# Understanding corrugated iron buildings in north west Wales



Beach Huts at Abersoch (Author 2011)

University of Birmingham The Ironbridge Institute MA Historic Environment Conservation Dissertation: 09 20346 Student ID Number: 1062396 November 2011 Tutor: Harriet Devlin Academic Year of Enrolment: 2009-10

## Contents

List of plates	iii
List of figures	v
Introduction	vi
Aims	vii
Methodology	viii
Limitations	X
Acknowledgements	x
1.0 Historic background	1
1.1 Origins of corrugated iron	1
1.2 Uses of corrugated iron	3
1.3 Development of corrugated iron	5
2.0 Characterising the resource	14
2.1 Regional context	14
2.2 Data analysis	14
2.2.1 Agricultural buildings	16
2.2.2 Industrial and maritime structures	20
2.2.3 Military structures	25
2.2.4 Leisure development	
2.2.5 Religious buildings and other meeting places	33
2.2.6 Commercial buildings	
2.2.7 Residential / domestic buildings	
3.0 Conservation	42
3.1 Perception	
3.2 Redevelopment and reuse	
3.3 Maintenance	51
3.4 Condition	55
4.0 Conclusions - defining significance	57
4 1 Designation	

4.2 Managing change	61
4.3 Recommendations	64
5.0 Appendices	67
5.1 Appendix 1 Survey data	67
5.2 Appendix 2 On-site recording form	140
5.3 Appendix 3 Extracts from Hill & Smith Ltd sales catalogue	142
5.4 Appendix 4 Categories of importance	145
5.5 Appendix 5 Welsh Office Circular 61/96 Annex C	146
5.6 Appendix 6 Listed building description	148
5.7 Appendix 7 Example information leaflet- INFORM	149
6.0 Bibliography	151
6.1 Primary Sources	151
6.2 Secondary Sources	151
6.3 Websites	154

## List of plates

Frontispiece – Beach Huts at Abersoch (Author 2011)
Plate 1 – Prince Albert's Ballroom, Balmoral (Thomson 2011)
Plate 2 – Construction of a Nissen Hut (www.nissens .co.uk)11-12
Plate 3 – Agricultural complex near Eglwysbach, Conwy (Author 2011)16
Plate 4 – Hill & Smith hay shed, Hendre Wen Farm, Conwy (Author 2011)17
Plate 5 – Hill & Smith type 700 shed (Hill & Smith Ltd Sales Cat. n.d.)
Plate 6 – W H Smith & Co hay shed, Henblas nr Eglwysbach, Conwy (Author 2011)19
Plate 7 – Llechwedd Slate Mill, Blaenau Ffestiniog (R. Evans 2011)20
Plate 8 – Llechwedd Slate Mill gable elevation (R. Evans 2011)21
Plate 9 – Gweithdy Welsh Highland Railway, Minffordd (Author 2011)22
Plate 10 – Fishermen's sheds at Gallow's Point, Beaumaris (Author 2011)24
Plate 11 – Abersoch boat workshop (Author 2011)24
Plate 12 – Airship hangar RNAS Mona, Anglesey 1917 (Fleet Air Arm archive)25
Plate 13 – Type B1 & T2 hangars, Saunder's Roe, Beaumaris (Jones 2008)26
Plate 14 – Remains of Bron Aber Camp (Author 2011)27
Plate 15 – Bron Aber Camp / 'Tin Town' 1916 (K. O'Brien archive)27
Plate 16 – Bron Aber during the 1940s (K. O'Brien archive)
Plate 17 – Nissen Hut reused as garden shed, Llangaffo (Anglesey Council 2008)28
Plate 18 – Corrugated hangars at Griffith's Crossing, Caernarfon (Author 2011)29
Plate 19 – Postcard of the Roller Rink, Butlins, Pwllheli (www.butlinsmemories.com)30
Plate 20 – Early 20 <sup>th</sup> century postcard, beach huts, Abersoch (Gwynedd Archive)31
Plate 21 – Beach huts at Abersoch (Author 2011)
Plate 22 – Bangor City Football Club (Author 2011)
Plate 23 – Arenig Chapel (Author 2011)
Plate 24 – Llanfairfechan English Wesleyan Methodist Chapel (Author 2011)34
Plate 25 – Canadian & Scandinavian sheeting (Wolverhampton Corrugated Iron Co.)34
Plate 26 – Mission Room, Ganllwyd (Author 2011)
Plate 27 – Christ Church, Corris Uchaf (Author 2011)

Plate 28 – Women's Institute, Llanfairpwllgwyngwll (Author 2011)
Plate 29 – Jettied workshop, Blaenau Ffestiniog (Author 2011)
Plate 30 – Grosvenor Garage, Menai Bridge, Anglesey (Author 2011)
Plate 31 – Maelgwyn Pub, Llandudno Junction (Author 2011)
Plate 32 – Inter-war domestic dwelling, Trefor (Author 2011)
Plate 33 – Corrugated cottage, Dolbenmaen (Author 2011)
Plate 34 – Inter-war prefabricated cottage, Pontllyfni (Author 2011)40
Plate 35 – Minafon / Post office, Pont Llangwnadl (Author 2011)41
Plate 36 – Penhesgyn Hall, Menai Bridge, Anglesey (Author 2011)45
Plate 37 – Tuberculosis Units, Penhesgyn Hall (Author 2011)47
Plate 38 – Corrugated house at Llanrug (Author 2011)
Plate 39 – Mission Hall, Ganllwyd during conservation work in 2006 (National Trust)50
Plate 40 – Mission Hall Ganllwyd (Author 2011)
Plate 41 – Nant Gwynant Mission Room (Smith 2009)51
Plate 42 – Nant Gwynant Mission Room (Author 2011)
Plate 43 – Pump house at Penhesgyn Hall (Author 2011)
Plate 44 – Arenig Quarry Workers' Cottages (Google Streetview <i>circa</i> 2009)56
Plate 45 – Arenig Quarry Workers' Cottages (Author 2011)

## List of figures

Figure 1 – The historic county of Gwynedd – Study area (Author 2011)viii
Figure 2 – Illustration Thomas Edington's Machinery 1844 (Herbert 1978, 38)2
Figure 3 – Illustration of corrugated sheets & profiles (Wolverhampton Corrugated Iron Company n.d.)
Figure 4 – King Eyambo's Iron Palace (Thomson 2011)7
Figure 5 – Prince Albert's Ballroom, Balmoral (Mournement & Holloway 2007)7
Figure 6 – Map showing distribution of corrugated iron buildings by theme15
Figure 7 – Ordnance Survey 1 <sup>st</sup> edition map 1889, Beaumaris extract23
Figure 8 – Map showing distribution of corrugated iron buildings by date57
Figure 9 – Table showing listed building data
Figure 10 – Extract from database showing category A sites
Figure 11 – Extract from database showing category B sites

## Introduction

Although some consideration is given to the historic uses of corrugated iron in Herbert's *Pioneers of Prefabrication* (1978), little research into the historic significance and conservation of the material has been published until the 21<sup>st</sup> century. Studies have been undertaken in Australia (Heritage Victoria 2001) and New Zealand (Thomson 2005) whilst the first UK based research produced with practitioners in mind was published by Historic Scotland in 2004 (Walker 2004) and focussed on materials conservation.

Mournement & Holloway's glossy publication (2007) examined corrugated iron in an international context as well as reviewing some of its more innovative uses in contemporary architecture. More recently, Ian Smith (2009) undertook a thematic review of *Tin Tabernacles*, whilst Shire Publications (Thomson 2011) produced the latest addition to the Shire Library which focussed on corrugated iron buildings earlier this year.

The recent interest in corrugated iron is in stark contrast to the poor public perception of the material. This is partly due to the utilitarian nature of corrugated iron and its image as a scrap product ubiquitously found recycled on suburban allotments or dumped in urban wastelands. The most familiar contemporary use of corrugated iron on modern industrial estates does not positively enhance the image of the material either; often indicative of poor quality construction where economic margins dictate the architectural agenda rather than thoughtful design. However, through the 19<sup>th</sup> and 20<sup>th</sup> centuries the historical uses of corrugated iron have been associated with a number of buildings of significant architectural merit and have allowed the material to enter the vernacular design vocabulary across much of the world.

There has been no national survey of corrugated buildings in England or Wales and few corrugated structures have any form of national or regional designation or protection. There is currently little data to help inform management and strategic decision making for local and national historic

environment bodies and the nature, character and distribution of historic corrugated iron buildings is currently unknown.

### Aims

This dissertation has been prepared for the Ironbridge Institute MA in Historic Environment Conservation. It has been produced to meet the academic requirements of the University of Birmingham.

The report aims to examine corrugated iron as a historic building material and develop an understanding of its character, significance and uses within the context of north-west Wales. The report will provide baseline quantitative and qualitative data to help inform future management and conservation decisions. The data will be deposited with the Regional Historic Environment Record (HER) and will therefore be in the public domain where the recommendations can be accessed and used by owners, occupiers and managers as well as builders, architects, local authority conservation staff, planners and other relevant decision makers. Extant sites referred to in the text will be incorporated into the HER (noted by the relevant Primary Reference Number (PRN) throughout the report).

The objectives of the report are:

- Record a representative sample of corrugated iron buildings and map their distribution
- Identify key sites for designation at national, regional or local level
- Highlight specific management and conservation issues
- Define criteria by which future assessments and designations can be made
- Provide a framework for future research

## Methodology

The study area was limited to north-west Wales, as defined by the historic county of Gwynedd, including Anglesey and the western part of Conwy (see Fig 1). The scope of the study included all buildings which are mostly or wholly constructed from corrugated iron and date to before the 1960s. The study does not include buildings of a small domestic nature such as garages or garden sheds, lean-tos or other attached outbuildings or extensions.



Figure 1 - The historic county of Gwynedd, North West Wales - Study area

Research was undertaken to explore the historical development and use of corrugated iron structures nationally and within a regional context. Themes were identified following a review of

the published sources and consultation with relevant local specialists in vernacular, industrial and military buildings.

Only a handful of corrugated iron buildings are recorded on the regional Historic Environment Record, held by the Gwynedd Archaeological Trust, or the National Monuments Record, held by the Royal Commission on the Ancient and Historical Monuments of Wales. This made it difficult to establish a methodology for a systematic survey.

The main arterial roads across Anglesey, Conwy and Gwynedd were initially surveyed to identify any sites visible from the highway. Additional areas of potential were later identified using *Google Streetview* and were subsequently visited. However, many of the most interesting sites were discovered using the local knowledge of the author or through chance conversations with owners and local residents.

