Archaeological Evaluation
of land at
LLYNFI ROAD,
MAESTEG, SOUTH WALES
for
Morbaine Ltd.

Report No.1299/2005

Bristol and Region Archaeological Services

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Archaeological Evaluation

of land at

LLYNFI ROAD,
MAESTEG, SOUTH WALES.

Centred on
N.G.R. SS8500 9160

Client: Morbaine Ltd.

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NOTE
Notwithstanding that Bristol and Region Archaeological Services have taken reasonable care to produce a comprehensive summary of tbe known and recorded archaeological evidence, no responsibility can be accepted for any omissions of fact or opinion, however caused.

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SUMMARY

Bristol and Region Archaeological Services were commissioned by White Young Green Planning on behalf of Morbaine Ltd to undertake an evaluation at Llynfi Road, Maesteg. The evaluation revealed the in-situ remains of two of the blast furnaces associated with the 19th century iron works and the remains of the foundations of the casting house walls and floor. Both the structures showed evidence for being disturbed by later robber trenches.

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1. INTRODUCTION

1.1 Bristol and Region Archaeological Services (BaRAS) were commissioned by White Young Green Planning on behalf of Morbaine Ltd to undertake an evaluation at Llynfi Road, Maesteg. A planning application has been submitted by Morbaine Ltd to construct a foodstore in the vicinity of the former Llynfi Vale Iron Works

1.2 The site, centred on NGR SS 8500 9160, covers an area of approximately 3.2 hectares. Two industrial units are sited to the north of the application area with a sports centre sited to the south. The majority of the site is currently used as a car park both for the industrial units (contained within a fenced compound) and the sports centre. To the east of the site lies Maesteg Rugby Football club and its associated parking spaces. At the time of the evaluation a builders compound lay within the area of this car park.

1.3 The sports centre is situated within the former Blast Engine House which is a listed Grade II building. The southernmost of the blast furnaces has been partially restored and is a scheduled ancient monument listed as Grade II (418 Glamorgan) .

1.4 The underlying geology of the Maesteg area is from the Carboniferous period in the form of Pennant measures and Productive Coal Measures.

1.5 The evaluation archive will be deposited at an appropriate local museum after all fieldwork has been completed. A copy of the report will also be sent to the National Monuments Record (Wales) at Aberystwyth.

1.6 The fieldwork and archive completion was undertaken by Darren Lankstead. The illustrations and report compilation was undertaken by Ann Linge. The project was managed by Bruce Williams.

2. ARCHAEOLOGICAL BACKGROUND

2.1 Prior to the present project the study area formed part of an archaeological desk based assessment (BaRAS 2001). The full historical and archaeological background to the site is contained within this document. Relevant details are summarised below:

2.2 Two sites pre-date the arrival of the iron works in Maesteg. A small distance up the valley from the study area lies a holy well of medieval origin (SMR 01156m) and the Grade II listed Nantycrynwydd farmhouse (NMR NRPN 19,393; SMR 01434m) lies a short distance to the south of the standing sports centre.

2.3 To the east of the ironworks site lies a Grade II listed cast iron bridge dating to 1835 (NPRN 43,136; SMR 01434) and the Grade II listed Zoar Chapel dating to 1911 (NMR 9824). To the south of the study area lay the now demolished National Coal Board locomotive shed (NMR NPRN 34822).

2.4 The ironworks itself has been assigned NMR NPRN 327 and 34,095; SMR 10321 and the former engine house has been assigned NMR NPRN 33714.

3. HISTORICAL BACKGROUND

3.1 The Llynfi valley was a rural area until the nineteenth century. During the early part of the nineteenth century iron production was begun at Maesteg in the 'Old Works' which lies to the south of the study area on the opposite side of the valley.

3.2 James H. Allen realised the potential of the area and formed a partnership that purchased 53 acres of Nantycrynwydd Farm. This was later sold to the 'Cambrian Iron & Spelter Company' which commenced work on the iron foundry in 1838.

3.3 The 1841 Tithe map (see **Fig.3**) shows two square blast furnaces attached to the northern end of a large rectangular structure to the east. The structure is most likely the adjoining casting house. Subsidiary buildings are shown further to the south of these which lie outside the application area.

3.4 The exact date of construction of the two southerly blast furnaces is open to question (see BaRAS 2001). However they would seem to have been constructed by the mid 1850's when the site was deemed to be a large integrated iron works undertaking all processes from the preparation of ore to the manufacture of bar iron and rails of wrought iron (Lewis 1999). By 1852 the iron works employed 1500 men and women and included 4 blast furnaces, 30 puddling furnaces, 2 squeezers, 2 muck rolls and 4 rolling mills with a pattern shop, 107 coke furnaces and a brickworks producing approximately 17,000 bricks per week (Richards 1982).

3.5 James Colquhoun published a report in 1874-5 regarding improvements to the blast furnaces (see **Figs.4 & 5**). Colquhoun states that the northernmost (and thus original) of the blast furnaces had been altered to a circular structure which reached the height of 60 feet after alteration.

3.6 The alteration of the northern blast furnace is clearly visible in the Ordnance survey map surveyed in 1876 (**Fig.6**). Also of interest is the casting house to the east of the blast furnaces, which would seem to have been altered. In earlier plans the structure is given as solid and thus presumably covered. However in the 1876 plan its northern end shows only two walls with tramways protruding through or over them.

3.7 Owing to financial difficulties, iron production ceased in 1885. By the time of the 1897 revision of the O/S 1:2500 plan only the blast furnaces and blast engine survive from the original works. At this point the latter was utilised as a store house which led to its present name of 'The Cornstores'. The 1897 edition O/S plan also shows the path of the railway line from Port Talbot to Maesteg which passed between the 'cornstore' and the most southerly of the blast furnaces. Embankments are also clearly visible on both sides of the railway track.

3.8 Passenger services from Port Talbot to Maesteg ceased in 1933 and the final freight train ran on the 28th August 1964. At the beginning of the 1950's two long rectangular omnibus depots had been constructed to the south east of the application area and the last surviving blast furnace was robbed of the majority of its facing stones. Lewis (1999) points out that the facing stones from a total of three of the blast furnaces were removed in the 1950's to construct the tower of St. Michael's Church.

3.9 Since 1980 the 'cornstores' have been altered into the reception for the sports centre, a squash court has been constructed between the cornstores and the standing blast furnace and the extant industrial units and their accompanying car park have been constructed on the northern part of the proposed development.

4. OBJECTIVES AND METHODOLOGY

4.1 The fieldwork complied with the methodology contained within the Written Scheme of Investigation (BaRAS 2004). The aim of the fieldwork was to determine the location, extent, degree of survival and dates of archaeological features and deposits.

4.2 At the request of the client, a sub surface magnetometry and radar survey was carried out on the area to ascertain its effectiveness. The results of the survey were inconclusive owing largely to the quantity of ferrous material present in the survey area.

4.3 Initially four trenches were excavated and recorded between 14th December 2004 and 20th December 2004 in the positions shown in Fig 2. Trench 2 had to be relocated owing to an abandoned car being placed where the trench was originally intended.

4.4 Following the visit of Neil Maylan (GGAT) it was decided to excavate a further trench (Trench 5 see **Fig.2**). The purpose of this trench was to ascertain the preservation of the most northerly of the blast furnaces and to investigate the phasing of the structure. This was initially unsuccessful and a further trench (Trench 6) was excavated. The second phase of the evaluation was completed between 5th January and 7th January 2004.

4.5 The six trenches were placed to locate specific features, these were:
Trench 1. Located to find the small extension of the New Mill
Trench 2. Located to intercept the Boiler House
Trench 3. Positioned to locate the east wall of the Casting House
Trench 4. Located to investigate the north side of the third square blast furnace
Trench 5. Positioned to locate the northernmost blast furnace
Trench 6. Positioned to locate the northernmost blast furnace

4.6 All trenches were excavated by a mechanical excavator using a toothless grading bucket. A toothed grading bucket was used in Trenches 1 and 3 in an attempt to break open the indurated hard standing ferrous layer. Despite this it still proved impossible to break open the surface (see Results).

4.7 The evaluation was carried out in accordance with the strategy document and the IFA's Standard and Guidance for Archaeological Evaluations. Recording was carried out using Bristol & Region Archaeological Services' single context recording system. Plans and sections were drawn at a scale of 1:20. A full photographic record comprising 35mm monochrome and colour slide film was kept which included all stratigraphic units and working shots.

5. RESULTS

5.1 Trench 1

5.1.1 Trench 1 measured 10m x 1.5m and was oriented in an ENE-WNW direction and was sited on the grass verge at the south easterly portion of the development area. The trench was excavated to a maximum depth of 1.5m (see **Figs.7 & 8 & Plates 1 & 2**).

5.1.2 The stratigraphically earliest deposit in the trench was an indurated dark reddish brown deposit containing large amounts of ferrous material and occasional sandstone blocks (103). Despite repeated attempts to break open the surface it proved impossible with the mechanical excavator. Analysis indicated that 103 contained significantly more material associated with secondary iron smelting processes and may illustrate an alteration of activity from primary to secondary processes within the sites development (Dr. T. Young per comm).

5.1.3 The indurated surface (103) was truncated by two regular steep-sided cuts which, although not fully exposed, would seem to have been either square or rectangular in plan (105 & 107). The cuts contained a friable mixture of building rubble and mortar and coal debris in their uppermost fills and a layer comprising hot blast furnace slags varying from a pale mid grey to dark green at their base (104,106 & 108). Neither cut was excavated to its maximum depth owing to health and safety considerations. The purpose of the two regular cuts is uncertain owing to the limited exposure in the trench. However, a possible function is that they acted as substantial bases for structures which were once sited in the area.

5.1.4 Stratigraphically overlying fills 106 & 104 and physically overlying 103 was a friable dark greyish black deposit (102) containing 90% coal fragments with occasional slag and clinker fragments. This could possibly be associated with the use of the site as a railway/omnibus yard. Overlying 102 was a mid orangish brown, clayey silt (101) deposited as part of the landscaping associated with the still extant car park.

5.2 Trench 2

5.2.1 Trench 2 measured 4.3m x 2.5m and was oriented in an E-W direction. It was excavated in the grass verge in the northerly portion of the sports centres car park. It was excavated to a maximum depth of 1.4m below the present ground surface. As mentioned above the trench had to be relocated as a car had been abandoned over the site of the original Trench 9 (see **Fig.9 & Plate 3**).

5.2.2 The bottommost deposit (203) consisted of dark reddish black, clayey silt containing roughly hewn sandstone and mid whitish grey mortar fragments. Stratified above this deposit was a coal rich dark greyish black layer (202) containing occasional sandstone fragments. Above this lay a topsoil horizon which had been deposited at the same time as the landscaping associated with the modern car park and the aggregate filled cut for the car parks kerbs (201).

5.2.3 No structural remains were present within Trench 2 with the deposits probably representing landscaping horizons containing some demolition debris. These horizons are possibly related to the late 19th century railway embankment and may suggest that the boiler house had been demolished prior to landscaping.

5.3 Trench 3

5.3.1 Trench 3 measured 10m x 1.5 m and was oriented in a ENE-WNW direction. It was situated on the grass verge to the north of the sports centre car park's north-eastern limit. The trench was excavated to a maximum depth of 1.2m below the present ground surface (see **Figs.10-13 & Plates 4-6**)

5.3.2 The natural substrata (303), consisting of boulder clay of a probably colluvial nature, was encountered at the base of Trench 3. Physically cutting this deposit were the remains of two walls. The more substantial of the walls (304) ran in a NW-SE direction and consisted of squared to roughly hewn pennant sandstone bonded by a light whitish grey mortar containing lime and charcoal flecks. The wall was faced to the west and contained a rubble core. It could not be determined if the wall was faced to the east owing to the indurated surface (305) not allowing excavation in this area (see below).

