

RWCW/HBR



RADYR WEIR, CARDIFF

HISTORIC BUILDING RECORDING

commissioned by Dawnus Construction Ltd

11/02203/DC0

July 2016

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project info

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PROJECT SUMMARY

Planning permission for the installation of a hydroelectric generating plant on the River Taff was subject to a planning condition requiring a programme of historic building recording to be carried out in advance of the development.

The current weir dates to the 18th century and was constructed to supply water to the Mellingriffith tin plate works via a feeder channel.

Due to an oversight, the historic building recording was not undertaken in advance of the development. Towards the end of the construction programme, and in agreement with the archaeological advisors to the local planning authority, Headland Archaeology was engaged to undertake recording of the surviving historic structures.

Using available photographs taken prior to, during and post-development, this report documents the changes that took place to the historic structures as a result of the development.

The results of the survey confirm that the development has been undertaken with very little change to the post-medieval water management features that are present on the site.

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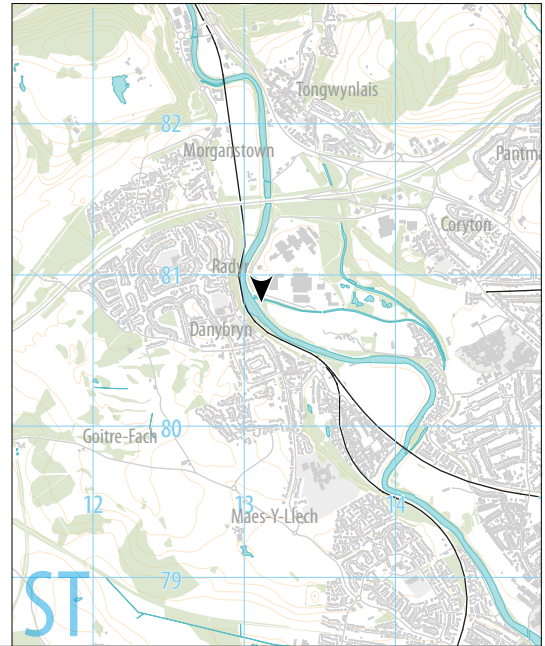
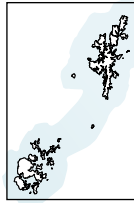
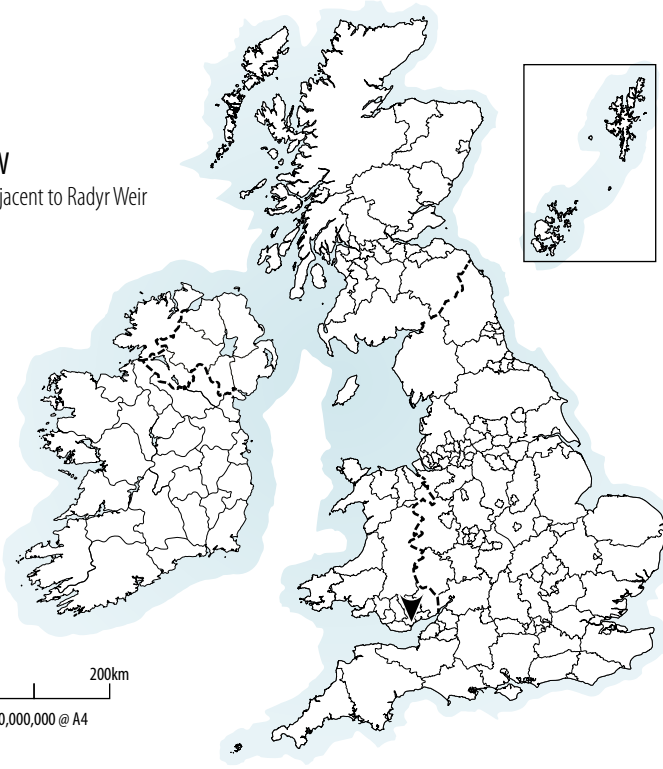
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RWCW
land adjacent to Radyr Weir
Cardiff

0 200km
1:10,000,000 @ A4



0 100m
1:5,000 @ A4



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ILLUS 1 Site location

RADYR WEIR, CARDIFF

HISTORIC BUILDING RECORDING

1 INTRODUCTION

This report presents the results of a programme of historical building recording (HBR) undertaken on land at Radyr Weir, Cardiff on June 30th 2016, as part of an attempt to mitigate a failure to undertake recording prior to the commencement of the development.

