

Former Air Products Site, Llangollen Road, Acrefair, Wrexham.

A Desk Based Archaeological Assessment and Walkover Survey



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Former Air Products Site, Llangollen Road, Acrefair, Wrexham: A Desk Based Archaeological Assessment and Walkover Survey

Non Technical Summary.

An archaeological desk-based assessment and walkover survey was carried out on the former Air Products site to the south of the A539 in the village of Acrefair, which is within Wrexham County Borough in NE Wales. The walkover was done on May 14th. Weather was overcast but fairly bright.

The site was closed for industrial use in the early 21st century, having been the site of a factory producing industrial gases for the Air Products Company, and was then allocated as a potential mixed use or housing development site by the Local Planning Authority due to its location in Acrefair.

The site is shown on early Ordnance Survey maps as part of the site of the New British Iron Works and was occupied by buildings serviced by rail or tram tracks which linked the iron works to mines owned by the company and to the main railway network. A bank of blast furnaces survives at the southern edge of the site, built against a steep bank which is part of the site but outside the area proposed for housing development.

The area under consideration was mainly used as the car park for the Air Products works with the demolished remains of a former office on the southwestern part and is the eastern part of the Air Products site. The remainder of the site is part of a separate development proposal by another developer.

The site inspection showed that the eastern end of the site is below a substantial revetment wall and was probably partly terraced into the slope of the land. Excavations for drainage test pits did not reveal any remains and the area in front of the furnaces on the southern side was cleared of vegetation and tarmac to reveal a clean clay surface.

A preliminary report on the assessment was submitted as part of Planning Application P/2021/0793. In the light of comments and advice from the Development Control Archaeologist at CPAT and further information on the layout and ground levels of the proposed development this revised report was prepared.

The site is considered, from the map evidence to have high potential for holding some structural evidence of the iron works. This is countered by the evidence from engineer's test pits that suggests there is a relatively shallow layer of deposits, most likely relating to site demolition and clearance and the creation of a level surface for the car park over a clay subsoil. The step down to the site from the level of the furnace arches of the southern block of furnaces may also be the result of levelling work on the site which would have removed any evidence for a casting bed in front of the furnaces extending into the area of the proposed housing. This all suggests the archaeological potential of the site is much lower.

Ironworks are a reasonable well documented type of site and the proposed shallow foundation design for the houses to be constructed on the site, along with importing clean fill to raise the surface to aid site drainage, will minimise impacts on any truncated fragments of the structures on the site. It is considered that a requirement for further extensive archaeological investigations on the site would be disproportionate to the significance of any fragmentary remnants of the works.

The structures of the furnaces on the south-eastern edge of the site however need to be assessed by an appropriately qualified structural engineer with experience of historical industrial structures and

a repair schedule and conservation plan for longer term management should be drawn up, which should include an archaeological record and may require further work specific to the engineer's recommendations for conservation and repair works.

Author

This Assessment Report was prepared by Peter McCrone of McCrone Archaeology, Consultancy and Contracting Services. The author is a Member of the Chartered Institute for Archaeology (MCIfA) and holds, amongst other qualifications, a B.Sc. (Hons) degree in Archaeology and a Postgraduate Diploma in Buildings and Heritage Conservation. The author has many years of experience of the historic environment of Britain including experience of “hot metal” industrial sites of Wales.

Acknowledgements

Thanks go to Doug Bailey of Turnpike Consulting Ltd. for commissioning the report on behalf of Gower Homes Ltd. and for enabling access to the site, discussing the details of the proposed development, and providing site documentation and photos of engineers’ test pits. Mr Gary Duckers at the Historic Environment Record (HER) at the Clwyd-Powys Archaeological Trust (CPAT) supplied the HER information for the site and surrounding area. Mark Walters, Development control Archaeologist at CPAT provided constructive advice on an early draft of the report. Edge Architects provided site sections and drawings to show site levels.

Site Location

The Ordnance Survey National Grid Reference for the approximate centre of the site is SJ 28163 43180.

Figure 1 Location in UK (contains OS data © crown copyright, 2021. Source OS Opendata).



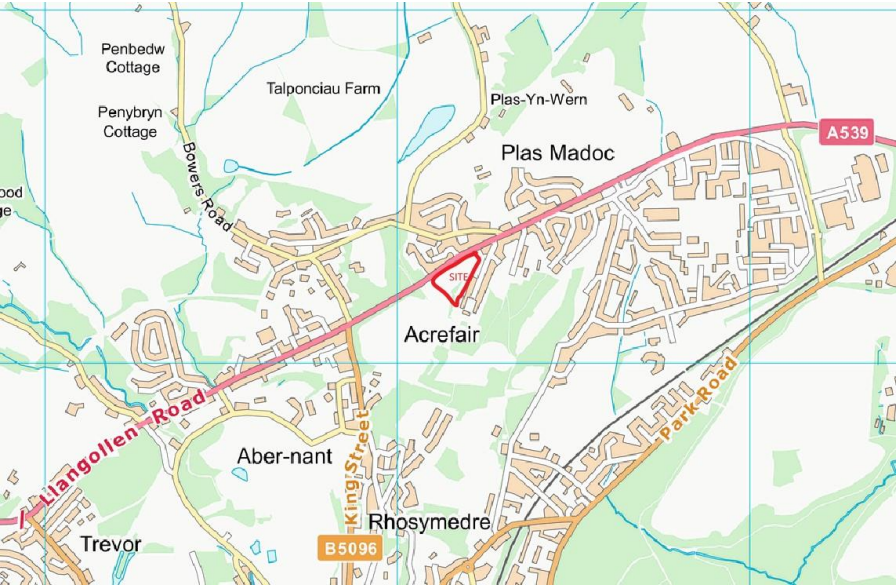
The site comprises c. 1.15 ha lying on the southern side of the Llangollen Road (the A 539) in Acrefair, which is c. 11 km SW of the town of Wrexham (Wrecsam) and 15 km north of the town of Oswestry (Figures 2 and 3).

Figure 2 Regional Location (contains OS data © crown copyright, 2021. Source OS Opendata).



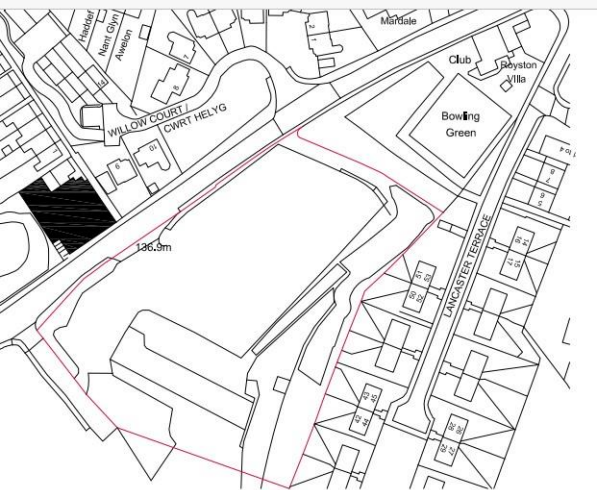
The former Air Products site is in two parts, north and south of the Llangollen Road and totalling 11.38 ha. This report covers the part to be developed by Gower Homes Ltd site which is the northeastern section of the southern part of the site (Figures 3 and 4).

