

**An archaeological
evaluation at Waterfall
Lane Sawmills, Waterfall
Lane, Blackheath, West
Midlands. 2002**

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1.0 Introduction

This report describes the results of an archaeological evaluation, by means of targeted trial-trenching, by Birmingham University Field Archaeology Unit (BUFAU), at the former Waterfall Lane Sawmills, Waterfall Lane, Blackheath, West Midlands (NGR SO 9638 8620, Fig. 1). The evaluation was commissioned by John Samuels Archaeological Consultants on behalf of Barratt (West Midlands) in advance of a housing development on the site of the former Waterfall Lane Sawmills. A two-phase archaeological investigation of the site was a condition of planning permission (DC/02/39106). The first phase of work comprised a Historic Landscape Appraisal and Historic Building Record. Cartographic evidence suggested the presence of two 19th /20th -century limekilns in the development area. A second phase established the presence of features below the current ground level by means of archaeological evaluation with a view to excavation and the preservation of deposits by record.

2.0 Aims

The aims of the archaeological evaluation were:

- To gather sufficient information to establish the presence/absence, extent, condition, character, quality and date of any sub-surface archaeological deposits.
- To preserve any remains by record.
- To deposit a satisfactory archaeological archive and provide a suitable publication.

3.0 Method

In consultation with Dr Paul Collins an excavation area measuring up to a maximum of 225m² was allotted to establish the location of the former limekilns. In practice, an area of approximately 124.5 m² was sufficient to reveal the presence of the two lime-kilns and their associated structures. The overburden was removed using a JCB excavator fitted with a combination of buckets. This was monitored by a qualified archaeologist at all times. Where appropriate, surfaces and sections were hand cleaned to aid interpretation and recording. A detailed context record on individual pro-forma record cards was maintained and all deposits were photographed using both colour and monochrome film, supplemented by digital images. Sections and plans were drawn at a scale of 1:50 or 1:20 as appropriate. Where no archaeological deposits were identified, a record of the stratigraphy was made. Spot heights and those of individual features were recorded relative to Ordnance Datum. These records constitute the site archive, which is stored at Birmingham University Field Archaeology Unit. The archive will be deposited with the relevant museum within a reasonable time following completion of the project, subject to the agreement of the landowner.

4.0 Excavation results

Excavation identified the truncated remains of a rectangular brick-built structure (F102), aligned northeast-southwest which contained the remains of two brick-built lime-kilns (F100 and F101). The remains of a metallised surface (F103) were also discovered further to the northwest. These features corresponded with structures and features depicted on the 1884, 1904 and 1919 Ordnance Survey (OS) maps (Figs. 4, 5 and 6).

4.1 Structure F102 (Fig. 2)

The rectangular structure (F102) comprised the fragmentary remains of a building with walls five bricks thick and surviving to a height of up to 0.25m. The foundations for the brickwork (1013) comprised of brick hardcore 0.15m in depth sealed by lime concrete 0.1m in depth. The remaining construct of the walls comprised four courses of clamped common red bricks (9" x 4½" x 3"), bonded with lime mortar, and laid in English bond (1003). Truncation was most severe on the southern and western sides of the structure. The brickwork continued to the northwest which may represent the fragmentary remains of a second, smaller adjoining structure depicted on the 1904 and 1919 OS maps. Two later walls (1016 and 1017) abutted the western and eastern sides of the building. The area encompassed by the rectangular structure and later brick insertions (F102, 1016 and 1017) was filled by a deposit of black ash, slack coal and lumplime (1014), recorded to a depth of 2.2m. This was overlain by a layer of dark sandy loam mixed with general demolition debris up to 0.1m in depth.

4.2 Kiln 1, F100 (Figs. 2 and 3)

Within the rectangular structure were the subterranean remains of a pair of well-preserved brick-built lime-kilns (F100 and F101). The larger of the two kilns (F100) had an internal diameter of 3.0m and was excavated to a depth of 2.0m. The construct of the kiln (1002) comprised six skins of bricks laid in header courses, bonded with lime mortar. A mixture of brick-types was employed in the construction of the kiln or 'pot' lining, predominantly common red bricks (8¾" x 4" x 2¾"), with occasional Staffordshire blue engineering bricks (9¼" x 4" x 3¼"), and yellow refractory bricks (9¾" x 4¼" x 2¾"). The lining had a burnt appearance, and the brick faces were worn, presumably from the receipt of continuous loads of limestone. The kiln was not excavated to the level of the structural base, which was overlain by a deposit of limestone residue (1018). Above this was a layer of wood-chippings (1006) 1.5m in depth. The latest deposit within the kiln comprised a layer of general demolition debris mixed with sandy loam, ash, and limestone (1004) 0.5m in depth. Within this deposit were two triangular sheets of steel that had been riveted together. It is likely that the steel sheets served as some form of lining for the kiln, or alternatively they may have been the remains of a chute used for loading limestone into the kiln. The interior of the kiln had been back-filled in the 1940s (Ron Moss, *pers. comm.*).

