Former Brymbo Ironworks, Wrexham County Borough

Archaeological Assessment

Phase 1 - Version 2.0

Ross Cook

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Acknowledgements

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Abbreviations used in this report

HER - Historic Environment Record.

DAT-DM - Dyfed Archaeological Trust Development Management

LPA - Local Planning Authority.

NGR - National Grid Reference.

NMR - National Monuments Record.

OS - Ordnance Survey.

BHT - Brymbo Heritage Trust.

All other abbreviations will be referred to in text.

Project Team

Ross Cook - An experienced archaeologist and surveyor with a background in archaeology and buildings conservation. He has undertaken archaeological fieldwork throughout Wales and has also worked to produced detailed surveys of a wide range of Scheduled Ancient Monument and Listed Buildings through Wales and England; this has included Neath Abbey, Llansteffan Castle, Tretower Castle, Cilgerran Castle, Newport Castle Pembrokeshire, Picton Castle, and Brymbo Ironworks. Ross is the Cathedral Archaeologist at St Davids Cathedral, Pembrokeshire. He previously worked for the Royal Commission on the Ancient and Historical Monuments of Wales as a Historic Buildings Investigator (Archaeology), where he recorded buildings and Monuments, and provided advice on historic buildings at a national level. Currently he is involved with project work with Cadw, The Brymbo Heritage Group, and The Buildings of Medieval and Ottoman Palestine Research Project.

Ross also works as an Associate Dendrochronologist with the Oxford Dendrochronology Laboratory, through which he has undertaken work on sites such as Hampton Court Palace, Winchester Cathedral, Queens House Greenwich, The Tower of London, Christ Church and Magdalen College Oxford, Llwyn Celyn (Mons), and a large number of other smaller listed buildings and schedules sites throughout Wales and England.

ArchaeoDomus Archaeological & Heritage Services is the trading name of Ross Cook. An affiliate member of the CIfA, and adheres to the CIfA codes of conduct.

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Updates and Additions

Version 2

New Sections	5.4	6.3	9				
Paragraphs	1.3	2.1.2	6.2.3				
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Former Brymbo Ironworks

Brymbo, Wrexham County Borough

Archaeological Assessment

Summary

ArchaeoDomus Archaeological & Heritage Services was commissioned by the Brymbo Heritage Trust to undertake an Archaeological Assessment of the former Brymbo Ironworks in Wrexham County Borough, with the output forming a 'living' database of the surviving assets. This work aims to provide an assessment of the buildings, machinery and infrastructure of the former ironworks to determine the archaeological potential of the site. The assessment is to take place in 2 phases, with this report completing the first. The outcome of this work is this report, which is to support a Heritage Lottery Fund Round 2 Bid.

The plans for the former ironworks are to see the asset transformed into a heritage attraction, education centre and business space, whilst celebrating the community and people that have contributed to Brymbo over the centuries.

The Archaeological Assessment was undertaken on the 10th and 11th October 2019. The fieldwork sought to assess the buildings, infrastructure and machinery surviving on site, to provide information for the compilation of a database to detail the assets, their history and archaeological potential.

*The Archaeological Assessment has determined the potential for archaeological deposits and remains at the former ironworks to be **high** as a result of its development and transition of a late-18th century ironworks into a 20th century steel plant.*

*The Archaeological Assessment has also determined the significance of the ironworks to be **high**, for the same reasons as outlined above. This determination was also arrived at for the important associations Brymbo has with key 18th and 19th century industrialists, such as Wilkinson, Robertson and the Darby's, and the role the works had in shaping the industrial and social landscape of north-east Wales.*

Hen Waith Haearn Brymbo

Brymbo, Bwrdeistref Sirol Wrecsam

Asesiad Archaeolegol

Crynodeb

Comisiynwyd Gwasanaethau Archeolegol a Threftadaeth ArchaeDomus gan yr Ymddiriedolaeth Treftadaeth Brymbo i gwblhau Asesiad Archeolegol o'r hen waith haearn Brymbo yn Bwrdeistref Sirol Wrecsam, gyda's allbwn yn ffurfio cronfa ddata 'byw' o'r asedau sydd wedi goroesi. Nod y gwaith hwn yw i ddarparu asesiad o'r adeiladau, peirianwaith a'r isadeiledd o'r hen waith haearn er mwyn penderfynu'r potensial archeolegol y safle. Mae'r asesiad i gael ei gynnal mewn 2 gam, gyda'r adroddiad yn cwblhau'r cyntaf. Canlyniad y gwaith hwn yw'r adroddiad, sef cefnogi'r Cais Rownd 2 Cronfa Dreftadaeth y Loteri.

Y cynlluniau ar gyfer yr hen waith haearn yw i weld yr ased trawsnewid mewn i atyniad treftadaeth, canolfan addysg a gofod busnes, tra dathlu'r cymuned a'r bobl sydd wedi cyfranu i Brymbo dros y canrifoedd.

Cynhalwyd yr asesiad ar y 10fed a'r 11eg o Hydref 2019. Ceisiodd y gwaith maes i asesu'r adeiladau, isadeiledd a peirianwaith wedi'i goroesi ar y safle, i ddarparu gwybodaeth ar gyfer llunio cronfa ddata i fanylu'r asedau, eu hanes a potensial archeolegol.

Mae'r asesiad archeolegol wedi penderfynu'r potensial ar gyfer adnau archeolegol ac olion yn yr hen waith haearn i fod yn uchel o ganlyniad i'w ddatblygiad a'i drawsnewidiad o waith haearn diwedd yr 18fed ganrif mewn i gorsaf dur 20fed ganrif.

Mae'r asesiad archeolegol hefyd wedi penderfynu'r arwyddocâd o'r waith haearn i fod yn uchel, am yr un rhesymau a amlinellwyd uwchben. Daethpwyd i'r penderfyniad hwn hefyd ar gyfer y cysylltiadau pwysig sydd gan Brymbo efo diywdianwyr allweddol 18fed a 19eg, fel Wilkinson, Robertson a'r Darby's, a'r rôl oedd gan y gwaith wrth lunio'r tirwedd ddiwydiannol a chymdeithasol o gogledd-ddwyrain Cymru.

1 INTRODUCTION

1.1 ArchaeoDomus has been commissioned by Brymbo Heritage Trust to undertake an Archaeological Assessment of the former Brymbo Ironworks (hereafter also referred to as 'the site') (***Fig. 20***), as part of the Trust's Phase 2 Heritage Lottery Fund bid, submitted November 2019.

Fig. 1 – Brymbo Heritage Area

1.2 The aims of the project at the former ironworks, under the Brymbo Heritage Trust, are:

- *To conserve and selectively reuse the historic buildings of Brymbo to develop a visitor attraction, learning hub and small business space;*
- *To further explore the 300 million year old Brymbo Fossil Forest, interpreting its natural history and the impact on the development of industry; and*
- *To celebrate the people, skills and attitudes that have contributed to Brymbo's place in the world.*

1.3 The purpose of this Archaeological Assessment is to further understand the unique archaeological resource present at the Former Brymbo Ironworks. As such, this report documents the results of the assessment and presents a gazetteer (**Appendix 2**) of the surviving building, machinery and infrastructure. The principal aim of this work has been to understand evolution and archaeological potential of each asset. To promote wider readership and understanding, a Glossary of terms has been provided under section 9.

1.4 This report does not assess the impacts of potential schemes or development. Proposals will require separate Historic Impact Assessments to determine their effect to the heritage assets in consideration of the principles set out in Cadw's *Conservation Principles for the sustainable management of the historic environment in Wales* (2011).

1.5 Maps detailing the individual buildings described, both in the site history and gazetteer, are marked up on OS 25-inch and 1:2,500 maps in Appendix 1 – Figs. 14-19.

1.6 **Section 6** details the Archaeological Potential, Significance and Impact of Development to the former works.

1.7 The gazetteer is a 'living' piece of work that can be updated and amended as new information comes to light through research and work on site.

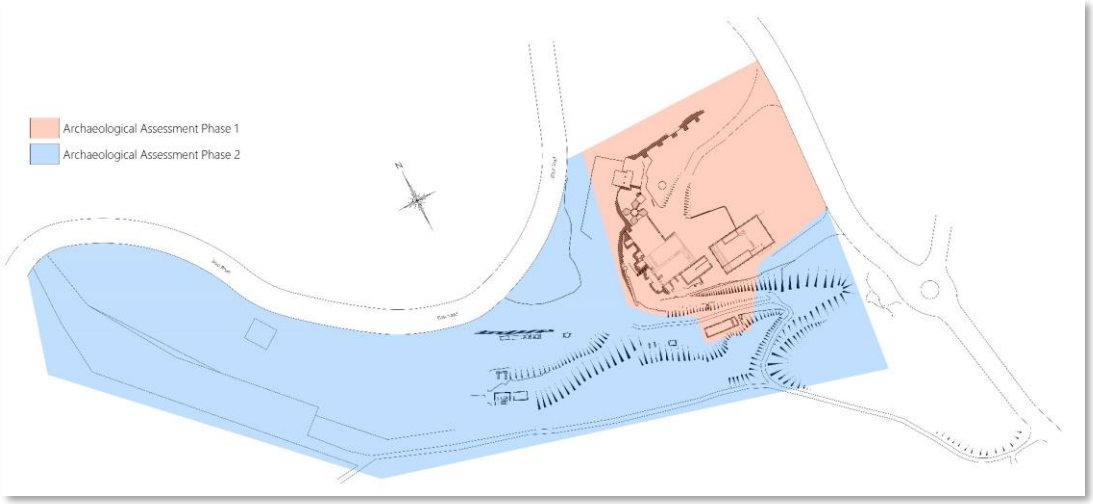

Fig. 2 – Brymbo Ironwork Archaeological Assessment Phase 1 and 2 Areas.

1.8 The production of the Archaeological Assessment will be undertaken in two phases (***Fig. 2***). Phase 1 (red) will focus on the lower site, up to the Agents House. Phase 2 (blue) will cover the upper end of the site, from the Agents house onward.

1.9 In 2013, the RCAHMW began work at the site and produce measured plans, photographic record and written account of the ironwork's history and development.

1.10 Since 2014, this work has been continuing on a project-by-project basis with ArchaeoDomus. To date this work has included three contracts:

1. **AD006** – Measured survey and photographic record of the east elevation of the Cast House and Foundry prior to dismantling of roof and ironwork front to foundry, and photographic record post-works. (***Fig. 21***; ***Fig. 22***)
2. **AD031** – Photographic record and measured survey of the Agents House, prior to roof removal. (***Fig. 23***)
3. **AD065** – Laser scan of the Patternmakers and Carpenters Workshop for the production of archaeological and architectural plans. (***Fig. 24***)

1.11 The fieldwork was undertaken on 10th and 11th October 2019, in accordance with the guidance laid down by the Chartered Institute for Archaeologists, CIfA *Standards and Guidance for the*

Archaeological Investigation and Recording of Standing Buildings (December 2014), and Historic England's *Understanding Historic Buildings: A guide to good practice* (2016).

2 41SITE AND LOCATION

2.1 General

2.1.1 Brymbo Ironworks is located at the southern edge of the village of Brymbo, in the County Borough of Wrexham, historically being Denbighshire. The site runs uphill from east to west, with the lowest and most level part of the former ironworks bounding the western edge of an unnamed road (leading from Phoenix Drive). The lower part of the site sits within a cut into the hillside, with Blast and Charge Walls bounding this area to the north and west; the Brymbo Enterprise Centre is located above the site to the north. Blast Road bounds the site to the west and north, with the south bounded by a track, with sparse woodland and fields beyond. The Ironworks sits at an elevation of circa 330m and at NGR SJ 29454 53526 / 53°04'27.9"N 3°03'15.3"W.

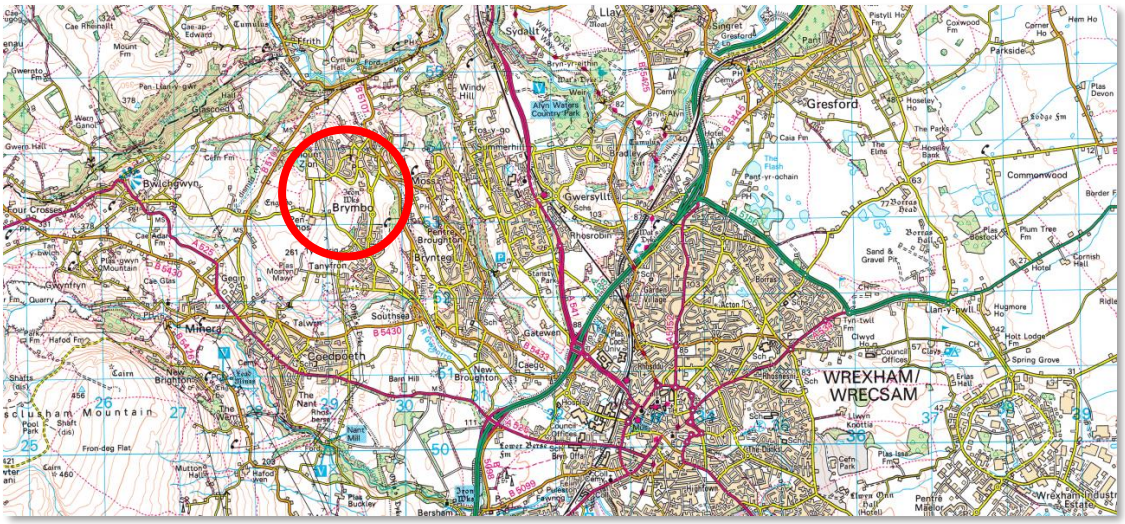

Fig. 3 – Location – Brymbo.
Contains Ordnance Survey OpenData © Crown copyright and database right 2019.

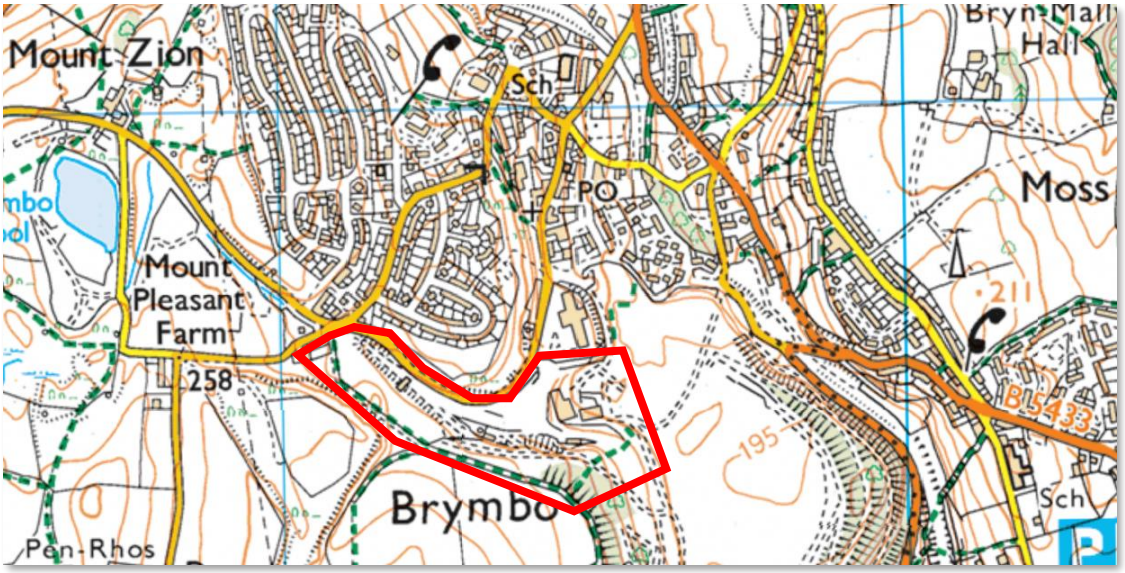

Fig. 4 – Location – Brymbo Ironworks Site
Contains Ordnance Survey OpenData © Crown copyright and database right 2019.

2.1.2 The surviving ironworks is divided between the 'lower site' and 'upper site' (***Fig. 5***). The lower site forms what can be considered the core of the heritage area, with the Scheduled Monument Area, Machine Shop and Winch Room (***Fig. 6***), and is the point of entry for all visitors. The upper site starts on arriving at the Agent's House, after rising up via the site road, and extends to the western reaches of the site bounding Blast Road and the end of Mount Zion (road) to the west. In this section of the site, the Agent's House, Pit Head, Winding House, Ancillary Railway Buildings and Rail Platform (***Fig. 6***) are to be found.

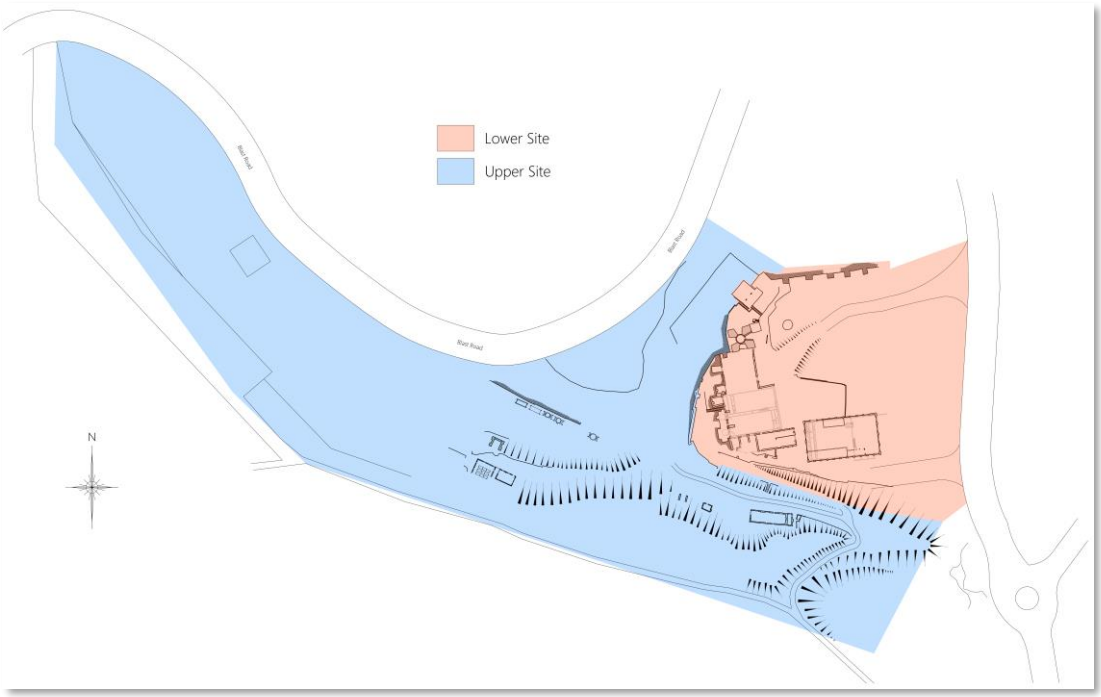

Fig. 5 – Brymbo Ironworks Upper and Lower Site.

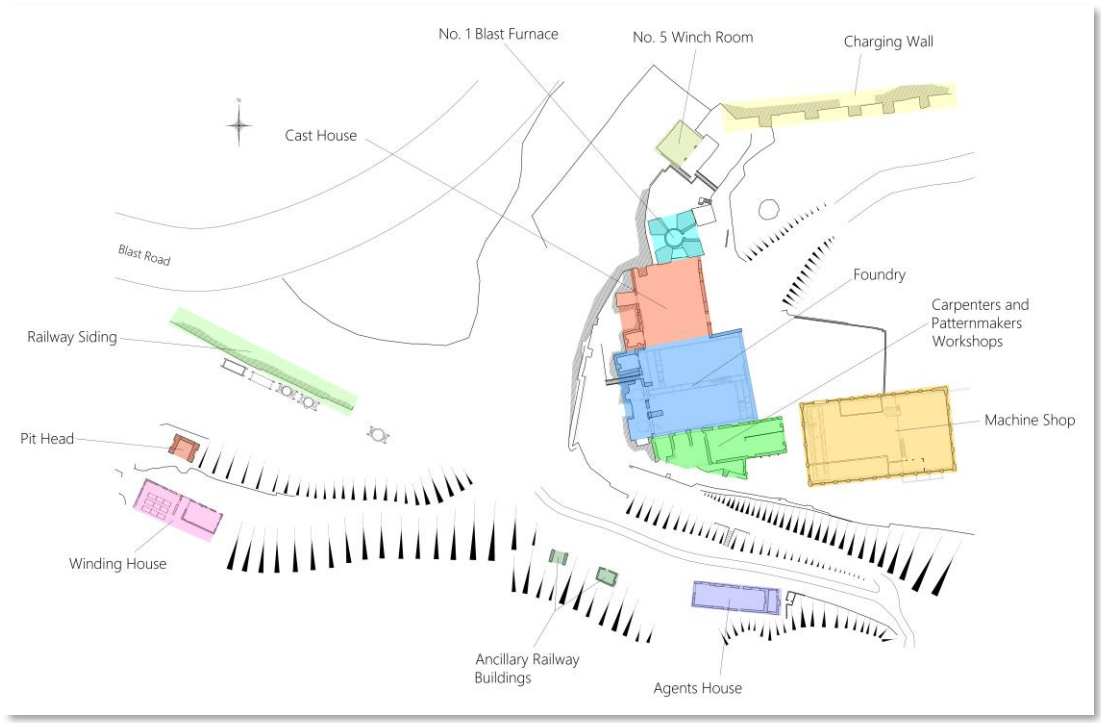

Fig. 6 – Brymbo Buildings as currently named

2.2 Geology

2.2.1 The underlying geology is formed of the Pennine Lower Coal Measures Formation and the Cefn Rock sandstone formation mudstone (BGS) with no superficial deposits recorded (BGS). The local soil type is unclassified (UKSO).

3 AIMS AND OBJECTIVES

3.1 Archaeological Assessment

3.1.1 The aim of the archaeological assessment is to produce a gazetteer of the known archaeological assets on site, such as buildings, machinery and infrastructure. This work will highlight areas of potential archaeological sensitivity and support the development of subsequent programmes of works on site.

3.1.2 The above will inform the production and maintenance of a zoned site plan detailing the archaeological sensitivity of buildings and potential for below ground remains.

3.1.3 The record will use CIfA's guidance for recording historic buildings as a guide, which states:

> *A programme of archaeological building investigation and recording will determine, as far as is reasonably possible, the nature of the archaeological resource associated with a specified building, structure or complex. It will draw on existing records (both archaeological and historical sources) and fieldwork. It will be undertaken using appropriate methods and practices which satisfy the stated aims of the project, and which comply with the Code of conduct, Code of approved practice for the regulation of contractual arrangements in archaeology, and other relevant by-laws of the CIfA. The programme will result in the production of drawings, an ordered accessible archive and a report*

3.1.4 The record will also use Historic England's Understanding Historic Buildings; a guide to good practice (2016) as a guide when producing the record and description.

3.1.5 On site work will aim to record each asset by photography, and written accounts, which will determine its development, significance, archaeological potential and condition, with recommendations made for future archaeological input. Each of these will in turn form a part of the gazetteer record for each asset.

3.1.6 To produce the gazetteer as a 'living' record, to allow for records to be updated and amended as the BHT project progresses. This will also enable the creation and addition of new records as unknown archaeological assets are uncovered and to expand our knowledge of the known buildings and features of the former ironworks.

3.1.7 To deposit, on completion of the assessment, a gazetteer for archive with the NMRW and Regional HER.

4 METHODOLOGY

4.1 Introduction

4.1.1 All archaeological works have been conducted by a qualified archaeologist in accordance with the methodology set out in the *Written Scheme of Investigation* (ArchaeoDomus 2018) and in accordance with the *Standards and Guidance for the Archaeological Investigation and Recording of Standing Buildings* (December 2014) and *Standards and Guidance for an Archaeological Watching Brief* (November 2014) from the Chartered Institute for Archaeologists.

