

**TUTBURY CRYSTAL
GLASSWORKS, BURTON
STREET, TUTBURY,
STAFFORDSHIRE:**

**AN HISTORIC BUILDING
RECORDING AND
ASSESSMENT. 2005**

Project No. 1358

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*Brief for an Archaeological Building Recording: Tutbury Crystal Glass Ltd,
Burton Street, Tutbury. September 2005*

*Written Scheme of Investigation for Archaeological Building Recording at Tutbury
Crystal Glassworks, Burton Street, Tutbury, Staffordshire.*

**TUTBURY CRYSTAL GLASSWORKS, BURTON STREET, TUTBURY,
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SUMMARY

An historic building assessment was carried out at Tutbury Glassworks for Friel Construction Ltd. The glassworks date to the earliest part of the 19th century and continued in use until 2005. Survival from the earliest period is limited to a single range of workshops and two storage rooms which may represent annealing chambers. The remainder of the structures date to the 20th century. The most significant of these is the remains of the blow-house which dates to the early part of the 20th century and contains an oil-fired furnace and associated chimney-stack. The rest of the structures date to the mid-20th century and represent the expansion of the glassworks during the inter-war and post-war periods, and subsequent replacement of earlier buildings.

1.0 INTRODUCTION

In October 2005 Birmingham Archaeology carried out an historic building recording and assessment of Tutbury Crystal Glassworks, Burton Street, Tutbury, Staffordshire, which comprises a mixture of 19th and 20th century industrial buildings. The project was commissioned by Friel Construction Ltd, in order to meet a condition of planning permission prior to the demolition of the glassworks in advance of the construction of 37 retirement units, 10 dwellings and 3 retail outlets. The project was informed by a brief prepared by Staffordshire County Council and adhered to a Written Scheme of Investigation prepared by Birmingham Archaeology (Appendix 1).

2.0 SITE LOCATION AND GEOLOGY

The site is situated on land at the junction of Burton Street and Ludgate Street (NGR SK 2123 2878, Fig. 1). The total plot is composed of approximately 5000m² of land that is aligned north-south in a linear arrangement east of Ludgate Street (Fig. 2). It slopes from east to west and has been subject to landscaping to provide level terraces for the separate factory units.

The underlying solid geology is mudstone, overlain with patches of boulder clay. The soil is mostly permeable clay, with a more loamy soil over the glacial sand and gravel (VCH forthcoming).

3.0 OBJECTIVES

The objectives of the project were to carry out a Level 2 photographic, written and drawn survey of all the historic buildings on the Tutbury Crystal Glass site. This was undertaken to the standards specified in the *Recording Historic Buildings: A Descriptive Specification* (RCHME 1996) and in accordance with the standards set out by the Institute of Field Archaeologists *Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures* (IFA 1999, revised 2001). All stages of the project were carried out in accordance with the guidelines

established in the *Management of Archaeological Projects (MAP2)* (English Heritage 1991).

4.0 METHODS

Recording of the standing buildings and structures involved the following;

- A written description summarising the buildings' type, purpose, material and possible date(s) as well as a more detailed discussion of the plan, form, function, age and development sequence of the buildings.
- The production of plans of all floors within the buildings. These were produced at a scale of 1:50. The plans detailed all features of historical significance, whether still in use or extant within the fabric of the buildings (blocked doorways, former access routes etc.).
- A photographic record including general views of the exterior of the building, overall views of the internal spaces and detailed photographic coverage of the external elevations of the building. All the archival photography was undertaken using 35mm black and white format film with appropriate scales throughout. In addition to this further photography was undertaken using 35mm colour transparency film of general views and particular architectural details as well as digital photography for the purpose of publication. All these photographs were referenced by index and site plan of shot locations.

The project findings concerning the buildings and site were set within their historical and geographical contexts by means of a detailed map regression and consultation of available records within the Staffordshire and Lichfield Record Offices and consultation with the Historical Environment Record (HER).

The project complied with all Health and Safety requirements stipulated by Friel Construction Ltd and those outlined in the *Health and Safety in Field Archaeology Manual* (SCAUM 2002) and in the project Risk Assessment (Birmingham Archaeology 2005).

The project archive was compiled in accordance with the guidelines contained in *Guidelines for the Preparation of Excavation Archives for Long-Term Storage* (UKIC 1990) and *Standards in the Museum Care of Archaeological Collections* (Museum and Galleries Commission 1992).

5.0 HISTORICAL CONTEXT

Glassmaking was introduced to Britain in the Roman period, but fell into decline and was not reintroduced until the 13th century when the earliest references relate to a colony of French workers started by a man called Vittarius in the village of Chiddingfold on the border between Sussex and Surrey. This area continued to be a centre for glass production due to the ready supply of wood to fuel the furnaces. During this period the industry was small-scale and relied on locally obtained materials such as sand and potash, the artisans moving on to another area of the forest when supplies were exhausted.

For much of the medieval period glass-making in Britain lagged behind the rest of Europe but this changed in the second half of the 16th century when foreign glassmakers were encouraged by the government to settle in England. This led to an influx of skilled protestant refugees fleeing the religious wars and persecution in Central Europe. Such individuals included the Venetian Jacopo Verzelini who worked in the Crutched Friars glasshouse in the city of London and produced the earliest crystal-like glass seen in England.

However, expansion outside the south-east of England was slow. A change in the law in the early 17th century led to a radical change in fuel sources. In 1615 James I became alarmed by the rapid deforestation of England and banned the use of wood as a fuel in glass furnaces. This led to glass production moving to areas where coal was available, in particular areas such as Stourbridge in the West Midlands.

It was the development of Crystal Glass by George Ravenscroft in 1676 that replaced the fragile, expensive Venetian cristallo. This development, substituting lead for lime and soda ash for potash enabled a strong clear glass to be produced. Subsequently, the mechanisation of many industrial processes in the Victorian period had little impact on the development of glass. However, the development of press-moulding spread from America to Britain in the 1830s. This process involved the pressing of molten glass into a two- or three-sided metal mould with a hand-operated plunger. It meant as many as four times the number of glass objects could be produced by less-skilled workmen, so bringing the cost of glass within the reach of ordinary households.

The layout of factories also changed in the Victorian period. Prior to this period industrial glass manufacture relied on the cone. The cone acted as a chimney for the main furnace but was also the area where the glassmakers worked, situated between the furnace and the cone wall. Good examples from the late-18th century include the cone at the Redhouse glassworks in Stourbridge (Orton 2000). The cone gradually began to be replaced after the 1830s by larger glasshouses composed of large sheds housing several furnaces connected to a central chimney which rose centrally through the cast-iron ceiling.

6.0 HISTORY AND DEVELOPMENT

There is early evidence for the history of glassmaking in Tutbury dating from 1472 with the reference to a Thomas Wakelyn, a glassmaker from Tutbury who was in trouble for minor offences at nearby Abbots Bromley (Tutbury Crystal Glass 2005). In addition, in 1646 Thomas Preston of Tutbury described himself as a glazier (VCH forthcoming).

A continuous presence in the glassmaking industry has existed in Tutbury since at least 1810 with the establishment of works on the Ludgate Street and Burton Street site. The earliest history of the site was associated with a glass cutting works, probably established by Henry Jackson: it was owned in 1817 and 1820 by Mary Jackson and run by Henry Jackson the younger. Glass vessels were produced off-site in Birmingham and imported to be cut, patterned and finished (Underhill 1930, 126). By 1832 Henry was using steam-powered machinery to cut glass brought from elsewhere, but by 1839-40, he was making his own glass, using 40 tons of coal a week. From 1851 Eleanor Jackson, evidently his widow, was running the works with a workforce of 91 men and 9 women.

The works was separated into several separate departments which included the Blowing House, the Roughing Shop and the Grinding Shop. Conditions within the factory were relatively good if the Report on Children's Employment of 1865 is to be believed (SRO MF22). However, detailed examination of the census returns reveals children as young as nine and ten were working in the factory (Census Returns 1861). Thomas Waston who worked in the blowing house described conditions like this;

"I am 12 years old. I take in. I have worked a year and a half. I took in when I first came. I came at 1 o'clock last night and worked to 7 this morning, and then came again at 1 o'clock this afternoon. On Friday I usually stop at 7 o'clock on Friday night. I don't work on Saturday".

