts requiring drilling and turning delivered to the lathes and drills in the Boring Mill run by smaller steam engines.
11. Engine parts 'fitted' in Fitting Shops, i.e. filed, planed and smoothed to ensure that they fit together properly, particularly on air-tight connections, and fixings made such as screws and bolts; steam engines required to run lathes, planes and screw making machines.
12. Boilers manufactured as completely separate process in Boiler Shops.
13. All the parts of the steam engine brought together for assembly in Erecting Shop. Some fitting carried out as part of this process and steam engine required to run drills, lathes and planing machines; cranes to move heavy parts and completed engines.
14. Completed steam engines transferred to canal side for delivery to customer.

7.0 Buildings Assessment and Statement of Significance (Figs 2, 4, 5 and 6)

Note: Appendix I contains further details on the historical development and significance of all the buildings within the Avery Berkel site.

Historic Building Categories

Assessment of all the buildings on the Avery Berkel site resulted in the grouping of the historic buildings into three principal categories based on historical periods of ownership. These are, in order of date:

- Boulton and Watt (1795-1848)
- Watt and Company (1848-1895)
- W. & T. Avery/Avery Berkel (1895 – present)

The approach to the conservation of the historic buildings is based on the premise that the most significant remains are those of the Boulton and Watt, and Watt and Company periods, the buildings of which were concentrated at the west end of the Avery Berkel complex. The Avery buildings themselves are less important historically, as well as being more numerous, more widely distributed across the site, and having a more easterly focus. Recommendations for retention are based on the historic, architectural and technological significance only, but it is accepted that any further development plan may wish to consider the retention of other buildings on a practical basis.

Boulton and Watt

Surviving elements of the Boulton and Watt complex are:

- The Soho Foundry (1795-7 and 1801-2). Fig.2:1.
- Erecting Shop (1847). Fig.2:3.
- 14II Shop (1814, incorporating elements of the earlier Fitting Shed/Crank Shed/Coppersmiths' Shop). Fig.2:4.
- Lower ground storey of the Pattern Stores (part 1799, 1809), Fig.2:2.
- West boundary wall (1795-6). Fig.2:32.
- The ash bank retaining wall opposite the B&W Pattern store vaults and beneath the Light Foundry floor (c.1809). Fig.2: 33.
- The bridge over the Soho canal basin (1823). Fig.2: 11
- A row of cottages on the north side of the main driveway (1801-2 and 1808-9), Fig.2: 8.

These represent the main standing structures of historic and architectural significance on the site; They are mostly listed Grade II*, and should be retained at all costs. No alterations should be made to the Boulton and Watt fabric, though it may be desirable and permissible for blocked to be unblocked, and concealed fabric to be revealed.

James Watt and Company

The principal survival from the James Watt and Company period is the Mint building of 1860 (Fig. 2: 9a). As with the Boulton and Watt structures it must be a general rule that the James Watt and Company fabric should not be altered, though here again it might be beneficial to restore former openings. Specifically, it is recommended that the later extension (1920s, Fig.2: 9b) attached to the northeast side facing the Foundry be removed and this elevation restored to its original appearance the predominant feature of which was a series of cast iron round headed windows.

W. & T. Avery

The rest of the buildings that make up the Foundry complex at the west end of the site belong to the Avery period, and are largely of late nineteenth- and early twentieth-century date. It is these buildings with their brick arcaded elevations and steel Belfast roof trusses that defined the architectural character of the site until the late twentieth century when several were disguised with external cladding. Although, in general, the Avery buildings form a distinct architectural category they are not considered to be of sufficient architectural or historic interest or to be of sufficient rarity to warrant preservation, other than by archaeological record. However, there are a number of exceptions.

- The early twentieth century Restaurant (Fig.2: 30), an early and architecturally interesting example of a works canteen, together with the ornamental green laid out in front of it and the associated air raid shelters on the south side.
- The Gatehouse and Office Block at the east end of the site (Fig.2: 14), the gatehouse of 1925 (see Appendix 1, below) with its giant portico *in antis*, being the imposing public face of the company.

- The post-1896 Boiler House to the northwest of the Mint (Fig 2: 9c). This is one of the few buildings that retains plant from Avery's use of the site, namely, four boilers, associated flues, fuelling mechanisms and operating systems. The retention these, with low key restoration/conservation, would provide an interesting feature of industrial history and also justify the retention of the tall chimney that served them. Without the boiler house the chimney is lacking in context and to demolish the chimney would seriously affect the general landscape value of the site when seen from the canal.

In addition, there are a number of Avery buildings that should be retained in order to preserve the structural stability of the earlier and more important buildings.

- The walls at the east and west ends of the Main Foundry (1896), together with the clerestorey of the south wall and the walls of the First Light Foundry (1896) are crucial for the retention of the Bolton and Watt foundry.
- The upper stories of the Pattern Stores, at least temporarily, in order to support the west boundary wall and to protect the listed Boulton and Watt Pattern Store vaults.
- The roofs over the Foundry and 14H Shop (after 1896).

Also, it is suggested that the retention of the Power Houses, which appear to be structurally sound, would help to protect the archaeology of the Boring Mill.

Further Recording Work

Although the building sequence of the Foundry complex is understood to a great extent from the documentary evidence, the extent to which the historic fabric of the various phases survives requires the degree of confirmation that only a detailed measured survey can provide. For this reason it is recommended that building recording and structural analysis of the surviving buildings of the historic Foundry complex be carried out in order to produce a series of phased drawings of the buildings in greater detail than has hitherto been possible. It is vitally important that this is undertaken as part of a future conservation strategy and before any demolition takes place. It will act as a guide for the development plan and provide a long term academic record; it will also act as a management tool for ongoing restoration and preservation of the buildings. The methodology is largely set out in the initial Sandwell MBC brief (2002), the scope of which had to be curtailed on health and safety grounds. Nevertheless it is important to stress that a detailed record of the fabric is essential prior to any redevelopment taking place.

8.0 Archaeological Assessment

8.1 Archaeological Character

The below-ground archaeology of the Soho Foundry complex (Fig 7) falls into three categories:

- Buildings
- Yards associated with the buildings
- Water features

All these remains are concentrated in the western half of the Avery Berkel site, the exceptions being the row of early nineteenth-century cottages on the north side of the main driveway, that were demolished between 1897-1900, and Brindley's former canal basin of 1769 which extends into the southeastern quarter of the site.

It should be noted that any scheme involving groundworks within the archaeologically sensitive area shown on Fig.7 must be preceded by an archaeological assessment and evaluation where the over-riding principle will be the *in situ* preservation of nationally important archaeological remains.

Within the redundant foundry complex in the northwest quarter the archaeology may be divided into three levels of importance (Fig.8).

- 1 (the highest)
- 2
- 3 (the lowest)

Areas of Level 1 Importance

Areas of Level 1 (high) archaeological importance include:

- Boiler house and steam engines of 14H Shop (Fig.8: 1).
- The Boring Mill (Fig.8: 2).
- The line of the Foundry west wall of 1795-6 (Fig.8: 3).
- The line of the Foundry west wall of 1801-2 (Fig.8: 4).
- The tunnel, cupolas and air furnaces immediately south of the Foundry (Fig.8: 5).
- Possible site of William Murdoch's laboratory (Fig.8: 6)
- Entrance to accessway descending between sand bins (1801) and earliest ash retaining wall (c1800) (Fig.8: 7)
- The line of the main drain and other culverts in the area of the Boring Mill and Fitting Shop (Fig.8: 8).
- The coining press room, engine and boiler house and rolling mill in the Mint building (Fig. 8: 9).

Areas of Level 2 Importance

The whole of the area covered by the Boulton and Watt, and James Watt and Co. period buildings (other than those parts that fall within category 1) is deemed to be of Level 2 importance. This includes the original canal basin and associated features.

Areas of Level 3 Importance

These areas include the Boulton and Watt, and James Watt and Co period yards, later Avery period buildings, the Casson (a pool of water) and the ash bank, which might contain failed castings (though not the ash bank retaining wall which falls into Level 2) .

8.2 Recommendations for a Programme of Archaeological Evaluation

It is recommended that a number of trial trenches be excavated in order to inform any future conservation strategy and development plan. The methodology set out below was outlined in the Sandwell MBC Brief (2002) which had to be curtailed on health and safety grounds:-

- Assess the presence/condition of the original west wall and historic floor levels of the 1795 Foundry.
- Determine the condition/metallurgical potential of an air furnace and to assess the potential significance of the other furnaces/stoves within the Foundry.
- Locate and assess the condition of the drying stoves and the possible site of William Murdoch's gas laboratory below the floor of the Foundry.
- Consider the condition/completeness of the foundations for the large face plate lathe and to assess the significance of the below-ground deposits within the Erecting Shop.
- Assess the condition of the buried archaeological remains within the Boring Mill and to consider its possible contribution to the building's engineering history.
- Locate and assess the archaeological deposits of the 6H Shop, and to provide information on the significance of the remains beneath the Avery Weighbridge Shop.
- Assess the state of preservation of the canal basin(s) and its associated historic land surface.
- Locate and assess the remains of the two steam engines in the 14H shop

In addition, it is recommended that the main drain and other culverts are investigated and any historic fabric recorded.

9.0 Ecological Statement

Note: Appendix II contains the detailed ecological appraisal.

The areas of vegetation within the site include scrub, an old orchard, landscaped ornamental gardens, improved grassland and two hedgerows. There are currently no signs of legally protected species within the site. The two hedgerows do not meet the criteria for an 'important' hedgerow set out in the Hedgerow Regulations 1997 (wildlife & landscape). There are no Tree Preservation Orders within the site. The mature trees and dense scrub are likely to support breeding birds which are given protection under the Wildlife and Countryside Act 1981 in respect of damage or destruction to their nests during the breeding season (1 February to 31 August). Adverse impacts to the nests of wild birds can be avoided by careful timing of site clearance operations.

There are no records of Black Redstart currently breeding within the site, although there are records from the 1980s. The West Midlands conurbation has 5 – 12 breeding pairs which constitute some 10% of the national population. The first pair bred in Birmingham in 1943.

and in recent years there appears to have been an increase in Black Redstarts breeding in the Black Country and an apparent decline in some of the former sites in Birmingham. The Black Redstart is included in the *Red Data Birds in Britain* (Batten *et al* 1990) and is included as a species of Conservation Concern in the UK Biodiversity Action Plan. There is a Species Action Plan for Black Redstart in the *Biodiversity Action Plan for Birmingham and the Black Country* (2000) and one of the objectives is to raise the breeding population from 5 – 12 pairs to 20 pairs by 2006.

It is recommended that a Black Redstart survey is carried out in Spring 2003 should development not commence before March 2003. The presence of a breeding pair within the site would preclude any development starting until the birds had finished breeding (by early summer). Black Redstart is included in Schedule 1 of the Wildlife and Countryside Act 1981 and is legally protected against disturbance whilst on or near the nest in addition to the legal protection afforded by this Act and the Countryside & Rights of Way Act 2000 against damage or destruction of its nest. Redevelopment of the site will have no adverse impacts on the wildlife and nature conservation value of Edgbaston Pool (Site of Special Scientific Interest), Edgbaston Reservoir (Site of Importance for Nature Conservation), Galton Valley Reservoir (Site of Importance for Nature Conservation) or the Birmingham Canal to the south of the site. If development of the site does not commence within 12 months of this survey, we would recommend that consideration should be given to a further bat and badger survey to check that these species have not colonised the site.

10.0 Recommended Amendments to Statutory Protection

10.1 Scheduling

Although large parts of the western area of the site almost certainly merit scheduling, this cannot be determined in the absence of further evaluation. It is therefore recommended that the archaeologically sensitive area shown on Fig. 7 is managed in accordance with PPG 16 where the over-riding principle is the *in situ* preservation of nationally important archaeological remains.

10.2 Listing

A number of the buildings on the Avery Berkel site are listed as Buildings of Special Architectural or Historic Interest (see descriptions of individual buildings in Appendix I). These statutory designations have been reconsidered in the light of recent research and recommendations are made here regarding amendments to the list.

- The Foundry (Fig. 2: 1), which is currently listed Grade II* should be considered for upgrading to Grade I in recognition of its international historic significance as the principal surviving element of the first purpose built steam engine manufactory in the world.
- The 14H Shop (Fig. 2: 4a), which may be considered to be listed by virtue of being attached to the Erecting Shop should be listed in its own right, though not the extension (Fig. 2: 4b).

- Part of the west boundary wall is included in the listing of the Pattern Stores, but it is evident that the wall is more extensive than this and should be added to the list in its own right (Grade II* as it was built before the Pattern Stores).
- The Soho Foundry Mint (Fig. 2: 9) is not listed. List Grade II.
- The Avery Berkel Foundry Stores of 1895 (Fig. 2: 6), which are listed Grade II* as the upstanding remains of the Boring Mill, should be delisted.
- Finally, it is recommended that the Restaurant be added to the list (Grade II) on the grounds that it is an early, and architecturally ambitious example of a works canteen.

11.0 Acknowledgements

George Demidowicz undertook the historical research, Paul Belford compiled the building descriptions. Paul Belford, George Demidowicz and Malcolm Hislop carried out the buildings and archaeological assessments, and the ecological constraints assessment was completed by Wardell Armstrong. The report was written by Paul Belford, George Demidowicz and Malcolm Hislop. The illustrations were prepared by John Halstead of BUFAU. Shane Gould, Borough Archaeologist, monitored the work for Sandwell MBC.

12.0 References

Batten, L.A. Bibby, C.J. Clement, P. Elliot, G.D. and Porter R.F. (edd) 1990. *Red Data Birds in Britain: Action for Rare, Threatened and Important Species* (Nature Conservancy Council and the Royal Society).

Biodiversity Action Plan for Birmingham and the Black Country. 2000.

Birmingham University Field Archaeology Unit 2003. *Written Scheme of Investigation for an Historic Environment Assessment (with Ecological Statement) of Soho Foundry, Foundry Lane, Smethwick*.

Collins, Paul and Smith, Nicola, 1990. *A survey of the surviving Industrial Remains in the Stour Valley*, The Ironbridge Institute Research Paper No 69 for Dudley MBC, Sandwell MBC and Groundwork.

Demidowicz, G. 1998. *The Soho Foundry Mint: Smethwick: A Documentary and Archaeological Study* (unpublished report for Sandwell MBC).

Demidowicz, G. 2002. *The Soho Foundry, Smethwick, West Midlands: A Documentary and Archaeological Study* (unpublished report for Sandwell MBC and the Heritage Lottery Fund).

Demidowicz, G (forthcoming) *The Watermills of Birmingham*

Hayman, R. 1998. *Soho Foundry Mint Smethwick: A Desk-top Assessment* (Ironbridge Archaeological Series No.77).

Joyce N. and Haywood, F. 2003. *Health and Safety Structural Condition Survey: Soho Foundry, Foundry Lane, Smethwick* (unpublished report for Sandwell MBC).

Royal Commission on Historical Manuscripts 1994. *Records of British Business and Industry 1760-1914 Metal Processing and Engineering*, Guides to Sources for British History based on the National Register of Archives 9

Royal Commission on Historical Monuments (England). 1996a. *Soho Foundry, Foundry Lane, Smethwick, West Midlands: Historic Buildings Report* (National Monuments Record, Swindon).

Royal Commission on Historical Monuments (England). 1996b. *Soho Mint, Soho Foundry, Foundry Lane, Smethwick, West Midlands: Historic Buildings Report* (National Monuments Record, Swindon).

Royal Commission on Historical Monuments (England). 1997. *Soho Foundry, Foundry Lane, Smethwick, West Midlands: Historic Buildings Report Supplementary Report* (National Monuments Record, Swindon).

Sandwell MBC. 2002. *Brief for an Historic Building & Archaeological Assessment Soho Foundry, Foundry Lane, Smethwick*.

Sandwell MBC. 2003. *Brief for an Historic Environment Assessment (with Ecological Statement): Soho Foundry, Foundry Lane, Smethwick*.

University of Leicester Archaeology Services. 2000. *The Mint Building, Soho Foundry, Smethwick: Archaeological Evaluation and Photographic Survey* (unpublished report for Sandwell MBC).

West Yorkshire Archaeological Service 1996. *The Round Foundry, Water Lane, Leeds, Preliminary archaeological assessment*. (unpublished report)

The source material consulted for the historical background of this report is listed in detail in Demidowicz 2002, 9-33 above. In summary the sources include:

Birmingham City Archives
 The Boulton and Watt Collection
 The Matthew Boulton Papers
 The Muirhead Papers
 The James Watt Papers
 The Avery Papers
Avery Museum, Soho Foundry
 The Avery Collection
Sandwell Borough Council
 Microfilm Building Plans

Published books and articles and unpublished reports of immediate relevance to the Soho Foundry are listed and appraised

The Black Country Sites and Monuments Record, Wolverhampton Borough Council

The National Monuments Record, Swindon

APPENDIX I: BUILDING DESCRIPTIONS

Note: see Fig.2 for building locations.

1a. Foundry and Foundry Extension (*Listed Grade II**; *SMR 10021, NBR 948/4*)

Substantial brick and steel-framed building, oriented E-W, representing the earliest surviving remains of the Boulton and Watt period foundry - albeit enclosed within, and partially truncated by, later (Avery period) extensions and alterations (Plate 1). Remains are extant at two main floor levels, ground and lower ground.