Figure 3 Local Map (contains OS data © crown copyright, 2021. Source OS Opendata).



The site is an irregular quadrilateral narrowing from the south-western edge to the north-eastern, the longer axis running NE – SW. The north-west edge of the site is bounded by the Llangollen Road, the north east end is the narrowest part with a high revetting wall, the south east side is along the rear of properties on Lancaster Road which runs parallel to the site boundary. A steep slope falls from the boundary to the edge of the proposed development area. The south-western end opens on to the remainder of the main Former Air Products site (Figure 4).

Figure 4 Gower Developments site map.



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Parry Davies Architects.		Chartered Architects.	
PROJECT TITLE	LAND AT ACREFAIR	DATE	JUNE 2016
DRAWN	1:1250@A4	SCALE	RSG
DRAWN	20.6072/L1	DATE	REV
LOCATION PLAN		20.6072/L1	
Studio 55:20, North Wales Business Park Abergele LL22 8LJ		Tel: 01745 585517 E-mail: PDPArchitects@aol.com	

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Site description

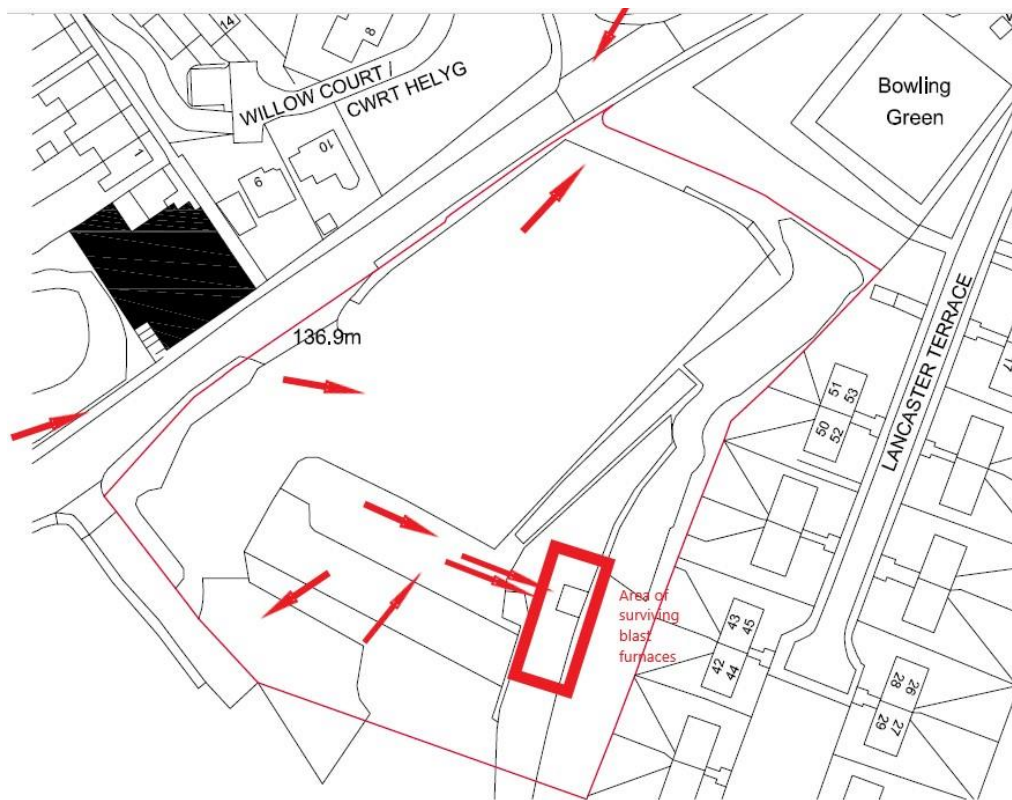


Figure 7 Plan with photo viewpoints and direction of view.

The site appears generally level, although it falls slightly from E – W (Figure 6). The eastern end has a revetment wall supporting a raised platform beyond the development site. This supports a bowling green to the east and c 5 metres higher than site level (Figures 8 and 9).

Figure 8 Revetment Wall at NE end of site, Llangollen Rd to left.



Figure 9 View of north-eastern end of site from Llangollen Road, showing step created by revetment wall. The Former Air Products site starts to the right of step in wall heights.



There is a steep slope along the south-eastern edge of the site, with a rise of c 3.m rising from site level to a ledge c 10-15 m wide, with a further steep slope rising to the rear boundaries of properties along the residential road named Maes Derwydd or Lancaster Terrace (Lancaster Terrace was originally a row of houses off the Llangollen Road to the northeast of the site, the names are used interchangeably by different map sources). These form the eastern boundary of the site ownership. At the base of the slope is a steel palisade fence that bounded the Air Products works and which will be retained to form the eastern boundary of the housing development area. The area of the slopes between the palisade fence and site boundary will be a “natural” buffer and wildlife area although the woodland is secondary growth over parts of the iron works (Figure 10).

Figure 10 The steep bank on the south-eastern edge of site, the furnaces are just left of centre.



A set of blast furnaces survive, standing against the steep slope.

The south-western edge of the site is on a level with the remainder of the main Former Air Products site. That area is in separate ownership and is subject to a separate planning application (Figure 11).

Figure 11 South-western edge of the site looking SW over remainder of Former Air Products site.



The north-western edge of the site is bounded by the A539 Llangollen Road which falls c 3 metres from E – W as it passes the site. Revetting walls retain the levelled site interior (Figure 12).

Figure 12 North western side of site from Llangollen Road, site entrance towards top of picture. Entrance on right is to adjoining development area.



The site was last used as the car parking area, with some buildings sited at the southwestern part, for the Air Products works which had most of its buildings on the remaining area of the site to the south-west. The site is currently a level area with stretches of tarmacadam surface, areas of brick rubble from the demolition of an office building of the of the former works and developing scrub woodland (Figure 13).

Figure 13 Former car park area from north.



Planning Background

The role of the planning authorities in terms of responsibilities to the historic environment are set out in legislation at national and local level.

Welsh Government Planning Policy Wales, Edition 11, Section 6, Distinctive and Natural Places, (Welsh Government 2021) sets out the importance of the historic environment as part of Distinctive and Natural Places and the policies of the government towards the historic environment. Sections relevant to this site are quoted:

Para 6.1.2 The historic environment is made up of individual historic features which are collectively known as historic assets. Examples of what can constitute an historic asset include:

- Listed buildings;
- Conservation areas;
- Historic assets of special local interest;
- Historic parks and gardens;
- Townscapes;
- Historic Landscapes;
- World Heritage Sites; and
- Archaeological remains (including scheduled monuments).