However, the blowing house worked short shifts due to the heat, and life in the cutting shop and grinding shop would often require twelve or thirteen hour shifts. The majority of the workers lived on the adjacent Burton Street and Ludgate Street with whole families involved in the trade. Along with the cotton mill and agriculture, it was one of the principal employers in Tutbury (Census Returns 1841). The family traded as the Tutbury Glass Co., principally manufacturing cut-glass, until 1880 when the works was closed (VCH forthcoming).

By 1884 the business had been bought and reopened by Sir Tonman Mosley of Rolleston Hall, who retained the company name. The company at this time was predominantly involved in the production of jugs, tumblers and measures for the Burton brewery houses (WSL CB/TUTBURY/6). In 1894 the works was leased to the Tutbury Glass Co. Ltd., and in 1906 the lease was taken over by Thomas Webb & Corbett Ltd. of Wordsley, in Kingswinford, which bought the works in 1920. Webb & Corbett extended production from jugs and tumblers for the licensed victualling trade to a wide range of decorative wares, and during the two World Wars more utilitarian items were also produced. The glassworks was extensively modernised at this time with addition of oil-firing and pulverised fuel for melting and lehrs (WSL CB/TUTBURY/6). Eventually the works changed over to town gas. Indeed the Tutbury works was the first to use de-sulphurisers for town gas.

The business changed its name to Webb Corbett Ltd. in 1952 and then became part of the Royal Doulton Group in 1959. The works was closed in 1980, with 150 employees made redundant, but a group of them re-opened it in 1982 under the name of Tutbury Glassworks Ltd and it has continued to trade till the present day. (later Tutbury Crystal Glass Ltd.) (VCH forthcoming).

6.1 Cartographic Evidence

The 1810 Estate Map of Tutbury (Fig. 3) indicates that a number of structures relating to the Glassworks existed on the site. At this time the land was sub-divided into four plots. Two existed along the Ludgate street frontage, a further plot of what appeared to be terraced houses on the corner facing Burton Street, with a further much larger plot to the rear with access from Burton Street. This was defined by an S-shaped complex of buildings.

By the 1840 Tithe apportionment (adopted as the base for the 1840 Parish Map, Fig. 4), the two plots facing Ludgate Street had been amalgamated to form a single land

apportionment with the extension of the buildings to include a series of long ranges. The plot of terraced houses facing Burton Street had been extended along Ludgate Street. The large plot to the rear was extended and an additional L-shaped range was constructed.

The 1st edition Ordnance Survey (c. 1888, Fig. 5) was the first map to annotate the land plot as the Glassworks and by this period the plot appeared to have been amalgamated into a single unit. The linear units along Ludgate Street were extended but expansion otherwise appeared to have been minimal. Indeed, little alteration is visible on the 2nd Edition Ordnance Survey revision (c. 1900, Fig. 6).

Sometime before 1948 the terraced houses on the corner of Ludgate Street and Burton Street were demolished and replaced by a single unit, presumed to be an extension to the factory units. Between 1948 and 1969 many of the buildings on Ludgate Street were replaced and extension occurred to the rear of the buildings facing Ludgate Street. The structures to the rear of the main range were demolished and the land sub-divided. A single building (still extant) was constructed on the Burton Street frontage.

The last change in the land plot occurred with further sub-division of the land to the east of the Ludgate Street range, the demolition of the building facing Burton Street above and subsequent construction of a single free-standing rectangular building.

7.0 ARCHITECTURAL DESCRIPTION

Structure A (Figs. 7 and 8; Plate 1)

Two-storey office/workshop block. 1930-1940s in date. Built in reinforced-concrete and steel-girder box construction, in-filled in machine-cut red-brick in the Flemish Garden Wall bond. L-shaped plan associated with the available land plot.

The principal façade faced north (Burton Street). Central two-storey bay with moulded surround extending to roof level, with central doorway and casement window above. There is a false architrave above the door flanked either side by three symmetrical bays of ground and first floor windows. The western (Ludgate Street) façade continued with six bays of ground and first floor windows. The eastern façade had three utilitarian bays of windows with a side entrance located in the southernmost bay. Plain whitewashed concrete plinth throughout, and a wide moulded concrete string and upper wall coped in concrete on the principal façade which continued within the first two bays on the western façade and the initial bay on the eastern façade. Flat-roof construction with later addition of felt-covered roof.

Open interior plan on ground and first floor. Single original toilet block on ground floor. Subsequent sub-division using plasterboard partition. Later alteration had resulted in the open plan continuing into Structure B and C. Floors are of concrete construction. Roof structure was formed in I-shaped steel girders.

Ground floor was used as a shop and as storage facilities with the first floor used as office and workspace.

Structure B (Figs. 7 and 8; Plate 1)

Two-storey workshop extension. 1950s in date. Built in reinforced-concrete box-construction, in-filled in machine-cut red-brick in Stretcher bond. Sub-rectangular plan designed to fill available land plot.

The principal façade faced west (Ludgate Street) and was a continuation of, and mimicked structure A. There were 14 bays of plain eight-pane casement windows on ground and first floors with continuous narrow concrete sills and heads. Plain concrete plinth continued from structure A. Flat roof structure.

The eastern façade consisted of four large, 24-pane lights onto two open courtyard areas, between Structure B, and Structures C and D. Subsequent alteration had incorporated these into the overall build of the main workshop block with the courtyards now covered. The southern façade was plain.

Open interior plan on ground and first floor. The ground floor had subsequently been extensively sub-divided with plasterboard walls in order to provide storage space. The first floor was open throughout. Floors were in concrete construction and supported by a framework of reinforced-concrete box-girder construction with a row of central columns on ground and first floor. Access to the first floor was provided by a stairwell constructed abutting structure D and structure G. The eastern wall was formed by structural elements of these structures.

The ground floor was probably originally storage space and workshops but extensive sub-division has seen it converted completely to storage. The upper floor continued to be used for tertiary glass processing in particular cutting, polishing and cleaning.

Structure C (Figs. 7 and 8; Plate 2)

Three-storey workshop. Original build dated to the mid-to-late 19th century. Original build in hand-made red-brick predominantly in Stretcher bond which survived for two stories. Later, late-20th century, upper storey continued up in machine-cut red-brick in the Flemish Garden Wall bond. Interior build had been extensively replaced by reinforced-concrete box construction contemporary with the construction of structure A.

Eastern façade consisted of two bays with four basement level windows and two doorway at first floor level above. Single doorway accessed by wooden ramp, other appeared to be extant. Later internal plasterboard sub-division associated with conversion to storerooms and workshops. Originally part of a series of linear workshops. It had been converted as part of the 20th century renovations to open workshops.

Structure D (Figs. 7 and 8; Plate 2)

Two-storey workshop. Early-19th century in date. Built in hand-made red-brick in the Flemish Garden Wall bond. The eastern Façade was plain with a single doorway on the ground floor leading down to basement level ground floor. Single light in the first floor. Eaves had dentilated pattern. Pitched slate roof. The southern façade, formerly enclosed by building to the south, had a semi-circular arched opening now bricked-up.

Plain interior on ground floor, single doorway to the north and south. Original hand-sawn floor joists support wooden floor. First floor also plain but partially altered to allow open access to the west and north into structures C and D.

Originally part of linear range of workshops. Lower ground floor had been converted to storage whilst upper continued to be used as glass-cutting workshops.

Structure E (Figs. 7 and 8)

Low single-storey flat-roofed block. Late-20th century in date. Built in machine-cut red-brick in the Stretcher bond. L-shaped plan. Double doorway access to the south with further access to the west and north. The interior is open with late-20th century machinery still in operation for chemical processing.

Structure F

Two-storey toilet-block extension to structure B. Late-20th century in date. Built in machine-cut red-brick in the Stretcher bond. In plan consisted of east-west passage adjacent to structure B with a single rectangular toilet block to the south on both ground and first floors.

