



A465 Heads of the Valleys Section 2

Redundant Sewer Pipe Historic Building Record



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Summary

Wessex Archaeology was commissioned by Costain Ltd, on behalf of Welsh Government, to produce a historic building record of an elevated section of redundant sewer pipe located near the Brynmawr section of the A465 Heads of the Valleys road scheme. This project was part of a wider programme of cultural heritage works along the route of the A465 road improvements Section 2.

The removal of the elevated sewer pipe was subject to a public consultation exercise, and the decision to remove it was based on aesthetic grounds, to reduce the future maintenance liability of the redundant overhead infrastructure and need for access to a Scheduled Monument. Planning permission was granted by the Brecon Beacons National Park Authority (ref: 17/15473/FUL) for the removal of the sewer pipe subject to certain conditions which included a programme of building recording in advance of the removal works. The survey was carried out on 8th March 2018.

The Site is located to the east of Brynmawr and on the north side of the Clydach Valley in Gwent. The route of the pipeline partly follows the course of the historically important Clydach Railroad and over the 18th century Hafod Arch, a Scheduled Ancient Monument, and is centred on National Grid Reference (NGR) 320174 212335. The elevated section consists of 23 individual brick piers with stone cradles at their top. The cast iron sewer pipe sits in the cradles in order to maintain a suitable gradient flow. This means that the piers increase in height from west to east. Maker's marks were identified as 'Stanton', a well-known and large iron foundry in Derbyshire. They produced many products and were large producers of spun cast iron pipes. Map evidence would suggest a construction date for the pipeline in the late 1920s or 1930s. The pipeline carried sewage from Brynmawr to the treatment works to the east which is first shown in 1938.

The drawn and photographic archive of the overhead sewer pipe will form part of the wider heritage record carried out across the road scheme.

Acknowledgements

This project was commissioned by Costain Ltd and Wessex Archaeology is grateful to Toby Bedford, Deputy Construction Manager, in this regard. The Heritage Statement was prepared by Mick Rawlings, Technical Director Historic Environment, RPS. Wessex would also like to thank Dale Flower, STATS Section Manager, and Jonathan Lewis, Engineer, both of Costain, for their assistance in arranging site access. The on-site assistance of Alex Bromley, Groundworks Technician, is gratefully acknowledged.

The photographic survey and drawn record of the pipeline was carried out by Bob Davis. This report was compiled by Bob Davis. The illustrations were prepared by Bob Davis and Ken Lymer. The project was managed for Wessex Archaeology by Phil Andrews and Matt Rous.



A465 Heads of the Valleys Section 2

Redundant Sewer Pipe Historic Building Record

1 INTRODUCTION

1.1 Project background

1.1.1 Wessex Archaeology (WA) was commissioned by Costain Ltd to create an historic building record (HBR) of a section of early 20th century elevated sewer pipe at the site of Hafod Arch, a Scheduled Monument (**Figure 1**). The elevated pipe and supporting piers are to be demolished as part of the new A465 Heads of the Valleys Section 2 road scheme, and this project forms an additional part of a wider programme of heritage work along the route.

1.1.2 Planning permission was granted by the Brecon Beacons National Park Authority (BBNPA) (ref: 17/15473/FUL) for the removal of the sewer pipe subject to certain conditions which included a programme of building recording in advance of the removal works. Condition 5 stated:

No development shall take place until an appropriate programme of buildings recording (equivalent to a Level 2 Buildings survey) has been secured and implemented, in accordance with advice provided by the Local Planning Authority. A copy of the resulting report and digital photographs shall be submitted to the Local Planning Authority National Park Archaeologist for approval. Following approval, copies of the report and photographs shall be submitted to the Local Planning Authority and the local Welsh Archaeological Trust for inclusion in the Regional Historic Environment Record (HER).

1.1.3 The work was commissioned by Welsh Government to be implemented by the team carrying out the improvements to the A465 Heads of the Valleys Dualling Section 2 Scheme. The removal of the elevated sewer was subject to a public consultation exercise, and the decision to remove it was based on aesthetic grounds, to reduce the future maintenance liability of the redundant overhead infrastructure and need for access to the Scheduled Monument.

