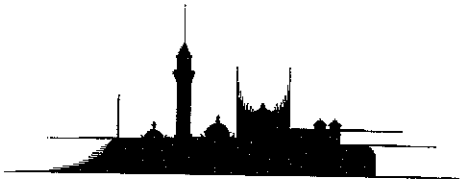
No. 550

BIRMINGHAM UNIVERSITY
FIELD ARCHAEOLOGY UNIT

Early Gasworks
Gas Street, Birmingham

Architectural Recording and Analysis
An Interim Report

B.U.F.A.U.



Birmingham University Field Archaeology Unit
Project No. 550
September 1998

Early Gasworks
Gas Street, Birmingham
Architectural Recording and Analysis

An Interim Report

by
S.J.Linnane

For further information please contact:
Simon Buteux, Iain Ferris or Peter Leach (Directors)
Birmingham University Field Archaeology Unit
The University of Birmingham
Edgbaston
Birmingham B15 2TT
Tel: 0121 414 5513
Fax: 0121 414 5516
E-Mail: BUFAU@bham.ac.uk
Web Address: http://www.bufau.bham.ac.uk

Early Gasworks, Gas Street, Birmingham
Architectural Recording and Analysis
An Interim Report
September 1998

Contents

Illustrations

1.0 Summary

This report is an Interim Report and although containing the main elements of interpretation, the text cannot be considered as the final interpretative document. Architectural features and details not described in the current text may be considered relevant to the final interpretation and be included in the final text, whilst some details will remain on record within the archive.

The Figures accompanying this report form a representative selection of the body of illustrations intended to accompany the finished document.

This report attempts to provide a detailed breakdown of the methods used in recording and analysing the structural history of the Early Gasworks, the results of the analysis and a set of recommendations as to the future development of the site.

2.0 Introduction

The Retort House and associated building complex situated between Gas St. and Berkley St. form an important relic of Birmingham's industrial history. The search for alternative energy sources is one of the main themes of the industrial revolution and indeed remains one of the pressing concerns of the modern era. The realisation that gas could provide many benefits to society and that commercial production was a possibility is well known through documented history but the survival of this building is unique in the architectural record. Although the area surrounding the Gas St. complex is destined to be re-developed, and this could pose a threat to the integrity of the building, yet it has also provided an opportunity to survey the surviving work and to investigate ways by which this important building group can be retained and provided with a new lease of life, with an alternative use for the future.

3.0 Historical Background

The following history is taken from information supplied by Toni Demidowicz of the Conservation Section of Birmingham City Council and references provided by Ken and Maggie Bonham.

The potential properties of coal gas had been recognised on the continent for some time and the experiments of Lebon (Hotel Seignelay, Paris, 1802) and Winzer had illustrated its use for lighting heating and even cooking. However no financial backers could be found to invest in the commercial development of these early experiments. In England this was not the case. Gregory Watt had seen Lebon's experiments in Paris and had written home to describe them, thus inspiring William Murdoch to continue his research into the commercial potential of coal gas production. By 1806, working with Boulton and Watt, the first commercial installation was set up to light a cotton mill in Salford, near Manchester, belonging to the company of Phillips and Lee. By 1814 Boulton and Watt had abandoned the production and installation of gas lighting,

undermined by more successful commercial competitors, in particular Samuel Clegg who had been apprenticed at Boulton and Watt and Albert Winsor who had demonstrated street lighting in 1804 in London. It was Samuel Clegg who became involved with the Birmingham Gas Light and Coke Company which had been formed in 1819 after the Board of Birmingham Street Commissioners had asked for tenders for the provision of gas street lighting in the town. The first works on Gas Street were erected for John Gosling in 1818 (before he formed the Joint Stock Company).

The retort house which still stands (Building A) was built in 1822 to replace the earlier house. It was designed by Alexander Smith and cost £1,500. It was noted that the new building was to have an iron roof and slates. The first extension (Building C) was built in 1828 taking advantage of the newly constructed canal basin which ran between Gas St. and Berkley St. and was roofed with the same cast iron trusses as in Building A. This was swiftly followed by a further extension (Building D) which had timber roof trusses. This was probably a coal store.

Building B is a two-storied extension to the north of Building A, in the angle of the "L"-shaped building. The dating of the architectural details would suggest that it was constructed after 1855, after the gas works had ceased production and the buildings had been converted for other uses.

All three of the original gas works buildings are easily distinguishable to the present day.

4.0 Methods

After initial clearance of debris and recent plasterboard panelling within Buildings A, C and D, the walls were selectively trowelled clean of many coats of whitewash etc. in order to reveal mortar types and delineate features such as blocked-in openings, butt joints etc. The walls were then drawn using as a template the architects' elevations, as prepared by Richard Johnson and Associates at a scale of 1:50. All observed architectural details were added to these elevations. Each detail was recorded and numbered on pro-forma recording sheets. The elevations were then photographed using black and white and colour slide films. Certain sections of masonry were drawn at a scale of 1:20 whilst some elevations were photographed with black and white film, using a rectifying lens. These will form the basis of a photo-montage to complement the drawn elevations. All aspects of the record have been catalogued and will form part of the site archive. Mortar sampling and analysis of brick type and size were undertaken. A combination of the recorded architectural detail with the documented history of the site then allowed a Phased interpretation of the site's structures which forms the basis for the following section.

5.0 Structural Analysis

For the sake of simplifying the text North is referred to as being in the direction of Broad Street: This direction is actually North East.