5.3.3 Wall 302 ran in a W-E direction and consisted of both brick and pennant sandstone bonded by a light whitish/grey mortar containing lime and charcoal flecks. It was less substantial than wall 304 with its eastern extent disturbed by machining. Walls 302 and 304 were bonded together with the smaller, 302, seemingly abutting 304. The walls are thus likely to be broadly contemporary and are thought to represent the main eastern wall of the casting house and an internal partition wall.

5.3.4 Evidence for the in-situ casting room floor was also present within the trench in the form of a layer of sand (310) contained within cut (309). The sand was mixed with ferrous material at the south-west corner of the trench which is possibly debris associated with the casting process (Dr. T. Young per comm.). A further oval cut and fill was encountered to the east of the casting room floor (307 & 308) with the fill consisting of a friable light greyish white mortar containing lime and charcoal flecks. The exact function of this feature is uncertain but it is stratigraphically contemporary with the casting room floor and is probably related to the casting process.

5.3.5 Sealing both the remains of the casting room floor and fill 307 to the west of the trench was a compact dark blackish brown deposit (306) containing a substantial quantity of ferrous and slag debris including iron bars. The mixed nature and the amount of debris contained with the deposit suggests it contains material dumped over the casting room floor after its abandonment.

5.3.6 Cutting layer 306 were two substantial cuts (314 & 312) filled by friable dark blackish grey silty clay containing frequent sandstone and mortar fragments (301 & 313 respectively). Both features were interpreted as robber trenches excavated so as to remove the upper reaches of walls 302 & 304. The fact that both cut the debris deposited over the casting room floor suggests that the stone was utilised elsewhere (perhaps to construct St. Michael's Church) some time after the abandonment of the casting room floor.

5.3.7 To the north of the trench lay an indurated ferrous rich deposit (305) identical to that recorded within Trench 1 (103). Again it proved impossible to break through the surface and its stratigraphic relationship with cut 312 could not be determined.

5.3.8 Overlying surface 305 and deposit 306 was the mid reddish brown, clayey silt topsoil deposited as part of the landscaping associated with the car park (300).

5.4.1 Trench 4

5.4.2 Trench 4 measured 5m x 1.5m and was oriented in a N-S direction, it was excavated to a maximum depth of 1.2m below the present ground surface (see **Figs.14 & 15 & Plates 7 & 8**).

5.4.3 The bottommost deposit (407) was encountered at the northern end of the trench and consisted of a dark reddish brown clayey silt containing large tabular pennant sandstone fragments. The deposit was not excavated so its exact stratigraphic position could not be ascertained. However, it was physically seen to abut the foundation course of wall 405.

5.4.4 Wall 405 consisted of 3 courses of dressed pennant sandstone blocks above a faced protruding footing. The wall was bonded by a light whitish/grey lime mortar containing occasional charcoal and slag inclusions. The wall retained a rubble infill (406) consisting of roughly hewn pennant sandstone rubble bonded by an identical mortar to that within wall 405. The rubble layer continued southwards to the edge of the trench so was at least 2.6m in length. Wall 405 and rubble infill 406 are thought to represent the in-situ remains of the northern face of the third blast furnace.

5.4.5 Physically abutting and overlying wall 405 and infill 406 was a substantial demolition deposit (404) consisting of sandstone rubble and mortar. Overlying layer 404 was a mid reddish/brown deposit containing frequent slag and ferrous material that had formed a firm surface (403). Above this layer, a friable dark blackish grey clayey silt containing frequent slag and coal fragments was present (402), above which lay a redeposited landscaping horizon (401) consisting of heavily bioturbated mercia mustone.

5.4.6 It would appear that a managed landscaping and demolition episode had taken place after the demolition of the blast furnace. Initially the area surrounding the blast furnace had been levelled with the demolition rubble (404) after which an iron rich deposit (403) and a silty layer (402) had been deposited to aid stabilisation. Above this depositional sequence a non-local topsoil layer had been deposited.

5.5 Trench 5

5.5.1 Trench 5 measured 5m x 1.5m and was sited 2m to the north-west of Trench 4 (see **Fig.16 & Plate 9**). It was excavated to a maximum depth of 1.9m. The trench contained successive layers of demolition debris stratified within differing deposits being either mortar or slag rich (505,504,503,502).

5.5.2 No structural remains of the northernmost blast furnace were apparent within the trench although the bottommost deposits (504 & 505) contained heat affected fire bricks associated with the inner core of the structure. Given health and safety guidelines it was not possible to further excavate the trench so it could not be ascertained if the blast furnace was located beneath the successive deposits of demolition debris.

5.6 Trench 6

5.6.1 Trench 6 was oriented in a north to south direction and measured 5.3m north to south. The northern edge of the trench measured 1.7m east to west which increased to 2.5m towards the south of the trench. It was deemed necessary to widen the trench to fully explore the exposed features (see **Figs. 17-19 & Plates 10-13**).

5.6.2 The remains of a wall (608) was identified within the western limit of trench 6. The wall fragment was constructed of roughly hewn pennant sandstone bonded by a light whitish grey limestone mortar. The main body of the wall was heavily disturbed and consisted of mortar bonded rubble reaching a maximum height of 0.6m above the base of the excavated trench. The eastern limit of the wall exhibited a definite face and is most likely to be the base of the tapping arch which would have led from the main base of the blast furnace. This is supported by the presence of heat affected fire bricks to the rear of the arch which are likely to have formed the internal superstructure of the blast furnace itself.

5.6.3 The fire bricks themselves were laid upon a substantial pennant sandstone base (609) situated to the north and east of wall 608. A substantial ferrous fragment appeared to be integral to the base but whether or not it was a fitting or simply a waste product of the industrial process could not be ascertained. The limited exposure of the base did not allow any definite conclusions to its shape but it appeared to be circular in plan.

5.6.4 To the south-east of wall 608 and base 609 lay wall 615. Again this was constructed of pennant sandstone and bonded by a whitish grey mortar. It was faced to the north and west. Wall 615 lay broadly parallel to wall 608 and may be part of the same blast furnace structure, perhaps being a subsidiary wall supporting the chimney of the blast furnace (see conclusion & fig.4).

5.6.5 Possibly abutting both wall 608 and 615 was a friable black sandy silt containing 80% coal debris and occasional slag fragments. This deposit was not excavated so its exact stratigraphic relationships could not be ascertained. However, it would seem likely, given that it abutted both walls 608 and 615 and was cut by possible robber trenches 610 and 612, that it was deposited as part of the landscaping/make up event which occurred immediately after the demolition of the blast furnace.

5.6.6 Stratigraphically overlying wall 615 lay deposit 617 being a moderately compacted mid grey silty clay containing a distinct lens of mortar at its interface with overlying deposit 616. Deposit 616 itself was a heavily disturbed loose to friable deposit consisting of topsoil and modern debris.

5.6.7 Deposits 616,617 and 614 had been truncated by a substantial linear cut feature (612). The amount of bioturbation and disturbance witnessed within deposit 616 had obscured the uppermost reaches of the cut but it was clear within the lower reaches of 616 and the whole of 617. The cut was interpreted as a robber trench dug to remove the facing stones from wall 608, presumably in the 1950's so as to construct St. Michael's Church tower.

5.6.8 The lowermost fills of the cut (613 and 606) contained frequent roughly hewn pennant sandstone block and mortar fragments within a mortar rich and dark blackish brown slag rich deposit (613 and 606 respectively). The uppermost fills of the cut (604 and 603) contained predominately coal (90%) fragments (604) and light whitish grey mortar fragments (603).

5.6.9 A further linear cut and fill (610 and 611) extended north eastwards from the eastern face of wall 608. The linear nature of the cut and fill would suggest a robbed structure which once formed an integral part at the base of the tapping arch.

5.6.10 Overlying the base of the blast furnace 609 to the north of wall 608 was a deposit (607) consisting entirely of demolition debris contained within a light whitish grey mortar matrix. The deposit contained frequent angular pennant sandstone blocks some of which were fragmentary facing stones. Stratified above deposit 607 lay a friable to moderately compacted, dark blackish brown clayey silt containing lens's of mortar and coal fragments (605). Both deposits are thought to be the in-situ demolition and landscaping horizons associated with the demolition of wall 608.

5.6.11 Stratigraphically overlying fill 603 and physically overlying deposit 605 was a friable, black, sandy silt containing fragments of mortar, charcoal, coal and slag (602). Above this deposit lay a heavily disturbed topsoil horizon containing angular sandstone, slag and charcoal fragments (601). Both deposits were interpreted as recent make up and landscaping events which occurred after the robbing of the walls in the 1950's.

6. CONCLUSIONS

6.1 It was the stated aim of the evaluation to determine the location, extent, degree of survival and dates of archaeological features and deposits. To aid in this the 1876 Ordnance Survey plan was enlarged and transposed onto the modern plan of the area (see **Fig.2**). Results from **Trenches 3 and 4** corresponded almost exactly with what was expected, or that Trench 3 contained the remains of the eastern wall of the Casting House and Trench 4 contained the remains of the northern wall of the third blast furnace.

6.2 **Trench 5** contained demolition debris deriving from the blast furnace where we had expected to locate the structural remains of the most northerly furnace. As a contingency plan **Trench 6** was excavated which was positive in that the remains of the northerly blast furnace and its base were present. Therefore, we can conclude that the extrapolation of the 1876 plan onto the modern plan is broadly correct in relation to the remains of the blast furnaces and the casting house.

6.3 It has already been discussed that the most northerly of the blast furnaces had been altered from a square to a round structure during the life of the iron works (see **Figs.4 & 5**). Comparison of Colquhoun's plans and sections of the two structures show distinct similarities in their ground plans, in that they are both circular. The exposed remains within **Trench 6** would seem to correspond with the earlier square blast furnace (see **Fig.4**). If this is the case it would seem reasonable to assume that the earlier blast furnace was not demolished, rather that its upper portion was altered to encompass Colquhoun's circular improvements. However the limited exposure within **Trench 6** does not allow any firm conclusions to be drawn from the evidence.

6.4 The blast furnace was relatively well preserved within **Trench 4** with a seemingly managed demolition and landscaping event taking place. The preservation of the most northerly blast furnace is more problematic, with **Trench 5** containing demolition debris including fire bricks which would have originally lined the furnaces hearth. This could indicate that the southern portion of the furnace was completely demolished, although it could equally be true that the remains of the blast furnace lay below the limit of **Trench 5.**

6.5 A floor plan of the northernmost blast furnace was discernible within **Trench 6** with the possible remains of the base of the Tapping arch, the outer superstructure to the blast furnace, rubble mortared infill and the base of the hearth being present. It was also apparent that a substantial robber trench had been cut through the preserved walls so as to remove the facing stones. This event has been historically documented as occurring during the 1950's when the stones were utilised to build the tower of St. Michael's Church in Maesteg.

6.6 Further robber trenches were also observed within **Trench 3** where the upper courses of the casting house walls were removed after demolition. Despite the robbing of the Casting House walls the preservation of the structure itself appeared relatively good, especially in respect of the evidence for the in-situ casting room floor within **Trench 3.**

6.7 The indurated layer present within both **Trenches 1 and 3** is significant for analysis of the deposit (see Appendix 3) suggests that the material derives from secondary iron processing, rather than primary residues encountered within the deposits associated with the Casting House. The layer could thus indicate both a spatial and temporal alteration in the sites usage. The tithe map (1841) shows the large rectangular casting house to be integral to the earlier, northern, blast furnaces. By the 1876 edition of the O/S map only the southern portion of the casting house remains with the northern portion being depicted as two separate walls with tramways leading over or through them.