The field recording methodology conformed with a level 1 survey as defined by English Heritage (English Heritage 2006) and was informed by the methods suggested by Walker (2004, see Appendix 2). Records included digital photography (Nikon D60 DSLR set to highest resolution) and a descriptive external survey, paying particular attention to architectural detailing and makers' labels. Internal recording was also undertaken where access was possible.

A desk-based map regression exercise was subsequently undertaken to attempt to determine approximate dating and further archival research was completed where required. Survey data (see Appendix 1 for survey) was entered onto an Access database using a data structure supplied by the regional Historic Environment Record in order to ensure compatibility with the record.

Resources from Cadw, The Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW), Bangor University Library, Gwynedd Archives, The University of Birmingham / Ironbridge Gorge Museums Trust library at The Ironbridge Institute and the regional Historic Environment Record for north-west Wales were used to produce this report.

## Limitations

There are many significant buildings that adjoin larger non-corrugated buildings which fall outside the remit of this study. The geographical scope of the survey was also limited with many upland and more remote areas not included.

Not all owners could be contacted and therefore very few interiors were surveyed and many buildings could only be photographed from the public highway.

## Acknowledgements

The author is particularly grateful to the owners and occupiers of all corrugated iron buildings included within this study. The author would like to thank Nina Steele and Robert Evans, Gwynedd Archaeological Trust; Tony Herbert, University of Birmingham and Keith O'Brien, Snowdonia National Park, for their help and suggestions. Information and advice was also received from Judith Alfrey, Cadw; Dafydd Gwyn, Govannon Consultancy; John G Roberts, Snowdonia National Park Archaeologist and Kathy Laws, National Trust Archaeologist.

## 1.0 Historic background

## **1.1 Origins of corrugated iron**

The use of metal cladding has been recognised through the archaeological record and evidence dating to the Bronze Age is thought to have been identified at some sites in the Eastern Mediterranean (Walker 2004). Buckling or corrugating sheet metal in order to add rigidity and strength is a fundamental concept that has equally been in use for many centuries.

The original technique for creating corrugated sheets of iron involved pressing indentations into hot wrought iron, however this was a slow process which limited the size of sheet to the dimensions of the press. Later techniques involved rolling machines that limited the length of sheet but not the width.

In 1829 Henry Robinson Palmer, Architect and Engineer to the London Dock Company, registered patent no. 5786 for 'indented or corrugated metallic sheets' to be used '...on the roofs and other parts of buildings (Mournement & Holloway 2007, 10). The material was developed primarily to facilitate the expansion of the London docks through the construction of large, single-span, self-supporting roofs that would allow low-cost, light-weight storage to be constructed quickly. The first such building, The Turpentine Shed at the London Docks, was built in 1830.

Richard Walker of Bermondsey, London is thought by some to have invented the technique and was certainly one of the pioneers developing and promoting it during the 1830s, owning premises marked on the 1829 Ordnance Survey Map of London as *Corrugated Iron Works* (Herbert 1978, 37). Iron was becoming a popular building material of the age with three types of iron roof being described in Loudon's Encyclopaedia 1836: 'the cast iron roof, as invented by Carter of Exeter; the Russian Roof, made from wrought-iron rafters and sheet iron plate; and the newly invented corrugated iron roof, without rafters of any kind' (Loudon's Encyclopaedia 1836, 205). The

benefits of these early iron roofs appear mainly to be in their speed of construction and the great spans now possible rather than the strength, cost or portability of the material. Fire resistance was also a key consideration in the promotion of the material, although where timber framing was used to support the iron sheets, this benefit was erroneous; such buildings were just as susceptible to fire as traditionally constructed building of the period (Herbert 1978).

Walker promoted other uses for corrugated iron including walls, doors and windows. He also saw the potential for the use of the material for complete 'portable houses' by 1832 (*ibid.*). However, the product required very regular painting and maintenance when exposed to adverse weather conditions and rapid changes in temperature which caused, warping, fracturing and rust.

The process of hot-dip galvanizing was not developed until 1837 when Craufurd took out a British patent whilst Sorel patented a similar technique in France. The process was not applied to corrugated iron until 1843 when Morewood and Rogers developed a zinc coated product resistant to corrosion and oxidation (*ibid.*). The product was further perfected in 1844 by Thomas Edington of the Phoenix Iron Works, Glasgow who created the first efficient cold process using a fluted rolling machine (Figure 2). The process then remained relatively unchanged into the modern era.



Figure 2 – Illustration of Thomas Edington's machinery for making corrugated iron, 1844 from *The Civil Engineer and Architect's Journal 1845* (from Herbert 1978, 38)

MA Historic Environment Conservation

## **1.2 Uses of corrugated iron**

Corrugated iron has historically been used for construction of such varied structures as lighthouses, windmills and even aircraft (Mournement & Holloway 2007, 115) but is most commonly found in use as a roofing material and is best suited to this purpose. Lightweight, wind resistant and efficient at shedding water and preventing ingress, it allows large spans of unsupported roof to be constructed, but cannot be used to provide structural support as it lacks compressive strength. Although it is sometimes used as a cladding material for walls and other elements it is normally supported by a timber frame or steel superstructure.

The portable nature of corrugated iron has allowed the material to be used for a diverse range of building types in any number of locations, environments and climates. It is the local vernacular building material in modern Reykjavik, Iceland, where its fireproof qualities are valued in a city built in the shadow of volcanoes, but it has also come to help define the sense of place of this and many other urban and rural environments across the world (*ibid*.).

Mournement & Holloway (2007) examine the historical use of corrugated iron as a material of the frontiers. The most significant factor in the export of corrugated iron buildings was that many of the parts of the world importing these buildings had undeveloped quarrying industries and limited building skills. They had no infrastructure, resources or time to devote to developing a construction industry, but had a need to accommodate a sudden influx of migrants. Corrugated iron buildings were sold as requiring little or no skill for assembly and being hard wearing enough to sustain no damage over long or arduous journeys (Thomson 2011).

The flat-packed qualities of early prefabricated corrugated iron buildings made them ideal for transportation by sea and by rail where the weight of the material was no real problem and large quantities of material could be moved in a single shipment. However, on arriving at the frontiers transportation became more of an issue. Whilst individual sheets can be easily transported by cart, truck or even on foot, in the most part, the quantity of material being transported along with the iron frames, cast-iron rainwater goods, internal timber cladding and the bricks required for chimneys and foundation platforms, meant that many buildings were less portable than might be envisaged. As a result the distribution of corrugated iron buildings is generally focussed on the coastal fringes of distant places (Smith 2004, 191).

In the UK many suppliers and distributors of corrugated iron buildings boasted in their sales catalogues that they would deliver and construct anywhere within 100 miles of a railway station (*ibid.*). Although corrugated iron remained to some extent a material synonymous with marginal places, it became increasingly widespread towards the end of the 19<sup>th</sup> and into the 20<sup>th</sup> centuries. Throughout this period the UK had well developed extraction and construction industries along with good national infrastructure. It can therefore be assumed that where corrugated iron is used in a UK context, it is not through necessity and can be an indicator of some other social, cultural, economic or political stimulus.

4

## **1.3 Development of corrugated iron**

### 1829 - 1860s

Having been specifically designed to aid the development and expansion of the London waterfront at the start in the 19<sup>th</sup> century, the beginnings of corrugated iron production involved a small number of specialised makers based in London being commissioned to produce industrial buildings within the capital and for the burgeoning railway industry (Mournement & Holloway 2007, 24). These makers were not iron foundries but were manufacturers with a background in engineering and carpentry who bought in wrought iron from elsewhere to produce made to measure structures (Herbert 1978).

As iron foundries in the industrial centres of the north and Midlands, particularly Glasgow, Liverpool, Norwich, Birmingham and the Black Country, began to enter the market during the late 1830s and early 1840s, a more diverse range of corrugated products began to be produced in a wide range of profiles, gauges and sizes (See Figure 3). Although this marked the beginnings of a material synonymous with prefabrication, mass production was not yet standard practice and most buildings remained tailor-made.

Understanding corrugated iron buildings in north west Wales



Figure 3 – Illustration of corrugated sheets and profiles (Wolverhampton Corrugated Iron Company sales catalogue n.d.)

Corrugated iron was seen at this time as an exciting, modern, progressive material and was used in the construction of several high status buildings of cutting-edge design. The most notable examples dating to this period are Laycock's iron palace for King Eyambo (Figure 4) illustrated in The Builder May 1843; the ballroom at Balmoral, Aberdeenshire (Figure 5) commissioned by Prince Albert in 1851 and produced by E T Bellhouse of the Eagle Foundry (Thomson 2011) and Isambard Kingdom Brunel's Paddington Station, London, in 1851.



Figure 4 – King Eyambo's Iron Palace (from Thomson 2011)



Figure 5 – Prince Albert's Ballroom, Balmoral, Aberdeenshire (from Mournement & Holloway 2007). Note the unusual blind arcading, decorative barge boards and ridge line.



#### Plate 1 – Prince Albert's Ballroom today (from Thomson 2011). Note the unusual 5' profile horizontal corrugated iron.

There was an enormous expansion of the iron industry during the 1850s (Aston & Bond 2000, 177) and the wholesale cost of the material reduced substantially through this period. Simultaneously an increase in demand from the new world resulted in speculators, particularly in the gold rush towns of the Transvaal, California and Victoria, constructing small settlements in remote areas, requiring dwellings, stables, shops, hospitals, churches and all other structures required to sustain a self-sufficient community. At the peak of demand, between 1853 and 1855, over 40,000 packages of corrugated iron were imported into Melbourne. Although a large building such as a church might fill as many as 60 packages (Walker 2004, vii), hundreds of buildings were erected across the southern territories of Australia during this decade.

8

### 1860s - 1890s

The rise in Methodism in the UK during the 1860s combined with a growth in urban populations led to an increased demand for chapels in Britain (Smith 2009). This need was met by the corrugated iron manufacturers who by this time were publishing sales catalogues with a wide variety of designs of chapel, tabernacle or mission room to suit the requirements and tastes of different denominations in different locations and environments. Although the first recorded corrugated iron church was built in 1855 and only a small number were produced between 1855 and 1860 (Mournement & Holloway 2007), over 1000 churches were consecrated in Britain between 1861 and 1870 (Smith 2009).

Increasing numbers of missionaries and settlers across the empire also required portable churches that could be transported to remote parts of Africa, India, South America and the Caribbean Islands. During the 1860s corrugated buildings were far more numerous in the colonies than they would have been on the British mainland, but by the 1890s corrugated iron buildings, mainly religious buildings, had become familiar land marks in most British counties.