4.2 Archaeological Assessment

4.2.1 The Archaeological Assessment seeks to record and understand, in gazetteer format, the buildings, machinery and infrastructure surviving on site to determine their archaeological significance, evolution and further potential. This will use as guidance the EH Level 2 record:

> *'...a descriptive record, made in similar circumstances to Level 1 but when more information is needed. It may be made of a building which is judged not to require a more detailed record, or it may serve to gather data for a wider project. Both the exterior and interior of the building will be seen, described and photographed. The examination of the building will produce an analysis of its development and use and the record will include the conclusions reached, but it will not discuss in detail the evidence on which this analysis is based. A plan and sometimes other drawings may be made but the drawn record will normally not be comprehensive and may be tailored to the scope of a wider project.' (EH 2016: 26)*

4.2.2 The onsite investigation and analysis have been compiled into a Microsoft Access Database (AD079 – Brymbo Archaeological Assessment), with each asset recorded using the following:

- Database Entry No.
- Asset Name
- Asset Number (TACP numbers)
- Asset Type
- Date Range
- Other Comments
- NGR
- NPRN
- Scheduled
- Listed
- ID (Cadw ID)
- Assessed By
- Assessed On
- Description
- History
- Condition
- Archaeological Potential
- Images

4.2.3 The output from the database is the main focus of this work and forms the gazetteer in **Appendix 2**.

4.2.4 A basic photographic record has been made of the assets using a Canon 760D, where safe to do so. This will seek to provide enough detail to identify each asset and document the materials, alterations and construction methods used, where these are visible and safely accessible. The record will be made using a standard 18-50mm EFS lens and, where suitable, a 10-22mm EFS Wide Angle lens will be used to provide record photographs where the 18-50mm lens is not sufficient; this will be logged. Where possible, a tripod will be used for all photos, with a ranging rods of 2 x 1m or 1 x 2m used for scaling.

4.2.5 Existing plans will be used to locate each asset, with each asset provided with an ID, which has previously been identified (TCAP 2019).

4.2.6 The resources of the regional HER and other readily available resources will be consulted during this process.

4.2.7 The results of this work will be an illustrated report and photographic archive. These will be produced, within 12 months, and provided to both the client, Cadw, Regional HER and deposited with the NMRW.

4.3 Documentary Research

4.3.1 Documentary research was undertaken using readily available resources with additional research aided by map regression. Further research was undertaken using unpublished and published sources.

4.4 Health and Safety

4.4.1 All work was carried out in accordance with the *Health and Safety at Work Act 1974* and *Health and Safety Advice in Archaeology* (BAJR 2005).

5 HISTORICAL BACKGROUND

5.1 Introduction

5.1.1 This historic overview has been undertaken from a range of readily available material from the National Library of Wales, the RCAHMW, and published and unpublished sources.

5.1.2 The core of the Former Brymbo Ironworks is designated a Scheduled Monument (**ID DE202**), which consists of No. 1 Blast Furnace, the Cast House, Foundry and Carpenters and Patternmakers Workshop, and as such has Statutory Protection. The Agent's House, overlooking the monument, is a Grade II* Listed Building.

5.1.3 This historical background is concerned with the area affected by the Brymbo Heritage project and, as a result, it does not detail the history of the larger steel plant. This history will be updated with Phase 2 of the archaeological assessment

5.1.4 A glossary of terms is available in section 9. Appendix 1 (***Fig. 14-19***) contains all historical mapping, with buildings discussed labelled on the Ordnance Survey plans of 1873-1984.

5.2 Archaeology and History

Fig. 7 – Cartouche of the Plan of the Brymbo Estate, 1798
© National Library of Wales. 2019.

5.2.1 In 1792 John 'Iron Mad' Wilkinson purchased the 500-acre estate of Brymbo Hall for the sum of £14,000, with the intention of developing an iron works using the mineral and coal deposits that were known to exist on the site. With the invention and development of the steam engine Wilkinson was able to found an iron works away from running water as steam power could provide blast for blast furnaces.

5.2.2 Brymbo Hall became Wilkinson's primary residence, where he spends considerable money to upgrade the house, including new panelling, windows and carpets (likely referring to rugs) for the chambers and principle rooms.

5.2.3 A letter sent by James Watt Jr. soon after Wilkinson's acquisition of the Brymbo estate states that Wilkinson has spent £20,000 on levelling the site, constructing parapet walls and building a puddling furnace (Soldon 1998: 73). An estate map produced in 1798 (*Error! Reference source not found.)*, though likely surveyed circa 1796-8 by T. Williams, names the site as Plasnewydd Works and demonstrates the extent of the site during this early period; the Puddling Forge can be seen at the east of the site and a blast furnace with attached Cast House, Blowing Engine House and Charge House, which post-dates Watts account, located west of the Puddling Forge he describes; whilst there appears to be several other buildings on site at this time they do not represent what remains today. By circa 1796 the core of the site; Blast Furnace (original dem.), Casting House (B04), Blowing Engine House (dem.), Charge House (dem.) and Coke Ovens (dem.); had been completed, with the first output of iron recorded as 884 tonnes (Riden & Owen 1995: 49), thus commencing Brymbo's one hundred and ninety-four year association with metalworking. The cartouche in the lower right corner of the Estate Plan shows the ironworks as it appeared when the map was completed in 1798. Within this initial development the site Wilkinson's blast furnace is depicted in both plan and cartouche form as being cylindrical.

5.2.4 Further development under Wilkinson's management saw the construction of the Agent's House (B05) and No.2 Blast Furnace, with associated Cast House, sometime between 1800 and 1809. The Agent's House, although not depicted on the Estate Plan of 1798, was certainly in its present form by the time it was depicted on the *Longitudinal Section of the Strata at Brymbo Colliery* of 1809.

5.2.5 In the years between 1792 and 1798 Wilkinson had begun sinking mines near to the site to provide coal and ironstone for his planned works, with a total 8 reported by 1808. A plan of the Brymbo Colliery, dated 1809 and produced by William Rowe, shows the expansion of mining in the Brymbo area, but importantly shows the ironworks as it is in 1809, clearly showing the addition of a second blast furnace.

5.2.6 During his management of the Brymbo Hall estate Wilkinson expanded it to almost 800 acres, to include new farmlands and mineral deposits.

5.2.7 When Wilkinson died in 1808 at the age of 83, the works passed into trusteeship for the next two decades under the guidance of Ann Lewis (his mistress and mother to his only children), William Smith of Birmingham, James Adams and Samuel Foreday of Ettingshall. To survey the wealth of coal seams at Brymbo the trustees commissioned plans of Brymbo Colliery in 1809, then again in 1812, when a long section was also produced, all showing the contemporary ironworks.

5.2.8 In the period following the Battle of Waterloo in 1815, the ironworks saw a slump in its production, resulting from the declining need for weaponry and the continued disputes over Wilkinson's Will. The decision was made to lease the ironworks for a 10-year period and by 1818 John and James Thompson were renting the iron works for a yearly sum of £1,500, with the Wilkinson estate taking in a total of £9,758.16.8d from rents and lets (Brymbo Steel Works Ltd, 1975: 5). In 1820 the original blast furnace was decommissioned by the Thompson brothers and

a new furnace commissioned on the same footings (S01), remaining in situ to this day. This rebuilding, recorded in the company history, is confirmed by the Estate Plan of 1798 and Colliery Plans of 1809 and 1812, all of which show the original Wilkinson furnace as cylindrical.

5.2.9 By the late 1827 the Ironworks was in receivership, a two-year period passing with minimal production taking place. Several years of financial instability and mounting legal costs from the disputed Will led the Chancery to insist that Wilkinson's estate should be sold in order to meet claims. In 1829 a public auction was held at the Wynnstay Arms in Wrexham over the 23rd and 24th April, with all Wilkinson's land acquisitions being sold until the Brymbo Hall estate was back at its 1792 size of 500 acres. John Wilkinson Jr. remained in residence at Brymbo Hall and in late 1829 decided to restart the works using the money gained from the sale of estate lands earlier that year. However, lacking the production and business abilities of his father, the works were again in financial trouble by 1837, when Wilkinson Jr. went overseas. The works continued under the trusteeship of William Rowe until a buyer was found in 1840, a Scotsman by the name of Robert Roy, being financially backed a Scottish bank.

5.2.10 In 1840 'The Brymbo Company' was formed, with William and Charles Darby, descendants of Abram Darby, taking over the site's management. Charged with managing and developing the ironworks, the Darby brothers, commissioned a new Foundry (B03) and Machine Shop (B02) (now the Carpenters and Patternmakers Workshop) in 1843, which remain today. This work made material alterations to the Cast House (B04), removing the gabled south elevation and inserting new archways onto the east and west walls. In 1847 a new blowing engine was installed, raising the output of the blast furnace from 50 to 84 tonnes per week.

5.2.11 In 1842 the highly recommended Henry Robertson was appointed by Robert Roy to undertake an appraisal of the works, concluding that a railway was essential for continued development. In the same year Robertson, along with Robert Roy, Alexander Ross and William Betts formed the Brymbo Mineral and Railway Company, with the 1844 North Wales Mineral Railway Act being passed to allow construction. Initially this section of the railway was powered by horses, but by 1850, with the desire for greater output, a locomotive was purchased.

5.2.12 In 1856 new hot air stoves were built to preheat the blast, with bell-tops added to the furnace to reuse the hot gasses to heat the boilers and stoves, therefore making savings on the amounts of coal required. A note in the company records states that No. 1 Blast Furnace (S01) was, at one time, in continuous blast for 32 years with the same firebrick lining. By 1880, bell tops were added to the furnaces, alterations were undertaken to the foundry and in 1872 No. 3 blast furnace was erected with a Haigh Blowing Engine to increase iron output.

5.2.13 Continued expansion from the mid-19th century, saw the requirement for expansion of the Machine Shop (B02) to supply parts to and maintain the new steel plant. A new brick extension was added to the south-east corner of the Machine Shop (B02) commissioned by the Darby brothers in 1843.

5.2.14 On 13th April 1880, the fuel consumption No. 1 Blast Furnace (S01) is recorded as 10.22 cwts (hundredweight) of coal and 26.6 cwts of coal per ton of iron, making a weekly consumption of 134 tons. The same month, on 30th April, the proportions of materials used to charge the furnace were recorded as: Coal 10.22%, Coke 26.60%, Native Mine (ore) 27.84%, Northampton (ore)

0%, Desada (ore) 9.34%, Guton (Spanish) (ore) 4.60%, Bilbao (ore) 4.60%, Irish (ore) 0%, and Limestone (flux) 16.80%. A month later, on 28th May 1880, the blast temperatures at the tuyeres were recorded as North 1020°F, East 1110°F, South 980°F, and West 1080°F.

5.2.15 Communications were improved in 1877 with the installation of a Wheatstone Telegraph and by 1880 telephones had made their way to the iron works.

5.2.16 In the last decades of the 19th century, steel started becoming a production priority and in 1883 an experimental Open-Hearth steel furnace was erected, the results being so successful that Robertson made the decision to found a steel plant. On June 4th 1884 The Brymbo Steel Company was incorporated and its operations began the following year.

5.2.17 In 1894, No. 4 blast furnace was constructed to replace No. 3, and was equipped with three Cowper stoves, a dust catcher and three Lancashire boilers blown by a Davy Engine. It was at this time that the large Charging Wall to the north of the site was built, to help enable the development of No. 4 by providing a new level area of ground for the placement of a charging house. In the same year, No. 1 blast furnace (S01) was damped down for the last time after 74 years of work and retained as a sand hopper for the Cast House (B04).

5.2.18 In the late 19th century, the Foundry (B03) was upgraded, with the addition of two cupola furnace, although not at same time.

5.2.19 April 1902 saw the commissioning of the new Power House, which brought 3 phase electric generation to Brymbo. Power was produced by an electric alternator powered by a 125hp Westinghouse Gas Engine. In the following year, 1903, a Theissen Gas Washer was installed to wash the blast furnace gas, which in turn was used to drive turbines in the Power House.

5.2.20 In 1908, No. 5 Blast Furnace (S14) was commissioned, which would be the last of the iron furnaces built at Brymbo. In October 1908, the new furnace was lit by Peter Williams, the recently appointed General Manager of the works, who had taken over from J. H. Darby earlier that same year. With the construction of No.5 (S14) a new, sunken iron line (H02) was built to carry molten iron from the furnace to the Casting Shop to the east.

5.2.21 In 1910 bosh tuyeres were used for the first time at Brymbo in an attempt to increase output from No. 5 by starting reduction of ore higher up the furnace. However, the results proved this not to be the case. In the same year refrigeration units were installed for the testing of 'dry blast' in an attempt to improve the iron to a grade containing less than 1% silicon, which could be used in basic open-hearth steel furnaces. After 2 years of trials, this was also abandoned. From 1912, No. 5 will be the only operational blast furnace at the plant.

5.2.22 With increased steel production and the requirement for constant maintenance and upgrades, combined with continued investment in the plant since the WWI, a new machine shop was commissioned and built in 1921 (B01). Integral to the build was the installation of the large overhead Travelling Crane by the Vaughan Crane Co. It has SWL (safe working load) of 7½ Tons and was electronically driven and operated, which was usual for new machinery and tools at the works during this period.

5.2.23 In the post-war period the steelworks were upgraded from gas to electric furnaces, with demand driving the increased production of silicon steel for transformer cores. For part of the 1920s, silicone steel becomes a major output from the plant during a time of national electrification.

5.2.24 By the 1930's the demand for iron had decreased sufficiently that it became a minor part of the works at Brymbo, which were now focused on the production of steel.

5.2.25 Little is recorded of the earliest part of the site from 1912, with steel being the primary concern. The only noted development in the first half of the 20th century, since the development of No. 5 (S14), was the refitting of the Foundry (B03). This came at the height of WWII, when in 1943 new overhead travelling cranes from Joseph Adamson & Co. Ltd. were installed to carry crucibles for heavier pours from the cupolas.

5.2.26 The next period of major development in the production of iron comes in November 1964, when the decision was taken to modernise No. 5 (S14). At this time the furnace was still being charged by hand, using a system of barrows. This upgrade introduced a winched mechanism for loading the furnace, with the Winch House (B10) built for this purpose. A new double bell top, fume emission system, gas cleaning was introduced to No. 5, with the replacement of the old Blast Engine of 1894 for a turbo-blower unit installed to increase efficiency. In February 1965, the furnace was relit by Mrs. E Davies, wife of the Managing Director of the plant. In 1966, a gas cleaning installation was completed, with a scrubbing tower to remove dust from the gas, a thickening plant to settle the dust in water, and a cooling tower to enable the waste water to be reused. On 28th June 1967, No. 5 (S14) set a new weekly record with an output of 2,123 tons produced. In 1969, further upgrades were made to No. 5 (S14), with new hot blast stoves, gas cleaning plant, new boiler and new turbo-blower. These additions increased the output to 3,000 tons per week. 1970 saw the decommissioning and removal of the Davy Blowing Engine, which had been operational at the site for the last 70 years. On 15th July 1971, No. 5 (S14) was blown out for relining and was relit on 15th September the same year. Four years later, No. 5 (S14) was blown out at the end of May 1975 for relining and general maintenance works, being relit by the wife of the Technical Director, Mrs. O. Harris, on 3rd May 1976. The record weekly output for a blast furnace at Brymbo was held by No. 5 (S14), which produced 3,349 tons during the week of 1st December 1973.

5.2.27 In the 1970s, new cupola furnaces (S32/S38; S33/S37) were installed to the Foundry, in conjunction with the fabrication of a new façade and roof in steel frame. The new furnaces were designed by Walter Salisbury and a colleague and were then manufactured at the works. When in operation, each furnace was producing 2 tonnes per week.

5.2.28 In 1973, Brymbo Hall was demolished to make way for an open cast mining operation.

5.2.29 The works closed in 1990, with the loss of all jobs and a rich industrial heritage.

5.3 Cartographic Sources

5.3.1 One of the most significant pieces of evidence for the early development of the Brymbo Ironworks is the Brymbo Estate Plan of 1798 (***Fig. 14***). The plan was commissioned by Wilkinson and produced by T. Williams. The plan is likely to have been surveyed sometime between 1796-8, as it shows the works complete with blast furnace with the blast engine house, charging house and cast house. At this time the ironworks are labelled as the 'Plasnewydd Works'. Latterly, the estate plan was updated to reflect the addition of No. 2 Blast Furnace. This has been drawn onto the map in black ink, with hatching to the new buildings, which is unlike the pink shading to the original.

5.3.2 Colliery plans made in 1809 and 1812, commissioned by the executors and trustees of the Wilkinson estate, show the ironworks at the same level of development as those shown on the 1798 Estate Plan. It may be at this time that the earlier estate plan was updated to reflect the addition of No. 2 Blast Furnace. Importantly, a section of the coal strata (***Fig. 8***), shows the works in section, with clear depictions of the blast furnaces, puddling furnaces and the Agent's House.

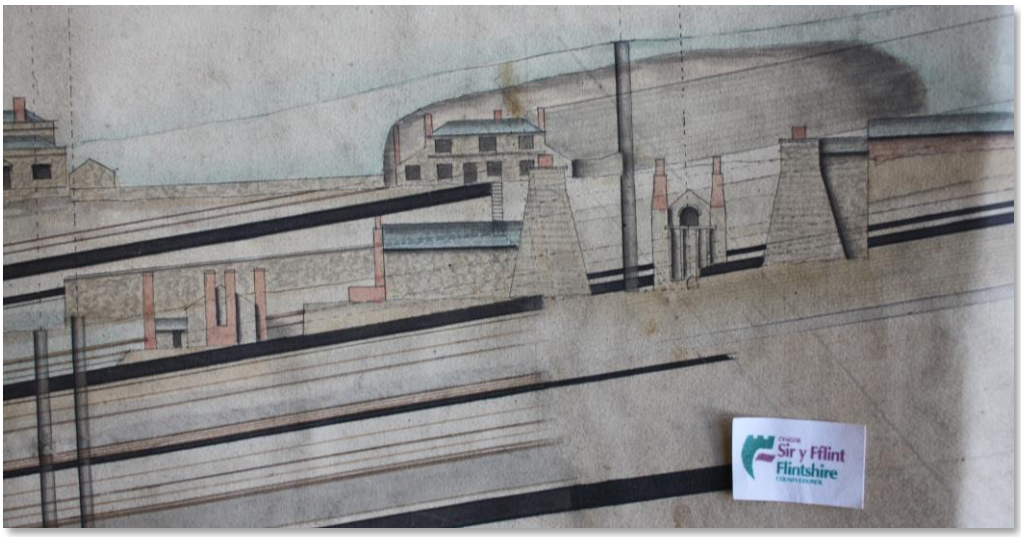

Fig. 8 – Longitudinal Section of the Strata at the Brymbo Colliery. Dec. 1812. Flint Archives.

5.3.3 The later Tithe Map of 1845 shows the ironworks at the same level of development as the updated 1798 Estate Plan, with the ironworks again labelled 'Plasnewydd Works'. At this date the Agent's House is labelled as 'Field Number 210; 'Agents Office', owned by 'Robert Roy Esquire and Others', in use by 'Self and Others'. The Tithe Map does not show the Foundry and Machine Shop (Carpenters and Patternmakers Workshop), which are known to have been built in 1843, which gives two possibilities; 1) the Tithe Map was surveyed before 1843; or 2) it has been based on the earlier Estate Plan of 1798.

5.3.4 The First Edition 25 Inch to One Mile Map of Brymbo was published in 1873 (***Fig. 9***) (Denbighshire XXVIII.2). By this time, the works had undergone large amounts of development under the Darby brothers' management. It is also the first time we see a formal plan of the plant's railway infrastructure, largely developed thanks to Robertson and the 'North Wales Mineral Railway Act' of 1844. It is also the last time that the ironworks are depicted as being focused around the blast furnace bank and before the foundation of the steelworks at Brymbo. The map demonstrates the existence of buildings within the modern footprint of the 1921 Machine Shop

and within the yard to its north, and the extent of workings to the north of the works. To the immediate south-west of the Agent's House, a small quarry to its south is shown in work.

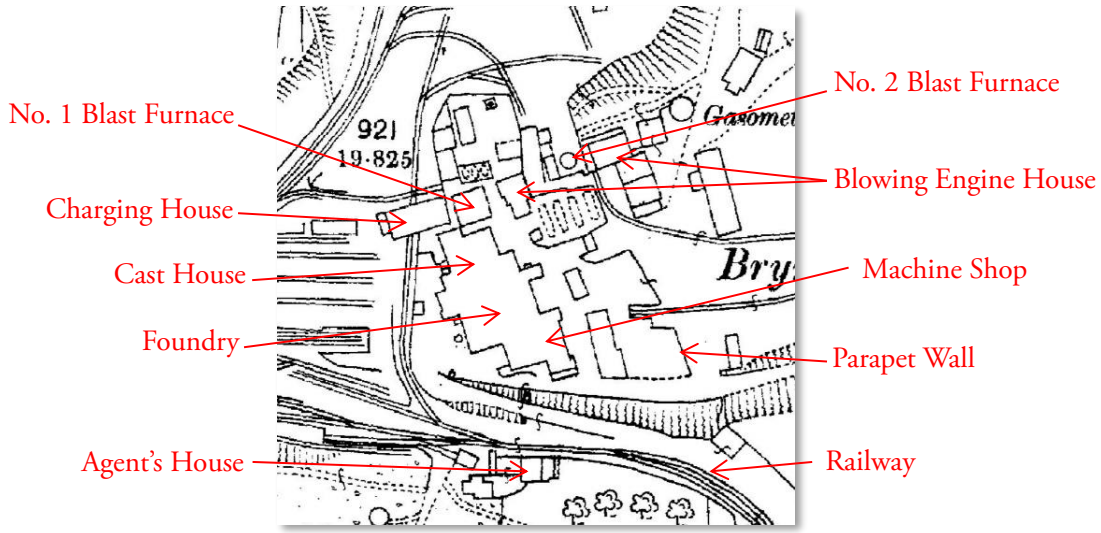

Fig. 9 – 1873 25 Inch to One Mile, OS.
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5.3.5 By 1899 (***Fig. 10***), the second edition map shows Brymbo Steelworks, incorporated in 1884, with its new mill developed on a large slag mound to the east of the ironworks. The map clearly demonstrates the addition of No. 4 Blast Furnace and the construction of the Charging Wall, which had been built just four years before its publication. The map is a little unclear, but shows the development of new stacks and buildings associated with the development of No. 4 Blast Furnace. No. 2 Blast Furnace survived this development and remains to the west of No. 4. Between the first and second editions, the railway had also expanded significantly with the addition of third and fourth lines to the northern and western approaches. The map also demonstrates that the Agent's House becomes linked with the railway at this time. At some point between the first and second editions the Carpenters Workshop was added to the rear of the Patternmakers Workshop (Machine Shop of 1843). The quarry shown on the First Edition map to the south-west of the Agent's House was already out of use by this time.

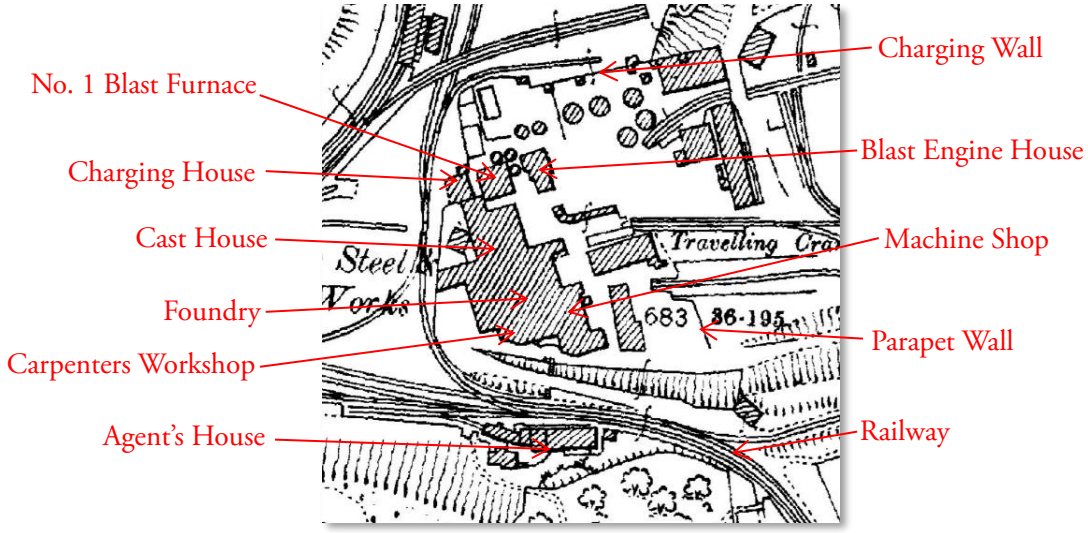

Fig. 10 – 1899 25 Inch to One Mile, OS.
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5.3.6 The 1912 (***Fig. 11***) map demonstrates the continued expansion of the works, most notable being the demolition of No. 2 Blast Furnace and the building of No. 5 and its infrastructure. This included the new sunken iron lines, which took molten iron direct to the Casting Shop via rail. The charging bridges are shown for the and span from the Charging Wall to the tops of No. 4 and 5 blast furnaces, something omitted from the 1899 map. The Power House also appears drawn for the first time. The railway is altered with the new works, with the Agent's House becoming further developed with additions of extensions to its western end.