1.1 PLANNING BACKGROUND

Planning consent for the construction of a hydropower station on the River Taff was granted in 2012 subject to conditions. Those relating to the historic environment were as follows;

Condition 11

'No development shall take place until the applicant, or their agents or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved in writing by the LPA.'

Condition 12

'No site works shall be undertaken until the implementation of an appropriate programme of structural recording and analysis has been agreed with the LPA, to be carried out by a specialist acceptable to the LPA and in accordance with an agreed written specification.'

Due to a misunderstanding of the planning conditions, the main contractors on the project, Dawnus Construction Ltd, failed to engage an archaeological contractor to submit the required WSI prior to the commencement of site works in 2015.

Upon realising the oversight, Dawnus contacted Headland Archaeology for advice. Following discussions between the archaeological advisors to the local planning authority (Glamorgan Gwent Archaeology Trust) and Headland Archaeology, it was agreed that an archaeological watching brief (Condition 11) would be undertaken during the remainder of the project, and this would be followed by a programme of historic building recording (Condition 12). The results of the watching brief have been reported on in a separate report (Blackburn 2016).

A Written Scheme of Investigation (WSI) for the HBR works (Bennett 2016) was submitted to and approved by the archaeological advisor to the LPA, Janet Bailey.

A programme of recording equivalent to Historic England Level 2 was undertaken in accordance with the WSI on June 30th 2016.

1.2 SITE DESCRIPTION

The application area covered an area of approximately 3,750m² centred on the eastern end of Radyr Weir (Illus 1), where it meets the eastern bank of the River Taff (ST 13106 80786). The underlying bedrock is sandstone of the Llanishen Conglomerate overlain by superficial deposits of alluvium. The application site is located at a height of approximately 29m OD.

The 'Taff Trail' cycle path passes through the site adjacent to the River Taff. To the east of the cycle path is a sparsely wooded area containing the continuation of a feeder channel into the Taff, and an overflow channel which formerly returned water from the feeder channel back into the river. During the construction project, a contractor's car park and compound was established in this area. The surface of the carpark has now been removed and topsoil restored to the site.

The development plans consisted of two Archimedean screw turbines installed in a new channel immediately to the east of the current weir, as well as the installation of new fish pass facility, and the building of a new housing facility for equipment associated with the turbines.

The scheme involved work on the eastern bank of the river Taff and within the river channel itself, with the deepest excavations taking place immediately adjacent to the river. The depth for the installation of the turbines was approximately 9m below ground level, with dredging of the river bed also taking place.

Located within the application area are post-medieval features associated with the water management system associated with Mellingriffith tinplate works. These included culverts and sluice gates integral to the water management system.

2 OBJECTIVES

The objectives of the building survey were to record the standing structures within the development area, to produce a report and to deposit the archive within a suitable local repository.

3 METHOD

An historic building survey commensurate with Historic England Level 2 was undertaken. The scope of the work is summarised in the following points:

- › Drawn record – Sketched plan, section, elevation or detail drawings as appropriate;
- › A site plan relating the structures/elements to each other and to any related landscape features;
- › Photographic record – General views and detailed shots of the structures forming the water management system;
- › Collation of photos taken by Headland Archaeology and Dawnus Construction both prior to and during the development works;
- › Written record including details of dimensions, materials, form and function of structures.

4 HISTORICAL BACKGROUND

The current weir was constructed between 1774 and 1775 to provide a water supply for Melingriffith Tinplate Works. The weir is believed to have been built near the site of an earlier one, potentially of medieval origin.

Melingriffith, as an industrial unit, was in existence long before the advent of the Industrial Revolution and of the development of the modern metallurgical industries. Prior to the establishment of the tinplate works in the 1740s the site is believed to have been the location of a corn mill driven by water power from the River Taff, and it was probably the existence of this power that encouraged the adaption of the mill site for the purposes of iron and tinplate manufacture (Chappell 1940).

The 1875 Ordnance Survey map of the site illustrates the functioning of the water management system in operation during its heyday (Illus 3). The weir directed water along a feeder channel to the tinplate Works. The course of an overflow channel running south from the feeder stream is still visible, and enters back into the Taff beneath a brick arched tunnel which runs beneath the Taff Trail cycle path.

5 BUILDING SURVEY

The location of all structural elements and photo locations are recorded on Illus 2.

The weir and fish pass (Structural element A)

The extant weir structure (Illus 21) measures approximately 80m in length and spans the River Taff from south-west to north-east. The structure of the weir was unaffected by the current development.

A stone retaining wall which formed the northern bank of the River Taff was partially removed (Illus 19) to the north of the weir face in order to channel water into the hydroelectric turbines. No recording was undertaken on this structure.