The E end wall and easternmost seven bays of the S wall contain Boulton and Watt period fabric, dating from 1795-1796 (Demidowicz 2002, 79). The original E wall survives well at lower ground storey level, has been truncated by later Avery openings immediately above this so that in some places only the buttresses survive (this part of the wall is obscured by a late twentieth-century brick structure between the S [external] elevation of the Avery Foundry Stores and the S wall of the original foundry), and is evident again at a higher level where it retains original arched windows and circular ventilation openings.

The S wall retains its original brickwork, with alternate bays of windows at ground and first floor levels and openings at ground floor level for air furnaces. All of these openings have been blocked, and some of the blockings are early, possibly pre-1896. The original N and W walls have been removed by subsequent alterations and additions (see below). The second phase of the foundry, dating from 1801-1802, is represented by three bays along the S wall to the W of the original terminus (Demidowicz 2002, 79); this is possibly truncated by the large opening created by Averys in 1896. Further extensions date from the Avery period and comprise the extension of the S wall to the W, the return northwards at the W end, and the clerestory running along the whole length of the S wall (Demidowicz 2002, 79). This latter feature was installed in the late nineteenth /early twentieth century in conjunction with the roof which is constructed of Belfast trusses of a different design to those noted elsewhere on the site. The installation of the roof also resulted in the demolition of the original N foundry wall and the N wall of the associated outshot. The line of the N wall of the main foundry is preserved as the S wall of the Great Arch at lower ground floor level. The line of the N wall of the foundry outshot is preserved as the N wall of the Great Arch and the S wall of the furnace supporting arches at lower ground floor level, and a stub of the wall at upper ground floor level is preserved in the buttress on the W (internal) side of the later Avery wall in the north east corner of the foundry. This buttress is not central to the elevation of the Avery wall, suggesting that it respects the earlier structure.

The foundry roof is in two parts, supported by a central and N row of double steel stanchions. These support travelling cranes which travel E-W. The cranes survive *in situ*.

To the S are a series of external extensions, mainly of twentieth-century date and relating to the Avery period of the site. However, the pitch roof extension at the W end of the main foundry building is noted in Demidowicz 2002 (80) as being possibly the remains of the strip foundry of 1861. This is depicted on Sale Plans of 1895 (Demidowicz 2002, Figs 58 and 59). However, further examination of field and photographic evidence suggests that this building is in fact from the Avery period.

The history and remains of the Great Arch and associated arches are discussed at length in Demidowicz 2002 (79-81) and the present survey has not added to our knowledge of this area. It is clear that the extensions to the Great Arch correspond with the expansion of the foundry above, and that these are evident in the structure of the Great Arch itself. However, it is worth noting that these features form an integral part of the early foundry, and should therefore be considered effectively part of this structure in any subsequent redevelopment and associated archaeological intervention.

1b. Light Foundry (*Listed Grade II*; SMR 10021/10039; NBR 94784*)

L-shaped range to N and W of earlier foundry 1a; constructed by Averys in 1896 for light castings (Demidowicz 2002, 82), causing the removal of earlier buildings erected in the James Watt and Co period. These buildings included the Brass Foundry, Coremakers' Shed and the Hay Band Shed (Demidowicz 2002, 82). Walls of brick with Belfast truss roof. N wall truncated by doorway to later Extension [1c] to N at E end, but remaining elevation retains original arched windows (blocked). Equivalent windows, with original cast iron frames, survive in E-W oriented fragment of S wall adjacent to Pattern Stores [2d].

1c. Light Foundry Extension (*Not listed; SMR 10039; NBR 94784*)

Large roofed space to N of [1b], built by Avery between 1904 and 1912 (Demidowicz 2002, 83). Of irregular plan, narrowing to the N, due to being fitted in between earlier buildings, namely the Erecting Shop [3] to the E, the Pattern Stores [2a] to the W and the Light Foundry [1b] to the S. Roof comprises five parallel ranges oriented E-W and supported by single H-section steel stanchions. Roof of Belfast trusses with steel and glass covering. The floor of this building is built over the former ash bank and may incorporate former bridges over the W extent of the ash bank to the pattern stores, although it is possible that these bridges were demolished and the present jack arch roof built by Avery to cover the whole void.

2a. Pattern Stores (*Listed Grade II*; SMR 10081; NBR 94784*)

Palimpsest of various phases, incorporating the original Boulton and Watt pattern stores of 1799, and their extension in 1809 (Demidowicz 2002, 84). At lower ground level the vaulting of the original pattern stores survives, although in poor condition due to the collapse of later Avery floors above it. The sequence of development is well described in Demidowicz 2002 (81-85), primarily involving considerable alteration by Avery including the demolition of the original upper part of the structure and the building of a new (and wider) building accessed from the upper ground level (top of ash bank).

2b. Pattern Stores (*Not listed; SMR 10081; NBR 94784*)

Area of 1797 and 1799 Pattern Stores, as noted in Demidowicz 2002 (86 and Figs. 35 and 87). The W boundary wall is possibly the only extant eighteenth century feature above ground, and is a continuation of that noted externally to the S, truncated by the early nineteenth-century canal bridge.

2c. Pattern Stores (*Listed Grade II*; SMR 10081; NBR 94784*)

This structure originated as sand bins built 1801-1803 rebuilt as pattern stores in 1845, and possibly given an additional storey in the latter part of the nineteenth century (Demidowicz

2002, 87). Partially demolished in 1896 (Demidowicz 2002, 87). The 1845 archways to the Pattern Stores [2c] at lower ground floor level are evident opposite the Great Arch, although refronted and blocked during the Avery period, butt joints between the wall fronting the arches and earlier style brickwork behind suggest that original fabric remains internally. Most of upper ground floor level appears to be of the Avery period, although some of the SE wall may retain elements of the earlier fabric; SW (end gable wall) also not entirely of one build. Butt joints at the edges of this wall suggest that original build respected earlier footings or footprint now lost. Due to raised ground level the direct relationship between upper and lower ground floor brickwork was not observable. Steel truss roof of Avery period.

2d. Pattern Stores (*Listed Grade II*; SMR 10081; NBR 94784*)

This area also represents the 1845 Pattern Stores as [2c] above, but earlier period fabric entirely demolished during Avery period (Demidowicz 2002, 87). Foundations to lower ground floor level may survive, buried beneath ground make up layers. Upper Ground floor entirely replaced by later Avery buildings on new footprints. Survival of W boundary wall noted in lower courses of W wall.

3. Erecting Shop (*Listed Grade II*; SMR 10079; NBR 94784*)

Substantial brick structure of 1847, oriented N-S with brick walls and early iron truss roof (Demidowicz 2002, 88) (Plate 2). Roof covering originally of slate (13, 300 in fact), but now felted boards and glazing. Building of single range, three storeys in height but single working space. Effectively two storeys on W and S sides due to the retained ground of ash bank. Shape, size and orientation of the Erecting Shop was entirely determined by the presence of earlier structures to the S, W and E - namely the Foundry of 1795 [1a], Ash Bank retaining arches of 1803 and the 14H shop of 1814 [4a]. This building is well illustrated historically, and the original functions of machinery well understood. Original fixtures and fittings do not survive, although traces of them are evident in the fabric. All windows now blocked, except upper storey windows on E side which have later frames. Windows in N elevation appear to retain original frames *in situ*, although blocked and painted over. Blockings in W elevation of brick, and probably relate to the erection of the Light Foundry Extension [1c]; those in E elevation of breezeblock and therefore quite late. Floor of concrete. Gallery at S end added in 1950s (Demidowicz 2002, 89).

4a. 14H Shop (*Listed Grade II* (attached structure); SMR n/a; NBR 94784*)

Large brick structure of 1814 but probably incorporating remains of earlier fabric (Demidowicz 2002, 90-91). Oriented N-S. Three storeys in height, with brick walls and steel Belfast truss roof (Plate 3). The 14H shop was originally single-storey in height, with transverse two-storey wing added 1823; original 14H shop was L-shaped, with extension to E at N end beneath present Weigh Bridge Shop [5]. S end of N-S range originally stopped 23m N of present S wall, leaving a 6m space between it and the pre-existing Fitting Shed to the S (Demidowicz 2002, 90-91). The original S end return is evident as a butt joint in the E wall ground floor elevation. Different spacing of original windows in E wall of 14H shop - those to S of original 14H shop slightly wider spaced suggesting that they represent a survival from the Fitting Shed Phase. Most of original fabric survives in E wall. Upper storey of E wall of Avery period with openings now blocked built over original wall plate which survives *in situ*. Belfast truss roof added. W wall also retains original fabric, for, although most of wall was rebuilt as E wall of Erecting Shop [3], "buttresses" abutting piers between arches in that wall

are of earlier build and appear to represent knocking through of earlier structure after completion of Erecting Shop. Only extant in northern two thirds of the 14H shop. Original N wall demolished during extension to N in late 1930s [4b]. Original walls appear to survive to S of present S end of building, although much modified during Avery period. Concrete floor.

4b. 14H Shop extension (*Listed Grade II* (attached structure); SMR n/a; NBR 94874*)

Large roofed space, comprising two ranges, extending to N of both 14H Shop [4a] and Erecting Shop [3]. E wall part of N extension of Weigh Bridge Shop dating from late 1930s (Demidowicz 2002, 91), and in same style as other walls of Weigh Bridge Shop. W wall formed by E wall of Light Foundry. N wall all new build in 1930s. Roof of Belfast trusses on steel stanchions.

5. Weigh Bridge Shop (*Not listed; SMR 10069; NBR 94874*)

Large and extremely impressive space, comprising four ranges oriented N-S (Plate 4). S walls formed of earlier Avery Foundry Stores [6a and 6b] and later Powerhouse [7]; W wall formed by 14H shop [4a] with additional storey added by Avery; E and N walls contemporary with the various phases of the Weigh Bridge Shop. The building is roofed by Belfast truss roof, largely of steel, but incorporating some wooden trusses. Entire roof within the building is supported on H-section steel stanchions; these are double stanchions in lower two thirds to support cranes (now removed). Westernmost two ranges built in late 1890s, running N from Foundry Stores [6a and 6b] to original E-W arm of 14H shop; these ranges extended to N between 1904 and 1912 (Demidowicz 2002, 93). Range to E was built c.1900 as Platform Weighing Shop originally with brick wall dividing it from Weigh Bridge Shop; this was also extended 1904-1912 and the dividing wall removed (Demidowicz 2002, 93). Further Range to E built 1904-1912. Single bay length survives of original W wall of Platform Weighing Shop, with tall arched windows (now blocked), abutting NE corner of Foundry Stores [6a]. E wall of Weigh Bridge Shop shows evidence of the building's development; extensions to N of 1904-1912 and 1930s evident in fabric, as is rebuild at S end of c.1941 following bomb damage. Mezzanine gallery, with access to Foundry Stores [6a], 14H Shop [4a] and Erecting Shop [3] added post-1930s; now part demolished. Ground floor rooms below this formerly High Voltage Electrical Testing area. Concrete floor, incorporating large sunken area for assembly and testing of Weigh Bridges. Cellars beneath N part of the Weigh Bridge Shop comprise two bays at E side oriented N-S; these appear to respect the footprint of the E-W arm of the 14H shop demolished c.1905 (Demidowicz 2002, 74 and fig81); further cellars may survive to W although blocked and probably filled in. Little original fabric evident here, due to extensive rebuilding in later part of twentieth century.

6a and 6b. Foundry Stores (site of Boring Mill) (*Listed Grade II* (as Boring Mill); SMR 10067; NBR 94784*)

Substantial brick-built structure of 1890s date, the creation of which resulted in the demolition of the earlier Boring Mill, Beam Engine House and Turning Shop. These earlier features are noted at length in Demidowicz 2002 (43-47, 95) and are referred to in the archaeological assessment. Only S wall of Foundry Stores respects footprint of earlier features. The surviving remains of the Foundry Stores comprise the S, E and N walls of Avery build; the W wall being the E wall of the original Foundry [1a], except to S of 14H shop, where Foundry Store building intrudes to form E and N walls of Foundry (see [1a] above). Building is two

storeys (there is only one floor in here) in height from lower ground level, and walls are of brick, with round arched windows (now blocked).

7. Power Houses (*Not listed; SMR 10064; NBR 94784*)

Two conjoined tall single-storey buildings oriented E-W forming a single open space (Plate 5). Built in 1905 to house Gas Engines, and overlying the remains of the Boring Mill Engine House and Turning Shop. These earlier features are noted at length in Demidowicz 2002 (97 and Fig. 74) and are referred to in the archaeological assessment. The Power Houses themselves have brick walls, with single entrances to the E elevations at ground floor level, and a doorway to a narrow passage to the S. There are no windows. Present form of building dates to rebuild of c.1930, when concrete roofs were installed. Interior of building probably reflects arrangement post-1925, when the Gas Engines were removed and replaced by compressors in the S room and generators in the N room (Demidowicz 2002, 97). The likely presence of the archaeological remains of the boring mill and associated engines within the footprint of the Power Houses means that the retention of these buildings in the short to medium term would protect the archaeology.

8. Former Cottages (*Listed Grade II; SMR 1480; NBR 94784*)

Early nineteenth-century range of terraced houses, fronting the site access road and oriented E-W (Plate 6). Built of brick, with slate roof covering - slates are graded, with large slates at eaves and smaller ones on the ridge. Brick chimneys, some of which have been removed. Truncated at the E end by Gatehouse [14], and possible associated modification to easternmost bay with inserted doorway supported by concrete lintel, subsequently blocked. Single range of two storeys, comprising five small cottages (built 1801-1802) with two larger ones at W end (added 1808-1809) (Demidowicz 2002, 98). Westernmost house (No. 13) was former residence of William Murdoch. Originally twelve-light vertical sash windows to front (S-facing) elevation; these have been removed and replaced with similar style horizontally hinged casements. N-facing elevation much modified, with blockings and new openings; ground level also appears to have been raised to N of building. Scars on N-facing elevation suggest outhouses now removed. Replacement sash windows to rear elevation of larger houses at W end; original vertically hinged casements for the other cottages still *in situ*. Cottages currently in use for storage, with much internal modification. Appear to have been very much altered in 1920s or 1930s with removal of original interior details, including fireplaces and interior walls. One fireplace of inter-war date installed; original understairs cupboard survives in No. 7 but first floor removed from this building and interior plasterwork stripped. Other cottages retain plasterwork, but have lost some interior walls and other details are obscured by later replastering and insertion of false ceilings. No single cottage retains original layout, although this can be surmised from the collective information retained *en masse*. Drops for coal chutes to cellars located against N wall.

9. Mint Building and associated structures (*SMR 10057, 10068; NBR 94784*)

9a. Main Mint Building (*Not listed; SMR 10021, NBR 94874*)

Large structure oriented NW-SE along later cut of canal. Originally constructed in 1860, as part of the James Watt period (Demidowicz 2002, 99), but subsequently extended and altered in early twentieth century. Comprises two ranges of thirteen bays which contain much original fabric, notably the NE wall with arched windows at ground floor level. SW wall is

noted in Demidowicz 1998 as a later build by Avery effectively moving this side of the building to the SW. Ends of roof trusses possibly respect line of an earlier wall plate, and are supported by internal brick buttresses. The roof, which is dated by Demidowicz (1998) to the Avery period, is constructed of steel trusses, supported in the centre by a series of round-section cast iron columns. Later modifications to roof include clerestories and roof vents. NW and SE (gable end) walls more difficult to assess; certainly N ends of these walls appear contemporary with NE wall and contain arched openings. Extension of SW ends of gables below eaves height of NE ends suggest that they were simply extended when the SW wall was rebuilt in its new location; however there is no trace of this in the main fabric of the wall. NE wall retains original cast iron framed windows in three apertures. Floor throughout of concrete, with evidence of earlier machine emplacements beneath the floor (University of Leicester Archaeology Services 2000).

9b. Mint Building Extensions (*Not listed; SMR 10021/10039; NBR 94784*)

Extension to NE of [9a] of 1920s date (Demidowicz 1998), of brick with steel framed roof and large loading bay aperture on NE side; clearly abuts earlier building. Main part of this extension is eight bays long, slightly later and smaller extension to NW of three bays, plus subsequent lean-to additions. Concrete and brick floor.

9c. Boiler House (*Not listed; SMR 10039; NBR 94784*)

Single-storey brick building oriented NW-SE, running alongside canal and abutting [9a] to the SE (Plate 7). Early twentieth century. Single pitched roof, with extension to NE having timber flat roof. Contains four large oil-fired boilers, with fireboxes at NE end and oil feed area in sub-basement within NE flat roof extension. All associated pipework gauges and controls still *in situ*. Railed walkway at ground floor level in front of fireboxes and around boilers; raised plinth along SW wall gives access to smoke boxes. Large multi-flued brick-built boiler apparatus in NE end of building, built by Goodbrand and Co, Stalybridge. Flue operating mechanisms and regulator controls still *in situ*. Adjacent chimney is part of original boiler arrangements; substantial brick structure with iron reinforcements. The chimney forms an integral part of the boiler complex and should be retained, not only as part of the character of the site, but as a dominant feature along the wider canalside landscape.

9d. Shed (*Not listed; SMR 10039; NBR 94784*)

Single-storey brick built structure to NW of Boiler House [9c], oriented NW-SE. Concrete flat roof and steel framed windows, probably of 1950s date. Function uncertain. Concrete floor.

10. Gas Buildings (*NBR 94784*)

Elements of the Gas Governor House and Condenser and Gas Purifying House of 1848 are suggested by Demidowicz (2002, 99) to survive in this location. Parts of the present retaining wall appear to be of mid-nineteenth century date, on the basis of the similarity of brickwork with other dated buildings on site. Some later modification of this structure was probably made with the 1939 northward extension of [17], and later brickwork is evident to the S. Only excavation will be able to ascertain whether more substantial remains survive.

