
Merthyr College, Merthyr Tydfil: archaeological desk-based assessment

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**A report for Ove ARUP & Partners Ltd.
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GGAT Projects



The development area, looking south ©GGAT

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Summary

The Glamorgan – Gwent Archaeological Trust, Projects Division (GGAT Projects) have undertaken an assessment of the archaeological effects of a proposed development at Merthyr College, Merthyr Tydfil at the site of the former Ynys Fach Ironworks. The assessment reviewed information held by the regional Historic Environment Record (HER) and the National Monuments Record (NMR), as well as cartographic and documentary sources. Aerial photographs were examined and a site visit conducted.

A total of eleven sites of archaeological interest were identified within the study area, however three of the HER entries (308383, 308384, and 308385) may refer to only one feature, namely a bridge on the River Taff. The Ynys Fach iron furnaces are located on the western edge of the development area, and are classified as a Scheduled Ancient Monument (Gm 331). Also on site is the restored north engine house belonging to the former Ynys Fach Ironworks, which is a Listed Building grade II (16073). The study area is located within the Registered Historic Landscape of Merthyr Tydfil (HLW (MGI) 2) (Cadw 1998).*

The proposed development has been assessed as having no effect on any of the known archaeological sites located outside the development area. The effect of the development on the building foundations of the casting houses, refinery, forge, all part of the former Ynys Fach Ironworks, but also on the workmen's housings to the north of the area, is difficult to estimate, given that no evidence is available with regard to the extent to which these were damaged in the late 1940s – early 1950s in conjunction with the construction of Merthyr College. Aerial photographs show that parts of the buildings mentioned above were still standing in 1947. By 1955 though, only the workmen's rows were still standing (and most probably still in use). The potential to encounter buried remains belonging to the ironworks and the workers' housing is considered high. The impact on these remains depends upon the final footprint and foundation design.

It has been recommended that an archaeological evaluation consisting of trenching and test pitting be carried out, to a design approved by the archaeological advisors to the LPA, to assess and record the survival and condition of any sites of archaeological interest and to determine the presence of hazardous materials in the cavities between and inside any surviving buildings. The completed evaluation would inform layout and foundation design for the reserved matters to minimise impact on the archaeological resource.

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1. Introduction

1.1 Planning history

Following a screening report (Ove Arup & Partners Ltd 2008) submitted to Merthyr Tydfil Borough Council, the Glamorgan-Gwent Archaeological Trust, Projects Division (GGAT Projects) have been commissioned to undertake an enhanced archaeological desk-based assessment to inform on the impact on the archaeological resource by the proposed redevelopment of the workshops at the rear of Merthyr College, Merthyr Tydfil, Glamorganshire.

Developments aiming at replacing the outdated workshops for motor vehicle engineering, welding, carpentry, plastering, bricklaying, plumbing, painting and decorating situated directly behind Merthyr College's main building are proposed. The planned building consists of several distinct elements accessed off a central spine corridor. The demolition area encompasses approximately 4000m².

1.2 Specification and methodology for study

The assessment comprises a review of existing information about the archaeological resource of an area of 1.9 ha on site behind the main building of Merthyr College, Merthyr Tydfil. The study area is centred on NGR SO 04584 06099 and is outlined in green in Figure 1. The assessment is intended to conform to the *Institute of Field Archaeologists' Standards in British Archaeology: Archaeological desk-based assessments*.

Information recorded on the regional Historic Environment Record (HER) and National Monuments Record (NMR) was assessed. Cartographic and documentary sources were studied, along with relevant published information. Current Listed Building data and information on Scheduled Ancient Monuments and registered landscapes was obtained from Cadw. Collections of aerial photographs held by the Central Register of Air Photography for Wales (CRAPW) were examined and additional information requested from the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW). A site visit was made on 21st May 2008.

1.3 Assessment criteria

The archaeological sites within the study area are categorised in accordance with the only available criteria that are nationally agreed; these are set out in the Department of Transport/Welsh Office/Scottish Office Design Manual for Roads and Bridges paragraph 3.4 Vol. 11 Section 3 Part 2 (Cultural Heritage).

- Category A: national importance
- Category B: regional importance
- Category C: local importance
- Category D: low importance

To these an additional category has been added

- Category U: unknown

The assessment of the importance of individual sites is essentially a subjective exercise based upon the experience of the project team. The importance of certain sites will be implied by their status within the statutory framework. Scheduled Ancient Monuments will always be of national importance; Listed Buildings will be of at least regional importance. Values assigned

to other sites are given both in relation to their individual importance and to their context within the wider landscape.

The condition of individual sites and the general overall condition of surviving remains has bearing on the value of the sites themselves and on the value that they impart within a wider landscape context. The condition of sites is recorded following the system used by the GGAT HER, using the following criteria:

- Intact: the site is intact
- Near intact: the site is nearly intact
- Damaged: the site has been moderately damaged
- Near destroyed: the site has nearly been destroyed
- Destroyed: the site has been destroyed
- Restored: the site has been restored
- Moved: the site has been moved (usually finds)
- Not known: the condition of the site is not known

For the purposes of desk-based assessments, rarity is assessed at regional level only. The following criteria are used:

- High: very few sites of this type are known
- Medium: the site is not unusual, but cannot be considered common
- Low: the site is quite common

Group association is where a connection between sites within the landscape can be demonstrated. These will usually be of the same period, but may include groups where the presence of an earlier site or sites has led to the formation of a later complex, or where an earlier site or sites can be shown to have acquired importance as part of a later complex. The criteria are as follows:

- High: the site forms part of an interconnected complex occupying a clearly definable landscape where little or no fragmentation has occurred
- Medium: the site is part of an interconnected complex, which is either limited in scope or badly fragmented
- Low: there are few or no other sites, which are associated

Historical association is where there is a link between the site and known historical or cultural persons or events. Prehistoric sites, which are by definition before historical evidence, cannot have any contemporary historical association, but they may acquire later associations. For the Roman and Early Medieval periods, where survival of historical evidence is poor and patchy, any contemporary documentation at all will be important. Two classifications are given for historical association, one reflecting the certainty of the identification, and the other its importance. Only sites with certain or possible association can be assessed for importance, and historical association can only increase the importance of a site; the absence of it will never decrease its importance.

Historical association- identification

- Certain

- Possible
- Unknown

Historical association- importance

- High
- Medium
- Low

The assignment of values to identified interests requires consideration of the reliability and accuracy of the source data, ranging from fully-recorded features seen in open excavation to antiquarian comments on finds of note from a poorly-defined location. The confidence with which the values have been assigned is noted, using the following criteria:

- High: existing information is reliable and detailed
- Medium: existing information is apparently reliable but limited in detail
- Low: existing information is too limited to allow its reliability to be assessed

The effect of the proposal on the archaeological resource has been assessed using the following criteria:

- Severe: total loss
- Major: significant loss, likely to result in a reduction of value of the surviving site
- Minor: loss unlikely to result in a reduction of value of the surviving site
- None: no identifiable effect
- Beneficial: development will protect, preserve or enhance the site better than if the development did not occur

2. Background

2.1 Location and topography

The study area is centred on NGR SO 04584 06099 to the west of the Merthyr College main building (Figure 1). The Ynysfach housing area borders its west and southwest sides, separated by the ruins of the Ynys Fach Ironworks furnaces. The ironworks was built against a steep bank, thereby taking advantage of the local topography. The charging platforms were situated on elevated ground and were level with the top of the blast furnaces, in order to facilitate access of the charging barrows to the top of the furnaces.

2.2 Geology

Merthyr Tydfil occupies a natural basin at the head of the Taff Valley, surrounded by high hills and ridges reaching 450m OD. The geology of the Merthyr College area is Garw Lower Coal Measures made up of Palaeozoic sandstone and shale, and coal seams. No geological specification is available for the topsoils (SSEW 1983), the site being situated within the urban area of Merthyr Tydfil. The grounds on which Merthyr College is located have been shaped by industrial activity, and the site is reportedly sitting on spoil derived from ironworks and colliery waste three to five metres deep. (Ove Arup 2008)

The development area is relatively flat, typically varying between 168m and 170m OD.

2.3 Walkover survey

A walkover survey was conducted on 21st May 2008. The area was photographed; all sites previously identified from a search of the regional Historic Environment Record (HER) and National Monuments Record were visited in order to assess their current condition. A sample of photographs taken illustrating the current condition of the archaeological interests and the site in general can be seen in Appendix II.