Large scale industrial buildings were produced in greater numbers during this period, particularly in provincial towns where increasingly mechanised manufacturing industries grew in scale and productivity and required storage space for machinery and produce. These towns also saw the proliferation of iron bandstands and shelters as well as public arenas, football and cricket stadia, constructed with corrugated iron grandstands. As the railway network expanded (Aston & Bond 2000), provincial railway stations with corrugated canopies, roofs, walkways and bridges also became more numerous.

There are few surviving domestic buildings from this period within the UK. Although sales catalogues increasingly advertised 'off the peg' housing and emphasised the low cost nature and versatility of the buildings of this period, the market was primarily seen as an export one.

### 1890s - 1913

The growth in church construction continued exponentially until the outbreak of World War I (Smith 2009) whilst general emigration to Australia, New Zealand, Canada and North America also increased during this period. The construction of corrugated iron domestic buildings in the UK during the early 20<sup>th</sup> century remained unusual, although this period did see the development of several so-called *Tin Towns*. These were mainly associated with speculative developments in remote locations where temporary accommodation was required for workers. At Birchinlee in Derbyshire, streets of houses were constructed to house the 900 strong construction teams of the Howden and Derwent Dams. The development was dismantled once its original purpose had ended and was sold on to the War Office in 1914 for the construction of a nearby Prisoner of War camp (Thomson 2011).

Whilst the use of corrugated iron in an agricultural context was in its infancy during this period, mechanisation would lead to increased yields and increased storage requirements for both produce and machinery. The pace of change was interrupted by the outbreak of World War I, but was particularly rapid following the invention and development of tractors and combine harvesters in the first two decades of the 20<sup>th</sup> century.

Galvanized mild steel became commonplace during the last decade of the 19<sup>th</sup> century, eventually leading to it replacing corrugated wrought iron entirely at the start of the 20<sup>th</sup> century (Victoria Heritage 2001). Although sales catalogues from this and later periods illustrate a variety of profiles and gauges of corrugated sheet, the 3" (distance between the peak of one ridge and that of the adjacent ridge) profile became the standard from the start of the 20<sup>th</sup> century (Walker 2004) and most buildings that survive today retain this type of sheet.

## 1914 - 1946

Corrugated iron structures had first been adopted by the British military during the Crimean War when Isambard Kingdom Brunel designed a field hospital in 1855. However the material was little used in a military context in the latter half of the nineteenth century or during the Boer War. From the outbreak of World War I corrugated iron became used for some of the largest and most numerous prefabricated buildings to ever be constructed (Mournement & Holloway 2007). There are very few structures that survive from this period when aviation was in its infancy, despite the scale of some of the hangars designed to house entire squadrons of biplanes or even vast airships (Clarke 2008).

The use of corrugated iron in a military context was revolutionised by the invention of the Nissen Hut by Peter Norman Nissen in 1916. They were mass produced and designed to be constructed quickly, cheaply and by an unskilled work force. At least 100,000 were produced during The Great War (Francis 1996) but the principles of this design (utilising the natural strength of a curved sheet of corrugated iron) were replicated for munitions stores, larger hangar buildings and smaller shelters over the next three decades.



Understanding corrugated iron buildings in north west Wales



#### Plate 2 – Construction of a Nissen Hut (www.nissens.co.uk)

The use of corrugated metal sheets and prefabricated construction in a domestic context also became increasingly common during the two World Wars when cost and speed of construction were important factors, particularly in the aftermath of Luftwaffe bombing campaigns of 1941 and in response to the subsequent Housing (Temporary Accommodation) Act of 1944. The Act developed strategies to solve a post-war housing crisis and proposed the construction of at least 300000 homes during the two year period after The Act. Examples of post-war prefabricated housing estates could be found in every port town and city affected by the bombing campaigns, although very few survive today. Liverpool received 3500 temporary bungalows spread over 40 different sites, the largest of which had 1159 buildings (www.mersey-gateway.org).

The increased mechanisation of agricultural practice during this period meant that there was a greater need for buildings for the storage of equipment and machinery as well as increased yields

and harvests. A diverse range of agricultural buildings began to become available during the 1920s and 1930s as evidenced by the range of products available in sales catalogues of this period which produce everything from piggeries, cow houses and covered yards to granaries, hay / grain barns, garages, cart and cattle sheds (see appendix 3 for extract from sales catalogue).

### **1947 – 1960s**

The post war uses of corrugated iron are heavily influenced by war-time, military uses. Whether this involves the reuse of material from disused airfields, prisoner of war camps and military installations or the reuse of entire sites as holiday camps, caravan parks and campsites, the early part of this period saw a focus on leisure.

Prefabricated housing continued to be constructed in many towns and cities for years to come but corrugated iron went quickly out of fashion during this period and became synonymous with a military and industrial context. In the post war era the perception of corrugated iron as a building material was one embodying the negative associations of wartime deprivation and poverty.

In the latter half of the 20<sup>th</sup> century corrugated iron became less frequently used other than in an industrial context. Although it has suffered a gradual decline in use in the UK, its low cost, portable nature particularly in developing countries has made it a popular material elsewhere in the world.

## 2.0 Characterising the resource

## 2.1 Regional context

There are no known corrugated iron manufacturers in north-west Wales although many producers of wrought iron, for example DeWinton's of Caernarfon, could have had the capacity to produce the material. The nearest recorded producer historically was W H Smith & Co Ltd of Whitchurch although in the later 20<sup>th</sup> century a manufacturer based in Llanfairtalhaiarn, Conwy, was established.

Corrugated iron buildings are found in most environments across the region but their distribution is not even. They are mostly found in coastal areas and along main arterial roads and railway lines, probably indicating the transport mechanisms used to import the material. They are more prevalent in more rural environments, probably because development pressures have led to their removal for redevelopment of more urban areas. They also tend to be found in clusters, regardless of building type or ownership.

## **2.2 Data analysis**

The themes identified within this survey (see appendix 1 for survey data) are not exhaustive and have been defined to aid characterisation and an understanding of significance. By understanding what common attributes certain building types might share it becomes possible to understand what is special about them individually and as a group; what features are important, because they are typical and therefore indicative of the type; and what about them is significant, because it is different or unique.

Understanding corrugated iron buildings in north west Wales



#### Figure 6 – Map showing distribution of buildings by theme

The survey itself is not comprehensive and it is likely that many more building types will be identified as further survey is undertaken and more buildings identified. Specifically, this study has only identified one site, Penhesgyn Hall (PRN 33372), which is of an institutional character. In this study the site has been included within the domestic theme because it comprises a number of prefabricated domestic structures. However, elsewhere across the UK it is likely that corrugated hospitals, schools, libraries, museums and other such buildings will be identified and subsequent themes will then need to be categorised.

## 2.2.1 Agricultural buildings

Corrugated iron agricultural buildings were at their most popular during the first three decades of the 20<sup>th</sup> century. The survey data (Appendix 1) shows that this building type is by far the most numerous within the study area.

The distribution of the building type in north-west Wales appears to be focussed in the more arable landscapes of Anglesey and Conwy with fewer examples found in the upland landscapes of Gwynedd. Anglesey remains very much an agrarian economy and many of the farms with extant corrugated iron buildings have extended or replaced them with larger, modern agricultural sheds which fall outside the remit of this study as they normally date to the 1970s onwards.

The agricultural buildings examined in this study comprise exclusively hay and grain barns, either of pitched-roof design (generally a slightly earlier type found in more marginal areas) on a timber frame and constructed in an *ad hoc* way, or later examples of prefabricated, curved roof design on iron frames. They tend to survive in a well maintained state because their agricultural utility provides a variety of alternative uses for modern farming. However, this does mean that they are often extensively modified with numerous additions to meet the ever changing demands of agricultural practices.



Plate 3 – PRN 33322 Agricultural complex near Eglwysbach, Conwy (Author 2011)

Agricultural buildings are the only type of prefabricated buildings in this study to consistently retain makers' labels or badges to identify the manufacturer (see plate 4). There are two producers which dominate the region, Hill & Smith Ltd, Brierley Hill and W H Smith & Co Ltd, Whitchurch.



Plate 4 – PRN 33354 Hill & Smith Type 700 all steel Grain Shed, Hendre Wen Farm, Llandudno Junction (Author 2011). Retaining cast iron rain-water goods, pitch hole door and makers label.

The Hill & Smith catalogue identifies that all steel buildings are supplied to include one coat of oxide lead at the Works and one coat on-site when erected (Hill & Smith n.d). 'Red lead', or oxide of lead, is commonly used and considered one of the best preservatives for iron structures (Walker 2004), however many of the buildings that survive are painted red, black and dark green, as well as occasionally more modern examples painted a sky blue.



Plate 5 – Hill & Smith Type 700 all-steel hay shed under construction (Hill & Smith n.d.). Over 6000 of this type had been produced before World War II.

Hay barns were supplied in a variety of sizes from 18ft – 30ft in width and at a standard 16ft to eaves height. They were mainly 2-storey, 3 or 4 bay structures with iron frames and curved roofs supported on cast iron columns and trusses. They are often open sided on one or both sides and sometimes on one gable end.



Plate 6 – PRN 33353 W H Smith & Co hay barn at Henblas near Eglwysbach, Conwy (Author 2011)

Evidence of every size and type of hay barn can be found across north Wales. They are sometimes found in pairs but are generally single units. Early examples are rare and very few retain well preserved rainwater goods or embossed makers labels (as seen at Hendre Wen Farm plate 5), as opposed to the more modern printed variety (see Henblas example plate 6).

## **2.2.2 Industrial and maritime structures**

The nature of the extractive industries of North Wales means that many of the structures within the quarry context are built from the extracted material, normally slate or granite. Small stone shelters were erected quickly and cost-effectively throughout the 18<sup>th</sup> and 19<sup>th</sup> centuries. In such contexts, structures of a very temporary nature would be required, for example whilst a particular terrace is worked within a quarry or during a particular operation in the construction of a mine. Towards the end of the 19<sup>th</sup> century corrugated iron structures were recognised as being ideally suited to these purposes, being easily dismantled and moved elsewhere when a particular operation was complete.



Plate 7 – PRN 33363 Llechwedd Slate Mill, Blaenau Ffestiniog (R. Evans 2011)

In the first half of the 20<sup>th</sup> century increased mechanisation and a global demand for raw materials led to the need for ever-larger slate mills, crushing mills and other structures to process extracted stone. Many large-span structures were built at this time, particularly in the quarries around Dinorwic and Nantlle. They were generally prefabricated, iron-framed buildings of a massive scale. Normally pitch-roofed in design and either north-lit sheds or double-pile structures with roof lights (as at Llechwedd plates 7 & 8).



