



Hafod-Morfa Copperworks Interpretation plan Final (Draft)



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Professor Huw Bowen

For the Cu @ Swansea Project

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1. Project Overview

The purpose of this plan is to develop informative and innovative interpretation for the 12 ½ -acre site of the Hafod-Morfa Copperworks an industrial heritage site of world significance located in the Lower Swansea Valley. This opportunity has arisen due to a major physical improvement scheme at the hitherto derelict site which has been undertaken by the Cu @ Swansea project, supported by grant funding secured as part of Cadw-Welsh Government's Heritage Tourism Project of 2012. A grant funding package of £542,000 has been provided by Cadw-Welsh Government, The European Regional Development Fund, Swansea Regeneration Area, and the City and the County of Swansea, with supplementary funding provided by Swansea Regeneration Area.

Work began on the site in February 2013 under the supervision of the project contractors Groundwork Bridgend-Neath-Port Talbot, and since then significant areas have been cleared to reveal buildings and features, paths have been laid out, buildings have been stabilised, safe access has been established; and landscaping and improvement to the physical environment have taken place. The next stage in the development of the site is to transform it into a 'must-see' attraction for local people and visitors who will be excited and inspired by the story of the site and the people and communities connected with it over the past 250 years.

2 The Key Message

The Hafod-Morfa Copperworks was an immensely important industrial concern of global significance, and today its former site is being brought to life through a bold and ambitious regeneration plan that connects the past, present, and future.

3 Project Methodology

The proposed methodology for developing the Interpretation Plan is based upon the research of the Cu @ Swansea project Interpretation Group and contributions from members of the local community, and in broad terms it is informed by the framed by the following documents:

Historic Environment Strategy for Wales (May 2103)

Historic Environment Strategy for Wales: Headline Action Plan (May 2013)

The Story so Far: An Overview of the Pan-Wales Interpretation Plan (2012)

Wales – First Industrial Nation Interpretation Plan (October 2011)

Draft Cadw Urban Character Study of Hafod.

The overall aim of the plan is to provide a framework for interpretation at the site that will

- * **provoke excitement and curiosity**
- * **offer informed understanding of the lives, struggles, and achievements of diverse people in the past who worked on the site or lived in close proximity to it**
- * **make an powerful statement about the international significance of the site**
- * **relate to the everyday experiences of visitors**
- * **provide uniquely attractive infrastructure**
- * **generate a strong sense of place and change over time**
- * **be accessible and enjoyable for visitors of all ages**
- * **engage a diverse range of local communities**
- * **use a range of appropriate media and new technologies**

This will be achieved by drawing on:

The background knowledge and subject expertise of the interpretation Group

Research into primary sources materials undertaken by members of the Interpretation Group;

Site visits to facilitate full understanding of the site and its physical constraints.

Consultation with members of the community who have supplied knowledge, documents, objects, and artefacts in order to understand their hopes, aspirations, and concerns.

Input from students at local schools to inform the use of artwork and images.

Development of the key interpretive aims and objectives (educational, behavioural and emotional).

The placement of the site in its city-wide historic and physical context, and where appropriate linking it with other heritage sites and assets, especially those connected with the historic copper industry.

The placement of the site in its global historic context, and where appropriate linking it with sites connected in the past with the Hafod-Morfa works.

Understanding the proposed/potential markets based on information from City and County of Swansea's marketing team as well as looking at markets identified by other bodies including Cadw for similar heritage sites.

Identifying appropriate media for delivery, appropriate in terms of

- the story
- the multiple diverse audiences
- the physical location (and the design implications of the site and its features)
- the budget

Developing strong visuals and artwork to convey core interpretation themes as well as an overall site 'brand'.

Ensuring access (physical, digital, and intellectual) is maximised, in particular to facilitate engagement with disadvantaged groups.

Recommend ways forward including both the short term (to maximise use of a budget of £86,893 already secured) and the longer term to ensure that preliminary interpretation can be developed and extended as effectively as possible.

4 Aims of this interpretation Plan

- Identify key stories/themes and sub-themes.
- Identify historic connections with other sites locally and globally
- Recommendations on how to tell the stories.
- Recommendations on how to represent the site and its stories in artistic terms
- Propose interpretative interventions, with estimated costs, appropriate to both the target audiences and the site
- Recommend means of motivating visitors to visit and re-visit sites and to explore further afield.
- Recommend evaluation and monitoring techniques to measure the effectiveness and use of the interpretation in line with the interpretative objectives.

5. The Pan-Wales Interpretation Plan: themes and sub-themes

Cadw has been given a remit by Wales Government to develop an all-Wales approach to the interpretation of heritage sites.

It is an approach that is centred on 'stories' because:

'We love a good story in Wales and perhaps that's not surprising given our exciting, rich and diverse heritage and culture. Wales's stories and the means we use to convey them, have the potential to inspire people and enhance their lives. The Pan-Wales Heritage Interpretation Plan gives us a unique

opportunity to take these stories and interpret them for the benefit of our own people and our visitors ‘ (The Story So Far, p. 3).

In addition:

“The pan-Wales approach is an opportunity to join up the pieces, so that people can follow stories between sites with the help of inspiring interpretation.

We want audiences across Wales, local or visiting, to be met with creative, exciting, engaging and thought-provoking experiences — which are fun too. The benefits of getting this right are far reaching — socially, culturally and economically.

Everyone involved in interpretation in Wales has a role to play in helping our country to reap these rewards.

The Pan-Wales Heritage Interpretation Plan takes a practical approach. It provides a framework for anyone involved in interpreting the history of Wales — irrespective of the scale of their project or budget”

In practical terms, the approach provides mechanisms for linking sites geographically and thematically using tools such as the ‘story icons’ and the ‘Follow the Story’ mechanism which help refer people between sites.

More fundamentally for this project, in order to support and define interpretation Cadw has developed a number of thematic pan-Wales interpretation plans including one on ‘Wales – the first industrial nation’ (2011). This report focuses on three interconnected main themes:

People – This looks at the motivations of a selection of investors, inventors, entrepreneurs, benefactors, workers, political reformers, social ‘movers and shakers’ and the communities that made the industrial revolution in Wales possible.

Processes and Products– This identifies the seminal moments in Wales, where inventions were made or technologies were embraced that took industry to new and highly productive levels.

Places – This answers the question ‘why did all this happen in Wales?’ It outlines the importance of Wales’ rich mineral wealth (particularly slate, iron ore and coal), and identifies many of the key locations in the story.

Unfortunately, however, the plan is somewhat insular and makes no mention of Wales’s place in the world or connection with heritage sites overseas. It takes no account of recent understandings of global process of change and development that were shaped by inputs and innovations from Wales. In particular, no mention is made of markets or overseas sources of raw materials, and without this it is simply not possible to gain a full and proper

understanding of the Hafod-Morfa copperworks or indeed the broader copper industry as a whole. So, in addition to People, Processes and Products, and Places, it is proposed that due prominence in the Interpretation Plan also be given to a fourth theme:

Connections – This identifies the places near and far that formed the wider world of the Hafod-Morfa Copperworks. It stresses the importance of the global sources of copper ore and the overseas markets to which large quantities of finished copper were dispatched. By doing this, the sea is brought to the very centre of the story, and the works is afforded its proper place in the story of the development of the global economy.

Key sub-themes

‘Wales- the first Industrial Nation’ identifies the following sub-themes to provide a framework for interpretation:

Innovation and exploitation – from the start of the Industrial Revolution, people in Wales, or people who came to Wales, maximised natural and human resources for economic and social betterment through adopting and developing new processes, products, transportation methods and trading opportunities.