11. Canal Bridge (*Listed Grade II; SMR 1461*)

Bridge of 1823 survives intact, although bisected by later Avery boundary wall which contains relieving arch (Plate 8). Comprises single arch span of cast iron, with cast iron parapet, resting on ramped brick abutments. Very similar in design to other bridges along this section of canal, although smaller, and, unlike the other bridges, is not dated or marked with manufacturer's name. Nevertheless appears contemporary with the new cut of the canal and the reconstruction of the wharf area within the Boulton and Watt premises.

12. Pooley Gates (*Listed Grade II; SMR 1482*)

Cast iron gates and piers from the Sailor's Home in Liverpool (Plate 9). Cast by Henry Pooley and Son, and brought to Soho Foundry site following the amalgamation of the two firms in 1931. Condition generally good, although no longer functional and appear to have been tarmac-ed in place.

13. Watt Gate (*Listed Grade II; SMR 1481*)

Cast iron gate and surround, set in brick and stone arch dated 1837 (Plate 10). These were brought to the site in the 1920s from Heathfield Hall, Handsworth (built 1790, demolished 1925), the residence of James Watt. Condition generally good, although hinges appear to be rusted or otherwise non-functional.

14. Gatehouse and Office Block

Inter-war style office and gatehouse range fronting Foundry Road and oriented N-S (Plate 11). Designed by Buckland and Heywood of Birmingham and built in 1925 (Demidowicz 2002, 75-76). Main gateway consists of two storey block in brick, central to which is an arched opening with lettering "Soho Foundry" above, and "Avery" logos to either side above ground floor windows. Archway is fronted by four concrete columns with vaguely Tuscan detailing, these are surmounted by a short stretch of roof covered in interlocking rounded tiles. Office range to N of 8 bays and 2 storeys with brick walls, steel-framed windows and flat roof. Interior much modified in later twentieth century, with removal of original skirting and architrave, although original windows retained. Staircases in centre and at N end of office are original, concrete steps with steel balustrade and supports. First floor entirely devoid of original features. Ground floor retains original partitions with glass windows at N end (site of Avery's museum); at S end a large room retains original Art Deco ornamentation to ceiling and mural on N wall depicting the Rearing Feast of the Soho Foundry by Boulton, Watt and Sons in January 1796. S wall of this room has been recently removed. Cellars to this building contain old archives, and retain some of the original doorways, architraves and skirting. With the exception of the Museum, all ground and first floor office spaces are currently in use.

15. Executive Offices

Early Avery office range of rectangular plan, fronting Foundry Road and oriented NW SE (Plate 12). Built in 1897 as part of a large complex of buildings to the S of the main gateway and access road; designed by B. Corser and built by Henry Willcock and Company (Demidowicz 2002, 73). Truncated by Gatehouse [14] and forming a single build with Offices [16]. Single storey, comprising two parallel ranges with hipped, slate-covered roofs.

All brick construction, with exuberant terracotta detailing to Foundry Road (NE-facing) elevation, including coat of arms "W. T. Avery, Birmingham" (Plate 12). Brick wall to rear (SW-facing) elevation has simple arched windows, with two blocked doorways towards N end, and inserted window (possibly a blocked door) towards S end. Present main entrance at S of building, in SE-facing elevation, which includes two doorways and various (asymmetrical) window openings (Plate 13). Interior retains much original skirting and architraves, although doors and windows are modern replacements. One small room (in use as store cupboard) at S end of building has original ceramic tiles to dado level and early paint finish to walls; also retains original plaster ceiling with mouldings. This room has been partitioned in 1920s with timber tongue and grooved boarding running N-S, with pencilled graffiti date "1927". Other original ceilings obscured by suspended ceilings, but probably survive.

16. Offices

Early Avery's office range of rectangular plan, fronting site access road and oriented E-W. Built in 1897 as part of a large complex of buildings to the S of the main gateway and access road; designed by B. Corser and built by Henry Willcock and Company (Demidowicz 2002, 73). Truncated at E end by Gatehouse [14] and forming a single build with Executive Offices [15]. Single storey, comprising a single range of 5 bays with slate roof. All brick construction with terracotta banding and window architraves to N-facing elevation. Original form of rear (S-facing) and W end walls concealed by modern rendering; these appear to have been connected to a much larger warehouse of the same date now demolished (Demidowicz 2002, 73). Architraves and skirting survive internally, but other original features obscured by later twentieth century alterations including panelling and suspended ceilings.

17. Welding and Assembly Shop

Linear workshop building, oriented N-S. The predecessor of this building was built in 1898 as Machine Shop on site of Magazine (1795), Boiler Shop (1803) and open space between them. Extended to N in 1912 (Demidowicz 2002, 73-74 and Figs 75, 76 and 81). Bomb damage on 11th December 1940 destroyed much of original building (Demidowicz 2002, 77); consequently the superstructure of present building appears much rebuilt although may retain elements of 1898 and 1912 buildings at ground level. Built of steel and concrete frame with brick walls and steel roof. Flat lattice trusses to roof, supported on steel H-section beams. Corrugated steel sheet roof covering; corrugated steel cladding to exterior conceals exterior detail. Single range of 20 bays, two storeys in height but single storey in form. Appears to abut, and is therefore later than, Workshops [18] to the E. Contains cranes, hoists and machinery. Concrete floor.

18. Workshops

Linear workshops oriented N-S and adjacent to [17] and [19]. Map evidence suggests that this range was built in 1898 as Counter Machine Shop, on the site of Smiths Shops (1795, 1797 and subsequent extensions) and part of the W row of Cottages (1796). Extended to N in 1939, over site of Boiler Sheds (1803 and 1824) and Blowing Engine House (1824) (Demidowicz 2002, 73-74 and Figs. 75, 76, 78 and 81). Much of the original structure survives internally, comprising three parallel single-storey ranges of 20 bays, each constructed of steel framing with brick end walls (N and S elevations). Original N end of 1898 building evident as change in floor levels and functions within parts of present structure. Steel frame

of I-section columns supporting RSJs with steel Belfast trusses supporting the roof, which was covered in corrugated steel sheets. Exterior clad in corrugated steel concealing exterior detail. Concrete floor, with cellars below. Cellars extend under N part only and relate to an earlier ground level, and comprise brick lined rooms. Brickwork and steel floor supports contemporary with 1939 extension; no trace of earlier masonry within structure. Ground floor levels reduce W-E following slope of ground, although this is not reflected in the roof structure. Subdivided by lightweight partitions into various assembly and workshop areas.

19. Workshops

Linear workshops oriented N-S and adjacent to [18] and [20] (Plate 13). Map evidence suggests that this was built at the same time as 18 to the W and formed a part of the same function, namely the Counter Machine Shop. S end built over part of the W row of Cottages (1796). Extended to N in 1939 (Demidowicz 2002, 73-75 and Figs. 75, 76, 77 78 and 81). Comprises two parallel single-storey ranges of 20 bays, each constructed of steel framing with brick end walls (N and S elevations) and retaining much original fabric. Brick infilling to E and W walls also. Steel frame originally of round-section columns supporting RSJs with steel Belfast trusses supporting the roof. Some round-section columns have been replaced with H-section columns. Belfast trusses longer here than in [18]. Roof covering of corrugated steel; corrugated steel cladding to exterior conceals exterior detail. Concrete floor. Generally open plan across both ranges, although subdivided by E-W breezeblock and plasterboard partition approximately halfway down the length of the building; this probably respects line of original N end wall prior to extension of 1939.

20. Cutting Room

Linear workshops oriented N-S abutting [19] (Plate 14). Map evidence suggests that this was also part of 1898 build, originally the Brassworking Shop (Demidowicz 2002, Fig. 81). Partly overlies the W row of Cottages (1796). Comprises two parallel single-storey ranges of 10 bays, each constructed of steel framing with brick end walls (N and S elevations) and brick external wall (E elevation). N end wall retains original detail, including circular (ventilation) holes in gables and various doorways and windows at ground floor level. All of these now blocked, and inserted doorway towards centre of this wall supported by RSJ as lintel. A-frame steel roof trusses rest on E and W walls, and on central RSJ forming valley between the two roofs; this RSJ is supported on six round-section columns and one H-section column. Roof covering of corrugated steel with skylights; corrugated steel cladding to exterior conceals exterior detail. Concrete floor on split level due to slope of ground to E. Open plan across both ranges.

21. Warehouse and Workshops

North-light style range abutting N end of Cutting Room [20] and post-dating it. This appears to have been the 'V' Department extension, designed in 1927-28 by Buckland and Heywood of Birmingham and erected in the early 1930s (Demidowicz 2002, 76 and Fig. 81). Single range of five bays running N-S, with steel trusses for North-light roofs running E-W. Single storey. E wall of brick, although clad externally so original exterior not visible; S wall formed by N wall of [20]; W wall formed by E wall of [19]; N wall not observed. Windows in E elevation. Concrete floor. Subdivided by plasterboard partition into working and storage areas. Roof covering of corrugated steel with plastic skylights on N-facing roofs.

22. Office

Small brick-built structure of c.1970 to N of [21]. Single storey building of 4 bays, with steel roof covering. Not inspected internally.

23. Warehouse and Distribution Depot

Large rectangular structure oriented NW-SE and abutting Mint Building [9]. Built in 1937 as 'S' Department; designed by S. N. Cooke, Birmingham and built by W. J. Whitall as Fabrication Department (Demidowicz 2002, 76 and Fig. 81). Overlies site of Carpenters' Shop (1852) (Demidowicz 2002, Fig. 79). Comprises steel-framed structure two storeys in height but single-storey in form. Brick walls and steel corrugated roof cladding supported by A-frame steel trusses. Exterior detail masked by later corrugated cladding; concrete floor.

24. Offices and Call Centre

Linear single-storey structure oriented NW-SE and comprising two parallel ranges of 24 bays. On site of Timber Shed of 1897-1900; this was extended and rebuilt in the 1930s to house casemakers (Demidowicz 2002, 74, 76 and Fig. 81). Brick door surround on NW end elevation in 1930s style; however remainder of original structure largely concealed by later corrugated steel cladding to exterior, and plasterboard partitions and suspended ceiling to interior.

25. Returned Items Warehouse

Two-storey brick and steel building of irregular ground plan, oriented E-W and abutting (and therefore later than) Offices, Laboratories and Assembly Shops to N [26] (Plate 15). This was built in 1938-1939 as the Testing Machine Building (Demidowicz 2002, 77). Comprises three contiguous ranges running E-W; N range has 9 bays (Plate 18). Roof structure of steel A-frame trusses resting on RSJs supported on I-section columns (Plate 16). Much of the original fabric survives, including brick walls, steel-framed windows in E, S and W elevations and well-preserved wood block floor to upper storey.

26. Offices, Laboratories and Assembly Shops

Three-storey brick and steel-framed building, sub-rectangular in plan, oriented E-W. Abuts 'R' Department [27] to N and abutted by Returned Items Warehouse [25] to S. Built in c.1905 as Automatic Department (Demidowicz 2002, 74 and Fig. 81). Extant external elevations have arched brickwork and steel columns inset into walls; original windows have survived on third floor. Comprises three contiguous ranges oriented E-W with pitched roofs. Much of the original exterior fabric is concealed by modern corrugated steel cladding; limited internal inspection found that original internal components are concealed by plasterboard and suspended ceilings. Extension to E of c.1980s date three storeys in height but containing one floor level housing testing machinery.

27. Conference Centre and Reception (SMR 10075, 10076, 10077)

Three-storey brick and steel-framed structure incorporating earlier fragments, rectangular in plan and oriented E-W along main site access road. This range incorporates the remains of the Japanning Shop (designed by W.L. Awdry and built 1898), the Petrol Pump Assembly

and Chart Department (designed 1917 by Crouch Butler Savage, Birmingham and built c.1920), the New Japanning Shop or Office Block (designed 1929-1930 by Buckland and Heywood, Birmingham and built c.1930) and the Office Block Extension (designed by S. N. Cooke, Birmingham and built 1936) (Demidowicz 2002, 74-76 and Fig. 81). The original Japanning Shop was partly destroyed by fire in 1927 and the latter two buildings replaced it (Demidowicz 2002, 76). The 1936 Avery structure overlies the Carpenters' Shops (1795 and 1798, parts of which were subsequently converted to Offices and other functions) and the Counting House and Offices (1804) (Demidowicz 2002, Figs. 75, 76, 79 and 81). This Counting House, with its fireproof construction, was demolished in 1936 except for the two-storey bay window and clock, which were incorporated into the new Office Block Extension. Bomb damage on 11th December 1940 severely damaged the 1936 building and the remains of the 1804 structure incorporated within it (Demidowicz 2002, 77). The original structures within [27] are largely concealed by exterior corrugated steel cladding and internal modifications, including plasterboard partition walls and suspended ceilings. A limited internal inspection found that fragments of brickwork relating to the original buildings are extant within this range, notably at the south-western corner. It seems likely that elements of the buildings which form the component parts of [27] are still *in situ*; however these could not be distinguished at the time of survey due to cladding and internal alterations.

28. Air-Raid Shelter

Single-storey subterranean structure on the S side of the open area between [13] and [30] (Plate 17). c.1940. Dog-leg entrance at N end in brick with concrete roof; interior comprises brick tunnel with concrete roof approximately 20m in length and 3m wide, oriented N-S and running underneath the car park to the S. Entrance at ground level; interior floor level 0.5m below this. Access via ladder to manhole at S end; although blocked by deposit of soil and debris. Identical to [29] to E.

29. Air-Raid Shelter

Single-storey subterranean structure on the S side of the open area between [13] and [30] (Plate 17). c.1940. Dog-leg entrance at N end in brick with concrete roof; interior comprises brick tunnel with concrete roof approximately 20m in length and 3m wide, oriented N-S and running underneath the car park to the S. Entrance at ground level; interior floor level 0.5m below this. Access via ladder to manhole at S end. Retains original exterior door, although no longer secured to its hinges. In use relatively recently, with white-painted walls. Identical to [28] to W.

30. Restaurant and Offices (SAM 10099)

Substantial two- and three-storey timber-framed building oriented N-S (Plate 18). Designed by Crouch Butler Savage, Birmingham, and built in 1919 (Demidowicz 2002, 75). Largely retains its original appearance and form, comprising 10 three-storey bays with a further two-storey bay at each end. First floor in main part set back from the front wall giving 'clerestory' effect. Due to slope of ground downwards to the E the lower ground floor is only accessed on E side; lower ground floor on E elevation has concrete-fronted loading bay at N end (part of which is shown as Fire Station on 1945 plan) and offices to S; timber pre-war garage structure abuts E wall (Plate 19). Garage has Belfast Truss roof, and concrete lintel to E wall of main building permits extension of garage space beneath it. Main part of building comprises large open-plan restaurant, with kitchens, on upper ground floor. Cellars below this accessed from

kitchen and from doorway in E elevation at lower ground floor level, in use for catering storage. Cellars comprise brick rooms with blocked arches in walls suggesting that cellars extend under the footprint of the entire building (although not confirmed as they are not accessible). First floor has offices, former kitchen and storage area. Much modified by conversion of N end into executive offices in c.1950s, with wood panelling and large panes of glass to windows. S end retains some original features, including timber-panelled cloakroom on E side, and end room with some original architrave and skirting. Door to eaves at S end is also original. It seems likely that the first floor was originally also cafeteria function - possibly segregation between management in first floor area and workers on ground floor cafeteria. Some internal modification with modern kitchens and partitions. Five sets of stairs and porches on W elevation; northernmost of these modified in 1950s with glass porch. Lower walls brick infill between timber beams (possibly later brickwork); upper levels entirely timber-framed multi-light glass windows. Original fenestration except in N part of first floor. Three iron brackets (for flag poles?) along top of first floor range. Timber frame in good condition, with much original lath-and-plaster walls in first floor range.

31. Offices and Laboratory

Single-storey concrete structure oriented N-S and comprising two parallel and conjoined ranges with extension to W at N end. Probably post-war, built to E of two-storey Cycle Sheds and Packing Department shown on 1945 plan and no longer extant. Constructed of concrete slabs, and retaining original 1950s steel-framed windows with concrete surrounds.

32. The West Boundary Wall

Boundary wall of 1795-6 with later alterations. Forms the west boundary of the site and also the west wall of the pattern shop vaults. Built of 2¼" red bricks, it extends beyond the foundry buildings to the south where it is truncated by the canal bridge (q.v. No.11).

33. The Ash Bank Wall

Spoil heap retaining wall immediately east of the Pattern Stores dating from c. 1809. Built of slag and clinker blocks and strengthened by brick buttresses.

APPENDIX II: ECOLOGICAL APPRAISAL

The Site (Figs 9 and 10)

The site is approximately 10ha in area, and much of the area is occupied by buildings in current use by Avery Berkel Ltd. In addition, there are redundant buildings with areas of hardstanding, landscaped/ornamental gardens, bare ground which has been colonised by scrub, an old orchard and areas of improved grassland. There are few mature trees and few hedgerows. There are walls around most of the site.

Appraisal Results

No Red Data Book or nationally scarce plant species were recorded during the site visit in August 2002 and the vegetation noted within the site and immediately adjacent to the site is not of significant nature conservation value.