6.8 Two possible explanations exist viewing the evidence. The first is that the northern portion of the casting house was demolished and a hard standing, truly metalled, surface was deposited on which the tramways were laid. The indurated surface would thus be redeposited secondary processing material. The other possibility is that the former casting house area was utilised for secondary iron production, with the residue accumulating during processing itself. If the latter was the case it would seem likely that the northern portion of the casting house was covered with a temporary type roof.

6.9 Preservation beneath the indurated surface could not be ascertained owing to it being impossible to break through the surface with the available machinery.

6.10 The square or rectangular features cutting the indurated surface within Trench 1 are difficult to interpret owing to the limited exposure. However, as noted above, the most likely explanation is that they represent footings or fittings for larger machinery or structures. The deposits at the base of the features are significant however because they contain uncemented and loose blast furnace slags. Cranstone has suggested that dumps of stratified slag may indicate temporal alterations in blast furnace technology (see Appendix 3). Therefore, any difference in debris produced by the improvements to the northernmost blast furnace may be indicated within the accumulation of slag debris to the east of the application area.

6.11 Trench 2 contained deposits comprising debris from iron manufacture stratified above similar deposits containing demolition debris. No firm conclusions could be drawn from this trench although the lack of structural remains suggests the boiler house had been demolished prior to landscaping.

7. CONSULTANT'S ADVICE

7.1 The proposed development is likely to have an impact on the soil strata and archaeological remains that are known to exist below the surface (Davis et al 2004).

7.2 Welsh Office Circular 60/96- Planning and the Historic Environment: Archaeology states that "Development plans should reconcile the need for development with the interests of conservation and archaeology" and that " Archaeological investigations, such as excavating and recording should be carried out before development commences".

7.3 The evaluation has identified the preserved remains of the Casting House, the two northern blast furnaces as well as a possibly later indurated surface associated with secondary iron processing. Any future archaeological study should aim to interpret these features in relation to the development of the iron works at Llynfi Road, Maesteg.

7.4 The absence of structural features within **Trench 2** would suggest the boiler house had been demolished prior to the landscaping and demolition events represented within the trench.

8. BIBLIOGRAPHY AND SOURCES CONSULTED

Maps

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9. ACKNOWLEDGMENTS

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APPENDIX 1: Policy Statement

This report is the result of work carried out in the light of national and local authority policies.

NATIONAL POLICIES

Statutory protection for archaeology is enshrined in national legislation, including the Ancient Monuments and Archaeological Areas Act (1979), amended by the National Heritage Act (1983). Nationally important sites are listed in the Schedule of Ancient Monuments (SAM). Scheduled Monument consent is required for any work which would affect a SAM.

Welsh Office Circular 60/96 – Planning and the Historic Environment: Archaeology

Paragraph 8 states that:
"Development plans should reconcile the need for development with the interests of conservation including archaeology They should include policies for the protection, enhancement and preservation of sites of archaeological interest and their settings."

Paragraph 10 states that:
"The desirability of preserving an ancient monument and its setting is a material consideration in determining a planning application whether that monument is scheduled or unscheduled."

Paragraph 18 states that:
"There will be occasions, particularly where remains of lesser significance are involved, when planning authorities may decide that the significance of the archaeological remains is not sufficient when weighed against all other material considerations, including the need for development, to justify their physical preservation in situ, and that the proposed development should proceed. Planning authorities will, in such cases, need to satisfy themselves that the developer has made appropriate and satisfactory arrangements for the excavation and recording, or other investigation, of the archaeological remains and the publication of the results."

Paragraph 19 states that:
"From the archaeological point of view excavation should be regarded as a second best option."
It also states that:
"The preservation in situ of important archaeological remains is therefore to be preferred."

Paragraph 20 states that:
"Archaeological investigations, such as excavation and recording should be carried out before development commences, working to a project brief prepared by the planning authority (with reference to their archaeological advisors). Investigation can be achieved through agreements reached between the developer, the archaeologist and the planning authority. Such agreements should secure and implement an appropriate scheme of archaeological investigation, to an agreed timetable, and provide for the subsequent publication of its results."

Planning Policy Wales (2002)

Planning Policy Wales (2002, section 6.5) indicates that archaeology forms a material consideration in the planning process and states that there should be a presumption in favour of the preservation of nationally important archaeological features and sites, whether scheduled or not. Where local authorities decide that preservation *in situ* is not justified and destruction of the archaeological remains may proceed, they must be satisfied that the developer has made appropriate provision for archaeological investigation, recording and publication (ibid, para. 6.5.3).

Paragraph 6.5.1 states that:
"The desirability of preserving an **ancient monument** and its setting is a material consideration in determining a planning application, whether that monument is scheduled or unscheduled. Where nationally important **archaeological remains**, whether scheduled or not, and their settings are likely to be affected by proposed development, there should be a presumption in favour of their physical preservation in situ. In cases involving lesser archaeological remains, local planning authorities will need to weigh the relative importance of archaeology against other factors, including the need for the proposed development."

Paragraph 6.5.7 states that:
"Where a development proposal affects a listed building or its setting, the primary consideration is the statutory requirement to have special regard to the desirability of preserving the building, or its setting, or any features of special architectural or historic interest which it possesses."

Unitary Authority Policy

Bridgend County Borough Council has included two policies on Development and Ancient Monuments (Policies EV47 & EV48) in its Unitary Development Plan. In this particular instance the term 'ancient monument' refers to nationally important monuments, whether scheduled or not. Policy EV48 refers to mitigation measures, which may either:

1. Preserve, protect, and enhance the archaeological remains and their surrounding setting 'in-situ'; and/or
2. Facilitate the excavation and proper recording of the detail, extent, and characteristics of the site, its artefacts and remains, and where appropriate, their rescue.

The Local Planning Authority has indicated that an "archaeological excavation and the subsequent recording of non replacement archaeological assets" should be secured for this site.

APPENDIX 2: Context Descriptions

Trench 1

Context No.	Description
101	Mid orangish brown, clayey silt. Topsoil deposited during landscaping of extant car park
102	Friable, dark greyish black. Deposit comprises 90% coal fragments with occasional clinker and slag fragments. Make up layer possibly related to railway yard.
103	Indurated, dark reddish brown containing occasional large sandstone fragments within matrix. Substantial surface consisting of ferrous material. Likely to be associated with railway.
104	Friable, mid orangish brown. Frequent sandstone rubble and mid grey mortar fragments within a silty sand matrix. High proportion of glass slag at base of context (see 108). Fill of 105.
105	Cut, not fully exposed. Regular 'square' cut through surface 103. Either regular cut utilised for storage or foundation of large structure associated with railway.
106	Friable, mid reddish brown-black. Similar to 104 with lens of coal dust amongst upper rubble fill. Fill of 107.
107	Cut, not fully exposed. Linear cut at eastern end of Trench 1. Probable similar function to 105.
108	Primary fill of 107 consisting solely of glass slag.

Trench 2

Context No.	Description
201	Modern aggregate fill associated with construction of modern car park kerb.
202	Friable, dark greyish black, clayey silt. Very frequent coal dust fragments. Probable refuse from railway yard or make up layer comprising of coal debris.
203	Dark blackish red, clayey silt containing angular sandstone fragments showing traces of mortar. Probable landscaping horizon partly comprising demolition debris.

Trench 3

Context No.	Description
300	Mid brown, clayey silt. Topsoil.
301	Friable, mid greyish black containing small angular stone fragments. Fill of robber trench 314.
302	Wall constructed of sandstone and brick bonded by a mid grey lime mortar. Uppermost reaches 'robbed out' by cut 314. Probable internal wall of casting house.
303	Mid grey, silty clay containing frequent rounded stone boulders. Natural boulder clay-possibly redeposited!
304	Wall constructed of two faces (east and west) with a rubble infill between. Bonded by a mid grey mortar containing lime and charcoal flecks. Substantial wall of casting house.
305	Very compact, dark blackish grey with Fe stains, underlies topsoil (300) at eastern end of trench. Possible metalled surface used as part of make up layer contemporary with railway use of site.
306	Variably compact dark blackish brown, frequent slag and industrial debris. Probable make up layer deposited after the casting house went out of use.
307	Friable, light greyish white with lime and mortar flecks. Localised mortar fill possibly contained within cut (308). Either dump of material or possibly robbed wall footing.
308	Cut, filled by 307. Possible localised rubbish pit or remains of insubstantial robbed out wall.
309	Possible cut. Filled by sand interpreted as in-situ remains of casting room floor.
310	Loose, yellowish orange to east changing to mid grey to west, sand. Sand floor, probably in situ remains of casting room floor.
311	Mid brownish orange, sand. Mixture of ferrous material and sand at western extreme of layer 310. Probable slag debris associated with use of casting room floor.

312	Cut of steep sided, flat bottomed robber trench associated with the extraction of stoneworks from wall 304.
313	Friable, dark to light blackish grey. Contains rubble, mortar and brick fragments within a sandy silt matrix. Fill of robber trench (312).
314	Steep sided cut associated with the extraction of stonework from wall (302).

Trench 4

Context No.	Description
401	Moderately compacted, mid brownish red, clayey silt containing frequent roots, occasional sandstone fragments and plastic remains. Redeposited Merica Mudstone topsoil.
402	Friable, dark blackish grey, clayey silt containing frequent coal and slag fragments. Make up layer.
403	Firm, mid reddish brown deposit containing frequent slag and ferrous material. Ferrous material has formed a iron pan possibly utilised, along with (402), as part of a managed demolition and landscaping horizon.
404	Friable, light whitish grey silty deposit containing frequent sandstone rubble amongst a light whitish grey mortar matrix. Deposit associated with demolition of blast furnace.
405	Substantial remains of northern face of blast furnace. Three courses of faced sandstone retaining a mortared rubble infill (407) to south. Protruding footing block at base of excavated wall.
406	Mortar bonded roughly hewn rubble infill retained by wall (405).
407	Dark reddish brown, clayey silt containing occasional large sandstone fragments. Topsoil type deposit possibly related to use of blast furnace. Could equally be part of dumped material against wall after demolition. Not excavated.

Trench 5

Context No.	Description
501	Moderately compacted, mid brownish red, clayey silt containing frequent roots, occasional sandstone fragments and plastic remains. Redeposited Merica Mudstone topsoil.
502	Friable, mid blackish grey, clayey silt containing frequent brick and sandstone rubble. Make up or landscaping horizon including demolition debris.
503	Friable, dark brownish black, sandy silt containing moderate amounts of slag and rubble debris. Make up layer or landscaping horizon.
504	Friable, light yellowish grey containing large amount of demolition debris within a light greyish white mortar matrix. Demolition debris includes heat affected fire bricks.
505	Moderately compacted, dark brownish black, sandy silt containing frequent amounts of sandstone rubble.

Trench 6

Context No	Description
601	Friable, dark brownish black,sandy silt containing moderate angular sandstone fragments and slag and coal fragments. Heavily disturbed topsoil.
602	Friable, black, sandy silt containing occasional mortar and charcoal fragments and coal and slag pieces. Make up or landscaping deposit.
603	Friable, light greyish white sandy silt. Deposit comprising 100% mortar - possible fill of robber trench 610.
604	Friable, black sandy silt. Deposit comprising approx. 90% coal dust and debris - possible fill of robber trench 610.
605	Friable to moderately compacted, dark blackish brown, clayey silt containing occasional lens's of mortar and coal fragments. Part of larger make up/landscaping event.
606	Friable to moderately compacted, dark blackish brown clayey silt containing occasional mortar fragments. Debris presumably associated with demolition of wall 608 or fill of robber trench 610.
607	Friable, light whitish grey matrix, silty sand containing frequent angular sandstone blocks, some of which are dresses facing stones. Debris associated with demolition of wall 608.