This section of the Interim Report will be extended for the final document with the descriptive text and Phasing clarified and extended. The later features will be described in greater detail and associated features from different buildings will be cross referenced and Phased appropriately.

Building A: Phase I

The earliest structure associated with gas production on the site is known as the Retort House and a surprising amount of the original structure survives, despite 170 years of use, during which it has been utilised for many different purposes.

Building A, in its earliest Phase (Ia), consisted of a reversed **"L"**-shaped building with no internal walls. Its roof structure was formed of cast iron trusses with a complex of iron struts reinforcing and tying together the trusses. The roof structure is at its most elaborate at the corner of the L and at both of its ends which are hipped. Surprisingly the main cast iron components of the roof survive almost unscathed and these have been recorded previously by the Royal Commission for Historic Monuments and require no further comment.

The eastern wall of Building A (AE2) has largely been removed with the insertion of a large sliding door at its southern end and two piers supporting the sliding mechanism. The northern pier obscures a rectangular doorway which had been blocked prior to the insertion of the sliding door. For the rest the brickwork is plain and flat and much patched with modern repair work, especially towards the top of the wall. The junction between the brickwork of the northern end of this wall and the north wall (AN2) is obscured towards the base by the insertion of a rectangular doorway in AN2 which had later been blocked. The upper courses of the wall, however, tend to indicate that there is little or no bond between the two walls. This may be caused by the complete replacement of the eastern wall, in Phase IV, at the time of the construction of Building B or, simply, to the extremely bad repair of the wall. The exterior face of this wall has been rendered but does contain architectural details such as the single recessed arcade which may once have been replicated. Further discussion is required to establish the integrity of this wall as part of the Phase I build.

The southern (AS) wall originally consisted of a run of cast iron pillars supporting the roof trusses. Although it seems possible that these ran for the whole length of the building yet after the seventh bay (running from the east) there is no trace of the pillars having previously existed. Instead it seems probable that this section of wall was always constructed of brick with a flat surface containing arched openings of which only one set are now visible.

At an early period in the life of the building, Phase Ib (possibly corresponding with the construction of Building C), the cast iron pillars were no longer deemed adequate and the pillars were encased in brick piers with panels spanning the gaps between. Although the first three cast iron pillars (from the east) are now wholly, or partially, visible, yet scarring in the surrounding masonry reveals the previous existence of brick piers around these also.

The eastern corner of this wall consists of a pillar of bricks which have been much disturbed but to which no other masonry is bonded. The pillar may be a primary component of the structure. The first bay is plain except for a segmental arched opening close to the floor. This has been blocked and its purpose is presently unknown. The second bay is plain. The third, fourth and seventh bays contain the remains of semi-circular arched openings. Although the fifth and sixth bays have been damaged by the insertion of a large rectangular opening with RSJ lintel, it seems probable that these would also have contained arched openings.

A large expanse of relatively recent brickwork has been inserted into bays eight and nine. The brickwork is keyed into the pillar of column seven and alters the wall alignment slightly as it rejoins the original brickwork. It is possible that this modern patch again conceals arched openings. At the western end of this wall a large segmentally arched opening has been bricked in and this sits below another semi-circular arch. These may be contemporary and could have operated in a manner as shown in Fig. 7 or they could be of different periods of use. The upper arched opening being the earlier, then, after being blocked, the lower opening was inserted which, in its turn, was blocked.

The corresponding wall, the northern (AN2) is constructed of brick and is plain except for three arched openings set at different levels. The lowest is within the second bay and the opening extends to a height of 3.5m from the current ground level whilst the next opening is in the 4th bay and its base is 1.0m above the present floor surface. The third opening is in the 7th bay and its base is 1.75m above the floor. It is possible that a further opening existed in the area of the 6th bay but this has since been obliterated by later alterations. The blocking of these openings is slightly recessed.

A clasp buttress encases the internal corner of the brickwork where the building turns to run to the north. The walls of this part of the building (AE1) are plain except for thin piers placed symmetrically between the roof trusses. The main feature in wall AE1 is a large arched doorway which would have given access to a yard situated between the retort house and the canal basin. This area is now mainly occupied by Building B.

The end wall (AN1) of this wing of the retort house has been largely destroyed with the insertion of a large rectangular doorway with RSJ lintel. It is possible that the original wall was plain.

The western wall of the retort house, towards its eastern end, has a segmentally-arched doorway which, initially, was partially blocked to turn it into a window or hatch and then later blocked completely.A thin buttress also survives, matching the alignment of

wall AN2. The upper part of the buttress has been removed but wall scarring suggests that it was part of the primary construction The southern part of this wall is otherwise plain except for the rectangular openings which have been created at various levels and then later blocked. The northern part has piers which match those in AE1 but is again otherwise plain.

It seems likely that the various apertures which pierced the brickwork were blocked when the building ceased to function as a gas works and was leased for other uses. At some point in its new use a series of six pairs of brick piers was constructed against the north and south walls of the eastern wing of the building. These provided support for a series of substantial timber beams. Although no doubt intended to support heavy weights for some aspect of its later industrial usage there are no clues as to their precise purpose.

In 1912 (pers. comm. Toni Demidowicz) a partition wall was constructed between walls AW and AE1 (P in Fig.2). The wall rises to roof height and is plain other than a large rectangular opening at its western end. This wall appears to be of the same date as the blocking of the large arched doorway in wall AE1.

All walls of this building have been pierced by rectangular openings some of which have later been blocked. These openings relate to the later activities on the site and not to the function as a gas works.