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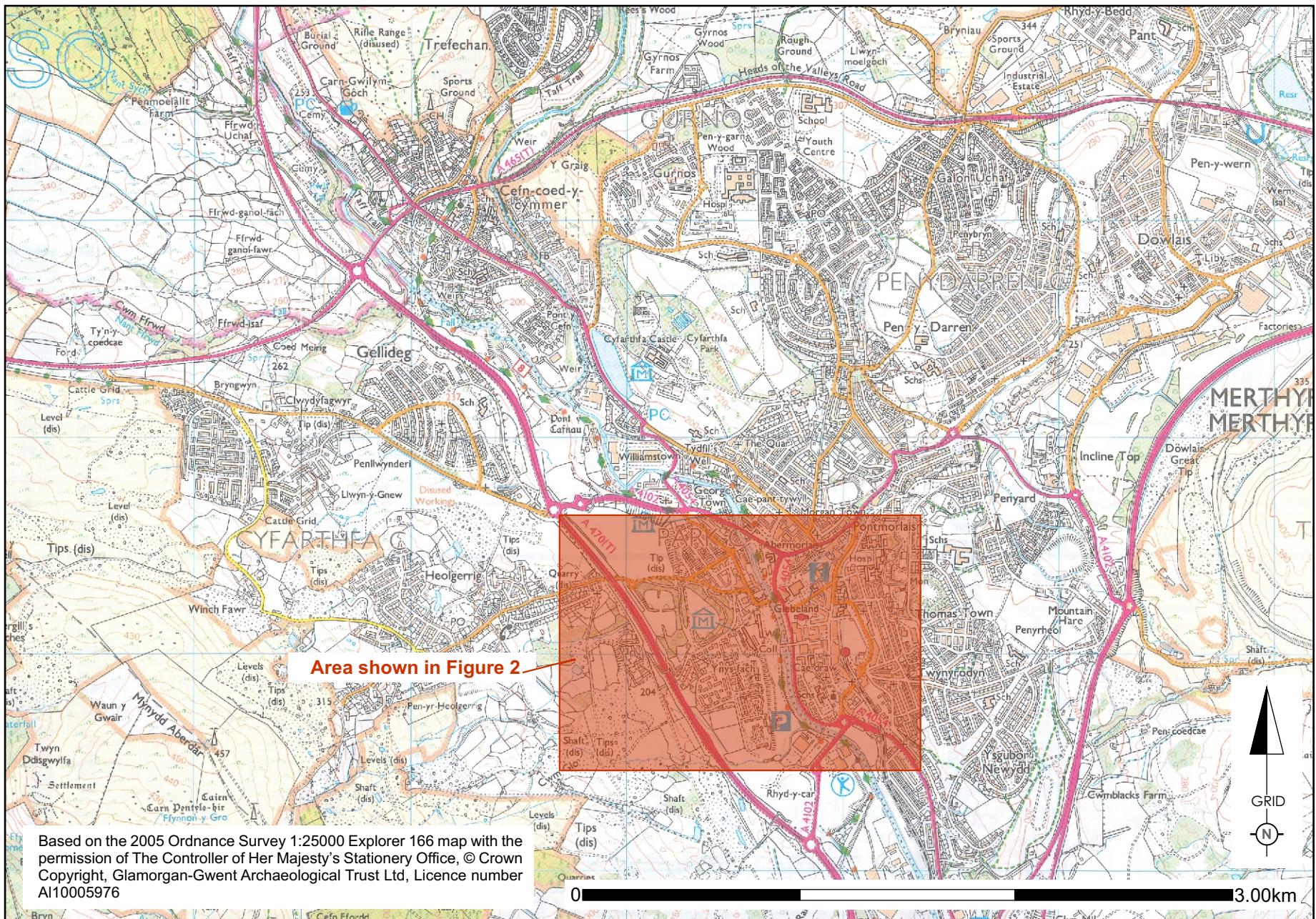


Figure 1. Location plan

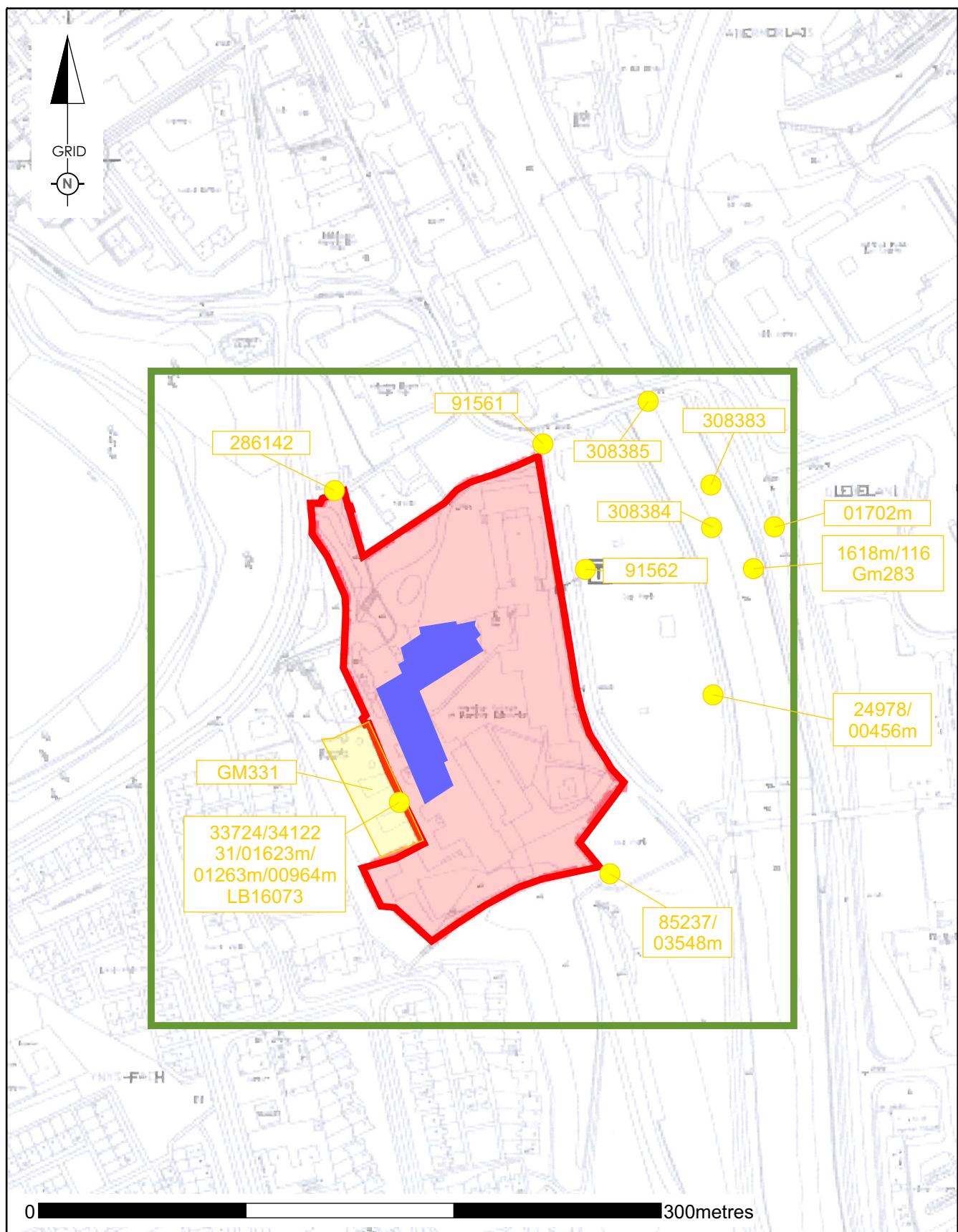


Figure 2. Location of the development area (red), study area (green) and archaeological interests including Scheduled Ancient Monument area (yellow) and building footprint (blue)

2.4 General historical and archaeological background

2.4.1 Prehistoric (up to AD43) and Roman (AD43 to 410)

Archaeological evidence is sparse for the area and is based primarily on artefacts indicative of general human activity. These include a flint scatter (PRN 00880m) of Mesolithic date found south of Abercanaid, and the find of a ‘thin butted axe-head of siliceous ash’ (PRN 00478m) from near Twynyrodyn, Merthyr Tydfil, which indicates continued activity into the Neolithic period. (Roberts 2005)

A chance find of a reddish / buff beaker together with a spindle whorl on the Penderyn to Brecon road, as well as three cairn and cist burials (PRN 00445m, 00458m, 00459m) found in the Merthyr Tydfil area, represents human activity in the Bronze Age. A copper alloy looped palstave axe (PRN 00802m), dated to c 1000 BC, was found during the construction of the Llwyn On reservoir. (Merthyr Teachers Centre Group 1981)