Structure G (Figs. 7 and 8)

Low single-storey covered storage area incorporating elements of former build. Original wall elements dated to the mid-19th century, whereas the superstructure was late-20th century in date. In plan it was linear continuation of north-south range.

Original wall structure consisted of five to six courses of hand-made red-brick on the eastern façade. The western façade survived as an upstanding two-storey wall that formed the eastern side of the stairwell associated with structure B. It was constructed in hand-made bricks in the Flemish Garden Wall bond. This consisted of a three-bay façade, plain on the ground floor, but still visible on the first floor, a central doorway flanked by two windows, all with flat-heads in false cement. The most northerly window survived, the other two have been bricked-up. Later alteration had converted it into a lean-to structure in box-girder steel construction covered in corrugated asbestos.

The interior consisted of a north-south passage with later sub-division to the east to create storage. Formerly part of linear workshops but only remnant brick walls represent survival.

Structure H (Figs. 7 and 8; Plate 3)

Single-storey flat-roofed industrial block. Dated 1952. Built in machine-cut red-brick in the Flemish bond. Sub-rectangular in plan designed to fit land plot.

Principal façade faced west (Ludgate Street). Consists of four bays with tall 12-pane casement windows set high in the wall. Continuous head and sill to windows in reinforced concrete. Two-course string of engineering bricks set low in the wall continued onto northern façade. Northern façade was plain, a single noticeable feature is two plaques dated *H.I. 1836* and *W.E.G. 1952*. Top of walls was simple cement coping.

Open interior with two wide entrances to the east and a single, wide entrance to the south. Single later sub-division to create room to the south. Plain cement floor with no distinct features. Gas regulator in the corner. Roof had two skylights.

Formerly workshops for the secondary production processes including fine working, and roughing. The presence of gas regulators supports the suggestion that machines designed to accomplish fine detailing (eg. addition of stems, handles etc.) were located in this room.

Structure I (Figs. 7 and 8)

Two-storey factory block. Original construction dated to the late-19th century. Considerably altered. The surviving elements of the eastern, northern and southern walls were built in machine-cut red-brick in Flemish Garden Wall bond. The western wall was shared with structure H, whilst the remainder of the first floor was in steel box-girder and corrugated asbestos. The pitched roof was of corrugated asbestos.

The ground floor was originally open but had been sub-divided in glass and plasterboard to create the continuation of the linear corridor from structure G. A series of three rooms were sub-divided to the right. The first floor was open with a single entrance to the east. The ground floor was of cement with the first floor built in steel-girder with cast concrete in-between.

The ground floor was an extension of storage located in structure G. It also housed several machines designed to monitor and regulate furnace and lehr temperature.

Structure J (Figs. 7, 8 and 9; Plate 3)

Large 8-bay single-storey industrial block. Two phases of build but of similar design. The earliest dated to the early-20th century, whilst the second phase was constructed in the 1950s. Built with box-girder construction with in-fill in machine-cut red-brick in Flemish bond. Open rectangular plan.

The principal façade faced west (Ludgate Street). Consisted of 8 bays of large 40-pane casement windows. The ultimate four bays also had low, ground-level twin-lights associated with the basement. The southern gable façade was of narrow rigid steel joists (RSJ) and brick composite construction. There were three high rectangular lights.

The interior was entirely open. Access was provided to the north and south through wide doorways. The eastern side of the structure was extensively open onto the underside of the ramp, structure K, with the wall above supported by a series of horizontal RSJs. The principal features within the interior were five gas-fired ceramic pots housed in square steel and brick built surrounds located against the western wall in a rectangular pit. Centrally at the southern end of the structure was a large cement capped structure covering the remains of a former furnace.

The floor was constructed in engineering bricks laid in running bond. Wear marks predominate around the open furnace. Floor re-laid along centre line in concrete to allow smooth passage along principal access route. Roof structure of seven Fink trusses formed in L-shaped steel connected directly to the vertical members of the steel box-frame.

The principal features located within the interior were five gas-powered pots (Plates 4 and 5) located on the western side of the room and set within their own pit. These were covered pots with small glory holes at the front similar to those manufactured at the Stuart Crystal Works, Lye (Dodsworth 1982, 16). They were set within a cube constructed of reinforced brick and steel joists. Located at the southern end of the structure centrally was a large square concrete base which covered the remains of the oil-fired furnace located in the basement. Immediately surrounding the furnace were wear marks within the brickwork consistent with continual usage as part of the glass-blowing process. This suggested that there were several pots located equidistant around the furnace.

The basement was an open pit extending from the yard under the structure. It housed the remains of the oil-fired glass furnace (Plate 6). Access was via a ramp located on the western side of the pit. The remains of the furnace consisted of a large circular metal drum (c.2.5m wide and a minimum of 1.0m deep) raised from the floor and set centrally between two stacks of bricks. These were recuperators (Plate 7) which recuperated the heat from the furnace and recycled it. They acted in pairs one passing waste fumes from the furnace into the mesh of bricks to heat them whilst the other heated the air prior to it passing into the furnace. The waste fumes were removed to the stack via a series of steel tubes. Air flow was assisted by a fan and the fumes passed through a brick-built structure, the equivalent of a water-scrubber which cleansed the air prior to it passing to the chimney stack. An underground tunnel took the waste fumes to the stack and contained oil residues supporting the supposition that the furnace was oil fuelled as opposed to gas or coal fuelled. A further passage passed to the north-west and the street it contained a large fan its function unclear.

Structure K (Figs. 7 and 8)

A Ramp located between structures J and L, dating to the 1930s - 1940s. Constructed using steel girders and concrete. Sloped north-south from the car-park up to the upper level of the factory. Open in interior onto Structure J (see above).

Structure L (Figs. 7 and 8; Plates 8 and 9)

Two-storey factory unit, dating to the 1930 - 1940s. Survival of earlier wall at the northern end on the ground floor built of machine-cut red-brick in Flemish Garden Wall bond. The remainder of the range had been constructed in concrete. Linear plan.

Principal façade faced west and onto the ramp at first floor level. Consisted of five bays at the northern end with a wide doorway access and four lights. The remainder of the façade was plain. The northern gable was largely ivy-clad. However, remains of hand-made red-brick in Flemish Garden Wall bond, of a previous east-west range abutted the structure.

Ground-floor interior consisted of two rooms, a long linear-room with open access beneath the ramp (structure K) onto structure J at the southern end, and another room located directly to the north. The southern room had another single later cut doorway to structure J. The northern room had access to the other room and to the exterior via steps. A single flue existed in the ceiling passing to the exterior of the building.

The first floor consisted of three rooms sub-divided by temporary plasterboard. Access to the west through a wide doorway was located within the central room. The northern room had lights to the east and to the west. The eastern lights were blocked later due to the presence of the extension to the east (structure M).

The ground floor was filled with debris (Plate 9). However, it is likely that this was the original location of the annealing tunnel or lehr. Electrical controls in the corner supported this supposition. The first floor was signed as the fitting room and it is likely to have been a combination of storage and small-scale secondary glass-working since the date of its construction.

Structure M

Single storey lean-to workshop extension. Late-20th century addition. Constructed in steel joists and corrugated asbestos. Single open plan located to the east of structure L, with access onto the first floor. The eastern façade had three simple casement lights.

Structure N (Figs. 7 and 8; Plate 10)

Twin single-storey factory blocks set within the hillside. Mid-to-late-19th century in date. Constructed in hand-made red-brick in a composite Flemish bond. High semi-circular arched vaulted roof. Floor laid in red-brick in the running bond. The plan comprised two simple rooms set side by side.

The principal façade faces west and is constructed in later brickwork of machine-cut red-brick in the English Garden Wall bond. The southern room faced onto the southern open yard with a simple doorway. It now has a brick and concrete flat-roofed porch. The northern room led to the interior of structure J. The northern entrance was formerly an open arch, but had subsequently been brick in-filled, contemporary with the remainder of the façade.

The interior originally opened to the west in open arches but had subsequently been enclosed. The interior was plain with access between the two rooms and also north from the northern room. Evidence of padlocks at head-height level (c.1.8-2.0m above ground) suggested former floor that had been removed. Flue located in ceiling and some smoke blackening.