Phase II: Building C

Building C is an almost square structure projecting to the west from the southern end of the western wall of Building A. It is brick built with irregular courses of headers and stretchers, sometimes three sometimes five courses of stretchers together. The northern and southern walls abutt the brickwork of Building A.

The roof structure consists of the same cast iron trusses with tie struts as in Building A although the ends of the building are gabled rather than hipped. The four roof trusses and end gables give a building of five bays. The doorway in the southern corner of the eastern wall gave access into Building A and is contemporary with A. Other than modern openings which have since been blocked the eastern wall is plain and belongs to Phase I except for the construction of the gable end above the Phase I brickwork. This has a a single circular vent with timber louvres.

The southern wall (CS) appears originally to have consisted of five bays with brick pillars supporting the roof trusses and arched openings at ground level above which panels of brickwork joined the pillars and are in bond with the pillars. The external face of this wall is flat with the supporting pillars projecting into the building. The last bay running towards the west shows no trace of an opening having ever existed. This wall has been much modified so that it is difficult to be certain of the original form. If the arched openings did once exist they have been much damaged by the insertion of RSJ lintels into them to create new rectangular openings which have since been blocked.

The western wall and end gable contains a single circular vent as its opposite does and is flat and plain. A doorway with segmental arch is contemporary and aligns with the Phase I doorway in the eastern wall. This has been blocked with brickwork using a grey ash mortar. The blocking has been partially removed to form a new doorway. There is another opening towards the northern end of this wall, with a timber lintel, which will be of recent date.

The northern wall has been much altered by the insertion of the Phase IV archway (see below). No architectural details are visible at the base of the wall. Modern panels of plaster on either side of this wall may conceal architectural features. It seems probable that a doorway and windows would have given access to the canal basin. Towards the top of the wall the remains of five (one per bay) semi-circular openings can be discerned. These will have provided light and ventilation but became redundant with the construction of Building D and were consequently blocked.

Phase III: Building D

The construction of Building D made use of the existing masonry of Buildings A and C. It occupies the space in the angle between the northern wing of Building A and the northern face of Building C. The latter wall (DS) was remodelled with the construction of the southern gable over the standing masonry of Building C with two circular openings towards the top of the gable. The earlier masonry is pierced by a large semi-circular opening (with a radius of 4.25m) which will have been inserted after the buildings were no longer used for gas production.. The arcade of five semi-circular openings at the top of the wall are blocked, probably in this Phase. No other features have been identified in this wall.

The western wall of Building D (DW) was constructed with a width of three bricks and is divided into a series of five bays separated by four piers (0.75m wide) leaving panels 2.5m wide. The piers are bonded into the main wall and support timber blocks which, in turn, support the timber roof trusses. The first and third bays (running from south to north) have been pierced by recent rectangular openings with RSJ lintels and with reveals which have been left rough and will have been covered by the modern plasterboard. The second bay has a central window opening with segmental arch. The fourth bay has a modern opening at the southern end but one reveal and part of the arch survive of another window, as in bay two. The fifth bay has a more unusual opening, running from ground level with chamfered faces to its reveals and a shouldered brick to the top of its southern reveal. The form of the whole top of this feature could not be discerned despite extensive cleaning. All the original openings in this wall had been blocked with brick bonded in dark grey ashy mortar, associated with the construction of the later building to the west. It seems probable that there were window openings in all of the first four bays whilst the fifth contained a feature, the purpose of which has not yet been determined. An examination of the external face of this wall provided no further architectural detail.

The northern gable (DN) has been rebuilt in very recent times and only the lower courses of masonry (visible in the external face survive the rebuild. It seems probable that this face would have reflected the southern gable with pierced circular vents

within the upper part. The modern reconstruction has removed nearly all trace of ground floor openings other than a straight joint visible externally at the eastern end of the wall.

The NE corner of Building D extends some 2.0m beyond the NW corner of Building A. The wall turns and runs up to form a butt joint against the earlier corner. Within this span of walling is a doorway with segmental arch and a square aperture with cast iron casing. Both openings are contemporary with the construction of Building D but have been blocked at a later date.

The use of the western wall of Building A as the eastern wall (DE) of this building meant that four piers had to be constructed against it in order to reflect those within the western wall. These piers are not in bond with the wall and are intended to support the roof trusses. Other than a late doorway pierced through the bay at the SE end of the wall and later blocked, this masonry from Phases I and II of the building sequence has survived remarkably unaltered.

The roof trusses are of timber. The original roofing material would probably have been slate although this has been replaced by corrugated iron sheeting. The louvred opening of the central section of the roof may well reflect the original form of the roof but this is uncertain.

The floor currently consists of a concrete slab. However, a test pit recently excavated by The Ironbridge Institute revealed a floor of bricks set on edge (immediately below the concrete floor) which may be the original.

Phase IV: Building B

This building is a two storied structure inserted into the corner of the reversed-L of the Phase I Building A. It consequently makes use of walls AE1 and AN2 as its western and southern walls. The building was constructed in 1857 when the site was no longer involved in gas production but had changed to metal-working.

The ground floor has been divided by a modern (breeze block) partition running from west to east. The northern room has been used as a display area and the remains of its decoration obscure any details other than the plain rectangular window openings with iron frames. The southern room has its eastern wall much damaged by the insertion of a large rectangular doorway whilst the southern and western walls reveal features discussed in the section on Building A.