Plate 8 – PRN 33363 Llechwedd Slate Mill, Blaenau Ffestiniog (R. Evans 2011)

Many of these quarries became redundant during the latter part of the 20<sup>th</sup> century and, during the 1960s and 1970s, before the foundation of many industrial heritage groups, were subject to comprehensive salvage operations. The widespread removal of rails, tracks, fences and any other iron parts, such as corrugated iron roofs or entire buildings, was commonplace. As a result many of the industrial buildings made from corrugated iron and still extant today are those which have remained in use, as at Penrhyn and Llechwedd quarries, or those connected with associated infrastructure.

The railways were a logical place to utilise such buildings since much of the corrugated iron imported into the area would have been transported by rail, by sea, or a combination of the two.



Plate 9 – PRN 33350 Gweithdy early 20<sup>th</sup> century prefabricated corrugated workshop on the Welsh Highland Railway (Author 2011). The building was most likely brought into Porthmadog by sea and then up the railway to Minffordd.

These buildings are generally iron-framed prefabricated workshops and warehouses of a similar type to those found in the quarries, although on a much smaller scale.

Some of the earliest known surviving corrugated iron structures in the study area are those associated with the fishing industry, again probably due to ease of transport. The fishermen's huts

at Gallow's Point, Beaumaris, are an interesting group of buildings marked on the Ordnance Survey 1<sup>st</sup> edition map (1889) and situated on the outskirts of the town. Although their exact function is not known they were probably used for boat storage or repair, rather than any more specialised activity.



Figure 7 – Ordnance Survey 1<sup>st</sup> Edition Map 1889. Extract of Gallow's Point, south-west of Beaumaris, Anglesey



Plate 10 – PRN 33346 The 19<sup>th</sup> century fishermen's huts at Gallow's Point, Beaumaris (Author 2011) have remained in constant use throughout their history

The buildings are all constructed from heavy-gauge, small sheets of corrugated iron which is indicative of their early date. They are timber framed and though clearly similar to one another in style, are not prefabricated structures.

Later maritime structures are of a more prefabricated nature and generally on a larger scale as can be seen at the inter-war boat building workshop at Abersoch (plate 11).



Plate 11 – PRN 33317 Abersoch Boat Workshop

## **2.2.3 Military structures**

The strategic significance of north-west Wales in both World War I & II was through its relationship with the Irish Sea (Clarke 2008) where the threat of attack from submarines, during World War I, and a German – Irish alliance, during World War II, was regarded as a potential reality. As a result the Royal Naval Air Service created 1 of the UK's 13 airship bases on Anglesey in 1915. The military went on to build 11 airfields and numerous camps and ranges across north-west Wales during World War II (Jones 2008).



Plate 12 - The airship hangar at RNAS Llangefni, later to become RAF Mona, Anglesey was home to the largest corrugated iron building ever constructed in this area (Fleet Air Arm records).

All of Wales' airfields, camps and ranges are being investigated through a programme of survey grant aided by Cadw over the next 2 years. However, most corrugated iron buildings from such sites have already been removed, reused or salvaged.

Some of the airfields which have remained in use as military establishments, such as RAF Valley and RAF Llanbedr, retain many corrugated hangars, mainly dating to the 1940s and 1950s. These
are of four main types: Bellman Hangars, T1, T2 and B2 Hangars (Francis 1996). They are all large, iron-framed prefabricated structures designed primarily for aircraft storage but versatile enough to adapt to many different uses.



Plate 13 – PRN 33375 Type B1 (centre left) and Type T2 (right) Hangars at Saunders Roe, Beaumaris (Jones 2008)

The Flying Boat Station at Saunders Roe, Beaumaris (plate 13) has been used as an industrial estate since the 1960s and as such is the only non-military site to retain substantial corrugated iron structures of this type.

However, many of the smaller corrugated iron storage units, support buildings, accommodation blocks and technical sites have been cleared or salvaged even from well preserved sites. Where such buildings do survive they are often constructed from materials that fall outside the remit of this study for examples timber cladding, brick, concrete and asbestos or only had corrugated roofs.

The camps of North Wales have frequently been reused in the post-war period as holiday parks, caravan and camping sites (see 2.2.4 below). Kingsbridge Caravan Park, Beaumaris reuses a World War I camp whilst the ranges at Bron Aber, Trawsfynydd have been reused as a holiday park. Neither of these sites retains any corrugated buildings as only the concrete foundation bases survive.

Understanding corrugated iron buildings in north west Wales



#### Plate 14 – PRN 33339 Remains of the Bron Aber camp today (Author 2011)

Bron Aber village does however retain some evidence of the former use of the site. A cluster of buildings survive at the junction with the A470, at least two of which are survivors from the road widening that took place here that cleared away Bron Aber's 'Tin Town'.



Plate 15 – Bron Aber camp, 'Tin Town' 1916 (Keith O'Brien)

MA Historic Environment Conservation



#### Plate 16 – Bron Aber during the 1940s (Keith O'Brien)

The most familiar and iconic prefabricated military building is the Nissen hut (Mournement & Holloway 2007). Many of these survive within the study area although they are generally difficult to identify and record as they are normally located in back gardens and on private land.



Plate 17 – Nissen Hut (demolished 2008) reused as garden shed, Llangaffo, Ynys Môn (Anglesey Council)

MA Historic Environment Conservation

Numerous standardised corrugated structures were developed between 1916 and 1945 and of a similar design to the Nissen Hut are generally of a different scale and construction indicating a more significant military purpose. The interesting group at Griffith's Crossing, Caernarfon is thought to have been used for fuel storage for nearby Llandwrog Airfield.



Plate 18 – PRN 33348 One of a large group of corrugated huts and hangars at Griffith's Crossing, Caernarfon (Author 2011)

# 2.2.4 Leisure development

Possibly the most well known leisure site in North Wales is the Butlin's Holiday Camp at Pwllheli. Billy Butlin developed the site on behalf of the Ministry of Defence during the 1940s as HMS Glendower and took on the camp as a holiday park following its decommissioning. The site comprised almost entirely corrugated huts during the 1950s but they have since been cleared by regular programmes of redevelopment.



Plate 19 – Postcard of the Roller Rink former HMS Glendower, Pwllheli was reused as Butlin's Holiday Park from the 1960s onwards

The perception of corrugated iron as a material associated with the beach, holidays or leisure activities is common amongst an older-generation of holiday-makers (Mournement & Holloway 2007, 8). The material is commonly used for beach huts which are often simple prefabricated sheds, however the group of corrugated beach huts at Abersoch (plates 20 & 21) are an unusual mixture of types and designs that form a significant aesthetic.

Understanding corrugated iron buildings in north west Wales



Plate 20 – Early 20<sup>th</sup> century postcard of Abersoch beach (Gwynedd Archives)



Plate 21 – PRN 33332 Abersoch beach huts, similar view 2011 (Author 2011)

Understanding corrugated iron buildings in north west Wales



Plate 22 – PRN 33330 Bangor City Football Club – Stands and entrance dating to the 1920s (Author 2011)

Bangor city football club was developed in the 1920s and retains corrugated iron grandstands. The site is proposed for demolition to make way for a new supermarket development.

# **2.2.5 Religious buildings and other meeting places**

Tin Tabernacles are the most well known but the least numerous of all of the building types in this study. This number is surprisingly low given the large number of non-Conformist chapels in the area, however a review of historic maps shows that numerous buildings marked *Capel Sinc (Zinc Chapel)* have been demolished in the latter half of the 20<sup>th</sup> century. Only 4 corrugated churches have been identified in the study area and only a small number of meeting rooms, public halls or other community spaces.



Plate 23 – PRN 33326 The corrugated church in Arenig was recently converted to holiday accommodation (Author 2011)

A decline in church congregations has lead to the conversion, demolition and closure of many churches and of those corrugated examples that survive only the church in Llanfairfechan retains its religious function.



Plate 24 – PRN 33361 Llanfairfechan English Wesleyan Methodist Chapel (Author 2011)

These buildings are almost always prefabricated structures of a gable-entry type. They are generally located on small roadside plots close to communities but with little space around the church because the land was often gifted to the congregation (Smith 2009). There is some variation in size because these structures were sold by the bay and erected by the local community, consequently they often reflect the demographic that attended the church when in use.



Plate 25 - Canadian and Scandinavian profile sheeting (Wolverhampton Corrugated Iron Company)

They employ certain standardised architectural details. The use of Canadian or Scandinavian profile sheeting on corrugated church roofs is synonymous with this building type (plate 25).



Plate 26 – PRN 33370 Ganllwyd Mission Room, Dolgellau (Author 2011)

The churches are generally architecturally understated with little ornament or detail. Any decoration is normally focussed on windows, doorways and sometimes ironwork along roof ridges or on barge boards. It is usually of a gothic style.



Plate 27 – PRN 33342 Corrugated prefabricated church in Corris Uchaf possibly dates to the 1870s (Author 2011) and is the earliest surviving example in the study area possibly the work of Isaac Dixon, Liverpool as it is stylistically similar to comparable examples (see Thomson 2011).

A period of rapid growth in the Methodist movement in Wales led to the construction of large numbers of chapels between the 1860s and the start of the First World War (Haslam, Orbach & Voelcker 2009). The only building in the area that potentially dates to this period is Christ Church in Corris Uchaf (see plate 27) which can be identified on the 1889 Ordnance Survey 1<sup>st</sup> Edition Map. This early type is also unusual for its decorative detailing and retention of original fixtures and fittings.



Plate 28 – PRN 33384 The Women's Institute building at Llanfairpwllgwyngwll – a secular meeting place (Author 2011)

The 20<sup>th</sup> century also saw the foundation of charities, groups and societies. With declining congregations came an increase in the number of more secular institutions, village halls, reading rooms and recreation rooms. The use of corrugated iron buildings to meet the needs of such meeting places was common as they were cheap to purchase and easy to erect.

# **2.2.6 Commercial**

There are numerous light industrial buildings of a commercial nature across north-west Wales and such buildings have consequently been considered as a separate theme. These buildings are defined by their roadside position allowing them to provide services or to produce and market goods. They are generally of a light industrial nature, such as workshops and garages.