The access recess to the kiln was located to the southeast and was formed by a wedge-shaped pit, flanked on either side by two brick walls (1011 and 1012) projecting from the base of the kiln exterior. These walls were spanned by a steel girder that would have received the above-ground cone element of the kiln. The construction of the southwest

wall (1011) comprised Staffordshire blue bricks and common red bricks bonded with lime mortar, and laid in English bond. Staffordshire blue bull-nosed bricks (9" x 4" x 3") were incorporated into the construction. This wall had been buttressed by a large block of brickwork (1007), seven bricks thick and surviving to least 2.2m in height (Sondage SO1). The northeast wall (1012) was of a similar construction to the southwest wall (1011), although the bull-nosed bricks were absent. They may have been removed to facilitate the rough 'toothing' of the brickwork at the point where the original wall had been extended by c1.0m.

The access recess pit led to the working entrance of the kiln. At this point, the wall of the kiln was reduced to two brick skins, and the exterior of the kiln lining was clad in steel shuttering reinforced by steel bands. The reduction in the thickness of the lining facilitated the insertion of two steel-framed openings with hinged doors, measuring approximately 0.2m x 0.2m. Directly below was a larger opening built into the brickwork, measuring 0.7m x 0.5m, spanned by a steel lintel.

4.3 Kiln 2, F101 (Figs. 2 and 3)

The second kiln (F101) was smaller than F100 and was ovoid in shape. The average interior diameter was 2.2m, and it was 2.2m in depth. The kiln wall (1001) comprised four skins of bricks laid in header courses, and bonded with lime mortar. As with F100, a mixture of brick-types was employed in the construction of the kiln or 'pot' lining. This too comprised common red bricks (8¾" x 4" x 2¾"), with occasional Staffordshire blue engineering bricks (9¼" x 4" x 3¼"), and yellow refractory bricks (9¾" x 4¼" x 2¾"). The kiln interior exhibited similar effects of burning and wear as observed in F100. The base of the kiln was formed by compacted lime mortar stained by iron oxide. This was overlain by a layer of limestone residue (1018) 0.1m in depth. Directly above this was a deposit of sandy loam mixed with ash and some general demolition debris (1008), c2.0m in depth.

The access recess pit to the kiln was located to the southeast and was formed by a wedge-shaped pit, 2.2m in depth, flanked on either side by two brick walls (1009 and 1010) projecting from the base of the kiln exterior. The extent of the pit was recorded by the excavation of a sondage (SO2), which revealed a stone slab surface and an arrangement of steel-runners leading to the working entrance to the kiln. The southwest and northeast walls (1009 and 1010) were four bricks thick, and comprised common red bricks bonded with lime mortar, laid in English bond. The access recess pit led to the working entrance of the kiln. At this point, the thickness of the kiln wall was reduced to two bricks width, and steel bands reinforced the exterior of the kiln lining. The reduction in lining thickness facilitated the insertion of one steel-framed opening with a hinged door, measuring approximately 0.2m x 0.2m. Directly below was a larger opening built into the brickwork, measuring 1.0m x 0.7m, spanned by a steel lintel, the opening having been blocked by several courses of dry-laid bricks. There was evidence for another truncated opening along the top of the kiln rim. This opening was delineated by two brick soldiers and measured 1.3m in width. The interior of the kiln had been back-filled in the 1940s (Ron Moss, *pers. comm.*).

4.4 Metalled surface F103 (Fig. 2)

A curvilinear metalled surface (F103) 2.5m wide, was aligned approximately east-west towards F101. The base of the surface comprised a layer of crushed grey stone hardcore (1021), probably broken lumplime from the limekilns. This was overlain by a deposit of crushed and compacted red bricks (1023), 0.1m in depth. Sealing layer 1023 were several faint linear depressions filled with loam. These were retained on either side of the metalled surface by a single course of dry-laid headers of various brick-types (1022). Directly above the metalled surface was a layer of yellow/white lime ash (1024), 0.1m in depth. There was a concentration of blue stone setts in the immediate area that were probably the remains of the metalled surface, but had been disturbed by the modern site traffic.

5.0 Interpretation and discussion

The earliest feature on the site appears to be the metalled surface (F103). This is probably the remains of a narrow-gauge rail-track depicted on the 1884 OS map (Fig. 4). The linear depressions across the surface of F103 seem likely to have resulted from repeated heavy cargo traffic. The 1884 OS map show rail-tracks aligned along the side of the canal which suggests they were involved in the delivery and despatch of raw materials to and from industrial areas to the east.

A network of rail-tracks and associated sidings are depicted across the site on the 1884 OS map (Fig. 4). By the time the 1904 OS map (Fig. 5) was produced the tracks had been removed and the first limekilns and associated structures were built. The walls of the rectangular structure (F102) correspond well with structures depicted on the 1904 and 1919 OS maps (Figs. 5 and 6) and although individual kilns are not depicted, the buildings are labelled '*Limekilns*'. There appears to have been a great deal of industrial activity on the site between the production of the 1884 and the 1904 OS maps, suggested by large earthworks surrounding the limekilns (Fig. 5), which are presumably the result of industrial waste deposited forming an incline to the kilns.