608 Wall fragment constructed of dressed to roughly hewn pennant sandstone bonded by a light whitish grey limestone mortar containing charcoal fragments. Faced to east where the 'tapping arch' probably lay. In-situ heat affected fire bricks observed on the rear (northern) side of wall. Southern edge of wall heavily disturbed and presumably robbed for facing stones. Face of the wall may be indicated by deposit 613 and cut 612.

609 Base of blast furnace constructed of tabular pennant sandstone blocks bonded by a light whitish grey limestone mortar containing charcoal fragments. Limited exposure possibly indicates circular base. Iron debris, possibly corroded fittings, observed within base.

610 Linear cut extending north-eastwards from wall 608. Possibly robbed feature or wall associated with base of the blast furnaces tapping arch.

611 Fill of 610. Moderate to firmly compacted yellow sand to north and light whitish grey mortar debris to south. Linear nature of feature suggests an integral feature at base of tapping arch. Possibly robbed.

612 Possible cut observed in plan to south of wall 608. Broadly lays parallel to wall 608, possibly an intrusive robber trench utilised to remove the facing stones to wall 608. Filled by 603, 604, 606 and 613.

613 Fill of 612. Friable mid whitish grey mortar to north and mid reddish brown to south deposit containing frequent roughly hewn pennant sandstone blocks. Possible debris associated with the robbing of the facing blocks of wall 608.

614 Friable, black sandy silt containing approx. 80% coal dust debris and slag fragments. Bottommost deposit encountered at base of Trench 6. Deposit not excavated but it was observed to abut structural features and to have been cut by robber cuts 610 and 612 and thus be indicative of a make up/landscaping event deposited during the demolition of wall 608.

615 Small wall stub located at south eastern corner of Trench 6. Constructed of pennant sandstone faced blocks bonded by a mid greyish white lime mortar. Runs broadly parallel to wall 608 and is likely to indicate a portion of the in-situ blast furnace.

616 Loose to friable, dark blackish brown clayey silt containing occasional small angular sandstone fragments and modern debris (crisp packets etc). Heavily disturbed topsoil. Boundary with 602 difficult to define owing to bioturbation.

617 Moderately compacted mid grey silty clay containing occasional sandstone debris. Contains distinct lens of light greyish white mortar at its interface with 616. Stratigraphically overlies wall 615. Likely to be make up or demolition layer deposited after demolition of 615.

APPENDIX 3: Metallurgical residues and structures from an evaluation at Llynfi Ironworks, Maesteg

Dr T.P. Young

Abstract

Materials sampled during the evaluation fall into two groups.

In material from the earlier group there is evidence for iron smelting, with a casting floor sand deposit in trench 3 and a dump of hot-blast blast furnace slag in trench 1.

These earlier features are then covered with a dark deposit, now hard and concreted, containing a higher proportion of residues from secondary puddling and forge processes. Particularly noteworthy is the deposit in context 305 of abundant sub-mm scale slag spheres (spheroidal hammerscale), which are probably the spatter from a power hammer. These deposits indicate that the evaluated area was more influenced by the secondary processing than the primary smelting of iron at this period, possibly indicating abandonment of the northern furnaces during the later history of the ironworks.

Contents

Background

The metallurgical residues discussed in this report were sampled during BaRAS' evaluation on the site of the former Llynfi Ironworks, Maesteg in December 2004 (Trenches 1 and 3).

In the context of the nature of this particular evaluation, it was considered most appropriate to discuss on-site the significance of materials, deposits and structures with the field staff. Only a very limited amount of significant stratified deposits were dug, therefore there is only very limited reporting on the metallurgical residues retrieved.

The descriptions are limited to visual observations. No petrographic, analytical or sieved grain size analysis has been undertaken.

Description

Context 305

Hard, dark, heterogeneous, concretionary layer. The fine matrix contains a large amount of sand, broadly comparable with that present in 310/311, but containing a large admixture of other materials. These include small pieces of coke, coal and shale, together with larger pieces (up to several 10s of mm) of slag. The slag clasts are dominantly of dark, almost black, vesicular glass, but also include rarer pieces of dense fayalitic slag. The deposit is cemented by large amounts of iron oxides, indicating a large availability of iron in the deposit, most likely from corrosion of metallic iron.

Most significantly, the finer grained parts of the deposit contain a large proportion of slag spheres (spheroidal hammerscale) as shown in Figure 1. These spheres are mostly in the range of 100-600μm in diameter, with a hard, shiny exterior This material is most likely to represent spatter produced by a power-hammer (probably during the production of wrought iron from puddled blooms).

Context 306

Hard dark, heterogeneous, concretionary layer. The sampled material was rather more sand-rich than the material from 305, with the sample from 306 apparently lacking the spheroidal hammerscale. Given the heterogeneity of the deposit and the small sample size, the significance of the difference is unknown. The material was rather variable cemented, with some pockets of very poorly indurated material. The material was seen to be particularly well-cemented adjacent to fragments of scrap wrought iron, including both rod up to about 40mm diameter and bar of about 40mm width.

The slag inclusions within the sandy matrix include the same dark vesicular glass as in 305, but also contain some pieces of paler glassy slag, probably blast furnace slag.

Context 311

Yellow-brown concretionary layer of sand, dominantly in the very fine sand class (but rarely up to about 600μm, particularly in small angular chips of chert/flint), well-cemented by iron oxides. The material contains some small clasts of other materials, particularly coke, especially near the top. This material is essentially the same as 310 but having undergone post-depositional cementation

Context 310

Unconsolidated very fine sand. Grains with moderate to good sorting and with shapes varying from sub-rounded to well-rounded. Grains dominantly quartz (>95%). Some small localised patches of partial cementation occur.

Context 106

A highly heterogeneous mix of metallurgical residues and demolition material. Sampling was restricted to a few more unusual clasts, including a 17mm diameter section of wrought iron rod, a piece of probably only partly reacted iron ore and some dense iron oxide-rich slags.

Context 108

Unconsolidated and uncemented loose accumulation of blast furnace slags. The slags vary from a pale/mid grey crystalline material, through to dark, usually greenish glass. Rare patches of bright blue glass are seen in some specimens. The texture and colour of this material would indicate that it is hot-blast slag.

Discussion

The metallurgical residues recovered, together with those observed in-situ, suggest a broadly two-fold division of deposits. The earlier deposits are almost entirely from iron smelting, whereas the younger deposits have a dominant input from the secondary processes of puddling and forging.

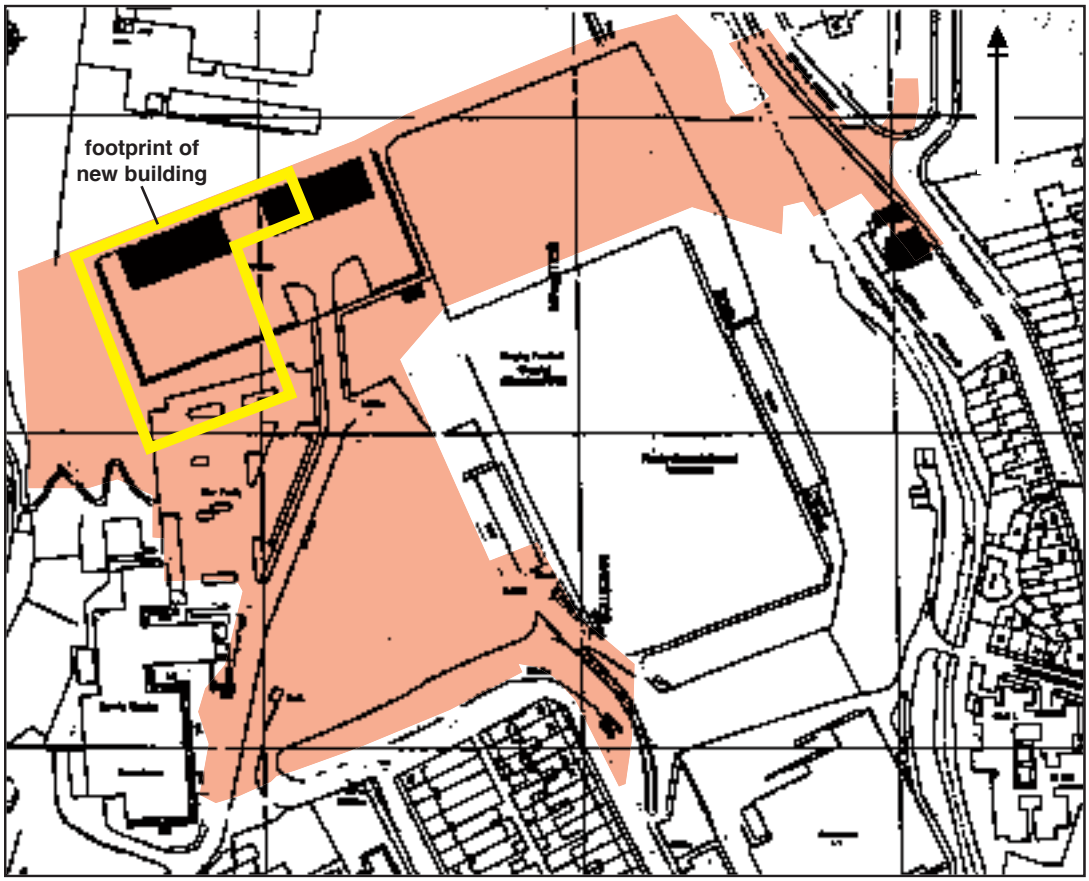
The major deposit seen in context 108 suggests that a large body of blast furnace slags may underlie that part of the site. It may be significant for the development of the site that these slags are loose and uncemented with a high bulk porosity. Cranstone has suggested that the stratified slag dump may preserve a history of changing blast furnace technology, but it is not possible to indicate where within that story the present material lies. The close proximity of trench 1 to the blast furnaces, and the location of the trench in front of the northern furnaces may suggest that these slags are likely to be relatively early within the site development.

Also presumably early in the site history is the structure seen in trench 1, where context 310 (and its secondarily cemented top, 311) is likely to represent the base of the casting sand, within a casting house. This is located in the "gap" between the northern two furnaces (Nos. 3 and 4), but apparently associated with the northernmost furnace (because it lies to the north of the "partition"). This association is strengthened by the apparent skew seen on the line of the dam on the northernmost furnace in trench 5.

Both the casting floor material in trench 3 and the unconsolidated blast furnace slags in trench 1 are overlain by an extremely hard, cemented, dark sandy layer (305, 306). The residues from this are mixed, but bear significantly more material associated with the secondary processes than the earlier deposits. This includes small fragments of dense slag, likely to be from puddling hearths, but particularly the large amount of spheroidal spatter in context 305. Whether that spatter arrived in the deposit directly, or by some secondary process of redeposition, cannot be determined on the present material. This concretionary dark layer is therefore likely to represent usage of the site, not demolition, but under a very different organisation than in the earlier period. The evidence is compatible with the layout seen on the 1875OS, by which time the northern furnaces do not appear to have a casting house. The investigated area appears as open ground between the northern blast furnaces (possibly not then in blast) and the processing sheds, possibly partially covered by an open sided building, and crossed by several tramways.

Figure Caption

Figure 1. Photomicrograph of an area of approximately 8mm x 11mm of a sample of concretionary material from context 305. The photograph shows the abundance of spheroidal hammerscale.