Plate 29 – PRN 33335 Jettied commercial workshop, Blaenau Ffestiniog (Author 2011)

Two of the best examples of a light industrial nature are the oxide lead workshops in Blaenau Ffestiniog (plate 29) and in Trawsfynydd (PRN 33379 – see Appendix 1). Both of these buildings are unusually over two storeys and are not prefabricated. The workshop in Blaenau is also jettied.

Most of these buildings developed during the early part of the 20<sup>th</sup> century as motorised transport expanded and arterial roads took on a greater importance. Relict examples of single-storey pitched roof garages and filling stations can be found in most villages and towns on the main tourist routes

across North Wales. A small number remain in use as garages and one of the best prefabricated examples survives in Menai Bridge, Anglesey (see below plate 30).



Plate 30 – PRN 33349 Grosvenor Garage, Menai Bridge, Anglesey (Author 2011)

Other more unusual prefabricated commercial structures include pubs and clubs. This brutalist example at Llandudno Junction dates to the 1950s (see below plate 31).



Plate 31 – PRN 33366 Maelgwyn Public House, Llandudno Junction (Author 2011)

# 2.2.7 Residential / domestic buildings



Plate 32 – PRN 33380 Inter-war detached dwelling house at Trefor (Author 2011)

Domestic corrugated iron buildings are not common within the study area. Their distribution is focussed mainly on the coastal fringe of western Gwynedd and along the Llŷn Peninsula. This is thought to be a reflection of their origin as seasonal holiday accommodation, but it may also demonstrate that the marginal parts of the county have not been subject to the same development pressures and clearance of buildings of this type as those areas further east.

The buildings are almost entirely detached single-storey, pitched-roof structures dating to the early part of the 20<sup>th</sup> century. Examples dating to before 1914 are very rare and none have been identified in the survey.



Plate 33 – PRN 33356 Early 20<sup>th</sup> century corrugated cottage Dolbenmaen, Porthmadog (Author 2011)

The buildings are small in scale and are a mixture of both prefabricated and a more vernacular style of construction employing reused materials. All examples are of timber frame construction with timber internal partitions, tongue and groove internal wall cladding and brick built chimneys. Chimneys, and internal fixtures and fittings were rarely included with prefabricated buildings (Thomason 2011).



Plate 34 – PRN 33357 Inter-War prefabricated corrugated dwelling, Pontllyfni (Author 2011)

They rarely retain their original rainwater goods, windows or doors but where timber sliding sash or metal casement windows do survive they should be considered an integral element of the historic character of the building.



Plate 35 – PRN 33368 Minafon / the former post-office at Pont Llangwnnadl is an unusual 1½-storey domestic building (Author 2011)

Many domestic buildings included in this survey have had their corrugated appearance obscured by timber of synthetic cladding, cement based render or other materials (see plate 35). This can present significant conservation issues for such buildings (see 3.1).

# 3.0 Conservation

## **3.1 Perception**

The biggest conservation challenge for corrugated iron buildings in the UK is their public perception (Mournement & Holloway 2007). In undertaking this study the most commonly encountered attitudes towards the subject matter were negative ones. After some explanation of the interest and significance of corrugated iron buildings attitudes could normally be improved to some extent, although numerous misconceptions generally prevailed:

#### Corrugated iron is a cheap and low quality material that is prone to rust.

Most corrugated iron buildings have had little or no maintenance since their original construction and therefore survive in surprisingly good condition in general.

### Corrugated iron is cold and difficult to insulate.

Most corrugated iron buildings currently have no insulation. However, insulation of almost any sort can be applied to the internal surface of a corrugated iron sheet and as most internal spaces of such buildings are usually timber stud work with tongue and groove cladding, the cavity can be altered to suit the purposes of construction in most cases. Additionally, insulation can be inserted in the floor void since almost all corrugated chapels use a suspended floor construction on a concrete or brick foundation slab. This is generally considered a very cost-effective solution (English Heritage 2010a) which has a significant impact on heat-loss U-values (the rate at which energy passes through one square metre of a barrier when air temperatures either side differ by one degree).

#### Corrugated iron structures are of little historic interest.

As already discussed (See 1.2), wherever corrugated iron is used it can be seen as historical evidence for economic, social, or cultural changes. Some of the buildings which survive today are over 100 years old and are evidence of turning points in history. They are a finite resource, are no longer produced and are under increasing threat.

#### Corrugated iron structures are of little architectural significance.

This view tends to be associated with the idea that prefabricated buildings are all massproduced, low quality and identical. Even prefabricated structures were sold with various options of detailing, finishes, fixtures and fittings so no two buildings are exactly the same. Many of the early corrugated iron structures were valued for their architectural qualities and even some of the more generic designs often reflect craft skills, technical ingenuity and design flare.

#### Corrugated iron structures are ugly.

Whether a building can be considered beautiful is obviously a subjective matter. However, it is surprising how often individuals with an apparently negative attitude towards corrugated iron structures have fond memories of a corrugated air raid shelter from their childhood or a familiar allotment shed.

#### The above misconceptions often lead to the following problems:

#### Salvage

Corrugated iron is often seen as a scrap material and corrugated iron buildings are therefore considered a useful source. This problem is increasingly relevant in the current climate of high global scrap metal values feeding a market of unscrupulous scrap merchants across the UK.

#### Neglect

It is very common to see corrugated iron buildings suffering from neglect. As temporary structures, their original purpose or function often no longer exists. However, most corrugated iron structures survive well and it takes many years before the signs of neglect become obviously detrimental.

#### **Demolition / removal / replacement**

Most corrugated iron buildings are easily removed without professional skills or specialist equipment. Because the material is unfamiliar to most developers, builders, potential owners and occupiers (discussed further in 3.2 below), the easy option is to use the precedent set by the existing use of the site to replace the corrugated iron structure in its entirety. Corrugated iron buildings are usually condemned with little consideration.

#### 'Improvement'

Many corrugated iron buildings, particularly in a domestic context, are often said to have been 'improved', generally in order to comply with modern building standards (discussed in 3.2 below). However, the work undertaken to improve such structures often only alters the appearance rather than the performance of the building.

An example of such work can be seen at Penhesgyn Hall, Anglesey (plate 36) where one of the group of early 20<sup>th</sup>-century corrugated buildings went through a process of modernisation during the 1970s and 1980s. This involved the addition of a slate roof, a cement based render on all external elevations and the installation of UPVC double glazing. Unfortunately, this work not only entirely altered the external appearance of a once interesting building, but also added a huge amount of weight to a structure designed to support a simple corrugated iron skin (attaching slate roofs to corrugated buildings can often have this effect). Nothing was reinforced and no underpinning or strengthening of the foundation slab was undertaken. As a result the building is now structurally unsound, covered in cracks and beyond repair.



Plate 36 – PRN 33372 Penhesgyn Hall, Menai Bridge, Anglesey (Author 2011)

### **3.2 Redevelopment and reuse**

Many of the structures considered in this study are under immediate threat from development, redevelopment or clearance. Even those that remain in use face significant management and maintenance issues in the future. Obtaining a mortgage or any other type of finance on a corrugated iron building is difficult as lenders are often suspicious of the temporary nature of such buildings and the unorthodox construction material. This makes the long term viability of such buildings, particularly domestic ones, very uncertain.

When local planning authorities are faced with applications for reuse of corrugated iron structures they are often presented with difficult decisions, particularly in relation to building regulations, specifically Part A – Structure, Part E – Resistance to the passage of sound & Part L – Conservation of fuel and power. As discussed above these issues are generally misconceptions that can be solved through alterations to the cavity wall construction and sensitive consideration of the existing building fabric. However, if they are considered to be temporary structures only permissions for a 'change of use' may be required

Deleterious materials are not common place in all corrugated structures but many prefabricated structures after 1907 do contain asbestos. This presents particular problems for buildings with corrugated asbestos sheet roofs. This type of asbestos is known as white asbestos and only becomes a potential health risk when the material is broken, cut or snapped as might be necessary during a conversion or redevelopment (Douglas 2006). Such roofs can normally be simply replaced with a metal corrugated sheet, however in the case of some Nissen huts for example, where the roof forms the main part of the structure, its replacement can be difficult to justify and the favoured option is more likely to be demolition.

Where they are no longer wanted or required reuse of prefabricated buildings is often best achieved by dismantling and rebuilding, however the building entirely loses its context in such circumstances and this should only be considered as a last resort, or if the alternative is demolition.



Plate 37 – Some of the buildings that formed the open air tuberculosis hospital at Penhesgyn Hall (PRN 33372), now proposed for demolition (Author 2011)

Many buildings that remain in use suffer inappropriate or unsympathetic alterations, extensions and additions, particularly when used as domestic structures. Owners and occupiers often attempt to disguise the appearance of a corrugated iron building or extend

its footprint and mass so far beyond that of the original structure that it becomes barely identifiable as a corrugated iron building.



Plate 38 – PRN 33340 An almost unrecognisable corrugated house at Llanrug, Gwynedd (Author 2011)

The wholesale replacement of corrugated roofs with 'traditional slate' is commonplace and normally justified using the erroneous rationale that the corrugated iron is an inefficient roofing material that is not contemporary with the construction of the building.

Historic Scotland (Walker 2004, 8) recommends the following general conservation advice as good practice in relation to the redevelopment, reuse or repair of corrugated iron buildings:

- a) Retain as much existing material as possible.
- b) Use traditional materials and techniques.
- c) Identify replacement items unobtrusively but positively.
- *d)* Use reversible processes wherever possible.
- e) Record in detail before, during and after work.

Issues which require particular consideration in the conservation of corrugated iron structures would be:

- The pitch and profile of corrugations.
- The thickness of the corrugated sheet.
- The sheet layout and size (width and length) of sheet used.
- The lap of the corrugated sheet.
- The coating of the sheet: painted, galvanised, electroplated and oxide conversion.

There are few examples of good practice, however the National Trust-owned Ganllwyd Mission Hall (plates 39 & 40) presents a useful case study following the principles of the Historic Scotland guidance. During 2006 the building was overhauled, the insulation was upgraded and the usability and functionality of the space was improved to meet the future needs of the building as an asset to the local community. In accordance with the guidance set out by Walker (2004) the corrugated iron sheets were removed by hand, repaired, treated and reinstated.



Plate 39 – PRN 33370 Mission Hall, Ganllwyd during conservation work in 2006 (image provided by the National Trust)



Plate 40 – PRN 33370 Mission Hall, Ganllwyd (Author 2011)

MA Historic Environment Conservation

# **3.3 Maintenance**

Corrugated iron buildings suffer from many of the same maintenance issues as other historic buildings. The replacement of timber sash windows with UPVC is commonplace where buildings continue in use and owners / users perceive these options as helping to reduce the burden of maintenance.