Ambition and success – armed with natural resources, technical developments, expanding markets and personal aspirations, entrepreneurs and working people in Wales exploited every opportunity to increase their wealth, education and social position from the achievements of the Industrial Revolution

Landscape change – the Industrial Revolution created widespread and irrevocable changes to the landscape to provide sites for extraction, manufacturing, transport, housing and administration, and today’s landscape reflects the transformation of an agricultural landscape to an industrial one and still has an impact upon how many people in Wales live and work.

Social reform – the industrial and commercial achievements of entrepreneurs in Wales brought prosperity and opulence to the few but poverty and deprivation to the many which motivated individuals and groups to seek improved conditions and personal betterment for working people, and representation of their interests.

Again, these sub-themes are somewhat narrow and limited, and they ignore a key dynamic element in the process of industrialisation which was the creation of multiple forms of community, many of which still exist today. It is thus proposed that the Interpretation Plan incorporates a fifth sub-theme, as follows:

Community and identity: Industrialisation created many different types of community across Wales and each had its own distinctive industry-specific

identity, formed by different types of work, gender relations, immigration etc. They were physical communities – sometime purpose-built as in Trevivian/Hafod – but they were also communities of the mind – social, cultural, and political.

6. The Assets (Statement of Significance)

6.1 The History

The Hafod-Morfa Copperworks was a large, integrated industrial complex located in the Lower Swansea Valley, an area which by 1900 had become the most intensively industrialised part of Britain.

Copper smelting began in earnest in the Lower Swansea Valley in 1717 with the establishment of the Llangyfelach Works in Landore. Although no copper ore was to be found locally, the Valley provided an ideal location for enterprising smelters because of abundance of coal deposits and good transport links to the sea provided by the River Tawe. Ore was brought in from Cornwall and Ireland, and the early growth of the industry was stimulated by capital investment from businessmen from Bristol and London. Labour and skills were provided by a largely immigrant workforce recruited from West Wales, Cornwall, and the Midlands, and a particular ‘Welsh method’ of smelting emerged in which ores passed through a process of repeated ‘roastings’ in a line of furnaces.

The early growth of the industry was rapid with overseas markets – notably those in the East and West Indies – providing steady and then rising demand, and this attracted the attention of other entrepreneurs who identified opportunities for productive investment. As a result, the second half of the eighteenth century saw the development of a number of new works and this resulted in the rapid growth of the industry and its attendant transport infrastructure, notably Smith’s Canal and the Swansea Canal. By 1800 nine copper works had been developed in close proximity to one another, as follows:

Llangyfelach (1717)
Cambrian (1720)
White Rock (1727)
Fforest (1746)
Middle Bank (1755)
Upper Bank (1758)
Rose (1781)
Birmingham (1793)
Landore (1793)

This growth was characterised by product diversification, sales to an increasingly wide range of overseas markets, and the growth of the work

forces. The wider effects of this process were felt across the area and the nearby port-town of Swansea which experienced population growth, an increase in the size of the built environment, and a rise in shipping activity. However, a critical constraint upon the future growth of the industry was continued access to supplies of ore, and by 1800 this was already a significant problem. From 1780, large volumes of ore had been imported from Parys Mountain on Anglesey, as well as from Cornwall, but this source was being rapidly depleted causing a search to be made for alternative supply relationships with copper mines in other increasingly far-flung places.

It was against this background that the Cornish entrepreneur John Vivian established the Hafod Copperworks in 1810. This works was constructed in order to smelt Cornish ores, and it was carefully and deliberately positioned on a site between the Swansea Canal and the River Tawe so as to facilitate the importation of both ore and coal. The works was initially little more than a small collection of buildings but under the supervision of Vivian's son, John Henry, and then his grandson Henry Hussey it grew in size and scale becoming one of the largest and most innovative industrial plants in Britain. As this happened, the overseas supply and distribution connections of the works were extended and widened, putting it at the centre of a globally integrated heavy industry, the first of its kind.

But the Vivians built more than a copper works. They diversified their productive activity on the Hafod site, acquired other copper works, and constructed an iron foundry, phosphate works, and a nickel and cobalt works. Most importantly, they also set in motion the construction of a township or settlement for their expanding workforce – Trevivian – which was developed progressively in stages from 1824 onwards, and contained not only terraced houses but also churches, chapels, and schools.

In 1835 a new copperworks was established alongside the Hafod works. This was the Morfa works of Williams, Foster & Co., which grew rapidly to become the largest non-ferrous metal smelting works in Europe, and it too was dependent on global connections for both the supply of ore and the distribution and sale of its products.

Commercial logic dictated that as technologies, skills, and knowledge developed, and as local coal deposits were opened up, ore would be smelted at source rather than be shipped thousands of miles to Swansea from countries such as Cuba and Chile. As a result, from the 1870s onwards Swansea smelters faced increasingly stiff competition from overseas rivals and their pre-eminent position in world markets was quickly eroded. It became no longer feasible or profitable to import foreign ores in huge quantities and, in order to survive, from the 1890s onwards firms diversified into other forms of metallurgical activity and in some cases they merged.

The Hafod and Morfa works merged in 1924, at which point the smelting and refining of copper ceased, and activity centred on the finishing of copper products. Four years later the new works passed into the hand of ICI. When

ICI amalgamated with Yorkshire Metals in 1957, ownership of the Hafod-Morfa site was taken over by Yorkshire Imperial Metals, which retained control until the works finally closed in August 1980.

The decline of the copper industry from the 1890s was accompanied by the abandonment of works in Lower Swansea Valley. The Hafod-Morfa works was the last of the historic works to function, but it did so within a surrounding landscape that was deeply scarred by the ravages of industrialisation. Large-scale copper production had been accompanied by multiple forms of pollution, including the uncontrolled emission of noxious fumes and the unregulated disposal of copper waste or 'slag', and by the 1950s the Lower Swansea Valley had become the largest post-industrial wasteland in Western Europe.

From 1961 onwards this situation was addressed by the Lower Swansea Valley Project which was an ambitious land reclamation scheme designed to make the area fit once more for habitation and work; and to make the valley 'green' again. In many ways this multi-partner project was immensely successful, and it paved the way for new forms of social and economic activity in the valley, but one of the casualties of the process of regeneration was industrial heritage, as unprotected historic buildings and structures were systematically demolished. This meant that all around the Hafod-Morfa works the evidence of the area's industrial past was all-but destroyed and remains were often covered over by new buildings, most notably in the case of the Upper and Middle Bank works. The overall effect of this process means that today the site of the Hafod-Morfa works contains the only surviving cluster of buildings and structures that provide the only major visual reminder that Swansea once dominated the first globally integrated heavy metal industry.

6.2 The site today

The Hafod-Morfa works ceased to function in 1980, at which point the 12 ½ acre site was abandoned and rapidly became derelict and overgrown. The vast majority of its buildings were demolished, and only limited attempts have been to use or develop the site. A river-focused regeneration project of the 1980s stabilised the river bank (a process which saw the loss of wharves and docking facilities), and later a Park and Ride car park was constructed on part of the site of the old Morfa works. A new main road has been constructed through part of the site, and a bus distributor road passes from the Park and Ride car park to the Neath Road. Fencing has been put in place to keep vandals out of some of the surviving buildings, only one of which is still in use (as Swansea Museum's Collections Centre).