The structure had fallen out of use and was derelict. However, the presence of a small flue in the ceiling and soot blackening may suggest that this was originally a rudimentary annealing chamber or lehr from the glass-work in its earliest form.

Structure O (Fig. 7)

Low lean-to block set between structure J and exterior factory wall. Early-20th century in date. Constructed in machine-cut red-brick in the Flemish bond. Lean-to roof of corrugated asbestos. Plain plan with access to the yard to the south and to structure J to the north. Former toilet block.

Structure P (Fig. 7)

Isolated single-storey factory block. Mid-to-late 20th century in date. Constructed in machine-cut red-brick in Stretcher bond. Open rectangular plan.

The principal façade faced west (Ludgate Street). Three bays each containing a high set casement window. The northern gable façade had a large open entrance onto the yard. The southern gable façade had single doorway access. Partially obscured by later woodshed (former timber-yard located to the south). Pitched roof in corrugated asbestos, supported by two Fink trusses in L-shaped steel. The interior was entirely open. Plain cement floor raised at eastern side. No clear function.

Structure Q (Figs. 7 and 9; Plate 12)

Circular chimney-stack. Late-19th to early-20th century in date. Constructed in machine-cut red-brick in the English Garden Wall bond. Simple stepped decoration at the base. Reinforced by iron rings from c.3.0m to the top of the stack. Stack is c.2.5m in diameter and 15-20m high. An underground tunnel located in the basement beneath structure J ran directly to the flue. The chimney was designed as stack for flue for oil-powered furnace.

Structure R (Fig. 7; Plate 11)

North-south retaining boundary wall. The earliest construction was early-19th century but with later 19th century alteration and addition. This was in a conglomerate of hand-made red-brick, re-used fire-brick and sandstone. Subsequent construction in hand-made red-brick with irregular bond. The east-west original southern wall of structure N, constructed in hand-made red-brick in the stretcher bond, abutted this wall. The wall had been subsequently raised up to its full height of c.6.0m and was reinforced by a buttress in machine-cut red-brick in English Garden Wall bond.

8.0 PHASING

8.1 Phase 1 – Early-19th century

The earliest buildings on the site relate to the glassworks in its initial form as a glass-cutting works using pre-manufactured vessels. Structural evidence from this period consists of structure D and the original fabric of structure C on the eastern wall. These were part of the original linear workshops on the site.

8.2 Phase 2 – Pre 1840s

The works expanded in the 1830s (probably 1836 as denoted on the side of Structure H). This included the expansion of the works to include the manufacture of vessels. It is probable the cone as denoted on the 1940s aerial photograph (Plate 13) was first constructed at this time.

Remains from this period are limited but it is probable that some of the earlier fabric visible within structure G, in particular the upstanding wall adjacent to the stairwell in structure B, was part of a continuation of the north-south linear range which included structures C and D. These are all recorded on the 1840s Parish Map (Fig. 4). The gable wall of structure L still retains some elements of an L-shaped block which formerly existed on the site and dated to the 1830s.

It is also likely that the two semi-circular arch vaulted rooms of Structure N related to this period. These are not depicted on any map so are difficult to date (they were probably always incorporated into the hillside and therefore may not have been not

visible as external structures). However, their construction in rudimentary hand-made red-brick suggest an early-19th century date.

8.3 Phase 3 – Early-20th century

The plan of the glassworks does not appear to have changed radically during the remainder of the 19th century which can probably be attributed to its continued ownership by the Jackson family. It was only in the early-20th century when the works were bought by Webb, Thomas & Corbett that modernisation and radical alteration of the fabric occurred.

The most significant addition appears to have been the addition of the oil-fired furnace located in the basement of Structure J. Associated with this was the addition of the chimney stack (structure Q, Plate 12). The southern half of structure J was constructed during this time period in order to house the furnace adjacent to the original cone. The cone survived until the 1940s and was probably still used in conjunction with the new furnace (Plate 13). It was constructed using a composite of narrow RSJ box-girder construction and brick in-fill. This technique was a short-lived early-20th century development, prior to the use of box-girder construction with reinforced concrete in-fill.

Structure O, the small lean-to and the earliest part of structure L at the northern end can probably be placed within this period of construction.

8.4 Phase 4 – 1930-1940s

The most significant alteration during Phase 4 was the addition of structure A. Stylistically this dates to the 1930s and appears to have replaced a series of terraced houses that existed on the corner of Ludgate Street and Burton Street. Presumably these were former factory houses owned by the works (the 1891 census lists glassworkers occupying these house numbers) and were subsequently demolished and replaced as part of the expansion of the works under the management of Webb, Thomas Corbett.

The long linear structure L and adjacent ramp also appear to have been constructed during this time period. The construction material used in these structures was predominantly reinforced concrete of poor quality and it may be they were built as part of a conversion process as the works altered to produce utilitarian goods as part of the war effort. The use of low-grade concrete was typical of buildings constructed during World War II.

8.5 Phase 5 – 1950-1960s

Large-scale alteration to the works occurred during the post-war years. This included the entire removal of the original cone and demolition of much of the associated buildings. Structure J was extended in an identical style and structure H was added. It was probable that the works were converted to town gas at this period and evidence of gas regulators and pipes is visible in structure H.

The small cramped workshops which had existed over much of the centre of the site since its conception in the early-1800s, were replaced by the purpose built open-plan workshop, structure B, which provided good natural light from extensive windows.

8.6 Phase 6 – Late-20th century

Alteration in this period has been restricted to the construction of structure E within the centre of the site and the lean-to asbestos structures of structure I and structure M.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The buildings represent an interesting example from a significant industry within the Staffordshire region. However, the architectural and historical quality of the buildings within the glassworks is relatively poor considering the history of continuous occupation on the site. The earliest survival, dating to the beginning of the 19th century, exists within structure C and D of which only structure D, a small workshop block, remains in its complete state. Elements of structure G also date to the early-to-mid 19th century and the entirety of structure N, a possible annealing house, probably dates to this period.

Of the later buildings the most significant is the southern half of structure J. Architecturally it represents an interesting example of composite construction in industrial buildings using both steel joist box-construction and an in-fill using conventional brick-built techniques. This was a short-lived phase of development within industrial buildings prior to the extensive use of reinforced concrete.

However, of particular interest are the remains of the early-20th century glass furnace housed within structure J. It uses an oil-fired power system that compliments the changing fuel use visible within the site. The use of oil within the glass industry was unusual and certainly a short-lived phenomenon. Prior to this period coal was the preferred fuel, typically used in cone furnaces, used on the Tutbury site and visible in aerial photographs dating to the 1940s (Plate 13). Later developments employed town-gas, a cleaner and more controllable fuel system and also used on this site. This structure is not entirely understood and certainly warrants further investigation as part of the demolition process.

Of the remainder of the buildings architecturally only structure A is of merit. Even then it represents an interesting architectural frontage as opposed to a distinct building associated with the glass industry. The majority of the remainder of the buildings although interesting in a local context, have little architectural or historical merit beyond their immediate setting.