1.2 Previous work

1.2.1 A previous Heritage Assessment was produced in 2017 (RPS 2017) in support of an application for planning permission for the removal of the elevated section of sewer pipe and associated brick supports. The Hafod Arch conveys the former Clydach Railroad (built 1794–5) over the Nant Melyn and is a Scheduled Monument (MM263). This report concluded that the proposed removal of the overhead foul sewer and the support piers would have a permanent beneficial effect on the Hafod Arch Scheduled Ancient Monument and on the registered Cwm Clydach Landscape of Special Historic Interest.

1.2.2 Scheduled Monument Consent (SMC) was required for the removal of the support piers where they are founded within the stone-built viaduct that carries the former Clydach Railroad over the Nant Melyn. This was obtained before the commencement of any works associated with the proposed removal of the overhead foul sewer and the support piers.



- 1.2.3 The report recommended a survey of the overhead foul sewer and the support piers ahead of their removal and an archaeological watching brief carried out during the removal of the bases of the support piers. The watching brief will follow on from this report.

1.3 Site location and description

- 1.3.1 The Site is located on the north side of the Clydach valley and approximately 0.5 km to the east of Brynmawr in Blaenau Gwent. It is centred on National Grid Reference (NGR) 320174 212335 (**Figure 1**). The section of elevated pipeline consists of 23 separate brick piers constructed on the north side of the course of the former Clydach Railroad. As the valley sides slope down to the east, and in order to form the correct gradient for flow rate, the piers gradually increase in height from west to east until they stand approximately 7 m high over the Scheduled Hafod Arch and Nant Melyn gorge. The cast iron sewer pipe itself is supported on each pier by means of a stone cradle. Each length of pipe is joined to the next by means of a flange and bolts. At the eastern end the pipeline is buried in the valley side and, originally, led on to the sewage works further to the east.
- 1.3.2 At the time of the survey the pipeline was in fair condition and each of the brick piers was visible. However, there were signs of erosion and movement in some of the piers, including cracking of brick joints and displacement of brick piers.

2 AIMS

- 2.1.1 The aims of the historic building recording exercise was to create a lasting record by means of, principally, a photographic survey of the structure prior to its demolition.

3 METHODOLOGY

3.1 Methodology

- 3.1.1 The historic building recording involved a combination of limited research and drawn and photographic survey in order to produce the drawn, photographic and written record compiled in this report. The methodology was outlined in the approved RAMS (Wessex Archaeology 2017) and is reproduced below for reference.
- 3.1.2 This is a descriptive record of the subject in accordance with the guidelines for Level 2 recording as detailed in the document: *Understanding Historic Buildings: A guide to good recording practice* (Historic England (HE) 2016).

Documentary research

- 3.1.3 The historic background has been largely taken from the Heritage Assessment (RPS 2017). An online search was also carried out to identify any significant data recorded on Site.
- 3.1.4 Cartographic sources were consulted on line at Old-maps.co.uk
- 3.1.5 A full list of sources is provided in the **References** section.

The Written account

- 3.1.6 The written account includes the following information:

- *the building's location as a NGR and address;*

- *any statutory or non-statutory designations;*
- *the date of the record, the names of recorders and, if an archive has been created, its location; and*
- *a description of the building's form, function, date and sequence of development, as well as the names of architects, builders, patrons and owners if known.*

The Photographic record

3.1.7 The photographic record comprises:

- *general views of the building in its wider setting or landscape*

3.1.8 High quality digital images were taken with a Canon EOS 5D Mark III full frame digital camera (with 22.3 megapixel capability). A photographic scale of appropriate size was included in all general and specific detailed views, except where considered inappropriate or prevented by on-site conditions or health and safety concerns.

3.1.9 A selection of the photographs is included in this report (**Plates 1–11**).

The Drawn record

3.1.10 The drawn record comprises existing plans (A465HOV2-CH2-HDG-01_GEN-SK-D-0001, 12/10/17) supplied by the client (Costain). These have been annotated by Wessex Archaeology and presented as **Figure 2** in this report. In addition, a representative pier was drawn to show the front and side profiles.

3.2 Record date

3.2.1 The building record was carried out on 8th March 2018 by Bob Davis, Senior Buildings Archaeologist. Conditions were a mixture of cloud and sun with some snow present on the ground.