6.1.7 It is important that the planning system looks to protect, conserve and enhance the significance of historic assets. This will include consideration of the setting of an historic asset which might extend beyond its curtilage. Any change that impacts on an historic asset or its setting should be managed in a sensitive and sustainable way. 6.1.8 It is the responsibility of all those with an interest in the planning system, including planning authorities, applicants, developers and communities, to appropriately care for the historic environment in their area. The protection, conservation and enhancement of historic assets is most effective when it is considered at the earliest stage of plan preparation or when designing proposals new proposals. 6.1.9 Any decisions made through the planning system must fully consider the impact on the historic environment¹⁰² and on the significance and heritage values of individual historic assets and their contribution to the character of place

Preserve and enhance the historic environment

Protect archaeological remains which are a finite and non-renewable resource

Ensure that the character of historic buildings is safeguarded

Ensure that conservation areas are protected or enhance

6.1.8 It is the responsibility of all those with an interest in the planning system, including planning authorities, applicants, developers and communities, to appropriately care for the historic environment in their area. The protection, conservation and enhancement of historic assets is most effective when it is considered at the earliest stage of plan preparation or when designing proposals new proposals.

6.1.9 Any decisions made through the planning system must fully consider the impact on the historic environment and on the significance and heritage values of individual historic assets and their contribution to the character of place

Archaeological Remains

6.1.23 The planning system recognises the need to conserve archaeological remains. The conservation of archaeological remains and their settings is a material consideration in determining planning applications, whether those remains are a scheduled monument or not

6.1.25 In cases involving less significant archaeological remains, planning authorities will need to weigh the relative importance of the archaeological remains and their settings against other factors, including the need for the proposed development.

6.1.26 Where archaeological remains are known to exist or there is a potential for them to survive, an application should be accompanied by sufficient information, through desk-based assessment and/or field evaluation, to allow a full understanding of the impact of the proposal on the significance of the remains. The needs of archaeology and development may be reconciled, and potential conflict very much reduced, through early discussion and assessment.

Welsh Government Technical advice note 24 states:

Heritage Impact Assessment

1.15 Heritage impact assessment is a structured process that enables the significance of a designated asset to be taken into account when considering proposals for change.¹² Heritage impact assessments should be proportionate both to the significance of the historic asset and to the degree of change proposed, and should include sufficient information to enable both the significance of the asset and the impact of change to be understood. The results of the heritage impact assessment should be summarised in a heritage impact statement which must form part of any listed building consent, conservation area consent and, when requested, scheduled monument consent applications.

4.7 Where archaeological remains are known to exist, or considered likely to exist, and a study has not already been undertaken by the applicant, the local planning authority should ask an applicant to undertake a desk-based archaeological assessment and, where appropriate, an archaeological evaluation. These should be done by a qualified and competent expert to the appropriate standard.⁵⁶ The reports of these investigations will form part of the planning application. Applicants should show they have modified their development proposals to minimise any negative impact on the identified archaeological remains, and how they intend to mitigate any remaining negative impacts

The Wrexham Local Development Plan includes Policy SP 16 (Historic and Cultural Environment).

The policy is supported by several explanatory paragraphs including the following:

5.106 Not all archaeological remains meriting preservation will necessarily be scheduled and the vast majority of archaeological sites will not be afforded any statutory protection. The Historic Environment Record (HER, compiled and maintained by Clwyd Powys Archaeological Trust) contains records of known archaeological sites and should be consulted when preparing proposals within archaeological sensitive areas such as Holt, Overton, Maelor, region, Llay and Brymbo to identify any potential assets that could be affected. Where

development would directly affect non-designated archaeological remains it will be important to undertake archaeological investigation to determine the nature, extent and significance of the remains. This process will help determine whether in-situ preservation and a programme of excavation and recording will be needed. The desirability of preserving archaeological remains and its setting is a material consideration in determining planning applications.

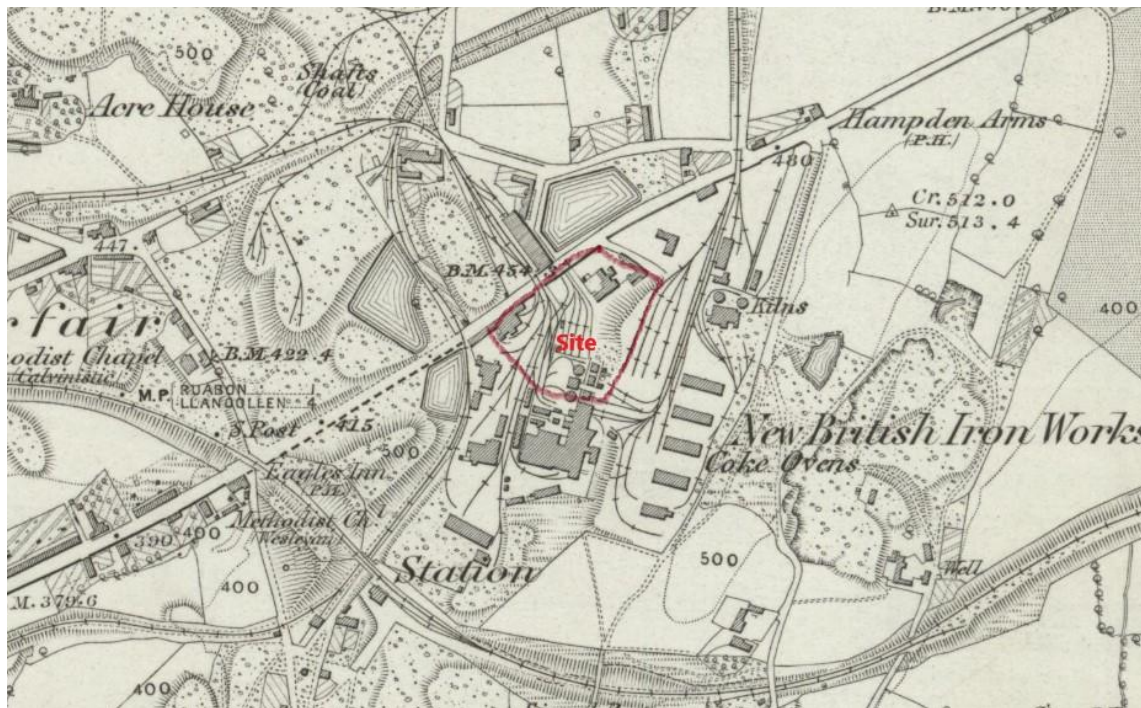
Following the closure of the former Air Products factory on the site, Wrexham County Borough Council produced a supplementary Development Brief for the site; *Planning Brief – January 2012, Air Products, Llangollen Road, Acrefair, Wrexham*.

This sets out the context for development, the site being in two parts (north and south of the A539) indicates that it is allocated for mixed use development in the emerging Wrexham Local Development and sets out background and advice for developers. This includes:

5.5 Archaeology: It is expected that the above ground archaeological feature, the former kiln to be used within the proposals as part of the site's layout. An archaeological audit is required to inform the design of the sites.

The Regional Historic Environment Record indicates that this was part of the former British Iron Works site and has entries on and around the site for elements of the works. These are all short entries and those on the development site are for the buildings of the New British Iron Works

Figure 14. 1st edition OS 1:10560 surveyed 1872-73 (Courtesy National Library of Scotland).



The Acrefair site was the company's principal site in north Wales, generally known as the Ruabon works. An ironworks had been established before 1824 but the owner became bankrupt and the works were bought by the British Iron Company in 1825. There were three furnaces, forges, and mills. The works finally closed in 1887. The company also had collieries in the area, including Acrefair, Plas Benion and Wynnstay which were connected by railways to the ironworks.