Six main habitats are present on the site:

- Hedgerows
- Landscaped/ornamental
- Scrub
- Improved grassland
- Hard standing
- Planted woodland

Hedgerows

There are two managed hedgerows situated in the south east of the site in the vicinity of the landscaped ornamental gardens. One hedgerow is situated adjacent to the tarmac road (Fig. 10: 1) which runs in a south easterly direction and bounds the landscaped garden. The hedgerow is approximately 40m in length and is planted with privet; some elder and ivy are also present. There are four mature common lime trees along this hedgerow. The second hedgerow lies to the north of the first hedgerow, adjacent to an Avery Berkel building and a car park (Fig 10: 2). The hedgerow is some 15m in length and is planted with laurel, dog rose and exotic species.

Landscaped/ornamental

There are landscaped and ornamental gardens in the south east of the site which are maintained and managed (Fig. 10: 3). The gardens lie adjacent to the Avery Berkel buildings which are in use and the presence of picnic tables would indicate that the gardens are used often by the staff. There is a rose garden (Fig. 10: 4) with a mature planted cherry in the middle, exotic planted species such as *Yucca*, and an area of mown grassland. Along the margins of these areas, where there is no management, species such as bindweed, sow thistle, rose bay willowherb, nettle and dock are present.

Scrub

There is an area of scrub in the north west of the site on a northwest-facing sloping bank (Fig. 10: 5) which separates a tarmac road within the site from a concrete wall and adjacent Foundry Lane. The scrub contains elder, 3 buddleia, bramble, rosebay willowherb, nettle, cow parsley, yellow toadflax and weld. There are also some semi-mature trees of silver birch, ash and sycamore. In the centre of the site, to the south west of the principal road through the foundry, is an area where buildings were demolished some years ago. This area is now dominated by buddleia in conjunction with rosebay willowherb, yellow toadflax, dandelion, dock, mugwort and the grasses Yorkshire fog and cock's foot. There are small areas of scrub around the south east margins of the site where smaller buildings have been demolished. Plant species within these areas include rosebay willowherb, nettle, dock, common bindweed, dandelion and wild poppy.

Improved grassland

There are two areas of mown grassland within the site. One area is in the south east of the site within the landscaped garden and is an area which is managed intensively. The second area is to the north of the landscaped area and is on the boundary of the car park; it is less intensively managed and contains common bindweed and docks.

Hard standing

A large part of the site consists of hard standing including tarmac roads, car parks and disused buildings. There are a number of car parks within the site. The margins of the car parks support a variety of wild plants including buddleia, bramble, colt's foot, yellow toadflax, weld, dandelion, mugwort, common bindweed, rosebay willowherb, red clover, common poppy, sow thistle, common nettle, cock's-foot and Yorkshire fog. There are some semi-mature trees including beech, crack willow, common lime and silver birch. The margins of the tarmac roads support species such as yellow toadflax, rosebay willowherb and buddleia.

Planted Woodland

The remains of an old apple orchard is present in the north west of the site, adjacent to the disused foundry (Fig. 10: 6). There are some semi-mature silver birch and elder, bramble and cow parsley; there are small areas dominated by rosebay willowherb.

Fauna

No watercourses or ponds were observed on the site. The site will not be used by water vole, otter or great crested newt due to the lack of wetland habitats. There was no evidence of badger activity on the site and it is unlikely that badgers would use the site because of its isolation from suitable habitats. It is unlikely that bats would roost in the few mature trees found on the site due to the lack of cracks and fissures. The mature trees and the areas of dense scrub are likely to support breeding birds.

Additional information

Sandwell MBC has indicated that there are no Tree Preservation Orders (TPOs) within the site.

The West Midlands County Bird Recorder (Tim Hextell) has indicated that there are no records of Black Redstart nesting on the site, although there are records for the site from the 1980s.

EcoRecord have no records for any legally protected species from the site.

The English Nature National Map Series (March 1998) indicates that the nearest Site of Special Scientific Interest (SSSI) is Edgbaston Pool SSSI which is some 5km to south east of the site.

The nearest non-statutory Sites of Importance for Nature Conservation (SINC) are Galton Valley (some 1.5km away) and Edgbaston Reservoir (some 1.7km away) (Sources: Black Country Nature Conservation Strategy, April 1994; Nature Conservation Strategy for Birmingham, 1997).

The Black Country Nature Conservation Strategy (April 1994) indicates that the Birmingham Canal to the south of the site has been identified as a 'Wildlife Corridor'.

APPENDIX III

**HISTORIC ENVIRONMENT ASSESSMENT
(WITH ECOLOGICAL STATEMENT)
SOHO FOUNDRY, FOUNDRY LANE
SMETHWICK**

JANUARY 2003

PHASES III & IV



SANDWELL MBC

Site: Soho Foundry, Foundry Lane, Smethwick

Statutory Status: LB II* & LB II

SMR No.: 1430, 1481, 1482, 10021, 10039, 10057, 10064, 10067, 10068, 10069, 10079, 10081

NBR No.: 94734

Owner: Avery Berkel Limited (Tony Adcock 0121 6075156)

Heritage Lottery Fund Contact: Hani Ahmed (020 7591 6083)

English Heritage Monitoring Officer: Ian George, Inspector of Ancient Monuments (0121 625 6859)

Project Manager: Shane Gould, Borough Archaeologist, Sandwell MBC (0121 569 4025)

1.0 Introduction

The Borough Archaeologist for Sandwell MBC has prepared this Brief for an Historic Environment Assessment (with Ecological Statement) of Soho Foundry, Smethwick. A substantial grant award has been given to Sandwell MBC by the Heritage Lottery Fund for the preparation of a Conservation Plan for this internationally important site. Once complete, the results will inform future discussions on the protection, conservation, management and future reuse of the surviving heritage asset. Phases I and II of the six phase project have already been completed, but major health and safety concerns has resulted in the methodology for Phases III and IV being considerably revised.

2.0 Site Location and Description

Soho Foundry lies in the Soho Victoria Ward of Sandwell Metropolitan Borough Council within the central part of the West Midlands conurbation (SP 03638883). The site occupies a substantial plot of land bounded by Foundry Lane to the north and east, the Birmingham Canal to the south and a scrap yard to the west. Privately owned, the site is currently occupied by the well-known weighing machine manufacturers, Avery Berkel.

3.0 Background to the Project

The names of Matthew Boulton and James Watt are synonymous with the Industrial Revolution and their contribution to the historical development of the steam engine cannot be over-estimated. For many years there has been a general presumption that the sites of these momentous events were no longer extant and that both the Soho Manufactory and Soho Foundry had been largely demolished. Following the submission of a planning application by Avery Berkel it was found that much of the Foundry survived intact and the up-standing remains were subsequently listed Grade II & II* by the Department of Culture Media and Sport in 1996/7.

Given the international importance of the site, the complexity of the surviving remains and the presence of a vast archive at the Birmingham Central Library it was decided that funding should be sought from the Heritage Lottery Fund for the preparation of a Conservation Plan (Heritage Lottery Fund 1998). The resulting document would aim to assess the significance of the surviving heritage asset how that significance is vulnerable or

sensitive to change and the policies that need to be adopted in order to retain that significance in any future use, development or alteration.

The bid document to the Heritage Lottery Fund for the preparation of a *Conservation Plan and Archaeological Assessment of the Soho Foundry* by Sandwell MBC (1998) was successful with the Contract being issued in January 2000. The preparation of the Plan being divided into six separate, but inter-related pieces of work:

- Documentary Assessment
- Desk-Top Assessment
- Archaeological Evaluation
- Historic Building Survey
- Structural Condition Survey
- Conservation Plan

The Phase I and Phase II report by George Demidowicz (2002) provides the following statement on the international, national and regional significance of the site.

- **The Soho Foundry is the first purpose-built steam engine manufactory in the world**

The Soho Foundry was conceived and founded by the Boulton and Watt Partnership in 1795 as an integrated engineering works dedicated to the manufacture of steam engines. This was a pioneering venture of fundamental importance for in this period the engineering industry had barely developed. Before 1795 the various stages that can be identified in the production of a steam engine e.g. melting, casting, boring, turning and drilling, fitting/assembly/erecting were carried out, if at all, at a small scale in furnaces, foundries, forges and workshops scattered around the country. Locational factors such as sources of fuel, raw materials and power, usually water, caused this dispersion and, not surprisingly, fragmented ownership. Where larger scale operations managed to develop, they made a variety of products. Steam engines had only been powering machines from about 1783 and had very rarely been applied to boring rods, lathes and drills. Engines were normally erected for the first time at the allotted site, using parts of variable quality made in any number of places. The Boulton and Watt solution to this expensive and time consuming process was to make all the engine parts in their own manufactory, assemble as many as possible there and deliver the engine to the purchaser, who was then required to organise relatively little for its reception on site. Many products were already made this way, certainly at the Soho Manufactory; the novelty (and the necessity of circumstances) was to apply such techniques to the making of a complex engineered artefact such as a steam engine. Fortunately the conjunction of events that precipitated the creation of the Soho Foundry was matched by a combination of technological and engineering advances that made the whole venture at least feasible. Matthew Boulton would have wished to have done it this way in 1769 just after he first met James Watt, but his idea was far ahead of the technological capability of that time. Even twenty-five years later some of the best engineers in the country struggled to perfect the new Soho Foundry machinery.

- **The Soho Foundry is associated with the illustrious name of Boulton and Watt and was the workplace of many of the great engineers of the industrial revolution such as William Murdoch, John Southern, and Peter Ewart**

It is no coincidence that the first purpose built steam engine manufactory in the world was founded by the leading steam engine firm, Boulton & Watt. The company attracted many engineers, who, in devoting their working lives to the firm, made a name for themselves, for example, William Murdoch, John Southern and Peter Ewart. The buildings were not merely workshops, places for the manufacture of products, but also laboratories for innovation and experiment.

The sons of Matthew Boulton and James Watt are less well known and their contribution has often been dismissed, but it is clear that James Watt Jnr masterminded the creation of the Soho Foundry, no mean achievement. He was ably assisted by his partner, Matthew Robinson Boulton, who in turn, completely rebuilt and extended the engine works at the Soho Manufactory between 1802 and 1804.

Both partners were heavily dependent on William Murdoch, whose supposed inability to compose a fine phrase in correspondence, and his straightforward and unsophisticated manner meant he remained backstage, and willingly so, in the commercial, social and political milieu that the senior partners needed to frequent and foster. These apparent social deficiencies were easily overcome by an engineering genius and inventiveness. On many occasions William Murdoch was begged to return from his work at other engines in the country in order to solve a technological problem at the Soho Foundry, which remained at a standstill awaiting his appearance.

- **The Soho Foundry is synonymous with the very earliest experiments in gas lighting and the production of gas lighting equipment on a commercial basis. In 1798 it was the first factory in the world to be lit with gas from a fixed retort and was lit again in 1802**

Gas lighting was one of William Murdoch's great achievements. He had begun experiments in Cornwall in the 1790s and transferred them to the Soho Foundry on his return in 1798, lighting part of the Foundry. The Laboratory where he conducted these experiments has possibly been identified and its survival will need to be established by archaeological excavation. A little later in 1802 the Peace of Amiens was celebrated at the Soho Manufactory by the illumination of the front of the principal building. A myth has arisen that all the illumination was produced from coal gas, but the truth is that only two lights, called Bengal lights, were produced from small retorts such as those tried in the Foundry Laboratory. In contrast to the Soho Foundry, the Soho Manufactory was not known to have been lit by gas.

William Murdoch was beaten by a whisker in lighting the first industrial premises outside Soho. His supposed assistant in the Soho experiments, Samuel Clegg, set up on his own in 1803 and in the same year installed a gas making plant at the cotton mill of Henry Lodge at Sowerby bridge, near Halifax. Two weeks later Boulton & Watt illuminated the larger cotton mill of Phillips and Lee at Salford.

Thereafter until 1814 Boulton & Watt produced gas making plant from the Soho Foundry for about twenty firms. Here they were front runners with Samuel Clegg in the production and installation of gas making equipment.

- **The Soho Foundry was associated with the illustrious Soho Manufactory**

The association of the Soho Foundry with the Soho Manufactory endowed the site with an instant celebrity but unfortunately brought about much confusion. After the demolition of the last Manufactory building in 1863 the Soho Foundry stood alone as a monument to the Boulton & Watt achievement. It is important to stress that the survival of buildings at the Soho Foundry is made doubly significant in view of the loss of the all the buildings above ground at the earlier enterprise.

The Soho Foundry and engine works at the Manufactory were inextricably linked in production and organisation. This relationship is yet to be satisfactorily analysed. The closure of the Manufactory engine works in the early 1850s heralded a major expansion at the Soho Foundry where room was made for many of Manufactory engines and machinery, with relatively little being abandoned.

Together with the site of Soho Manufactory and Soho House, the Soho Foundry is a possible World Heritage site.

- **The Soho Foundry is associated with the great archive of the industrial revolution -- the Boulton & Watt Collection, Matthew Boulton Papers and the James Watt Papers**

On their own, the points made above would place the Soho Foundry in an eminent position in world industrial history. In the two-hundred year history of the site, however, fortune has been kind to the buildings and the business records. Indeed their survival confers an additional layer of significance on the site. The Soho archives in Birmingham Central Library constitute one of the most important international collections on the industrial revolution and its aftermath. This site ably demonstrates how the combination of archaeological investigation and documentary research is a potent and effective approach to the study of the material past.

4.0 Research Strategy

The methodology for the Phase III Archaeological Evaluation and Phase IV Historic Building Survey was set out in a Brief prepared by Sandwell Council dated April 2002. Although Ironbridge Archaeology and Birmingham University Field Archaeology Unit were appointed to undertake these works, the start date was deferred pending the submission of a Health and Safety Structural Condition Survey by Nick Joyce Architect (2002); this being completed as part of the Phase V programme. Unfortunately, the report concluded that large areas of the building posed significant hazards to anyone working within them and access should be precluded pending the completion of major remedial works involving the installation of scaffolding and designed crash decks. In light of these findings the measured survey and archaeological evaluation has been deferred and, the historic environment assessment (with ecological statement) will be largely undertaken from outside the buildings using

existing sources of information and in particular Demidowicz 2002. The methodology will include a series of meetings at the Sandwell MBC Council Offices, Lombard Street, West Bromwich with George Demidowicz and the Borough Archaeologist, Shane Gould, in order to discuss the significance of the monument and its component parts.

An accompanied visit will be permitted in order to clarify a number of outstanding points, but this must be agreed in advance with the Borough Archaeologist and Avery Berkel.

The aims of the Historic Environment and Ecological Assessment are as follows:

- To inform the preparation of the Phase VI Conservation Plan
- To provide further information on the origins, development, condition and significance of the surviving heritage asset
- To produce an inventory of the upstanding fabric
- To identify areas of below-ground archaeological potential
- To provide an initial assessment of the on-site ecology
- To place these remains within their local, regional, national and international context
- To enable a full review to be undertaken of the statutory designations
- To identify the need for additional survey works and formulate a long-term research strategy for the investigation of the site based on current national and regional initiatives

5.0 Methodology

5.1 The Contractor will operate with due regard for Health and Safety regulations. The work may require the preparation of a Risk Assessment of the site, in accordance with the Health and Safety at work regulations (1992). Any such Risk Assessment should take particular note of the need to work in derelict buildings. Those who wish to undertake the work should ensure they are adequately insured, to cover all eventualities, including risks to third parties. Sandwell MBC and its officers cannot be held responsible for any accidents which may occur to contractors engaged to undertake this survey while attempting to confirm to this Brief.

5.2 The national expert on the Soho Foundry, George Demidowicz, will be a key member of the team. George Demidowicz prepared the Phase I/II report and his knowledge will be vital in understanding and assessing the significance of the surviving heritage asset. The costs for this work should be included in the overall budget.

Contact address: 11 Sourham Road, Hall Green, Birmingham, B28 8DG. Tel. 0121 777 3668. E-mail: Demidowicz@aol.com

5.3 The Contractor is expected to follow the Code of Conduct of the Institute of Field Archaeologists.

5.4 A site code must be obtained from the Borough Archaeologist.

6.0 Results

N.B. The Report should not be a lengthy document and written to address a non-specialist audience

6.1 The Report must contain:

6.1.1 A brief overview of the historical significance of the site based on the earlier work by Demidowicz (2002) and in accordance with regional and national research objectives.

6.1.2 A brief consideration of the technologies involved and the way these are likely to be reflected in the surviving fabric/archaeological record.

6.1.3 An assessment of the vacant buildings at the west end of the site (the Foundry Complex, Erecting Shops and Mint Building) in accordance with the room layout and numbering system adopted by Demidowicz (2002) and N Joyce (2003). Having considered the dates, range, form, function and significance of the surviving structures an assessment will be made of their component parts: the internal plan form, walls, floor, roof covering, roof truss, columns, window furniture, door furniture, stairs, partitioning, fixtures/fittings, etc. The over-riding objective is to assess the significance of the surviving historic fabric together with those fixtures/fittings that should be retained from those that can be removed and not to provide a highly detailed fabric analysis as set out in the reports by the RCHME. Those areas where further information needs to be obtained in order to inform the decision-making process must be clearly identified together with the nature of the work. Each section should also consider the key factors that need to be considered in order to ensure that the significance of the building/room is retained in any future scheme of reuse. Using existing survey drawings the assessment must be accompanied by a plan(s) which identifies all the numbered features.

6.1.4 An assessment of the archaeological potential of the site based on the existing state of knowledge. Areas of below-ground archaeological potential should be defined, described and assessed in terms of their possible significance. The narrative being supported by a deposit model/plan and a recommended programme of archaeological evaluation.