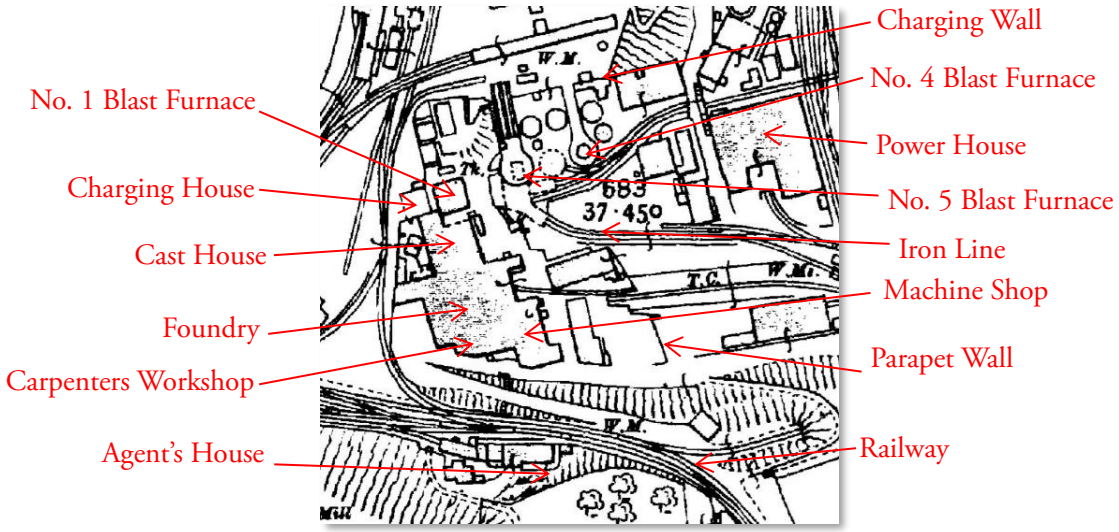

Fig. 11 – 1912 25 Inch to One Mile, OS.
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5.3.7 The next edition of the 25 Inch to One Mile, by now referred to as the 1:2,500 scale, is produced in 1963 (***Fig. 12***). This map shows large developments within the historic ironworks site including the demolition of No. 4 Blast Furnace, the covering of the sunken iron line with a cast house, construction of the 1921 Machine Shop, the Smithy to its immediate north, and tanks and chimneys to the face of the Charging Wall. By this time, the additions to the Agent's House have been demolished, returning the property to the size shown on the section of 1812. A range of new, small buildings are built to the immediate west of the Power House, likely incorporating some elements of the buildings shown on the 1912 map.

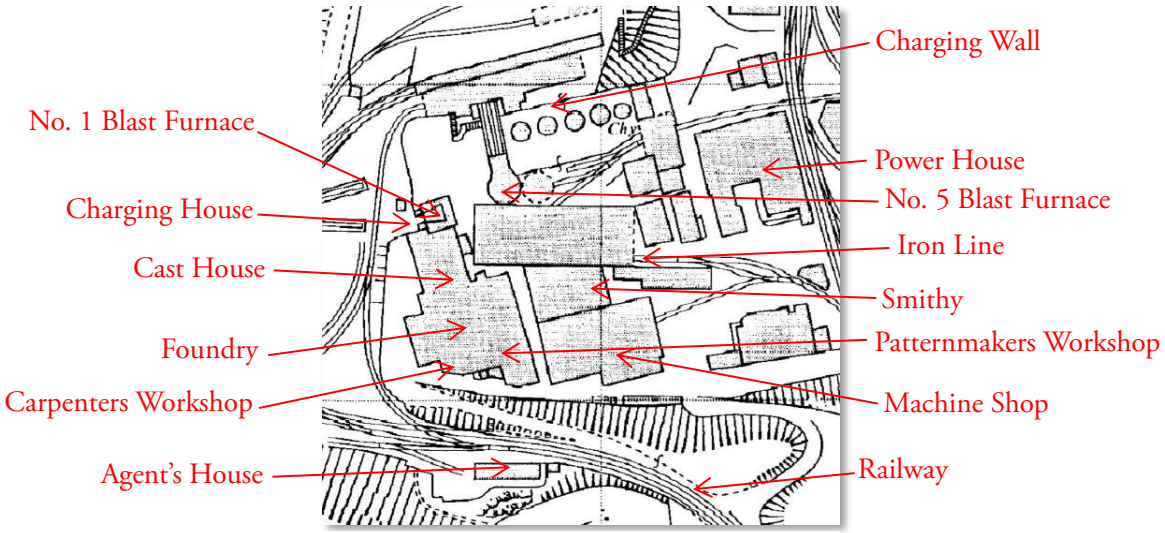

Fig. 12 – 1963 1:2,500 map, OS.
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5.3.8 The map of 1984 (***Fig. 13***) was the last to be produced before the closure of the works in 1990. As such, the map shows the plant in its most developed state. The most obvious changes are the upgrade works to No. 5 Blast Furnace, which came in the 1960s and 1970s, when the charging of the furnace was mechanised. This is clearly shown with a new charging ramp from the top of the Winch House to its north-west, with the associate ore bins. The small range of buildings to the west of the Power House have been demolished to make way for a new works building. The tanks and chimneys seen to the south of the Charging wall have also gone.

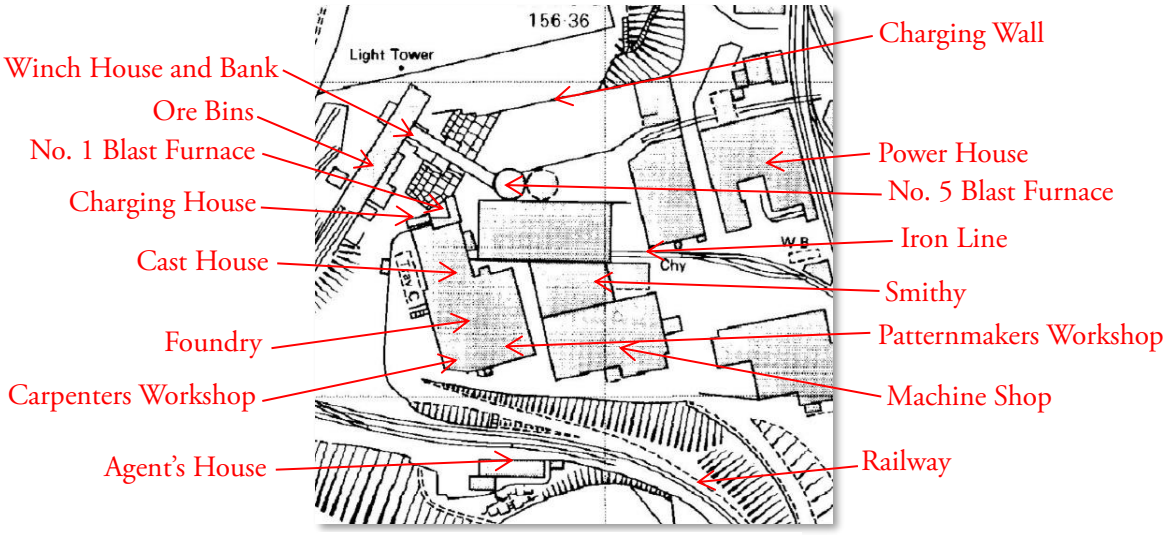

Fig. 13 - 1984 1:2,500 map, OS.
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5.4 Landscape Development

5.4.1 The landscape of the Brymbo iron and later steel works has seen a complicated development, having been transformed by heavy industry and the waste it produces. At Brymbo, as with any other large-scale metal producing operation, these changes can be attributed to two main elements. The first is the tipping of slag and spoil from the industries of Brymbo, namely iron, steel and coal. The production of iron slag and coal spoil from industrial activity was disposed of by tipping in unutilised areas of the site, typically in locations that were quickly and easily accessible from the main works. This deposition of material, in time, supported the second which utilised waste material to level and landscape the site to enable the development and expansion of the late 19th century steelworks.

5.4.2 The earliest area of landscaping was that undertaken by Wilkinson between 1792-3, when part of the site was levelled an area for the siting of his new ironworks. Reference is given to this levelling, with the construction of a parapet wall, by James Watt Jr. in a letter to his father, where he notes Wilkinson has spent £20,000 on this landscaping (Soldon, 73). Today, this area forms the lower part of the site around the Scheduled Area. Importantly, some of this early landscaping works survive, including the parapet wall within the Machine Shop of 1921, elements of the Charging Wall to the rear of No. 1 Blast Furnace, and the retaining wall to the south of the site road (bounding the Machine Shop and Carpenters and Patternmakers Workshop).

5.4.3 From the beginning of industrial activity, waste from the ironworks and coal mining began the transformation of the site. Waste is known to have been deposited into the valley to the east and within a small vale to the west, with cartographic evidence and reclamation work by Brymbo Developments Ltd confirming this (pers. comms. Andrew Foster 2014). Waste to the east filled the valley, with enough deposited by the 1880s that the Brymbo steel plant was constructed newly levelled ground (1872-1899, Denbigh XXVIII). To the west, waste subsumed the original road through the site, causing the rear of the lower site to be filled (behind the Cast House, Foundry and Carpenters and Patternmakers Workshop) and a new roadway formed in the bank to the north of the Agent's House. This landscaping enables the laying of railway tracks to transport materials around upper site and for export.

5.4.4 With subsequent development and redevelopment of site infrastructure and buildings, it is probable that demolition material has been used as fill associated with landscaping. As such, the waste deposits and infill across the site may contain deposits and materials relating to the development of the site.

5.4.5 As a result of historic activity, the site has been subject to a complex landscape development and is likely to preserve historic land surfaces associated with the works early development, with potential for the survival of land surfaces, structures and buildings.

6 ARCHAEOLOGICAL ASSESSMENT RESULTS

6.1 Introduction

6.1.1 The results of Phase 1 of the Archaeological Assessment are presented in **Appendix 2** as a gazetteer of individual archaeological assets. Each asset has been entered into a Microsoft Access database, using the fields as detailed in 4.2.2.

6.1.2 The aim of this results section is to provide a summary assessment of the ironworks, drawn from the larger gazetteer. As such, it will seek to keep the descriptions and reasonings brief and intelligible, with archaeological potential, significance and impact of development assessed at ***high, moderate*** and ***low***. These criteria will be assessed based on the below.

6.1.3 The assessment has been made with consideration to the criteria for scheduling, in this case for determining significance, laid down in the Welsh Government's *TAN 24: The Historic Environment; Annex A: Scheduled Monuments* (2017), and considers the following criteria:

- Period
- Rarity
- Documentation
- Group Value
- Survival/Condition
- Fragility/Vulnerability
- Diversity
- Potential

6.1.4 The assessment also uses the four values that need to be considered when assessing significance, these are set out in the Welsh Government's *TAN 24: The Historic Environment; Annex B; Listed Buildings* (2017) and Cadw's *Conservation Principles for the sustainable management of the historic environment in Wales* (2011)*:*

- Evidential Value
- Historical Value
- Aesthetic Value
- Communal Value

6.1.5 The impact of any potential development to the site has been considered using the *Significance of Impact*, as set out in *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011). This table provides a framework to assess the scale and severity of change against the value of the heritage asset, with the impact ranging from neutral to very large.

6.1.6 Understanding value is subjective beyond any statutory or registered designation and is based on the professional experience and knowledge of the assessor. Other factors do contribute to the overall assessment of value (and significance) of heritage assets and the assessment criteria above contributes to an overall robust assessment framework.

6.1.7 This is not a statement of significance, but instead provides a baseline document from which one can be produced.

6.2 Archaeological Assessment

6.2.1 The archaeological potential of the individual structures within the study area are described in depth within the gazetteer in Appendix II. This section summarises the collective archaeological potential of Brymbo Ironworks as a group of features and assets of historic significance.

6.2.2 The overarching archaeological potential for Brymbo Ironworks should be considered as high as a significant resource for understanding the historical development of a late-18th century ironworks into a late-19th and 20th century steel plant. There is the potential for archaeological deposits and remains, both disturbed and undisturbed, across the entire site. Importantly, the building up and levelling of the site using waste materials from the works, have the potential to preserve, either intact or as substantial remains, buildings, infrastructure and landscapes which pre-date the site or were part of the earliest developments at Brymbo. The standing buildings, machinery and infrastructure at the ironworks, also provide a valuable and very tangible archaeological resource for understanding their construction, development, production methods, alterations and change of use for both archaeologists and the general public alike.

6.2.3 The assessment has also demonstrated that the significance of the ironworks should also be considered high. Brymbo is a surviving example of a late-18th century ironworks and its transition to a late-19th and 20th century steelworks. The association with a number of key industrialists, predominantly John Wilkinson, Henry Robertson and the Darby family, link the ironwork to figures of national and international importance for the roles they played in industrialising a nation. The surviving upstanding and buried structures and deposits relating to all phases of the development of the site demonstrate the continuous nature of the industrial processes in action at Brymbo, from iron and coal, to steel, the railways and development of specialist alloys and materials. As such, the remains associated with all periods of activity at Brymbo contribute to the overall significance of the site and our understanding of its development. Any removal or alterations, particularly of later assets which are commonly seen as being of lesser value, should be carefully considered to determine what the impact of such changes could be for the future interpretations and understanding of the site. Importantly, in recent years, the aesthetic qualities of the former ironworks have become somewhat iconic; the oxide red of the cupola furnaces against the green valley and blue sky, the solidity and stoutness of No. 1 Blast Furnace, and the Machine Shop striking out towards the east.

6.2.4 Any plans that will require material alterations and additions to facilitate the transition of the former works will need to be undertaken in the best interest of preserving the site as a heritage attraction and education centre. As such, any proposed scheme will need to play an important role in the preservation and ongoing maintenance of the site, without which the ironworks is at risk of further decay and therefore may be seen as beneficial and a positive outcome.

6.2.5 Phase 1 of the assessment has shown that the works at Brymbo not only supported the transformation of this area of Denbighshire (historic county) into a busy industrialised region in north-east Wales, but that it also had a profound and lasting impact on the surrounding landscape and community. From the earliest days of Wilkinson's Plasnewydd Works, waste from the site formed and filled the landscape, physically transforming the valley in which the ironwork, and later steel plant, existed and contributed. With most of the late 19th and 20th century steelworks

now demolished, the surviving elements within the heritage area provide tangible evidence of the larger industrial landscape and production of Brymbo.

6.2.6 It is important to remember that Brymbo Ironworks not be seen as only a Wilkinson site, but a multi-phase, multi-era industrial complex, each of which made significant contributions to the British and Global iron and steel industry, and an important location in the world's first industrial nation – Wales.

6.3 Archaeological Recommendations

6.3.1 **Archaeology:** As a result of the complex nature of the sites development, the potential for archaeological deposits, features and remains is significant and could support further interpretation and understanding. It is therefore recommended that any proposed work within or outside of the Scheduled Area is subject to an archaeological evaluation in advanced of commencement of ground or construction works.

6.3.2 However, if it can be demonstrated with confidence that the area to be affected has been subject to disturbance to the point where no new information can be reasonably expected to survive or only superficial levels will be affected, other provisions for archaeological supervision may be put in place. In such instances an archaeological watching brief may be put into effect, with a 'stop' caveat put in place should unknown remains be encountered during the course of works. In the even such discoveries are made, a meeting should be convened between the BHT, Cadw Inspectorate, LPA and archaeological contractor.

6.3.3 **Historic Buildings:** All conservation works and structural alterations to the buildings should be subject to the production of an archaeological record. This should take the form of a Level 2 or Level 3 Historic Buildings Record as laid down by Historic England's *Understanding Historic Buildings; a guide to good practice* (2016). Any planned works to the Scheduled Monument should be recorded in detail, through the production of a written, photographic and drawn record to a Level 3 standard. For any dismantling and rebuilding works, an archaeological method for the recording and reinstatement should be produced and communicated to all parties to ensure the integrity of the monument.

6.3.4 **Reporting:** All archaeological works should be reported in accordance with the standards laid down by the Chartered Institute for Archaeologists and Historic England. At a minimum, reports should contain a descriptive, photographic and drawn records.

6.3.5 On completion of the Brymbo Heritage Trust's project, provision should be made for the production of a final report to consolidate all the information gathered and documented as a result of archaeological and historical programmes of work.

6.3.6 **Publication:** On completion of the grey literature reports, an article should be prepared for publication in the Industrial Archaeology Review, the journal of the Association of Industrial Archaeology, and Archaeologia Cambrensis, journal of the Cambrian Archaeological Association.

7 ARCHIVING

7.1 The results of the Archaeological Assessment are this written report, interpreted survey, and photographic archive. This will be held by ArchaeoDomus Archaeological & Heritage Services and will be deposited with the regional HER, and the NMR. A PDF copy of the report will be made available from www.archaeodomus.co.uk.

8 SOURCES

8.1 Written Sources

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8.1.5 **Riden, P. & Owen, J. G.** 1995, *British Blast Furnace Statistics 1790-1980*. Merton Priory Press Ltd, Cardiff.

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8.1.7 **Historic England.** 2016, *Understanding historic Buildings; A guide to good practice.*

8.1.8 **CIfA,** 2014, *Standards and guidance for the archaeological investigation and recording of standing buildings or structures.*

8.1.9 **CIfA**, 2014, *Standards and guidance for an archaeological watching brief.*

8.1.10 **Welsh Government,** 2017, *Planning Policy Wales; Technical Advice Note 24: The Historic Environment.* Crown Copyright.

8.1.11 **Welsh Government,** 2018, *Managing Scheduled Monuments in Wales.* Crown Copyright.

8.1.12 **Welsh Government,** 2019, *Understanding Scheduling in Wales.* Crown Copyright.

8.1.13 **ICOMOS**, 2011, *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties.* United Nations Educational, Scientific and Cultural Organisation (UNESCO)

8.2 Online Sources

8.2.1 British Geological Survey

Accessed: April 2018

www.bsg.ac.uk

8.2.2 UK Soil Observatory

Accessed: April 2018

www.ukso.org.uk

8.3 Maps

8.3.1 1873 OS 25 Inch to One Mile Map First Edition – Denbighshire XXVIII.2

8.3.2 1899 OS 25 Inch to One Mile Map Second Edition – Denbighshire XXVIII.2

8.3.3 1912 OS 25 Inch to One Mile Map Third Edition – Denbighshire XXVIII.2

8.3.4 1963 OS 1:2,500 Map Fourth Edition – Denbighshire XXVIII.2

8.3.5 1984 OS 1:2,500 Map Fifth Edition – Denbighshire XXVIII.2

8.3.6 Plan of the Brymbo Estate in the Parish of Wrexham and County of Denbigh the Property of John Wilkinson Esq. Surveyed in 1798 by T. Williams. National Library of Wales.

9 GLOSSARY

Bell Top	Mounted to the top of the blast furnace and used to control the temperature and entry of raw material.
Blast Engine	Steam or gas-powered engine used to provide air compression to supply the 'blast' to the furnaces.
Blast Furnace	A type of furnace used for the production of pig iron from raw constituents.
Buttress	Large masonry structures used to support other structures, often used when other buildings are subsiding.
Casting	The method of producing fully or semi-formed parts or items by pouring molten metal into a single or two-part casting mould.
Cast House	A building where pig iron beds are housed for the tapped molten iron from the blast furnace to run.
Charging Floor	An area to enable the loading of metal into the charging doors of cupola furnaces.
Charging House	A building where the materials for 'charging' the blast furnace are weighed before loading.
Charging Wall	The high wall behind a blast furnace, on top of which a Charging House is usually located. Usually acts as a retaining wall to higher ground.
Coke	High carbon fuel produced by heating coal in ovens to drive off impurities.
Cowper Stove	A regenerative heat exchanger which uses the heat of the blast furnace to pre-heat the air blown into the furnace.
Crucible	A ceramic or metal containing in which metals or other substances are melted.
Cupola	A freestanding vent rising from the ridge of a building to provide ventilation.
Cupola Furnace	A type of furnace used for melting cast iron and some bronzes, which can be manufactured in almost any size.
Dry Blast	The method of using refrigeration to remove moisture in the air before it is forced under pressure (blast) into the furnace.

Fire Brick	Sacrificial brick used for use in high temperature environments such as lining furnaces, kilns and fireboxes. Used to protect furnace structures.
Flux	A chemical cleaning agent used to purge the iron of impurities, such as phosphorus, and to render the slag in a more liquid state at smelting temperatures.
Foundry	A building used for the production of metal castings; whereby molten metal is pored into moulds.
Gas Washer	Tower-like structure used to clean dust and contaminants from the blast furnace exhaust gasses using water and water spray.
Green Sand	A casting sand which contains water, minerals and organic bonding compounds, usually referred to as clay. The term 'green' is not a literal name, but instead refers to the use of the mixture in an uncured state, such as working with green wood.
Ingot	A block or formed shape of metal for further processing or storage.
Jib Crane	A form of crane consisting of the 'jib' or arm at or near the horizontal, supported by a vertical mast or tower and able to pivot around 360° or part therefore of.
Machine Shop	A building that houses machinery, such as lathes, for the refinement of cast parts or machining of metal blanks into usable parts.
Ore	Natural rock or sediment containing minerals or metals that can be extracted.
Pattern	A form in the shape of the object to be cast and used to form a cavity in a casting mould into which the molten metal will be poured during the casting process.
Pier	Upright masonry structure used to support high masonry walls or overhead superstructures, such as roofs or arches.
Puddling Forge	Metalmaking process used to create wrought iron or steel from the pig iron produced by blast furnaces whereby the fuel and metal do not come into direct contact. More commonly known as a Puddling or Reverberatory Furnace.
Quoin	Masonry blocks at the corner of walls often used to provide stability and strength, whilst also often appearing decorative.
Slag	A waste product left over from the smelting process formed of metal oxides, flux material and silicone dioxide.
String	A decorative course of masonry, often used to delineate between storeys.

Tapping	The process of 'opening' a furnace to release molten metal into pig iron beds or pattern moulds.
Travelling Crane	A crane consisting of parallel runways with a travelling bridge spanning the gap, raised overhead on masonry or metal gantry. Used for lifting heavy materials and objects.
Turbo Blower	A method of achieving air blast by use of compressors driven by steam turbines mounted on a common shaft.
Tuyere	Pronounced 'tweer'. An injector or nozzle through which air is blown into the furnace or hearth under high pressure from a blowing engine or bellows.

APPENDIX I

Maps

&

Plans

Fig. 14 – Plan of the Brymbo Estate. © National Library Wales.