A potential hill-fort site at Castell Morlais (PRN 00831m), now partly obscured by the medieval castle, north of Merthyr Tydfil, and another hill-fort in Gwersyll (PRN 00483m), southwest of Merthyr Tydfil, attest to the presence of Iron Age settlement in the region. It is quite likely that upland settlement and associated agricultural enclosure during the late prehistoric period was far more extensive within the area than the distribution of known surviving sites would suggest, with much of the landscape irrevocably masked and altered during the post-medieval and modern period. The majority of settlements of the late prehistoric period in the area were associated with a pastoral cattle-based economy. The settlement site of Garth Fawr (PRN 04313m) provides an interesting example of a late prehistoric agricultural settlement. This site comprises above ground remains of at least three hut circles, a number of scoops, platforms, a hollow way, associated enclosures and wandering walls. (Roberts 2005)

Settlement evidence from the Roman period in the Merthyr Tydfil area is suggested by a Roman fort on the site of Penydarren Park (PRN 00833m), discovered during the construction of Penydarren House in 1786. Excavations at the site, carried out in 1902-1904, revealed that Penydarren Fort was occupied c 74-120 AD. (Merthyr Teachers Centre Group 1981)

Almost all Roman remains relate to military activity (the fort at Penydarren) or related work (the road from Gelligaer to Brecon), though presumably, settlement and associated agriculture was continuous throughout the Iron Age and the Roman period. A cattle-based pastoral economy, which probably dictated a dispersed and mobile settlement pattern, is considered, by analogy, to have been characteristic of the period. (Roberts 2005)

2.4.2 Early Medieval (410 to 1066)

The extent of early medieval settlement in the area is unknown; however, it is likely that some measure of continuity of native settlement carried over from the late prehistoric/Roman period. The only definite indication of early-medieval occupation comes from the early-medieval dedication of the Church of St. Tydfil at Merthyr Tydfil and place-name evidence indicating early Christian church/monastic settlement (Cil or Church of Sanos, the sister of St Tydfil), in the area of Cil-Sanws, when Merthyr Tydfil was part of the Lordship of Senghenydd. The industrialised and urbanised nature of the valley floor has probably resulted in the significant loss of earlier settlement features. (Roberts 2005)

2.4.3 Medieval (1066 to 1485)

In Norman times, Merthyr Tydfil was a hamlet consisting of a wattle and daub church, a mill belonging to the de Clare family that stood near the Chapel of St Tydfil, and scattered farmsteads. Morlais Castle was erected on site of the Iron Age hill-fort by Gilbert de Clare

probably in 1270. It is assumed that the castle was never completed, but it was nonetheless used as a defensive post of the stronghold of the native lord of Senghenydd. (Merthyr Teachers Centre Group 1981)

The cartographic record and place-name evidence affords some indication of the location of medieval settlement along the valley floor, as on the higher ground, *i.e.* hendre and hafod place-names, *e.g.* Hendre-Fawr. The surviving settlement features of the period are exclusively known from the higher upland areas. The settlement features would have been predominantly platform houses, longhuts, typically in set out pairs; these upland dwellings or hafodau appear to have been occupied on a seasonal basis and were associated with pastoral agriculture, chiefly based on the rearing of cattle. The platform house sites are typically situated at the upper break of slope of the valley side along the periphery of the extensive upland pasture, the location frequently reflects the upper extent of the post-medieval enclosure and encroachment. Further study of the cartographic evidence may allow a correlation to be made between the distribution of known upland settlement with that of valley bottom settlement. (Roberts 2005)

2.4.4 Post-medieval (1485 to 1901) and modern (1901 to present)

Prior to the arrival of the ironmasters, several of whom migrated from Sussex as early as the 17th century (Merthyr Teachers Centre Group 1981), activity in the region was closely linked to agriculture, *i.e.* lime burning, corn-milling and leather tanning. Merthyr Tydfil had no established industrial tradition. The reliance on dairy farming continued into the 17th and 18th centuries; it is known for instance that during the period 1688-1725 farmers in the Merthyr Tydfil area each on average owned fifteen cows (Merthyr Teachers Centre Group 1981). Merthyr Tydfil underwent a radical transformation in the second half of the 18th century. In 1696, it is described as ‘a village of about 40 houses’ and a population of 110 inhabitants has been conjectured; by 1801, the population of Merthyr Tydfil had increased to 7,700, making it at that time the largest town in Wales. (Merthyr Teachers Centre Group 1981)

Despite the lack of industrial skills in the region, the Taff Valley represented an ideal setting for the establishment of an iron industry, due to the availability of iron ore, coal, timber, limestone, and waterpower, all in convenient proximity. Thanks to improved means of production in the late 18th century, iron had become more readily available and more affordable. At the same time, the wider context of constant wars, the increased use of iron tools and implements in domestic and agricultural contexts, and the spread in iron use in construction, all resulted in an upsurge in the demand for iron. This represented a very lucrative market, which lured potential investors into shedding vast sums of money into the iron industry. The ironworks of northern Glamorganshire and Monmouthshire were large-scale enterprises from the beginning, where outside capital was essential. Large-scale expenditure on transport was necessary if the venture was to be successful.

The first iron furnaces and forges were erected near the head of the Taff Valley between 1759 and 1765. By the early 1780s, there were four ironworks in operation in Merthyr Tydfil: Dowlais, Plymouth, Cyfarthfa, and Penydarren. Dowlais Ironworks started as probably the first coke powered ironworks in South Wales in 1759. Plymouth opened in 1763, Cyfarthfa in 1765, and Penydarren in 1784. Ynys Fach Ironworks was conceived as a subsidiary works to Cyfarthfa, and opened in 1801. Other subsidiary ironworks to open in the early 19th century were Ivor by Dowlais, Dyffryn by Plymouth, and further forges in Pentrebach, a part of Plymouth Ironworks.

The years 1791-4 saw the construction of the Glamorganshire Canal by the Merthyr Tydfil iron masters, linking Merthyr Tydfil with Cardiff through 50 locks (Ynys Fach had its own transhipment point at Chapel Row, connected by a tram-line). An iron bridge (PRN

01618m/116/Gm283) over the river Taff was finished in May 1800, and became a vital link between Ynys Fach and the town itself. Dismantled in 1963, it has been restored and is now on display in Cyfarthfa Park. The Local Board of Health, set up in 1850, was given powers to lay down a sewerage system and provide Merthyr Tydfil with an adequate water supply. However, work of supplying water only began in 1858 and were completed in 1861, when water was finally available from standpipes in the streets. (Perkins, Thomas, and Evans 1986)

With the global demand for iron being gradually replaced by the need for steel during the second half of the 19th century, the Merthyr Tydfil ironworks were faced with transformation into steel production plants or closure; Penydarren was closed in 1858, Plymouth bought out in 1863 (Newman 1995). Ynys Fach was reconditioned and put in stand-by in 1879, while Cyfarthfa was given a second life as a steel production works.

2.5 Specific historical and archaeological background

The history of the Ynys Fach Ironworks is intimately linked to that of the Cyfarthfa works. It was conceived to supplement the Cyfarthfa furnaces, primarily in order to increase the total output in pig iron. The ironworks was situated on a prime flat of land, abutting a steep sloping hillside, with coal and ore being initially mined only a few yards away. Transportation of materials was available in the form of an easy access to the Glamorganshire Canal, on which Ynys Fach works had its own transhipment point, reached by way of a tram-line.

A working forge is recorded on site in 1769, but unfortunately no name for the leasee of the land at that time is known. Plymouth was in the hands of Anthony Bacon since he had bought the works in 1765. Following this, the forge in Cyfarthfa was used to process pig iron produced in the Plymouth factory. Charles Wood states in his diary that Cyfarthfa Ironworks commenced in 1766, and it is therefore imaginable that forging was carried out in Ynys Fach prior to the opening of Cyfarthfa. There is no evidence to suggest that Bacon was leasing land at Ynys Fach at this early date. He did, however, lease part of Ynys Fach from the Griffiths family of Gelly in the Parish of Llanwonno, in May 1782, at an annual rent of £3 3s. (The Merthyr Tydfil Heritage Trust)

In September 1782, Bacon leased part of the Cyfarthfa Ironworks to Francis Homfray for a term of 50 years. Homfray was granted the ‘Lower Works’ or ‘Foundry’ and a mill at Cyfarthfa for the boring of cannon. It has been suggested that the ‘Lower Works’ included the forge at Ynys Fach. However, the site is not unequivocally identified. Francis Homfray left for Penydarren in October 1784, and the mill and the forge were taken over by David Tanner of Monmouth. In March 1786, Tanner’s lease passed into Richard Crawshay’s hands. The cannon boring mill was reportedly so successful that pig iron had to be imported from Dowlais and Plymouth in addition to the Cyfarthfa production.

On Bacon’s death in January 1786, lease of the works at Cyfarthfa – with the exception of the above mentioned cannon boring mill and forge, already in Crawshay’s possession – was granted by the Court of Chancery to Richard Crawshay and Company, *i.e.* Crawshay, James Cockshutt, and William Stephens from January 1, 1787, until 1795, when Bacon’s eldest illegitimate son would reach the age of maturity. The Crawshay – Cockshutt – Stephens partnership was dissolved in 1871, and Richard Crawshay and George Watkins took over the works from 1792 onwards.