In 1883 the works had two cold blast furnaces (Griffiths, 1883).

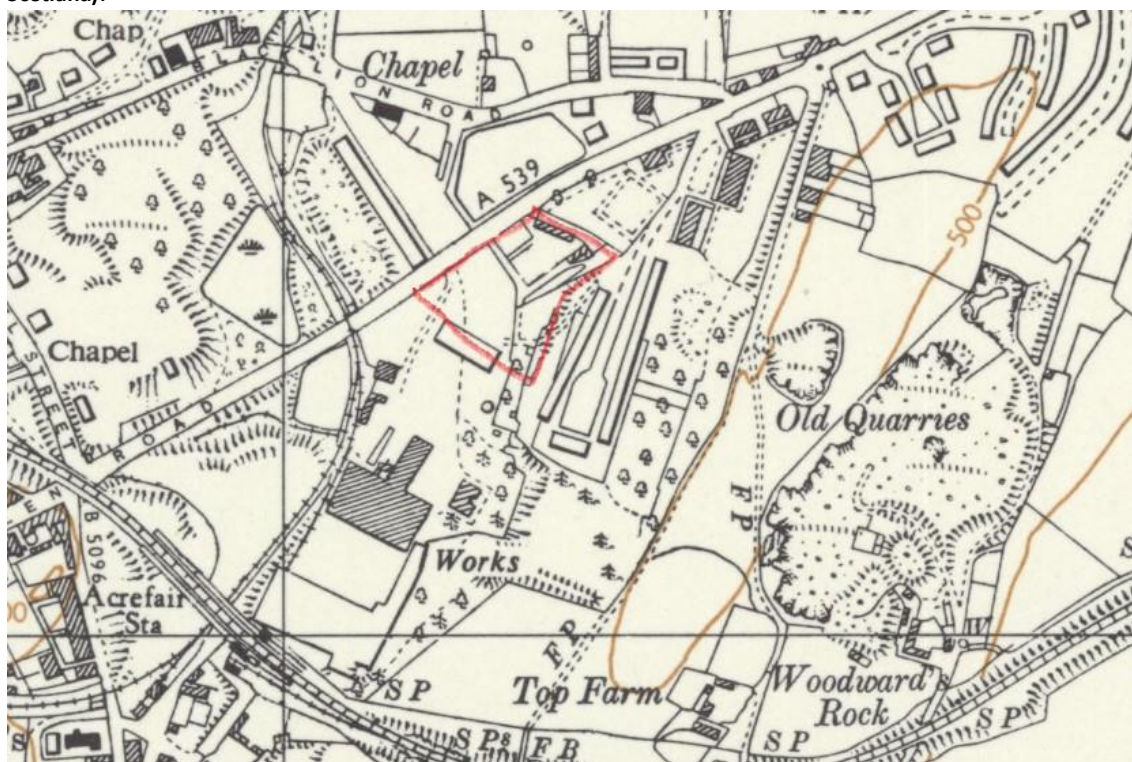
In the 20th Century the site was owned by the Butterley Co. Ltd. An engineering firm with interests in other areas such as brickmaking and mining (Figure 15).

Figure 15. Revised OS 1:10560 surveyed 1898 (Courtesy National Library of Scotland)



On 15 August 1957 Air Products, a US based company, signed a joint venture agreement with the Butterley Company and so Air Products (Great Britain) Limited came into existence with offices in London and a manufacturing site in Acrefair, North Wales (Figure 16).

Figure 16 Air Products site in 1963 A series 1:10.000 Published 1963 (Courtesy National Library of Scotland).



Air Products produced a range of gases for industrial use and developed the site as their production plant, most of the buildings being on outside of this development area although the demolished remains of some lie in the southwestern part of this development's area (Figure 17).

Figure 17. View North-east along south-eastern boundary of the site with demolition rubble in foreground



The Air Products site closed in the early 21st century and the buildings were demolished, leaving the site as it appears today. The site was sold for housing development shortly after closure and its assessment as a suitable site for “brownfield” development by the Local Planning Authority which led to the production of the planning brief.

Archaeological potential

The site has existing structures in the shape of the bank of kilns or furnaces on its southern side. Historic mapping shows the site covered with a complex of buildings and structures relating to the iron works during the 19th century. By 1912 the site was occupied. The site was cleared prior to the construction of the Air Products works. This removed all structures above ground level (except for the furnaces on the south side) and the revetment walls around parts of the site boundaries) and it is likely that features such as rail and tram lines were taken up and scrapped along with any other machinery that formed part of the works.

There is a high probability that the area in front of the furnaces at the southern side held features relating to the production of iron, most likely a casting bed, a structure holding sand for the creation of channels and ingot moulds for tapping the furnaces and creating “pigs” of iron, ingots of c.1 cwt (56kg). It is also possible that after the invention of the Bessemer process for converting cast iron to steel the molten metal was run off into a ladle car and transferred to a convertor without the intermediate pig iron stage.

Small scale clearance of vegetation and some overburden on the slope immediately behind the east palisade fence revealed a short length of low brick wall that does not appear to have significant

foundations, or is the shallow foundations for a lightly constricted building between the front of the bank and the furnaces (Figures 18 and 19).

Figure 18 View of area between palisade fence and furnaces (courtesy D Bailey)



Figure 19 Fragment of brick wall at top of slope immediately behind palisade fence. (courtesy D. Bailey)



The brick wall may be the footings of a casting house building in front of the furnaces. This would have contained the sand bed for casting “pigs” of iron from the furnaces.

The slight nature of the brick wall could indicate that the structure it supported was lightweight, possibly timber framed with corrugated iron sheet covering. It may indicate that the top of the bank originally extended further forward with the ground supporting the structure but with the bank being cut back to create more room on the main site level for later industries’ use of the site.

The 1st edition OS shows a pair of circular structures with a square structure between them (see Fig. 14). The two circular structures may be later blast furnaces of the type constructed of refractory brick enclosed in a cylinder of iron plates. These first appeared in the 1860s (Gale, 1981) so may be part of an update to the furnace technology of the site, the survey being dated to the early 1870s, the square structure between them possible housing blowing engines and hoppers for top loading.

Much of the remainder of the site was occupied by railway and tramway lines probably forming sidings and marshalling yards for trains of materials being brought onto the site and products being taken off site. There is a high probability that the rail lines were taken up and scrapped when the railway infrastructure was no longer needed.

The potential is therefore for the only the lower parts of any structures that existed of the site, such as the foundation walls of buildings, pits below machinery for catching waste and to enable machines to be fastened to massive stone structures using long “holding down” bolts and the ballast from rail lines and former roads through the site. There may also be bases for boilers for providing steam power for parts of the site.

Test pits for engineering tests revealed the site had a subsoil of yellow clay overlain by deposits of demolition rubble and industrial waste (Figures 20 and 21)

Figure 20 Engineer’s test pit with demolition debris and yellow clay subsoil. (photo D. Bailey).



The last use of the site as a car park and offices would have required the levelling of the surface and construction of foundations. It is unknown if levelling was by adding material to the site or scraping and grading rubble from the former works.