The first floor is of timber planking supported on steel joists running from north to south.and accessed via a timber staircase placed against the southern wall (BS). The roof would originally have been "V"gabled but has been replaced with rounded gables and the roof trusses are now made of angle iron, using a mix of bolts and rivets to fasten them. The gables (BW and BE) each contain three round headed windows which will date to the 1857 build, whilst the northern wall contains rectangular windows and openings.

Externally the eastern wall has been rendered and any contemporary architectural detail has been obscured. The northern wall has been damaged by later structures which had been built against it but which have since been demolished. Notable features are the five buttresses which support the wall and appear to be contemporary and, unattached to the wall, a brick chimney once associated with the brass smelting industry which existed on the site.

6.0 Results

The detailed analysis of these structures has demonstrated that the three main phases of construction, associated with gas production, can all readily be identified. Initial examination of the fabric suggested that the many alterations of the recent past had obscured, if not destroyed, the integrity of the original structures. The analysis has revealed that this is not the case. It seems probable that the buildings treated sympathetically could be returned to their original forms with a high degree of architectural accuracy.

A study of the standing masonry has not allowed the writer to come to a clear interpretation of the manner in which the buildings were used to house the gas producing retorts etc. This will be the subject for debate and further study. It is probable that only archaeological excavation, to reveal the floor surface contemporary with the use of the buildings as a retort house, will clarify such areas of debate.

There are other areas of uncertainty where alternative interpretations can be made. An example occurs in Fig.4 where at the western end of the southern wall (AS) the two arches are shown as contemporary and in use together. They could possibly have operated in the manner shown in Fig.7 which shows the retort tubes packed into an upper arched opening above the opening for the fire. It is however possible that the upper arch is the earlier feature, that it was blocked and that the lower opening was then inserted through the blocking. Again further information could be gained from the careful un-blocking of the features as part of the restoration programme.

The following section proposes a series of actions which would supplement the results already obtained.

7.0 Recommendations

All buildings tend to have unique histories and when a particular structure is deemed to be worthy of being "Listed" the reasons for its special status need to be understood and these reasons will form a part of the thinking behind any works, restoration or other, which might be contemplated for the future survival of that structure.

Within the field of structural conservation/restoration there are two, contrasting arguments. On the one hand the total history of the structure is considered of paramount importance and each alteration to it is to be preserved within the restoration process so that not only the structure but all its historical changes are retained. The alternative argument would maintain that a structure is generally Listed because of a particular aspect of its history, usually pertaining to the original purpose

of the building. If the latter argument is preferred then some or all secondary aspects of the structure might be considered for removal with the intention of highlighting those architectural features which directly illustrate the original form and function of the structure.

In agreeing future works on a structure one or the other of these arguments might be considered as the correct way to proceed or, perhaps more commonly, a solution which encompasses elements of both arguments might be adopted.

Generally other considerations such as structural engineering implications and future alternative use will follow on from the conclusions agreed upon after discussion of these opposing methods.

The following recommendations are the writer's initial observations and tend towards recognising the Listed Gas Retort House as important for its primary purpose. Where possible the original form and function of the building should be highlighted and secondary features, unconnected with gas production, removed. Where reconstruction is required it is generally the practice to ensure that the new work can be distinguished from the old.

Building A

1. The roof to be made good with slates and the cast iron work conserved.

2. The removal of all secondary features e.g. the brick piers and timbers which they support against the north and south walls of the eastern arm of the structure.

3. The cleaning of all brickwork to brick face and re-pointing or the ontroduction of an appropriate surface coating.

4. The unblocking of all Phase Ia and Ib openings and the making good of their arches and reveals.

5. The removal of all square headed openings and their RSJs and replacement with brickwork and architectural features if considered appropriate.

6. The effective removal of both ends of the building which have been almost totally altered by recent insertions and reconstruction in modern material sensitive to the buildings previous and future usage.

7. The removal of the internal dividing wall and the blocking of the main entrance arch in the eastern facade.

8. Assuming preservation of this building, archaeological recording of features and floor surfaces encountered in the removal of existing concrete floor with a view to learning more about the building's historical usage and possible hints as to replacement flooring.

9. Glazing, weatherproofing etc. as appropriate to future use.

Building C

As with Building A

Building D

As with Buildings A and C but with particular notes

1. Reconstruction of roof structure from the purlins upwards with Welsh slate finish. Cleaning of roof trusses back to wood.

2. The western wall has been pierced by modern openings, these to be removed and brickwork replaced with inclusion of architectural features if deemed suitable e.g. bays 1 and 3 could have contained window openings.

3. The removal of the northern gable and replacement with modern material possibly reflecting the form of the large arch separating Buildings C and D and its circular vents.

Building B

1. This building was constructed in 1857 and is associated with the later metal-working industries on the site. It is therefore not relevant to the usage of the site for gas production. A series of options are available for this area

a: Demolition of the building which would enable the area between the early retort house and the canal basin (as partially re-constructed) to be developed as an open space, recreating the original relationship between these two components.

b: Retention of the building, restoration and new use of the space.

c: Demolition and construction of a new building in the same location but using modern materials, including glass, to ensure visibility of architectural features and relationships between the canal basin and Building A.

2. The chimney currently standing to the north of this building is not associated with gas production and methods of incorporating it into the site will need consideration based upon which option is chosen for development of the site.

3. Dependent on which option is chosen, any oportunity presented by development should be taken to examine early ground surfaces within the area in order to further our knowledge of the site and possibly to indicate appropriate ground finishes.