6.1.5 Based on the earlier work by Demidowicz (2002) and comparative information on the iron and engineering industry, the site and its component parts will be placed within their international, national and regional typological context. This will be achieved by discussing the results with recognised national experts, the field recording staff of English Heritage and interrogating the data held at the National Monument Record Centre, Swindon. The recent results from the archaeological evaluation and recording at the Round Foundry, Leeds are likely to be especially useful as it is broadly contemporary with the Soho Foundry. Contact Address: Helen Gomersall, West Yorkshire Archaeology Service, County Sites & Monuments Record, Registry of Deeds, Newstead Road, Wakefield WF1 2DE (Tel. 01924 306797).

6.1.6 The criteria for scheduling and listing as set out in Paragraphs 6.10 - 6.16 of PPG 15 (DoE & DNH 1994) and Annex 4 of PPG 16 (DoE 1990) should be used to assess the national importance of both the site and its key attributes. The Contractor is also expected to recommend revisions to the existing statutory designations (Listing, Scheduling and possible Conservation Area status)

6.1.7 An initial assessment of the ecological potential of the site based on Section 4.6 of the Written Scheme of Investigation prepared by Birmingham University Field Archaeology Unit/Ironbridge Archaeology and dated October 2002. Based on an external inspection only the limitations of the ecological statement must be clearly identified together with objectives/requirements of any additional survey

6.1.8 Using the information from the Phase III/IV Assessment together with the earlier recommendations outlined by Demidowicz (2002) a research/evaluation strategy should be formulated for the site in accordance with national and/or regional research frameworks

6.1.9 Conclusion

6.2 The following illustrations should be included:

Site location plan

Copies of any historical maps/drawings/lithographs

The annotated floor plan

Deposit model

Sufficient photographs (both colour and black & white) to support the text

Sufficient plans by period and area to aid interpretation

6.3 The following appendices should also be included:

Completed summary sheet (copy attached to brief)

Recording Brief

6.4 **Twenty (20)** of the report shall be submitted to the Borough Archaeologist within time-scale defined in **9.0** below.

6.5 A further copy of the results should also be submitted on CD-ROM. Additional advice on the format should be sought from the Borough Archaeologist.

7.0 Archive

There will be no archive for the Phase III/IV Historic Environment and Ecological Assessment.

8.0 Monitoring

8.1 The Borough Archaeologist will be responsible for monitoring progress and standards throughout the project and should be kept regularly informed during fieldwork, interpretation and reporting stages.

8.2 Written Notification of the start date will be given to the Borough Archaeologist at least one week before the commencement of work and once the fieldwork stage of the investigation has been completed.

9.0 Timetable

- Brief issued 27/01/03
- Draft report encompassing information from Sections 6.1.3 & 6.1.4 of the Brief issued to Borough Archaeologist, English Heritage & CSR Partnership by 21/02/03

- Draft report to be discussed at the English Heritage Regional Office, Birmingham on 28/02/03
- Full report to be issued to Borough Archaeologist 24/03/02
- Following formal approval from the Borough Archaeologist twenty (20) copies of the completed Report are to be issued

References

Demidowicz G 1998 *The Soho Foundry Mint, Smethwick: A Documentary and Archaeological Study* (typescript report produced for Sandwell MBC)

Demidowicz G 2002 *The Soho Foundry, Smethwick, West Midlands: A Documentary and Archaeological Study* (typescript report produced for Sandwell MBC and the Heritage Lottery Fund)

Heritage Lottery Fund 1998 *Conservation Plans for Historic Places* (Heritage Lottery Fund)

Joyce N & Haywood F 2002 *Health and Safety Structural Condition Survey, Soho Foundry, Foundry Lane, Smethwick* (typescript report prepared for Sandwell MBC)

Royal Commission on the Historical Monuments of England 1996a *Soho Foundry, Foundry Lane, Smethwick, West Midlands: Historic Buildings Report* (National Monuments Record Centre, Swindon)

Royal Commission on the Historical Monuments of England 1996b *Soho Mint, Soho Foundry, Foundry Lane, Smethwick, West Midlands: Historic Buildings Report* (National Monuments Record Centre, Swindon)

RCIIME 1996c *Recording Historic Buildings. A descriptive specification* (3rd Ed. RCHME)

Royal Commission on the Historical Monuments of England 1997 *Soho Foundry, Foundry Lane, Smethwick, West Midlands: Historic Buildings Report Supplementary Report* (National Monuments Record Centre, Swindon)

Sandwell MBC 1998 *The Soho Foundry Site: Conservation Plan and Archaeological Assessment* (Sandwell MBC)

University of Leicester Archaeology Services 2000 *The Mint Building, Soho Foundry, Smethwick: Archaeological Evaluation and Photographic Survey* (typescript report prepared for Sandwell MBC)

APPENDIX IV

SANDWELL MBC/BLACK COUNTRY SMR
SUMMARY SHEET

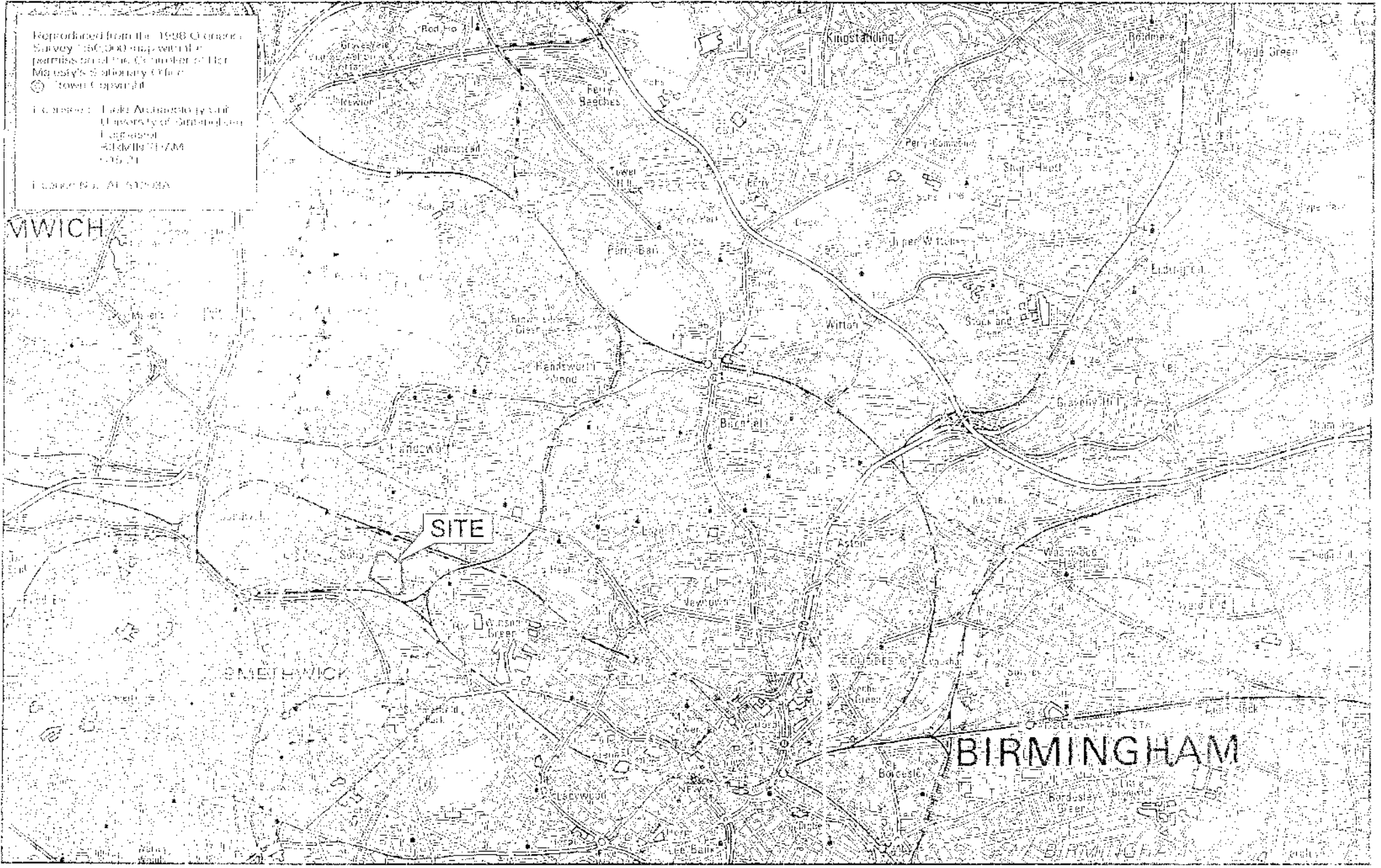
Site name/Address: Soho Foundry, Foundry Lane, Smethwick	
Borough: Sandwell	NGR: SP 03638883
Type of Work: Historic Environment & Ecological Assessment	Site Code: SF 03
Contractor: Birmingham University Field Archaeology Unit, Ironbridge Archaeology, George Demidowicz	Date of Work: March 2003
Location of Finds/Curating Museum: None	
Title of Report: An Historic Environment Assessment (with Ecological Statement) of Soho Foundry, Foundry Lane, West Midlands, 2003	
SUMMARY OF FIELDWORK RESULTS: The assessment comprised the following aspects:-	
<ul style="list-style-type: none"> • An inventory of the upstanding fabric • A summary of the below-ground archaeological potential • An initial statement on the on-site ecology • Situating the remains in their regional, national and international context • A review of statutory designations • Identification of the need for additional survey work • Formulation of a research strategy for investigation of the site 	
<p>The study covered the whole site currently occupied by the Avery Berkel weighing scale manufactory. It identified three principal historic building periods:</p> <ul style="list-style-type: none"> • Boulton and Watt (1795-1848) • James Watt and Company (1848-1895) • W. & T. Avery (now Avery Berkel) 1895-present 	
<p>It was advised that the buildings and archaeology of the first two periods were extremely significant, and should be preserved at all costs. On the other hand, the Avery period structures that contribute to the complex of redundant buildings at the west end of the site are of lesser architectural or historic importance, and are replicated by buildings within other parts of the Avery Berkel premises. Therefore where their removal might facilitate the preservation of the earlier remains and contribute to a greater understanding of the Soho Foundry, demolition should be considered.</p>	
<p>Detailed recording of the historic foundry buildings is recommended in order to produce a set of phased drawings.</p>	
<p>The below ground archaeology has also been divided into three levels of importance:</p> <ol style="list-style-type: none"> 1. The most significant areas of the Boulton & Watt, and James Watt & Co. periods 2. Areas covered by other Boulton & Watt, and James Watt & Co. buildings not in 1 3. Boulton & Watt, and James Watt & Co. period yards, later Avery buildings, the Casson (pool) and the ash bank. 	
<p>A programme of evaluation trenching is recommended to assess the state of the archaeology.</p>	
<p>The Soho Foundry is considered to be one of the most important sites of the industrial revolution in the UK, and of international significance. Together with the Soho Manufactory and Soho House it has the makings of a World</p>	

Heritage Site.

Recommendations for changes to statutory protection include upgrading the foundry to grade I, listing the 14H Shop in at II*, the west boundary wall at II*, the Mint at II, the Avery restaurant at II, and delisting of the Avery Foundry Sites of 1895 which was listed in error as the remains of the Boring Mill.

Author of Summary: Malcolm Hislop

Date of Summary: 18.7.03



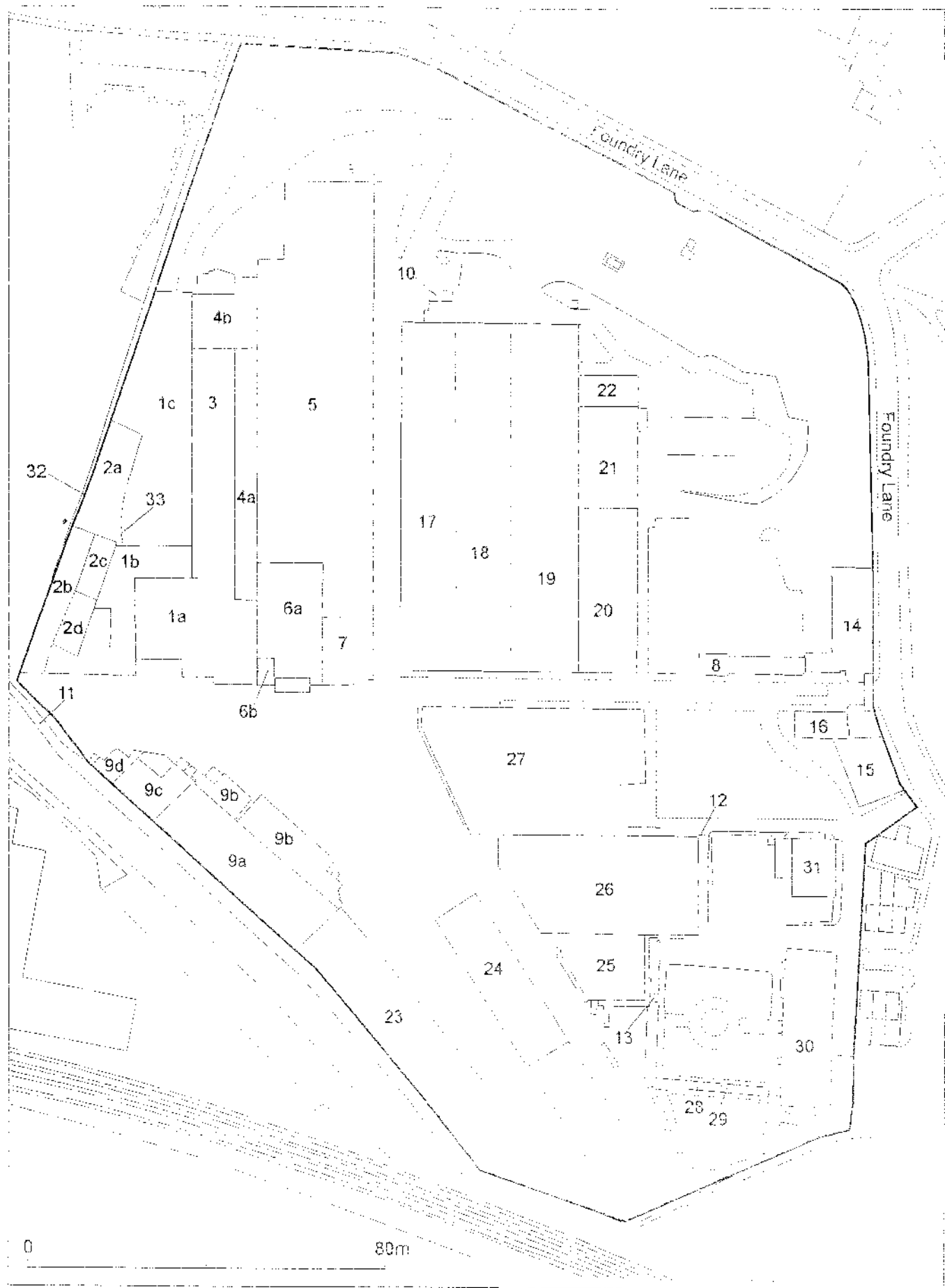


Fig.2 The Avery Berkel site (for a key to the building numbers see Appendix 1)