Figure 21 Engineer's test pit showing layers of material levelling up site in sections (Photo D. Bailey).



The area in front of the furnaces and within the housing site boundary was roughly cleaned off using an excavator to remove vegetation and soil build up allowing an examination of the surface below.

This revealed a surface of demolition debris and surviving kerbstones from the car park (Figures 22 and 23). It should also be noted that the developer's surveys indicate a height difference of c.3.5 metres between the level of the former car park and the base of the furnaces in the bank to the south (Bailey, pers.com.). The location of Figures 22 and 23 are in the foreground of Figure 18

Figure 22 Area below (NW of) furnaces

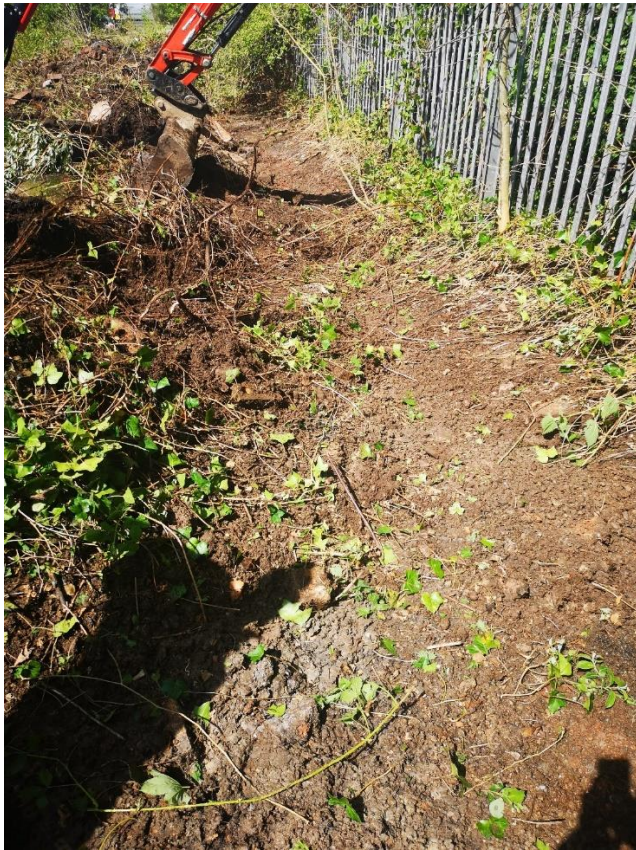


Figure 23 Area below furnaces with demolition debris and length of kerb from car parking area.



Most of the iron works buildings shown on the 1st edition OS map are beyond the limits of the site under consideration here with a complex of buildings immediately to the south of the development site. Part of the area outside the application boundary was also used as a tip, probably for furnace waste and other industrial debris as the sides of the embankment beside the Llangollen Road had low revetment walls of large slag lumps and there are cobble and gravel sized pieces on the surface of the site. This material may have been graded and levelled to form the level platform to the west of this development site and possibly graded over the development site itself. The tarmac of the car parking area associated with the last use of the site by Aur Products Ltd. is likely to have been laid over a base of crushed stone or perhaps on top of levelled furnace waste.

On the eastern edge of the site the bank of furnaces is of high significance as well preserved, structures possibly relating the original relating to the operations of the iron works and the expansion of the site under the New British Iron Works company. The furnaces form a group with the remains of the banks of coke ovens to the south of Lancaster Terrace (beyond the eastern site boundary). The kilns were constructed in at least two phases, the western block first. The furnaces were encased in masonry with arched access to the furnace arches at the front and a slight batter to the walls of the stone encasing the furnace shafts. The two phases can be identified by a straight joint between the different blocks of work and the eastern furnace structure overlies the batter of the western block. The monument is vulnerable to damage, mainly from tree growth and the potential for windthrow to cause damage from the impact of falling trees and for roots penetrating the joints of the structure to pull masonry apart. A programme of conservation should be put in place to consolidate and manage the structure to aid its long-term survival as a monument to the industries that shaped the area (Figures 24 and 25).

Figure 24. Phase 2 furnace. Phase 1 on right, joint behind tree to right of furnace arch.



Figure 25 Furnace showing visible structural defects.



Significance and Heritage Impact of development proposals

Assessing significance is embedded in national planning policy and outlined by CADW (2011).

Heritage values that contribute to a greater understanding of significance are identified in the above document as being: -

- Evidential
- Historical
- Aesthetic
- Communal

There are six commonly accepted levels of significance. These are as follows: -

- Outstanding
- High
- Medium
- Low
- Negligible
- Unknown

Categories of rarity relate to monuments. This should be assessed in relation to what survives today, since elements of a once common type may now be rare.

- Very high: sole survivor of its type.
- High: very few sites of this type are known.
- Medium: the site is not unusual but cannot be considered common.
- Low: the site is quite common.

Group value is defined by the Secretary of State as “The extent to which the exterior of the building contributes to the architectural or historic interest of any group of buildings of which it forms part” including “where buildings comprise an important architectural or historic unity, a fine example of planning or where there is a historical functional relationship between the buildings.”

Group value also relates to the contribution elements and structures make to each other, such as their function and structural relationship, such as field system, and landscape for example. These are categorised as: -

- Very high: largely complete interconnected complex of heritage assets or landscapes (e.g UNESCO World Heritage Site).
- High: significant survival of an interconnected complex of heritage assets.
- Moderate: some surviving elements of an interconnected complex of heritage assets; some disintegration has occurred.
- Low: single or unconnected/unrelated groups of heritage assets

Survival/Condition: the survival of a monument's archaeological potential both above and below ground is a particularly important consideration and should be assessed in relation to its present condition and surviving features. The West Yorkshire Historic Environment Record uses the following criteria:

- Class I (statutory sites of special archaeological value – i.e., scheduled monuments) are pink;
- Class II (non-statutory sites, yet considered to be of special archaeological value and potentially worthy of preservation in situ) are orange;
- Class III (sites of unknown significance, or of local archaeological value) are Green;
- Class IV (destroyed archaeological sites or isolated find spots) are yellow.

The impact of the proposed development on the heritage asset or landscape can be assessed follows:

- Very high: total loss of the integrity of the heritage asset(s).
- High: significant loss of integrity to the heritage asset(s), significant reduction of group and rarity values.
- Moderate: some loss of integrity to heritage asset(s) and reduction in value.
- Low: slight loss of integrity to heritage asset(s) and value.
- None: no perceived or identified effect, or loss in value.
- Beneficial: development will protect, preserve or enhance the heritage asset resulting in an increase in value.

Evidential value is limited. The site's main interest is related to the early use as the Ruabon works of the New British Iron Company and its predecessor, with the works integrated into the surrounding industrial landscape of coal mines, brickworks, railways, and canals by the transport links (road and rail) shown on the 1st edition OS maps. Most of the site has been cleared and levelled and redeveloped in the 20th century while the surrounding industries have disappeared and the rail links with them largely obliterated by later developments and changes in the surrounding landscapes.

The surviving features of the iron works are limited to a bank of blast furnaces on the south-eastern edge of the site and the retaining walls that revetted the sides of the site to create level platforms for the iron works equipment and machinery.