Note: All four buildings are interdependent and any proposed development of one structure will have to take into account the likely impact on adjacent structures.

8.0 Acknowledgements

The recording and analysis was undertaken by S.J.Linnane (the writer), M.Breedon and J.Halsted for Birmingham University Field Archaeology Unit, having been commissioned by Dr.P.Collins of The Ironbridge Institute. The work was instigated by Crosby Homes Ltd. (the prospective developers) whose representative Mr.K.Cooper was most helpful in all aspects regarding the work, most particularly in making available the architectural survey drawings prepared by Richard Johnson and Associates for Crosby Homes Ltd. Thanks also go to Dr.M.Hodder and Toni Demidowicz of Birmingham City Council who provided much background information on the site. Lastly thanks go to Ken and Maggie Bonham who provided further documentary information.. The publication drawings were prepared by N.Dodds and M. Breedon whilst the editor was Dr.P.Collins.

9.0 References

To be included in final document.

10.0 Notes on the illustrations

The illustrations included in this Interim Report are intended only to provide a sample and examples of the figures which will be included in the final report. In the light of recording undertaken since this Interim Report was initially produced, amendments will be required for these illustrations. Annotation and cross referencing with the text will be introduced for the final document.

1 Location plan, based on documentation provided by City of Birmingham and indicating codes (ABC and D) for structures relevant to this report.

2 Ground plan with wall codes used within the text and partially phased. The plan also indicates true north and north used for ease in understanding the text.

3 Location based on Piggott-Smith, surveyed 1824-25. This drawing has yet to be prepared.

4 Building A, wall AS. Elevation of existing masonry, plan and reconstruction of elevation incorporating the cast iron pillars of Phase 1A and the brick in-filling of Phase 1B.

5 3D reconstruction of Building A with Phase 1A cast iron pillars and 1B brick in-filling included.

6 Reconstruction drawing of the main structures at Phase 3 (post 1828), showing the structures associated with gas production within their general surroundings.

7 Illustration showing the construction of retort housing taken from Peckston's publication of 1819 and indicating the possible form of the housings at Gas Street.

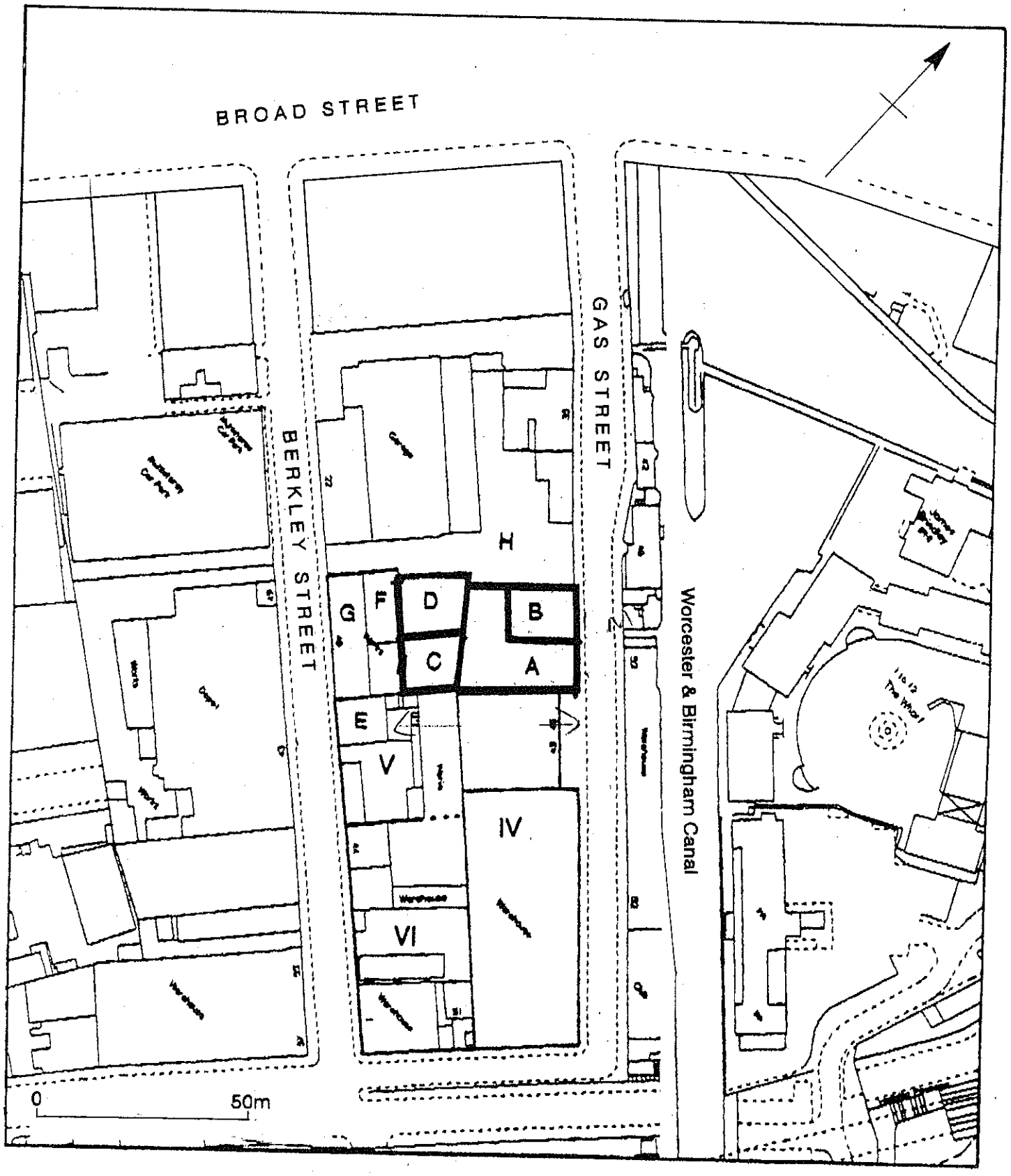

BROAD STREET
BERKLEY STREET
GAS STREET
Worcester & Birmingham Canal
H
G
F
D
B
C
A
E
V
IV
VI
0
50m