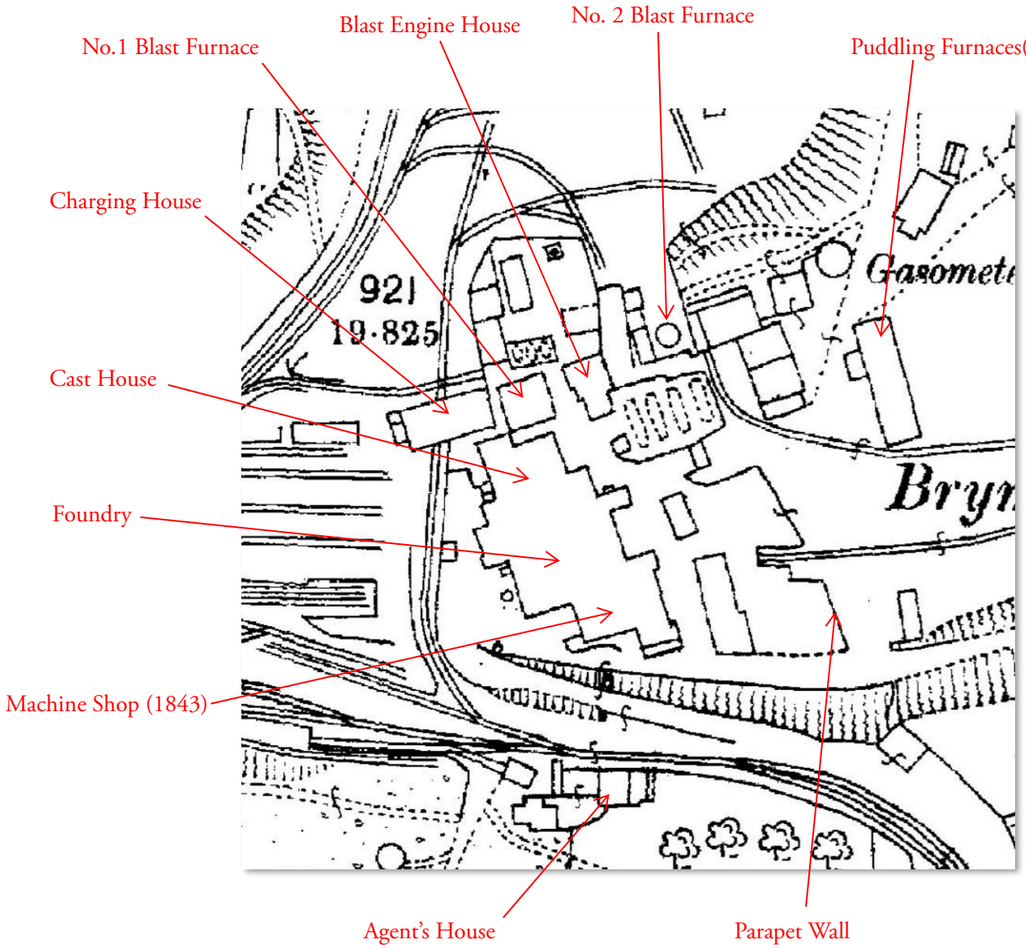

Fig. 15 – 1873 25 Inch to One Mile, OS.
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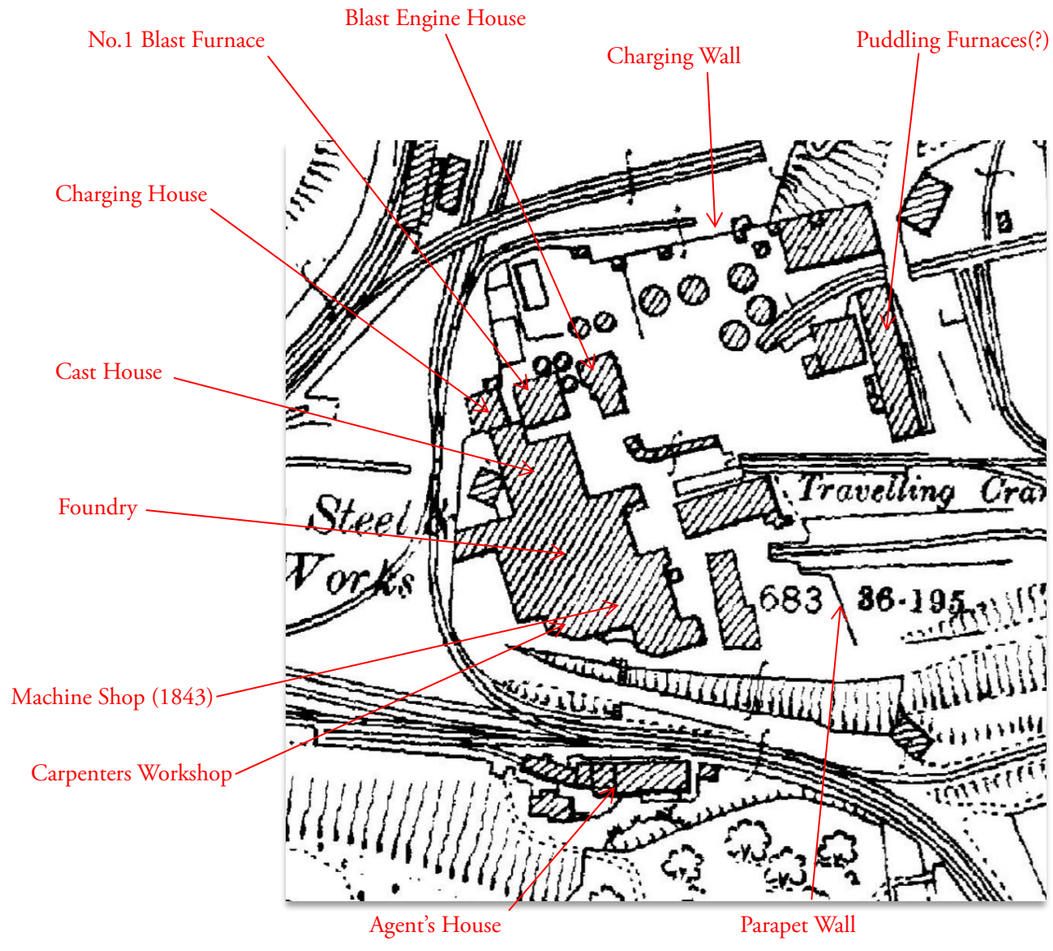

Fig. 16 – 1899 25 Inch to One Mile, OS.
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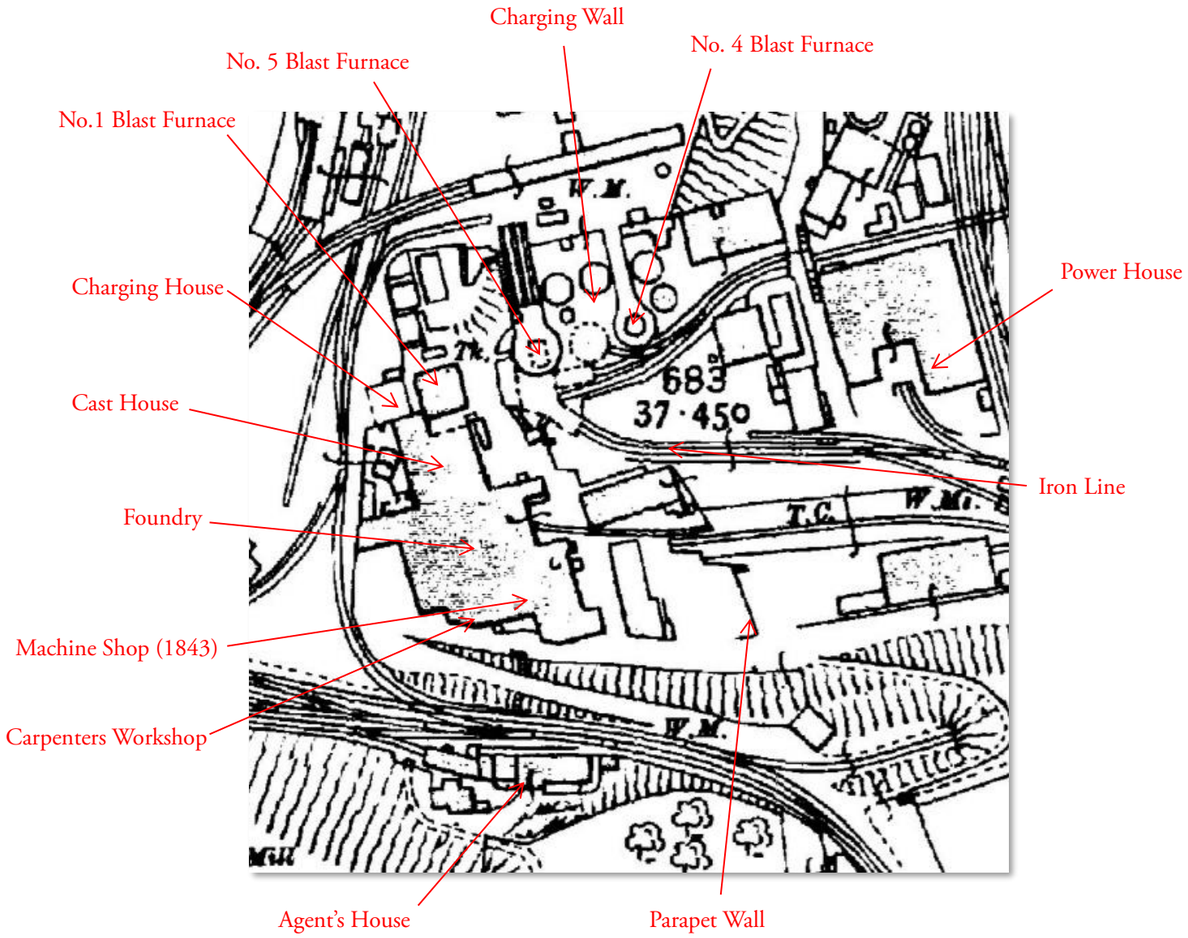

Fig. 17 – 1899 25 Inch to One Mile, OS.
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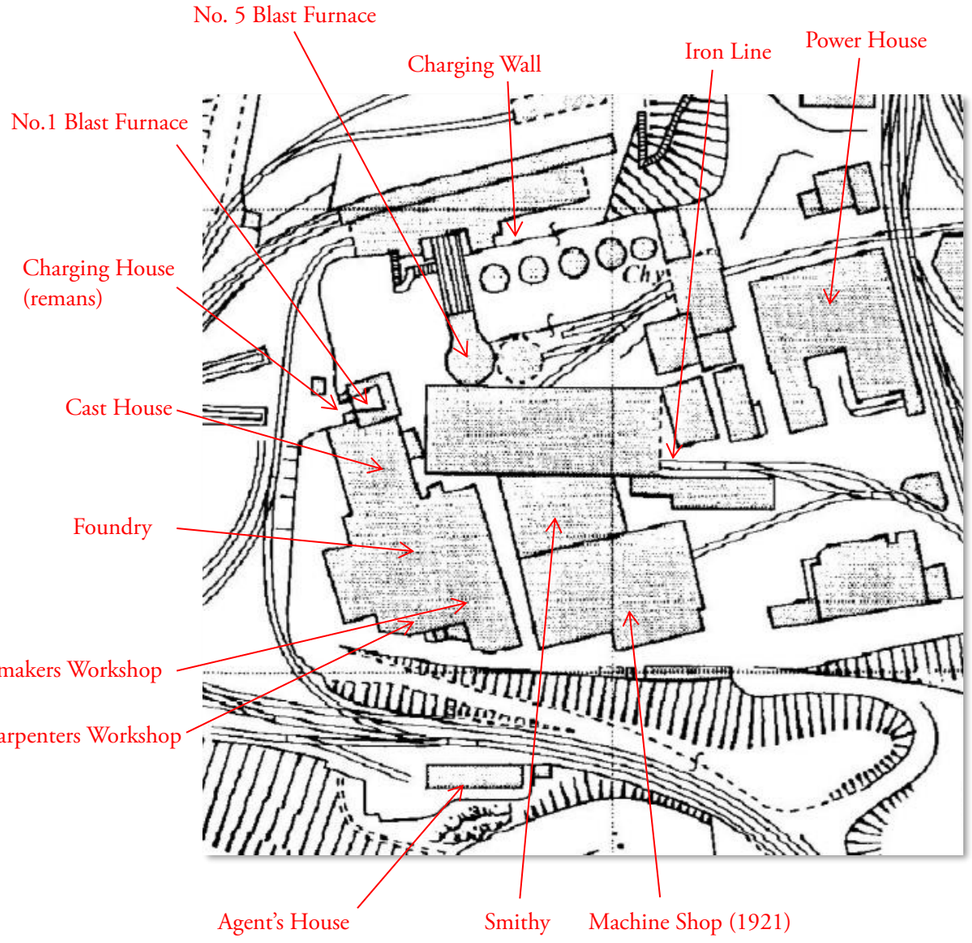

Fig. 18 - 1963 1:2,500 map, OS.
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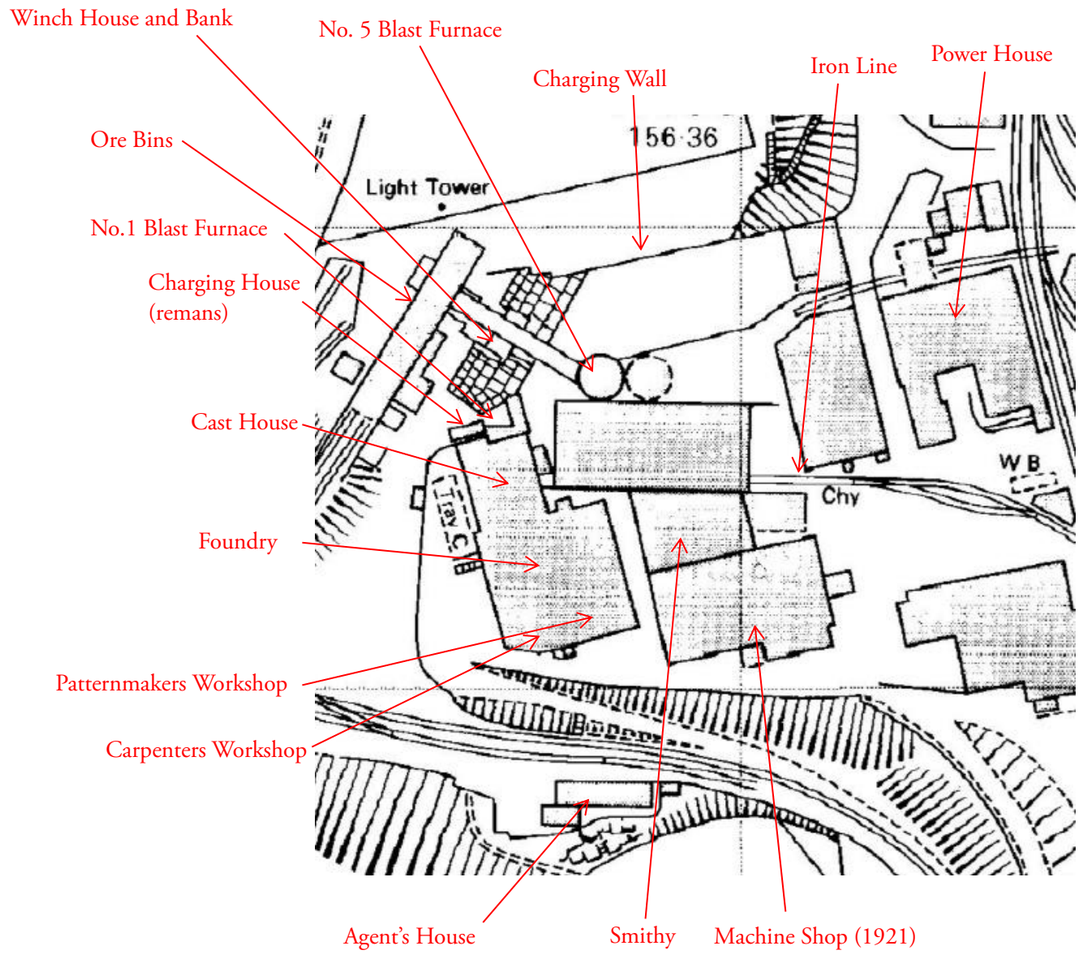

Fig. 19 - 1984 1:2,500 map, OS.
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Site NPRNs

Agents House - 26839; Grade II* 16/F/02 (1)
Blast Furnace - 34055; SAM DE202
Charge Wall - 418127
Fitters Workshop - 418133
Foundry & Cast House - 34056; SAM DE202
Pattern Store - 418128; SAM DE202

Brymbo Iron Works

Master Planning Day 1 - Scoping

Site Plan

NPRN: 34054

NGR: SJ 2944 5355

Surveyed: Ross Cook

10 0 10 20 30 metres
30 0 30 60 90 feet

CBHC RCAHMW

Noddir gan Lywodraeth Cymru
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Fig. 20 – Plan of the former Brymbo Ironworks - 2015

Fig. 21 – Carpenters and Patternmakers Workshop. ArchaeoDomus 2015. AD006.

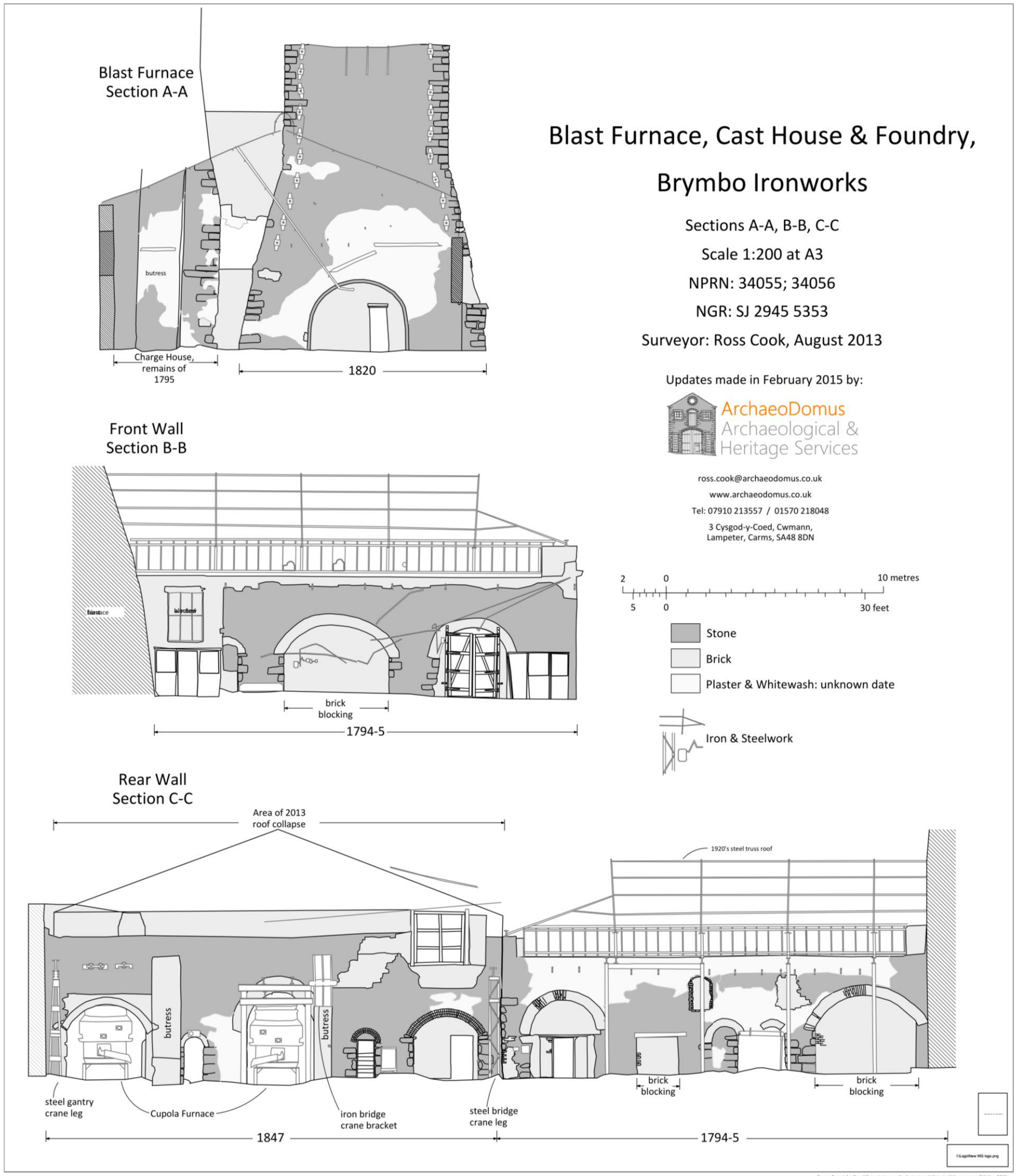

Fig. 22 – Blast Furnace, Cast House and Foundry Sections. ArchaeoDomus 2015. AD006.

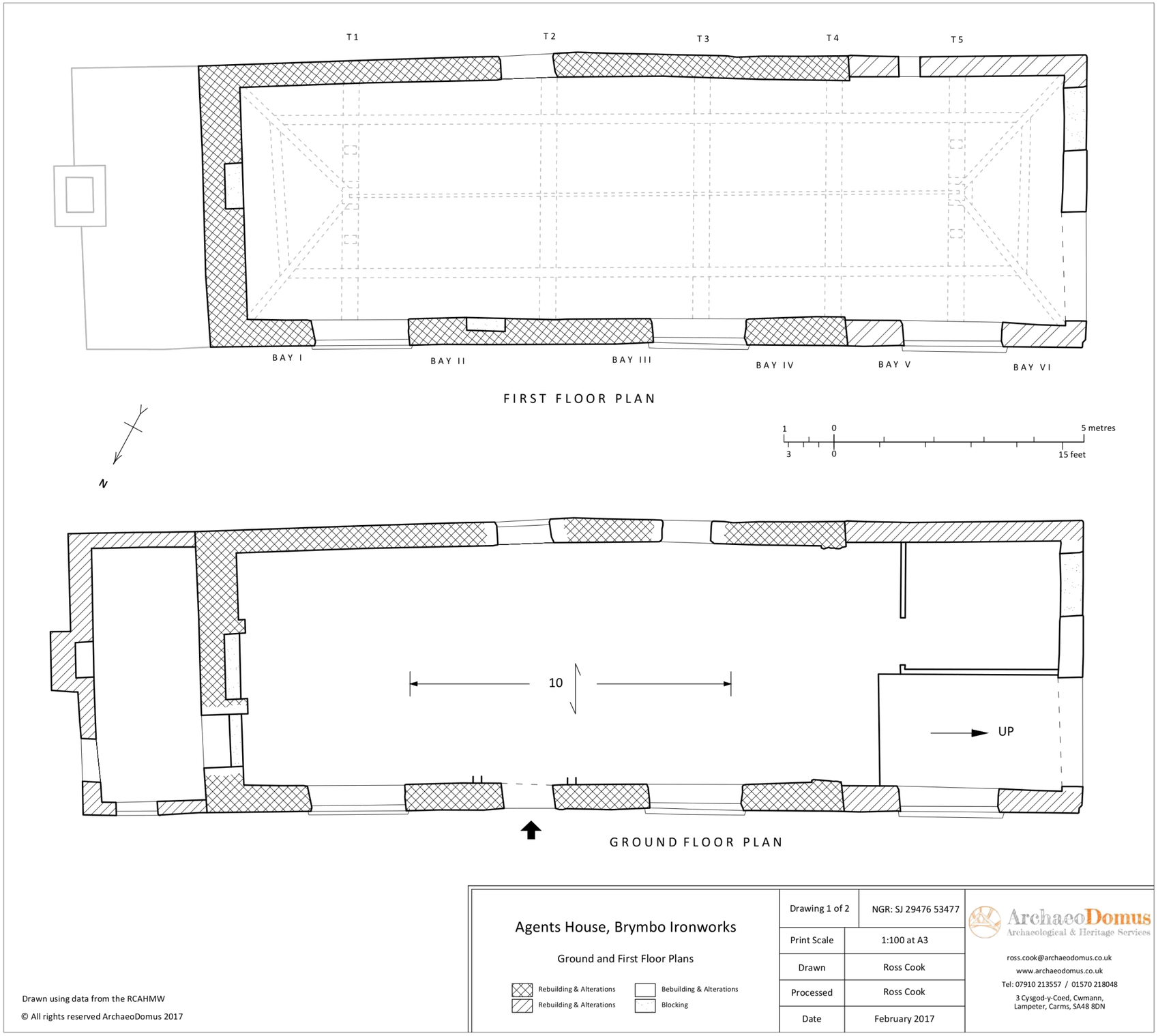

Fig. 23 - Agent's House. ArchaeoDomus 2017. AD031.