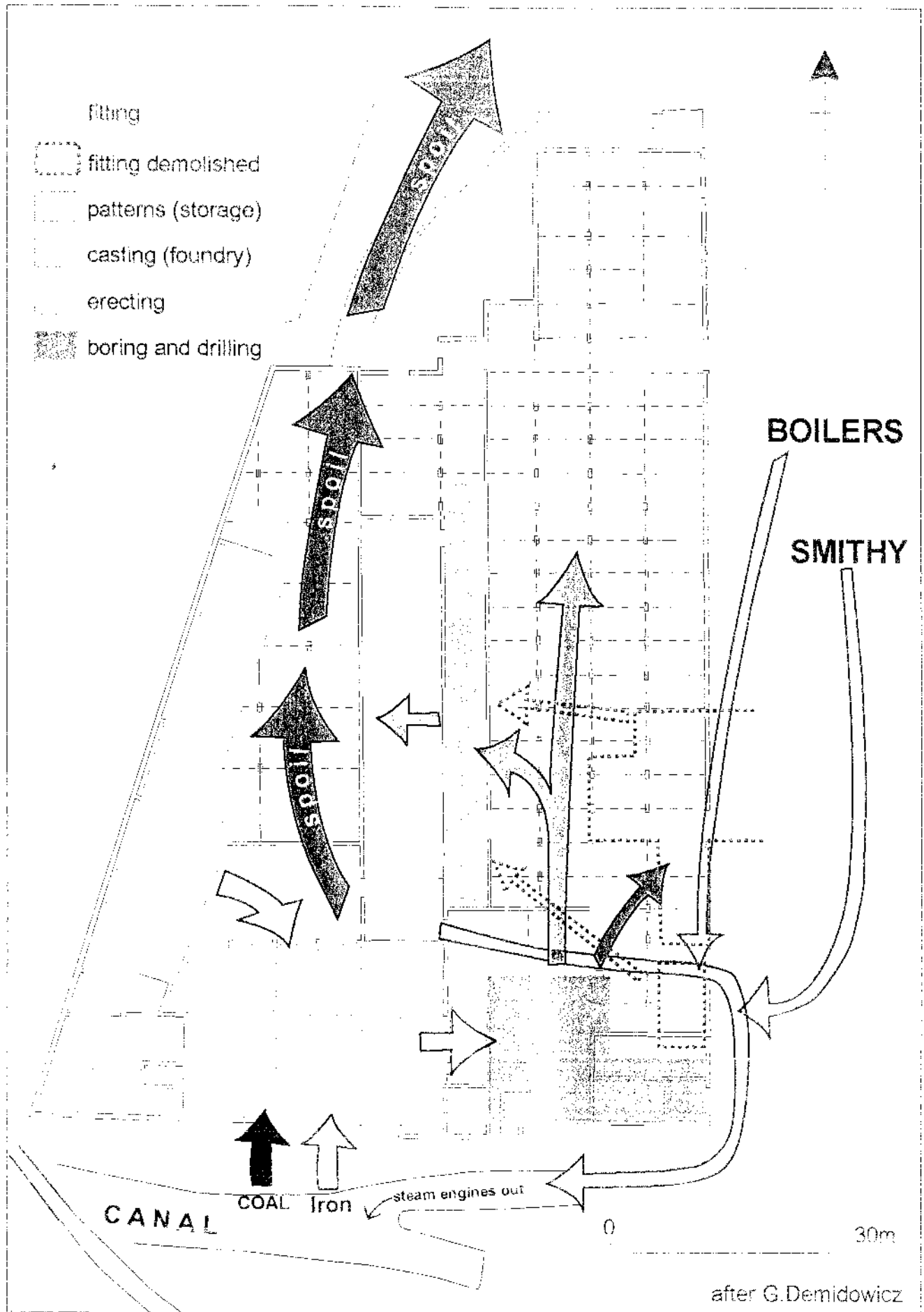


Fig.3 Process flow

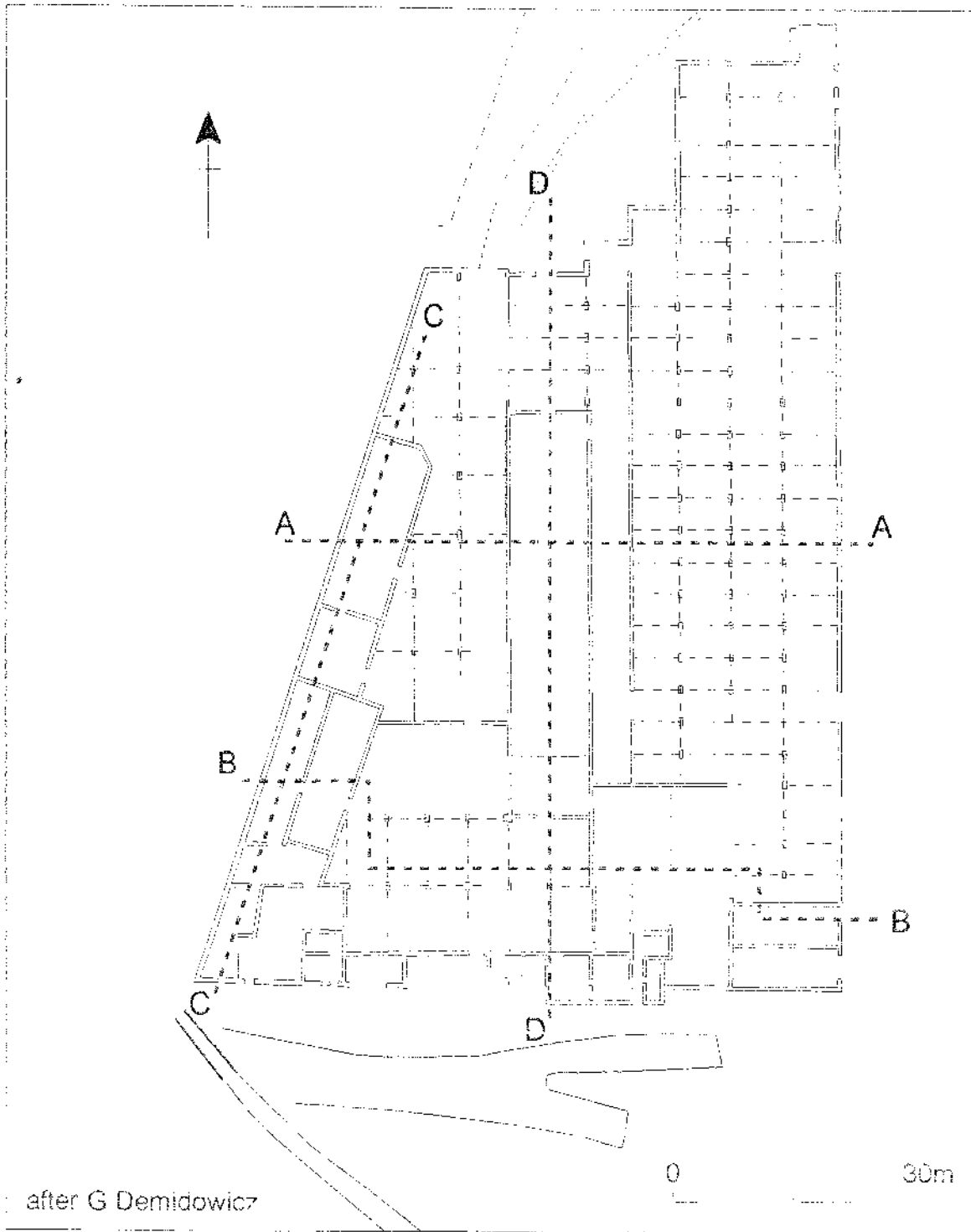


Fig.4 Foundry complex with section locations

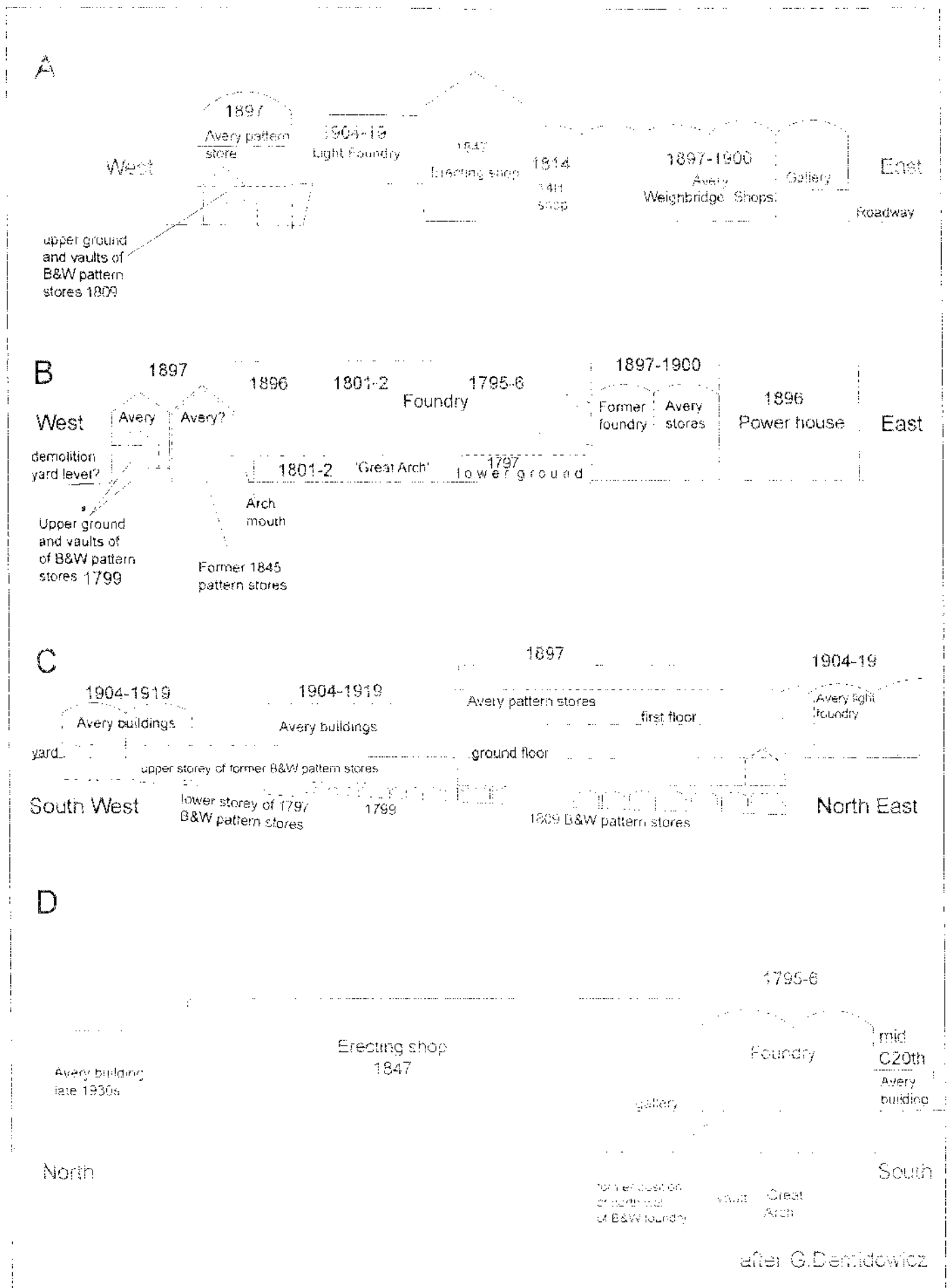


Fig. 5 Sections through the foundry complex

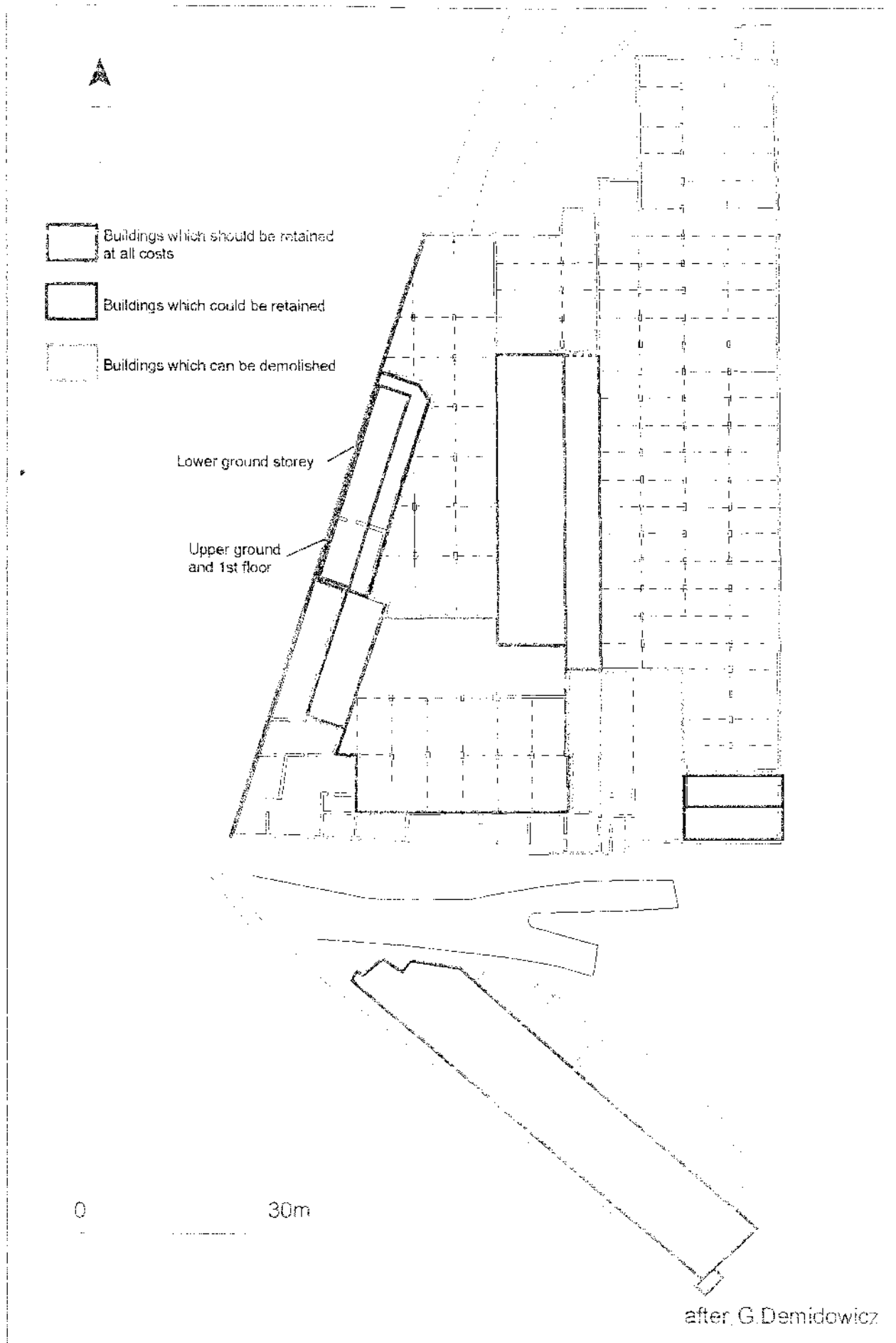


Fig.6 Significance of the buildings

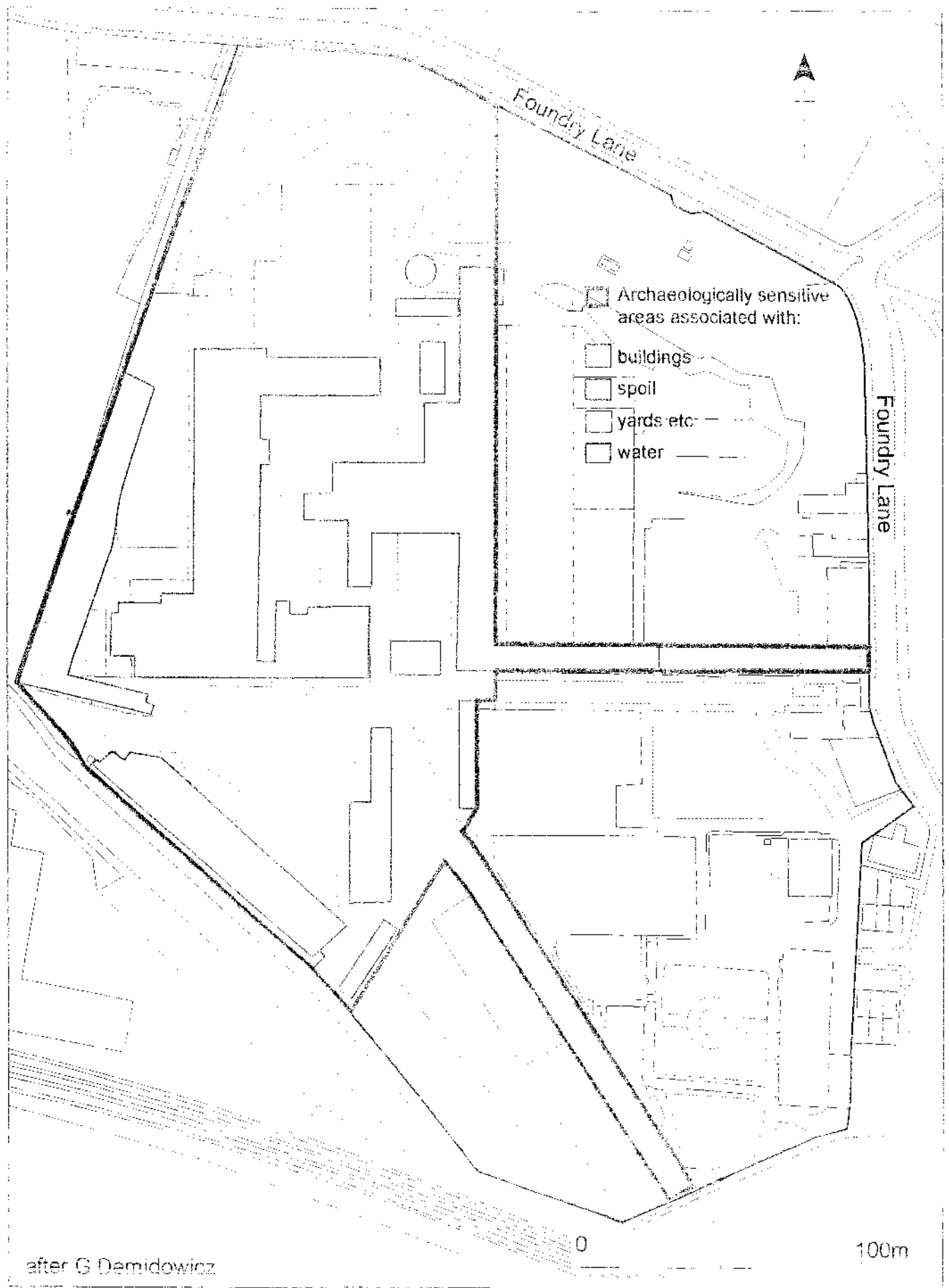


Fig.7 Archaeology of the Avery Berkeley site

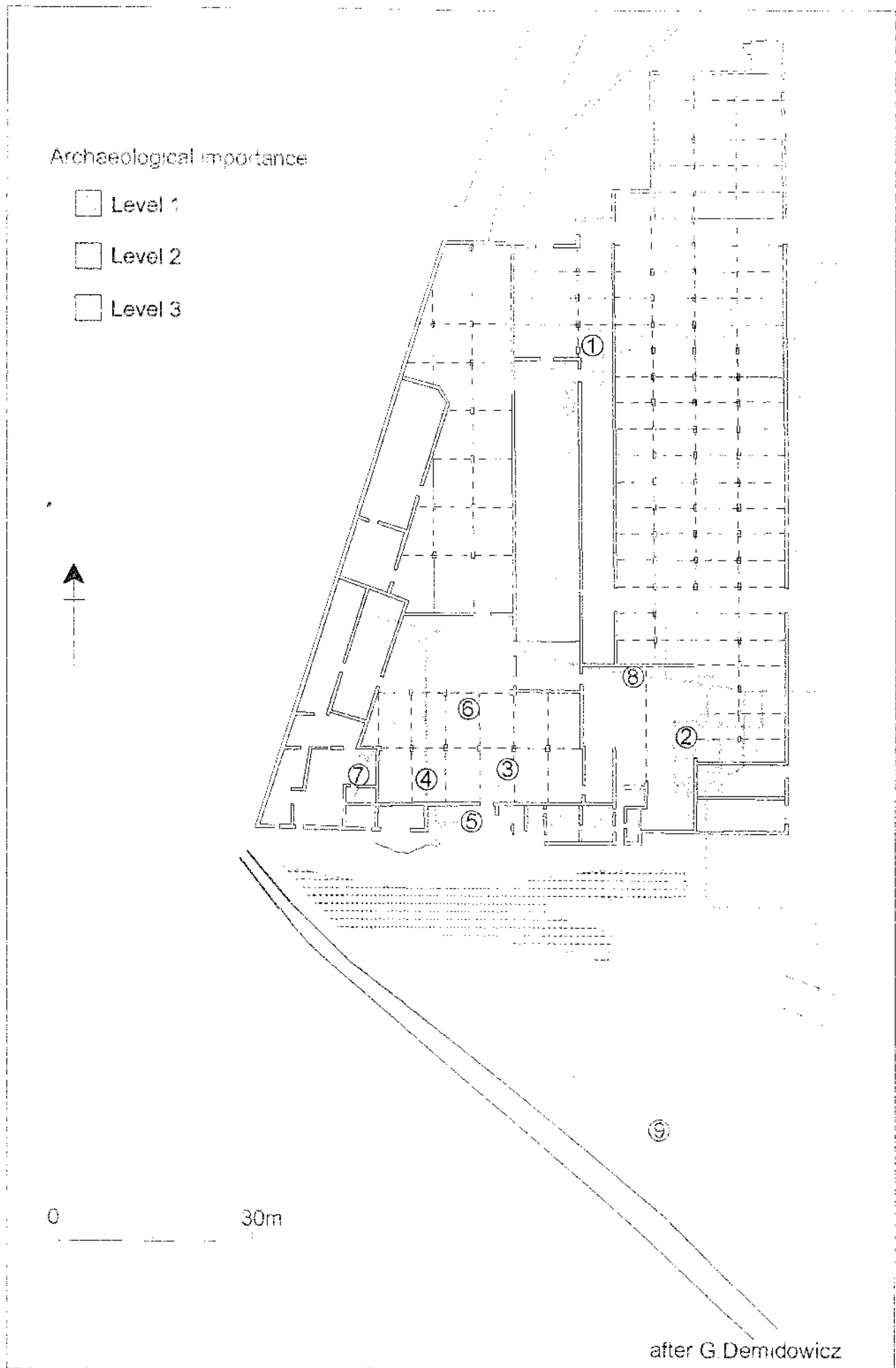


Fig.8 Significance of archaeology

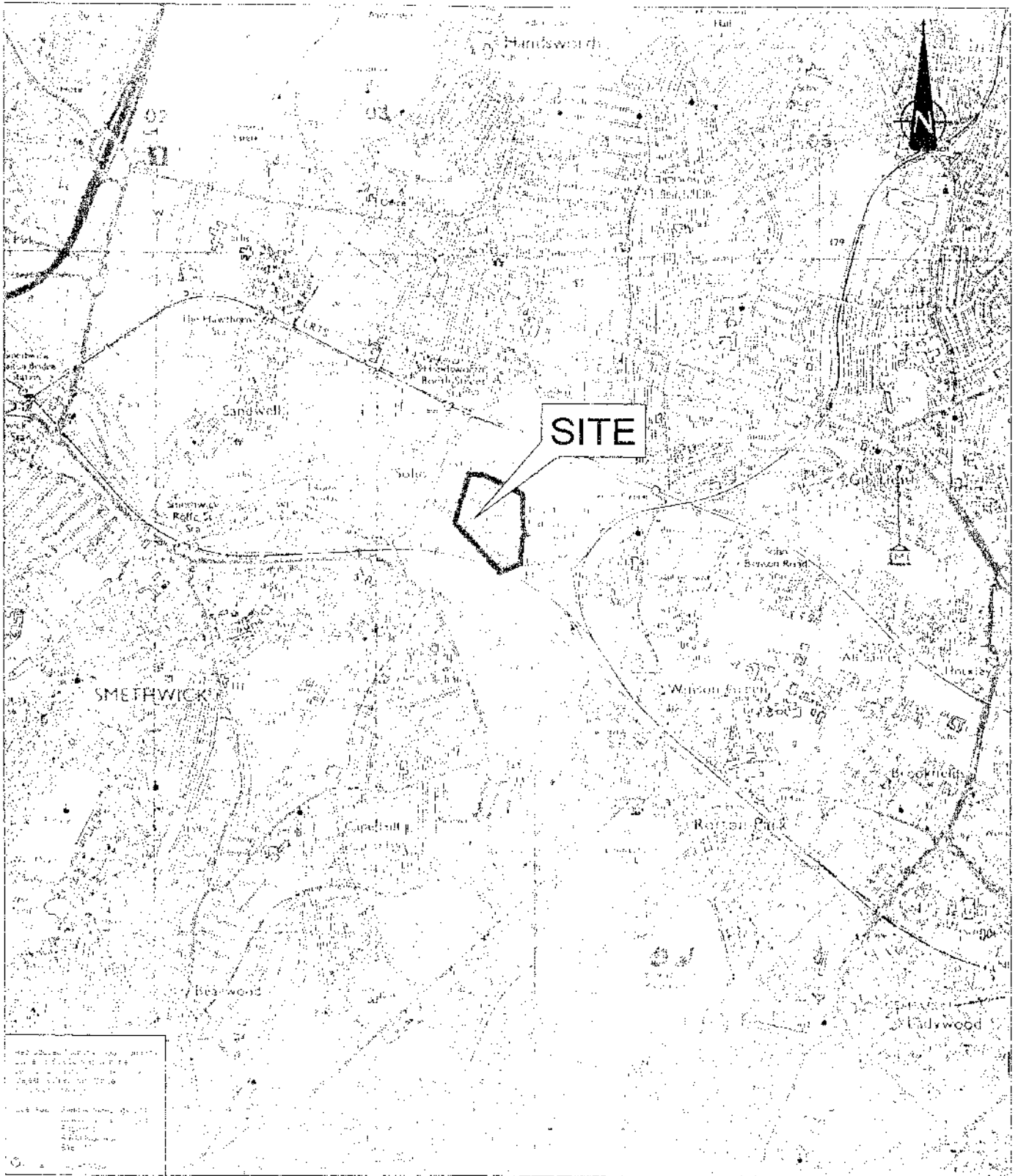


Fig.9 Ecological appraisal location map

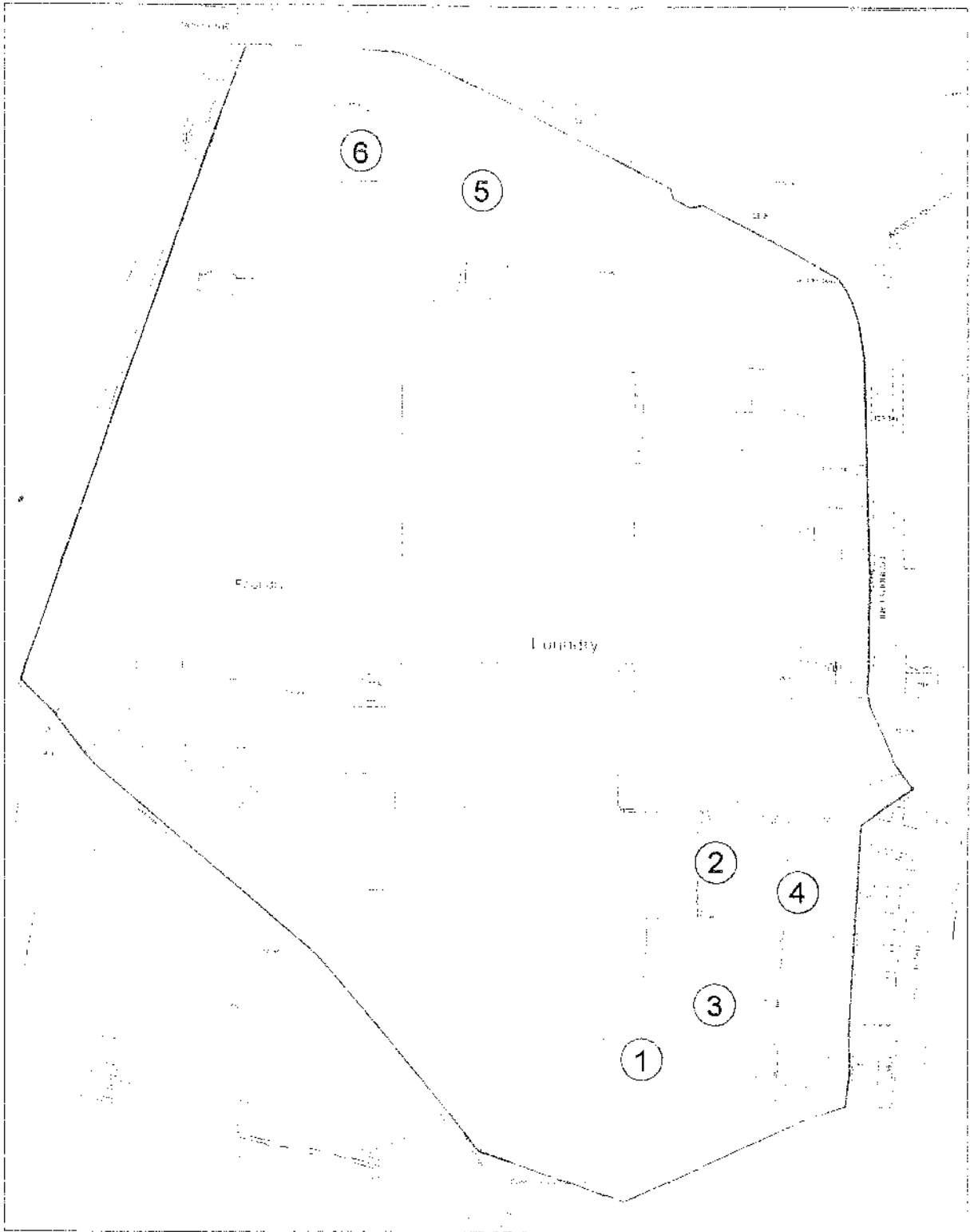


Fig 10 Ecological appraisal site plan