Despite four decades of neglect of the historic environment and surviving buildings, the site retains important structures that are of international significance:

The course of the Swansea Canal: Running alongside the Hafod and Morfa works, the filled in and largely concealed remains of the canal – which was

built between 1794 and 1798 - provide a powerful reminder of the importance of waterborne transport to the development of the works. Unlike other surviving parts of the canal that have been restored to a very high standard, this section has been neglected; yet it contains many important features such as boundary walls, doorways, a dock entrance, and the remains of several bridges. It offers considerable scope for archaeological investigation, and provides a 'spine' that runs the length of the site.

Swansea Museum Collections Centre: Part of this large building was constructed in 1828 to function as a rolling mill for the Morfa works. In its day it was the largest building of its type in Europe, and it is well maintained, having been converted into a store for a large collection of industrial and maritime objects and artefacts.

The Power House: This attractive building was built in the late nineteenth century to house the engines and machinery that supplied power to the Morfa works. Towards the end of its working life it was adapted to become a canteen building. It was fully restored and refurbished after the close of the works in 1980 but suffered fire damage which caused the loss of almost all of its slate roof. It is Grade II listed.

The Laboratory: This building was constructed with many classical ornate features in the mid nineteenth century to serve as the Assay Office for the Morfa works. It is Grade II listed.

Pier to the former waste tip (which was located on the site of present-day Pentrehafod school): This very large, yet largely concealed, feature supported a tramway which carried copper waste to a large slag heap or tip situated on a site located some distance away from the Morfa works across the Swansea Canal and Neath Road. It is Grade II listed.

Copper Slag Abutment: Like the pier above this large and impressive structure supported the tramway that conveyed waste to the tip. Again, it is largely concealed but, most notably, it is constructed from copper slag blocks. Built in the mid-nineteenth century, it is Grade II listed.

A Lime Kiln: This kiln, which used locally produced limestone, was built in the mid-nineteenth century alongside the Swansea Canal on the site of the former Hafod works. It is Grade II listed.

Chimney to the West of the Vivian Engine House: This large brick-built chimney is emblematic of Swansea's past as the world's leading producer of smelted copper. During the mid-nineteenth century well over 150 large chimneys were to be found in the copper works in the Lower Swansea Valley. Now only two survive (both on this site) and this one is Grade II listed.

The Vivian Engine House: This imposing steam-engine house was constructed during the early 1860s to house a large engine which drove rolling machinery across the Hafod works site. It is a Grade II listed building.

The Musgrave Engine House: This building, with its distinctive chimney, was built in 1910 to house the state-of-the art Musgrave triple-cylinder compound steam engine which provided rope-driven power to the rolling mills. Rusting remains are still located in the engine house, but the engine has been sadly neglected since 1980 when it last operated. Recent clearance work has exposed large fly wheels, rope-drive belts, and rolling machinery. The Building is Grade II listed.

The Vivian Locomotive shed: At the southern extremity of the site, this building was constructed in 1910 to house a standard gauge railway engine which hauled goods around the Hafod site. Situated on the river bank this attractive and unusual building is in advance state of disrepair and requires urgent attention to prevent further decay and collapse. It is Grade II listed.

In addition to these major survivals, the site contains numerous small and often concealed features which all add to its story, and its imposing river frontage presents a powerful visual reminder of connections with the port, the oceans, and the wider world of Swansea copper.

The site sits in close proximity to three sites, which were once similarly dedicated to the copper industry but in recent years have been regenerated to serve different purposes:

- a. The 20,500-seat Liberty Stadium which is the home to Swansea City AFC and the The Ospreys regional rugby team, and to a conference centre.
- b. The Morfa Retail Park
- c. The Copper Quarter housing development.

A and B are located on the part of the former Morfa works; C is located on the site of the Upper and Middle Banks works.

6.3 Existing Interpretation

There is currently no interpretation or signage on the site. The attractively produced *A Short History of the Hafod Copperworks* published by the City and County of Swansea is now out-of-print. Some visitors are able to take advantage of a trail leaflet produced by the Swansea Community Boat Trust.

6.4 Connected Local Copper Heritage Sites

The other major copper works in the area have been demolished and in most cases their sites have been built upon or re-developed. The enormously important and interesting White Rock site has been designated as an 'Industrial Heritage Park' but, as with the Hafod-Morfa site, it has no interpretation to explain its past or significance. Yet, it would be quite wrong to assume that Swansea has lost all of its physical connection with its historic

copper industry. It has been estimated that there are 179 surviving copper-related buildings or structures of international significance. Some of these, such as Singleton Abbey (former home of the Vivian family) or Morris Castle, are very prominent; others are often obscure and concealed. In short, the Hafod-Morfa site lies at the heart of a large collection of extremely important copper industry remains which in different ways contribute to a better understanding of the economic, social, and cultural processes that led to Swansea's emergence as 'Copperopolis' in the mid-nineteenth century. There is in effect an entire social system still in place which – if properly interpreted – can conjure up an entire way of life and the economic system that sustained it.

6.5 Current Issues and Constraints

The site currently suffers from:

- Long-term neglect
- Its current use as a car park and a place to 'pass through'
- No access point for people conveyed by water transport
- No footpath or cycle-path link to the city centre along the river bank
- Lack of public awareness of its historic importance
- Lack of public awareness of its international significance
- A perception that parts of it are derelict and dangerous
- A continuing belief that it is 'empty' with nothing special to see
- A separation from the community it once shaped and served
- Its isolation and separation from nearby regenerated sites
- A forbidding and unwelcoming exterior
- A lack of easy access to some areas
- A lack of joined-up publicity/interpretation with other similar or connected sites in the area

7 Audiences

7.1 General Background

Tourism is very important to Swansea's economy, as these figures from the 2011 tourism economic activity model suggest:

- Tourism related expenditure - £335.27million
- Over 4.2million visitors to the area
- No. of jobs supported – 5,602

Swansea's Tourism Team has identified a number of important market segments¹ for the City and County as follows:

¹ <http://www.swansea.gov.uk/index.cfm?articleid=22846>

- Affluent 'Empty Nesters' 45+ years
- Affluent early retired couples 45+ years
- Younger affluent professionals 25 - 45 years
- Mid income families with children
- Businesses and groups

Research² undertaken by the council suggests that 97% of visitors would recommend a visit to Swansea Bay, which is a very high percentage, reflected in 97% of respondents also saying that their time in the Bay has been either enjoyable or very enjoyable. Interestingly, 56% of visitors are staying at least one night, and the average stay is 5 nights. 33% of those who stay overnight are staying within Swansea itself as opposed to the Gower or Mumbles. 42% of those surveyed were Welsh, 44% came from elsewhere in the UK and 12% were overseas visitors. 86% were repeat visitors.

Currently marketing campaigns for Swansea Bay do not concentrate on the heritage product, although the general campaigns do list attractions/places to go. At present Hafod-Morfa copperworks does not feature on this listing.

Yet as part of a broader heritage and cultural offer, the Hafod-Morfa site does have the potential to attract more visitors:

“Culture is an intrinsic part of the visitor experience. Most visitors will come into contact with Wales’ culture during their trip - either through generic encounters (sense of place, language, local food and drink, crafts, and music), or through specific visits to heritage and cultural attractions.

The culture and heritage offer is a significant contributor to the Welsh visitor economy. In 2010, £144 million was spent on holidays where culture was the main activity for the holiday, and £590 million was spent on holidays where a cultural activity was undertaken as part of the holiday.”³

More specifically, there is a considerable body of evidence which points to local curiosity and concern about the site and interest in the historic copper industry. In 2011, 2,700 people attended a one-day, city-wide, ‘Copper Day’; and between July and October that year over 100,000 people passed through the ‘World of Welsh copper’ exhibition at the National Waterfront Museum in Swansea. Visitors continue to attend the ‘Copperopolis’ exhibition staged by Swansea Museum since the end of 2010. Recent public events on the Hafod-Morfa site, such as community archaeology digs and guided walks, have attracted good numbers of local adults and children.