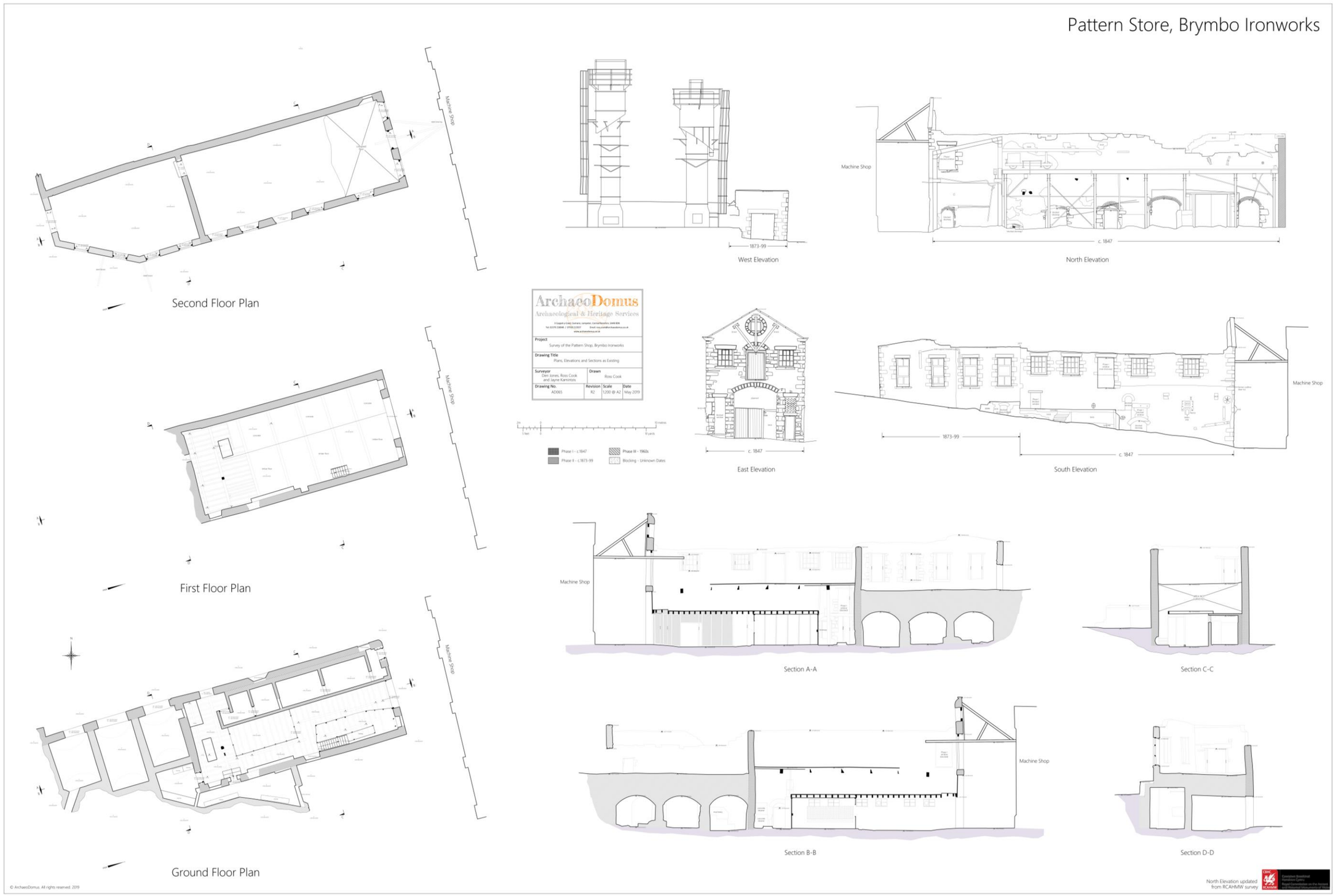

Fig. 24 – Survey of Patternmakers and Carpenters Workshop. ArchaeoDomus 2019. AD065.

APPENDIX II

Gazetteer

Entry Number
1

Asset Name
Former Brymbo Ironworks / Brymbo Steelworks

Date Range	Asset Number	Asset Type		
1792-1990	Not Attributed	Site		
NPRN	NGR	Scheduled	Listed	ID
34054	SJ 29476 53532	☑	☑	SM DE202 / LB 1731

Description

Brymbo Ironworks is located at the southern edge of the village of Brymbo, in the County Borough of Wrexham, historically being Denbighshire. The site runs uphill from east to west, with the lowest and most level part of the site bounding the western edge of an unnamed road (leading from Phoenix Drive). The lower part of the site sits within a cut into the hillside, with Blast and Charge Walls bounding the site to the north and west; the Brymbo Enterprise Centre is located above the site to the north. Blast Road bounds the site to the west (lower site) and north (upper site), with the south bounded by a track, with sparse woodland and fields beyond. The Ironworks sits at an elevation of circa 330m.

Today the site comprises of several early buildings from the Plasnweydd Works period at Brymbo as constructed by Wilkinson in the 1790's; the Cast House, Agents House, Charge House, and Parapet Wall; Thompson's rebuilding of the blast furnace in 1820, and the additions made by the Darby's and Robertson in the 1840's; Foundry, Machine Shop, and Blast Walls; the 1920's Fitter's Workshop also remains.

History

In 1792 John 'Iron Mad' Wilkinson purchased the 500-acre estate of Brymbo Hall for the sum of £14,000, with the intention of developing an iron works using the mineral and coal deposits that were known to exist on the site. With the invention and development of the steam engine Wilkinson was able to found an iron works away from running water as steam power could provide blast for blast furnaces.

Brymbo Hall became Wilkinson's primary residence, where he spends considerable money to upgrade the house, including new panelling, windows and carpets (likely referring to rugs) for the chambers and principle rooms.

A letter sent by James Watt Jr. soon after Wilkinson's acquisition of the Brymbo estate states that Wilkinson has spent £20,000 on levelling the site, constructing parapet walls and building a puddling furnace (Soldon 1998: 73). An estate map produced in 1798, though likely surveyed circa 1796-8 by T. Williams, names the site as Plasnewydd Works and demonstrates the extent of the site during this early period; the Puddling Forge can be seen at the east of the site and a blast furnace with attached Cast House, Blowing Engine House and Charge House, which post-dates Watts account, located west of the Puddling Forge he describes; whilst there appears to be several other buildings on site at this time they do not represent what remains today. By circa 1796 the core of the site; Blast Furnace (original dem.), Casting House, Blowing Engine House (dem.), Charge House (dem.) and Coke Ovens (dem.); had been completed, with the first output of iron recorded as 884 tonnes (Riden & Owen 1995: 49), thus commencing Brymbo's one hundred and ninety-four year association with metalworking. The cartouche in the lower right corner of the Estate Plan shows the ironworks as it appeared when the map was completed in 1798. Within this initial development the site Wilkinson's blast furnace is depicted in both plan and cartouche form as being cylindrical.

Further development under Wilkinson's management sees the construction of the Agent's House and No.2 Blast Furnace, with associated Cast House, sometime between 1800 and 1809. The Agent's House, although not depicted on the Estate Plan of 1798, was certainly in its present form by the Longitudinal Section of the Strata at Brymbo Colliery of 1809.

In the years between 1792 and 1798 Wilkinson had begun sinking mines near to the site to provide coal and ironstone for his planned works, with a total 8 reported by 1808. A plan of the Brymbo Colliery, dated 1809 and produced by William Rowe, shows the expansion of mining in the Brymbo area, but importantly shows the ironworks as it is in 1809, clearly showing the addition of a second blast furnace.

During his management of the Brymbo Hall estate Wilkinson expanded it to almost 800 acres, to include new farmlands and mineral deposits.

When Wilkinson died in 1808 at the age of 83, the works passed into trusteeship for the next two decades under the guidance of Ann Lewis (his mistress and mother to his only children), William Smith of Birmingham, James Adams and Samuel Foreday of Ettingshall. To survey the wealth of coal seams at Brymbo the trustees commissioned plans of Brymbo Colliery in 1809, then again in 1812, when a long section was also produced, all showing the contemporary ironworks.

In the period following the Battle of Waterloo in 1815, the ironworks saw a slump in its production, resulting from the declining need for weaponry and the continued disputes over Wilkinson's Will. The decision was made to lease the ironworks for a 10-year period and by 1818 John and James Thompson were renting the iron works for a yearly sum of £1,500, with the Wilkinson estate taking in a total of £9,758.16.8d from rents and lets (Brymbo Steel Works Ltd, 1975: 5). In 1820 the original blast furnace was decommissioned by the Thompson brothers and a new furnace commissioned on the same footings, remaining in situ to this day. This rebuilding, recorded in the company history, is confirmed by the Estate Plan of 1798 and Colliery Plans of 1809 and 1812, all of which show the original Wilkinson furnace as cylindrical.

By the late 1827 the Ironworks was in receivership, with a two-year period passing with minimal production taking place. Several years of financial instability and mounting legal costs from the disputed Will led the Chancery to insist that Wilkinson's estate should be sold in order to meet claims. In 1829 a public auction was held at the Wynnstay Arms in Wrexham over the 23rd and 24th April, with all Wilkinson's land acquisitions being sold until the Brymbo Hall estate was back at its 1792 size of 500 acres. John Wilkinson Jr. remained in residence at Brymbo Hall and in late 1829 decided to restart the works using the money gained from the sale of estate lands earlier that year. However, lacking the production and business abilities of his father, the works were again in financial trouble by 1837, when Wilkinson Jr. left overseas. The works continued under the trusteeship of William Rowe until a buyer was found in 1840, a Scotsman by the name of Robert Roy, being financially backed a Scottish bank.

In 1842 Henry Robertson, with high recommendations, was appointed by Robert Roy to undertake an appraisal of the works, concluding a railway was essential to the works continued development. In the same year Robertson, along with Robert Roy, Alexander Ross and William Betts formed the Brymbo Mineral and Railway Company, with the 1844 North Wales Mineral Railway Act being passed to allow construction. Initially this section of the railway was powered by horses, but by 1850, with the desire for greater output, a locomotive was purchased.

In 1840 'The Brymbo Company' was formed, with William and Charles Darby, descendants of Abram Darby, taking over the site's management. Charged with managing and developing the ironworks, the Darby brothers, commissioned a new Foundry and Machine Shop (now the Carpenters and Patternmakers Workshop) in 1843, which remain today. This work made material alterations to the Cast House, removing the gabled south elevation and inserting new archways onto the east and west walls. In 1847 a new blowing engine was installed, taking the blast furnace output from 50 to 84 tonnes per week.

In 1856 new hot air stoves were built to preheat the blast, with bell-tops added to the furnace to reuse the hot gasses to heat the boilers and stoves, therefore making savings on the amounts of coal required. A note in the company records states that No. 1 Blast Furnace was, at one time, in continuous blast for 32 years with the same firebrick lining. By 1880, bell tops were added to the furnaces, alterations were undertaken to the foundry and in 1872 No. 3 blast furnace was erected with a Haigh Blowing Engine to increase iron output.

Continued expansion from the mid-19th century, saw the requirement for expansion of the Machine Shop to supply parts to and maintain the new steel plant. A new brick extension was added to the south-east corner of the Machine Shop commissioned by the Darby brothers in 1843.

On 13th April 1880, the fuel consumption No. 1 Blast Furnace is recorded as 10.22 cwts (hundredweight) of coal and 26.6 cwts of coal per ton of iron, making a weekly consumption of 134 tons. The same month, on 30th April, the proportions of materials used to charge the furnace were recorded as: Coal 10.22%, Coke 26.60%, Native Mine (ore) 27.84%, Northampton (ore) 0%, Desada (ore) 9.34%, Guton (Spanish) (ore) 4.60%, Bilbao (ore) 4.60%, Irish (ore) 0%, and Limestone (flux) 16.80%. A month later, on 28th May 1880, the blast temperatures at the tuyeres were recorded as North 1020°F, East 1110°F, South 980°F, and West 1080°F.

Communications were improved in 1877 with the installation of a Wheatstone Telegraph and by 1880 telephones had made their way to the iron works.

In the last decades of the 19th century, steel starts becoming a production priority and in 1883 an experimental Open-Hearth steel furnace was erected, with the results being so successful that Robertson made the decision to found a steel plant. On June 4th 1884 The Brymbo Steel Company was incorporated and its operations began the following year.

In 1894, No. 4 blast furnace was constructed to replace No. 3, and was equipped with three Cowper stoves, a dust catcher and three Lancashire boilers blown by a Davy Engine. It was at this time that the large Charging Wall to the north of the site was built, to help enable No. 4s development. In the same year, No. 1 blast furnace was damped down for the last time after 74 years of work and retained as a sand hopper for the Cast House.

In the late 19th century, the Foundry is upgraded, with the addition of two cupola furnace, although not at same time.

April 1902 sees the commissioning of the new Power House, which brings 3 phase electric generation to Brymbo. Power was produced by an electric alternator powered by a 125hp Westinghouse Gas Engine. In the following year, 1903, a Theissen Gas Washer was installed to wash the blast furnace gas, which in turn was used to drive turbines in the Power House.

In 1908, No. 5 Blast Furnace was commissioned, which would be the last of the iron furnaces built at Brymbo. In October 1908, the new furnace was lit by Peter Williams, the recently appointed General Manager of the works, who had taken over from J. H. Darby earlier that same year. With the construction of No.5 a new, sunken iron line was built to carry molten iron from the furnace to the Casting Shop to the east.

In 1910 bosh tuyeres were used for the first time at Brymbo in an attempt to increase output from No. 5 by starting reduction of ore higher up the furnace. However, the results proved this not to be the case. In the same year refrigeration units were installed for the testing of 'dry blast' in an attempt to improve the iron to a grade containing less than 1% silicon, which could be used in basic open-hearth steel furnaces. After 2 years of trials, this was also abandoned. From 1912, No. 5 will be the only operational blast furnace at the plant.

With increased steel production and the requirement for constant maintenance and upgrades, combined with continued investment in the plant since the WWI, a new machine shop was commissioned and built in 1921. Integral to the build was the installation of the large overhead Travelling Crane by the Vaughan Crane Co. It has SWL (safe working load) of 7½ Tons and was electronically driven and operated, which was usual for new machinery and tools at the works during this period.

In the post-war period the steelworks upgrades from gas to electric furnaces, with demand driving the increased production of silicon steel for transformer cores. For part of the 1920s, silicone steel becomes a major output from the plant during a time of national electrification.

By the 1930's the demand for iron had decreased sufficiently that it became a minor part of the works, with steel the focus at Brymbo.

Little is recorded of the earliest part of the site from 1912, with steel being the primary concern. The only noted development in the first half of the 20th century, since the development of No. 5, is the refitting of the Foundry. This comes at the height of WWII, when in 1943 new overhead travelling cranes from Joseph Adamson & Co. Ltd. were installed to carry crucibles for heavier pours from the cupolas.

The next period of major development in the production of iron comes in November 1964, when the decision was taken to modernise No. 5. At this time the furnace was still being charged by hand, using a system of barrows. This upgrade introduced a winched mechanism for loading the furnace, with the Winch House (B10) built for this purpose. A new double bell top, fume emission system, gas cleaning and the replacement of the old Blast Engine of 1894 for a turbo-blower unit. In February 1965, the furnace was relit by Mrs. E Davies, wife of the Managing Director of the plant. In 1966, a gas cleaning installation was completed, with a scrubbing tower to remove dust from the gas, a thickening plant to settle the dust in water, and a cooling tower to enable the waste water to be reused. On 28th June 1967, No. 5 set a new weekly record with an output of 2,123 tons produced. In 1969, further upgrades were made to No. 5, with new hot blast stoves, gas cleaning plant, new boiler and new turbo-blower. These additions increased the output to 3,000 tons per week. 1970 saw the decommissioning and removal of the Davy Blowing Engine, which had been operational at the site for the last 70 years. On 15th July 1971, No. 5 was blown out for a reline and was relit on 15th September the same year. Four years later, No. 5 was blown out at the end of May 1975 for relining and general maintenance works, being relit by the wife of the Technica Director, Mrs. O. Harris, on 3rd May 1976. The record weekly output for a blast furnace at Brymbo was held by No. 5, which produced 3,349

tons during the week of 1st December 1973.

In the 1970s, new cupola furnaces (S32/S38; S33/S37) were installed to the Foundry, in conjunction with the fabrication of a new façade and roof in steel frame. The cupola furnaces were designed by Walter and a colleague, which were then manufactured at the works. When in operation, each furnace was producing 2 tonnes per week.

In 1973, Brymbo Hall was demolished to make way for an open cast mining operation.

The works closed in 1990, with the loss of all jobs and a rich industrial heritage.

Condition

Archaeological Potential

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
2				
Asset Name				
Old Number One Blast Furnace / No. 1 Furnace				
Date Range	Asset Number	Asset Type		
1820	S01	Structure		
NPRN	NGR	Scheduled	Listed	ID
34055	SJ 29448 53554	☑	☐	Part of DE202

Description

Furnace of 1820. Built of dressed sandstone with firebrick lining. Measures c. W 11m x D 11m x H 14.5m. Latterly used as a hopper for green sand.

Old Number One is constructed to the rear of the lower part of the site, with sufficient rise behind for the construction of its Charging House, which obscures its west elevation along with building B11; the north elevation is partially covered by the Winding Slope S22.

The furnace is constructed of large, dressed sandstone blocks, bonded in lime mortar beds, with an interior lining of fireclay brick; the lining usually being replaced at 5 year intervals. The furnace tapers as it rises over the first 8.7m in height, before continuing vertically to its apex at 14.5m.

There are four arches at ground level, three of which (north, east and west) enabled blown air to the furnace through three tuyeres (pronounces 'tweer'). The fourth arch (south) faces into the cast house, where the molten iron was tapped into pig iron beds.

The east elevation has a large repair of black slag bricks. The arch to the east elevation has a red brick lining. 10 large iron ties to each corner provide support to the structure. To the top of the elevation are iron brackets, which support the remains of the bell-top. A stone 'pillar' form the lower quarter of the south-east corner.

The north elevation is largely obscured by the Winding Slope (S22). 10 large iron ties to each corner provide support to the structure. To the top of the elevation are iron brackets, which support the remains of the bell-top. The tope 12 courses of the stonework are bulging.

The south elevation faces into the Cast House (B04). The sandstone arch is supported by a brick arch, and once allowed access to the tapping hole to cast the molten iron into the pig iron beds; this is now blocked with cement blocks to create a storage room. 10 large iron ties to each corner provide support to the structure. To the top of the elevation are iron brackets, which support the remains of the bell-top. The scar of the Cast House roof can be seen. The lower south-west corner has been repaired in red brick. A vent pipe runs from the store to roof level. This elevation was whitewashed within the foundry.

The west elevation is obscured by the former Charge House and building B11. Large iron ties to each corner provide support to the structure. To the top of the elevation are iron brackets, which support the remains of the bell-top.

Internally the firebrick lining is covered in iron slag. An iron lintel sits above the southern archway, which is likely to have been water cooled. Greensand remains in the bottom of the furnace from its time as a sand hopper to the Foundry.

History

Old Number One Blast Furnace is the only surviving furnace of six furnaces built at Brymbo between circa 1795 and 1908. In 1818 the ironworks was leased to John and James Thompson, following a slump caused by the end of the Napoleonic Wars. At this time, the original Wilkinson furnace was decommissioned and a new furnace was built by the Thompson brothers in 1820, occupying the same location to make use of the existing Cast House and Blast Engine. In 1856 new hot air stoves were built to preheat the blast, with bell-tops added to the furnace to reuse the hot gasses to heat the boilers and stoves, therefore making savings on the amounts of coal required. A note in the company records states that Old Number One was, at one time, in continuous blast for 32 years with the same firebrick lining. At some point in the furnace's history, the east face was caused to be forced out and required repair, for which black slag bricks were used; a late 19th century photo (7) shows the area of damage before repair. This is possibly the result of instability caused by the huge amount of heat caused during blast. On 13th April 1880, the fuel consumption No. 1 Blast Furnace is recorded as 10.22 cwts of coal and 26.6 cwts of coal per ton of iron, making a weekly consumption of 134 tons. The same month, on 30th April, the proportions of materials used to charge the furnace were recorded as: Coal 10.22%, Coke 26.60%, Native Mine (ore) 27.84%, Northampton (ore) 0%, Desada (ore) 9.34%, Guton (Spanish) (ore) 4.60%, Bilbao (ore) 4.60%, Irish (ore) 0%, and Limestone (flux) 16.80%. A month later, on 28th May 1880, the blast temperatures at the tuyeres were recorded as North 1020°F, East 1110°F, South 980°F, and West 1080°F. The furnace remained in blast until 1894, when it was damped down for the last time. After decommissioning, Old Number One was retained for use as a sand hopper to the Cast House, by then being used to make castings in specialist metallic compositions.

Condition

Overall, Old Number One is in good condition. Historic repairs have been made, mainly to the east face, for reasons outlined in the history section; part of the east face's stonework can be seen pushed outwards. There is a risk, particularly to the upper stonework, of damage from freeze-thaw action and shrub growth. The iron ties and brackets are at risk of corrosion, with one tie plate already having fallen. The top 12 courses of the north elevation are bulging outwards.

Archaeological Potential

The archaeological potential of Old Number One is mainly derived from the structure itself, which provides a complete example of an early 19th century blast furnace. There is potential that the foundations and below ground structure are those reused form Wilkinson's original furnace. The remains of slag to the firebrick lining provide a source of analysis for the mineral and chemical composition of late 19th century blast materials and iron.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
3				
Asset Name				
Cast House				
Date Range	Asset Number	Asset Type		
1792-5	B04	Building		
NPRN	NGR	Scheduled	Listed	ID
34056	SJ 29447 53544	☑	☐	DE202

Description

Much altered Cast House originally built by Wilkinson, completed by 1795-6. Constructed of dressed sandstone blocks, with brick arches. Measures c. D 16.6m x L 19.3m x H 5.7m.

The Cast House is constructed to the rear of the lower part of the site, to the south of Old Number One. The south of the building is open to the later Foundry.

The building is constructed of large, dressed sandstone blocks, bonded in lime mortar beds, with brick archways and later brick repairs.

The east elevation is partially obscured by two small red brick buildings (B13 & B14). A small doorway allows access alongside Old Number One to the north, and a second doorway, formed within an archway, provides access to the south of the elevation. The north quarter of this elevation is constructed of later red brick and houses two windows, one blocked in brick, one in concrete block. The top of the elevation is formed of later red brick, with cast concrete pads for a steel framed roof of circa 1943. The doors are of pine and painted blue.

The west elevation is largely obscured by later ground fill to the rear of the Cast House. As a result only a small amount of dressed stone wall is visible.

The north internal elevation is formed of Old Number One, the Charging House and an area of red brick infill. A large buttress provides stability to the Charging House. The arch of the blast furnace is where molten iron would have been tapped into the pig iron beds of the Cast House.

The east internal elevation is has two large blocked archways to the north and south ends of the elevation. The north quarter of this lateral wall has been rebuilt in red brick. Remains of an arched doorway are visible at juncture between red brick and sandstone. Pipework and cables run to the face. A large iron bracing tie provides fixing/stability to the south end.

The west internal elevation has two large archways, the north blocked, the south providing access into a later barrel-vaulted store. An inserted opening to the mid elevation provided storage for sand. Vertical steels to the walls once provided support to the 1960s roof. Store to the south archway is brick vaulted, with flues/chutes to the S-E, N-W and over the doorway, concrete pier supports the wall to the south.

Internally the floor is of poured concrete, and iron edged concrete slabs. A number of sand mixers survive (F03, F04), along with a brass furnace and extraction units (F05).

History

The Cast House, although much altered, is one of the few surviving buildings known to have been built by Wilkinson as part of his early development of the site. An estate map produced in 1798, though probably surveyed circa 1796-8 by T. Williams, names the site as Plasnewydd Works and demonstrates the extent of the works during this early period, which includes the Cast House. The cartouche in the lower right corner shows the ironworks as it appeared when the map was completed in 1798 and clearly shows the Cast House with two large archways to its south elevation and a small entrance with windows over to the east elevation. This arched-form is a common design for cast houses as it allows for the movement of air through the working floor, both keeping the workers cool and cooling off the pig iron. Brymbo Colliery plans of 1808 and 1812 show the Cast House occupying the same position as surviving today. The Cast House continued to be used for the tapping of the furnace for pig iron with some modifications in 1843 to create new arched openings to the east and west elevations, as a result of the addition of the Foundry to its south end. The Cast House continued to be used for tapping the furnace until the dampening down of Old Number One in 1894. From 1894 the furnace was used for storage and the Cast House turned over

for the casting of specialist components and metals, with brass being the predominant metal in the 20th century. In 1943, during upgrading works to the Foundry, the roof of the Cast House was replace in steel. In 2014, heavy snow caused the collapse of the Foundry roof and damage to that of the Cast House. The collapsed roofs of both buildings were removed in 2015 in order to prevent outward pressure casung their external walls to collapse. The wall heads were then subject to localised repointing to make them stable.