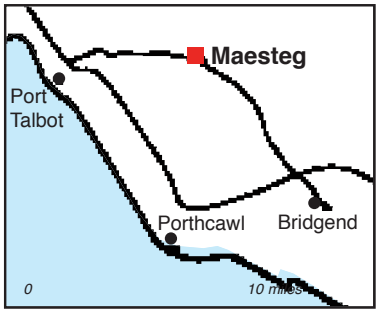


Fig.1 Site location plan, 1:2500

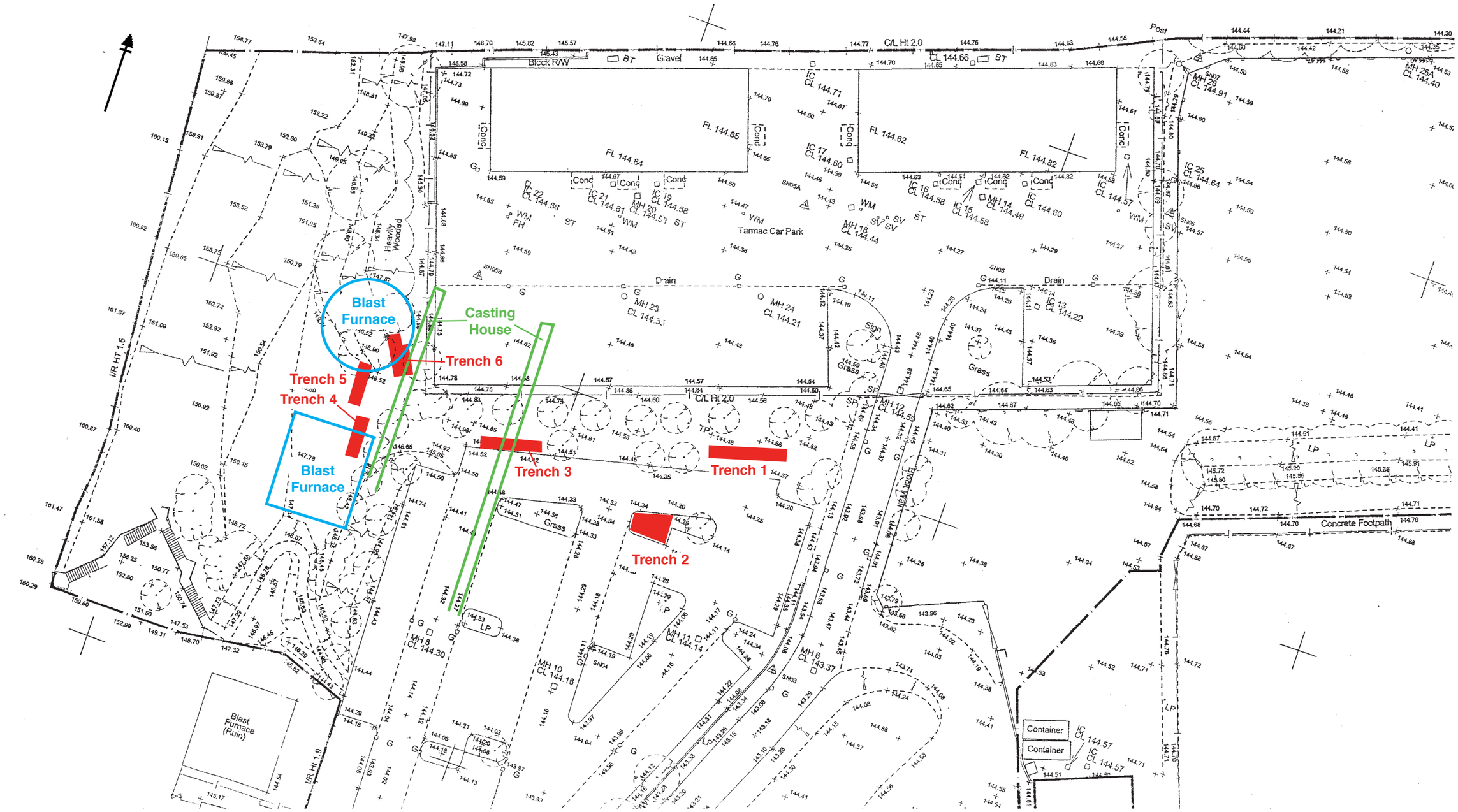


Fig.2 Plan showing location of trenches, scale 1:500

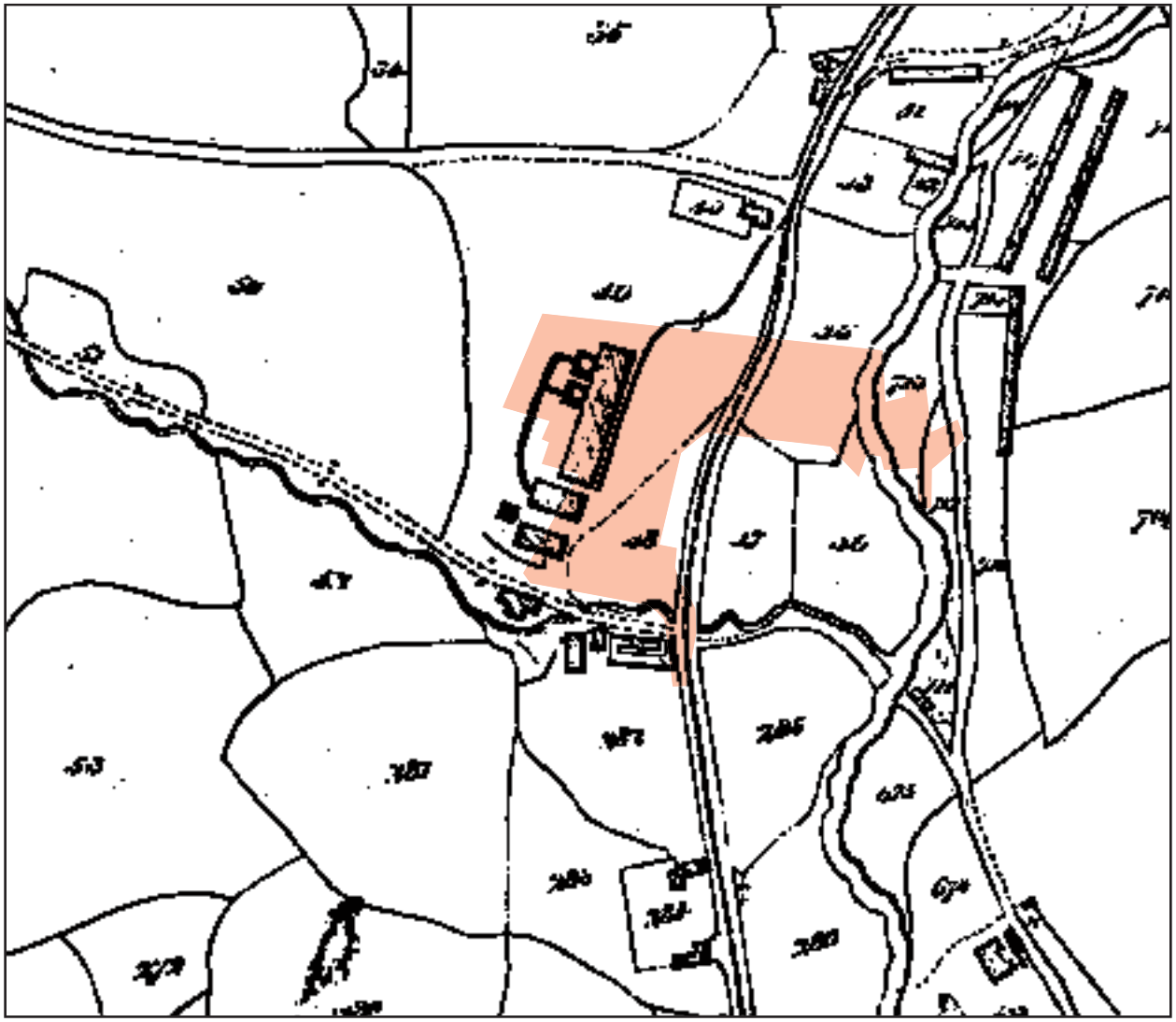


Fig.3 Tithe map, 1841

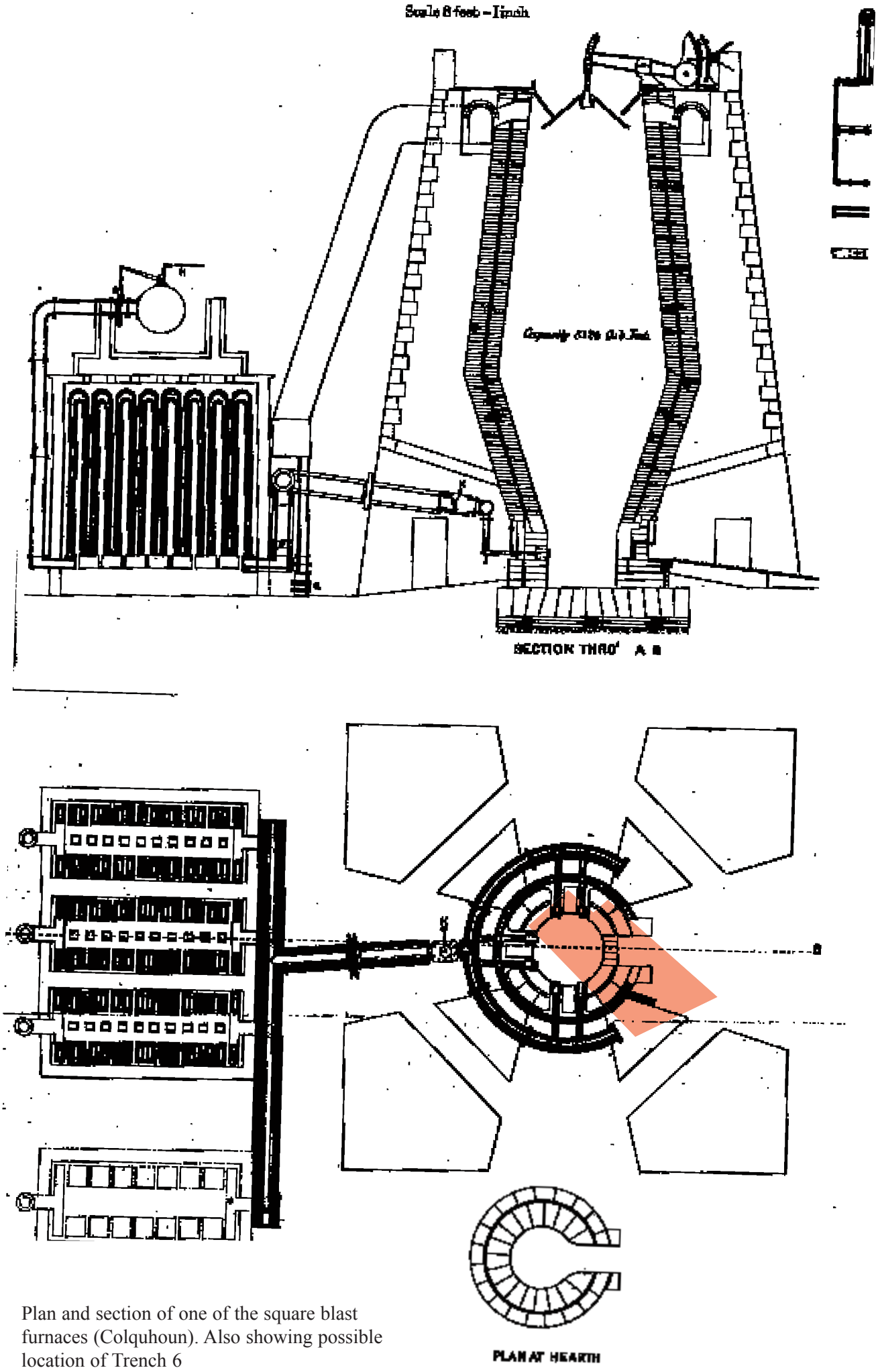


Fig.4 Plan and section of one of the square blast furnaces (Colquhoun). Also showing possible location of Trench 6