3.3 Historic background

3.3.1 The Heritage Assessment (RPS 2017) describes the historic background of the area as largely industrial, which developed from the 1560s, and was mainly associated with iron production. The area includes early iron working and related settlement sites, limestone quarries and lime working sites, and the remains of several impressive interlinking transport systems including a canal, railways, tram roads, roads and tracks.

3.3.2 Within the area of the pipeline, the Clydach Railroad crossed a stream known as the Nant Melyn. The stone-built viaduct carrying the former railroad is called the Hafod Arch and dates to the late 18th century. The overhead foul sewer was constructed in the late 1920s or 1930s, as part of a new sewage treatment works, and is formed of sections of iron pipe supported on piers built of red brick with a stone cap in which the pipes sit.

3.4 Cartographic evidence

3.4.1 The earliest map that shows the Brynmawr Sewage works to the east of the Site is the 1938 Ordnance Survey 1:10,560 scale map of Brecknockshire. This map clearly shows the sewage treatment works, but does not indicate the pipeline. The Ordnance Survey map of Monmouthshire of the same year and scale does not show the sewage works; this may be a result of the county boundary and different survey dates. The small scale of these two maps means that the pipeline itself is not shown. However, it could be reasoned

that the pipeline was there or soon to be built in order for the new sewage works to receive waste from Brynmawr.

- 3.4.2 The first large scale map that actually shows the pipeline is the 1961–66 Ordnance Survey 1:2,500 map. On this map the pipeline is labelled and depicted as a dotted line.

4 DESCRIPTION

- 4.1.1 The exposed section of pipeline measures approximately 168 m in length. The pipeline follows the route of the former Clydach Railroad, now a footpath, which meanders along the north side of the valley on a gradual west to east incline. In order to maintain the footpath, the support piers for the pipe have been constructed along the north edge of the footpath and at the base of a rock-cut cliff excavated for the route of the railroad (**Plates 1–4**). The support piers have been specially designed with ever-increasing heights in order to maintain the gradient flow for the pipe as the ground level slopes down from west to east. As the route passes over the Hafod Arch and the Nant Melyn they are at their highest before the pipe is buried again at the east end (**Front cover**).
- 4.1.2 At the west end, where the pipe emerges from the ground, the first two sections are unsupported. All of the piers are constructed in the same way comprising machine-extruded red bricks laid in English bond and set in a hard, coarse sand and cement mortar (**Plate 5**). The bricks are quite large, measuring 23 cm x 11 cm x 11 cm (9 inches x 4^{1/4} inches x 4^{1/4} inches). The basic short piers are rectangular and measure 0.585 m (1 ft 11 inches) x 0.94 m (3 ft 1 inch). At the top of each brick pier, the cast iron pipes are supported on heavily chamfered profiled cradles that appear to be made of re-constituted stone. They are all exactly the same and have a surface finish of thin, shallow fluting reminiscent of tooling, although it is more likely that they have all been cast in moulds as they are all identical and would have been cast in order to provide consistent, accurate diameters for the pipe cradle.
- 4.1.3 As the piers get progressively taller they are widened at their base forming a characteristic stepped profile (**Plate 6**). The top of each step is finished with a specially made moulded chamfer brick. At their widest they measure 0.94 m (3 ft 1 inch) x 1.32 m (4 ft 4 inches) and consist of four steps or stages (**Plate 7**). As the small gorge rises steeply to the east, the last two brick supporting piers get progressively shorter allowing the pipe to be buried in the ground.
- 4.1.4 The cast iron pipe itself is formed by a series of individual straight lengths of pipe measuring approximately 4.9 m (16 feet) in length and 40 cm (16 inches) in diameter with a 7 cm (2^{3/4} inch) flange (**Plate 8**). The pipes are cast iron and embossed with the maker's mark 'Stanton' (**Plate 9**). Online research identifies Stanton Ironworks at New Stanton, Ilkestone, Derbyshire (www.ilkestonehistory.org.uk). Stanton was a major iron foundry founded in 1846 and they produced a wide range of products including concrete pipes, pig iron, street furniture and spun cast iron pipes. The pipes at Hafod Arch would appear to be spun cast pipes formed by a process of pouring molten iron into rotating moulds in order to form a consistent thickness, and even forming an end flange for joining within the casting process. All that remained was to drill bolt holes around each flange. The pipes at Hafod Arch are joined by 16 bolts, each 4 cm (1^{1/2} inches) across flats.
- 4.1.5 The sewer pipe has several distinct curves to navigate due to the significant bends of the Clydach Railroad route. Specially designed angled sections of pipe were fitted (**Plates 10–11**) to allow for the curves. To anticipate any blockage on the bends, the special