² <http://www.swansea.gov.uk/index.cfm?articleid=53604>

³ <http://wales.gov.uk/topics/tourism/development1/culturaltourism>

7.2 Target Audiences for New Interpretation

At its own sites, Cadw is focussing on attracting a broad audience base with the family market at its core. In view of this, and given its location and the above information, the key visitors for the site are:

Day to day:

- Members of the local community who have traditionally used the site for exercise, dog-walking etc.
- Casual visitors (visitors including families) – the site is close to the Morfa Retail Park and the Liberty Stadium. On match days, several thousand people pass through the site, especially en route to Premier League football matches at the Stadium.
- General heritage enthusiasts.
- Holiday makers spending a day in the city.

Booked tours by appointment:

- Local heritage groups and other societies looking for something to do.
- Small education groups.

Events

- Families
- Local people
- General visitors (day/staying)
- Special interest groups (archaeologists, engine enthusiasts etc)

7.3 Methods for increasing the audience

As well as highly visible interpretation, there are opportunities for increasing the site's profile through links with other heritage sites within the City, the broader region, and the rest of the world. The Cu @ Swansea project already has signage relevant to the site and with new interpretation will be able to attract the attention of visitors and passers by.

Once there is confidence in the site as an attractive place to send visitors, it would also follow that its profile within the City's own tourism marketing strategy should increase to reflect this.

Much of this can be done within existing print literature and through existing on-line resources. A new guidebook/trail/ would be a useful new resource, and again this could be available digitally (web based or an app) as well as in a hard copy format. New social media will play a key role by encouraging input and participation from members of the community and visitors.

These are basic industry-standard methods for attracting visitors to any site, but, in addition, the Cu @ Swansea project can utilise cutting-edge technology developed by Swansea university researchers, such as:

- a. The Hafod-Morfa animated film which provides a digital reconstruction of the site and the copper-smelting processes.
- b. Experimental sound-related technology which enables visitors to engage with the site in new and creative ways.
- c. The projection of virtual reality images onto buildings and features.
- d. The use of QR code technology to engage with visitors operating hand-held devices.

This will require an effective digital strategy to maximise the impact of the interpretation to be delivered by new and sometimes experimental technology.

8 Interpretation aims and objectives

8.1 Our aims - why do we want to tell the story?

The former Hafod-Morfa copperworks is a large site with clusters of listed buildings and structures which collectively provide the last striking visual reminder that Swansea once dominated the world's copper industry and in so doing became a leading centre of innovation, technology, and enterprise. The site has had more than one life, however, because it has passed through successive phases of development, growth, decay, dereliction and, now, regeneration. So, too, it has had multiple economic, social, and cultural impacts, internationally as well as locally, and accordingly it has shaped the lives of numerous people, social groups, and communities.

As such, the interpretation aims to:

- Be creative/imaginative/inspiring
- Provide the basic information necessary for people to understand the site and its complex industrial processes
- Focus on people and their lives, struggles, and achievements
- Celebrate the historic environment of the area and its links across the world
- Increase public interest in the area's international significance
- Complement other access and interpretation projects locally and regionally
- Maximise the potential offered by the site for heritage-led development and regeneration.
- Increase local pride and sense of place, identity, and ownership
- Be a part of creating/sustaining a positive and dynamic image for Swansea
- Have a positive economic, social, educational, and cultural impact
- Improve the local environment and the site's fundamental infrastructure

8.2 What are our interpretation objectives?

The site Hafod-Morfa copperworks is well known to industrial heritage enthusiasts but not to most local people, visitors, or passers-by. As such the interpretation objectives need to engage local communities and visitors with the site and the ways of life that once echoed around it.

EMOTIONAL OBJECTIVES

We want visitors to:

- Feel that they are part of a living-history site that is being brought back to life.
- Be in awe of the size, scale, and complexity of the site.
- Be surprised by how much has survived and can be revealed.
- Be amazed at how important the site was not just locally but to the development of the world economy.
- Be inspired by the innovation and invention that found expression on the site.
- Be proud of the city and its historic achievements
- Create a bond between the visitor and the people who once worked on the site.
- Empathise with those whose lives were characterised by hardship, struggle, and poor health.
- Be appalled by the pollution and poisoning of the environment.
- Be proud of the re-birth of the Lower Swansea Valley since 1960.
- Find it so exciting that they can't wait to tell their friends about it as a 'must see' on the Swansea visitors' list

LEARNING OBJECTIVES

We want visitors to:

- Understand the site's buildings and structures, and how they connected with one another to form an integrated industrial complex.
- Understand the historic relationship between the site and the communities that grew up around it.
- Understand the story of industrial Swansea and the role the site played in far-reaching processes of economic change.
- Understand how the copper industry shaped the economic, social, cultural, and physical contours of modern Swansea.
- Appreciate the extent to which industrial success was built upon the labour, skills, and energy of working people: men, women, and children.
- Realise that the advance of industry came at a very significant cost in terms of pollution and the poisoning of people, animals, and the soil.
- Understand that harsh conditions gave rise to protest and conflict.

- Understand how the landscape and waterscape has changed and developed since the site was established and read the clues in the surviving buildings, features, spaces, and vegetation.
- Make the links between this site and other historic sites in the region and the wider world.
- Understand that the site once lay at the heart of the most densely industrialised part of the United Kingdom, and that the copper industry forged Wales's first industrial connections with the wider world.

BEHAVIOURAL OBJECTIVES

We want visitors to:

- Respect the site because of its importance.
- Feel that the site belongs to them and the community.
- Feel driven to find out more about it and its historic links.
- Participate in events and activities.
- Engage creatively with the site.
- Visit other sites in the area/across Wales as a result of their experience.

8.3 How will these objectives be achieved?

In order to achieve these objectives, the interpretation will be focused on the 'stories' centred on the generic themes and sub-themes identified above, made site-specific, and then represented in different forms of media at the most appropriate location on the site.

In addition, and so that people will better understand what they are looking at, the interpretation will include visual representations of the historic site and its buildings supported with explanatory information, with way markers indicating connections between different parts of the site.

9. Media and Locations of media

9.1 What different media will be used?

The interpretation will utilise several different media, which will be linked by a site branding style and logo which has emerged through the life of the project. Stories and basic information will be reinforced by artwork and images to create a striking visual representation of the site during different stages of its life-cycle.

Site information will be conveyed through:

- Contextual information about the significance of the site
- Stories about the people who worked on the site
- Historic details about specific buildings
- Images (photo's and maps)
- Visual artworks
- Poetry
- Statistics

In physical terms the interpretation information will be presented in the following formats

1. Large interpretation boards at the gateway which provide contextual information and an introduction to the site
2. Smaller boards beside key buildings and features that detail specific information. These will include a historical photograph of the building/feature.
3. Short audio stories based on one of 8 characters, 2 set within each character plinth.
4. Words, images, numbers and poetry engraved in brick work and paving on and around the entrance artwork and character plinths which contain information and evoke a sense of what the site was like.
5. A number of other interactive interpretation mechanisms have been proposed which will be incorporated into future phases, funding permitted.

The location of elements 2 and 3 is indicated on the map attached in appendix 2.

All of these elements will, as appropriate, contain follow-on links to other parts of the site and also to other linked heritage locations.