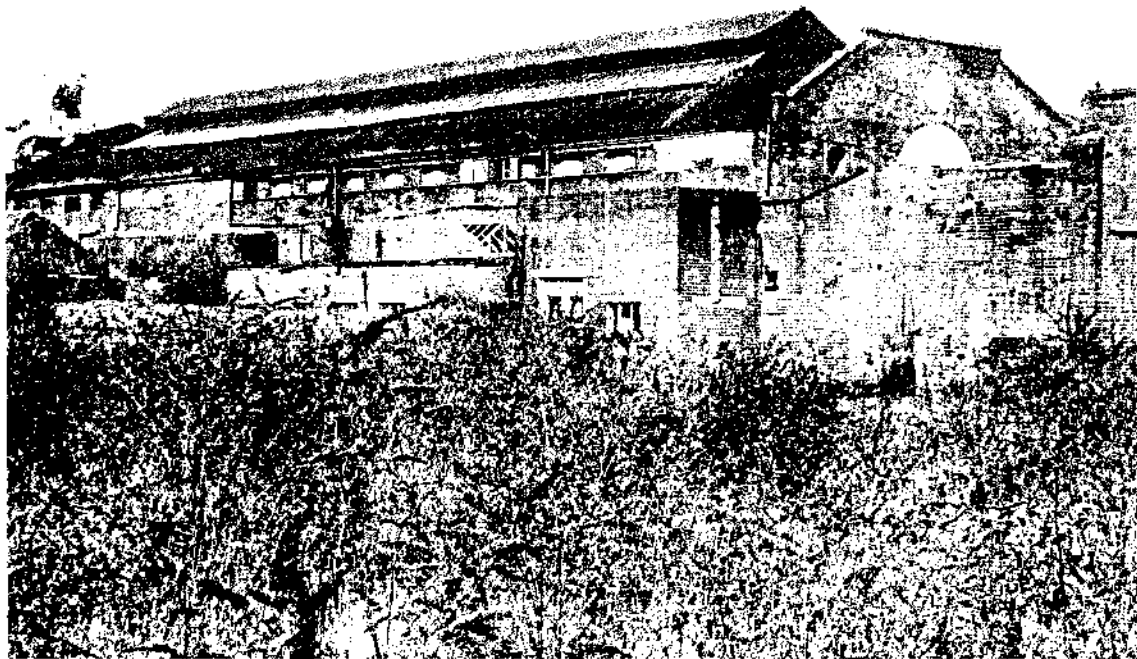


Plate 1 Foundry (1a) from the SE



Plate 2 Erecting Shop (3) from the S



Plate 3 14H Shop (4a) from the S



Plate 4 Weighbridge Shop (5) from the N

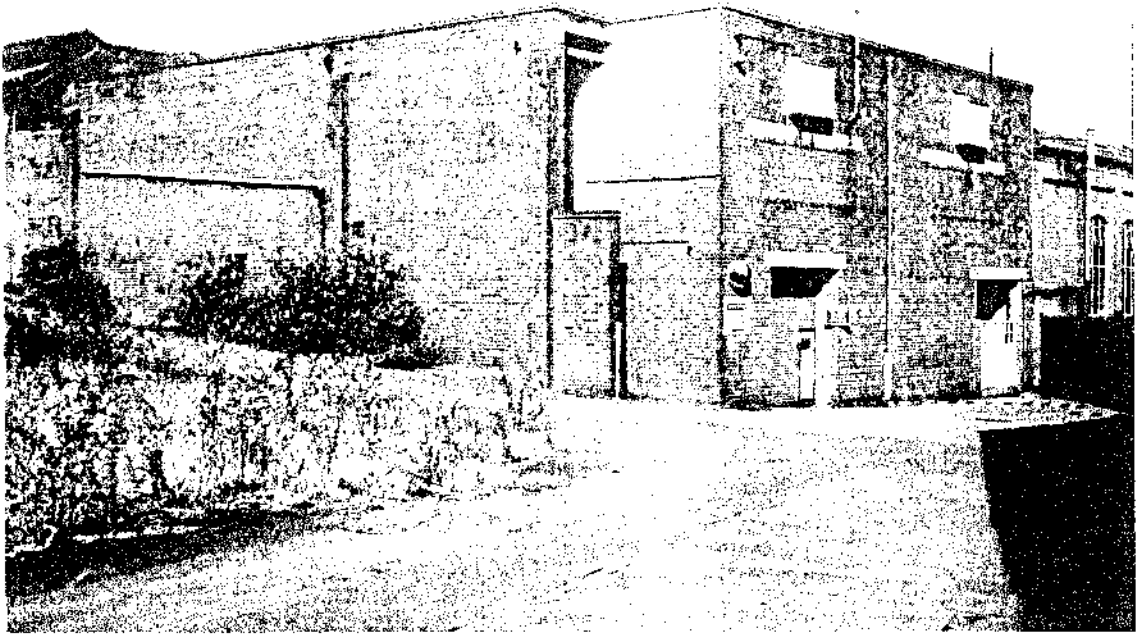


Plate 5 Powerhouses (7) from the SE



Plate 6 Former cottages (8) from the SE

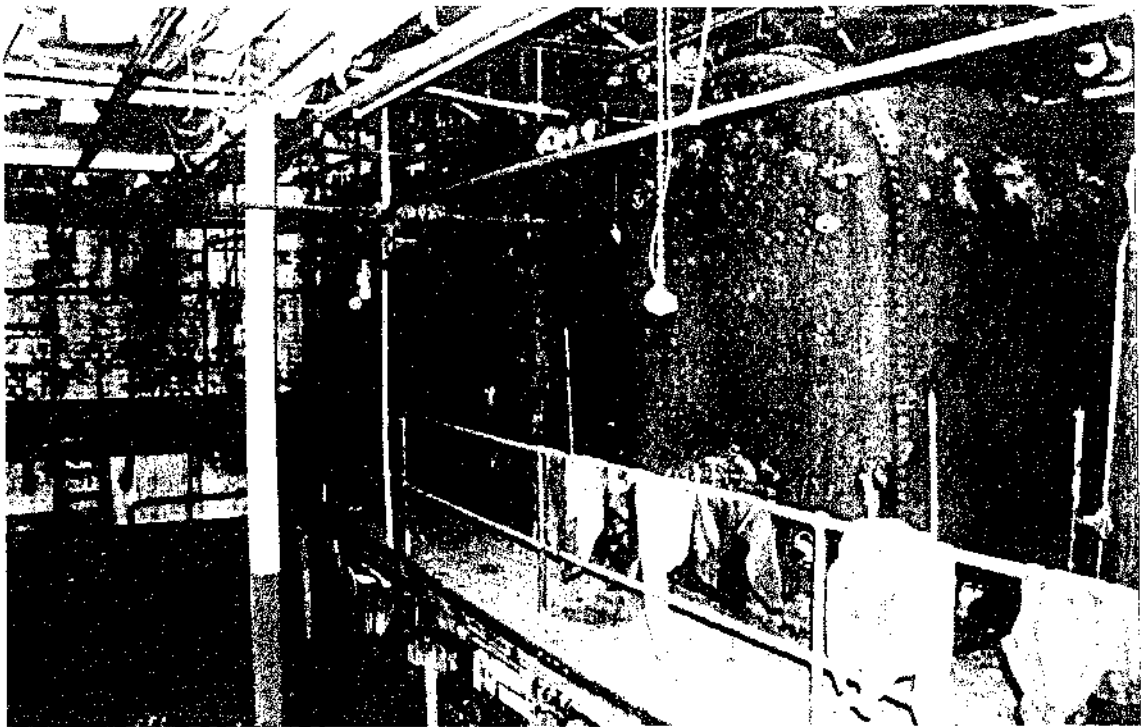


Plate 7 Boiler House interior (9c) from the NW

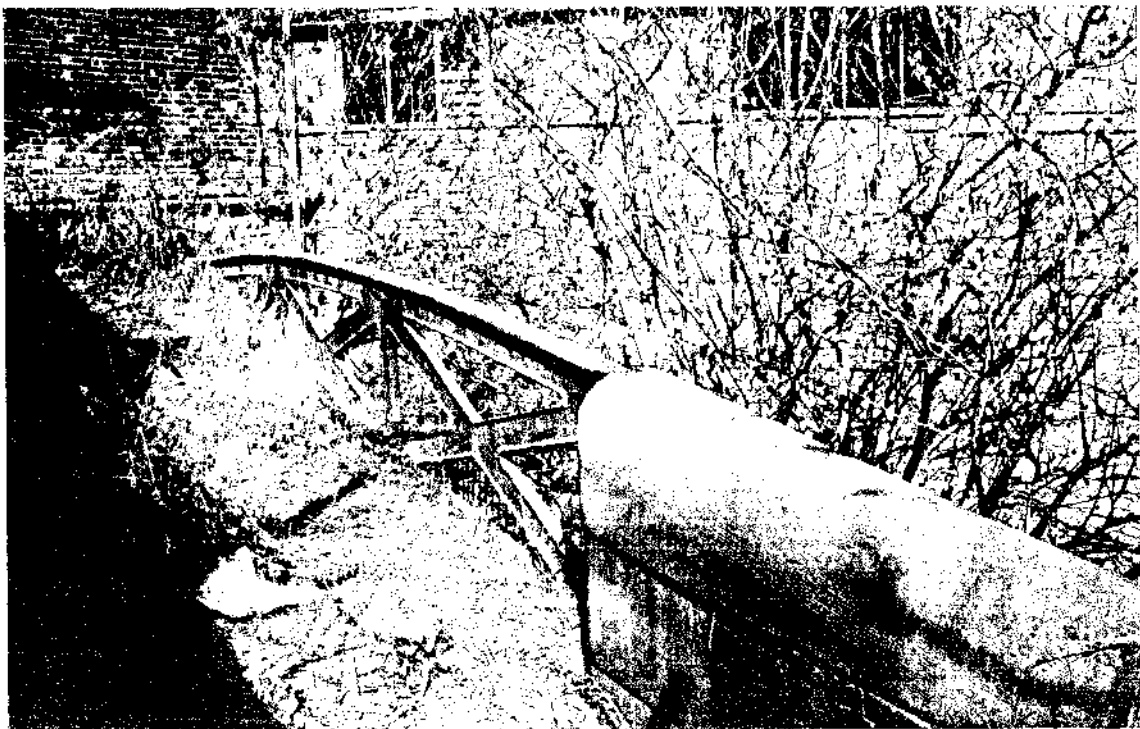


Plate 8 Canal Bridge (11) from the S

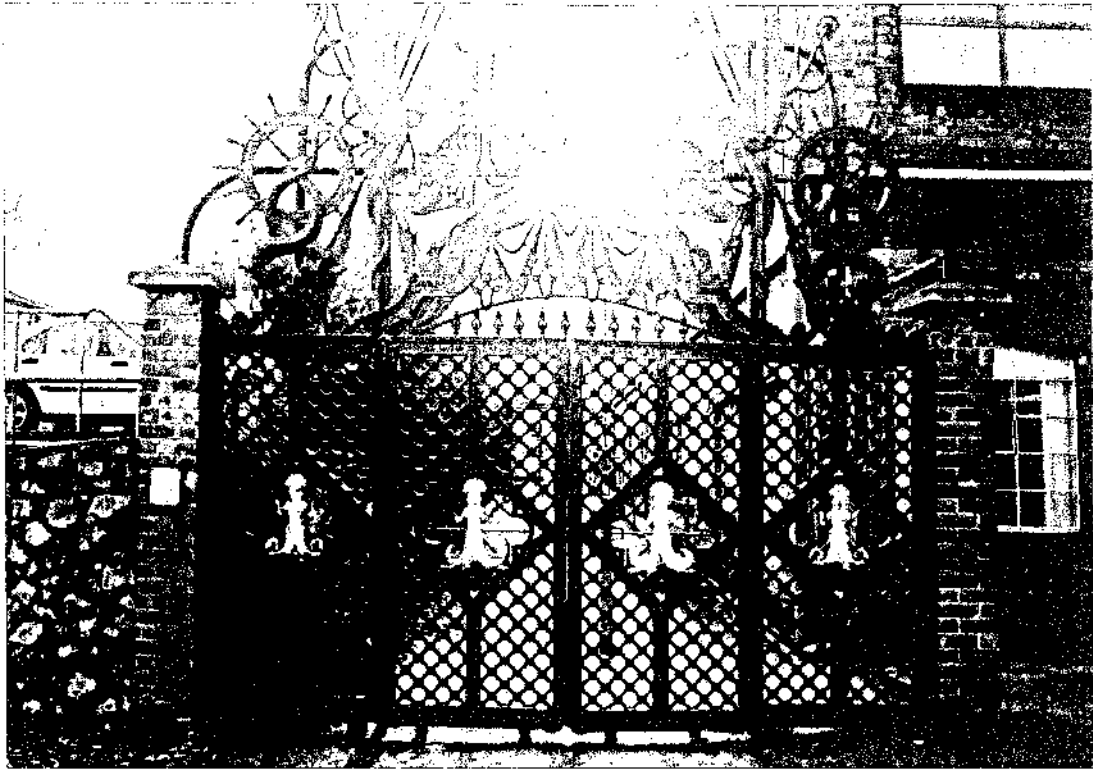


Plate 9 Pooley Gates (12) from the N



Plate 10 Watt Gate (13) from the S