Prior to the start of development, and photographed as part of the pre-determination desk-based study (Craddock-Bennett 2012), a subterranean fish pass was located adjacent to the weir on the east bank of the River Taff (Illus 4). The fish pass was visible from surface level as two metal grills overlying the fish transit channel and an associated brick built building measuring c.3.5m x 2m in plan. The building and fish pass, which dated (on the basis of form and materials) to the late 20th century were removed during the current development. Photographs of the subterranean structure were taken by Dawnus Construction during demolition (Illus 18).

A new fish pass (Illus 22) was constructed as part of the current development, removing all traces of the previous structure. Excavations were undertaken to a depth of approximately 9m below ground level (Illus 17).

Entrance and sluice gates of Melingriffith feeder channel (Structural element B)

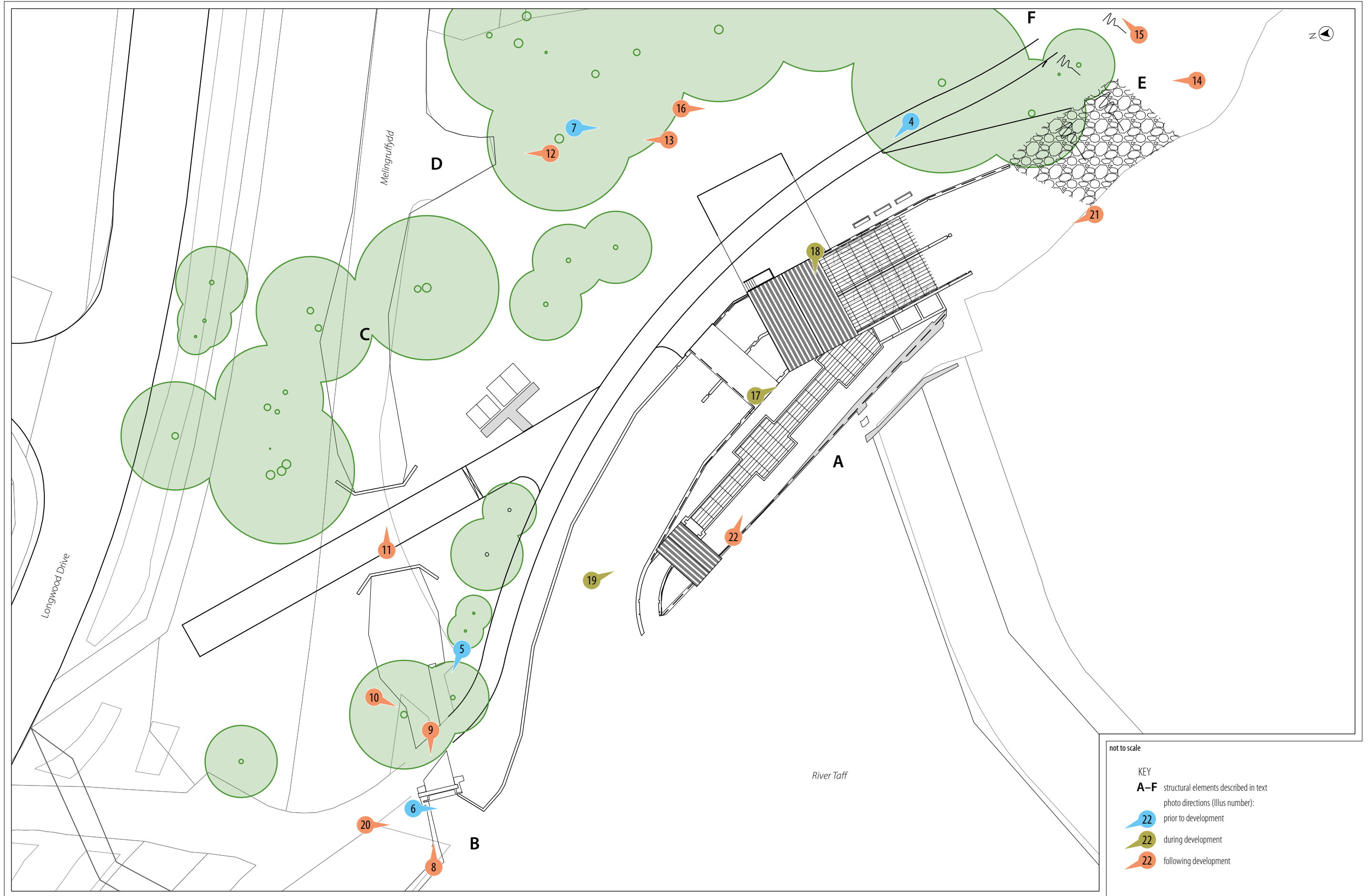
The entrance to the Melingriffith feeder channel is located c.60m to the north of the weir. Brick and stone wall termini (Illus 6), capped with concrete during the development (Illus 20) form the entrance to the channel which leads directly onto a set of sluice gates.