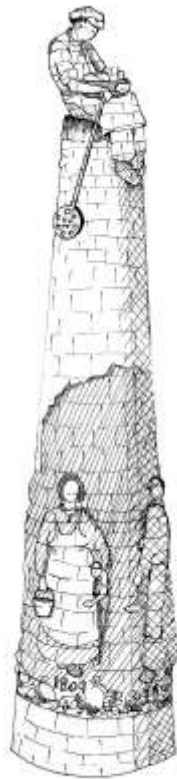
Supplementing the physical interpretation will be digital and web-based material accessed via QR codes and hand-held devices such as pico projectors.

9.2 How will artwork be used on the site?

The artwork (One voice, many lives) consists of three elements

1. Carved brick entrance feature including chimney and carved images of workers.
2. 4x Carved brick character points depicting characters who worked on the site.
3. Bespoke ornamental railings at the entrance to the site featuring the tools involved in copper production.

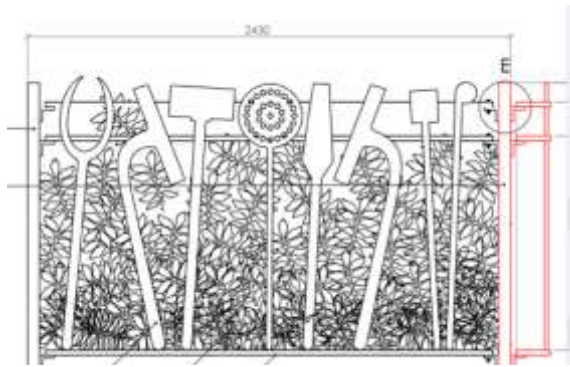
1.



2.



3.



A gateway art feature is an event and a declaration. It will 'announce' that the copperworks site is special and unique and by extension, that the area and communities are also special too. The gateway art feature will be placed in a hard landscaped context with interpretation panels a little distance behind. This signals to the viewer that an exploratory journey of understanding is possible and that they have arrived at the beginning.

The art works and interpretative points foreground the people of Hafod Copper works. Using characters from the history of the site to convey the many different lives that animated the copper works.

A powerful combination of sculpture and audio will realise the personal occupations and preoccupations of individuals to give both general and very particular insights to the life of the Copper works and its people, here and abroad.

The entrance artwork is designed to herald the site from a distance and to engage people in its details once they are close up. The design idea for the entrance artwork was initiated by community consultation with local children who consistently focused either on the two tall chimneys on site or the people who worked at the copper works or both. The Gateway Artwork could be created in carved brick. By rearticulating the

process and skills used to create the chimneys, entrance artworks can be created that emphasise the history of the area in a contemporary and unique way, to perfectly suit the site. Anything can be represented in brick. It can be effectively employed to create both form and detail. Almost any level of detail will read in the finished works. Vandalism is an issue in the area of Hafod and a low maintenance, robust work is essential. There is scope to reference other themes in the details of all brick designs. All works are intended to be striking, accessible on many different levels, inclusive, absolutely unique, high quality and durable.

9.2.1 Gateway Artwork

The sketch above (and in appendix 2 shows a work completely carved in brick. It is a complicated structure which gives a simple and cohesive appearance. It will look strong and permanent.

A chimney form is used as a plinth with which to mount an ordinary copper puddler. He is 'built in' to the copper works. There is no generic copper worker but his, cap, necktie; apron, rolled sleeves and waistcoat are instantly recognisable by local people. His lofty position gives him a heroic position but his aspect is weary and the tools of his trade are in hand. There is an opportunity to inlay copper into the basket he is holding.

The figure on top of the chimney will face the road and his 'back' will be made so as to ensure interest in the round.

Lower down on the 'chimney' are three or four high relief representations of characters with the tools of their trade represented in aspects suitable to their lives. This sketch shows a woman with her child and a bucket. There is carved writing and a date beneath her. All visual information will be taken from historical records. Below the characters feet are carvings of local flora and fauna, ingots of copper and some of the items that were made at Hafod Copper Works.

The column stands on three layers of engineering brick so the base will be blue in colour. The rest of the brick can be tinted to age it or to get a colour match with some of the brickwork on site. There is an opportunity to recycle some of the material from the site by embedding it into the structure. Some of the old bricks could be used in the structure, subject to a structural engineers agreement

Wind up interpretation can be embedded into the structure as can QR codes. Aspects from the entrance artwork will be made more particular at specific points around the site.

This work is envisioned to be 4.58 meters high. It will stand at 15" x 3.3" x 1.7". The artist will represent the figures in a simple contemporary manner and in high relief, as in the image in appendix .

9.2.2 Character points.

These are carefully chosen locations, which will describe and inform more about the heritage of the Copper works. They will present individual and specific characters in high relief in brick, in relative points around the site. Wind up audio interpretation boxes will be embedded in the brick so that the viewer who can have some experience of the physical stature and labour of a person will then be able to listen to the 'thoughts' of the sculptures; relayed 'talking heads' style via an engagement with

the audio. The audio is presented in two minutes spoken in the first person, which enables an immediate emotional connection to the character. This particular combination of the inside and outside of a character presented in audio and 3D in the relevant context is a powerful mix

This drawing shows how an interpretation panel might look. The character protrudes in high relief from a back panel, or wall of brick. The wind up audio is embedded at a height in the brick that allows access to anyone. The character is life size and either at work, or his / her occupations are described. There is the potential to carve words and information into the brick, which may describe the name of the person or the nature of their employment.

To be enjoyed individually the accumulative impression will populate the site with an impression of work, toil, sweat, tears, business, family life etc. Each panel is to be considered carefully with regard to character, profession, personal story and relevance to the site

9.2.3 Bespoke Railings

There are a number of artist-makers who could undertake converting this most mundane of features into something worthy of being looked at and genuinely part of the sites attractions. There are plenty of stretches of palisade fencing around which could use this treatment.

9.3 What Physical Interpretation features will be installed and where?

9.3.1 Interpretation hub including gateway artwork



1 Location Opposite and to the south of Landore Park and Ride Car Park	The entrance artwork will be accompanied by three or four large interpretation panels in a semi-circle around the new paved area and benches made from reused railway sleepers. This provides a main entry point to the site and represents a place where the first-time visitor is provided with a powerful visual interpretation of the site plus key information to facilitate site navigation and understanding.
Comment	This is the 'must see' element of the site – a new and unique photo opportunity.
Theme/sub theme	As far as possible touches on all themes and sub-themes
Interpretive elements	To include a large aerial photograph or image of the whole site in its prime, an image of the 1960's dereliction, timeline,
Features	Embedded QR code linking to the Hafod Copperworks animated film. A follow the story link to other key heritage sites in Swansea and Wales.

9.3.2. Building/feature specific interpretation boards

The following buildings/structures will have basic interpretation/signage indicating their function/purpose, date of construction and a photo of the building / structure in its heyday:

1. Swansea Canal: located at the Hafod entrance and bridge
2. Laboratory Building: location to be decided after consolidation works
3. Power House/Canteen Building: located at the entrance to south east corner
4. Vivian Engine House: located on paved area overlooking the building
5. Musgrave Engine House: located on the path down towards the river.
6. Vivian Locomotive Shed: located on north east corner
7. The Historic Quay: looking over to the White Rock site and out to sea
8. Rolling Mill (Swansea Museum Collection Centre) – location to be discussed with the SMCC.
9. Pier to former Waste Tip. – dependent on works to canal to make it accessible
10. Copper Slag Abutment - dependent on works to canal to make it accessible
11. The Lime Kiln (between lime kiln and road)
12. Chimney to the West of the Vivian Engine House. – to be added when access allows
13. Boundary Wall of the Hafod Copperworks. – to be added later
14. On the white rock site looking over the river at the Hafod Copperworks.