Plate 11 Gatehouse and office block (14) from the SE

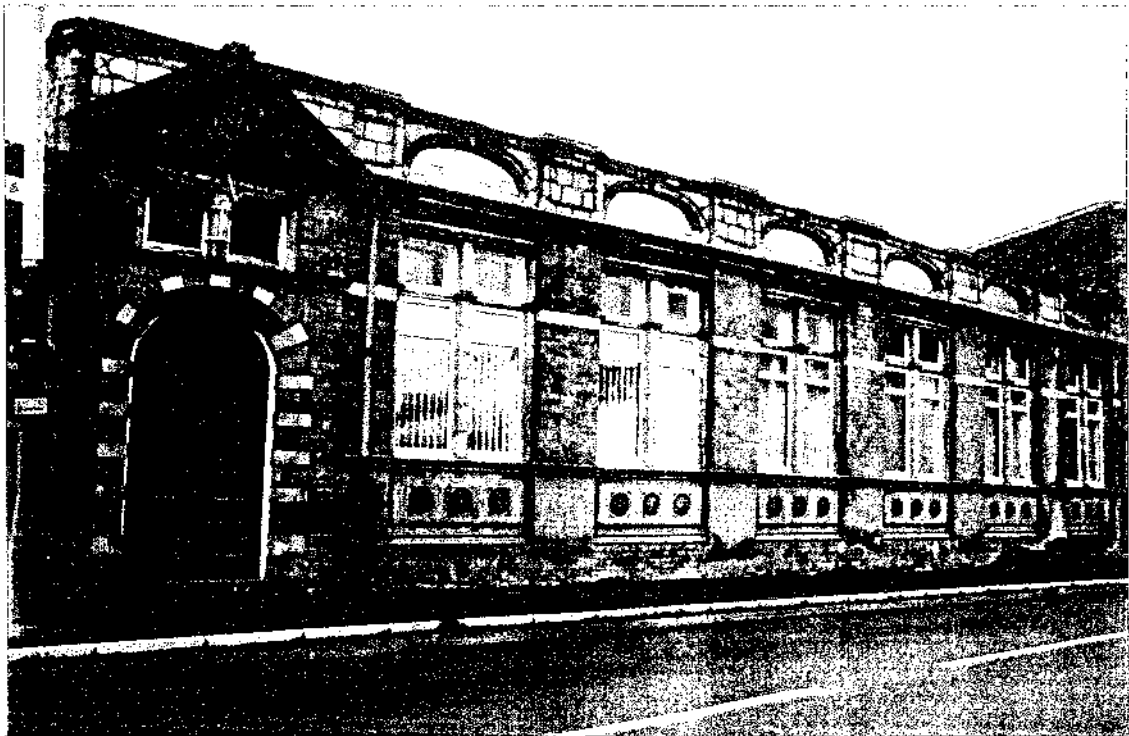


Plate 12 Executive Offices (15) from the SE



Plate 13 Workshop (19), interior from the N

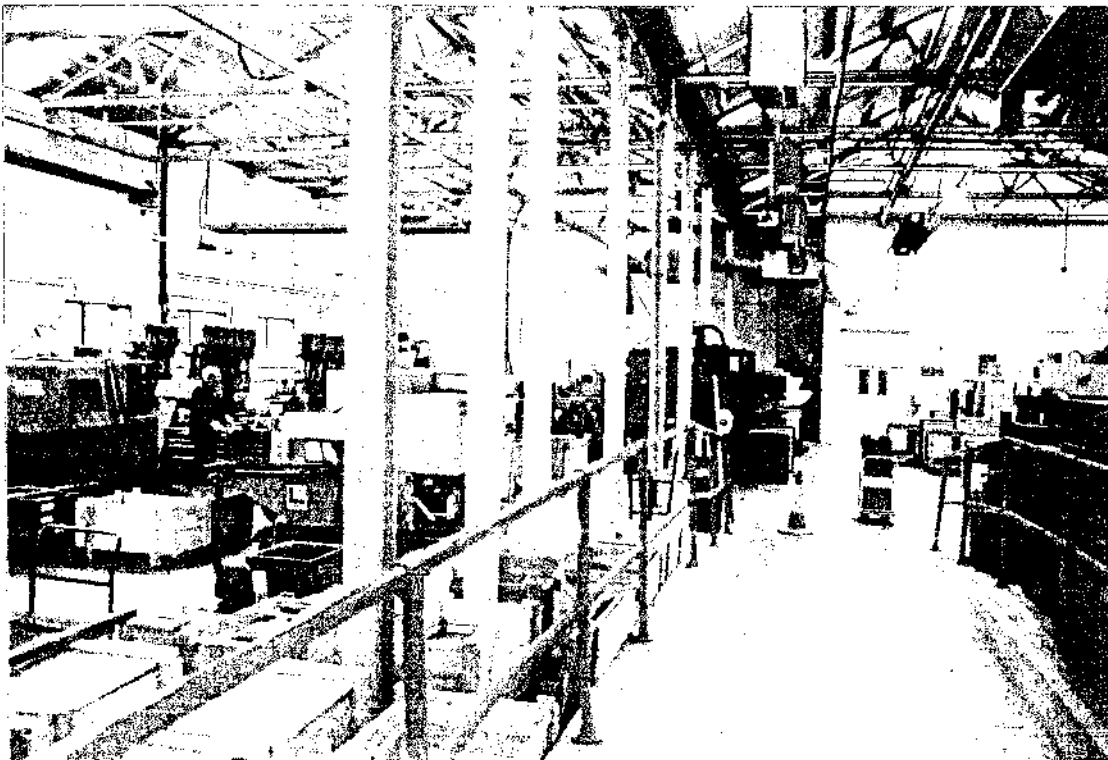


Plate 14 Cutting Room (20), interior from the N

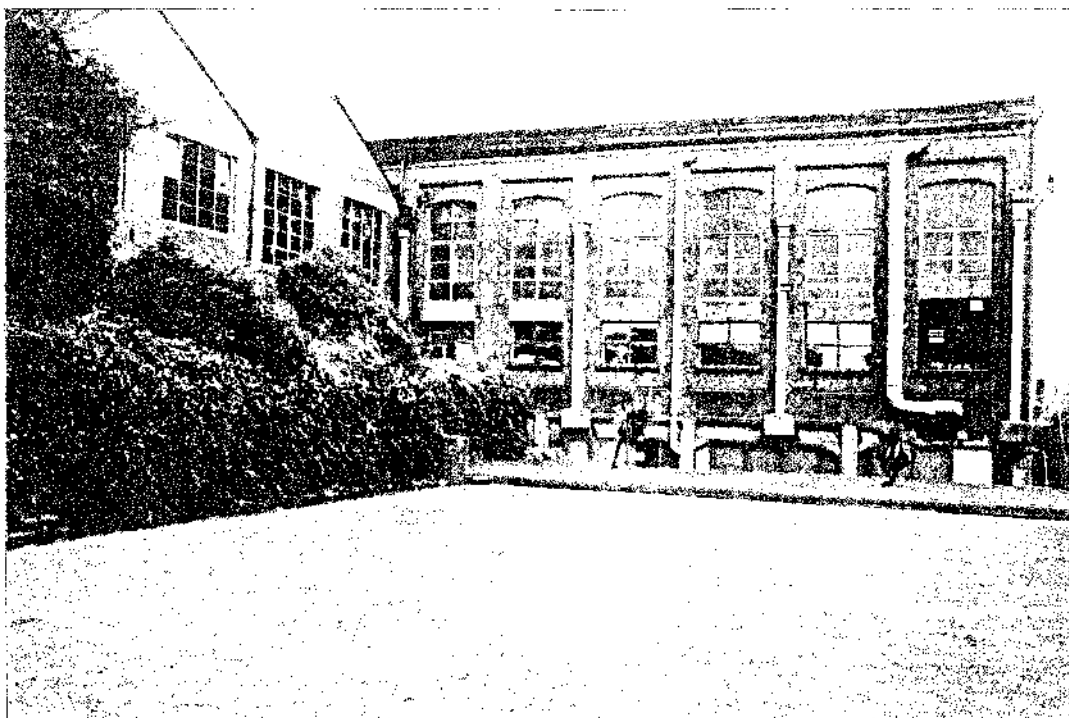


Plate 15 Returned Items Warehouse (25), SE corner



Plate 16 Returned Items Warehouse (25), general view of interior from the NE

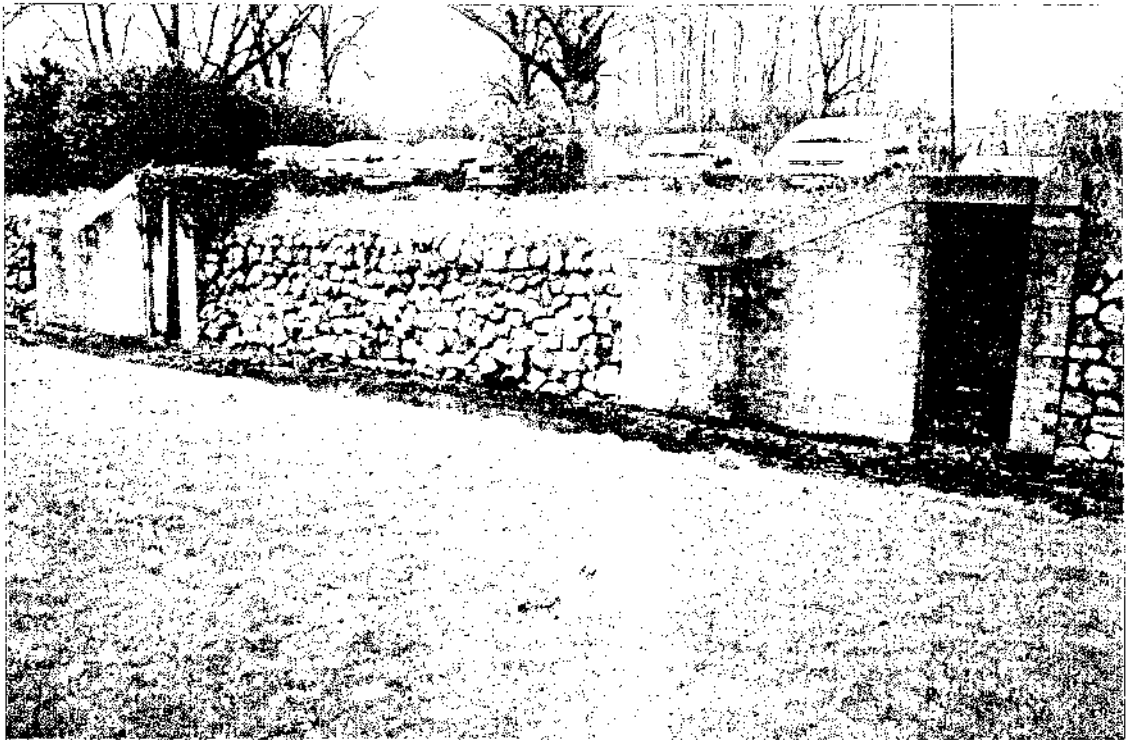


Plate 17 Air raid shelters (28&29) from the NE



Plate 18 Restaurant (30) from the E



Plate 19 Grange to rear of restaurant (30) from the N