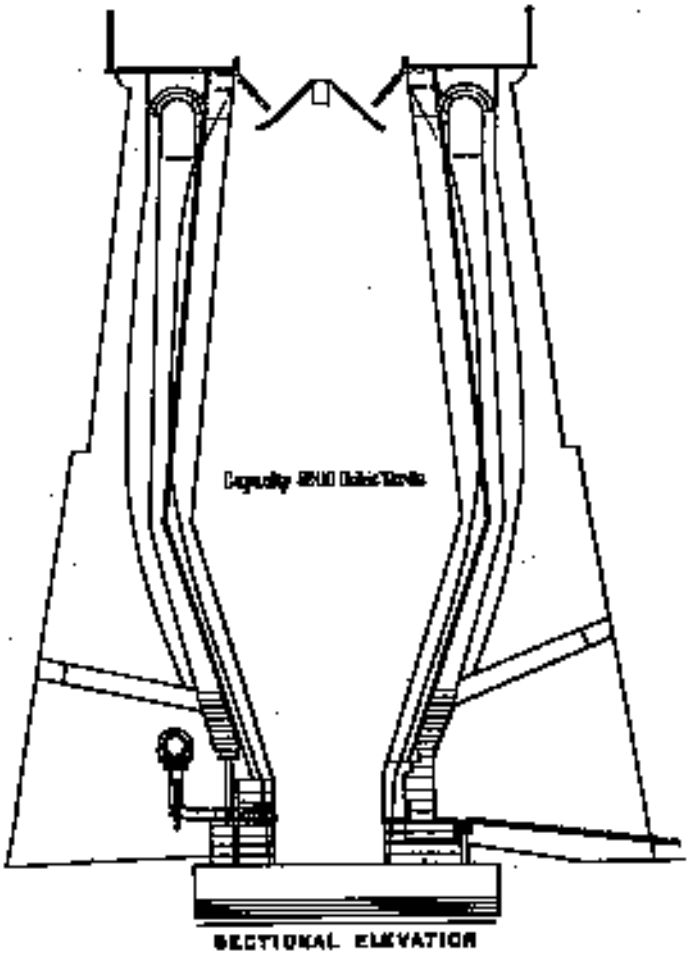


Fig.5 Plan and section of the circular northern blast furnace (Colquhoun)