At this point, Crawshay’s lease of the Lower Works and mill was not due to expire until 1832, whereas his lease of the Cyfarthfa Ironworks would, at best, need to be renegotiated with Bacon’s heir at the latest in 1795. Again, assuming that the Lower Works partly, or fully, referred to the forge at Ynys Fach, it is natural to assume that Crawshay would preferably invest in the latter, more secure leasehold for the time being.

In 1794, the Glamorganshire Canal was completed, and Ynys Fach was later granted its own transhipment point.

Ynys Fach Ironworks was opened in 1801. It initially had two blast furnaces, according to planning by engineer Watkin George and built by Thomas Jones of Merthyr Tydfil. These were voluminous furnaces for the period, being 53 feet (*c* 16.15m) high, and 12 feet (*c* 3.65m) across the boshes. They were the second furnaces to have steam-powered air blast in Merthyr Tydfil, the first ironworks using a steam engine owned by Richard Crawshay. As a consequence, output was more regular, and considerably higher than that of the Cyfarthfa works. Between 45 and 62 tons of steel were produced weekly at the waterwheel-powered Cyfarthfa plant, whereas Ynys Fach produced between 65 and 70 tons a week.

The northern engine house, which survived until present day, has a style typical for Cyfarthfa. It comprises three storeys, and its quoins consist of limestone work. It housed a beam engine, possibly similar to the double acting Boulton and Watt blowing engine installed at Dowlais three years previously. The adjacent boiler house supplied steam from coke of coal fired boilers. A 100 feet high square stack stood nearby.

In 1836, two additional furnaces and adjoining casting houses were erected at Ynysfach (the inscription WC 1836 on the cast iron keystone of furnace no. 3 is still visible today – Plate 7). A new engine house with boiler and chimneystack, built to the south of the new furnaces, provided them with blast power.

A structure depicted on the 1852 map of the Ordnance Survey Department Under the Provisions of the Public Health Act (Figure 5), displayed twelve circular kilns, above the blast furnaces and to the west of these can be seen. These could well be calcining kilns, rather than the limekilns they are referred to as. Due to the limited amount of iron in the Welsh ore, it was common practice in Wales to roast the ore prior to smelting, in order to reduce its carbon and water content. From 1850 on, richer ores were imported.

On the hillside, above the calcining kilns lay the coke ovens and coke yards, where coal mined in the Cyfarthfa collieries to the south was prepared and stored, prior to use in the furnaces.

A rectangular building referred to as “refinery” on the 1852 map of the Ordnance Survey Department Under the Provisions of the Public Health Act, is linked by rail to the casting houses. Given that no engine house is present in the proximity of the refinery, it is unlikely that forging or rolling took place there. The refinery process – an intermediate stage of puddling – might have been carried out on site, while the actual puddling and rolling processes took place at Cyfarthfa.

Ynys Fach Ironworks closed during the strike of 1874 until Robert Thomson Crawshay’s death five years later. While Cyfarthfa was converted to a steel production plant, the Ynys Fach furnaces were reconditioned and held in stand-by in case of a renewed demand for iron. However, Ynys Fach was probably never used again, and by 1905 the masonry was reported to be starting to crumble. The southern engine house was demolished some time after 1905, and the masonry was reused to construct a fan pit at Gethin.

Due to its perceived precarious condition, one boiler stack (belonging to the northern boiler house) was brought down in December 1949 using a charge of explosives.

The majority of the 19th century buildings and canal structures survived until the late 1950s, when development of the college commenced. All buildings were then destroyed, with the exception of the western part of the ironworks and its northern engine house. The canal and all other water retaining structures were also backfilled.

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It is likely that most structures that lay beneath the footprint of the college buildings were substantially damaged during construction works.

3. Archaeological Interests

There are eleven sites of archaeological interest identified within the study area (Table 1). The furnaces and kilns of the Ynys Fach Ironworks, identified in the Southeast Wales Industrial Ironworks Landscapes as IW 019 (Roberts 2005), are a Scheduled Ancient Monument (SAM Gm331). The Iron Bridge over the River Taff is a Scheduled Ancient Monument (SAM Gm283). The northern Ynys Fach Ironworks engine house is a Listed Building (LB 16073). Merthyr Tydfil is a Registered Historic Landscape (HLW (MGI) 2) (Cadw 1998). Further information relating to these interests can be found in the gazetteer in Appendix IV.

Numbers with a letter suffix are Primary Record Numbers (PRNs) in the regional Historic Environment Record (HER). Five and six figure numbers without a letter suffix are National Primary Record Numbers (NPRNs) of the National Monuments Record, as supplied to the HER under the ENDEX agreement. Numbers with a ‘LB’ prefix are Listed Buildings, as provided by Cadw. Numbers with a ‘Gm’ prefix are Scheduled Ancient Monuments (SAMs).

Table 1: Identified archaeological interests

ID	Name	NGR	Period	Site status	Value
33724/34122/31/01623m/01263m /00964m/LB16073/SAM Gm331	Ynysfach Ironworks	SO04550605	Post-Medieval	SAM / LB	A
01618m/116/SAM Gm283	Iron Bridge	SO04720616	Post-Medieval	SAM	B
85237/03548m	Parliament Lock No. 3	SO0465006015	Post-Medieval	None	B
308383	Merthyr Bridge, Ynysgau, Merthyr Tydfil	SO047062	Post Medieval	None	B
308384	Lattice Girder Bridge over River Taff, Ynysgau, Merthyr Tydfil	SO04700618	Post Medieval	None	B
308385	Bridge over River Taff, Ynysgau Merthyr Tydfil	SO04670624	Post Medieval	None	B
91561	Middle Lock No. 2, Glamorganshire Canal, Merthyr Tydfil	SO04620622	Post Medieval	None	B
01702m	Ynysgau	SO04730618	Post-Medieval	None	C
91562	Canal Square Warehouses, Merthyr Tydfil	SO04640616	Post Medieval	None	C
286142	Old Ynysfach, 35-36, Ynysfach	SO04520620	Post Medieval	None	C
24978/00456m	Ynys Fach Manorial Mill	SO047061	Medieval	None	U

3.1 Map regression

Most structures constituting the former Ynys Fach Ironworks have been removed in the late 1940s, early 1950s. The destruction process has not been sufficiently documented, so that the former structures could only be located using map regression and aerial photographs. On one map (Map of Merthyr Tydfil, 1836, Figure 3), the first phase of the Ynys Fach Ironworks is clearly discernable. Unfortunately, the lack of accuracy of this map only allows for an approximate mapping. It is therefore impossible to locate the structures of the first phase of the

Ynys Fach Ironworks with much precision. However, the Ynys Fach Ironworks displayed on this map does not exhibit its final form, following its aggrandisement in 1836. The two initial furnaces of the ironworks – reused in the second phase of Ynys Fach Ironworks post 1836 – are depicted as forming one block with what is presumably a casting house to the east, and a boiler house to the north of the furnaces. Two new furnaces erected in that same year are depicted to the south of the initial ironworks. The corresponding casting houses are apparently missing, as well as the southern engine house and accompanying boiler house. Also present on the 1836 map mentioned above is, interestingly, the Ynys Fach Row, located north of the Ironworks. Consequently, it can be assumed that the Ynys Fach Row was designed to provide accommodation to the ironworkers of the first generation of Ynys Fach Ironworks.

The later maps display Ynys Fach Ironworks in its final form, post 1836. The most accurate depiction of the distinct structures constituting Ynys Fach Ironworks is provided by the Ordnance Survey (OS) Department Under the Provisions of the Public Health Act for the Local Board of Health, on their 1852 Plan of the Town of Merthyr Tydfil (Figure 5). Each structure is identified individually and assorted with a description. This map is the first of the regression, following their chronological sequence, to allow for an accurate plotting. It allows for each building to be located with a satisfactory level of precision.

The three subsequent OS maps (Figure 6, 7, and 8) from 1876, 1904, and 1919 respectively, show that the structure of the Ynys Fach Ironworks has not been altered following its enhancement in 1836. By the time of the second and third edition maps (1904 and 1919) were published, the Ynys Fach Ironworks is marked as being “disused”.

4. Assessment

4.1 Effect of the development on archaeological sites (Table 2)

A total of eleven sites have been identified within the study area; of these, one site complex lies within the proposed development area. The eastern buildings associated with Ynys Fach Ironworks do not survive above ground; however, there is a likelihood of finding remains related to the Ynys Fach Ironworks surviving below ground within the development area. As the replacement workshops are to be built on top of the location of the Ynys Fach casting houses, refinery, southern engine house, forge, and Ynys Fach Row, the effect of the proposed development upon the buried remains of the ironworks has been assessed as ‘major’. Whilst the building work seemingly does not directly impede on the location of the Workers’ Housing (NPRN 286142), some degree of activity might in reality threaten this site, the remains of which could accidentally be damaged. As a result, the effect of the proposed development on site has been assessed as ‘minor’.