10.0 ACKNOWLEDGEMENTS

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11.3 Cartographic Sources

1810 Town Estate Map

1840 Parish Estate Map (Based on the 1838 Tithe Map)

1888 Ordnance Survey First Edition

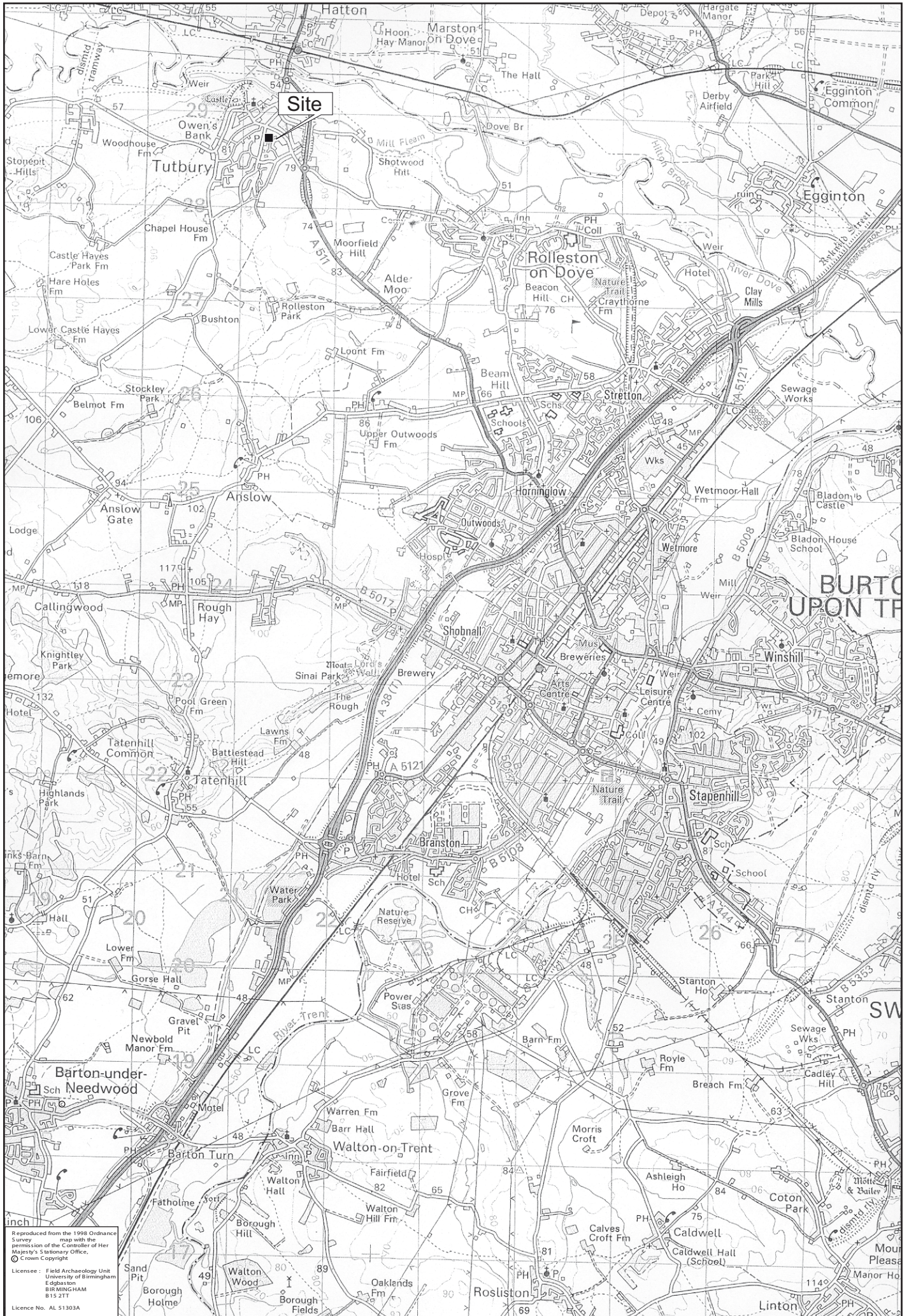
1900 Ordnance Survey 2nd (Revised) Edition