Condition

The overall condition of the Cast House ranges from good to poor. The main risk to the Cast House is the impact of freeze-thaw action and water ingress to the mortar and masonry. The most immediate area of concern is the red brick section to the north of the east lateral wall; the timber lintel has rotted out, causing the the decorative brick header course above to drop and the face of the wall over this to fall.

Archaeological Potential

There is a high potential of encountering archaeological deposits beneath the current working surface of the Cast House. Whilst there is a poured and slabbed concrete floor to the Cast House, the full extent of any earlier casting beds is not known. Information from Walter Salisbury, a former Foundryman, tells us that there were once two coke fired furnaces just to the south of No. 1, which were covered with the later work surface. As such, any works within the Cast House should be subject of an archaeological evaluation should be undertaken to explore the potential for survival of these earlier surfaces.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
4
Asset Name
Charging House

Date Range	Asset Number	Asset Type		
1792-5	N/A	Structure		
NPRN	NGR	Scheduled	Listed	ID
N/A	SJ 29442 53550	☑	☐	Part of DE202

Description

Charging House (W13) built by Wilkinson, completed by 1795-6. Constructed of dressed sandstone blocks, with large buttress to south elevation. Wall continues to the west, although not much deteriorated.

The Charging House is constructed to the rear of the lower site, straddling bank to the west of Old Number One. The south elevation is the only remaining visible and forms a part of the north end of the Cast House. To the upper west end of the Charging House, the wall runs out into the Charge Wall (W13).

The building is constructed of large, dressed sandstone blocks, bonded in lime mortar beds. The Charging House was used to continually weigh and control the mix of the of ironstone, coke and limestone (flux) before 'charging' (loading) the blast furnace over the charge bridge. As such, it played a critical role in Brymbo's first ever production of iron in 1796.

History

The Charging House, although largely concealed and reduced in height, is one of the few surviving buildings known to have been built by Wilkinson as part of his early development of the site. An estate map produced in 1798 demonstrates the extent of the site during this early period, which includes the Charging House. The cartouche in the lower right corner shows the ironworks as it appeared when the map was completed in 1798 and clearly shows the building over the original blast furnace. Brymbo Colliery plans and sections of 1808 and 1812 both show the Charging House. With the rebuilding of the original blast furnace, it is likely some modifications were made to retain it in use, although these can not be confirmed. The Charging House remained in use until 1894 when Old Number One was damped down for the last time. A photograph from the late 19th century clearly shows the building standing to the rear of Old Number One, with kneelers to the gabled elevation. It is not known when the Charging House was reduced in height, however it is likely to have taken place sometime in the late 19th or early 20th century after decommissioning.

Condition

The remains of the Charging House are only visible to its south elevation, as such the condition can only be partially assessed. The condition of the visible wall is good. However, the upper west end of the wall has a large crack where the buttress has started to peel away from the main structure.

Archaeological Potential

There is a high potential of encountering archaeological deposits and structures associated with the top structure of the Charging House. This may take the form of the remains of walls, trackways and the charging bridge used to load Old Number One.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
5
Asset Name
Parapet Wall

Date Range	Asset Number	Asset Type		
1792-3	W03	Wall		
NPRN	NGR	Scheduled	Listed	ID
34054	SJ 29505 53516	☐	☐	

Description

Parapet Wall built by Wilkinson shortly after his purchase the Brymbo Estate in 1792. Constructed of large, dressed sandstone blocks, bedded in lime mortar.

The wall is constructed to the eastern boundary of the lower site, where the remnants of the Brymbo Ironworks stand today. This surviving part of Wilkinson's wall now sits within the Machine Shop (B01) of 1921 and divides the upper and lower levels of the workspace. To the north end of the wall, a stair rises to an opening, which provides access to a small store room. The wall is covered in the remnants of 20th century blue and white paints.

The wall is likely to be related to that seen beneath No. 1 Blast Furnace (W05; W06), having been truncated by later site developments.

History

A letter sent by James Watt, Jr. to his father in 1793, describes Wilkinson had spent £20,000 on levelling the site, constructing a parapet wall and building a puddling furnace (Soldon 1998: 73). An estate plan of 1798 confirms the existence of a number of Wilkinson's early buildings, but not any site infrastructure, such as walls. Ordnance Survey maps of 1873 (Denbighshire XXVIII.2) is the first time the wall is represented in plan form.

Condition

Good overall condition. Protection afforded by being within 1921 Machine Shop.

Archaeological Potential

Despite being a part of Wilkinson's original development of the site, the archaeological potential is low as it is at a low risk or being altered or removed. However, it should be considered to be of high significance due to its association with Wilkinson and the sites early development.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
6				
Asset Name				
Foundry				
Date Range	Asset Number	Asset Type		
1843	B03	Building		
NPRN	NGR	Scheduled	Listed	ID
34056	SJ 29458 53521	☑	☐	Part of DE202

Description

Foundry of 1843, commissioned by the Darby brothers. Constructed of large, dressed sandstone blocks. Measures circa L 25m x D 21m x 8.75m.

The Foundry, also referred to as 'Top Foundry', was added to the south end of the Cast House in c.1844 to provide space for castings to be made. It was commissioned by the then managers of the works, Henry and Charles Edward Darby, descendants of Abraham Darby of Coalbrookdale. Its construction is coeval with the Machine Shop, which forms its southern elevation. In 1943, two overhead travelling cranes fabricated by Joseph Adamson & Co. Ltd. were installed to lift crucibles of molten steel, produced from scrap, to be cast into ingots for further processing.

The building is constructed of large, dressed sandstone blocks, bonded in lime mortar beds, with brick archways to later, or possibly enlarged openings and repairs. The corrugated iron roof of the Foundry collapsed under heavy snow in 2013 and the building has been roofless since it was carefully removed and the wall heads consolidated in 2015.

The north elevation exists only to the eastern end, the remained being open into the Cast House, and is the only external elevation to the Foundry. This elevation is obscured at low level by a red brick control/fuse room (B14), which once served the travelling cranes in the Foundry. To the wall top, four courses of red brick remain after the eaves were raised to accommodate the new roof in 1943.

The north internal elevation is a reflection of its external face, albeit with four joist pockets of unknown use. Part of the northern travelling crane runway passes in front of this wall. The east end of the wall is of brick, which has been used to tidy the wall end after the original elevation of the Foundry was removed.

The south internal elevation is shared with the Machine Shop and as such forms its north elevation. This elevation has a single entry at the midway point, which allows access between the Machine Shop and Foundry; this being a later insertion, made evident by the cut to the stones of the reveals. At ground floor level, an inserted brick-arched doorway once gave access to the east end, but was latterly bricked up. Over this, an original window to the first floor has been similarly blocked. To the west of the doorway, an arch at ground level suggests that there may be an unknown lower level to the Machine Shop. A further brick-arched doorway to the east of the central doorway, has been blocked. The west of the elevation is formed of three arches at ground floor level; the eastern two once housing machinery/ventilation equipment, the western most serves as an outlet for a mining adit (S35; S36); large steel doors hang to the central archway. To the wall tops scars help identify where the bearings of the 1960s steel roof once rested. Patches of red brick beneath the wall tops may indicate the location of previous tie beams for the earlier roof. Layers of limewash survive to the elevation. The southern runway of the south crane runs in front of the elevation.

The west internal elevation is largely dominated by the two bricked archways to the cupola furnaces. A third archway to the north of the elevation, now bricked up, has doorway accessing a vaulted store room. A doorway between southern and middle archways provides service access to the sides and rear of the cupolas. From the Foundry floor, a doorway, to the south of the north archway, provides access via concrete steps to the raised level to the west of the Foundry. Two buttresses of brick, have been added at different periods to provide stability to the wall, presumably as a cause of inward movement after the addition of the first cupola furnaces; a large iron bracket secures the frame of the overhead crane to the northern buttress.

The floor of the Foundry is now covered in a temporary surface of Terram and quarry stone to cover the uneven floor surface and casting pits below. This has enabled the structure to be bought back into use as an outdoor venue.

History

In 1846, The Brymbo Company was formed, with William and Charles Darby, descendants of Abraham Darby (1678-1717), taking over the site's management. At this time the ironworks was under the ownership of the Scotsman, Robert Roy, who in 1842 had appointed Henry Robertson to appraise the works and produce plans for its development. The Foundry, although much altered, was commissioned by the Darby brothers in 1843 and probably completed the same year. The Foundry originally had a double-gables east façade, and a spine wall, is likely to have been perforated by large arches to maximise work space; a photo of circa 1900 shows this elevation. Little is recorded of the Foundry after its construction, other than in by referrence and the appointment of a Mr Crossley as Foundry Manager on 31st July 1852. During the late 19th century, upgrades were made to the Foundry for the addition a new cupola furnace, with a second being added soon after, for the recycling of scrap iron and steel; Ordnance Survey mapping evidence shows the expansion of the Foundry to its western end took place sometime between 1873 (Denbigh XXVIII) and 1899 (Denbigh XIX.NW). To make space for these furnaces, the ground behind the west wall was reduced in height, with a new retaining wall of red brick (W12) built to hold the ground behind, and the insertion of two large archways. It is likely that the first of the buttresses were added with the first archway, the second being added at the same time as the insertion of the second cupola. In 1943, at the height of WWII, new overhead travelling cranes from Joseph Adamson & Co. Ltd. were installed. In the 1970s, new cupola furnaces were installed (S32/S38; S33/S37), in conjunction with the fabrication of a new façade and roof in steel frame. The Foundry remained in production until the closure of the steelworks in 1992. Heavy snowfall in 2013 caused the collapse of the Foundry roof, which was removed in 2015.

Walter Salisbury, the last person to work metal at Brymbo, worked in the Foundry from 1943 until 1990. He recalls the Foundry having 5 original jib cranes with 1843 in raised lettering, the installation of the overhead cranes in late 1943, and the renewing of the roof in 1960. In 1970s the cupola furnaces were designed by Walter and a colleague, which were then manufactured at the works. Walter admits that the furnaces could have been 50% taller again, as the heat created by the furnaces was so great that it melted the spark arresters. As such, they were only able to produce 2 tonnes per week, rather than the potential of 5 tonnes.

Condition

Since the removal of the collapsed roof in 2015 and programme of remedial works, the walls to the foundry are in good condition. However, the wall tops, although capped in lime mortar, are at risk of freeze-thaw action and water ingress. Several areas where stone ashlars have fallen away to the rear elevation, along with some areas where large mortar gaps exist in the south wall, provide further concern for water ingress and freeze-thaw damage.

Archaeological Potential

There is a high potential of encountering archaeological deposits beneath the current working surface of the Foundry. Whilst there is a poured and slabbed concrete floor beneath the current surface, it is not known whether this has disturbed the original foundry floor and casting troughs. As such, any works within the Foundry should be subject to an archaeological evaluation in advance of any development, to explore the potential for survival of earlier surfaces.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
7				
Asset Name				
Patternmakers and Carpenters Workshop				
Date Range	Asset Number	Asset Type		
1844	B02	Building		
NPRN	NGR	Scheduled	Listed	ID
418128	SJ 29466 53510	☑	☐	Part of DE202

Description

Machine Shop built by the Darby brothers in 1844, latterly used as the Patternmakers and Carpenters Workshop until its closure in 1992. Constructed of dressed sandstone blocks. Measures circa L 31m x D 8.5m x H 11.5m.

The Patternmakers and Carpenters Workshop is located to the rear of the lower site, adjoins and forms the south wall of the Foundry. Sits to the west of the 1921 Machine Shop. The building is divided into the smaller western unit, being used by the carpenters, and the larger eastern storeyed unit, in use by the patternmakers.

The building is constructed on a split level, cut into the hillside to the west. The western end of the upper floor being founded on the higher ground level. Access to the building can be made to the lower level from the north and east, and the upper levels from the south and west. In 2015, the roof was removed due to the collapse of several trusses.

The eastern elevation, also being the principal, has a large arched central entrance and a smaller stone lintelled doorway at ground-floor level with a brick-blocked window above; to the opposite side of the central doorway a sill and higher lintel remain; at first floor level the elevation has a central arched loading door and square fixed-light windows to either side, an ocular window is located under the apex of the gable. The gable is finished with decorative string, running into kneelers. The large arched doorway allowed machining equipment to be easily installed into the building.

The north elevation is shared with the Foundry. This elevation has a single entry at the midway point, which allows access between the Patternmakers Workshop and Foundry; this being a later insertion, made evident by the cut to the stones of the reveals. At ground floor level, an inserted brick-arched doorway once gave access to the east end, but was latterly bricked up. Over this, an original window to the first floor has been similarly blocked. To the west of the doorway, an arch at ground level suggests that there may be an unknown lower level to the Patternmakers Workshop. A further brick-arched doorway to the east of the central doorway, has been blocked. The west of the elevation is formed of three arches at ground floor level; the eastern two once housing machinery/ventilation equipment, the western most serves as an outlet for a mining adit; large steel doors hang to the central archway. To the wall tops scars help identify where the bearings of the 1960s steel roof once rested. Patches of red brick beneath the wall tops may indicate the location of previous tie beams for the earlier roof. Layers of limewash survive to the elevation. The southern runway of the south crane runs in front of the elevation.

The south elevation has been altered with an extension to the first-floor (although at a ground-floor level), which has four 12-pane square windows, two either side of central doorway, and four later 6-pane windows in the later phase. The doorway was once a window, with the original dressed stone reveal of the window remaining in place; as this doorway is at first floor level a small run of steps once provided access. An inserted doorway to the ground floor has a red brick head and later red brick blocking, is not partially covered by a raised ground level or possibly backfilling to small set of steps. To the top left of the blocked doorway is a similarly formed and blocked window(?). Evenly spaces at mid-height level to the east end of the elevation are three red brick patches, likely caused by the replacement of several transverse beams to the second floor. To the east end, a large iron tie has been added to stabilise the end of the building. To the same end, brick scars to the corner give evidence of a later extension to the south of the elevation. A large iron bracket is attached at mid-height beneath the eastern most window, supplied a line shaft drive to the working area. From the south elevation projects a sandstone, red brick and concrete structure, which steps to its top.

The west elevation has a double central doorway.

At ground floor the building is entered from the north and south; a single doorway to the north elevation provides access to the Foundry; the smaller doorway to the east elevation provides access to changing/locker rooms. The large entrance provided access into the a passage with caged storage, with stairs to the first floor, to the south and washroom(?) ahead, the passage then

passes to the south of this and into a rear chamber. From this rear chamber, doorways to the south of this area provide access into storage rooms; to the north doorways provide access into the Foundry and to a tea room(?). A large cast concrete block has been added to the north-west corner of this area to stabilise a subsiding wall, alongside a machine base. Timber and acrow props currently support the first and second floor throughout.

The first floor is currently inaccessible, but has been used for the storage of patterns.

The second floor is accessed from the south and west elevations at the higher, upper level. The floor is divided into two units by a masonry crosswall, with access vial a doorway between the two. A doorway to the east end allowed for materials to be lifted via winch to for storage/machining. To the east end of the north lateral wall is a blocked window. The floor to the east end of the building has collapsed. The floor to the west end of the building, being of woodblock, has swollen and caused a hump to form.

As a result of continued decline, in 2015, the roof was removed and remedial works undertaken to stabilise the masonry. This entailed the removal of the roof, the dismantling of unstable secondary brickwork from a number of locations on the wall heads, extensive wall head capping, the reduction of the gable to the dividing wall, the rebuilding of some collapsed ashlar above the western doorway and extensive bracing works to the east and south elevations.

History

In 1846, The Brymbo Company was formed, with William and Charles Darby, descendants of Abraham Darby (1678-1717), taking over the site's management. At this time the ironworks was under the ownership of the Scotsman, Robert Roy, who in 1842 had appointed Henry Robertson to appraise the works and produce plans for its development. The original Machine Shop, was commissioned by the Darby brothers in 1844 and likely completed the same year. The purpose of the building was for the refining of cast iron parts and the manufacture of other goods and parts from blanks. Little information is recorded about the Machine Shop. However, Ordnance Survey mapping evidence demonstrates that the extension to the south-east of the machine shop was in existence by 1872 (Denbigh XXVIII), with the Carpenters Workshop added by 1899 (Denbigh XIX.NW). This south-east extension was to increate the capacity of the shop. With the construction of the Carpenters Workshop, the archways to the west end of the north elevation (facing into Foundry) were then created as vaulted chambers. In 1921, the Machine Shop was made redundant when the new shop (B01) was completed and the south-east extension demolished to make room. In the 1960s the first floor was inserted to provide additional storage space, and the north window to the east elevation was formed as a doorway to provide access to the new changing/locker rooms.

Condition

Overall the building is in poor condition, decades of water ingress having caused damage to the roof structure, which was removed in 2014. This ingress, along with 5 years of exposure, has caused most of the second and first floors to perish, with several collapses of transverse beams, which has only suffered further damage to the buildings internal structures. The external stone walls are in relatively good condition, having had lime mortar weather capping to reduce the impact of water ingress and freeze-thaw action. The lost of the roof structure has, of course, caused some spread to the walls, most notably the masonry crosswall, which was reduced in height. The east and west end of the south elevation have been supported by means of steel propping.

Archaeological Potential

There is a moderate potential of encountering features of both buried and structural archaeological and historical significance. Within the fabric of the building there is the potential for the uncovering of industrial artefacts pertaining to the buildings original use, such as machine bases, industrial deposits associated with machining, or evidence of their means of power (line shaft).

Images

Other Comments

A laser scan survey was undertaken in 2019, with archaeological drawings prepared under ArchaeoDomus project AD065.

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
8				
Asset Name				
Machine Shop				
Date Range	Asset Number	Asset Type		
1921	B01	Building		
NPRN	NGR	Scheduled	Listed	ID
418133	SJ 29501 53515	☐	☐	

Description

Machine Shop, built as part of post-WWI investment in the steelworks. Constructed of red brick, with steel roof, over two levels. Garden wall bond. Built on a split level over the remains of the earlier parapet wall. Measures circa L 35m x W 20m x H 15m.

The Machine Shop is built to the front of the lower site, being the larges and most obvious of the buildings to survive of the steelworks. The building is 11 (east-west) by 4 bays (south-north), on an east-west alignment, in brick, bonded with lime mortar, and utilises large glass windows and eaves to provide natural light.

The north elevation is double height to its east 4 bays, and single to the remaining 7. The 4 east bays each have a window to the upper level, with bay 10 providing an entrance; the lower level of bays 1-4 have arched and recessed panels. Brick piers define each bay, with the base of the lateral wall rising as a shallow plinth into plain red brick panels. To the top of each panel, a plain blue brick string course runs, before projecting back out into a deep brick head-panel, over which the eave windows rise. The roof is of corrugated iron sheets, with raised and vented ridge; a large downpipe allows water run-off from the roof. The west corner of the building is chamfered to allow for the passage of vehicles.

The east elevation, also being the main façade, is of double height and currently dominated the view of the ironworks. The elevation is of 4 bays, with bays 1, 2 and 4 being of decorative arched and recessed panels; bay 3 allows access via large double doors. Brick piers define each bay, with the base of the lateral wall rising as a shallow plinth to the upper level. From the plinth, large windows rise to plain red and blue brick head-panels. To the north of the elevation a runway of the overhead travelling crane projects. Below the apex is a date panel, which shows the date 1921 in raise relief.

The south elevation is a reflection of the north. A steel gantry runs between bays 6 to 11. Iron ties support piers 6 and 7. Pipework's runs the length of the elevation, entering at bay 4.

The west elevation is of 4 bays, with bays 1 and 4 both originally having doors; bay 4 is now blocked by red brick; bay 1 survives as two pine doors, although now blocked internally. As with the east elevation, a shallow pier foots the elevation, which rises to windows, bay 1 and 4 windows being shorter than 2 and 3. Over the windows are plain red and blue brick head-panels.

Internally the floor is split level, with the eastern 4 bays being at a lower level. A wall of large, dressed sandstone blocks splits the upper and lower level, with a steel stair providing communication between the two; a second set of stairs also provides access, through the wall and rises in an area overbuilt by later offices. To the south of this lower level, small brick stores occupy the south of bays 2-3 and 4. A Timber store, possibly a former office, sits at the upper level over bays 3 to 4. At the upper level, two offices have been built to bays 6-8 the north, and bays 2-11 to the south. Bay 11, north, has a storage unit. The floor is of woodblock with poured concrete repairs and former machine bases. Yellow lines demarcate a path through the shop floor and help identify work area. Brick paving creates floors to the later offices. 6 trusses with 4 purlins a side, supports the roof.

An overhead travelling crane, built by the Vaughan Crane Co., dominates the west end of the building, with runways flanking the entire workspace. All machinery has now been removed, although some evidence of bases survives. The crane rests in bay 1, with fixed ladder provided.

History

The construction of the Machine Shop comes as part of continued investment into the steelworks seen throughout WWI for the supply of armaments to the allied war effort. The new Machine Shop is built for the milling of rough castings and specialist metals for the upkeep and maintenance of steelwork machinery and equipment. The construction of this new Machine Shop superseded that built by the Darby brothers (B03) in 1844.

Condition

The Machine Shop is, generally, in good condition. However, the main area of concern is the roof as it is suffering from leaks, which are likely causing corrosion to the main steel framing. The brickwork appears to be stable, although weathering is causing mortar to be slowly washed out.

Archaeological Potential

The building itself is important as an intact survival of early 20th century industrial architecture. However, the greatest archaeological potential comes in the deposits below the shop floor, as the area over which it has been built was once a storage and processing yard, with a workshop of unknown use. It is therefore likely that archaeological deposits associated with the areas previous use lays beneath the floor of the Machine Shop.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
9				
Asset Name				
Agent's House				
Date Range	Asset Number	Asset Type		
1792-1809	B06	Building		
NPRN	NGR	Scheduled	Listed	ID
26839	SJ 29469 53474	☐	☑	1731 / Grade II*

Description

Much altered Agent's House originally built by Wilkinson, completed around 1795-8 and extended by 1809. Measures c. D 6m x L 19.75m

The Agent's House is constructed to the east end of the upper site, to the west of the main track through the ironworks.

The Grade II* Listed Building is of five bays, over two-storeys, of dressed sandstone blocks with plain string course and corbelled eaves, under a corrugated tin roof.

The building is divided into two distinct areas; the first being the main house, the second the Counting House added to the east end.

The north elevation, also being the principal, overlooks the ironworks site. The elevation of the main house has three windows at ground floor, with three over each at first, and a single window to the Counting House. A single doorway provides entry. Large sandstone window heads ornament the ground floor windows, with a timber lintel to the window of the Counting House. Large quoins support the corners of the building, with similarly finished stones to the window and reveals. A large joint distinguished the original phase of construction from the west extension.

The east elevation is entirely that of the Counting House, with a single doorway and corrugated roof pitching into the main building. The elevation is finished with sandstone quoins to the corners, the door has later brick reveals.

The south elevation is constructed of uncoursed sandstone blocks. A window to the centre of the elevation has been formed in a former doorway. To the west of this, a new doorway was formed, which has subsequently been blocked in red brick. The Counting House has a single window at ground floor. At first floor a single window sits centrally and has iron bars to an otherwise domestic window, this is likely due to its proximity to the bank behind making it susceptible to will be thieves. A second first floor window was added in the extension to the west. The joint for this extension is clearly visible as a vertical line in the stonework. Several pockets in the stonework demonstrate the existence of a former lean-to structure.

The west elevation is largely dominated by a large set of doors, inserted when the building was changed for use by the onsite railway and as a carpenters store.

Internally the building has been completely gutted as a result of long term deterioration caused by water ingress. Lime plaster survives in patches to the masonry, with evidence of lath and plaster to other surfaces.