Blocks or batteries of limekilns were often built beside canals and the expansion of the waterway network allowed raw materials for the processing of lime to be transported from source and the finished product to be distributed (Williams 1989). An indent in the canal bank may have served as a wharf, however, it should be noted that this indent is also evident on the 1884 OS map, and appears to pre-date the construction of the kilns. The importance of canals in the development of the lime-burning industry is well documented and there are several instances where new canals facilitated the expansion of the lime trade, as for example, the Montgomeryshire Canal, Powys in 1796/7 (Williams 1989).

The 1939 OS map (Fig. 7) depicts the outline of two kilns enclosed by a rectangular structure on a similar alignment as those shown on the earlier maps. The walls of this rectangular structure probably incorporated earlier structural elements, and seem likely to relate to walls (F102) recorded within the excavation area. The two limekilns depicted on the 1939 OS map correspond with the excavated limekilns (F100 and F101), which

suggests they were built between 1919 and 1939. The cartographic evidence is particularly useful here, as both kilns appeared to be constructed of re-used 19th-century materials, presumably from earlier kilns or other buildings. The absence of cemented mortar in the construction of the kilns can be explained by the obvious availability of raw materials. The 1939 OS map (Fig. 7) also shows that the morphology of the ground around the kilns has also been altered to a localised, smaller earthwork.

The basic draw-kiln design was typically cylindrical for two-thirds of their depth, narrowing sharply at the base. Design was aimed at creating a structure that maintained the calcining temperature with fuel economy, whilst achieving good lime flow without 'hang-up', that is the failure of the burnt lime to settle for drawing-off at the base (Williams 1989). This excavation suggests that the same design remained in use well into the 20th century, and also confirms the suggestion that limekilns were often paired for capacity and insulation. The limekilns and associated structures had been built upon successive layers of industrial waste. In the case of F100 the instability of the ground led to the addition of a buttress wall (1007) and the extension of the existing access pit walls (1011 and 1012) to mitigate the effect of internal pressures.

The small steel-framed openings with hinged doors were known as poking-holes. These were built into the kilns and served to control kiln temperature and facilitated inspection of the lime-burning process. The larger openings situated at the base of the access recess pit, were known as draw-holes or 'eyes' and were where the fire was lit, ashes were raked out, and the quicklime was removed. Sometimes the draw-holes were bricked-in to reduce the draught during the calcining process (Williams 1989). This may have occurred during the final firing of F101. The steel runners along the base of the access recess pit of F101 are probably the remains of a trackway associated with the removal of quicklime from the draw-hole. The base of F101 was formed by compacted lime mortar stained by iron oxide. This may be evidence of movable iron bars at the base of the pot that provided support for the charge and could be adjusted for drawing off the lime.

6.0 Acknowledgements

Richard Cherrington wrote this report and supervised the fieldwork with the assistance of Kate Bain, John Halsted and Andy Walsh. Forbes Marsden monitored the project on behalf of John Samuels Archaeological Consultants with the assistance of Dr Paul Collins. The project was managed for BUFAU by Dr Iain Ferris and monitored on behalf of Sandwell Borough Council by Shane Gould. The assistance of Rob and Mark from Datum Surveys is gratefully acknowledged.

7.0 References

Williams, R. 1989 'Limekilns and Limeburning,' Shire Album 236.