Plate 41 – PRN 33369 Mission Hall, Nant Gwynant *circa* 2009 (from Smith 2009)



Plate 42 – PRN 33369 Mission Hall, Nant Gwynant (Author 2011)

Rain water goods were often supplied with prefabricated corrugated iron buildings and were normally made from cast iron. Due to the expense of cast iron fittings and the regular maintenance required these have often been removed entirely or replaced with UPVC.

Although these replacements are detrimental to the appearance and historic character of a building, such changes do not normally affect the integrity of a corrugated iron structure in the same way that it would a more traditionally constructed historic building. This is because corrugated iron sheets are impenetrable to water and are either constructed from very heavy gauge wrought iron, or galvanized/zinc-coated mild steel, substantially reducing the risk of corrosion. This is not to say that corrugated iron buildings are not affected by acid rain and water ingress, but certainly many iron-framed prefabricated buildings are substantially over engineered and therefore not as easily damaged by the effects of water as might be assumed.

Where corrugated iron buildings employ timber frames, rot is common. This is generally caused by failed building fabric, moisture trapped between the iron cladding and the timber frame, or where the frame is in contact with the ground. In such cases corrugated sheets will begin to oxidize and corrode in areas where they are in continuous contact with moisture and air.

The problem areas for most corrugated iron buildings are:

- The edge of the corrugated iron sheet where the sheet might make contact with the ground.
- The lap between one sheet and the adjacent sheet
- Bolt holes or other fastenings that pierce the iron sheet

Student ID Number:1062396

- Window and door openings
- Flashings around chimneys or brick flues
- Ridge lines and barge boards

The most critical of these factors appears to be the failure of the barge board. If a traditionally constructed building reaches a tipping point when the roof fails, the comparable point for a corrugated iron building is when the barge boards fail, particularly if the failure is on a particularly exposed elevation. This allows water to penetrate the interior of the building, eventually leading to collapse.



#### Plate 43 – PRN 33372 Pump house at Penhesgyn Hall, Anglesey (Author 2011)

Repair or replacement of structural timbers and maintaining a water tight envelope are the key areas of maintenance required for corrugated iron buildings. This can be achieved by concentrating resources on the problem areas outlined in the list above.

The iron sheets themselves rarely require replacement although regular maintenance is required to help prevent the formation of destructive or corrosive elements. Deterioration can occur due to oxidation (caused by natural atmospheric processes), other electrochemical deterioration (normally caused by two different metals reacting with one another) and mechanical deterioration (caused by abrasion, fatigue or heat).

Rust, soluble salts and other surface deterioration should be removed by careful abrasion or flame cleaning, although care should be taken not to warp the sheet by overheating. Acid-pickling can also be used but only where corrugated sheets are to be removed from site and conserved in a workshop or factory specially equipped to undertake such work (Walker 2004, 11). Where corrosion or structural failure has occurred welding can be used to repair corrugated sheets but should not be used to replace a rivet, nor should it be undertaken in close proximity to a fixing or structural joint.

Regular maintenance of corrugated sheets by the removal of any vegetation or moss and regular repainting is the most effective maintenance technique. Walker (2004, 34) discusses the importance of determining original or appropriate pigments and also highlights that, in the British climate, painted surfaces are likely to require repainting every 5-10 years on average (*ibid*.).

Where replacement of corrugated sheets is required, Walker (2004) highlights a conflict between appearance and maintenance in that early buildings are often constructed from sheets of small dimensions, but when sheets fail and require replacement, the best technique to avoid future failure is to minimise the number of overlapping sheets and therefore to use a larger span sheet which might be more modern in appearance. In such circumstances a balance needs to be maintained, but generally a strategy of like-for-like replacement should be maintained in order to avoid a conservation approach which endorses the piecemeal replacement of all small sheets with more modern large-span sheets.

# **3.4 Condition**

Condition is an important consideration when undertaking building survey; in order to assess the conservation and management requirements of buildings, but also to evaluate the level of risk at each site and prioritise resources accordingly. However, to some extent the condition in which a building survives at the time of survey influences the level of significance ascribed to each site.

The deterioration and damage apparent at Penhesgyn Hall (PRN 33372) is such that what would otherwise be considered a category A site has been assessed as category B. Equally, Arenig Church (See Appendix 1 - PRN 33326) prior to conversion may have been included in recommendations for designation.

The *Pair of former Quarry Workers' Cottages* at Arenig (PRN 33327 see Appendix 5 for listed building description) were listed in 2001 have been in a poor state of disrepair for some time. They are in a much worse condition than many of the other buildings included within this study, with failed rainwater goods and barge boards (see plates 44 & 45). However, the rate of decay appears to have reached a critical point in the past two years since the removal of the doors, which have presumably been salvaged, has led to the weight of the slate roof damaging the small entrance porches.



Plate 44 - Quarry Workers' Cottages, Arenig, Meirionnydd (Google Streetview circa 2009)



Plate 45 – PRN 33327 Grade II Listed pair of Quarry Workers' Cottages, Arenig, Meirionnydd (Author, 2011)

In assessing significance, condition must not be allowed to become an overriding factor and must be considered against other criteria as described in Conservation Principles (Cadw 2010), including aesthetic value, historical value, evidential value and communal value.

# 4.0 Conclusions - defining significance

## **4.1 Designation**

Welsh Office Circular 61/96 Annex C sets out criteria which the secretary of state applies in deciding which buildings to include on statutory lists (Appendix 5). The criteria of age and rarity states that all buildings before 1700 and most before 1840 will be added to the list, however this cannot be fairly applied to corrugated iron buildings which will almost entirely date to after this period and will mostly date to the latter part of the 19<sup>th</sup> century and early 20<sup>th</sup> century (see figure 8).



Figure 8 - Map showing distribution of corrugated iron buildings by date.

For later 19<sup>th</sup> century and 20<sup>th</sup> century buildings the approach has been to identify key building types and to judge future additions to the list against the standards set by these examples. Unfortunately, defining buildings by type (e.g. industrial, educational, hospitals) rather than by material (e.g. stone, brick, earth) means that a building material such as corrugated iron has not been given adequate consideration and has consequently been underrepresented in previous listing surveys (see figure 9 below).

The principles of selection state that 'the fact that there are other buildings of similar quality elsewhere is not likely to be a major consideration'. The mass produced and prefabricated nature of many corrugated iron buildings should not therefore affect the eligibility of such buildings to be added to the list.

One of the principles of selection is historic interest: this includes buildings which illustrate important aspects of the nation's social, economic, cultural or military history. As discussed in earlier chapters, corrugated iron buildings are often a good source of such evidence.

Interrogation of listed building data for north-west Wales illustrates how corrugated iron structures form a very small percentage of overall designated buildings in the area. This is not surprising since neither the regional Historic Environment Record nor the National Monument Record hold more than just a handful of records for corrugated iron buildings. Understanding corrugated iron buildings in north west Wales

Local Authority	No. of listed buildings within authority area	No. of buildings to mention corrugated iron in description	No. of buildings where corrugated iron was a factor in designation
Anglesey	1120	25	0
Conwy	1733	79	0
Gwynedd	4160	202	1

Figure 9 - Table showing figures extracted from listed building data.

Most of the buildings where corrugated iron appears in the description field are traditionally built, domestic cottages with small corrugated iron extensions or vernacular farm buildings with corrugated iron roofs on outbuildings. In both of these cases owners, developers and planners usually see such features as inappropriate additions or obtrusive elements that are removed as part of redevelopment or conservation work.

The single listed building within the study area, the *Pair of former Quarry Workers' Cottages* at Arenig (see 3.4) is listed partly because it is considered an unusual example, as a designed pair of corrugated cottages (see Appendix 5). However, without baseline data and assessment criteria it is difficult to quantify the rarity of a particular building type (rarity is one of the key factors in listing), nor to identify the best examples. The historical review and characterisation exercise undertaken as part of this study have allowed the following areas of significance to be identified to help inform future survey, research and designation.

Defining buildings of national significance:

- All corrugated iron buildings dating to before about 1860 are extremely rare and should be considered of national significance and potentially of international significance. The earliest known surviving corrugated iron church is thought to be the Congregational Church in Hackney, East London which dates to 1858 (Mournement & Holloway 2007). Very few iron buildings of any sort survive from the 1830s or 1840s.
- Buildings dating between 1860 and 1890 and of some architectural or historical interest should be considered of national importance. Very few buildings, particularly those of a domestic, agricultural, military or industrial nature, survive from this period.
- Buildings of significant architectural or historical interest dating between 1890 and 1916 should be considered of national importance. Although corrugated iron churches and domestic buildings more commonly survive from this period a small number of agricultural, industrial or commercial buildings date to before World War I.
- Buildings dating to the period after 1916 and of exceptional architectural / historic interest should be considered of national importance.
- Buildings which display special architectural decoration or innovative design elements such as rare pagoda-style roofs, unusual ridge decoration, manufacturing

details such as rare / unusual (not 3 inch) profile or using ungalvanized sheets should all be considered of significance.

• Custom built structures or those associated with a significant or unusual maker such as Isaac Dixon, Liverpool should be considered for designation.

Defining buildings of regional significance:

Buildings of international importance will be listed at grade I or II\*. Buildings considered to be of national importance will be listed at grade II\* or II. In general, buildings considered to be of regional significance will be listed at grade II if they are of particular merit or will be added to the local list maintained by the Local Authority. All other buildings that are identified will be added to the regional Historic Environment Record.

## 4.2 Managing change

Identification and designation is not an end in itself. Mechanisms are required to ensure that all buildings designated at national or regional level are preserved; all structures recorded on the regional Historic Environment Record are retained where possible, and; wherever buildings cannot be reused, that a programme of recording is undertaken prior to any demolition.

Management mechanisms:

#### Listed Building Consent

Section 4.3 sets out recommendations for listing. Once buildings are added to the list they will be protected by national planning policy (Planning Policy Wales 2010 & Welsh Office Circular 61/96) and legislation (Listed Buildings and Conservation Areas Act 1990) which will manage
inappropriate alterations or additions that affect any buildings on the list though a consenting process that runs alongside the normal planning process. Listed building status also makes it a criminal offence to damage or demolish any building forming part of the listing.

#### Grant aiding and management agreements

Agreements between site owners and Cadw can implement policies to prevent deterioration of designated structures. Grants are available to owners to assist in the cost of repairs or conservation work carried out as part of such an agreement (<u>http://cadw.wales.gov.uk/historicenvironment</u>).