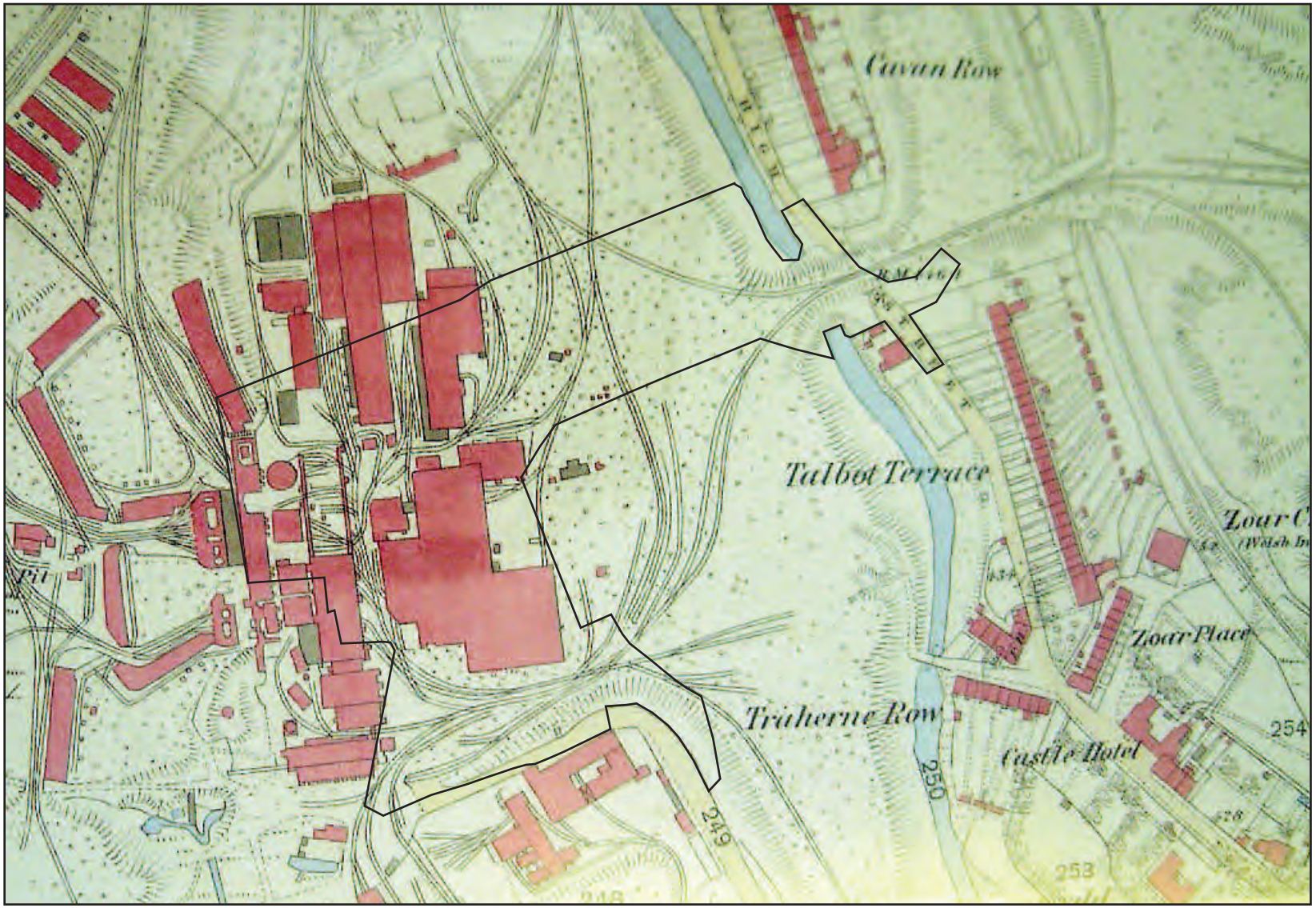


Fig.6 Ordnance Survey 1:2500 (reduced), surveyed 1876

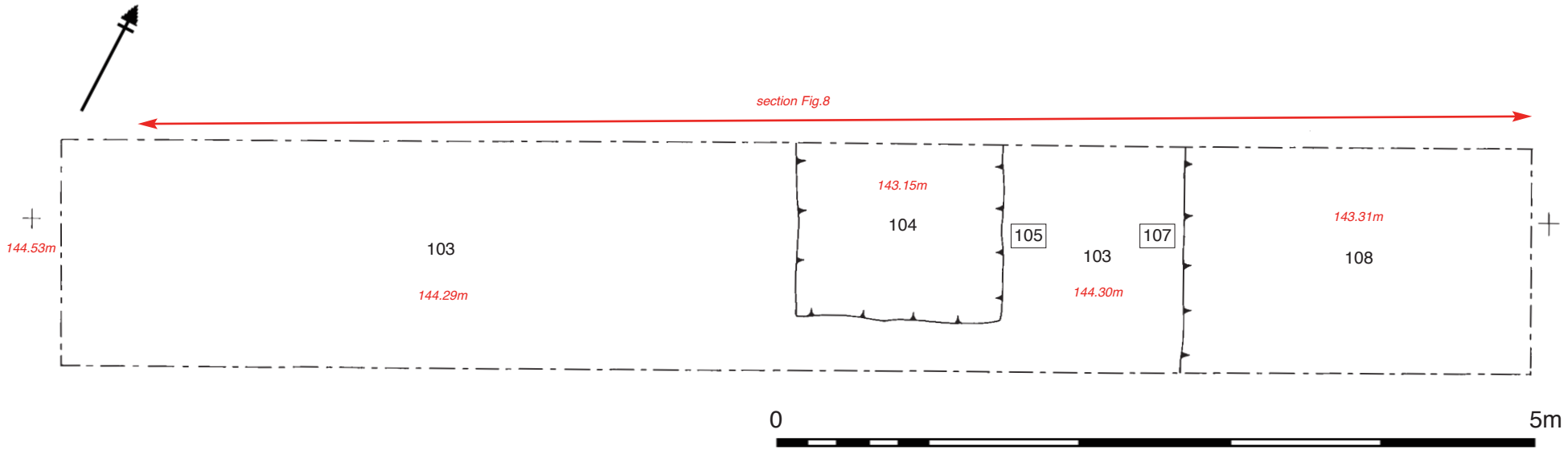


Fig.7 Plan of Trench 1, scale 1:40

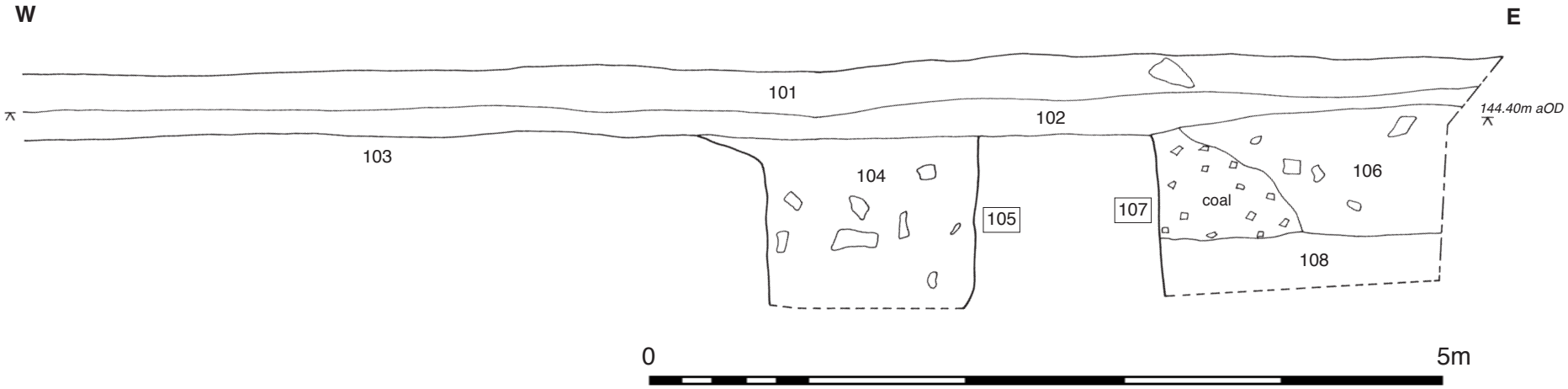


Fig.8 South-facing section of Trench 1, scale 1:40

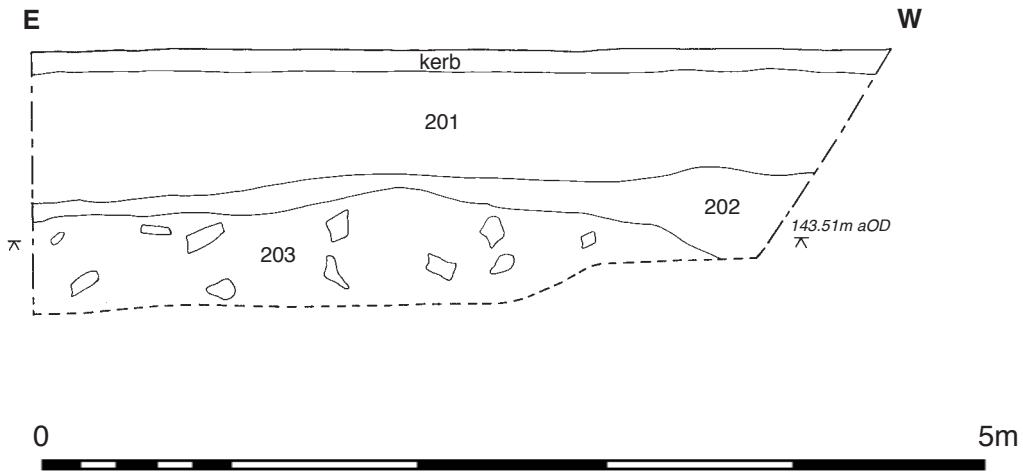


Fig.9 North-facing section of Trench 2, scale 1:40

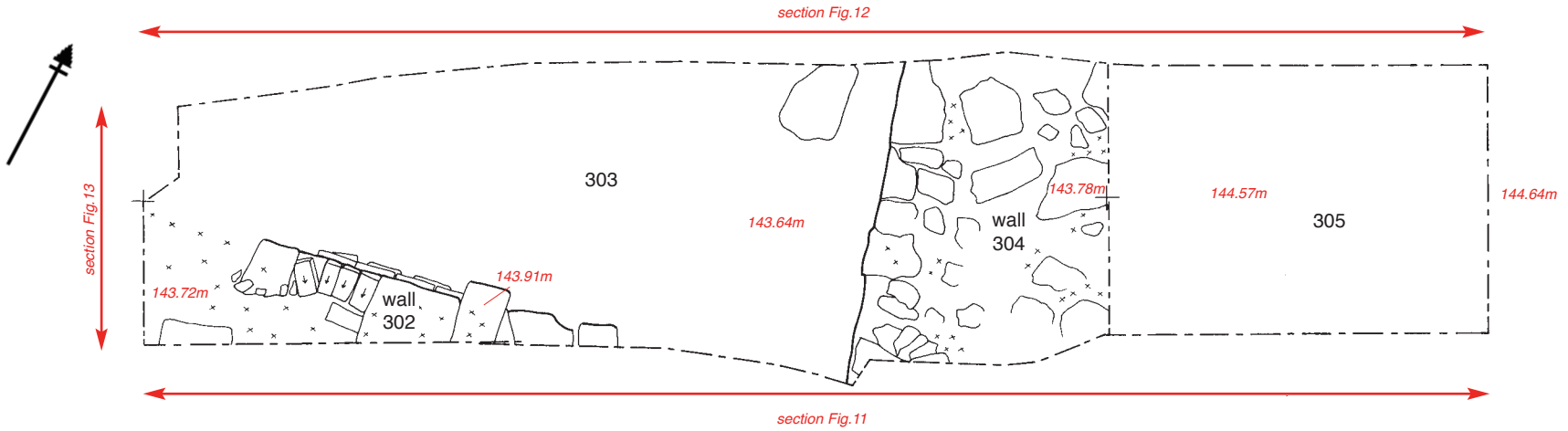


Fig.10 Plan of Trench 3, scale 1:40

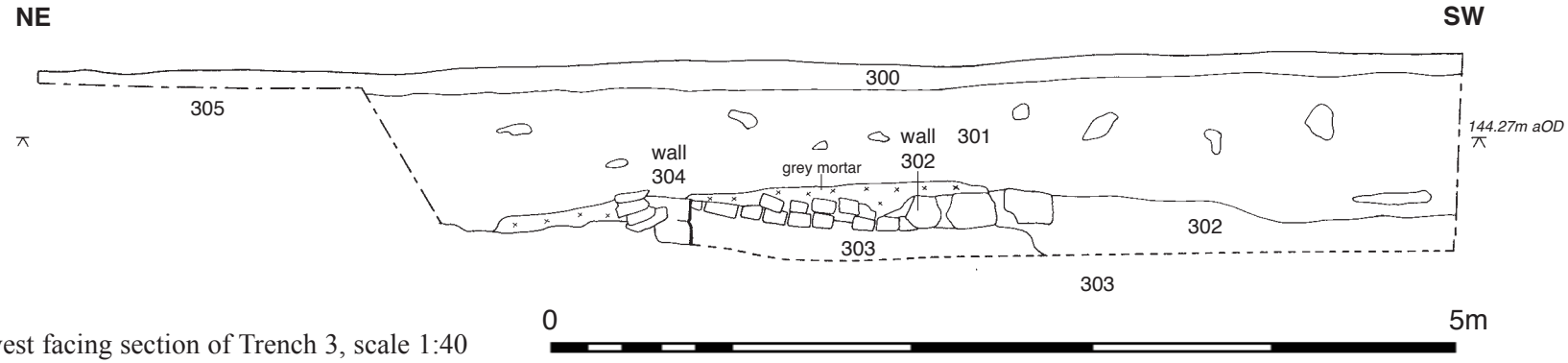


Fig.11 North-west facing section of Trench 3, scale 1:40

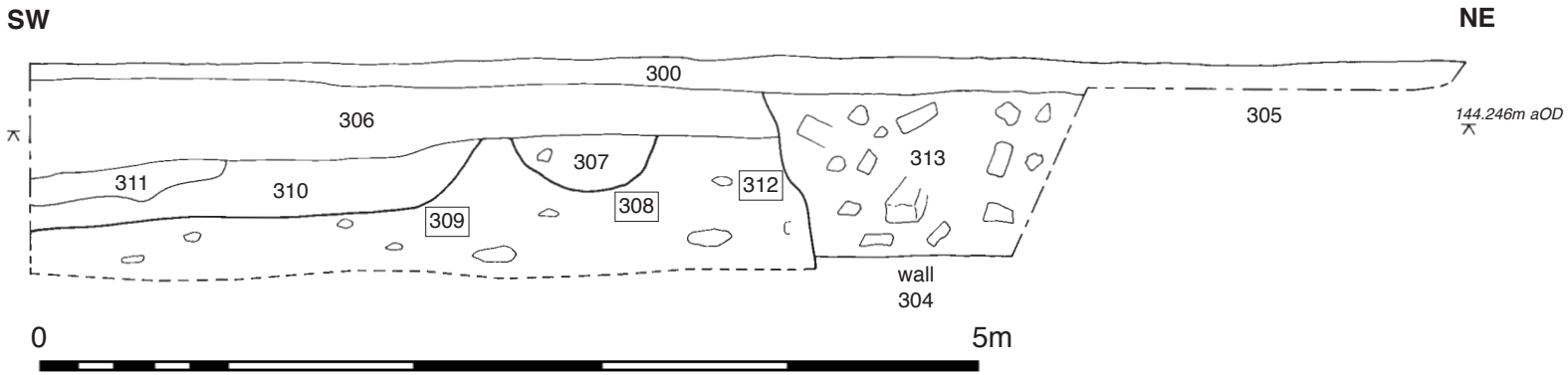


Fig.12 South-east facing section of Trench 3, scale 1:40

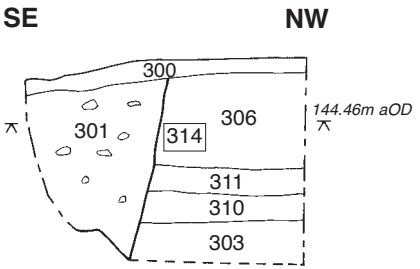


Fig.13 North-east facing section of Trench 3, scale 1:40

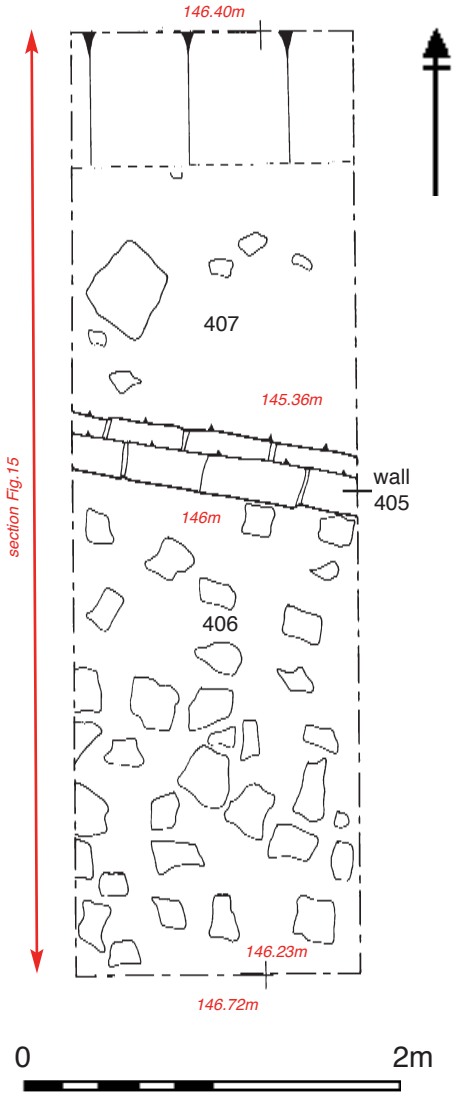


Fig.14 Plan of Trench 4, scale 1:40

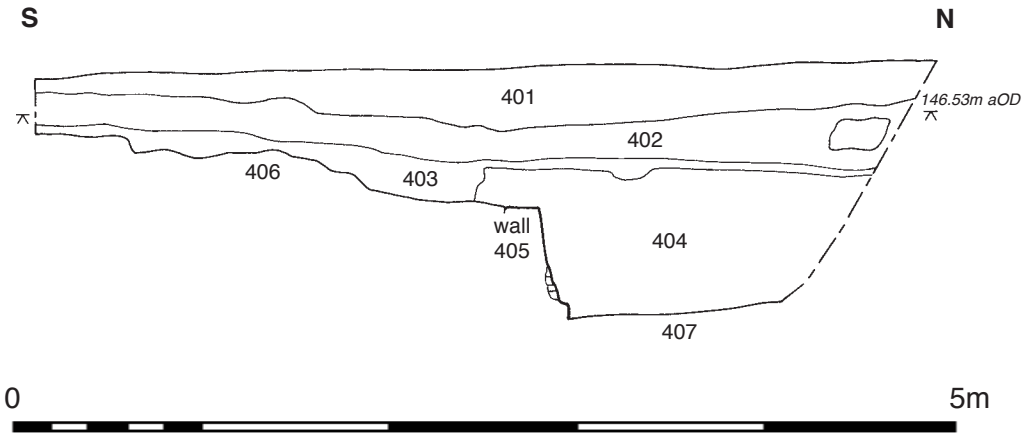


Fig.15 East-facing section of Trench 4, scale 1:40

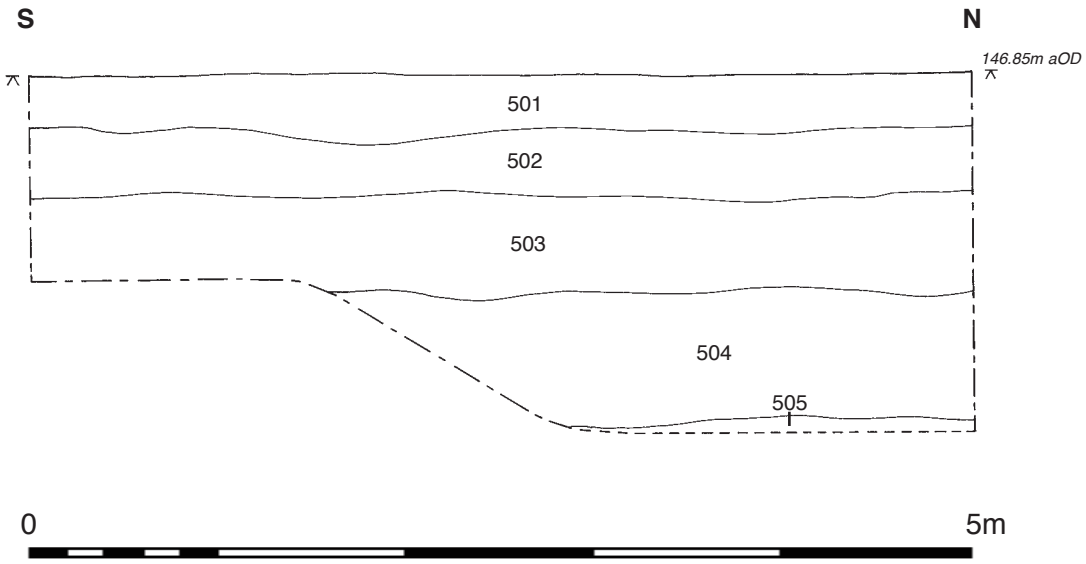


Fig.16 East-facing section of Trench 5, scale 1:40