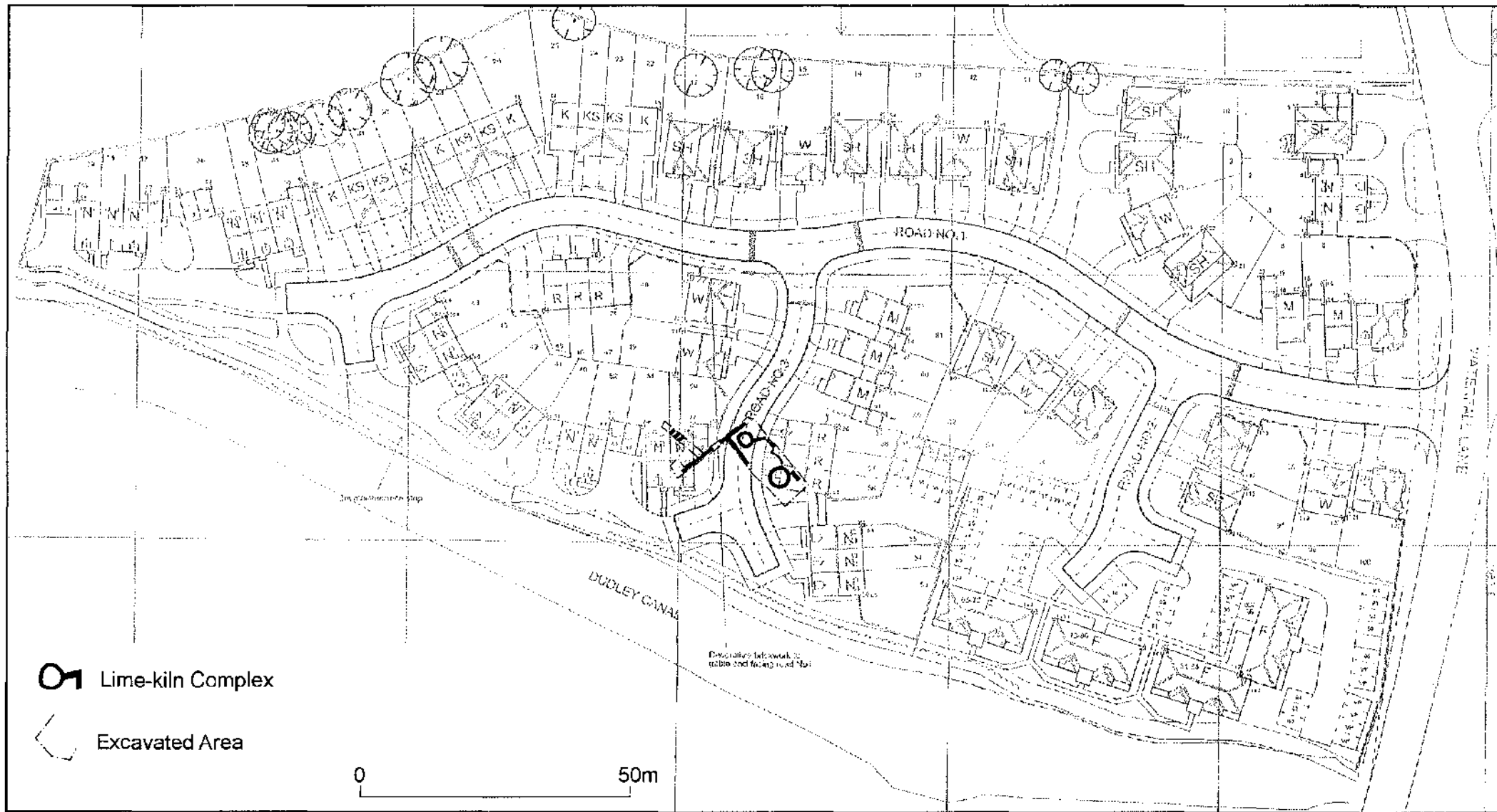


Fig. 1

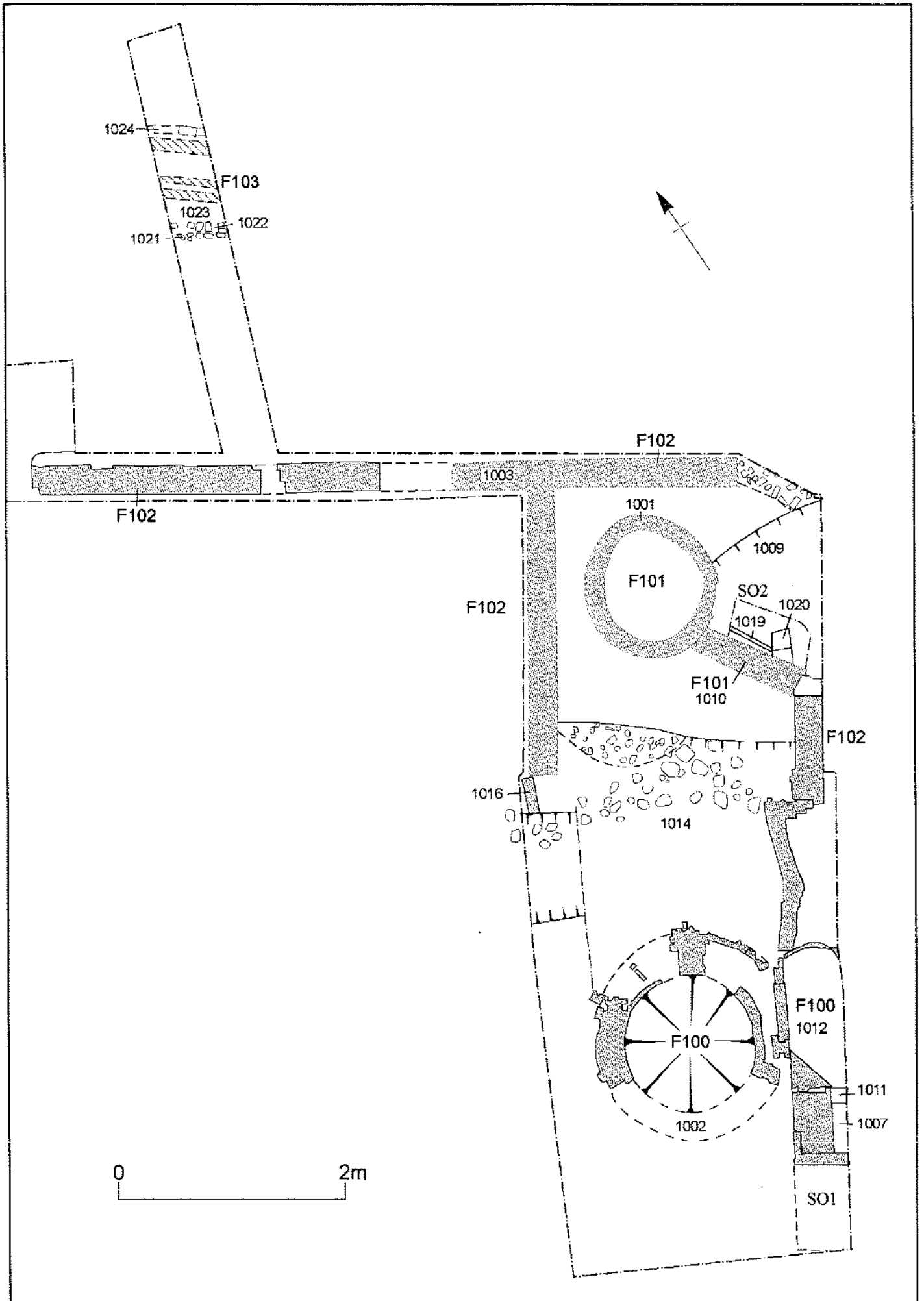