sections of angled pipe also have an access/rodding plate on the top. These comprise flat plates that could be un-bolted from the pipe to gain access into the pipe for cleaning.

5 DISCUSSION

- 5.1.1 The A465 road scheme has provided an opportunity to record various aspects of the rich industrial heritage of the Clydach valley. This has included industrial sites, as well as domestic and religious buildings. All of these aspects, of course, involved the people who lived in and around the area from its earliest times as a centre for industrial production. Little is ever mentioned of the more mundane aspects of daily life. With social and economic growth comes additional pressure on infrastructure such as welfare, housing and sanitation.
- 5.1.2 The growth of Brynmawr, from humble beginnings, increased throughout the 19th century due to the mines and foundries, and the population grew. Although local sanitation was dealt with as best as possible, it wasn't until the early part of the 20th century that the local authority built a planned sewage works well away from the centres of population. Filter beds were constructed to the east of Brynmawr in order to alleviate health risks and to treat sewage before water was fed back into the River Clydach.
- 5.1.3 The challenging topography and geology of the valley required specific designs and structures in order to process the sewage from Brynmawr. In ordinary terrain, pipes would simply be buried under ground and for large sections of the sewer pipeline from Brynmawr this was the case. However, the necessary line of the pipe and the gradient fall took the pipeline across the Nant Melyn gorge. The builders of the Clydach mineral railway had a similar problem. They constructed the Hafod Arch in order to bridge the gorge. The pipeline had different engineering requirements, and here the only solution was to bridge the gorge with free-standing support piers.
- 5.1.4 Constructed in the late 1920s or early 1930s, the structure was solidly built with large well-made bricks possibly from local manufacturers. While the bricks may have been local, the pipe itself was made at the large Stanton works in Derbyshire, a company experienced in spun cast pipe making. It would also appear that the cradles in which the pipe sits were manufactured in re-cast stone, a cost-effective and consistent way of maintaining the diameter for each cradle.
- 5.1.5 The result was a structure which dominated the Nant Melyn gorge for almost 90 years (**Plates 12–13**), a testament to its design and build quality. Although arguably not as significant as the other features recorded as part of the road scheme, the pipeline has proved a prominent local landmark which has now been documented for posterity.

6 STORAGE AND CURATION

6.1 Museum

- 6.1.1 A copy of the resulting report and digital photographs will be submitted to the BBNPA Archaeologist for approval.
- 6.1.2 Following approval, copies of the report and photographs shall be submitted to the Local Planning Authority and the Glamorgan-Gwent Archaeological Trust for inclusion in the Regional Historic Environment Record (HER). It is recommended that the project archive resulting from the building recording be deposited with the National Museum of Wales.

6.2 Archive

- 6.2.1 As part of the complete scheme archive, which includes paper records, photographic records, artefacts and digital data, this project archive will be prepared following the standard conditions for the acceptance of archaeological material by the receiving museum, and in general following nationally recommended guidelines (RCAHMW 2015; SMA 1995; CIfA 2014a; Brown 2011; ADS 2013).
- 6.2.2 An OASIS form will be completed at <http://ads.ahds.ac.uk/projects/oasis> for inclusion in the ADS database. This will include an electronic copy of this report in PDF format which will be accessible six months after deposition. The digital photographic record will also be deposited with ADS.