#### Conservation Area consent

Any work which affects the character of a designated conservation area requires Conservation Area Consent. Like listed building consent, conservation area consent is a process that runs alongside the normal planning process.

#### Urgent works notices and planning enforcement

Local authorities have powers which allow them to serve a notice on the owner of a listed building or one in a conservation area if the building requires works which are urgently necessary to provide stability and weatherproofing and protect against theft and vandalism. In special circumstances, where owners are not responsive to the notice local authorities can undertake a compulsory purchase of such buildings (http://ihbc.org.uk/context\_archive/51).

#### Article 4 directions

Some conservation areas already contain corrugated iron buildings within their protected zones. Some of these are subject to Article 4 Directions which remove permitted development rights to allow for tighter control of the historic environment (*ibid*.). This is the case for both the Methodist Chapel in Llanfairfechan (PRN 33361) and the Mission Rooms in Ganllwyd (PRN 33370).

#### Supplementary Planning Guidance

Conwy County Borough Council (CCBC 2011) identifies that 'metal sheet buildings... are relatively rare and distinctive buildings' in its Background Paper (No. 28, Historic Environment) to the Local Development Plan. In order to protect and enhance the resource all local authorities should consider utilising Supplementary Planning Guidance or other local policy frameworks in this way.

#### Development control and local listing

All buildings identified within this survey as category C or above (see Appendix 3) and not eligible for national or regional designation should be added to the Local List where one exists. These are maintained by Local Authorities and provide some protection for locally important buildings, normally ensuring they are not demolished. Any building that cannot be designated will be added to the regional Historic Environment Record which will allow management within the existing planning framework.

#### Further survey and research

A national survey of corrugated iron structures would provide data to identify 'at risk' buildings and those of significance. This would help to inform decision making and assist in targeting resources.

#### Raising awareness

It is essential to raise awareness with the public more generally but also to gain the understanding and support of local authority planners, conservation staff and heritage managers as well as owners, occupiers and the local community.

### 4.3 Recommendations

This section includes a table of recommendations for designation. Based on the current knowledge and the survey data included in this study, no buildings have so far been identified that would be considered of international importance, nor that could be considered for listing at grade I or grade II\*. However many buildings have been recognised as being of national or regional significance and should therefore be considered for listing at grade II (see category A sites – figure 10), for designation as conservation areas (figure 10), or for inclusion on local lists (see category B sites – figure 11).

prn	name	ngr	period	Category	Corrugated theme
33327	Quarry Workers' Cottages, Arenig	SH8338039300	Modern	A	Domestic
33332	Beach huts, Abersoch	SH31653796	Modern	A	Leisure
33335	Workshop, Blaenau Ffestiniog	SH7059045630	Modern	A	Commercial
33342	Christ Church, Corris Uchaf	SH7410008860	Post- Medieval	A	Meeting Place
33346	Fishermen's Huts, Gallow's Point, Beaumaris	SH5978275240	Post- Medieval	A	Industrial
33361	English Wesleyan Methodist Church, Llanfairfechan	SH6814274904	Post- Medieval	A	Meeting Place
33370	Mission Room, Ganllwyd	SH7263224305	Post- Medieval	A	Meeting Place

Figure 10 - Table showing Category A sites extracted from survey data

prn	name	ngr	period	Category	Corrugated theme
33 <mark>317</mark>	Boat Store, Abersoch	SH3166528110	Modern	В	Industrial
33337	Bellman Hangar, Bodorgan	SH3815568340	Modern	В	Military
33339	"Tin Town", Bronaber	SH7121131844	Modern	В	Military
33348	Huts, Griffith's Crossing	SH5003065545	Modern	В	Military
33349	Grosvenor Garage, Menai Bridge	SH5568072160	Modern	В	Commercial
33354	Agricultural Complex, Hendre Wen Farm	SH8100078125	Modern	В	Agricultural
33359	Hangars, Llanbedr	SH56802660	Modern	В	Military
33363	Slate Mill, Llechwedd	SH7025046730	Modern	В	Industrial
33367	Maritime shed, Menai Bridge	SH5592572130	Post- Medieval	В	Industrial
33369	Mission Hall, Nant Gwynant	SH6266050402	Modern	В	Meeting Place
33372	Former Hospital, Penhesgyn Hall, Menai Bridge	SH5330074000	Modern	В	Domestic
33375	Hangars, Saunders Roe Flying Boat Station, Beaumaris	SH60757753	Modern	В	Military
33379	Workshop, Trawsfynydd	SH7088535250	Modern	В	Commercial
33382	Hangars, RAF Valley	SH31037575	Modern	В	Military
33383	Wally & Co Ltd, Slate Quay, Caernarfon	SH4793062585	Post- Medieval	В	Commercial
33386	Workshop, Tudweiliog	SH2358536510	Post- Medieval	В	Domestic

Figure 11 – Table showing Category B sites extracted from survey data.

Britain led the world in the development, promotion, production and exportation of corrugated iron buildings (Walker 2004). It is a material well appreciated in Australia where its historical development runs in parallel with the historical development of the nation and many of their historic buildings are made from the material (Mournement & Holloway 2007), however its familiarity in a British context has led to it being underappreciated and taken for granted.

Other recommendations include:

- In order to combat the misconceptions surrounding corrugated iron structures and to promote a positive understanding amongst conservation professionals a publication of the Cadw *Care and Conservation* type should be produced.
- In order to target negative attitudes in the wider public a national educational leaflet, similar to those produced by Historic Scotland (see Appendix 7), would increase awareness and understanding of the resource.
- Given the difficulties inherent in undertaking a systematic survey of corrugated iron buildings and since many of the buildings identified in this study were chance discoveries based on local knowledge, a community-led project might be an effective method of identifying further examples whilst raising the profile of the material. An interactive web-based solution or 'crowd sourcing' exercise might be a productive way to raise awareness with the younger generation, but a newspaper campaign in both the Welsh and English language media would also be necessary in order to identify new sites that only the older generation are likely to remember.
- A programme of training for local authority staff, architects, builders and other practitioners should be developed.
- A programme of survey and research should be commissioned nationally.

Ironbridge Institute, University of Birmingham MA Historic Environment Conservation 2009-2010

Candidate No. 1062396

# Understanding corrugated iron buildings in north west Wales: Volume II Appendices



Beach Huts at Abersoch (Author 2011)

University of Birmingham The Ironbridge Institute MA Historic Environment Conservation Dissertation: 09 20346 Student ID Number: 1062396 November 2011 Tutor: Harriet Devlin Academic Year of Enrolment: 2009-10

# 5.0 Appendices 5.1 Appendix 1 – Survey Data

PRN	33317
Sitename	Boat Store, Abersoch
NGR	SH3166528110
Unitary Authority	Gwynedd
Corrugated theme	Industrial
Sitetype	BOAT STORE
Shown on OS map	1953
Status grade	
Description	Boat store / workshop / warehouse.
	Large, single-storey corrugated iron structure within levelled car park with slip road access to sea.
	Single storey, 6 bay, pitched roof structure retaining 4 large, 12 light, fixed- pane windows on the south elevation and full-height, centrally positioned sliding double-doors. Small lean-to range to east side with smaller sliding garage door. Painted dark green. No rainwater goods. Thought to date to the 1920s or 1930s but its origin and function is uncertain.



В



Student ID Number:1062396

PRN	33318
Sitename	Garage, Abersoch
NGR	SH3137028150
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	GARAGE
Shown on OS map	1953
Status grade	
Description	Two-storey timber and corrugated iron garage / workshop on the roadside.
	Pitched roof workshop painted light grey with various openings and doorways. In use as a commercial garage at time of survey but thought to date to the 1930s.
Category	С
Management Observation	



PRN	33319
Sitename	Garages, Abersoch
NGR	SH3149028115
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	GARAGE
Shown on OS map	1953
Status grade	
Description	Long range of garages. Single-storey brick, timber and corrugated iron.
	Long range of double door garages painted dark green. Possibly related to the nearby beach huts and boat store but perhaps built as private garages for Haulfryn. Thought to date to the 1920s or 1930s but origin and function uncertain.
Category	С
Management Observation	



PRN	33320
Sitename	Agricultural Buildings, Tal y Cafn
NGR	SH7881571720
Unitary Authority	Conwy
Corrugated theme	Agricultural
Sitetype	HAY BARN
Shown on OS map	1953
Status grade	
Description	Prefabricated corrugated iron hay barn. Green. Maker W H Smith & Co Ltd, Whitchurch
Category	C
Management Observation	



PRN	33321
Sitename	Agricultural Buildings, South of Eglwysbach
NGR	SH8084569000
Unitary Authority	Conwy
Corrugated theme	Agricultural
Sitetype	AGRICULTURAL BUILDING
Shown on OS map	1953
Status grade	
Description	Corrugated iron pitch roof. Oxide red.
Category	С
Management Observation	



PRN	33322
Sitename	Agricultural Complex, near Eglwysbach
NGR	SH8105164717
Unitary Authority	Conwy
Corrugated theme	Agricultural
Sitetype	AGRICULTURAL BUILDING
Shown on OS map	
Status grade	
Description	Pitched roof buildings made from corrugated iron. Demonstrates ad-hoc development. Oxide red.
Category	С
Management Observation	



PRN	33323
Sitename	Agricultural shed, Glan Conwy
NGR	SH8048076040
Unitary Authority	Conwy
Corrugated theme	Agricultural
Sitetype	AGRICULTURAL BUILDING
Shown on OS map	1953
Status grade	
Description	Prefabricated building made from corrugated iron. Painted black. Maker - Hill & Smith, Brierley Hill.
Category	С
Management Observation	



PRN	33324
Sitename	Agricultural Shed, Graig
NGR	SH8055074560
Unitary Authority	Conwy
Corrugated theme	Agricultural
Sitetype	HAY BARN
Shown on OS map	1953
Status grade	
Description	Prefabricated corrugated iron hay barn - galvanized. Maker - Hill & Smith Ltd, Brierley Hill
Category	C
Management Observation	



PRN	33325
Sitename	Agricultural Unit, Graig
NGR	SH8034571670
Unitary Authority	Conwy
Corrugated theme	Commercial
Sitetype	AGRICULTURAL BUILDING
Shown on OS map	1953
Status grade	
Description	Corrugated iron garage painted green.
Category	С
Management Observation	