9.3.3. Character points/plinths (x4)

These will facilitate the telling of the stories that illustrate the key themes. Located at major junctions on the site they will be a combination of art features and aural interpretation. The stories will be based upon the historic texts found in Appendix One, with the locations as follows.

a. Quayside: Michael Faraday and the Cape Horner

Themes: People, Places, Connections

Sub-themes: Innovation and Exploitation; Ambition and success; landscape change

b. Junction to the north of Vivian Engine House: The engineman and the child worker

Themes: People, processes

Sub-themes: Innovation and exploitation;

c. Corner of the Power House: The manager; and the furnaceman (or ticketing man).

Themes: People, Processes and products

Sub themes: Innovation and exploitation

d. Original entrance to the Hafod works by canal bridge: Hafod Woman and the Foreman

Themes: People, processes and products.

Sub-themes: Social Reform; Community and identity.

An example of the style of the two minute story telling in audio.

“I am a man who survives the everyday of sweat and toil. A man forged by the heat of the metal I work. Shaped by the process of puddling and spatching, since I was a boy, nine years old. I see slag heaps and breathe black air so that I can put bread on my table. I drink gallons of water to deal with the fire on my brow. I go to chapel and pray my children will survive. I go to the pub to let my hair down. My father and his father and his father all did the same as I do and I am proud of that”

The stories will be read by a volunteer who is a member of the public. We will advertise these opportunities generally and specifically seek people who have some family or emotional connection with the particular story or character being told.

9.3.4. Interpretation Features engraved on and around character points

a. Historic ‘sound bites’:

- “Swansea is the nearest Coal Port to the Atlantic and has an advantage over Liverpool in being nearer the American continent by twelve hours; a saving of twenty-four hours per

voyage. It may fairly be described as the best in the Bristol Channel for Bunkering purposes”.

Location: River Corridor Interpretation Feature point.

- “The trade of the Port is not confined to Coals, as is largely the case in most of the other ports of the Bristol Channel, but is of a most varied description, and although in tonnage it is less than that of Cardiff, yet in value it is about equal to the trade of Cardiff, Barry and Penarth combined”.

Location: at the Interpreting Viewpoint.

- “Its (Swansea’s) Imports embrace Ores – Gold, Silver, Copper, Calamine, Pyrites, Iron, &. – Grain, Flour, Tin, Spelter, Pig Iron and Timber – Swan and Hewn and Pitwood: - whilst its Exports consist of Coal, patent Fuel, Tinplates, Corrugated Iron, machinery, Chemicals, and general merchandise”.

Location: ?

** Source: Visit to Swansea of the Incorporated Law Society of the United Kingdom, Swansea Harbour Trust, October 1st, 1898.*

Poetry; Location.

Poem: “Landore” (The Lower Swansea Valley Project)

by Graham Allen (1938 -) A Landore boy who went to the Universities of Wales and Cambridge. After teaching in Northumberland, he became a lecturer in English, first in Nottingham, and then at Coleg Harlech, where he was also Vice-Warden. On early retirement he returned to live in Swansea where he worked as a full-time writer. His first book of poetry was published in 1974.

*“This Journal says grass is growing there, and shrubs,
even trees now, over the old works’ smokey dereliction.*

*“The worst three miles of industrial blight
this country has to offer”*

Well, maybe.

*We slid on the tips, chased the horses
- they clattered back at night tipping the ash-cans
over our dreams.*

*But Saturdays I remember best, mid-day,
the men clocking off.*

*They’d pinch our ball, twinkle studs, steel-borings,
And weave hobnail passes up and down the street,
my father too.*

*Or from the gates come kicking a tin
in one headlong impermanent break-out.
(Monday, all the hooters of the works
Would lift like lariats).*

*Of course there was my message to deliver,
and I could see my father clearly – never felt so
close while still so far, everyone running,
but the game, their game, it held me off
even as it held him in,
always across from me where he could only be himself,
with flick and nod – showing the apprentices how! –
swaying clean away in circles of himself alone,
nothing to do with words I should have said,
so clear his living that I learnt my own;
between us then, clean,
a clean slate.
Their game stopped at the King's.
The men turned in.
Last night's stale hit us like a preacher's warning.*

*Waiting, my mother twisted silence on her needles
and went on waiting.
I hung about the house, an absence,
from room to room, bringing only an absence.*

*Have they found some way of growing
grass over that kind of thing?"*

From "a time, a place", published. 1999. Swansea Poetry Workshop.

Location: laid into paving / route that leads the eye to the chimney

Names of ports that Swansea traded with in 1898;

- Amsterdam, Brindisi, Bordeaux, Baltimore, Belfast, Corfu, Gibraltar, Glasgow, Hong Kong, Kobe, Lisbon, Naples, New York, Odessa, Oporto, Philadelphia, Penang, Trieste, Venice and Yokohama.

Location: To paving of entrance and randomly cut into the flooring finish of the entrance area near main.

Random statistics:

The capital of Vivian and Sons.
1810 £50,000
1813..... £84,000
1831..... £142,000
1868..... £800,000

1887.....	£1,200,000
1914.....	£650,000

Location: at former entrance to the Hafod Copperworks.

- Montreal is 2947 miles from Swansea.
- New York is 2993 miles from Swansea.
- Bombay is 6223 miles from Swansea.
- Adelaide is 10710 miles from Swansea.
- Lisbon is 873 miles from Swansea.
- Valparaiso is 7135 miles from Swansea.
- Santiago de Cuba is 4370 miles from Swansea.

Location: at points around the Hafod Copperworks site still to be agreed.

Graphics:

Location: to be scattered randomly across the site to facilitate thought and discovery at random. These could be as simple as small squares of stone with an etched graphic cut into them. A number exist taken from an 18th century map which show copperworks buildings in various forms and which make interesting graphic marks as well as being reminders of how another age saw them.

Location: Random.

9.3.5. Additional proposals

- a) A large directional map or graphic detailing the destinations from which copper ore was imported: Cornwall, Cuba, Chile, Australia.

Location: quayside.
Theme: Connections.

- b) A clocking-in mechanism at the entrance to the Powerhouse/Canteen which is where workers clocked in to the site.

- c) A reconstruction* of the actual Time Lodge as used in the inter-war period based on drawings and information as supplied by Mr. Ken Paddison who worked there.

* This could take the form of a physical reconstruction or a two-dimensional one

10. Evaluation

There is an obvious need to analyse continuously the success or otherwise of the planned interpretation. As such a number of evaluation tools should be used to assess usage and maximise feedback from the public. This feedback can then be used to ensure that future elements for the project are suited to the needs of the users.

The development of the Hafod-Morfa site is ongoing. The project aims to engage people from schools, history societies, local resident groups, ex-employees and more in developing the stories to be told at the site in future phases of the project. This will provide opportunities to collect feedback and make use of this to inform the developments on the site.

Proposed post-development evaluation tools:

- An invitation will be used on the boards for people to share their stories and information about the site by linking to digital media (flickr, website and facebook)
- We will offer an on line feedback and evaluation form and count web hits
- Visitor numbers – we will be counting visitor numbers through visitor counters installed on the site.
- Link in to existing on-going visitor surveys (Capital Region Tourism/Visit Wales etc.)
- We would like to develop a youth focus group as part of the friends group.
- Feedback forms will be provided at open days/events which will be incentivised with prizes.

11. Summary and recommendations

This Interpretation plan recommends an approach to interpretation which will be capable of highlighting the importance of the site locally, nationally (within the context of Wales' history) and globally and bringing to life some of the personal stories of the people who either worked in the site or supported the people who worked there.