The upstanding remains of the Ynys Fach Ironworks located within the study area are some distance from the proposed works. As a result, the proposed development should have no impact on these remains. However, due to the constricted space available, particular attention should be given to the protection of exposed structures, such as the furnaces and charging banks.

The impact of the proposed development on the remaining nine sites situated within the study area, outside of the actual development area, has been assessed as ‘none’.

Table 2: Effect of the development on known archaeological interests

ID	Name	NGR	Period	Value	Effect
33724/34122/01623m/01263m/00964m/LB16073/SAM Gm331	Ynysfach Ironworks	SO04550605	Post-Medieval	A	Major
286142	Old Ynysfach, 35-36, Ynysfach	SO04520620	Post Medieval	C	Minor
01618m/116/SAM Gm283	Iron Bridge	SO04720616	Post-Medieval	B	None
85237/03548m	Parliament Lock No. 3	SO0465006015	Post-Medieval	B	None
308383	Merthyr Bridge, Ynysgau, Merthyr Tydfil	SO047062	Post Medieval	B	None
308384	Lattice Girder Bridge over River Taff, Ynysgau, Merthyr Tydfil	SO04700618	Post Medieval	B	None
308385	Bridge over River Taff, Ynysgau Merthyr Tydfil	SO04670624	Post Medieval	B	None
91561	Middle Lock No. 2, Glamorganshire Canal, Merthyr Tydfil	SO04620622	Post Medieval	B	None
01702m	Ynysgau	SO04730618	Post-Medieval	C	None
91562	Canal Square Warehouses, Merthyr Tydfil	SO04640616	Post Medieval	C	None
24978/00456m	Ynys Fach Manorial Mill	SO047061	Medieval	U	None

5. Mitigation

Without forms of archaeological mitigation it is possible that the construction works associated with the redevelopment of the workshops to the rear of Merthyr College will have an ‘major’ effect on any surviving buried remains associated with the Ynys Fach Ironworks and a ‘minor’ effect on any surviving elements of the Workers’ Housing.

Information concerning the extent of the surviving archaeological resource pertaining to the Ynys Fach Ironworks (including 33724, 34122, 01623m, 01263m, 00964m, LB16073 and SAMGm331) is limited, as at present the condition of these interests is not known. However, because the site was formerly utilised for the transformation of iron ore and the production of iron on an industrial scale, the grounds may still contain hazardous substances, which are likely to have been disposed of in the cavities of the disused ironworks buildings. In particular, blue asbestos is known to have been commonly used as cladding for pipe-work in the context of iron processing plants.

Based on the information provided by cartographic sources, aerial photographs and recent investigations by GGAT Projects at similar sites in the area (Cyfarthfa Ironworks), it is likely that significant archaeological deposits survive below ground across the site. Therefore, it may prove prudent to deal with the potential archaeological resource prior to the development commencing. It is therefore recommended that an archaeological evaluation consisting of trenching and test pitting be carried out, to a design approved by the archaeological advisors to the LPA, to assess and record the survival and condition of any sites of archaeological interest and to determine the presence of hazardous materials in the cavities between and inside any surviving buildings. The potential to encounter buried remains belonging to the ironworks and the workers’ housing is considered high. The impact on these remains depends upon the final footprint and foundation design. The completed evaluation would inform layout and foundation design for the reserved matters to minimise impact on the archaeological resource.

It is recommended that the evaluation be carried out to the standards laid down by the *Institute of Field Archaeologists* before any decision on the planning application is taken as the evaluation may provide information useful for identifying potential options for minimising or avoiding damage to the archaeological resource (*Welsh Office Circular 60/96 section 13*).

In addition, efforts should be made to reduce the off-site changes (i.e. noise, pollution, vibration) during the construction phase, in order to minimise the effects on the nearby structures that are protected as Listed Buildings and Scheduled Ancient Monuments (Ynys Fach Ironworks SAMGm331 and Engine House LB16073).

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Sources consulted but not cited

<http://www.alangeorge.co.uk/YnysfachIronworks.htm>

Cartographic sources

Plan of Merthyr Tydfil, From actual Survey, 1836. Arch. Ref. No. **DX 941/1**

Tithe map of 1850 for the parish of Merthyr Tydfil. Plan Ref. No. **P4**, Award Ref No. **D4**

Plan of the Town of Merthyr Tydfil, Surveyed by the Ordnance Survey Department Under the Provisions of the Public Health Act for the Local Board of Health, 1852. Arch. Ref. No. **B/M**