1948 Ordnance Survey First Imperial Edition

1968 Ordnance Survey First Metric Edition

1996 Ordnance Survey Revision

APPENDIX 1



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Fig.1

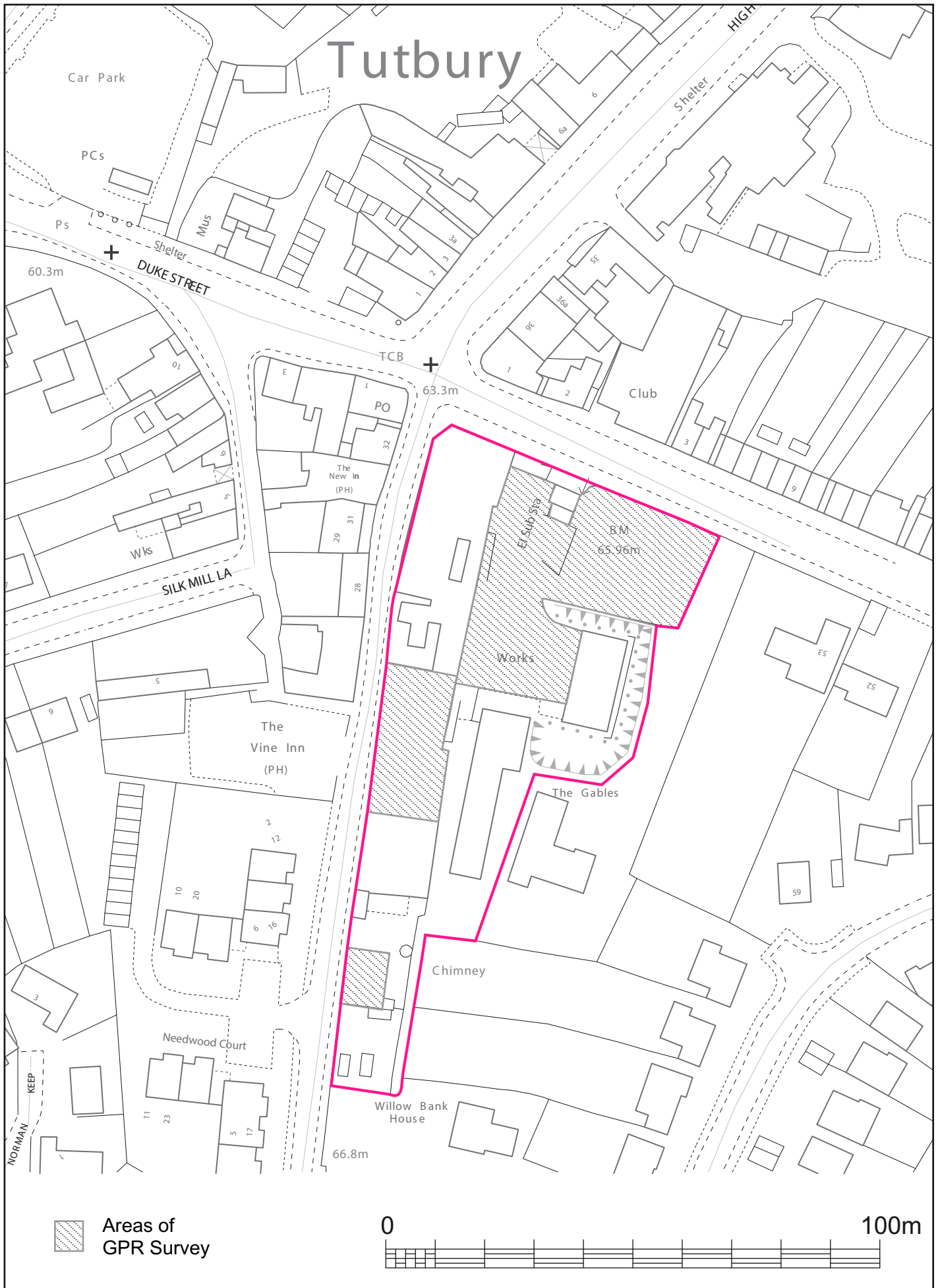


Fig.2



Fig.3



Fig.4