Fig.1

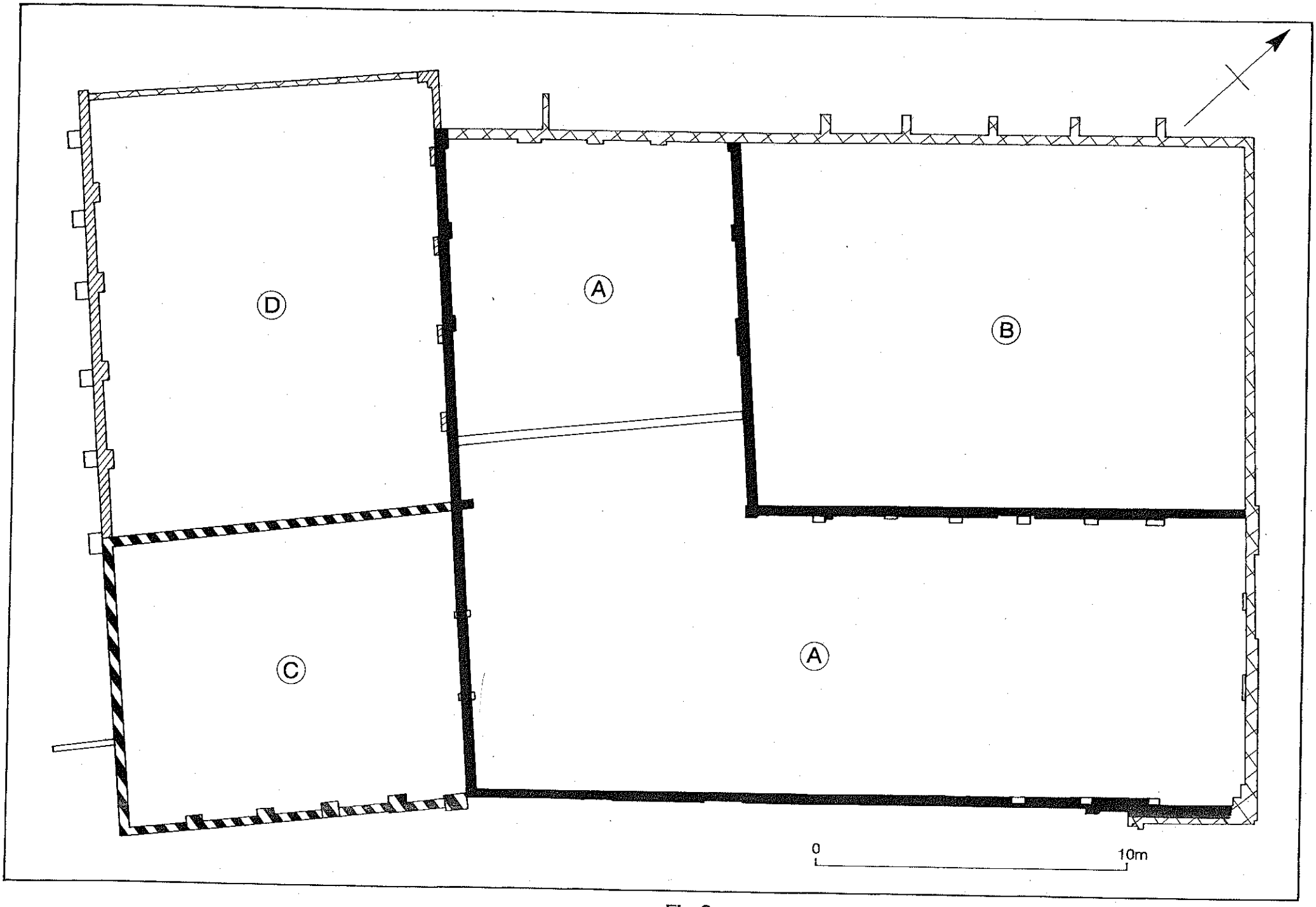


Fig.2