6.3 Copyright

- 6.3.1 The full copyright of the written/illustrative archive relating to the Site will be retained by Wessex Archaeology under the *Copyright, Designs and Patents Act 1988* with all rights reserved. The Client will be licenced to use each report for the purposes that it was produced in relation to the project as described in the specification. The Welsh Government, however, will be granted an exclusive licence for the use of the archive for educational purposes, including academic research, providing that such use shall be non-profitmaking, and conforms to the *Copyright and Related Rights Regulations 2003*.
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6.4 Security copy

- 6.4.1 In line with current best practice (e.g. Brown 2011); on completion of the project a security copy of the written records will be prepared, in the form of a digital PDF/A file. PDF/A is an ISO- standardised version of the Portable Document Format (PDF) designed for the digital preservation of electronic documents through omission of features ill-suited to long-term archiving.

7 REFERENCES

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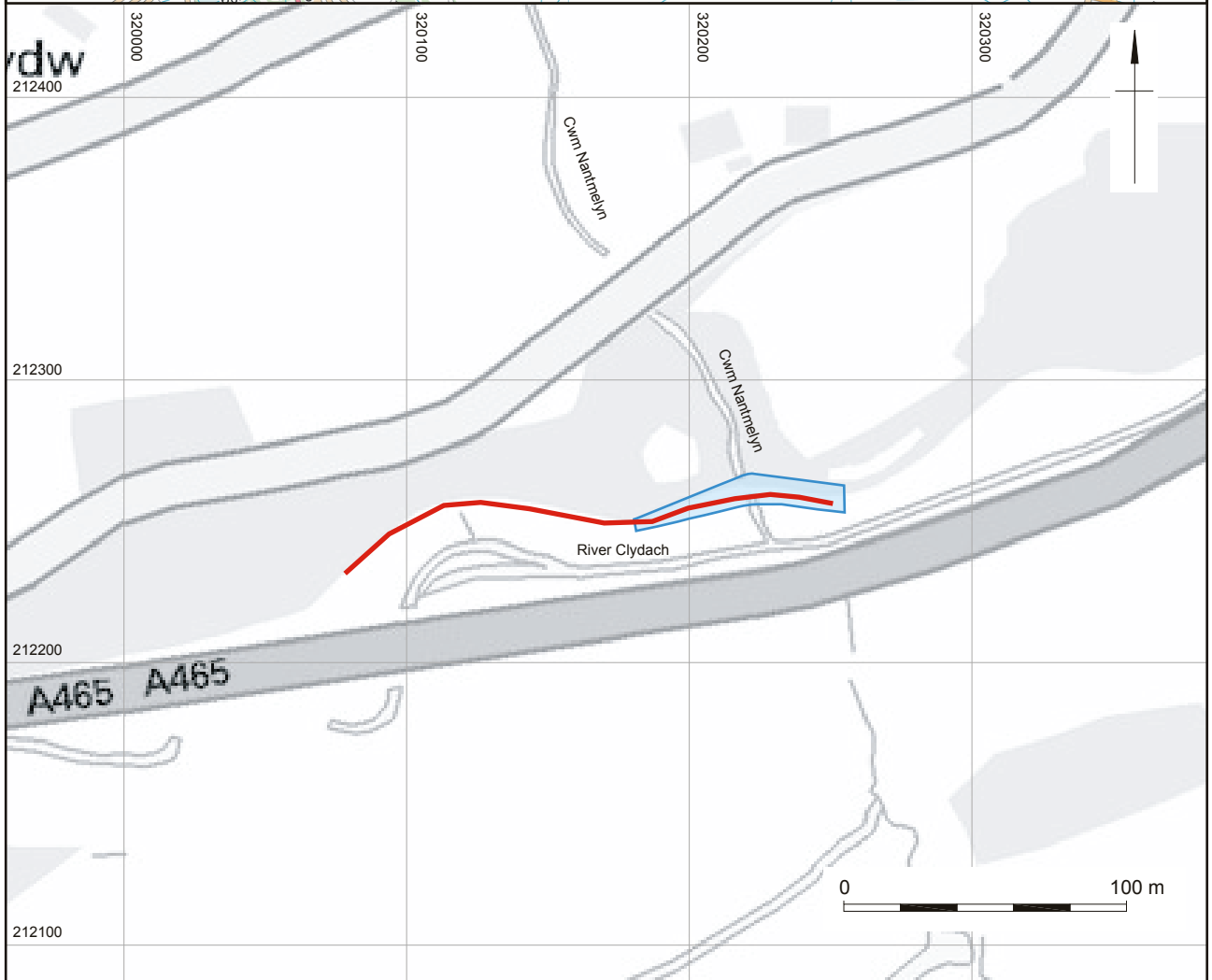
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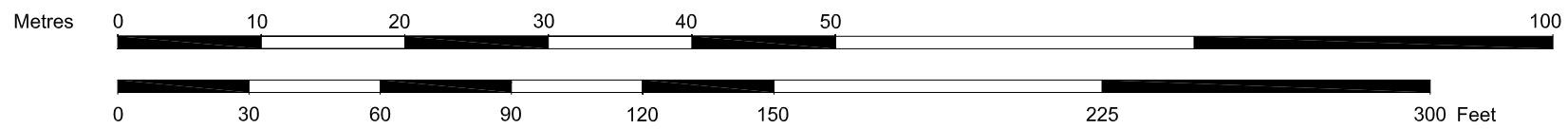
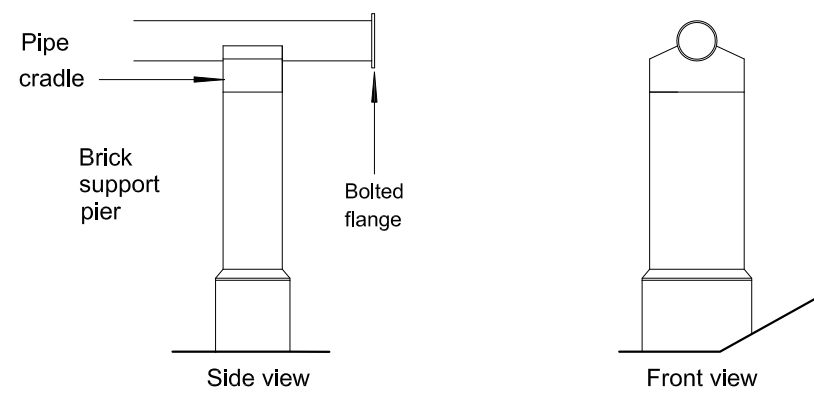
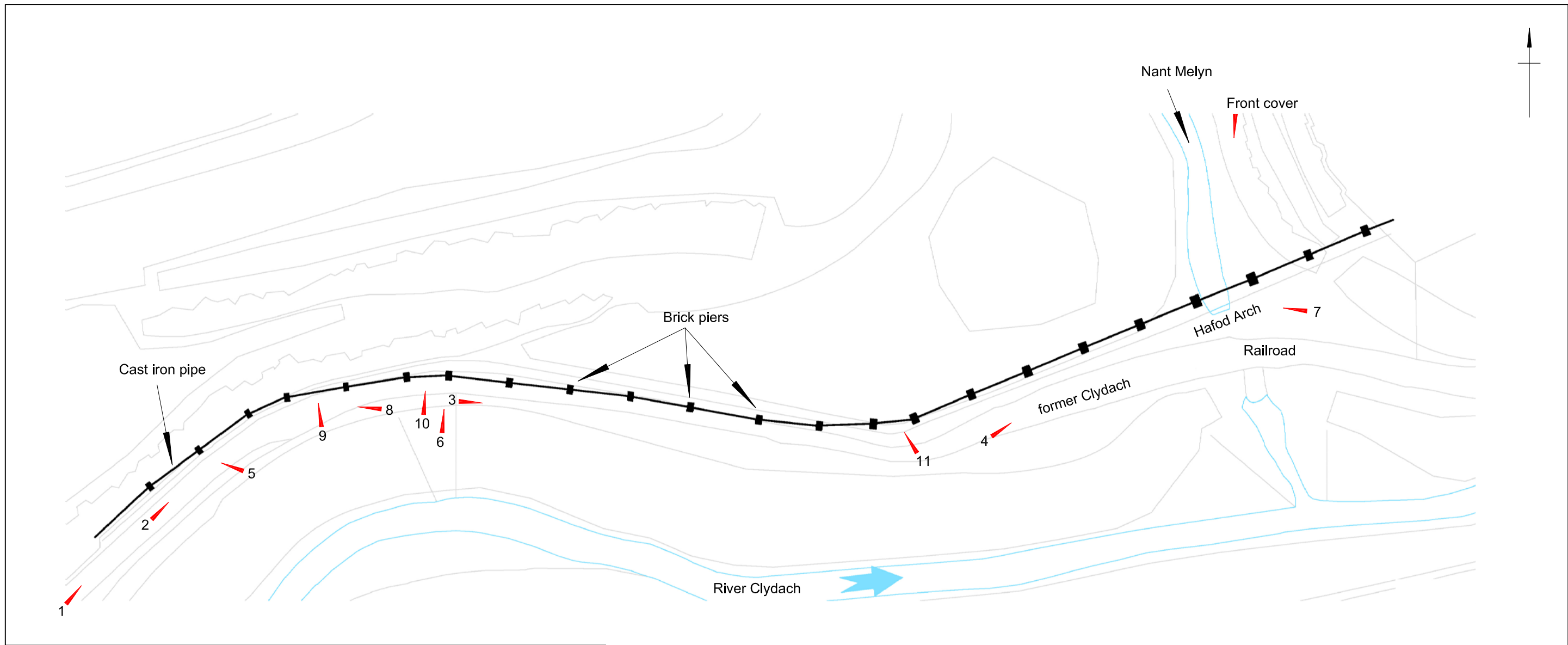
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Site location