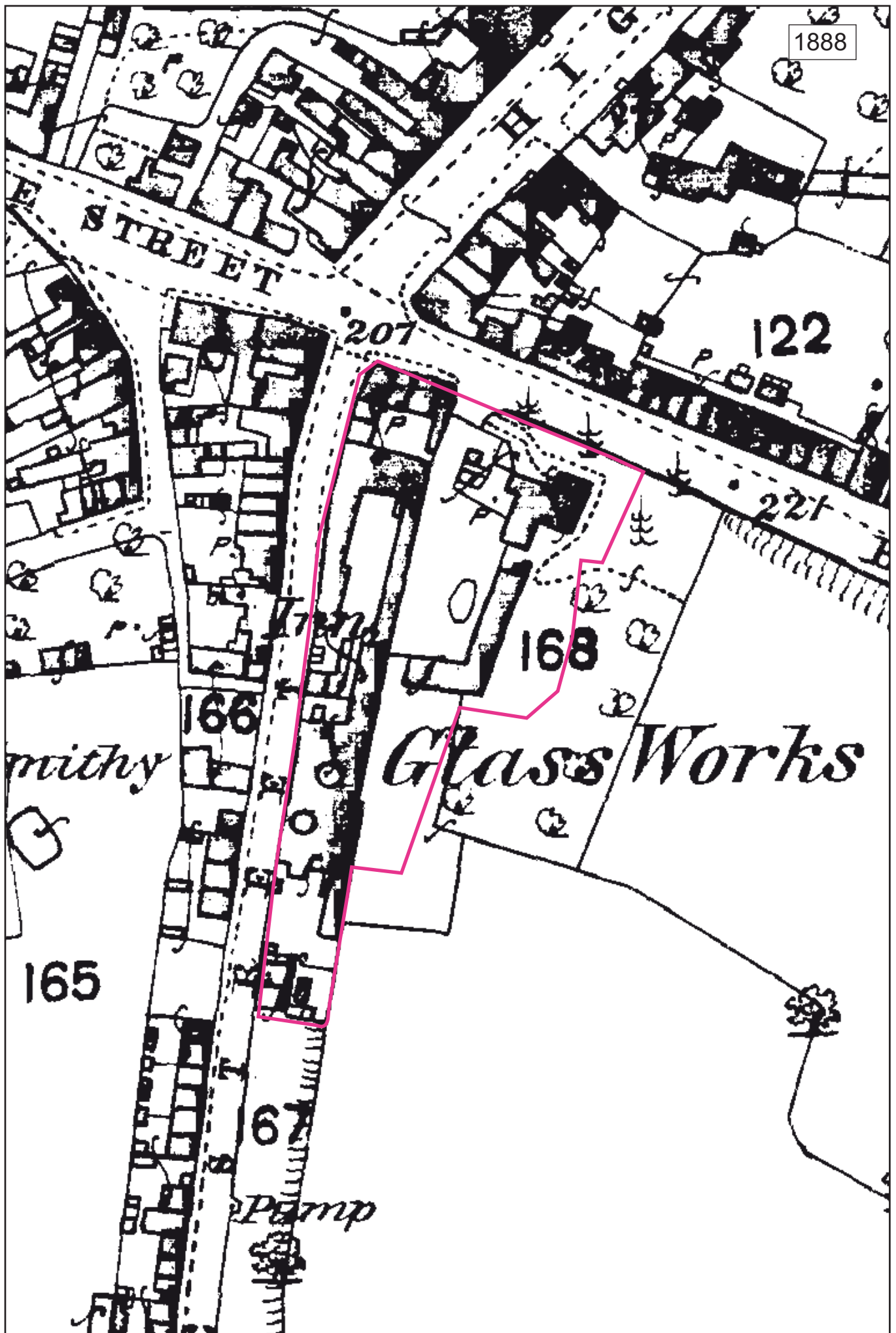


Fig.5

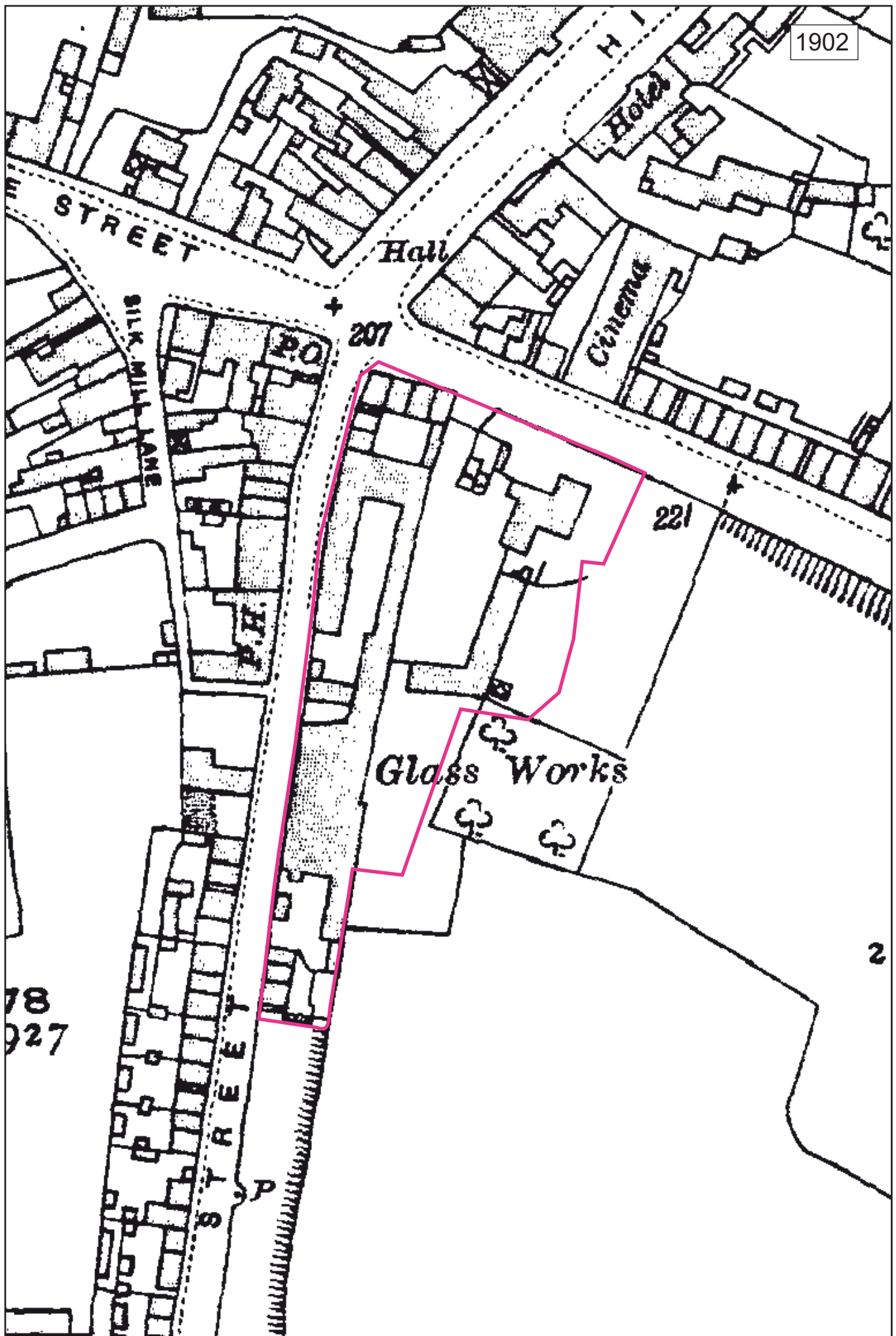


Fig.6

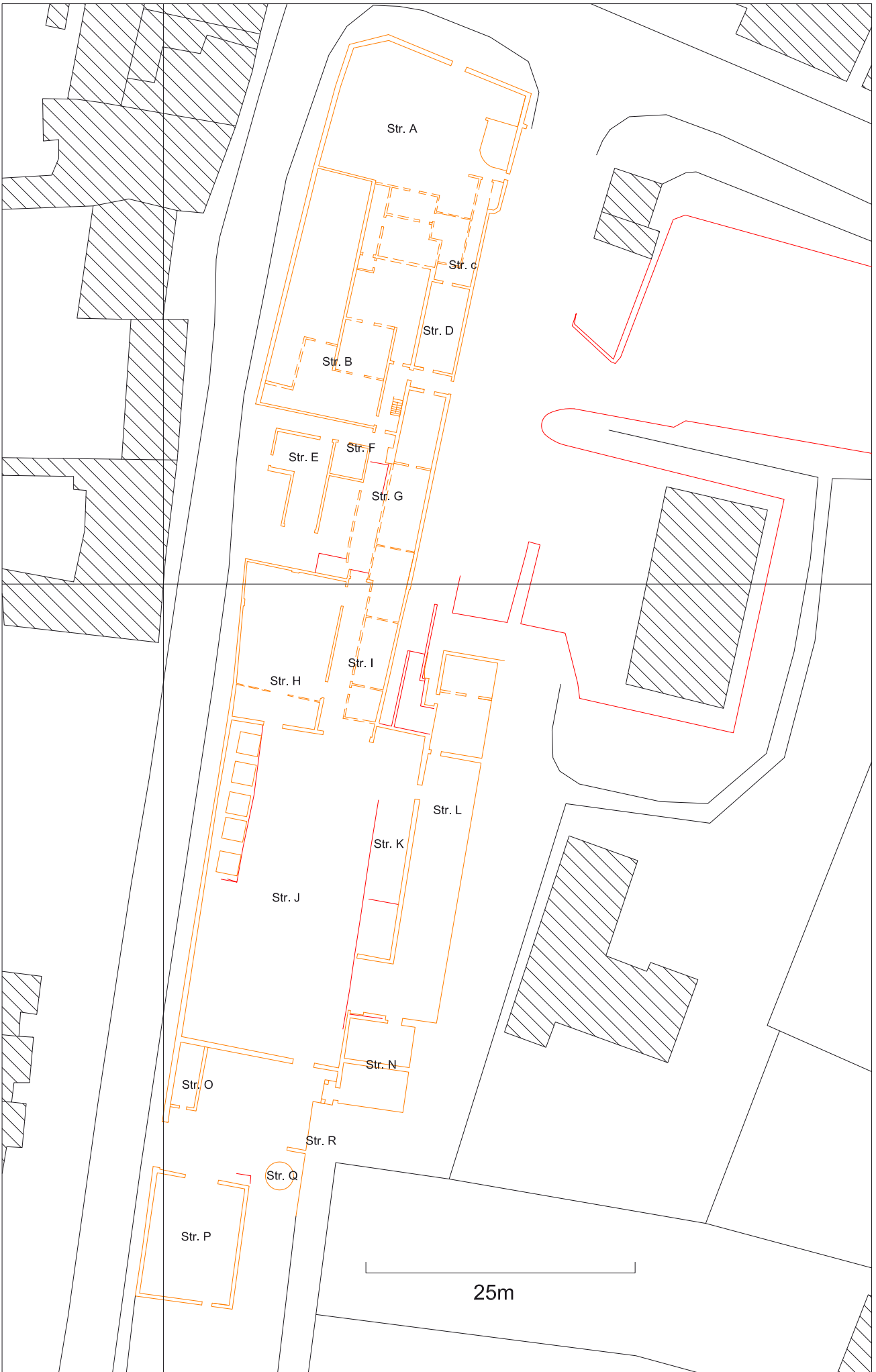


Fig. 7

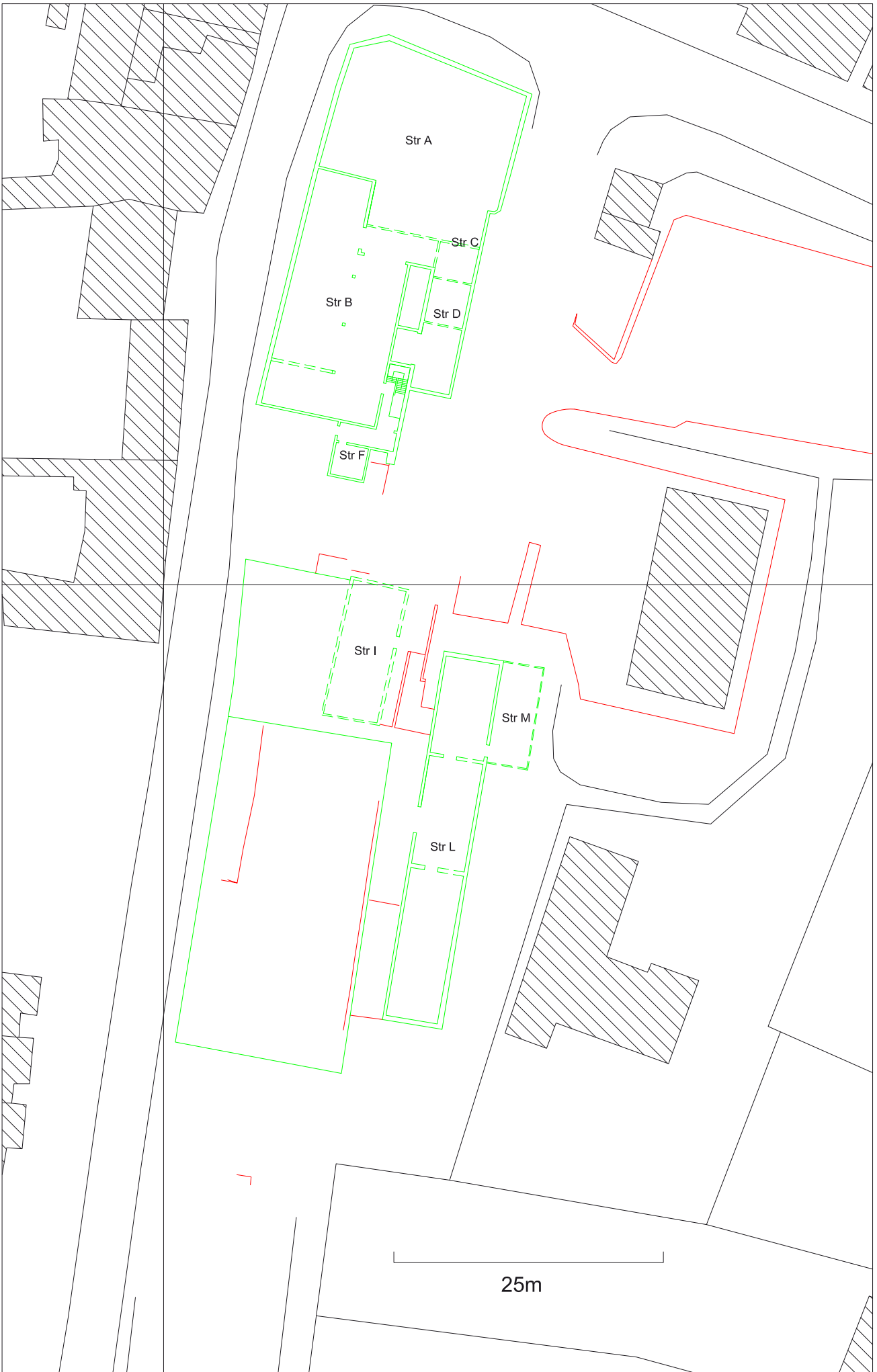


Fig. 8

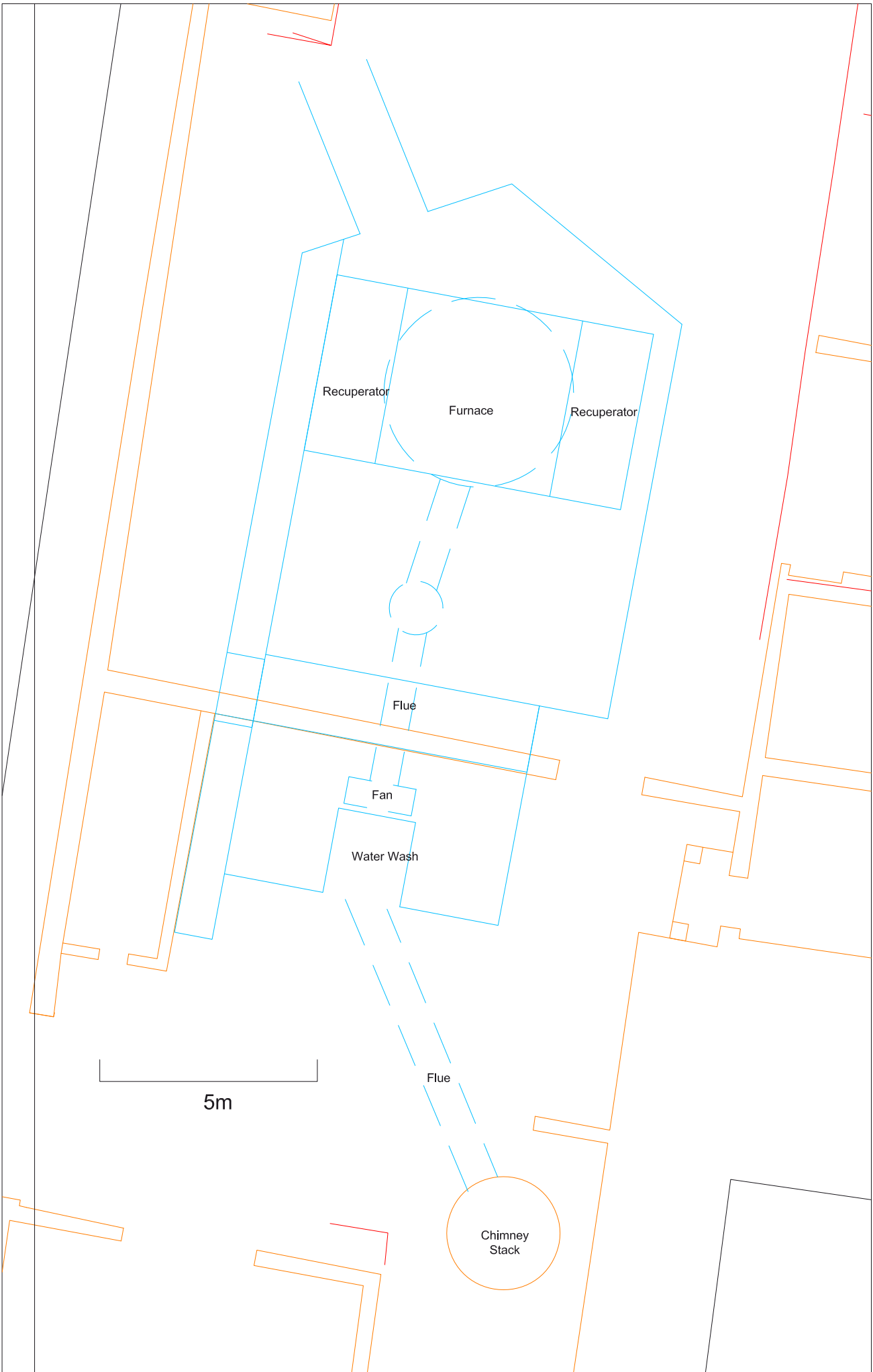


Fig. 9