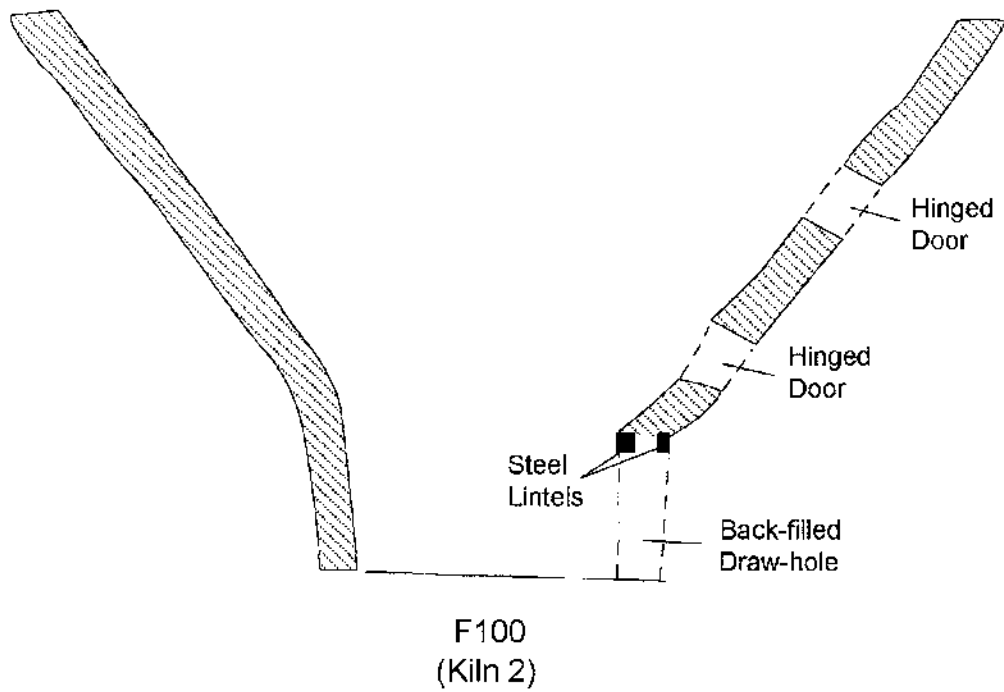
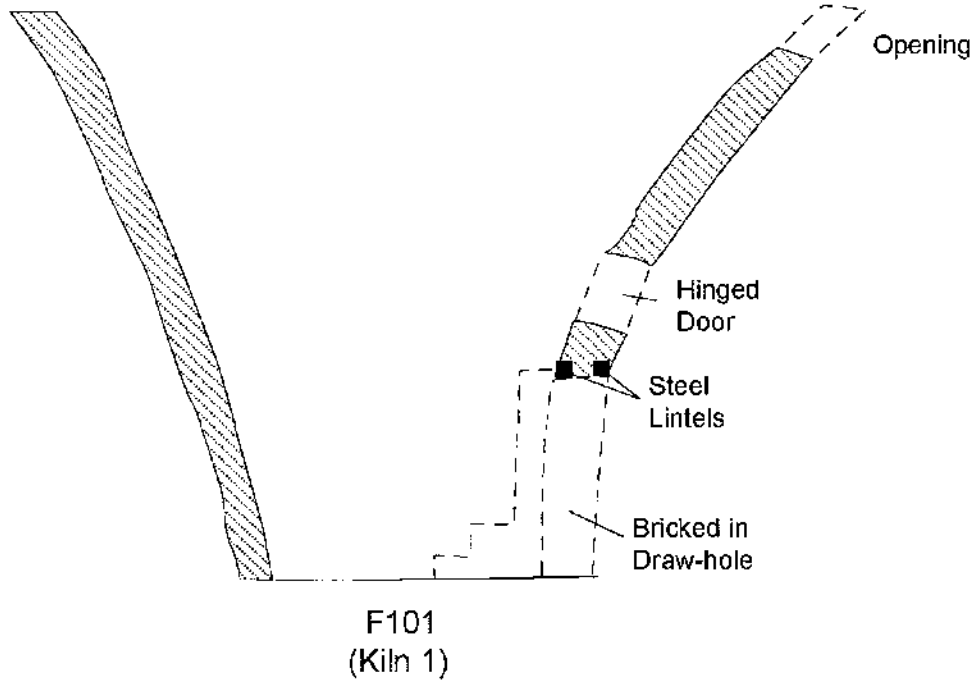