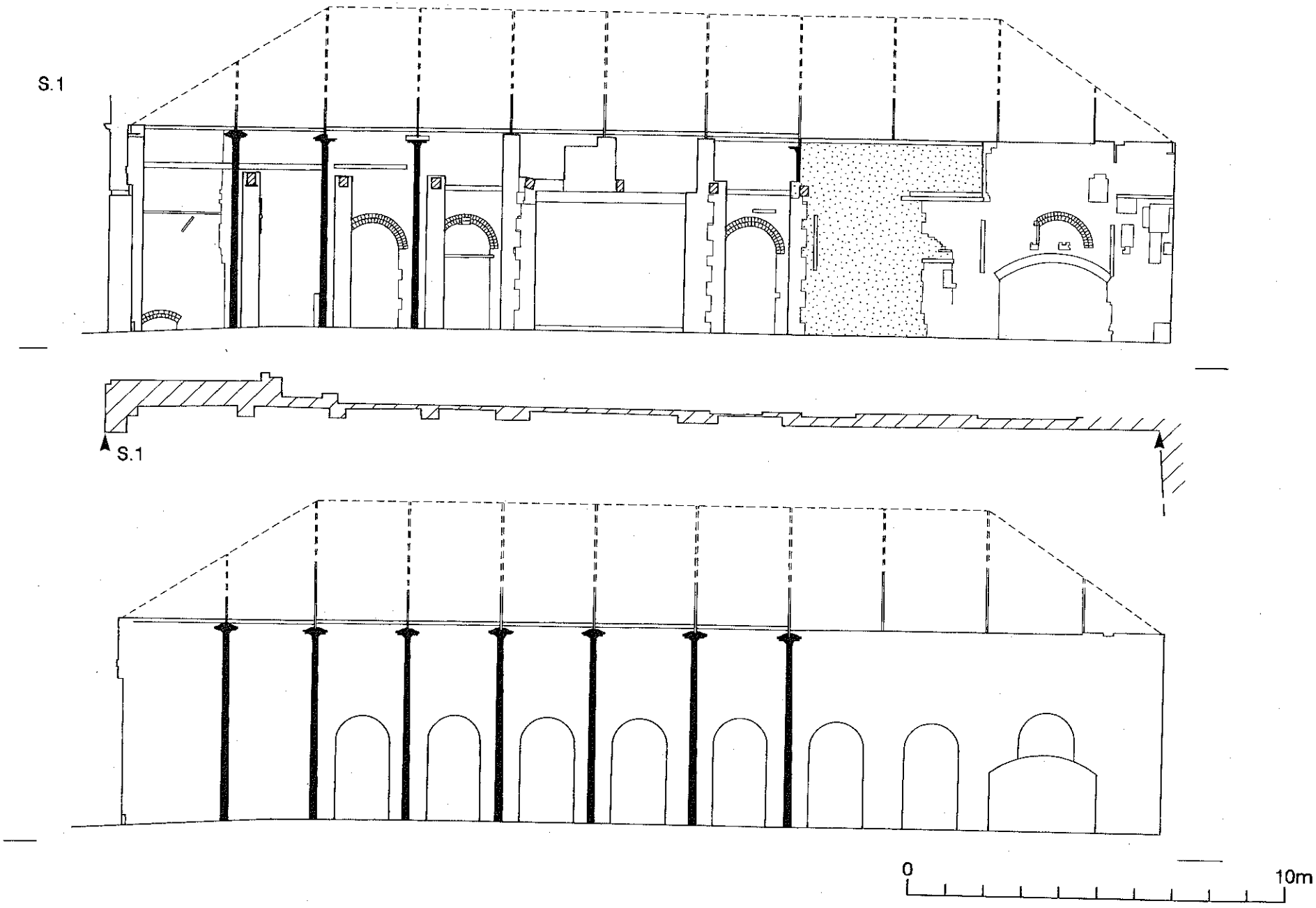


Fig.4

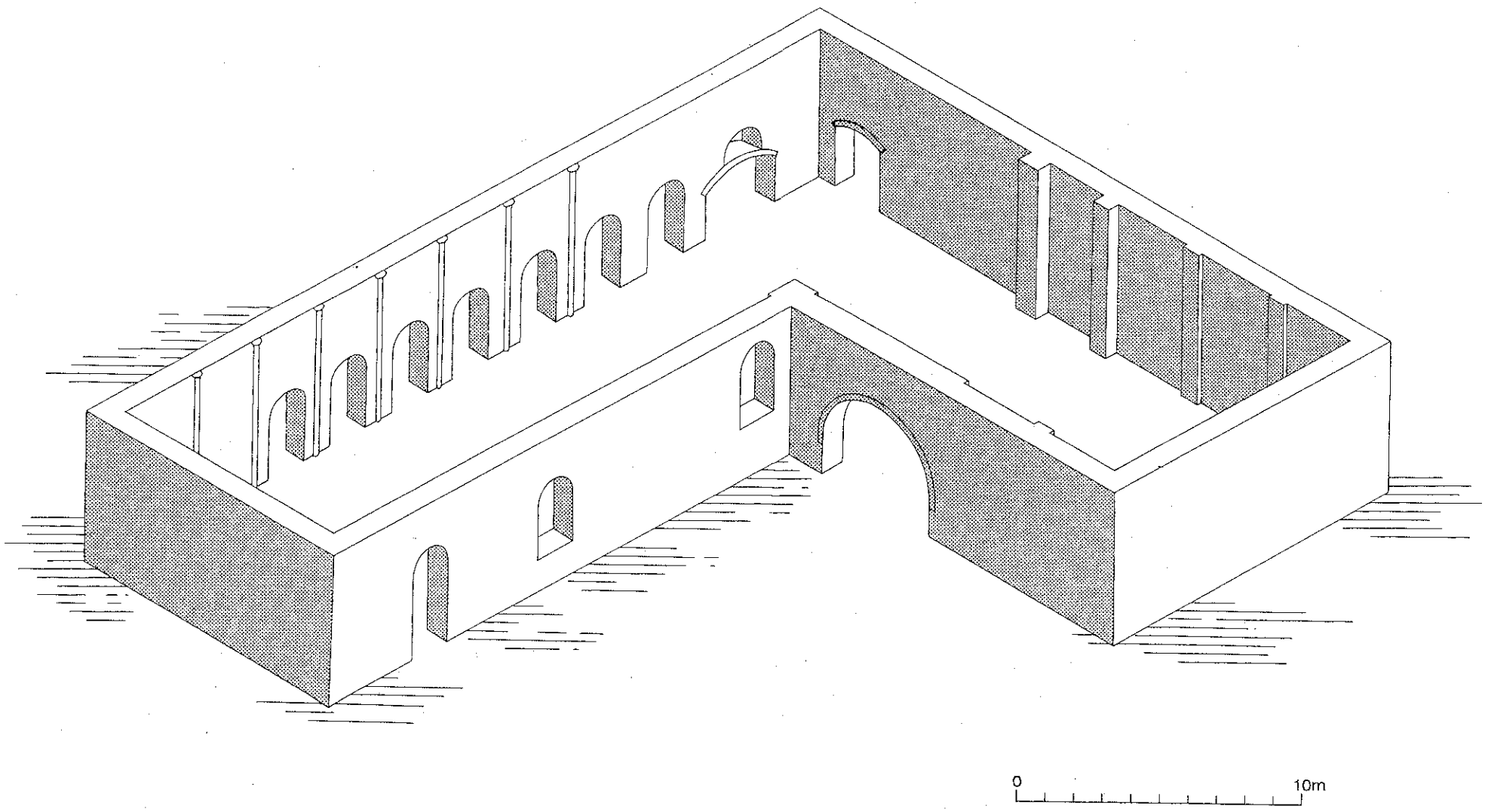