The bank of blast furnaces built into the south eastern side of the site increases its value in that these are the sole surviving elements of the iron works that are still extant and visible on this site (the adjacent site has other, more minor, features) although they are not directly impacted by the proposed housing development as the steep slope into which they are built is part of an environmental buffer and green space between the development site and the houses behind it to the south east.

The retaining walls around the site are being kept as their original function is applicable to the proposed use of the site for housing development.

Historical. The direct historical value of the site is limited by the fragmentary nature of the remains of the industries that used it. During the 19th century the site was of high significance as the main Welsh production site of the New British Iron Company and as part of a mosaic of industrial sites, many linked by ownership or as ancillary production sites for the iron works such as collieries producing coking coal. The current site has lost most of the historical evidence which would link it to its historical heyday as well as the physical links to other production sites in the surrounding landscapes. The historical value of the site as a former seat of heavy industry is enhanced by the presence of the surviving blast furnaces. As a link between the present day and past industrial use the value would be enhanced by suitable conservation and interpretation of the furnaces and how they related to the wider use of the site historically.

Aesthetic The site, overall, has limited aesthetic value. The furnace remains themselves, in common with other industrial features, have a certain muscular charm not dissimilar to that of the more “romantic” remains of many medieval castles and monasteries where all that remains are a few rather misshapen lumps of masonry and slight earthworks. More extensive remains, of course, can be utilised as heritage attractions, such as the National Trust’s site at Aberdulais Falls in South Wales but in the case of the Air Products site the limited nature of the remains lead themselves to local conservation and interpretation as part of the landscaped area of the wooded bank along the edge of the site.

Communal The communal significance of the site appears limited, although there may still be a connection between local people who worked on the site in its last phase of industrial use producing industrial gases and the site itself. A deeper meaning is more likely to be found in the connections of local people with their deeper heritage both locally and nationally, the history of coal mining and heavy industry being deeply rooted in the national psyche and in the memories of people whose parents and grandparents, and preceding generations, worked in heavy industry and who have family histories of connection with the historic industries of the area and the nation.

The criteria for assessing indirect or visual effects on the setting and significance is adapted from standard EIA evaluation criteria). Assessment is confined to sites of International, National and in some cases Regional value.

- Very severe: the key views and/or essential lines of sight to and from the heritage asset are dominated or obscured by the development resulting in severance of cultural heritage links.
- Severe: the key views and/or essential lines of sight to and from the heritage asset are interrupted by the development resulting in partial severance of cultural heritage links.
- Considerable: the key views and/or essential lines of sight to and from the heritage asset are significantly visible resulting in limited severance of cultural heritage links.
- Moderate: the key views and/or essential lines of sight to and from the heritage asset are visible resulting in some severance of cultural heritage links.
- Slight: the key views and/or essential lines of sight to and from the heritage asset are noticeable resulting in diminished cultural heritage links.
- Very slight: the key views and/or essential lines of sight to and from the heritage asset are noticeable resulting in little discernible severance of cultural heritage links.
- None: the key views and/or essential lines of sight to and from the heritage asset are not noticeable resulting in no severance of cultural heritage links.

The main interest in terms of setting is that the site forms the setting of the blast furnaces and less directly a revetting wall on the SE side of the adjoining part of the site which has features relating to the former industrial use. These vestiges of the past use however are currently almost invisible from any public viewpoint (although the wall outwith the site was more obvious after vegetations masking it had been cut back). The constriction of housing will limit site lines from the main road

Heritage Impact

The impact of any development is considered from two main angles, taking into account also the significance of the heritage asset. Significance is defined as

“The sum of the cultural and natural heritage values of a place, often set out in a statement of significance” (Welsh Government, Cadw 2017)

The National Planning Policy Framework for England elaborates on the definition of “significance” as:

“Significance (for heritage policy)

The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset’s physical presence, but also from its setting. For World Heritage Sites, the cultural value described within each site’s Statement of Outstanding Universal Value forms part of its significance” (MHC&LG, 2021).

The effect of changes to heritage assets can be given a grading in terms of impact of the asset by assessing significance and the potential impact and cross referencing those factors using a grid (see below) to calculate the impact of proposals on heritage assets.

Impact can be classified as High, Medium, Low, Negligible or None, with the Heritage Significance being classified as Very High, High, Medium, Low or Negligible.

	Magnitude of Effect					
		High	Moderate	Low	Negligible	None
Heritage Significance	Very High	Major	Major	Moderate	Moderate/Minor	Neutral
	High	Major	Major/Moderate	Moderate/Minor	Minor	Neutral
	Moderate	Major/Moderate	Moderate	Minor	Minor/Negligible	Neutral
	Low	Moderate	Minor	Minor/Negligible	Minor/Negligible	Neutral
	Negligible	Minor	Minor/Negligible	Minor/Negligible	Neutral	Neutral

Impacts and Mitigation

The original topography of the site is uncertain but it is likely that the original land surface sloped down from north east to south west, from the level of the Llangollen Road at the northern end of the site to the line of King Street at the south west and perhaps fell fairly evenly from the level of Lancaster Terrace/Maes Derwydd to the Llangollen Road, although the steep slope along the south eastern side of the site may have been present, perhaps in a less pronounced form. The site topography at the moment reflect significant landscaping and engineering works, on the heroic scales seen on other industrial heritage sites of the heavy industries of Wales, to create a large and relatively level platform for the iron works site. These included the excavation of the north eastern end with the construction of a substantial revetting wall, the material excavated probably being used both to fill behind the revetment to create the level platform now occupied by the public house and bowling green beyond the northern end of the site, and partly to build up the lower parts of the area along the Llangollen road side of the site. A revetment wall at the northern side of the current site entrance supports about 1.5 m of material behind it, the entrance being probably at the original ground level at that point.

The base of the slope below Maes Derwydd is probably also the result of cutting back to create a wider level area for the main site, along with a ledge along the front of the blast furnaces to site a casting shed for pig iron being tapped from the furnaces.

It is considered possible that the development of the site from its earliest construction to the extent of the site shown as occupied by the New British Iron works in 1872-3 may have involved further terracing to provide space for the new cylindrical blast furnaces shown on that map, while the production of huge volumes of slag and cinder as a waste product, and the dumping of this on the western part of the site, and probably beyond the present site boundary on the south create d further areas of level ground raised well above the original land levels.

The impacts of the proposed developments on the site will affect several elements:

The surviving blast furnaces are of very high/high significance. They are not directly affected by the proposed development, although this will have some impact on their setting, so the physical impact is negligible. Overall, the impact on these features is minor.

The buried remains of the iron works and engineering works are of moderate/low significance being the truncated remnants of 19th century ironworks which are known from other and better-preserved sites.