At ground floor, a single fireplace remains at the east end of the building. An entrance passage once provided access into a kitchen and parlour. To the east end of the building a doorway once provided access into the Counting House, which had a small fireplace to its east wall. A ramp at the west end of the building now provides access to the ground floor.

At first floor, a single fireplace survives to the east end.

History

An estate map produced for John Wilkinson in 1798 shows the a building standing above the then named Plasnewydd Works, at the location of the Agent's House. However, this is a later addition and it is clear that there is no building previously occupying this space. The lack of a building where the Agent's House now stands, suggests that the property was built sometime after 1798. The building shown is a later addition, inked onto the plan and labelled "Three Cottages", in cursive, which is unlike the earlier penmanship. This stands at odds with current thinking regarding the property and suggest that it was a later addition to the site. The same penmanship has also added No. 2 Blast Furnace, which leads us to the possibility that these updates may have been made by 1809. A building in the same location appears on site plans of 1809 and 1812, called ‘PLAN of the Workings in the MAIN COAL at BRYMBO Colliery’. In the same years, associated documents titled ‘A LONGITUDINAL SECTION of the STRATA at BRYMBO COLLIERY’ are also produced and shows the Agents House in elevation as it stands today. The evidence therefore demonstrates the construction of the Agent's House is likely to have taken place between 1798 and 1809. The Tithe Map of 1845, simply labels the property as 'Agent's Office', under the ownership of Robert Roy. The labelling of 'Three Cottages' is somewhat problematic and could possibly reflect an update sometime later in the century. The Agent's House has proved elusive in Census records and may have had a name other than Agents House. Ordnance Survey mapping shows the addition of extensions to the west elevation, with the building in use by the on-site railway at the time of the 1899 (Denbighshire XXVIII.2). By 1963, the additions to the west elevation were gone (Denbighshire XXVIII2). However, local history reports that families lived here until the 1940s, but this is unsubstantiated. It s certain that by the 1960s the building is in use as a siding building, for storage and office. Towards the end of the productive life of the plant, the Agent's House was used as additional patternmakers and carpenters storage.

Condition

Since the removal of the roof and collapsed floor, and installation of temporary corrugated roof, the former Agent's House is in a much more secure position than that of early 2017. However, movement within the lateral walls has caused the movement of some of the masonry, which has caused the large window heads to drop, as such this has caused other masonry to move and leaves the north elevation at risk of failure.

Archaeological Potential

Despite the alterations that have beset the building, there is a high potential of encountering archaeological deposits relating to the buildings development. To the north of the building, there is evidence for a small, enclosed garden area fronting the road. To the west elevation, buildings relating to the railway stood until 1963 and therefore there is a high risk of encountering underground remains or deposits pertaining to their date of construction and use. Internally, it is not known what survives under the present surface and therefore evidence may survive relating to the development of the Agent's House and the 'Three Cottages' as noted, albeit at a later date, on the 1798 estate plan.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
10
Asset Name
Charging Wall (North)

Date Range	Asset Number	Asset Type		
1873-1899	W01	Wall		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29484 53589	☐	☐	

Description

Charging Wall built between 1873-1899. Constructed of dressed sandstone blocks with simple stone string to head, buttresses of sandstone and red brick provide support. English bond to brick buttresses. Circa 15m in height.

The Charging Wall bounds the northern edge of the lower site, the recent Brymbo Enterprise Centre standing on the higher ground that it retains.

The Charging Wall runs on an west-east axis, with the east end reducing at a 35° angle from full height to ground level. Three dressed sandstone buttresses survive; 2 east, 1 west; with 3 red brick between, the west 2 of which are approximately 1/2 height. An opening to the east, now blocked up, was once used to charge No. 3 Blast Furnace, the opening to the west for No. 5 Blast Furnace. A lift mechanism to the centre of the Charging Wall was once used for lifting material and equipment for the repair of the furnaces.

History

No records have currently been found relating to the Charging Wall. Ordnance Survey mapping demonstrates that the Charging Wall was not in existence when No. 3 Blast Furnace was constructed in 1872 (Denbighshire XXVIII.2), but it had been built by 1899 (Denbighshire XXVIII.2). It is therefore likely that the Charging Wall was built when No. 3 Blast Furnace was decommissioned and replaced by No. 4 Blast Furnace (also known as 3b) in 1894.

Condition

Overall in good condition. A subsidence crack suggests that there is some movement associated with the east end of the wall.

Archaeological Potential

The archaeological potential of the Charging Wall is somewhat limited. However, excavations around the base of the wall do pose a risk of disturbing archaeological remains and deposits associated with the blast furnace, slag line and their workings.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
11				
Asset Name				
Iron Line				
Date Range	Asset Number	Asset Type		
1899-1912	H02	Historic / Infrastructure		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29485 53545	☐	☐	

Description

Site rail line, built circa 1910-20 to transport molten iron to casting shop from No. 5 Blast Furnace. Constructed of concrete to the northern retaining wall, with steel edging to eastern end. Southern retaining wall built of red brick in three tiers and garden wall bond, with later red brick wall above in stretcher bond. Originally rolled steel lines on timber sleepers, on rubble bed. Western end now covered by spoil. Measures circa L 20m x D 5m.

History

Constructed sometime between 1899 and 1912 (Denbighshire XXVIII.2) to carry molten iron from No. 5 Blast Furnace to the Casting Shop. Construction linked to No. 5 Blast Furnace, therefore likely to have been completed in or around 1908. Remained in use until closure of operations in 1992.

Condition

Currently overgrown and covered in later site debris.

Archaeological Potential

There is a moderate potential for archaeological remains and deposits within the area of the Iron Line. The construction of the sunken railway cut away some parts of the site to enable its construction and therefore it is likely to have removed potential remains of earlier structures and features. However, as it is difficult to substantiate fully whether deposits have been wholly removed by later activities, a watching brief should monitor all excavations within the area of the Iron Line.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
12				
Asset Name				
Red Brick Ancillary Building to North of East Elevation of Cast House				
Date Range	Asset Number	Asset Type		
1943-63	B13	Building		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29456 53547	☐	☐	

Description

Ancillary red brick building acting as electrical in take/control room and office space to the Cast House, which it adjoins to the west. Reinforced cast concrete roof, cast concrete floor. Iron railing to roof. Stretcher bond.

North elevation has a single window at its east end and doorway to the west end. Concrete lintels.

East elevation has no openings and shows evidence of a further building once standing to its east; wall scars and changes in brickwork make this apparent.

The south elevation has a single doorway, which is almost full height to the elevation.

The building was not assessed internally.

History

Mapping evidence demonstrates that this ancillary building was constructed sometime between 1949 (Denbighshire XXVIII.NW) and 1963 (Denbighshire XXVIII.2). However, it is likely to have been built with the programme of works to the building during 1943.

Condition

The building is generally in a good condition. Weathering has caused the wash of some mortar from the joints. The ironwork to the roof risks causing damage through oxide jacking/rust burst.

Archaeological Potential

The archaeological potential of the building is low. However, beneath the buildings footprint, there is the possibility for archaeological deposits and remains associated with the early operations of the Cast House.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
13				
Asset Name				
Red Brick Ancillary Building to South of East Elevation of Cast House				
Date Range	Asset Number	Asset Type		
1943-1963	B14	Building		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29461 53537	☐	☐	

Description

Ancillary red brick building acting as electrical in take/control room for the Foundry, which it adjoins to the south. Reinforced cast concrete roof, cast concrete floor. Garden wall bond.

North elevation has a single doorway to the west end. Iron strip lintel with header course over.

East elevation has a single window, with brick header window sill. Iron strip lintel with rebuild stretcher head.

The south elevation adjoins the Foundry.

The west elevation is a reflection of the east.

The building was not assessed internally.

History

Mapping evidence demonstrates that this ancillary building was constructed sometime between 1949 (Denbighshire XXVIII.NW) and 1963 (Denbighshire XXVIII.2). However, it is likely to have been built with the programme of works to the building during 1943.

Condition

The building is generally in a good condition. Weathering has caused the wash of some mortar from the joints. Works in the last 5 years have repaired the building.

Archaeological Potential

The archaeological potential of the building is low. However, beneath the buildings footprint, there is the possibility for archaeological deposits and remains associated with the early operations of the Cast House.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
14				
Asset Name				
No. 5 Blast Furnace Base				
Date Range	Asset Number	Asset Type		
1908	S14	Structure		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29467 53567	☐	☐	

Description

Remains of No. 5 Blast Furnace built by the Brymbo Steel Company Ltd in 1908 to south of Charging Wall. Roughly circular in shape and constructed of dressed stone, concrete and firebrick. Opening to Charging Wall (W01) to north once allowed charging. Diameter of 5m. Survival represents only a small percentage of No. 5 blast furnace.

History

No. 5 Blast Furnace was commissioned in October 1908 by Peter Williams, the then recently appointed General Manager of the works, who took over from J. H. Darby. No. 5 replaced No. 2 Blast Furnace, which had been in operation since 1805. In 1910 bosh tuyeres were used for the first time at Brymbo in an attempt to increase output from No. 5 by starting reduction of ore higher up the furnace. However, the results proved this not to be the case. In the same year refrigeration units were installed for the testing of 'dry blast' in an attempt to improve the iron to a grade containing less than 1% silicon, which could be used in basic open-hearth steel furnaces. After 2 years of trials, this was also abandoned. From 1912, No. 5 would be the only operational blast furnace at the plant. In November 1964, the decision was taken to modernise No. 5. At this time the furnace was still being charged by hand, using a system of barrows. This upgrade introduced a winched mechanism for loading the furnace, with the Winch House (B10) built for this purpose. A new double bell top, fume emission system, gas cleaning and the replacement of the old Blast Engine of 1894 for a turbo-blower unit. In February 1965, the furnace was relit by Mrs. E Davies, wife of the Managing Director of the plant. In 1966, a gas cleaning installation was completed, with a scrubbing tower to remove dust from the gas, a thickening plant to settle the dust in water, and a cooling tower to enable the waste water to be reused. On 28th June 1967, No. 5 set a new weekly record with an output of 2,123 tons produced. In 1969, further upgrades were made to No. 5, with new hot blast stoves, gas cleaning plant, new boiler and new turbo-blower. These additions increased the output to 3,000 tons per week. 1970 saw the decommissioning and removal of the Davy Blowing Engine, which had been operational at the site for the last 70 years. On 15th July 1971, No. 5 was blown out for a reline and was relit on 15th September the same year. Four years later, No. 5 was blown out at the end of May 1975 for relining and general maintenance works, being relit by the wife of the Technical Director, Mrs. O. Harris, on 3rd May 1976. The record weekly output for a blast furnace at Brymbo was held by No. 5, which produced 3,349 tons during the week of 1st December 1973.

Condition

The base of No. 5 is in good condition and at low risk of deterioration. The primary action of damage is caused by freeze-thaw.

Archaeological Potential

No. 5 Blast Furnace base is of high significance to the surviving works, as it represents the very purpose of Brymbo Ironworks existence - the production of iron from raw materials. The potential for archaeological survival beneath the structure is limited as the foundations are likely to have disturbed earlier structures or deposits. However, as the extent of the foundations are unknown, there is the moderate potential for the survival of plumbing associated with the blast furnace operation or structures relating to an earlier phase of the sites development.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
15				
Asset Name				
Travelling Crane (to front of No. 1)				
Date Range	Asset Number	Asset Type		
1908	S18	Structure		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29463 53563	☐	☐	

Description

Overhead travelling crane from the former Powerhouse of 1908. Used for the install of powerhouse plant and maintenance. Hand operated, with addition of later electric assistance. Large riveted bridge rail, with bolted trolley and hoist. Some chains and cable surviving. No manufacturer markings. Measures circa L 12m x 1.2m.

History

Installed into the former Powerhouse in c. 1908 for the manoeuvring of plant equipment and ongoing maintenance. Removed from the house and moved to its current location with the demolition of the Powerhouse in the 2000s.

Condition

Good to poor condition. Covered in surface rust, with delamination in places.

Archaeological Potential

Low archaeological potential. However, the crane remains a significant industrial artefact relating to an early 20th century Powerhouse.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
16				
Asset Name				
Retaining Wall to East of No. 1 Blast Furnace and Winch Room				
Date Range	Asset Number	Asset Type		
1792-1960	W05; W06	Wall		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29458 53568	☐	☐	

Description

Retaining wall to east of No. 1 Blast Furnace (S01) and Winch Room (B05). Lower wall of stone, with later addition of cast concrete to create level working area to east of No. 1. Brick repairs and additions.

History

The development of this wall is unclear and may relate to the early development of the site when Wilkinson had an area levelled to enable the construction of the early ironworks after his acquisition of the Brymbo Hall Estate in 1792. Mapping evidence doesn't provide any clear depiction of the structure, making its development difficult to accurately define. In the 1964, with the construction of the No. 5 Winch Room (B05) , a new working level was created in cast concrete.

Condition

Good overall condition.

Archaeological Potential

As little is known regarding the asset, there is a moderate potential for archaeological deposits and remains pertaining to the sites early development.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
17
Asset Name
Steps and Wall to North-East of No. 1

Date Range	Asset Number	Asset Type		
1960s	S20	Structure		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29450 53566	☐	☐	

Description

Two flights of cast concrete steps, once leading to the roof of the former Shower Block (S21). Steps rise over a stone-faced red brick chamber, partially filled will rubble.

History

Constructed during upgrade works associated with No. 5 Blast Furnace in the 1960. Not shown on any mapping.

Condition

No comment.

Archaeological Potential

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
18				
Asset Name				
Shower Room Floor to North-East of No. 1				
Date Range	Asset Number	Asset Type		
1960s	S21	Structure		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29451 53563	☐	☐	

Description

Shower Room floor of cast concrete with ceramic tile over. Some brick of the east wall survives. Doorway to north-east corner.

History

Constructed during upgrade works associated with No. 5 Blast Furnace in the 1960. Not shown on any mapping.

Condition

No comments.

Archaeological Potential

Demonstrate the upgrade in amenity's to the plant for the use of the workers.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
19				
Asset Name				
Winch House				
Date Range	Asset Number	Asset Type		
1964	B10	Building		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29448 53577	☐	☐	

Description

Winch House for No.5 Blast Furnace, built 1964. Constructed of cast concrete with brick panels. Flat roof to ground level over, set into bank to north of No. 1 Blast Furnace.

The south-east elevation forms the only elevation of the building. Cast concrete forms the main structure, with a central entrance, with panels to either side. The panels are of red brick to the lower panel, windows to the central and timber vents to the top. The windows are casements of 6 pane, with 2 to each panel. The end of an I-beam projects above the entrance.

Internally the remains of industrial fuse and control units, and winch bases survive The latter survive as both concrete and steel bases.

History

The Winch House was built in 1964 to mechanise the charging of No.5 Blast Furnace. The construction comes alongside a number of other improvements made during the 1960s to improve the blast and yields. Most closely associated with the Winch House are the Ore Bins (W27) to the west of the building. Mapping evidence shows that the area to the north of No. 1 was devoid of buildings in 1963 (Denbighshire XXVIII.2), with the construction in 1964 backfilling this area. However, earlier maps of 1873, 1989 and 1912 (Denbighshire XXVIII.2) all show this area previously occupied by site buildings.

Condition

Generally the Winding House is in good condition. However, water ingress is causing deterioration of the I-beams to the roof, which risks destabilising the flat roof.

Archaeological Potential

The archaeological potential of this area is limited as a result of the building up of ground in for the construction of the Winch House in 1964. As a result there is a low potential of encountering archaeological remains or deposit alongside any works related to the Winch Room and the associated structure.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
20				
Asset Name				
Winch Bank				
Date Range	Asset Number	Asset Type		
1964	S22	Structure		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29453 53575	☐	☐	

Description

Winding Bank, built in 1964. Constructed of stone and concrete, with steps (S23) rising to Winch House (B10). Abuts and obscured the north of No. 1 Blast Furnace (S01).

History

The Winch Bank and stairs were built in 1964 to enable the construction of the Winding House (B10) and Ore Bins above (W27). The construction comes alongside a number of other improvements associated with No. 5 Blast Furnace. Mapping evidence shows that the area to the north of No. 1 was devoid of buildings in 1963 (Denbighshire XXVIII.2), with the construction in 1964 backfilling this area. However, earlier maps of 1873, 1989 and 1912 (Denbighshire XXVIII.2) all show this area previously occupied by site buildings.

Condition

No comments.

Archaeological Potential

The archaeological potential of this area is limited as a result of the building up of ground in for the construction of the Winch House in 1964. As a result there is a low potential of encountering archaeological remains or deposit alongside any works related to the Winch Room and the associated structure.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
21

Asset Name
Trackway to Front of No. 1 Blast Furnace

Date Range	Asset Number	Asset Type		
2000s	N/A	Road / Track		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29472 53555	☐	☐	

Description
Site trackway to provide access up to Scheduled Area/Machine Shop level. Constructed of compacted rubble and hardcore.

History
Constructed in 2000s.

Condition
N/A

Archaeological Potential
The trackway covers part of the retaining walls associated with the Iron Line (H02) and retaining wall to the front of No. 1 Blast Furnace (W05; W06). Mapping evidence shows the trackway covers an area once occupied by the site slag line and tapping house associated with No. 5 Blast Furnace. As such, any works to the trackway would result in a high potential for the exposure of archaeological deposits and remains associated with the workings of Brymbo's blast furnace. It is therefore recommended that archaeological evaluation should be undertaken

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
22				
Asset Name				
Site Entrance / East Extent of Site / Area of Cabins and Parking				
Date Range	Asset Number	Asset Type		
1792-1992	N/A	Area		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29502 53568	☐	☐	

Description

This lowest part of the site, which today provides carparking and area for office cabins, is currently devoid of features. A mixed hardcore and concrete covers this lower part of the site.

History

The earliest records of the Brymbo Ironworks both describe and show in plan, the existence of Puddling Forge (Furnace) to this area; this being a variety of reverberatory furnace. A letter sent by James Watt, Jr. to his father in 1793, describes Wilkinson had spent £20,000 on levelling the site, constructing a parapet wall and building a puddling furnace (Soldon 1998: 73). An estate plan of 1798 confirms the existence of the Puddling Furnace, with it drawn and described. The furnaces are unlikely to have remained unaltered due to the high heat causing the brick to shatter, thus requiring them to be rebuilt regularly. Ordnance Survey maps of 1873 (Denbighshire XXVIII.2) and 1899 (Denbighshire XXVIII.2) show a building of approximately the same size and orientation where the Puddling Furnaces are on the 1798 plan. However, it is difficult to confirm whether or not this is the location of the Puddling Furnace. At this this later date, the building is unlikely to be the bank of furnaces, with the building now show a later development. The map of 1912 (Denbighshire XXVIII.2) shows that this building is now been replaced, which is confirmed by the 1938 map (Denbighshire XXVIII.NW). By 1963 (Denbighshire XXVIII.2), new buildings and structures occupy this area of the site.

This area of the site, between the first Ordnance Survey map of 1873 and the present day, has seen intense development as a result of new buildings and site railways being built or charged through as a result of the increased mechanisation and improving mass production.

Condition
No comment.

Archaeological Potential
This area of the site is likely to be much disturbed by later developments and additions to the site. However, this area should be considered as having high potential to retain structural remains and deposits associated with the development of the works from 1792 until its closure in 1990. In particular, archaeological horizons associated with site infrastructure and the improvement of both the blast furnace and steel plan, and their associated infrastructure, may still be present and offer a view of the sites complex history. As a result, an archaeological evaluation should be undertaken to determine prior to any planned ground disturbing works within this area.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
23
Asset Name
Overhead Travelling Crane (North) to Foundry

Date Range	Asset Number	Asset Type		
1943	N/A	Machinery		
NPRN	NGR	Scheduled	Listed	ID
34056	SJ 29456 53525	☑	☐	DE202

Description

Overhead Travelling Crane (North) to Foundry, one of a pair installed during 1943. Made by Joseph Adamson & Co. Ltd. in Hyde, Cheshire. Lifting ability of 5 tons E.O.T. (electric overhead travelling crane). Bolted construction to I-beam runways and trolley, with riveted I-beams and angle irons stanchions. Access to control cage via stairs (up), gantry and ladder (down). Electrical supply from B14. Shares central runway support structure with South crane.

History

New cranes were provided for the cupola furnaces in 1943, at the height of WWII. This work would have caused the spine wall is dismantled, to provide space for the new overhead travelling cranes from Joseph Adamson & Co. Ltd. It is likely a new roof was to facilitate the installation of the two new cranes. The cranes remain in use until the closure of operations in 1992.

The cranes represent substantial upgrades to the plant during a time when the production of steel and iron for munitions and military equipment was a national priority. As such, they are of high significance to the Brymbo story.

Condition

Overall in good condition. However, the more vulnerable element of the structure have suffered from severe rust.

Archaeological Potential

Archaeologically the crane itself has low archaeological potential.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
24
Asset Name
Overhead Travelling Crane (South) to Foundry

Date Range	Asset Number	Asset Type		
1943	N/A	Machinery		
NPRN	NGR	Scheduled	Listed	ID
34056	SJ 29458 53518	☑	☐	DE202

Description

Overhead Travelling Crane (South) to Foundry, one of a two installed during 1943. No name plate, but possibly made by the same manufacturer as the north; Joseph Adamson & Co. Ltd. in Hyde, Cheshire. Lifting ability of 5 tons, electric overhead travelling crane. Bolted construction to I-beam runways and trolley, with riveted I-beams and angle irons stanchions. Access to control cage via stairs (up), gantry and ladder (down). Electrical supply from B14. Shares central runway support structure with North crane.

History

New cranes were provided for the cupola furnaces in 1943, at the height of WWII. This work would have caused the spine wall is dismantled, to provide space for the new overhead travelling cranes from Joseph Adamson & Co. Ltd. It is likely a new roof was to facilitate the installation of the two new cranes. The cranes remain in use until the closure of operations in 1992.

The cranes represent substantial upgrades to the plant during a time when the production of steel and iron for munitions and military equipment was a national priority. As such, they are of high significance to the Brymbo story.

Condition

Overall in good condition. However, the more vulnerable element of the structure have suffered from severe rust.

Archaeological Potential

Archaeologically the crane itself has low archaeological potential.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
25

Asset Name
Cupola Furnace (North)

Date Range	Asset Number	Asset Type		
1970	S33/S38	Structure		
NPRN	NGR	Scheduled	Listed	ID
34056	SJ 29443 53516	☑	☐	DE202

Description

Cupola Furnace (North) to west of Foundry, of circa 1970. Taller of the two cupola furnaces. Used to melt scrap cast iron for casting into ingots or special castings. Steel shell with silica firebrick lining. Charging floor and door to stack accessed at the upper level to west of Foundry. Preheating, melting, and superheating zones, and well contained beneath charging floor. Fettling hole and tapping spout (missing) drops into Foundry. Blast provided by centrifugal blast fan. Spark arresters missing(?). Concrete base poured to support failing/frail legs.

A valuable asset to the heritage area, reflecting reprocessing of scrap iron at Brymbo.

History

Although no written accounts have been found for the Cupola Furnaces, an account provided by Walter Salisbury, a former Foundry Worker, tells us that these were installed in circa 1970, with the roof being renewed at the same time. The cupola furnaces were designed by Walter and a colleague, which were then manufactured at the works. Walter admits that the furnaces could have been 50% taller again, as the heat created by the furnaces was so great that it melted the spark arresters. As such, they were only able to produce 2 tonnes per week, rather than the potential of 5 tonnes.

Condition

Covered in iron oxide, giving iconic red colouring. Firebrick lining fallen in places. Legs now concreted to give greater support around base.

Archaeological Potential

The archaeological potential of the cupola furnace comes largely from the survival of internal deposits left from the smelting process. Such deposits, including the firebrick lining, have the potential to provide evidence for the materials and agents used in the process of recycling waste materials.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
26

Asset Name
Cupola Furnace (South)

Date Range	Asset Number	Asset Type		
1970	S32/S37	Structure		
NPRN	NGR	Scheduled	Listed	ID
34056	SJ 29445 53510	☑	☐	DE202

Description

Cupola Furnace (South) to west of Foundry, of circa 1970. Shorter of the two cupola furnaces. Used to melt scrap cast iron for casting into ingots or special castings. Steel shell with silica firebrick lining. Charging floor and door to stack accessed at the upper level to west of Foundry. Preheating, melting, and superheating zones, and well contained beneath charging floor. Fettling hole and tapping spout drops into Foundry. Blast provided by centrifugal blast fan. Spark arresters missing(?). Concrete base poured to support failing/frail legs.