The combination of artwork and different interpretation media will achieve the emotional learning and behavioural objectives and engage people fully in the site's many stories and will be appropriate for the audiences identified.

The plan needs formal approval before detailed work can take place to:

- Draft the text and visual material for the interpretation boards, informed by the interpretation themes identified in this document.
- Develop detailed design plans for each of the locations for artwork/interpretation
- Identify links to other sites and stories through the follow the story feature
- Make use of digital links to images, video and more

Meaningful community engagement is key to this project so members of the public will be given opportunities to input to the development and implementation of art and interpretation on the site.

This plan identifies some elements which cannot be funded at the present time. Work on the site will continue beyond this first phase of the project and more of the site will be opened up as more funds will be developed. This will provide the opportunity to install more building/feature specific interpretation boards and more character points and consider more of the interactive features suggested in the point 5 of the interpretation features.

As indicated, work is ongoing to explore the use of digital interpretation on the site and a digital interpretation plan will need to be developed in time.

12. Appendices

Appendix 1: Sample Stories:

The foremen, Hafod Copper Works (1841)

John Thomas, aged 59, and George Hughes, aged 46, foremen at the Hafod Copperworks. John Thomas had been working in the works for 26 years and George Hughes has been there for about five years.

'We look after the boys and girls that are labouring about the works. We put them to work and keep their time. We have in all about 130 boys and girls under 18. There are about 60 boys and 70 girls, about one half of them under 13.

The hardest work to which the boys are put is working 'the calciners' [types of furnace]. They are mostly worked by boys from 13 to 16 years old. Their turn continues for 24 hours and they are obliged to tend the furnaces every two hours. They can sleep for an hour, perhaps two or three times in the night. They work six turns or 'watches' one week and eight the other and get 2s. 6d. [12 ½ p] for each double watch of 24 hours.

The youngest boys and girls are employed to wheel the coal and ashes for the furnaces which are worked by their fathers and most of the children employed are the children of the workmen or those who have worked here. We do not consider the children are overworked here but we don't think it is a fit place for girls to work as it unfits them for all other work.

The characters of the men and their wives are generally improvident. The men are rather fond of drink and the women are bad managers. The colliers appear to save more money than the copper men although they do not get so much. The copper men must, however, from the nature of their work at the fires, live better, and they wear out more clothes, particularly shoes. They mostly wear flannel shirts and wear out four in the years when two will serve to colliers.

Source: *Children's Employment Commission* (1842)

Author ID: Professor Huw Bowen

The child-worker: James Jones, aged 12, Morfa Copperworks, 1841

'I work in the rolling mills. I put the copper sheets into the furnace to dry and when the man takes them out and cools them in water I put them up in a pile. There is another boy working at the same furnace. The work is not very hot. The furnace door is down when the sheets are drying.

The work is not hard and the boys do it very well but they are sometimes obliged to be busy. I have been working three years. I work from six to six every day and at

night every other night. I have meal times. I have lost very little time from sickness and have met with no accident. I work inside the mills. I get 5s 6d [27 ½ p] per week under the foremen. My father kept school at Morryston and had about 50 boys in it. He is dead. I can read Welsh and English’.

Source: *Children’s Employment Commission* (1842)

Author ID: Professor Huw Bowen

The Furnaceman (1850)

I saw two of the workmen at dinner at the fireplace of one of the calcining furnaces, and I questioned them. One was a robust and healthy looking young man, who had been only a few months in the works; the other looked spare and sallow, was married, and his wife and daughter, clean and well dressed, were waiting whilst he made his dinner...They were dressed (as nearly all the labouring men dress here whilst in their work) in white canvas trousers, a blue woollen shirt and checked neckerchief. They had each a handkerchief bound round the head in lieu of cap or hat. The strongest and youngest of them said:

‘I am nineteen years of age and I earn, as a calciner-man, 13 shillings a week. I am on duty twenty-four hours together; but I sleep here before the fire, from twelve at night till two in the morning. I come on at six in the morning; we then wheel ore from the bottom of the furnace to the receiving house, “turning by”; this takes us from six till eleven o’clock. Every two hours we are called by the watchman to stir the calciner, which takes a quarter of an hour. At ten at night we are called to “pull out”; this takes one hour and “recharging” takes one hour; it is then twelve at night. The watchman then calls us to stir at two, at four and at six o’clock, when the twenty-four hours are up. I then go home and am off duty twenty four hours; but in the meanwhile I can work at unloading vessels by which I earn sometimes four shillings in the course of twelve hours.’

Source: Letters of the *Morning Chronicle* correspondent in South Wales. They were published as part of a series in the *Morning Chronicle* newspaper between March and April 1850.

Author ID: Dr Louise Miskell

The Manager: Mr Pooley, Morfa Works

‘I have now been for thirty years an agent of the mines and smelting works, having from 25 to 1,000 men under my care during the whole of that time... We have made no reduction of wages here for the past six years. I never hear the slightest complaint as to their wages, or any expression of discontent on other subjects.

We have here no ‘truck’ but pay the men every Friday afternoon between two and three o’clock, so that their wives may go with cash in their hands to market on the Saturday.

A few of the men, and only a few, lose the Monday sometimes in drinking. They are mostly furnace-men who are thus intemperate; but we suffer no inconvenience by it, for there are always some 'hangers on' waiting an opening for steady employment, whom we put in the places of such as are absent until they return to their duty. As vacancies occur these hangers on are taken in as regular workmen.

The health of the men as a whole stands good. Drinking variously affects different classes of the workmen – for instance, refiners can bear almost any quantity of beer, they perspire so copiously at the furnaces. They drink beer chiefly – they rarely touch spirits.'

Source: Letters of the *Morning Chronicle* correspondent in South Wales. They were published as part of a series in the *Morning Chronicle* newspaper between March and April 1850.

Author ID: Dr Louise Miskell

The Scientist: Michael Faraday

'I found Mr Vivian's copper works out of the town, up the river; and during the walk there met Mr Morgan, the Agent who showed me the place and the processes.

A large quay intervenes between the river and the works, and close to it are the yards and warehouses for the ore. In several of them the ore was lying in large quantities. It comes from Cornwall and contains not more than 8 per cent of copper.

In one place the men were weighing it in trays and carrying it to the furnaces. The furnaces are placed in the interior of the building. They are large reverberatories, resembling high baker's ovens with an immense fire at one end and the flue at the other. Between four and five ton of ore is a charge for one of these furnaces. Here it is roasted for between 36 and 48 hours, being occasionally stirred with a rake' that all parts may be exposed to the fire.

Much sulphur and arsenic is separated, occasioning principally the immense volume of smoke which ascends up the vale.'

Source: *Faraday's Tour in Wales* (July 1819)

Author ID: Dr Louise Miskell

Hafod woman

'Look at me. One person, many lives

I started working in the copper works wheeling coal and ashes when I was 10. I went to school sometimes, unless I was needed at home. I was brought up speaking Welsh and I made my own clothes, I couldn't afford to be sick and I married a smelter from the next street.

Look at me. I look older than your mother, thinner than your wife, more careworn than your sister, and harder than your daughter. I always eat after my husband and children, I don't see the doctor and I always struggle to get back to normal after

childbirth. Some of my children didn't live to see their fifth birthday. I go to chapel and my neighbours are my friends. I care about keeping the range hot, my family fed, the house clean and the rent paid.

Look at me. My reflection shows a child, a young girl, a wife and mother, and if God spares me, an old woman looked after by my girls, if not I might end my days in the workhouse.