Ordnance Survey 1:2500, 1876, first edition

Ordnance Survey 1:2500, 1904, second edition

Ordnance Survey 1:2500, 1919, third edition

Appendix I

Map Regression

Merthyr College, Merthyr Tydfil: archaeological desk-based assessment

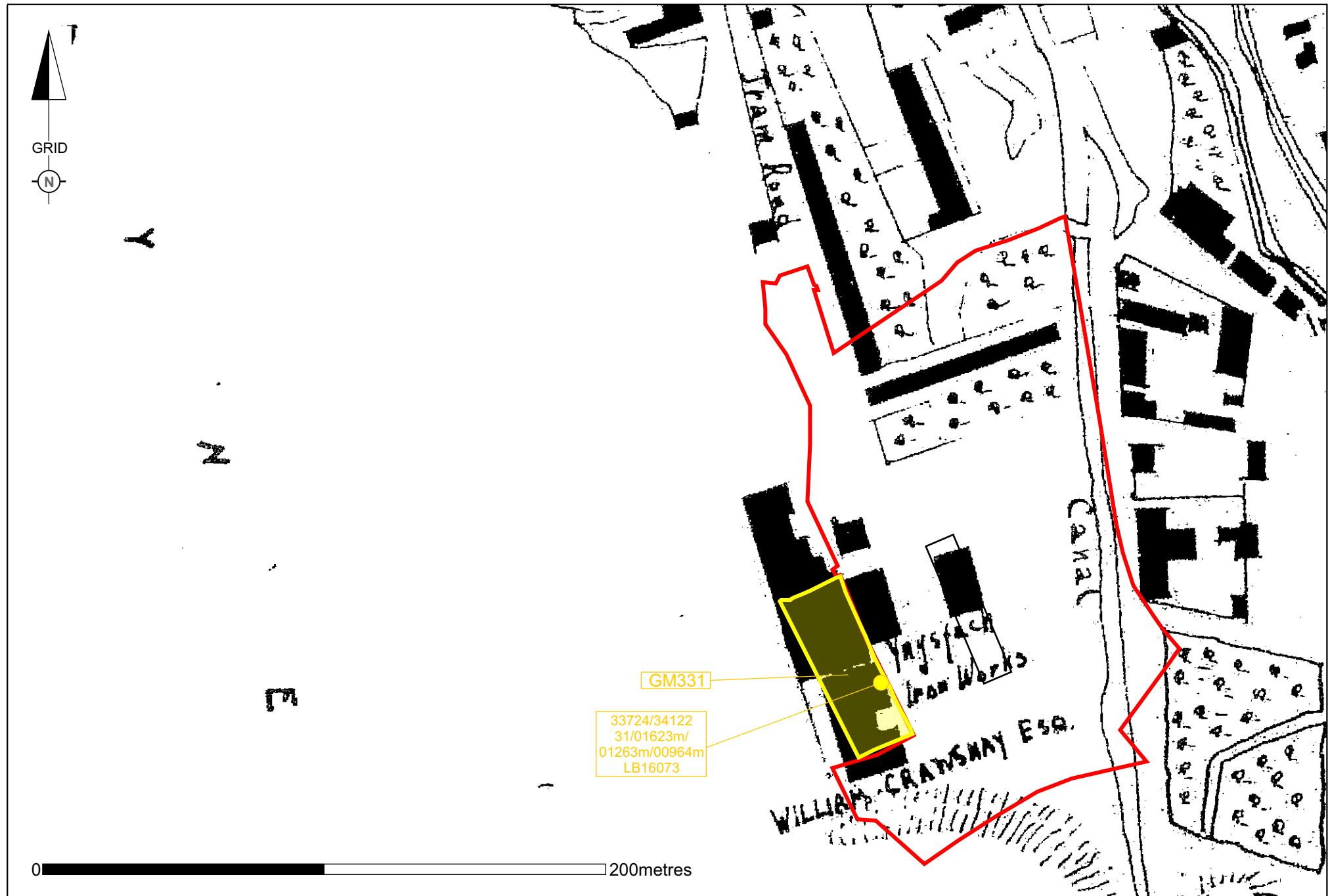


Figure 3. Plan of Merthyr Tydfil From actual survey, 1836



Figure 4. Tithe map of 1850 for the parish of Merthyr Tydfil

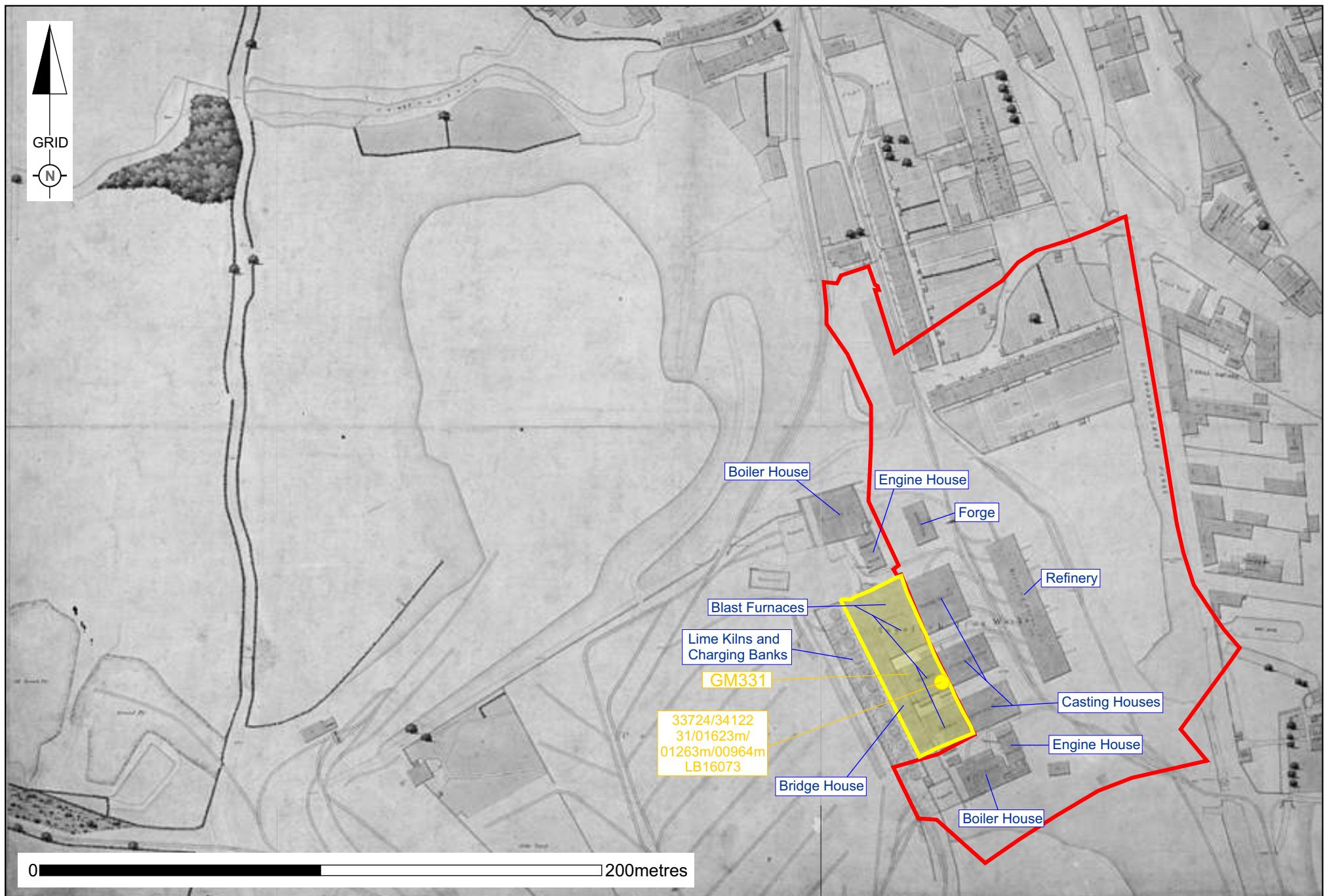


Figure 5. Plan of the Town of Merthyr Tydfil, Surveyed by the Ordnance Survey Department Under the Provisions of the Public Health Act for the Local Board of Health, 1852