A valuable asset to the heritage area, reflecting reprocessing of scrap iron at Brymbo.

History

Although no written accounts have been found for the Cupola Furnaces, an account provided by Walter Salisbury, a former Foundry Worker, tells us that these were installed in circa 1970, with the roof being renewed at the same time. The cupola furnaces were designed by Walter and a colleague, which were then manufactured at the works. Walter admits that the furnaces could have been 50% taller again, as the heat created by the furnaces was so great that it melted the spark arresters. As such, they were only able to produce 2 tonnes per week, rather than the potential of 5 tonnes.

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Archaeological Potential

The archaeological potential of the cupola furnace comes largely from the survival of internal deposits left from the smelting process. Such deposits, including the firebrick lining, have the potential to provide evidence for the materials and agents used in the process of recycling waste materials.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
27

Asset Name
Overhead Travelling Crane to Machine Shop

Date Range	Asset Number	Asset Type		
1921	N/A	Machinery		
NPRN	NGR	Scheduled	Listed	ID
418133	SJ 29501 53515	☐	☐	

Description
Overhead Travelling Crane by the Vaughan Crane Co., installed in 1921 and integral to the Machine Shop. SWL (safe working load) of 7½ Tons. Electronically driven and operated. Runways flank entirety of work area. Runways of modular riveted steel panel sections bolted together. Crane carriage of same construction with angle iron box framing. Cast casing to hoist carriage. Hook block by Smith Keighley. Crane rests in bay 11 of Machine Shop, with staired access to control box, a second stair allow access at bay 4; control leavers and fuse box remains, though damaged. Now orange in colour, originally yellow. For lifting rough castings and specialist metals for machining and processing to various work stations; turning, milling, turning, drilling, grinding and sawing.

History
Installed as an integral element of the Machine Shop of 1921.

Condition
Overall in good structural condition. The only element in poor condition are the controls within the control box.

Archaeological Potential
N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
28
Asset Name
Sand Mixer 1

Date Range	Asset Number	Asset Type		
20th Century	N/A	Machinery		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29447 53550	☑	☐	DE202

Description
Machinery in the Cast House for mixing materials for production of sand castings. 20th century. Located next to south face of No. 1 Blast Furnace, east of two in this location. Steel sheet construction. Powered by belt/chain drive from electric motor. No manufacturer marks.

History
N/A

Condition
Moderate condition. Deterioration caused by exposure to elements, causing paint loss and surface rust.

Archaeological Potential
N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
29				
Asset Name				
Sand Mixer 2				
Date Range	Asset Number	Asset Type		
20th Century	N/A	Machinery		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29447 53549	☑	☐	DE202

Description

Machinery in the Cast House for mixing materials for production of sand castings. 20th century. Located next to south face of No. 1 Blast Furnace, west of two in this location. Steel sheet construction. Direct drive from electric motor. No manufacturer marks.

History

N/A

Condition

Moderate condition. Deterioration caused by exposure to elements, causing paint loss and surface rust.

Archaeological Potential

N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
30
Asset Name
Sand Mixer 3

Date Range	Asset Number	Asset Type		
20th Century	N/A	Machinery		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29442 53541	☑	☐	DE202

Description

Machinery in the Cast House for mixing materials for production of sand castings. 20th century. Located to west of side of Cast House. Largest of three sand mixers. Steel sheet construction. Powered by direct drive from electric motor. Lever operated lift mechanism for heavy casting boxes; within safety caging. No manufacturer marks.

History

N/A

Condition

Moderate condition. Deterioration caused by exposure to elements, causing paint loss and surface rust.

Archaeological Potential

N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
31
Asset Name
Ingot Patterns x 4 (Cast House)

Date Range	Asset Number	Asset Type		
20th Century	N/A	Misc.		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29444 53536	☐	☐	

Description
Four large patterns for ingot moulds. Made in the on site Pattern Shop. Range from 3.4 to 2.4 tonnes. Pine with steel fixings. Painted red. Used to produce casting moulds for casting in the Foundry.

History
N/A

Condition
Poor condition. Large amounts of water damage/rot.

Archaeological Potential
N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
32
Asset Name
Brass Furnace

Date Range	Asset Number	Asset Type		
1960s	N/A	Machinery		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29452 53545	☑	☐	DE202

Description
Brass Furnace in Cast House, installed in 1960s. Furnace to floor, centrifugal blast fan and extraction hood over. Winch hook over; Ardegar Hoistmaster, SWL ½ ton. Diesel oil fired. Produced molten brass, in graphite crucibles, for casting of bearings and other specialist parts.

History
Installed in the 1960s for the production of bearings and other maintenance parts for the steel plant. Operational life ceased in 1992. Walter Salisbury the last Foundryman to work the furnace.

Condition
Good to poor. Deteriorating as a result of exposure to elements.

Archaeological Potential
N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
33
Asset Name
Cast Mould Breaker x 2 (Cast House)

Date Range	Asset Number	Asset Type		
1960s	N/A	Machinery		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29441 53545	☐	☐	

Description

Cast Mould Breakers, 1960s. Used to break apart casting moulds after cast. Two loose in Cast House. Electric motor driven. Toothed belt over motor driven drums. On wheeled base for moving around work area. Made painted steel sheet.

History

Used in the Cast House from 1960s until its closure in 1992.

Condition

Good to poor. Deteriorating as a result of exposure to elements.

Archaeological Potential

N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
34
Asset Name
Ingot Casting Head (Cast House)

Date Range	Asset Number	Asset Type		
Mid-Late 20th Century	N/A	Misc.		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29439 53546	☐	☐	

Description
Cast iron ingot casting head, 20th century. Square top, with ingot mould shaped extrusion to base. Sat on top of casting mould to direct pour from crucible suspended by overhead travelling crane. Ingots used transported via Iron Line (H02) for processing in steel plant.

History
Manufactured in the mid-20th century for use in the Foundry (B03) in the production of iron ingots from recycled material.

Condition
Poor condition. Rapidly deteriorating, rust and delamination

Archaeological Potential
N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
35

Asset Name
Cast Iron Beam with 'Brymbo 1861'

Date Range	Asset Number	Asset Type		
1861	N/A	Misc.		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29443 53541	☐	☐	

Description
Cast iron beam with 'Brymbo 1861' in high relief. Painted grey. Decorative moulding to top and bottom edge.

History
Presumably cast at Brymbo in 1861.

Condition
Good general condition. Pain flaking in placed, rust pitting to the top surface.

Archaeological Potential
N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
36				
Asset Name				
Railway Wagon Wheelset				
Date Range	Asset Number	Asset Type		
	N/A	Misc.		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29439 53546	☐	☐	

Description

Railway Wagon Wheelset (axle and wheels). Unknown association to Brymbo Steelworks. Loose in Cast House.

History

N/A

Condition

Good. Surface rust and pitting.

Archaeological Potential

N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
37
Asset Name
Powerhouse Cupolas x 2

Date Range	Asset Number	Asset Type		
1902	N/A	Misc.		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29496 53540 / SJ 29499 53527	☐	☐	

Description
Two large cupola vents from the former Powerhouse of 1902. Only surviving of three to the main ridge. Galvanized/tinplate steel construction. Loose/movable. Iconic shape.

History
Installed as ventilation to the Powerhouse in 1902 and surviving until its demolition in the 2000s.

Condition
Moderate and deteriorating. Damage to edges causing exposure and rust.

Archaeological Potential
Low. However, significance is derived from…

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
38				
Asset Name				
Wall to Machine Shop Yard				
Date Range	Asset Number	Asset Type		
Circa 1960	N/A	Wall		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29487 53542	☐	☐	

Description

red brick Wall to Machine Shop Yard, circa 1960. Sits on top of south retaining wall to Iron Line (H02). Stretcher bond panels between steel I-beams to east-west stretch. Garden wall bond to north-south stretch. Varies in number of courses, maximum 15. I-beams cut with oxy-acetylene and wall reduced in height; remains of building once linked to Machine Shop (B01).

History

Erected in circa 1960, with the earliest representation of the building on the 1963 Ordnance Survey map (Denbighshire XXVIII.2). Built as a Smithy, undertaking various fabrication works for the steelworks. Dismantled shortly after the works closed in 1990. Today the wall provides a safety barried to the lower Iron Line (H02).

Condition

Poor. As a result of being a partially dismantled wall, the top courses of brickwork are susceptible to freeze-thaw action due to the stepped nature of some of the brick coursing.

Archaeological Potential

The wall has some limited archaeological value, as the survival of the cut I-beams provides some clues for the origins of the wall as a structure.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
39
Asset Name
Machine Shop Yard

Date Range	Asset Number	Asset Type		
1792-1960	N/A	Area		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29485 53531	☐	☐	

Description

Concrete Yard to the north of the Machine Shop (B01). Former working floor to Smithy of circa 1960. Small stage occupies east end. Remains of red brick wall to west, in line with west elevation of Machine Shop, stopping some 10m to its north; this representing the location of the entrance.

History

It is possible that this area of levelled ground formed part of the levelling of the site in 1792-3, although no clear evidence of a surrounding retaining wall survives. The Ordnance Survey map of 1873 (Denbighshire XXVIII.2), shows a single, small building to the west of this area, with a yard and site railway to the east. In 1899 (Denbighshire XXVIII.2), the small building is replaced by a narrow building on an east-west alignment occupying the space, which is confirmed by a photograph of the same period. By 1963 a building is shown in this area, which is the Smithy. The Smithy undertook various fabrication works for the steelworks. Dismantled shortly after the works closed in 1990.

Condition

N/A

Archaeological Potential

There is potential to encounter archaeological remains and deposits within the yard area is high. These are likely to be in the form of foundations and workings associated with the buildings depicted on the 1873 and 1899 Ordnance Survey maps (Denbighshire XXVIII.2). There is also th potential to encounter earlier working floor surfaces to the Smithy. Any groundwork within this area will need or have as a requirement of a condition of Scheduled Monument Consent, an archaeological evaluation in advance of any such work.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
40				
Asset Name				
Pulley Wheel				
Date Range	Asset Number	Asset Type		
Early 20th Century(?)	N/A	Machinery		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29500 53526	☐	☐	

Description

Large Pulley Wheel, early-20th century(?). Cast iron. Grooved. Use unknown. Loose to north of Machine Shop (B01).

History

N/A

Condition

Poor condition. 4 spokes missing. Rust pitted.

Archaeological Potential

N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
41				
Asset Name				
Fuse Boxes				
Date Range	Asset Number	Asset Type		
20th Century	N/A	Machinery		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29498 53526	☐	☐	

Description

Fuse boxes, 20th century. Pressed steel. Rectangular. Various depths. One with door surviving. Loose to north of Machine Shop (B01).

History

N/A

Condition

Poor. Covered in surface rust and pitting. Rapidly deteriorating.

Archaeological Potential

N/A

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
42
Asset Name
Retaining Wall to Site Road

Date Range	Asset Number	Asset Type		
1792 - 1940	N/A	Wall		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29480 53500	☐	☐	

Description

Retaining Wall to Site Road rising from front of Machine Shop (B01) towards rear of Foundry (B03); on east-west alignment. South of Scheduled area. Multiple phases of construction from late 1792 to circa 1940. Mix of large, dressed sandstone blocks, red brick and concrete. Stone phase has an projecting coping course to the top. Stone buttresses provide support, with later brick fill between.

History

The Brymbo Estate Plan of 1798 shows a road passing to the south of the main workings, to which later penmanship has added a set of steps from and to the front of the Agents House, then labelled Three Cottages. This early road is shown to continue straight on from its current path, without the turn just beyond the Carpenters Workshop, instead continuing to meet Blast Road to the west. The construction of the retaining wall is therefore likley to have been built as part of Wilkinson's levelling of the site as described by James Watt Jr. in 1792-3. The later additions to the plan also show a wagon way; running the same route, from the ironworks to the Mount Pleasant Pits. Although we cannot acsribe an exact date to this, the Estate Sales Inventory tells us that there are 'six Iron Rail Roads' in existence by 1829. By 1873 (Denbighshire XXVIII.2), evidence demonstrates that the progression of the road up to Blast Road has been curtailed at the rear of the Carpenters Workshop, with the link from here up to the Agent's House now formed. To enable this, the ground level around the south and west of the site appears to have been made up sometime in the 19th century. Additions to the wall, in red brick appear to be of circa 1900, with late 20th century additions and repairs in concrete.

Condition

Archaeological Potential

The archaeological potential of the Retaining Wall is high, although excavations and interventions to the wall are unlikely due to the risk of destabilisation of the wall and bank, the relationship of this wall to the early development of the site provides a key historic link to the formation of the ironworks. The historic value of the wall is high, due to its associations with Wilkinson and the early development of the site.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
43
Asset Name
Retaining Wall to West of Site

Date Range	Asset Number	Asset Type		
19th & 20th Century	W13	Wall		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29423 53524	☑	☐	DE202

Description

Retaining Wall to west of site, behind Cast House (B04) and Foundry (B03), mid-19th century. Constructed of large, dressed sandstone blocks, bedded in lime mortar. Evidence of former building; purlin and ridge pockets survive. Two main phases to the stone construction, with the northern end of representing the earlier, the southern the later. Final alterations create a concrete and steel face to part of the elevation, used to drop scrap metal down to the charging floor of the cupolas, with parapet wall to the top of the wall.

History

First present on the Ordnance Survey 25 inch map of 1873 (Denbighshire XXVIII.2). The Sales Catalogue estate plan of 1829 shows a change in the road leading from the east, by this time being shown to turn south to the rear of the lower part of the site. This tentatively suggests that some alterations have been undertaken and may relate to the construction of the Retaining Wall as seen today. However, this is conjecture. Another possible date for construction would relate the retaining wall to the building of the Machine Shop (B02) (Patternmakers and Carpenters Workshop) in 1843, under the stewardship of the Darby brothers. Sometime in the late 19th century, the ground was built up to the south-west of the site, obscuring the lower sections of the wall. The 1899 map (Denbighshire XXVIII.2) demonstrated the existence of a building connecting the wall to the Foundry, which had not existed in 1873 (Denbighshire XXVIII.2). By 1963, this building has been demolished, but leaving purlin and ridge pockets visible in the wall today. In circa 1960, shuttered concrete and steel rails were applied to the southern end of the wall to allow for scrap metal to be dropped to the charging floor of the cupola furnaced below.

Condition

Overall the wall is in good condition. However, the top sections of masonry and concrete have become susceptible to freeze-thaw actions and oxide jacking/rust burst to the I-beam rails.

Archaeological Potential

The archaeological potential of the Retaining Wall is moderate, as whilst excavations and interventions to the wall are unlikely due to the risk of destabilisation of the wall and bank, the wall provides developmental evidence of the banking and building up of land to this area of the ironworks. Any excavations immediately to the east of the wall would demonstrate the depth of and nature of the material used to build up this area of the site.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
44
Asset Name
Railway Tracks

Date Range	Asset Number	Asset Type		
circa 1960	S40	N/A		
NPRN	NGR	Scheduled	Listed	ID
N/A	SJ 29433 53512	☐	☐	

Description
Iron rail tracks used by small railway crane, circa 1960. Used to the lifting of scrap metals to the charging doors of the cupola furnaces (S32/S38; S33;S37). North-south alignment.

History
Installed in circa 1960 to lift scrap loads to the charging doors of the cupola furnaces. Became redundent in 1990.

Condition
Good, athough becoming burried by site detritis and vegetation growth.

Archaeological Potential
Low archaeological potential, due to being surface-laid.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
45				
Asset Name				
Site Road from East rising to and past the Agent's House				
Date Range	Asset Number	Asset Type		
1792-1873	N/A	Infrastructure		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29472 53502	☐	☐	

Description

Site road leading from unnamed road to east of the site, rising to Agent's House and westwards. Multi-period. Tarmac, concrete and scalping finish.

To keep the interpretation below easier to follow, the roads will be named as follows:
A - lowest extent of the road, up to the rear of the Carpenters Workshio
B - road at the top of the site, to the front of the Agent's House, linked to A by;
C - the middle, rising section of road.

History

The earliest record of the road (A) comes with the Brymbo Estate Plan of 1798. At this time the road (A) runs from the east of the site toward the west, depicting its from the rear of the now Carpenters Workshop heading west where it then meets with Blast Road. The road to the front of the Agent's House (B), during this time, meets with road A to the west of the Agent's House. By 1829, when the Brymbo Estate Sales Catalogue is produced, the layout of the roads appear altered, with road A appearing to rise towards the south, meeting with road B beyond the Agent's House to the west. Differing again from the 1798 estate plan, a road has since been driven from road B to the rear of the Charging House of No. 1 Blast Furnace. In the years between 1829 and the first edition Ordnance Survey map of 1873 (Denbighshire XXVIII.2), the road layout becomes what we see on site today; the rising section of road (C) joining A and B to the north of the Agent's House, with the upper sections of road (B) now carrying part of the works railway.

Condition

N/A

Archaeological Potential

The roadway through the site has a high potential for the encountering of deposits relating to the sites development, particularly in relation to the historic landform. Importantly, the deposition of materials to create and raise the road, have the portential to have burried other natural and man-made features, which could provide information on land usage and occupation before the ironworks. Further to this, the works early wagon and later railway both ran over the upper sections of this area (B).

Importantly, the developments and changes to this road come as a result of the deposition of waste materials associated with the iron and coal works. The Cast House (B04), Foundry (B03) and Pattermakers and Carpenters Workshop (B02) buildings all display evidence of this build up of ground levels, blocked arches, doors and windows now sitting below ground level. This deposition of materials suggests that the rear of the site has been significantly built up, likley filling a small vale.

Due to the nature of the development of the site road and its potential to cover historically significant remains, all works to

this should be archaeologically supervised, with an archaeological evaluation undertaken prior to any major schemes, such as resurfacing.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
46
Asset Name
Retaining Wall to Site Road Rising to Agent's House

Date Range	Asset Number	Asset Type		
1829-1873	W17; W18; W19	Wall		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29471 53490	☐	☐	

Description

Retaining Wall to Site Road rising from rear or Carpenters Workship (B02); on east-west alignment. South of Scheduled area. Multiple phases of construction from late 1792 to circa 1940. Large, dressed sandstone blocks, with later brick buttressing. Steps (S41) towards west end. Stone only to east and west ends.

History

Although an exact date cannot be given, the construction of this wall coincides with the provision of a new linking road between the lower roadway, next to the Carpenters Workshop (B02), up to the Agent's House (B06). Mapping evidence shows that this was undertaken sometime between the Estate Sales Catalogue Plan of 1829 and the Ordnance Suevey map of 1873 (Denbighshire XXVIII.2). To enable this, the ground level around the south and west of the site appears to have been made up sometime in the mid-19th century. Movement, sometime around 1900, causes most of the wall to be buttresses to prevent possible collapse of the ground behind.

Condition

Good overall condition. Spalling brick masonry, though not structurally serious.

Archaeological Potential

The archaeological potential of the Retaining Wall is moderate. Although excavations and interventions to the wall are unlikely due to the risk of destabilisation of the wall and bank, the potential for materials and deposits behind the wall may provide evidence for the material build-up and deposition of materials on the site during the course of the 19th century.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
47
Asset Name
Retaining Wall to East of Agent's House

Date Range	Asset Number	Asset Type		
19th Century	W20	Wall		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29496 53479	☐	☐	

Description

Retaining Wall to Site Road to east of Agent's House (B07), on east-west alignment. South of Scheduled area. Single phases of construction from late 1792 to circa 1940. Large, dressed sandstone blocks.

History

The history of the retaining wall is difficult to fully assess and its construction could be associated with several different periods. However, its construction is may be associated with the construction of the site wagonway sometime in the first half of the 19th century.

Condition

Good overall condition. Some mortar wash.

Archaeological Potential

The archaeological potential of the Retaining Wall is moderate. Although excavations and interventions to the wall are unlikely due to the risk of destabilisation of the wall and bank, the potential for materials and deposits behind the wall may provide evidence for the material build-up and deposition of materials on the site during the course of the 19th century.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
48				
Asset Name				
Outhouse to East of Agents House				
Date Range	Asset Number	Asset Type		
1873-1899	B20	Building		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29484 53476	☐	☐	

Description

Outhouse with W/C and storage, built sometime between 1873 and 1899. red brick bedded in lime mortar. Roofless.

History

First appears on the Ordnance Survey map of 1899 (Denbighshire XXVIII.2), giving a date of construction as between 1873 and 1899. Still in use as W/C when works closed in 1990 and fallen into disrepair since.

Condition

Whilst the masonry structure is in generally in good condition, the roof collapsed some years ago. Some areas of brickwork have been damaged by both freeze-thaw and root action.

Archaeological Potential

Within this area there is a moderate archaeological potential for the discovery of debris and detritis associated with domestic habitation. Any works within this building/area should be subject to an archaeological evaluation prior to any development to assess the nature of any such deposits.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number				
49				
Asset Name				
Charging Floor				
Date Range	Asset Number	Asset Type		
1970s	N/A	Misc.		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29439 53510	☐	☐	

Description

Charging Floor to cupola furnaces (S32;S38 / S33;S37), poured in 1970s. Supports cupola furnace superstructure. Rinforced concrete. Used to charge cupolas with material; scrap, limestone and coke. Area retained by Foundry wall to the east.

History

In the 1970s, the original cupola furnaces were dismantled and replaced by two Brymbo designed cupolas. As part of this upgrade, a number of alterations and upgrades were made to the surrounding infrastructure, including the pouring of a new charging floor.

Condition

Good overall condition, with some spalling caused by freeze-thaw.

Archaeological Potential

The archaeological potential of the charging floor is low as the greater part of this area to the east is suspended over the base of the cupolas beneath. The area to the west has a a moderate potential for materials and deposits relating to the building up of the land surface to the west of the Foundry. As such, any planned works within this area should be subject to archaeological monitoring and investigation.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

Entry Number
50

Asset Name
Ancillary Building to West of No. 1 Blast Furnace

Date Range	Asset Number	Asset Type		
1967-1984	B11	Building		
NPRN	NGR	Scheduled	Listed	ID
	SJ 29440 53553	☐	☐	

Description

Ancillary Building to west of No. 1 Blast Furnace, 1967-1984. Sitting to the eastern extent of the upper site. Red brick bonded with cementitious mortar. Stretcher bond. Mono-pitch of corrugated iron.

The north elevation has one window to the east end, with standard doorway and large access doorway to the west. Concrete lintels to window and doorway. Under corrugated roof.

The east elevation abuts the top of No. 1 Blast Furnace.

The south elevation overlooks the Cast House (B04). The elevation has two windows, with concrete lintels.

The west elevation has a single central window, with concrete lintel. Four angle iron purlins project.

History

Mapping evidence shows the building was constructed sometime between 1967 (Denbighshire XXVIII.2) and 1984 (Denbighshire XXVIII.2). Likely associated with upgrade works to No. 5 Blast Furnace in the 1970s.

Condition

Good condition with little deterioration.

Archaeological Potential

Whilst the building is unlikely to be altered or demolished, the potential for archaeological deposits and remains is high. As a result of being built over Wilkinson's original Charging House, the building potentially protects valuable information and materials relating to the development of a late 18th century industrial building. Any development to the building that requires ground disturbance will require an archaeological evaluation prior to development to assess the extent of any deposits and remains.

Images

Other Comments

Assessed By	Assessed On
Ross Cook	11/10/2019

APPENDIX III

Misc.

Period	Approximate Dates
Palaeolithic	*circa* 225,000 BCE - 10,000 BCE
Mesolithic	*circa* 10,000 BCE - 3500BCE
Neolithic	*circa* 3500 BCE - 2000 BCE
Bronze Age	*circa* 2000 BCE - 600 BCE
Iron Age	*circa* 600 BCE - 43 CE
Roman	43 CE - 410 CE
Early Medieval	410 CE - 1066 CE
Medieval	1066 CE - 1485 CE
Post Medieval	1485 CE - 1700 CE
Early Modern	1700 CE - 1900 CE
Modern	1900 CE - Present

Table 1 - British Archaeological and Historical Time Periods.

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