Fig.2

Limekiln Profiles

NW

SE



0 1m

Fig.3

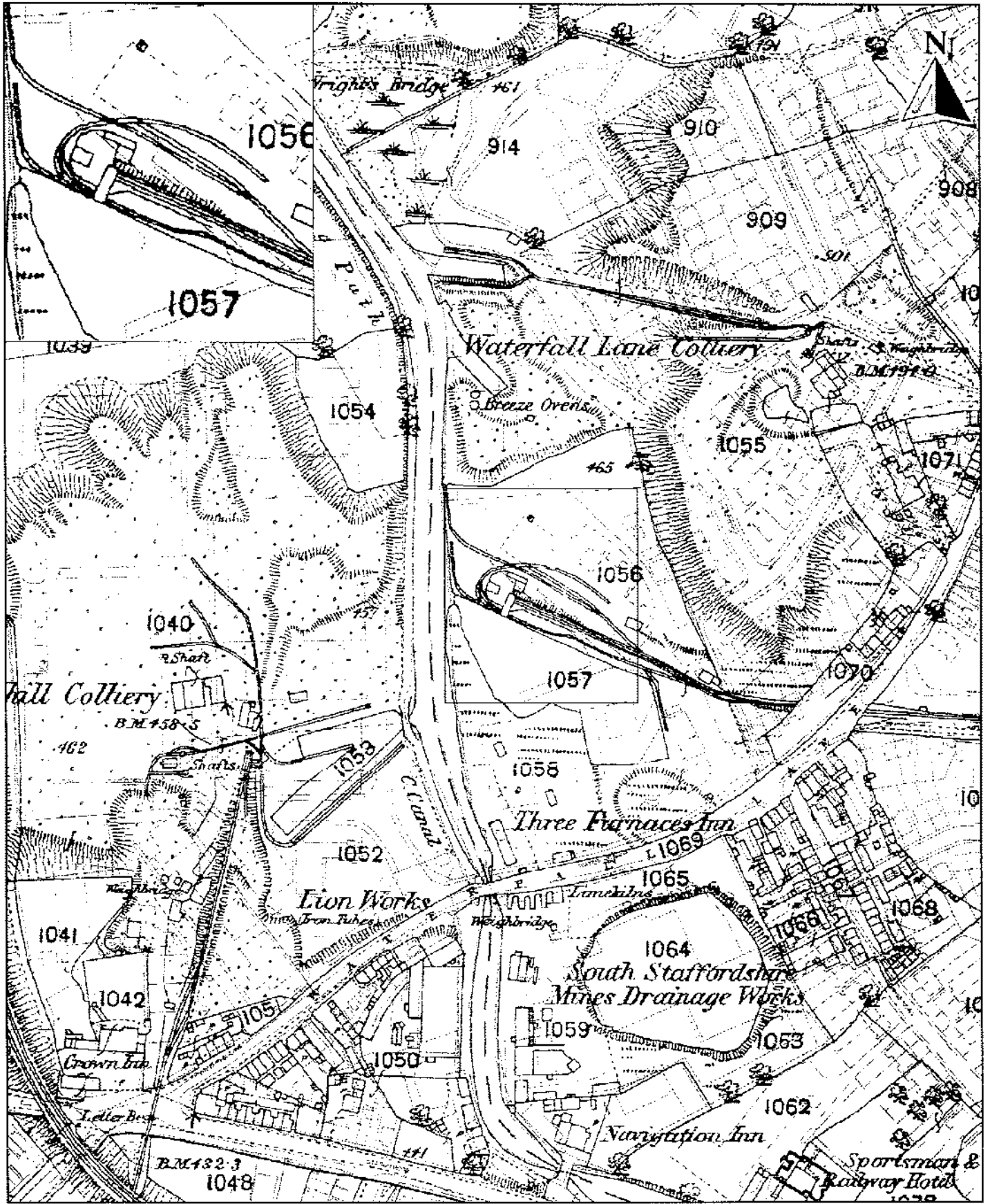


Fig.4 (1884)