Figure 1



Typical support pier, pipe cradle and cast iron sewer pipe (plate 6)



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Plate 1: Pipeline emerging from ground at west end, viewed from west



Plate 2: Pipeline section on low piers, viewed from west. Scale 1m


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Plate 3: Pipeline on intermediate piers, viewed from west. Scale 2m



Plate 4: Pipeline on tall piers crossing Hafod Arch, viewed from west. Scale 2m


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Plate 5: Typical small support pier and pipe cradle. Scale 1m



Plate 6: Typical intermediate pier with chamfered step in profile. Scale 2m


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Plate 7: East end tall piers with four stage stepped profile, viewed from south-east. Scale 2m



Plate 8: Pipe sections connected with bolted flanges


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Plate 9: Embossed maker's mark 'Stanton'



Plate 10: Angled connector and rodding hatch


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Plate 11: Angled connector and rodding hatch


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Plate 12: Historic view along the Clydach gorge showing overhead foul sewer and support piers, viewed from west

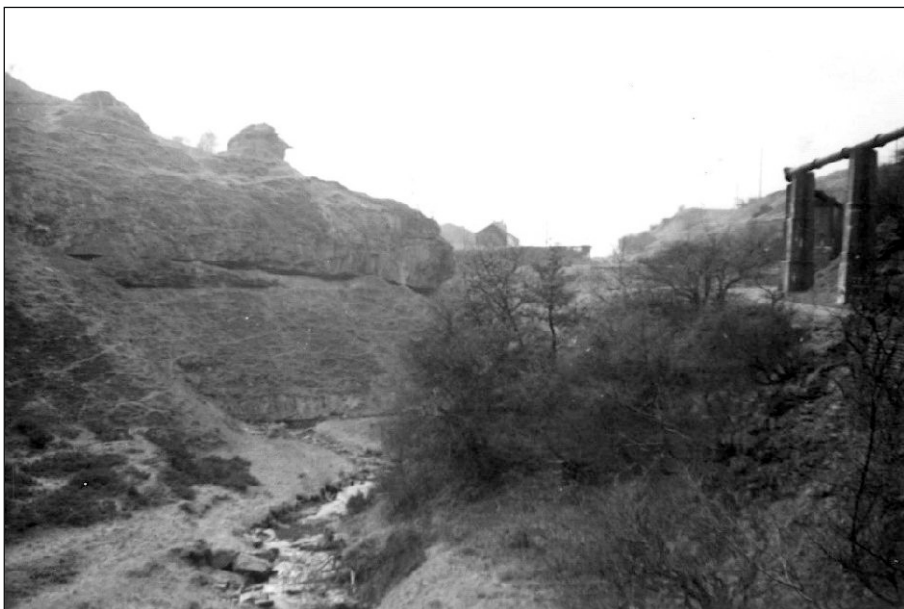



Plate 13: Historic view along the Clydach gorge showing overhead foul sewer and support piers, viewed from east

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