The sluice system is formed from a concrete dam measuring 3.2m in length, 2.3m in height and 0.61m in width (Illus 8). Three iron sluice gates of rack and pinion construction control the flow of water through the concrete dam. Each pinion, which is operated via a circular master cog measuring 0.74m in diameter (Illus 9), is connected to an iron gate measuring 0.9m x 0.9m. By engaging the rack and pinion via a removable handle the gates can be raised or lowered independently in order to control the flow of river water into the feeder channel.

An undated black and white photo held by Glamorgan Records Office shows the sluice gate mechanism and a small whitewashed building immediately to the north-west (Illus 5). The building which is no longer present was presumably connected to the operation of the sluice gate and feeder channel.

Melingriffith feeder channel (Structural element C)

Only limited traces of masonry remain of the formalised banks of the feeder channel (Illus 11). Eroded stone blocks were identified during data collection undertaken as part of the desk-based assessment. The development process involved the widening of a footbridge spanning the channel in order to provide access for plant. A short section of wall forming the southern edge of the feeder channel was

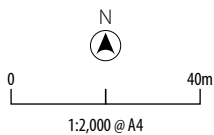


not to scale

KEY

- A-F structural elements described in text
- photo directions (Illus number):
- 22 prior to development
- 22 during development
- 22 following development

ILLUS 2 Photo location plan



ILLUS 3 First edition Ordnance Survey map, published 1875 (Reproduced courtesy of Glamorgan Records Office)

identified approximately 10m to the east of the feeder channel sluice gate. The wall, which survived to a height of c.1m above the water surface was constructed of cobblestone with evidence for modern cement pointing (Illus 10).

Overflow channel (Structural element D)

Approximately 65m along the course of the feeder channel, an overflow splits from the main channel in a southerly direction. The feeder, which measured 3.55m wide was canalised by means of limestone block walls (individual blocks measuring c. 0.30m x 0.15m x 0.15m). The walls were visible to a height of 0.96m (Illus 12 and 13).

At the northern end of the feeder channel, two parallel iron girders (each measuring 0.25m x 0.25m x 3.55m) were mortared into the upper stone courses of the channel sides. The girder arrangement bore similarities to the mounting points for the sluice gate system at the western end of the feeder channel; it is likely that a similar water management system was in operation here.

Photographs of the channel taken prior to the current development (Illus 7) show a sinuous channel, with masonry blocks eroding from the banks. As part of the development works the channel was backfilled with soil (Illus 16) and the feature is now only visible as an un-wooded path through the trees.



ILLUS 4 Fish pass and eastern side of weir prior to current development

Southern terminus of overflow channel (Structural element E)

In order to carry the overflow channel beneath the former Melingriffith and Pentyrch Railway, a culvert constructed of limestone blocks was located at the southern end of the channel and adjacent to the north bank of the River Taff (Illus 14). The southern elevation of the culvert is formed from narrow limestone blocks (0.05-0.10m height x 0.30-0.40m width) measuring 5.40m in width and 1.80m in height. The elevation is dominated by a stone arch framing a semi-circular aperture measuring 3.40m in width and 0.90m in height. It appears that waterborne silt has partially buried the structure. Large quoin stones form the southwestern corner of the structure. To the south and east a cobble stone wall forms a riverbank revetment.

Reconstructed section of Melingriffith & Pentyrch Tramway (Structural element F)

The current Taff Trail cycle route which follows the eastern bank of the river is aligned on the route of the Melingriffith and Pentyrch Railway. The line was established as a tramroad in 1812 to connect the Tinplate Works with the Pentyrch Ironworks and converted to a Railway in 1871.

On the northern side of the current Taff Trail, at the southern extent of the development area, a section of the tramway is preserved (Illus 14). It is not clear whether the track is in its original location or whether it has been reconstructed in its current location.

The iron rails measure 0.09m in width and are positioned 1.33m apart. Each rail comprises two sections of track, each measuring 0.91m in length. The rails are located upon limestone sleeper pads, each measuring c.0.4m x 0.4m and located 0.60m apart.

6 DISCUSSION

The current weir was constructed in 1774-5 to supply water power to the Melingriffith tinplate works.