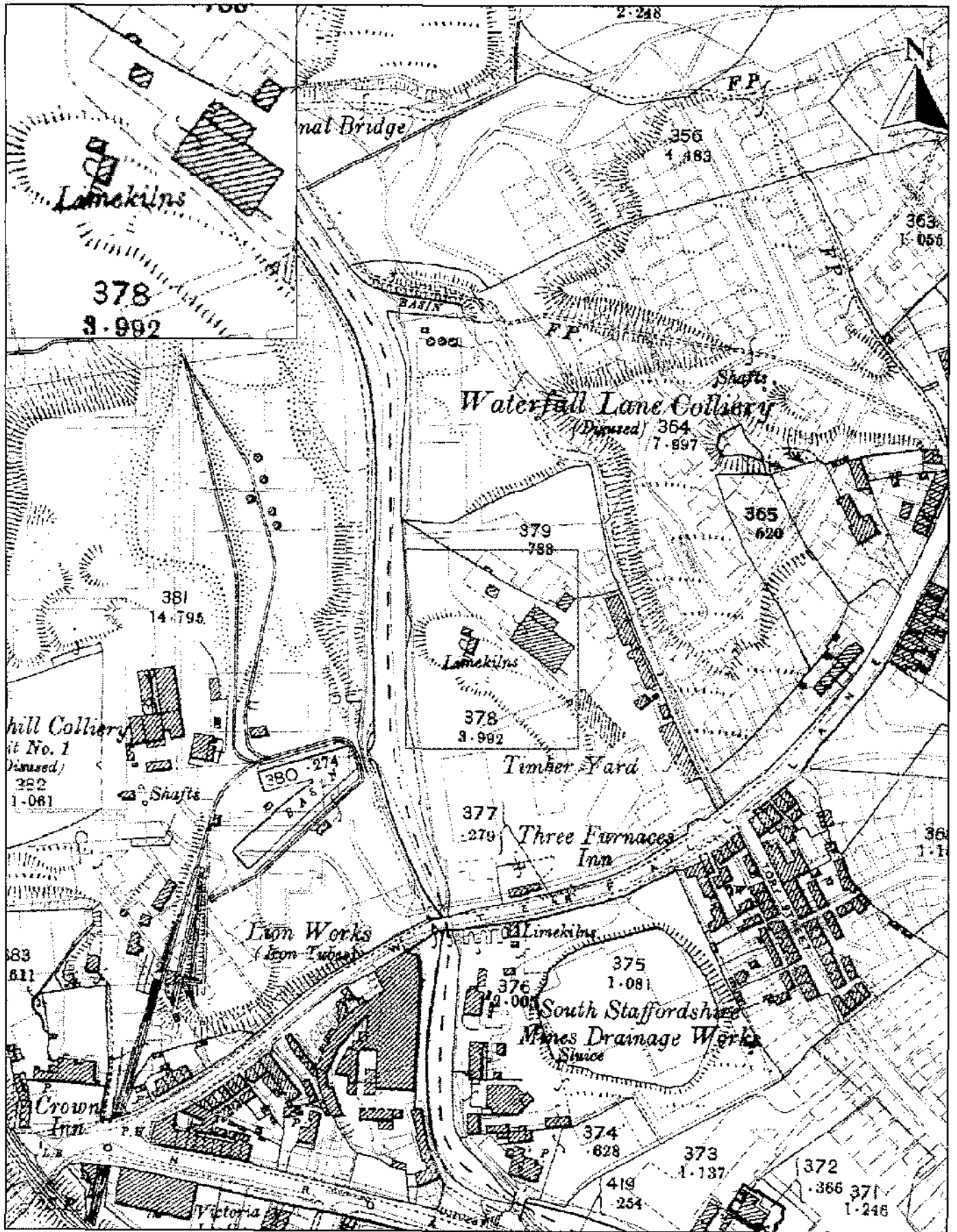


Fig.5 (1904)