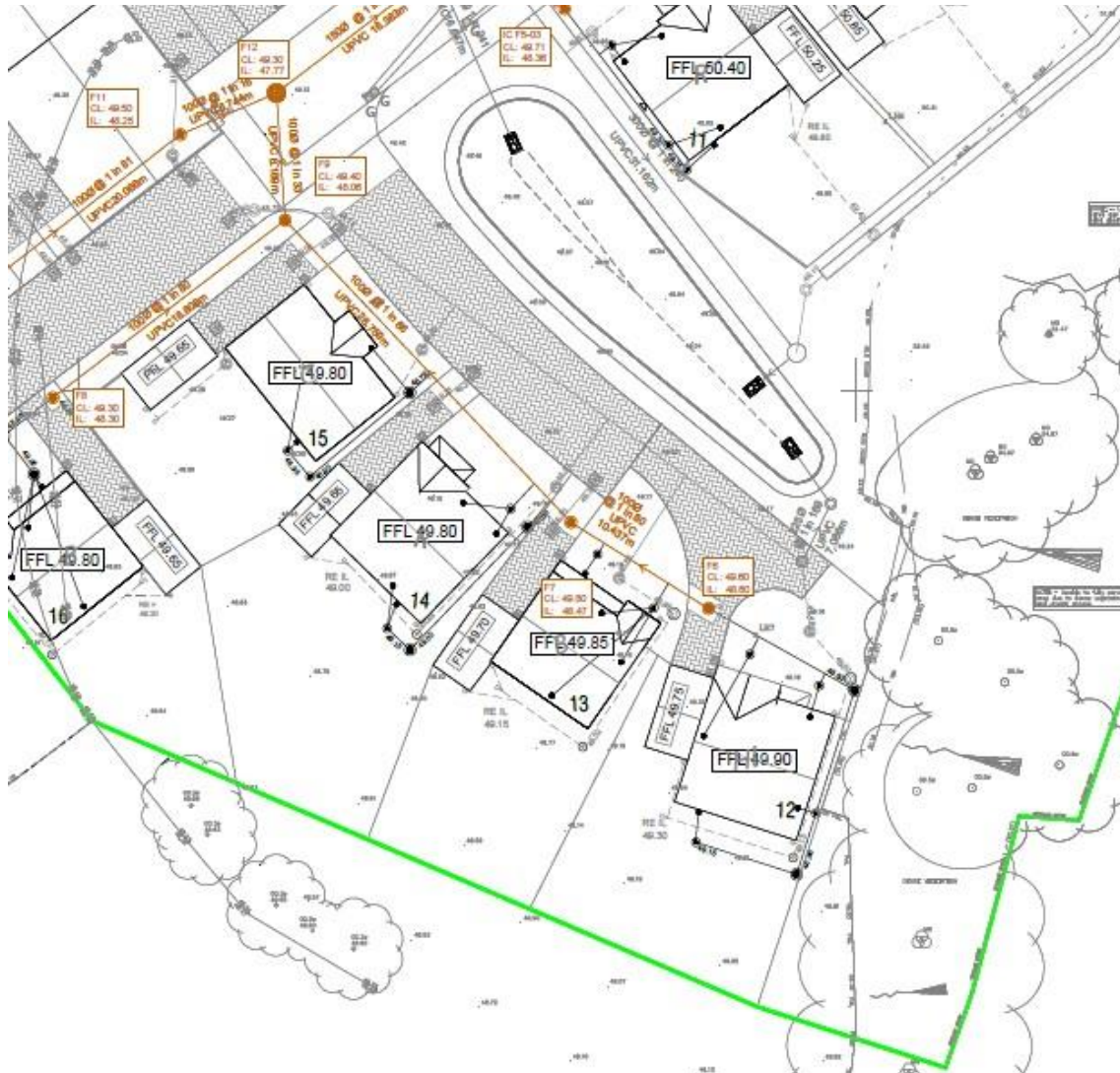
At the southern end of the site the 1st edition OS maps show several square and circular structures served by rail lines (Fig 26)

Figure 26. possible furnaces and associated building at southern end of the site



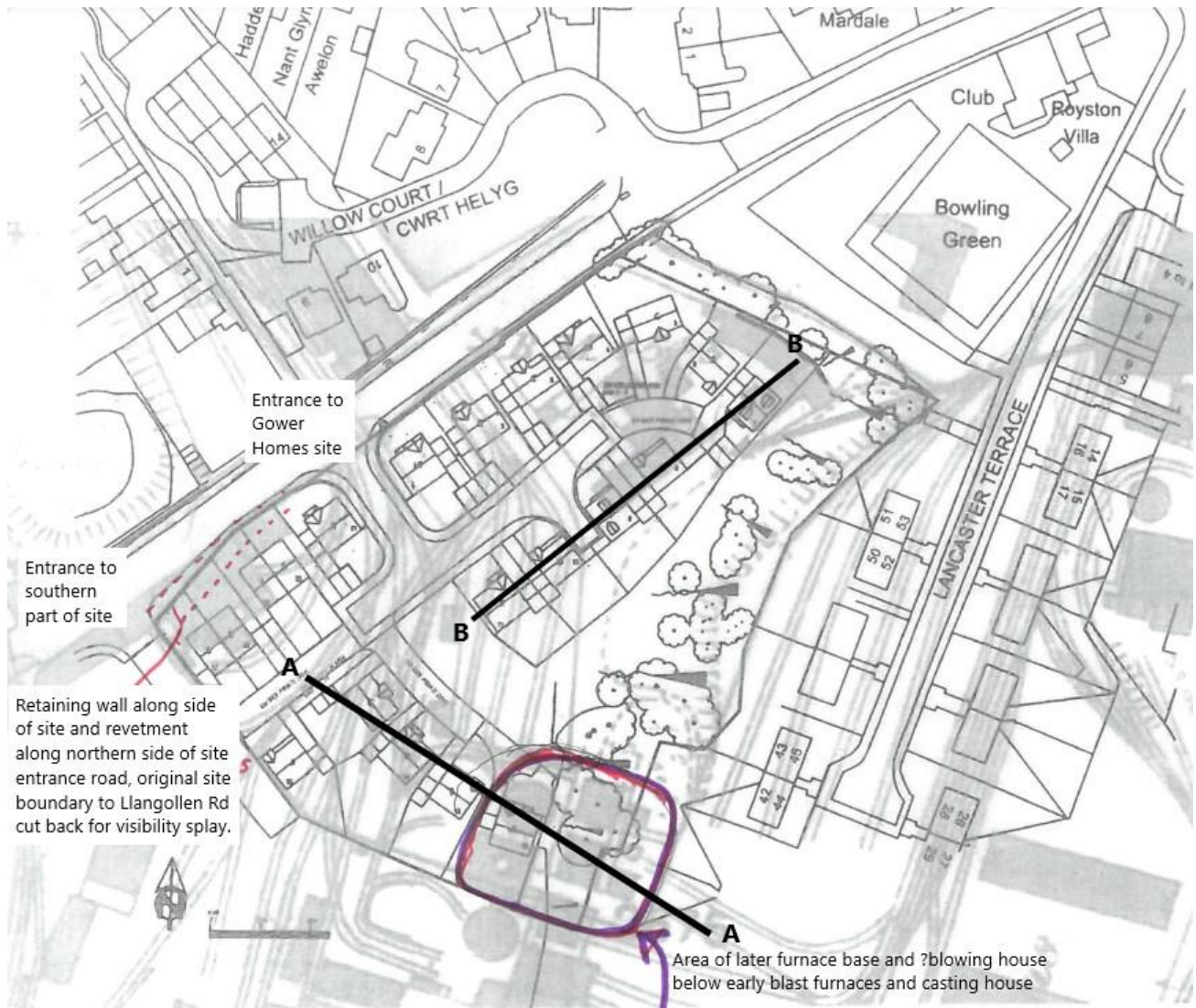
Figure 27 covers approximately the same area and show the proposed layout of the development, with the house plot numbers and SuDS attenuation area indicated.