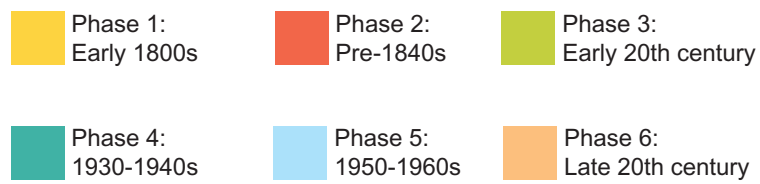
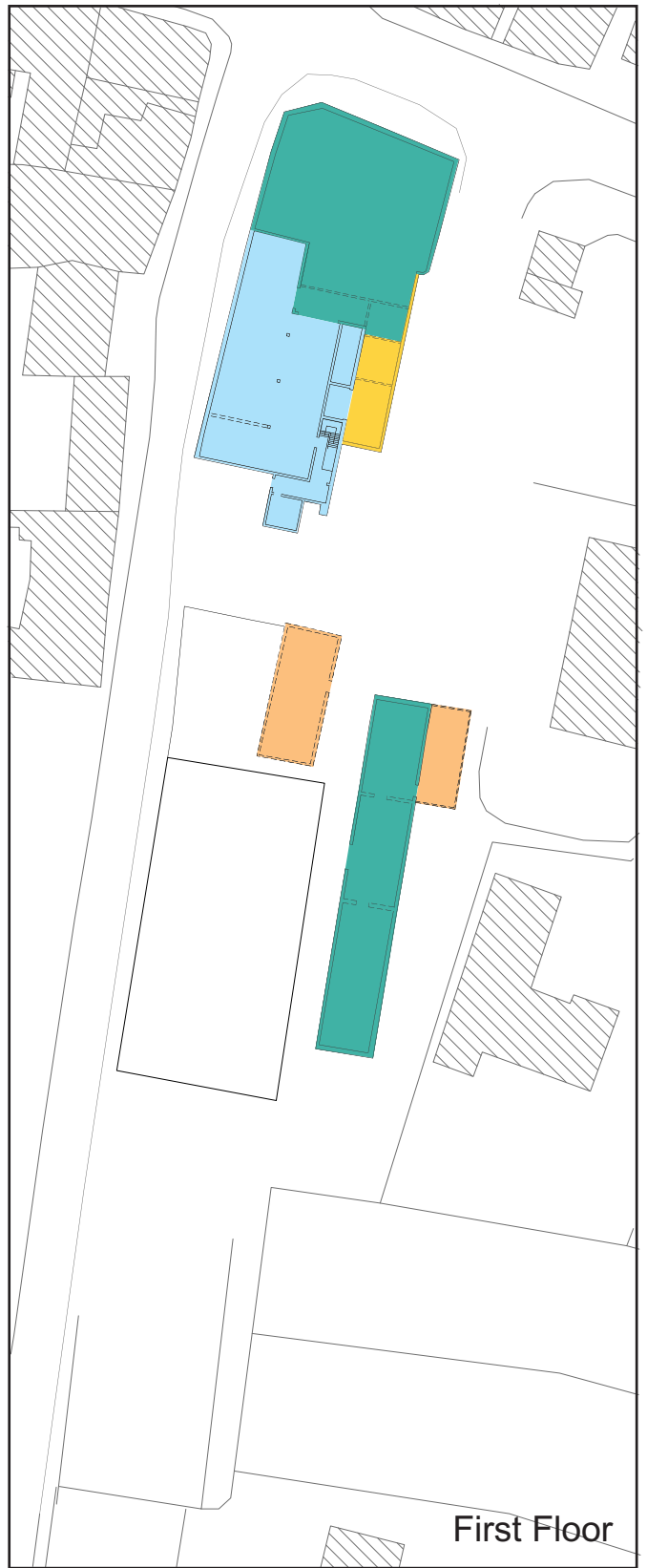


Fig.10



Plate 1



Plate 2



Plate 3



Plate 4



Plate 5



Plate 6



Plate 7



Plate 8



Plate 9





Plate 11



Plate 12

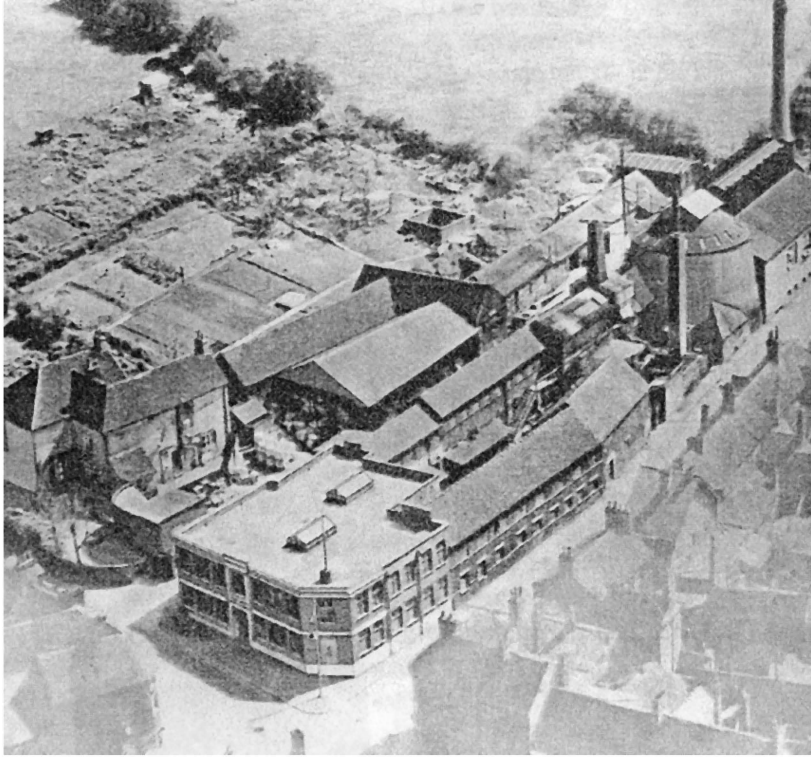


Plate 13