Fig.5

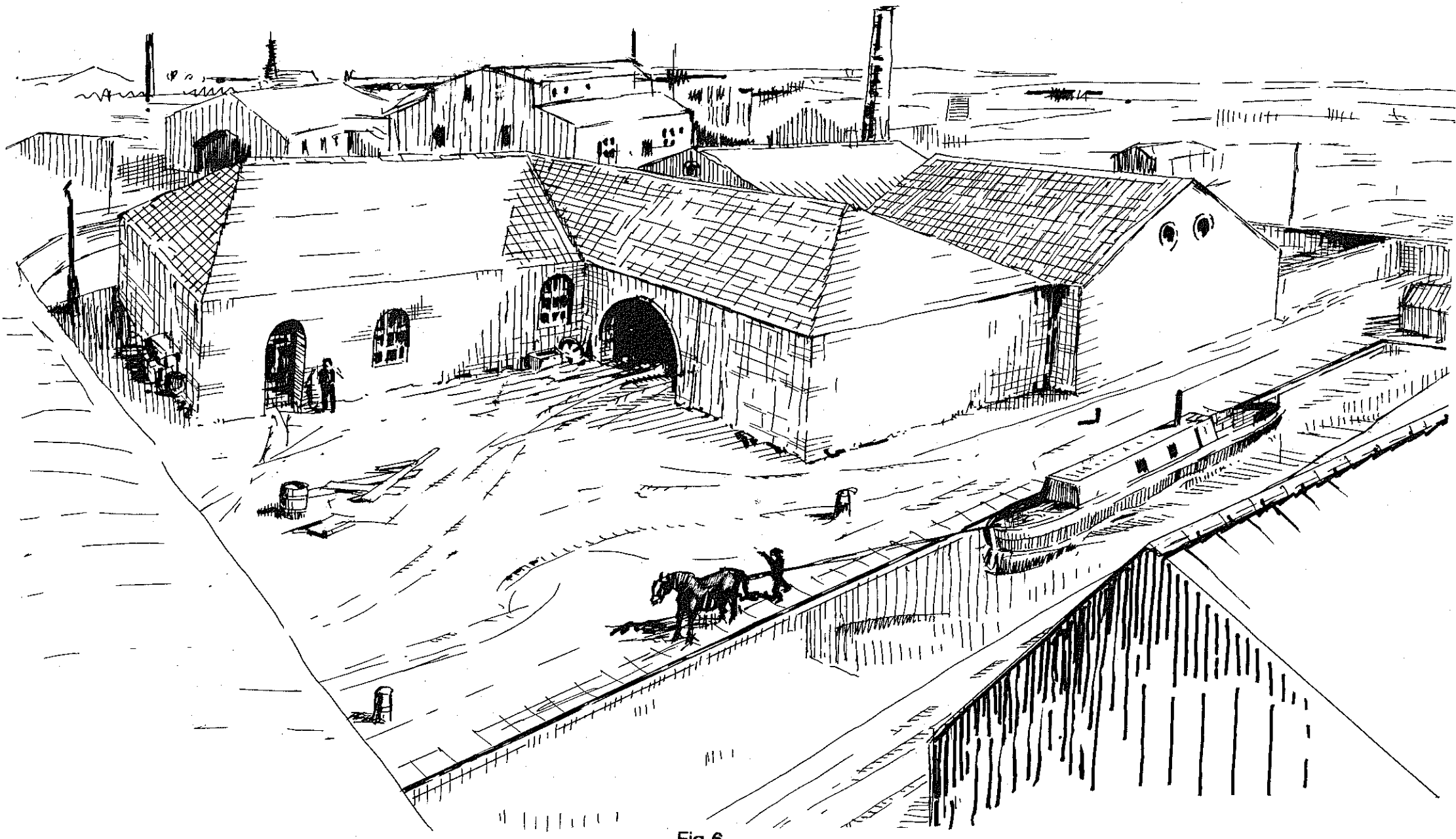


Fig.6

Fig. 7