Figure 27. Proposed drainage design and layout of house plots and roads



This area is the proposed site of House Plots 12-14 and the SuDS (Sustainable Drainage System) Attenuation area, the attenuation area being a slight hollow to catch surplus surface water and allow it to drain into the subsoil naturally or to be carried off site to the mains drainage system during periods of higher rainfall.

An overlay shows the proposed house plots in relation to the mapped structures. The section lines A-A and B-B relate to the sections on Figure 29 (Figure 28).

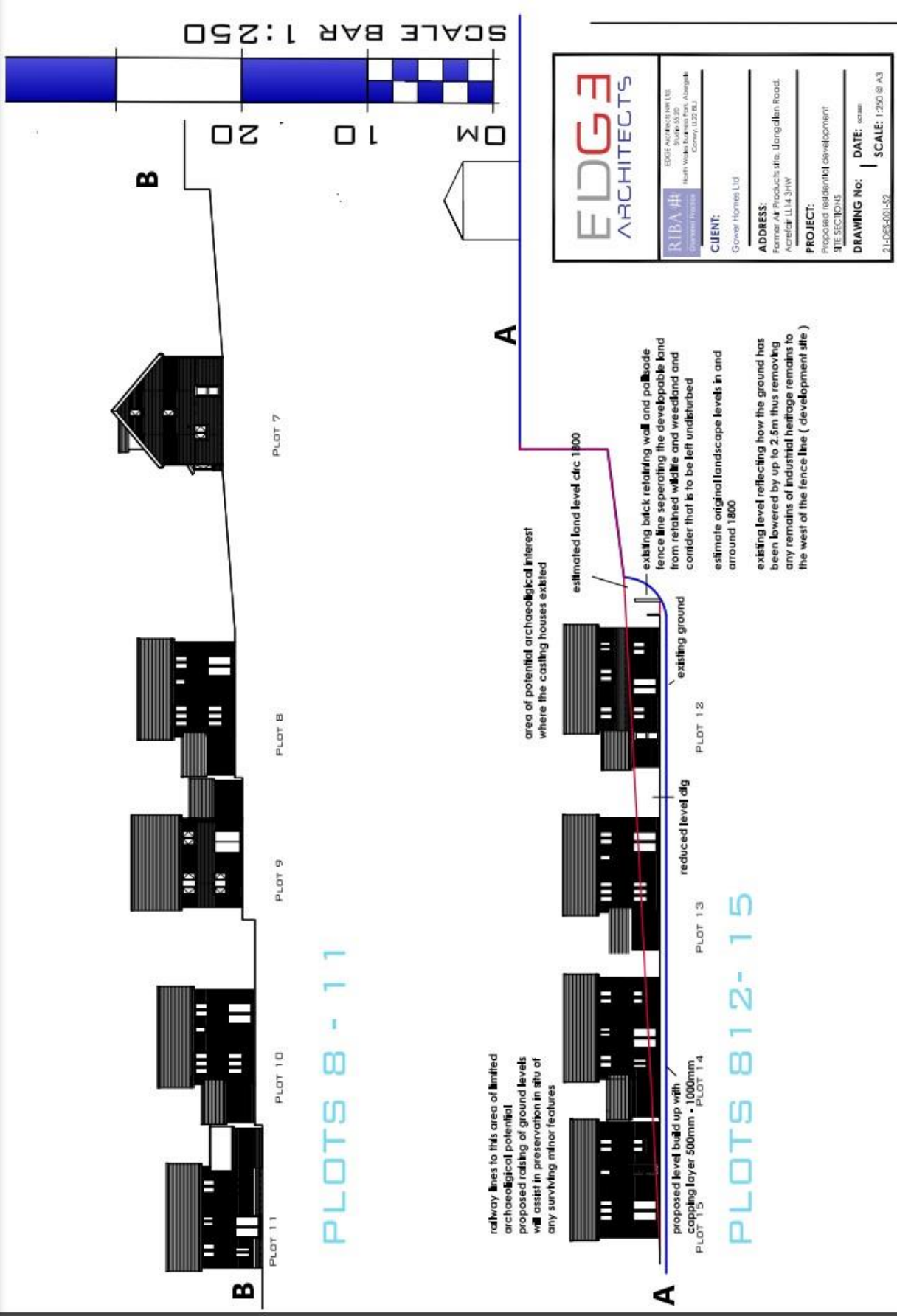


The two smallest square structures separated by a circle and served by rail lines are probably the blast furnaces still extant, or their predecessors, the buildings in front (to the west) perhaps being covered casting beds. The two circular structures separated by a square structure in front (west) of these may be later blast furnaces of the type constructed of refractory brick enclosed in a cylinder of iron plates. These first appeared in the 1860s (Gale, 1981) so may be part of an update to the furnace technology of the site, the survey being dated to the early 1870s. The construction of this type was such that clearance of the site for later uses may have left very little but circular foundations, the operational parts of the furnaces being entirely above ground level. The circular blast furnace is well-documented type and the below ground remains are considered as of low significance. The impact of both house foundations and the attenuation area might be considered moderate/major, depending on the survival of any archaeological features and the depth of the attenuation area.

Mitigation.

The proposed development requires changes to the ground levels to enable appropriate drainage falls and to provide a capping layer over any potentially contaminated ground relating to the industrial use of the site. The proposed levels are indicated in Figure 29. Raising ground levels and foundation design should reduce the impact to low/negligible

Figure 29 Site Cross Sections showing indicative ground levels and possible historic levels.



Conclusion

The site is considered to have high potential for holding some structural evidence of the iron works although clearance of the iron works infrastructure and machinery will have reduced this potential.

Any such remains however are likely to be of moderate to low significance because of site clearance and remodelling by grading and levelling of the site area for later development. Engineers test pits suggest the site is covered by a thin layer of demolition material and industrial debris over a yellow clay base.

The area in front of the furnaces seems to have been levelled down to create the platform for Air Products buildings, with a difference in levels of over 3 metres between the base of the furnace arches and the surface of the development site, which will have removed any traces of the casting floor for pig iron other than in the area immediately in front of the furnaces and beyond the area which will have houses built.

Shallow foundation design, which are proposed, will mitigate the potential impacts of housing development on the site. Further mitigation of the impacts of development will be provided by the proposal to raise the surface of the site by between 600 and 1000 mm using clean fill material, both to mask any risk of contact with contamination from the site's industrial past and to provide suitable falls for the drainage required by the proposed development which will fall from the south towards the Llangollen Road to meet mains services there (Bailey pers.com.).

The block of furnaces needs to be assessed by an appropriately qualified structural engineer with experience of historical industrial structures and a repair schedule and conservation plan for longer term management should be drawn up. This should include an archaeological record of the structures and, if advised, a programme of archaeological works during conservation work.

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