Happy? I've no time for happy. Look at me. I am everywhere in the Hafod and nowhere in the history books.'

Source: composite

Author ID: Ms Lesley Hulonce

The Cape Horner – Captain David Morgan (1836-1930)

'Briefly stated I went to sea in 1851. My father allowed me to go thinking that one voyage would satisfy all my inclinations to a nautical life. But his hopes were in vain, for I was apprenticed during the following year 1852, at the age of 16.

I obtained my Master's Certificate in 1864. The next thirty years were spent in long voyages round Cape Horn, altogether making 33 voyages, and crossing that dangerous Cape 66 times. I carried copper, nitrates, guano, hides, etc.

To give you some idea of the faith we sea-faring men have in our calculations as to latitude and longitude, I have started from Valparaiso [in Chile], sailed round the Cape, up the South Atlantic, through the North Atlantic, through the North Atlantic and not sighted land during the whole of that voyage until I reached Swansea Bay, a distance of between 7000 and 8000 miles.

The calculations are made by means of the sextant for gauging the sun's altitude; the chronometer, a sea-watch which keeps wonderful time; sometimes the stars; a chart of course with which to localise the position of the ship when the latitude and longitude are found.

For twelve months at a time I never saw my wife and children, and my visits home were often of very short durations.'

Source: Joanna Greenlaw, *The Swansea Copper Barques & Cape Horners* (1999), pp. 137-9.

Author ID: Professor Huw Bowen

The Engine House Man

The Engine House is near the Hafod Copper Mills its purpose was to drive the mills. This was done by a large wheel connected to the main engine by a number of ropes which were driving belts. The engine was a "Musgrave". The big wheel was geared to drive the mill rolls my father as a boy (George Paddison) had a near fatal accident on this wheel in 1916.

It was a game played by the boys at work to sit on the ropes at the lowest point to ride few feet on them and then jump off.

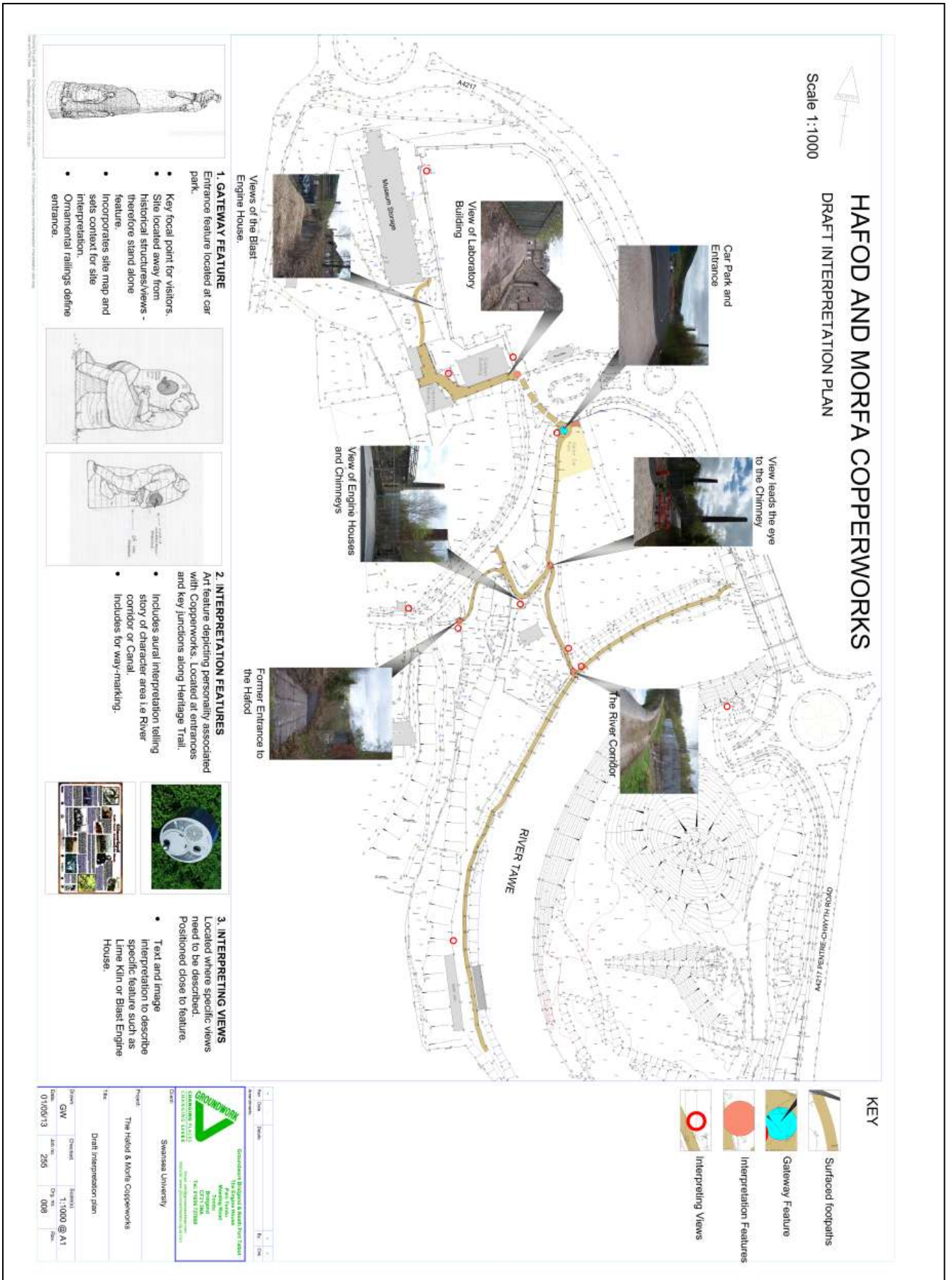
My father failed to jump off the ropes and was taken over the wheel and down into the pit, he was picked up thought to be dead wrapped in sacking and taken to Swansea Hospital mortuary where he was found to be still alive. He was literally sewn together all down his left side.

He was given a job for life no compensation in those days he was given a job as a weigh bridge operator and then a gantry driver. He worked there for approx 4 years.

The remains of the engine house still remain but vandalised to a ruin.

Source: Ken Paddison (2007)
Author ID: Richard Porch

Appendix 2: Map of interpretation and art features.



Appendix 3: Gateway Artwork

Gateway Artwork

This sketch shows a work completely carved in brick. It is a complicated structure which gives a simple and cohesive appearance. It will look strong and permanent. A chimney form is used as a plinth with which to mount an ordinary copper puddler. He is 'built in' to the copper works. There is no generic copper worker but his, cap, necktie; apron, rolled sleeves and waistcoat are instantly recognisable by local people. His lofty position gives him a heroic position but his aspect is weary and the tools of his trade are in hand. There is an opportunity to inlay copper into the basket he is holding.

The figure on top of the chimney will face the road and his 'back' will be made so as to ensure interest in the round. Lower down on the 'chimney' are three or four high relief representations of characters with the tools of their trade represented in aspects suitable to their lives. This sketch shows a woman with her child and a bucket. There is carved writing and a date beneath her. All visual information will be taken from historical records. Below the characters feet are carvings of local flora and fauna, ingots of copper and some of the items that were made at Hafod Copper Works.

The column stands on three layers of engineering brick so the base will be blue in colour. The rest of the brick can be tinted to age it or to get a colour match with some of the brickwork on site. There is an opportunity to recycle some of the material from the site by embedding it into the structure. Some of the old bricks could be used in the structure, subject to a structural engineers agreement. Wind up interpretation can be embedded into the structure as can QR codes.

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