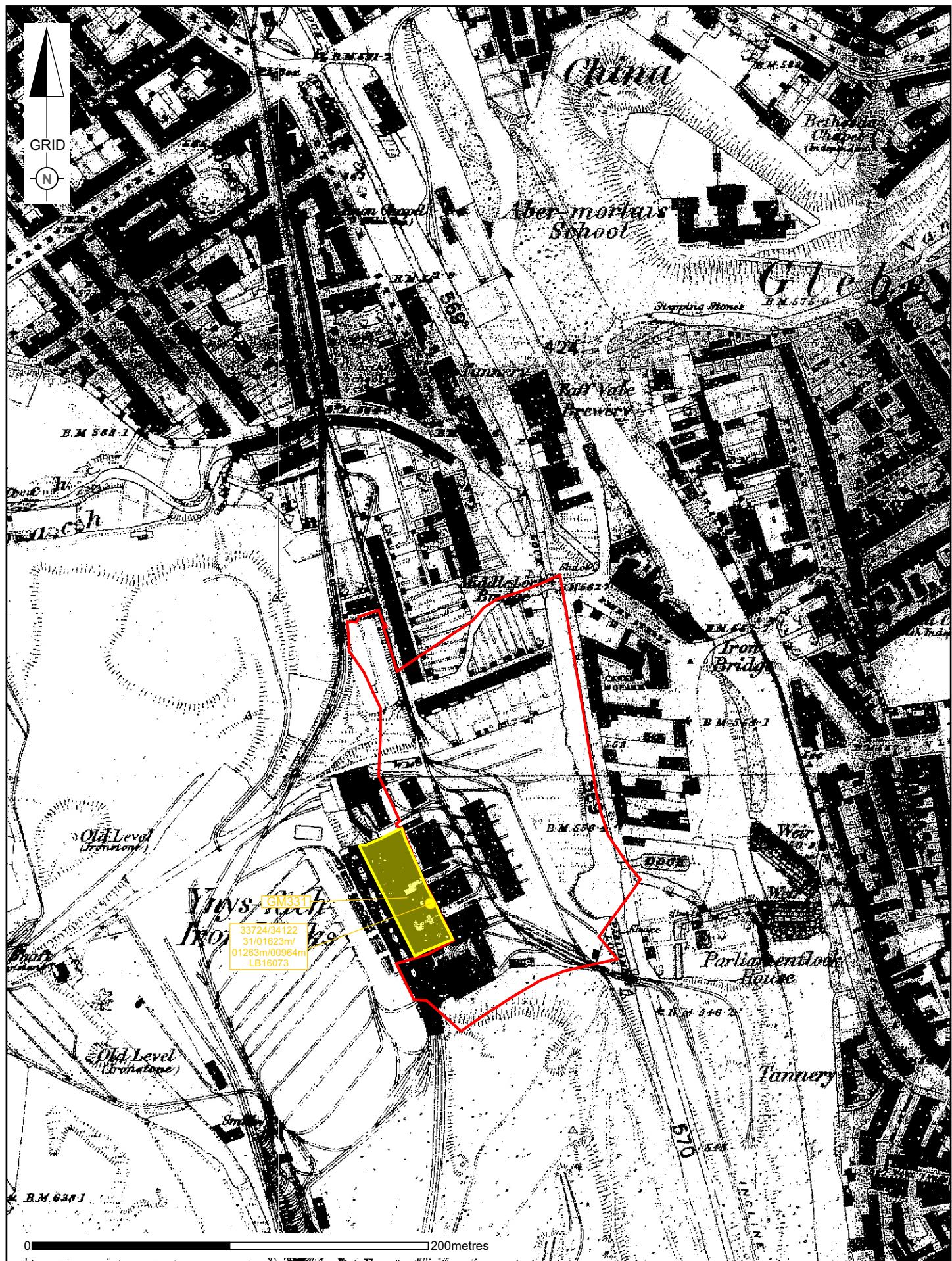


Figure 6. 1876 First Edition Ordnance Survey map showing development area

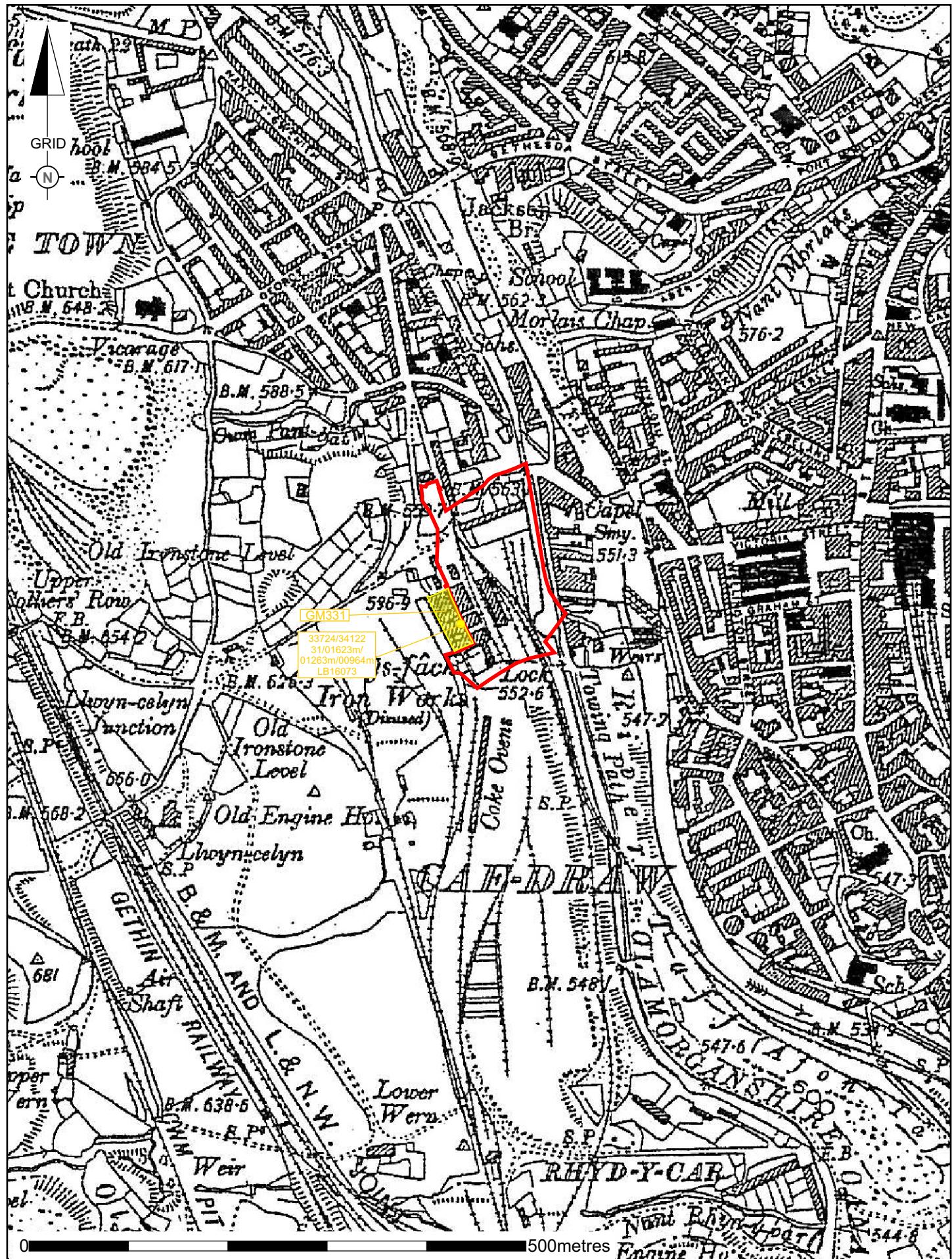


Figure 7. 1904 Second Edition Ordnance Survey map showing development area

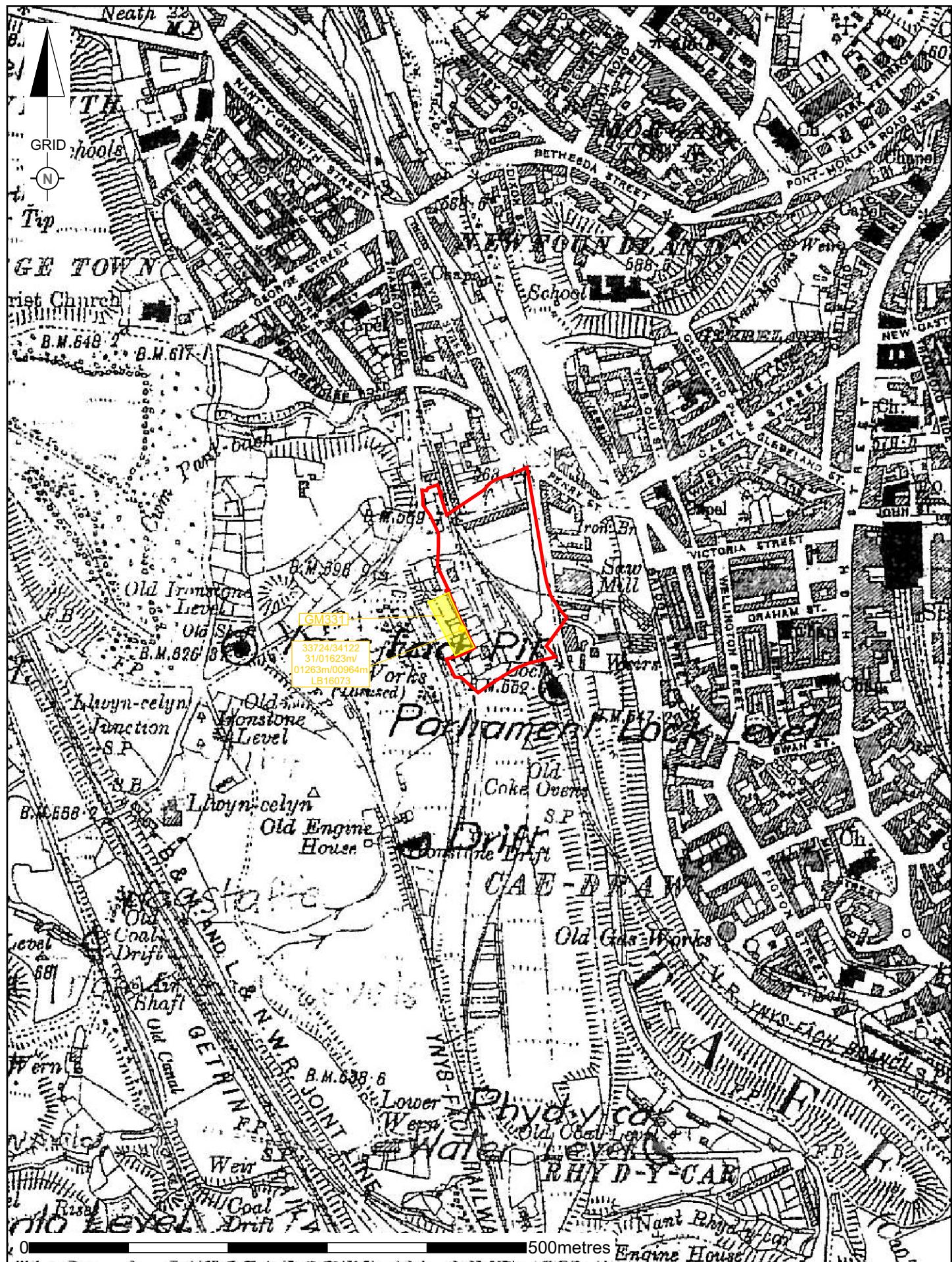


Figure 8. 1919 Third Edition Ordnance Survey map showing development area

Appendix II

Walkover Survey



Plate 1: View of development area looking east towards Merthyr Colledge's main building.



Plate 2: View of the development area looking southeast.



Plate 3: View from the modern boiler looking south.



Plate 4: View from the Engine House looking southeast.



Plate 5: Ynys Fach furnaces looking south.



Plate 6: Ynys Fach furnaces looking northwest.



Plate 7: Ynys Fach furnaces looking south.



Plate 7: Ynys Fach furnaces looking northwest.

Appendix III

Aerial Photographs with Coverage of the Evaluation Area

The following is a list of the aerial photographs with coverage of the study area held by the Central Registry of Air Photography for Wales.

RAF Sorties

Sortie	Scale	Date	Frames
3G TUD T19 Pt 1	1:25000	03/08/1945	Not available at present.
CPE UK 1997	1:9800	13/04/1947	3328, 3329
CPE UK 2487	1:16600	10/03/1948	4001 No prints held.
541 RAF 116	1:9960	29/07/1948	4031 No prints held.
58 RAF 676	1:10000	12/05/1951	4405 No prints held.
542 RAF 205	1:10000	11/07/1955	F21: 45, 46

Ordnance Survey

Sortie	Scale	Date	Frames
OS 75 071	1:26000	24/04/1975	161
OS 75 037	1:24000	24/04/1975	51, 52
OS 81 067	1:8200	01/08/1981	12, 13
OS 87 049	1:13000	06/05/1987	24, 25
OS 87 048	1:6500	06/05/1987	10, 11
OS 89 120	1:12800	04/05/1989	933, 934
OS 89 121	1:6000	04/05/1989	633, 634
OS 94 292	1:6300	22/08/1994	33, 34
OS 96 564	1:9100	08/05/1996	39, 40
OS 97 085	1:6000	09/04/1997	14, 15 No prints held.