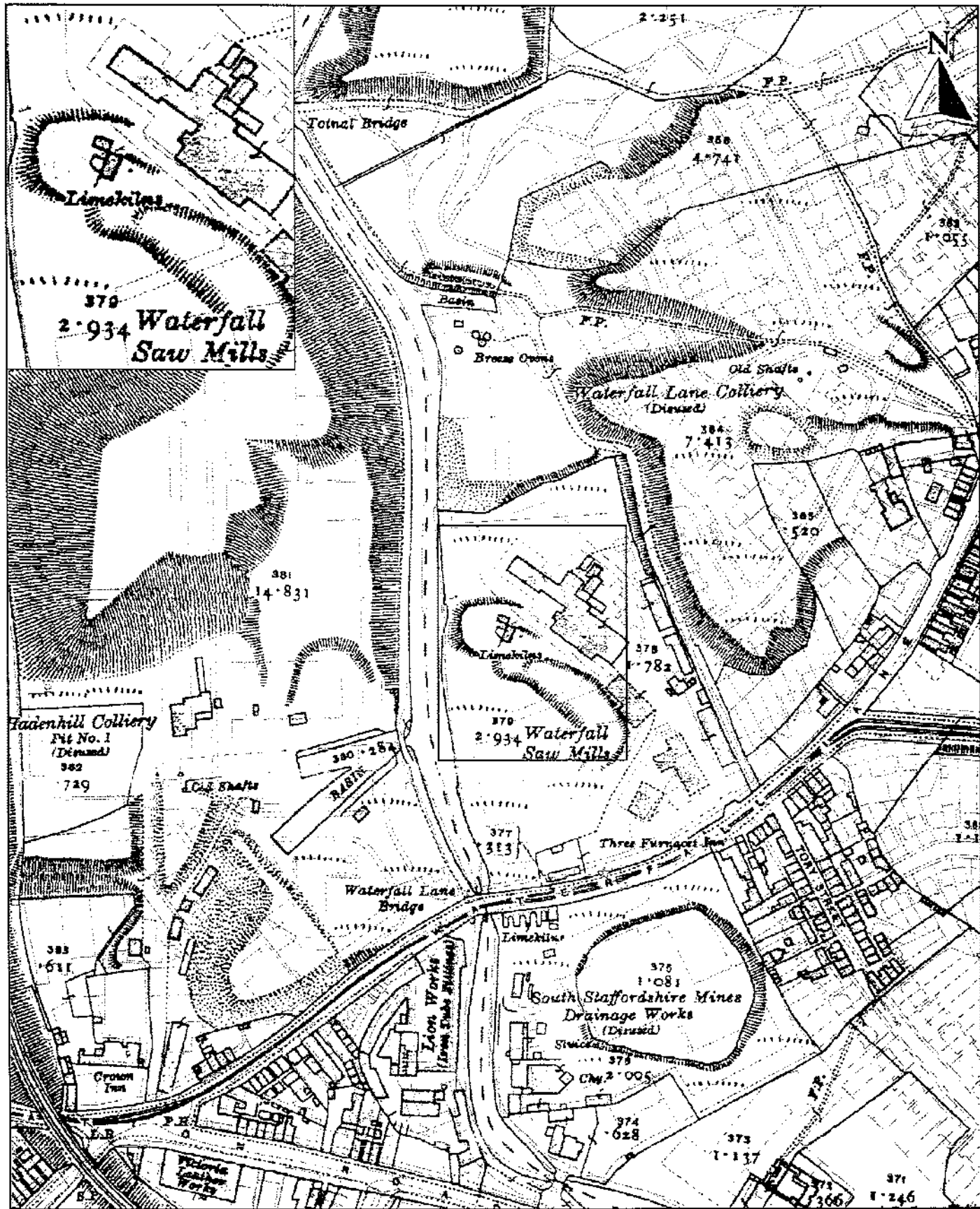


Fig.6 (1919)

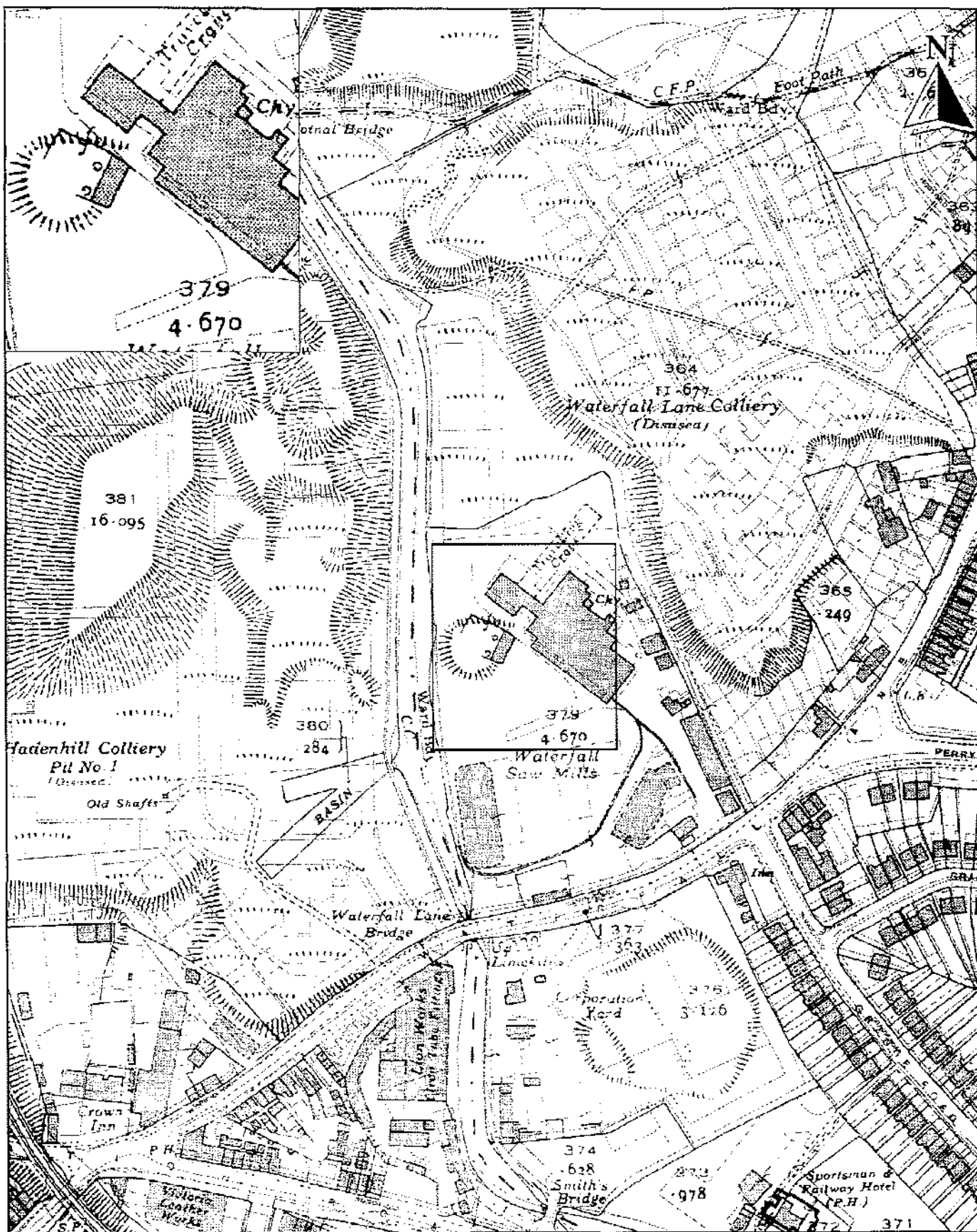


Fig.7 (1939)