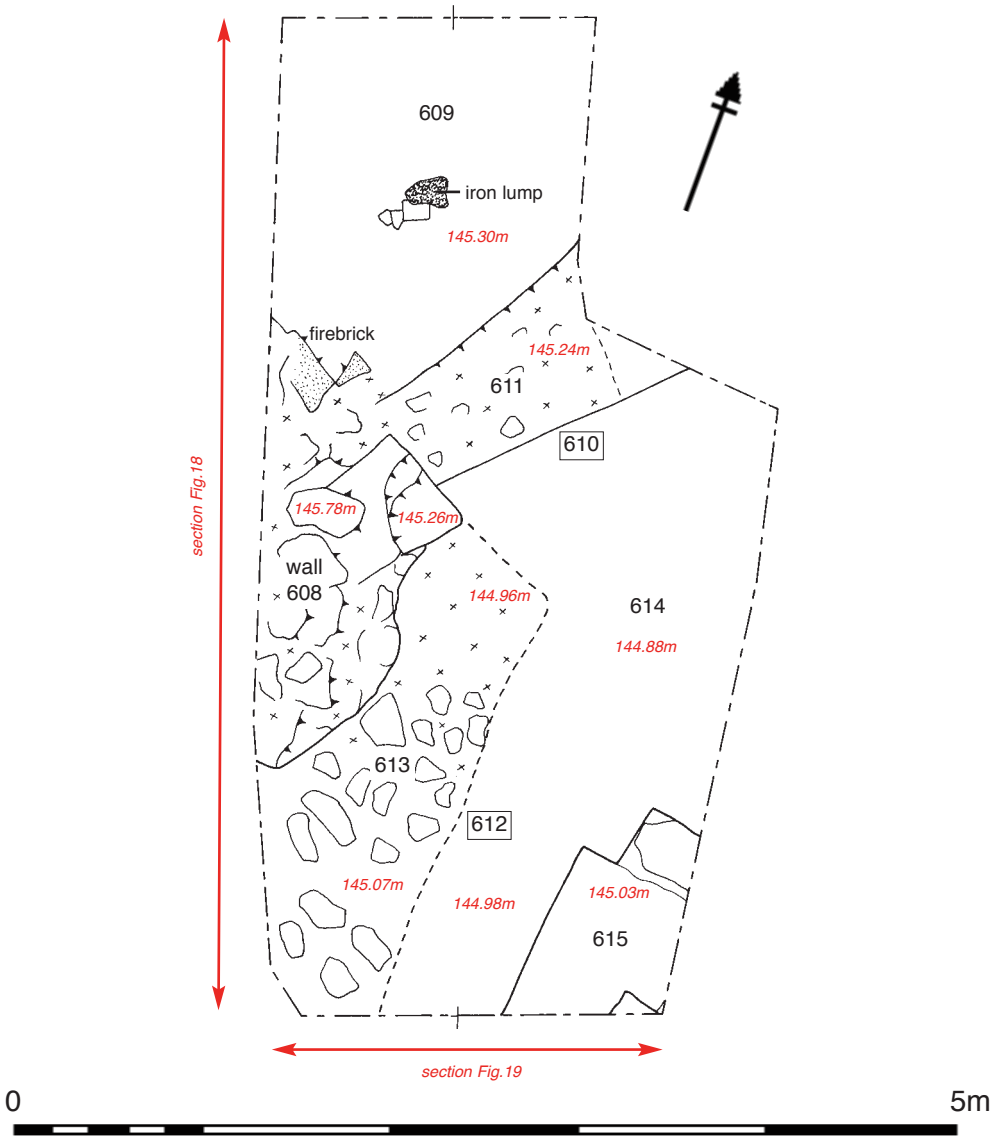


Fig.17 Plan of Trench 6, scale 1:40

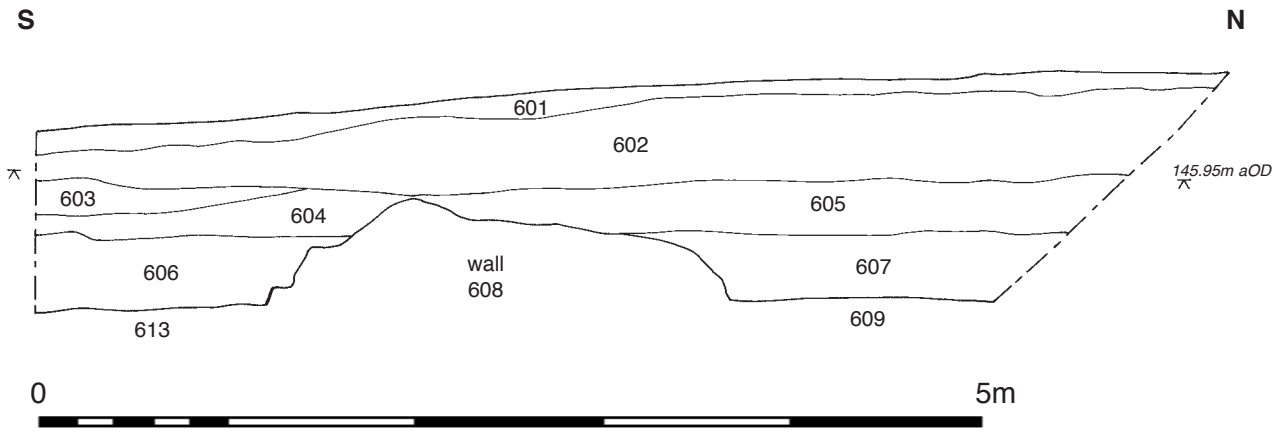


Fig.18 East-facing section of Trench 6, scale 1:40

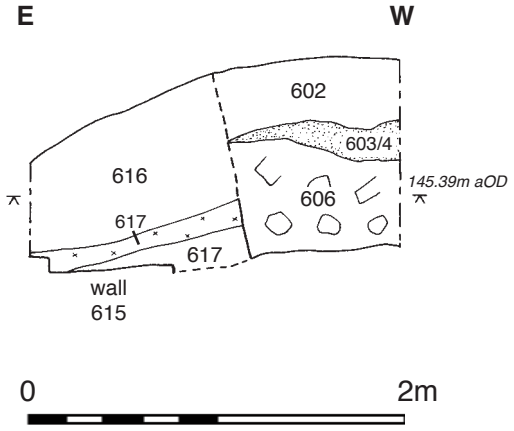


Fig.19 North-facing section of Trench 6, scale 1:40

Plate 1 Trench 1, cuts 105 and 107 at eastern limit of trench

Plate 2 Trench 1, cut feature 107 and fills 106 and 108

Plate 3 Trench 2, north-facing section

Plate 4 Trench 3, walls 302 and 304 and north-facing section

Plate 5 Trench 3, looking west

Plate 6 Trench 3, Casting House floor at western extent of trench

Plate 7 Trench 4, Wall 405 and rubble infill 406

Plate 8 Trench 4, Wall 405 and associated demolition debris and landscaping horizons

Plate 9 Trench 5, east-facing section

Plate 10 Trench 6, looking north

Plate 11 Trench 6, Wall 508 and internal fire bricks

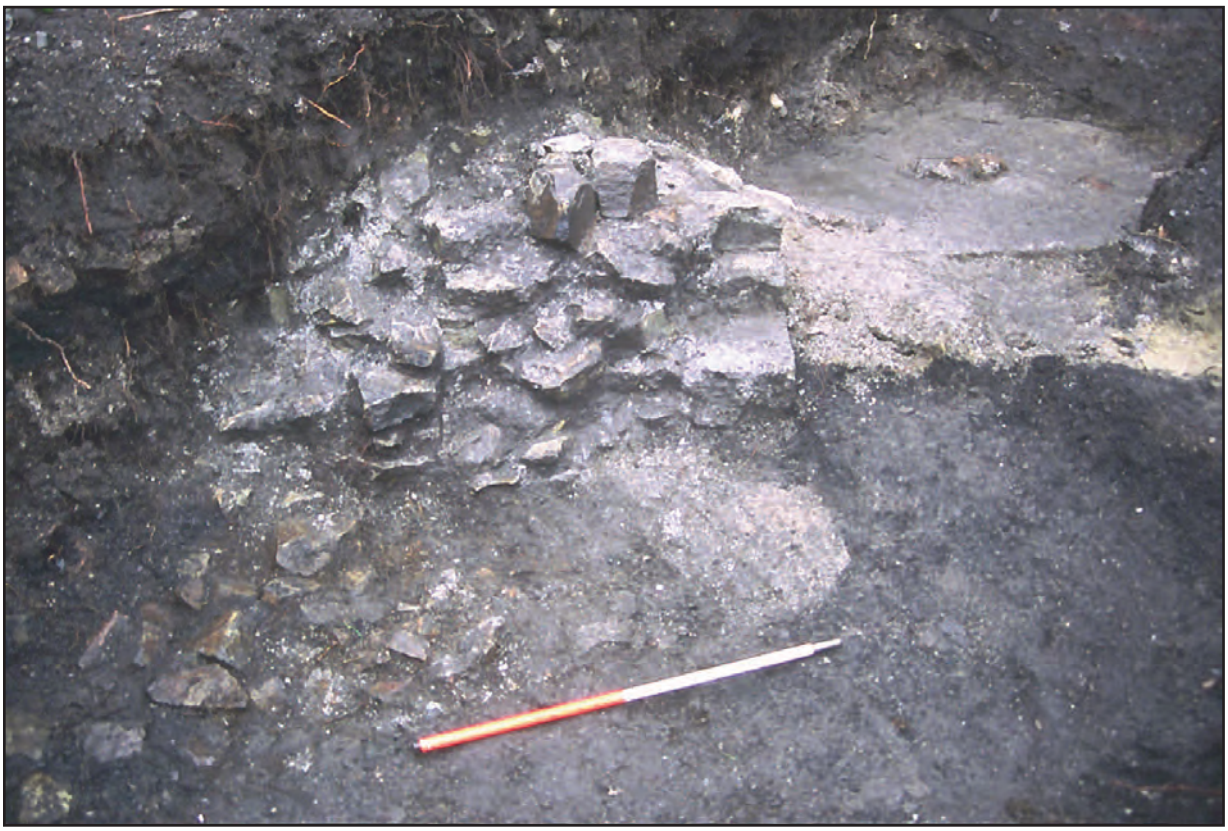


Plate 12 Trench 6, view of structural features and robber trench to north-west of trench

Plate 13 Trench 6, wall 508 and 515 and robber trench