Commercial and other Sorties

Sortie	Scale	Date	Frames
Meridian 71/67	1:5000	23/07/1967	116 - 118
Carto Serv. 667/77	1:12800 ?	20/05/1977	1742, 1743
MAFF	1:12000	10/06/1984	201: 196, 197
J A Story 0985	1:20000	28/04/1985	1285: 133, 134 0985: 17, 18
Carto Serv. 900525	Various	24/04/1990	8087, 8088, 8199, 8200
Geonex	1:10000	01/08/1991	8691: 189, 190

Merthyr College, Merthyr Tydfil: archaeological desk-based assessment

The above were examined and no new site was identified. However, the sortie CPE UK 1997 exhibited a building – described as “refinery” on OS map from 1852 (Figure 5), to the east of the Ynys Fach Ironworks casting houses, had a very different shape to the one represented on the maps.

Appendix IV

Apportionments relating to the tithe map of 1850 for the parish of Merthyr Tyfil

Land owner	Occupier	Parcel number	Name and description of parcel
William Crawshay	William Crawshay	1521	Cowder Tip
William Crawshay	William Crawshay	1523	Rubbish Tip
William Crawshay	William Crawshay	1528	Coke Yard and Furnaces
William Crawshay	William Crawshay	1529	Part of Cae Cwm Bach Ishaf (Isaf?)
William Crawshay	William Crawshay	1538	Waste

Appendix V

Gazetteer of archaeological interests

ID

24978/00456m

Name YNYS-FACH MANORIAL MILL

NGR SO047061

Period

Medieval

Full description

The supposed site of a medieval manorial watermill, identified in a document and plotted by Rees in 1932. The document records that in 1375, a fulling-mill worth 20d' a year was recorded in upper Senghenydd. The mill is mentioned again in 1427-8.

In 1861 the incumbent, the Rev John Davies, engaged Messrs Prichard and Seddon, Whitehall, to design a church to replace the existing structure, which was reported to be dilapidated and of which no part was fit to be incorporated in the new building. Seddon described the old church as 'a mere barn, without any architectural pretensions'. The new design broadly followed the position and layout of the old, with nave, chancel, south porch and west bellcote for two bells, and a north transept was added in place of the Lucas Chapel in the old church. The estimated cost was to be £1200. The work did not take place until 1867 and at a cost of about £1500. The memorials from the earlier church were re-fixed, and the old font retained. In 1906 a small vestry was added in the north west angle of the transept and nave, with heating apparatus in its basement. The pillar cross from near Stouthall was brought into the church for protection in 1977.

Type	Condition	Status
Water mill	Not known	None
Rarity	Group association	Historical association
High	Low	Possible
Confidence	Value	Effect
Medium	U	None

ID

33724/34122/01623m/01263m/00964m/LB16073/Gm331

Name YNYSFACH IRONWORKS

NGR SO04550605

Period

Post-Medieval

Full description

A block of 4 furnaces with an engine house freestanding at the N end. A cast iron plaque over one of the furnaces reads, 'WC 1836. The arches are now blocked with brick and the stacks have been reduced.

The Ynysfach Ironworks were founded in 1801 when 2 blast furnaces were built to plans by Watkin George, engineer and foundry manager at Cyfarthfa from 1792. In 1836 2 more furnaces were built together with the engine house which replaced an earlier one painted by Penry Williams c1815. The new engine house contained a beam blowing engine made at the Neath Abbey Ironworks. The Ynysfach works closed in 1874 and the engine house fell into disuse. It was restored between 1986 and 1989 and converted to a heritage centre and offices. The building was formerly part of the scheduled ancient monument Gm 331, which was revised to exclude the building following its conversion to a heritage centre and offices. The heritage centre was closed at the time of survey (2002).

Engine House:

Located at the W of Merthyr College and just N of the remains of the Ynysfach blast furnaces.

Engine-house was part of the old Ynystach iron works, which was attached to the Cylartha works.

Built in 1801, seems to have been rebuilt in the 1830s. The works closed in 1874 and the engine house fell into disuse. The engine house (1623m) is a well-built stone building with 3 storeys and a basement divided into 2 sections. Original roof now replaced. Scheduling revised following the building's conversion to a heritage centre and offices.

Engine House, built in 1836 for the adjacent furnaces of Ynysfach Ironworks, a subsidiary of the successful Cyfartha works owned by the Crawshay family.

Merthyr College, Merthyr Tydfil: archaeological desk-based assessment

Type	Condition	Status
Iron works	Damaged	SAM
Rarity	Group association	Historical association
Medium	High	Certain
Confidence	Value	Effect
High	A	Major

ID

01618m/116/Gm283

Name IRON BRIDGE

NGR SO04720616

Period Post-Medieval

Full description

Single span bridge of early C19th date over river Taff made of iron with crudely designed iron balustrade. The bridge is now situated in Cyfarthfa Park.

Type	Condition	Status
Bridge	Moved	Descheduled
Rarity	Group association	Historical association
High	Medium	Certain
Confidence	Value	Effect
High	B	None

ID

01702m

Name YNYSGAU

NGR SO04730618

Period Post-Medieval

Full description

Cwm-y-glo, the first permanent chapel was a barn, erected in 1689. This lasted until 1749 when it was replaced by the building of Capel Ynysgau.

Type	Condition	Status
Ecclesiastical building	Unknown	None
Rarity	Group association	Historical association
High	Low	Possible
Confidence	Value	Effect
Medium	C	None

ID

85237/03548m

Name PARLIAMENT LOCK NO. 3

NGR SO0465006015

Period Post-Medieval

Full description

GGAT assessment a243 Parliament Lock The surviving fabric of the lock was constructed to a high standard from ashlar limestone masonry. A sump hole dug by the contractors suggested that the lock was originally around 14ft deep.

Type	Condition	Status
Canal lock	Damaged	None
Rarity	Group association	Historical association
Medium	High	Possible
Confidence	Value	Effect
Medium	B	None

ID

308383

Name MERTHYR BRIDGE, YNYSGAU, MERTHYR TYDFIL

NGR SO047062

Period Post Medieval

Full description

Site possibly identical to PRN 308384 and PRN 308385. An aerial photography set (Meridian 71/67, 116 - 118) from July 23, 1967, shows that the two initial bridges on the Taff River have been removed and replaced by a modern, concrete, bridge.

Type

BRIDGE

Condition

Unknown

Status

None

Rarity

High

Group association

Medium

Historical association

Unknown

Confidence

Low

Value

B

Effect

None

ID

308384

Name LATTICE GIRDER BRIDGE OVER RIVER TAFF, YNYSGAU, MERTHYR TYDFIL

NGR SO04700618

Period Post Medieval

Full description

Site possibly identical to PRN 308383 and PRN 308385. An aerial photography set (Meridian 71/67, 116 - 118) from July 23, 1967, shows that the two initial bridges on the Taff River have been removed and replaced by a modern, concrete, bridge.

Type

BRIDGE

Condition

Unknown

Status

None

Rarity

High

Group association

Medium

Historical association

Unknown

Confidence

Low

Value

B

Effect

None

ID

308385

Name BRIDGE OVER RIVER TAFF, YNYSGAU, MERTHYR TYDFIL

NGR SO04670624

Period Post Medieval

Full description

Site possibly identical to PRN 308383 and PRN 308384. An aerial photography set (Meridian 71/67, 116 - 118) from July 23, 1967, shows that the two initial bridges on the Taff River have been removed and replaced by a modern, concrete, bridge.

Type

BRIDGE

Condition

Unknown

Status

None

Rarity

High

Group association

Medium

Historical association

Unknown

Confidence

Low

Value

B

Effect

None

ID

91561

Name MIDDLE LOCK NO.2, GLAMORGANSHIRE CANAL, MERTHYR TYDFIL

NGR SO04620622

Period Post Medieval

Full description

Type

LOCK

Condition

Unknown

Status

None

Rarity

Medium

Group association

High

Historical association

Possible

Confidence

Low

Value

B

Effect

None

ID

91562

Name CANAL SQUARE WAREHOUSES, MERTHYR TYDFIL

NGR SO04640616

Period Post Medieval

Full description

Type

WAREHOUSE

Condition

Unknown

Status

None

Rarity

Medium

Group association

High

Historical association

Possible

Confidence

Low

Value

C

Effect

None

ID

286142

Name OLD YNYSFACH, 35-36, YNYSFACH

NGR SO04520620

Period Post Medieval

Full description

Type

WORKERS HOUSING

Condition

Unknown

Status

None

Rarity

Medium

Group association

High

Historical association

Possible

Confidence

Medium

Value

C

Effect

Minor