Comparison of 1875 and 1920 Ordnance Survey maps of the site identifies the Sluice gates and entrance to the feeder channel as being of post-1875 date.

An assessment of photographs taken at the site both prior to, and following the development works indicates that the majority of features relating to the Melingriffith water management system have been unaffected by the development.

Although construction of the hydroelectric plant was completed prior to the commencement of the HBR, only limited change was observed on the key post-medieval water management features.

The weir structure itself was unchanged during the current works; only the revetment wall lining the north bank of the River Taff being affected by the installation of the turbines.

The sluice gates at the entrance to the feeder channel were unchanged; the largest alteration to the channel being the construction of a new bridge over the channel to allow vehicular access to the hydroelectric plant.

The only significant alteration to the post-medieval features on the site, is the backfilling of the overflow channel, however the most significant aspect of this feature, the southern outflow has not been affected by the development.



ILLUS 5 Undated photograph of post-1875 feeder channel and building (Reproduced courtesy of Glamorgan Records Office DX23/2.3)

7 CONCLUSION

The current development has utilised an 18th century weir to generate electricity via a newly constructed hydroelectric facility.

A photographic record of the site has been made, both to create a record of the structures, and to identify any change or alteration to these structures as a result of the development.

The results of the survey confirm that the development has been undertaken with very little change to the post-medieval water management features that are present on the site.

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ILLUS 6 Corner of retaining wall on entrance to feeder channel (photograph taken prior to current development) **ILLUS 7** Overflow channel (photograph taken prior to current development) **ILLUS 8** Post-1875 sluice gates at western end of feeder channel (west elevation)



ILLUS 9 Post-1875 sluice gates at western end of feeder channel (east elevation) **ILLUS 10** Cobblestone wall forming southern side of feeder channel **ILLUS 11** East facing view along Mellingriffith feeder channel **ILLUS 12** Detail view of iron girders spanning northern end of overflow channel **ILLUS 13** General view of northern end of feeder channel **ILLUS 14** Southern terminus of overflow culvert **ILLUS 15** Detail of Mellingriffith & Pentyrch tramway



ILLUS 16 Section of backfilled overflow channel (following completion of site works) **ILLUS 17** Excavation of hydroelectric plant footprint (photo courtesy of Dawnus Construction) **ILLUS 18** Demolition of 20th century fish pass structure (photo courtesy of Dawnus Construction) **ILLUS 19** Demolition of section of retaining wall to create feeder channel for Hydroelectric plant (photo courtesy of Dawnus Construction) **ILLUS 20** Corner of retaining wall on entrance to feeder channel (following development) **ILLUS 21** Eastern end of weir (following development) **ILLUS 22** Hydroelectric plant and fish pass following development

9 APPENDICES

APPENDIX 1 PHOTOGRAPHIC REGISTER

PHOTO	DIRECTION FACING	DESCRIPTION
1366	SE	Sluice gate – Record 5
1367	"	"
1368	"	"
1369	"	"
1370	S	Weir retaining wall
1371	NNW	Sluice gate – Record 5
1372	NNW	"
1373	NW	"
1374	SW	Pipe work under modern bridge
1375	W	"
1376	W	"
1377	N	Sluice gate – Record 5
1378	N	"
1379	-	Cancelled
1380	WNW	Arched structure – Record 4
1381	WNW	"
1382	WNW	"
1383	WNW	"
1384	WNW	"
1385	WNW	"
1386	NW	Retaining wall for Record 4
1387	WNW	"
1388	SE	"
1389	SE	"
1390	S	Working shot
1391	N	Remains of overflow sluice – Record 4
1392	N	"
1393	NW	"
1394	NW	"
1395	N	Backfilled overflow channel
1396	N	"
1397	S	"
1398	N	Overflow outflow – Record 2
1399	NE	"
1400	E	"

PHOTO	DIRECTION FACING	DESCRIPTION
1401	N	"
1402	N	"
1403	E	"
1404	E	"
1405	E	"
1406	-	Working shot
1407	NE	Joint in wall and tunnel – Record 2
1408	NE	Tramway – Record 1
1409	SE	"
1410	NW	"
1411	NW	Record 2
1412	NW	"
1413	N	"
1414	N	"
1415	N	"
1416	N	Record 7 – West
1417	NW	"
1418	W	"
1419	W	"
1420	SW	"
1421	S	"
1422	SE	"
1423	W	"
1424	-	Cancelled
1425	NW	Canal – Record 6
1426	NW	"
1427	N	"
1428	SE	"
1429	SE	"
1430	-	ID Shot



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