PRN	33326
Sitename	Calvinistic Methodist Chapel, Arenig
NGR	SH8346039330
Unitary Authority	Gwynedd
Corrugated theme	Meeting Place
Sitetype	CHAPEL
Shown on OS map	1953
Status grade	
Description	Prefabricated pitched roof building made from corrugated iron. Of gable entry type. Painted green. Much altered and converted to domestic use (holiday cottage) but in good condition with fair preservation.
Category	C
Management Observation	In good condition with fair preservation



PRN	33327
Sitename	Quarry Workers' Cottages, Arenig
NGR	SH8338039300
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	COTTAGE
Shown on OS map	1953
Status grade	GII
Description	Listed Building comprising semi-detached corrugated iron cottages with slate roof.
Category	A
Management Observation	In poor condition



PRN	33328
Sitename	Hay Barn, Arenig
NGR	SH8048539865
Unitary Authority	Gwynedd
Corrugated theme	Agricultural
Sitetype	HAY BARN
Shown on OS map	1953
Status grade	
Description	Black prefabricated corrugated iron hay barn of uncertain date.
Category	С
Management Observation	



PRN	33329
Sitename	Bakery, Aberdaron
NGR	SH1735026480
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	BAKERY
Shown on OS map	1914
Status grade	
Description	Small single cell ridged roof building on road side. Elevations painted white and all windows replaced.
Category	C
Management Observation	



PRN	33330
Sitename	Bangor City Football Club, Farrar Road, Bangor
NGR	SH5781371796
Unitary Authority	Gwynedd
Corrugated theme	Leisure
Sitetype	FOOTBALL GROUND
Shown on OS map	1953
Status grade	
Description	Corrugated iron stands. Painted blue.
Category	С
Management Observation	



PRN	33331
Sitename	Barn, Dolbenmaen
NGR	SH5086542795
Unitary Authority	Gwynedd
Corrugated theme	Agricultural
Sitetype	BARN
Shown on OS map	1953
Status grade	
Description	Pitched roof building
Category	С
Management Observation	



PRN	33332
Sitename	Beach huts, Abersoch
NGR	SH31653796
Unitary Authority	Gwynedd
Corrugated theme	Leisure
Sitetype	HUT
Shown on OS map	1953
Status grade	
Description	A line of corrugated iron beach huts stretches along the beach for a length of approximately 500m and terminates at the north end with a corrugated café building and a terraced amphitheatre of brick built huts with corrugated iron roofs. The huts to the south of the group are positioned in one long line facing out to sea and are painted bright colours. These are mostly modern or at least recent in date. To the north of the site a small group of approximately 20 dark green sheds are of a very different character, design and scale. These provide space for changing only and could be re-used military structures. A single such hut is used at the entrance to the car park to collect parking fees. The buildings at the north end appear on the 1953 map whilst none of the beach huts appear on early 20th century maps, although they were probably not surveyed due to their small size and temporary nature. Archive photographs from this period show that at least some of the huts were extant during this period.
	Interiors not inspected at time of survey.
Category	Α
Management Observation	Group Value





Student ID Number:1062396

PRN	33333	
Sitename	Benar Bungalow, Abersoch	
NGR	SH3166528110	
Unitary Authority	Gwynedd	
Corrugated theme	Domestic	
Sitetype	HOUSE	
Shown on OS map		
Status grade		
Description	Prefabricated, corrugated iron bungalow set within levelled car park with slip road access to sea.	
	Single storey building with white elevations. Elevations are clad with flat material obscuring corrugations beneath whilst roof has been covered by modern asphalt. The building retains 2 brick chimneys, a small veranda on the west elevation and numerous casement windows. The design and layout of the building are similar to early 20th century examples of prefab cottage but the building does not appear on maps before 1953. The building was apparently moved here in living memory.	
	Interior not inspected at time of survey.	
Category	C	





PRN	33334
Sitename	Billingtons Garage, Conwy
NGR	SH7828577340
Unitary Authority	Conwy
Corrugated theme	Commercial
Sitetype	GARAGE
Shown on OS map	1953
Status grade	
Description	Earlier cattle market. Large-scale curved roof prefabricated building.
Category	С
Management Observation	



PRN	33335
Sitename	Workshop, Blaenau Ffestiniog
NGR	SH7059045630
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	WORKSHOP
Shown on OS map	1914
Status grade	
Description	Very early 20th century workshop built from corrugated iron and local slate. Unusual jettied design.
	Over 2 stories the building comprises 4 bays and is of gable entry type. The gable end faces the high street with four windows, original door and 1st floor access above. The upper floor is jettied on either side. The upper floor retains 8 large 25 pane fixed windows with some inserted casements. All ground floor windows are secured and boarded up.
	Painted oxide red. Sign over door reads, 'R.L.JONES & SON BUILDERS'.
	A smaller pitch roofed corrugated iron ancillary building flanks the south east side of the building.
Category	Α
Management Observation	Fair Condition



PRN	33336
Sitename	Boat House, Caernarfon
NGR	SH4777562490
Unitary Authority	Gwynedd
Corrugated theme	Industrial
Sitetype	BOAT STORE
Shown on OS map	
Status grade	
Description	Pitched roof building opposite Slate Quay
Category	С
Management Observation	



Student ID Number:1062396

PRN	33337
Sitename	Bellman Hangar, Bodorgan
NGR	SH3815568340
Unitary Authority	Ynys Mon
Corrugated theme	Military
Sitetype	HANGAR
Shown on OS map	1953
Status grade	
Description	Bellman Hangar
Category	В
Management Observation	

PRN	33338
Sitename	Hay Barn, Brodnant Farm, Llandudno Junction
NGR	SH8091577745
Unitary Authority	Conwy
Corrugated theme	Agricultural
Sitetype	HAY BARN
Shown on OS map	1953
Status grade	
Description	Curved roof hay barn - no maker.
Category	С
Management Observation	



PRN	33339
Sitename	"Tin Town", Bronaber
NGR	SH7121131844
Unitary Authority	Gwynedd
Corrugated theme	Military
Sitetype	BUILDING
Shown on OS map	1953
Status grade	
Description	Collection of buildings associated with Bronaber. All other buildings in 'TinTown' now demolished. Pitched roof buildings.
Category	В
Management Observation	Building on road towards Bronaber probably in original location and therefore likely to be of more importance



PRN	33340
Sitename	Bryn Seriol, Llanrug
NGR	SH5412563235
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	HOUSE
Shown on OS map	1953
Status grade	
Description	Pitched roof domestic building. Much altered
Category	D
Management Observation	



PRN	33341
Sitename	Commercial Unit and Garage, Penmaenmawr
NGR	SH7172076300
Unitary Authority	Conwy
Corrugated theme	Commercial
Sitetype	GARAGE
Shown on OS map	1953
Status grade	
Description	Corrugated iron garages and shop to street front.
	Partly dismantled November 2011
Category	С
Management Observation	



PRN	33342
Sitename	Christ Church, Corris Uchaf
NGR	SH7410008860
Unitary Authority	Gwynedd
Corrugated theme	Meeting Place
Sitetype	CHURCH
Shown on OS map	1889
Status grade	
Description	Prefabricated pitched roof building made from corrugated iron. Of gable entry type. In poor condition due to abandoned nature of the site but retaining almost all its original decorative features, fixtures and fittings both inside and out.
	The earliest recorded corrugated church in north west Wales. No maker recorded but possibly from Isaac Dixon of Liverpool and dating to 1870s
Category	А





PRN	33343	
Sitename	Depot, Tyn y Fron Lane, Llandudno Junction	
NGR	SH7965077850	
Unitary Authority	Conwy	
Corrugated theme	Commercial	
Sitetype	DEPOT	
Shown on OS map	1953	
Status grade		
Description	Large-scale pitch roof building retaining original windows.	
Category	С	
Management Observation		



PRN	33344
Sitename	Garage, Eglwysbach
NGR	SH8029570635
Unitary Authority	Conwy
Corrugated theme	Commercial
Sitetype	GARAGE
Shown on OS map	1953
Status grade	
Description	Corrugated iron pitch roof. Oxide red.
Category	С
Management Observation	


PRN	33345	
Sitename	Elias Garage, Bangor	
NGR	SH5846072330	
Unitary Authority	Gwynedd	
Corrugated theme	Commercial	
Sitetype	GARAGE	
Shown on OS map	1953	
Status grade		
Description	Curved roof commercial building with lattice trusses	
Category	С	
Management Observation		



PRN	33346	
Sitename	Fishermen's Huts, Gallow's Point, Beaumaris	
NGR	SH5978275240	
Unitary Authority	Ynys Mon	
Corrugated theme	Industrial	
Sitetype	HUT	
Shown on OS map	1889	
Status grade		
Description	Collection of very early fishing buildings. Pitched roof buildings made from corrugated iron.	
Category	Α	
Management Observation		



PRN	33347
Sitename	Workshop, Tal y Cafn
NGR	SH7882071790
Unitary Authority	Conwy
Corrugated theme	Industrial
Sitetype	WORKSHOP
Shown on OS map	
Status grade	
Description	Fishing or railway workshop. Pitched roof corrugated building with sliding garage door.
Category	С
Management Observation	



PRN	33348
Sitename	Huts, Griffith's Crossing
NGR	SH5003065545
Unitary Authority	Gwynedd
Corrugated theme	Military
Sitetype	HUT
Shown on OS map	
Status grade	
Description	Collection of curved-roof military structures of varying sizes. Fuel Storage Depot.
Category	В
Management Observation	



PRN	33349	
Sitename	Grosvenor Garage, Menai Bridge	
NGR	SH5568072160	
Unitary Authority	Ynys Mon	
Corrugated theme	Commercial	
Sitetype	GARAGE	
Shown on OS map	1914	
Status grade		
Description	Large single-storey building with broad span curved roof. Very early building of its type at a very large scale given motoring was in its infancy during this period (perhaps alternative earlier purpose? Boat workshop? Hangar?)	
Category	В	
Management Observation		



PRN	33350
Sitename	Gweithdy, Minffordd
NGR	SH6008038560
Unitary Authority	Gwynedd
Corrugated theme	Industrial
Sitetype	WORKSHOP
Shown on OS map	1953
Status grade	
Description	Large, single-storey corrugated iron structure adjacent to the Ffesitniog Railway.
	Prefabricated single storey, 5 bay, pitched roof structure retaining 4 large, mullion and transom, fixed-pane timber windows on the south elevation and small entrance porch. West gable contains two ground floor (blocked) and one upper storey (roof space) light. Painted cream elevations with oxide roof. No rainwater goods.
Category	C





PRN	33351
Sitename	Haulfryn, Aberdaron
NGR	SH1742526535
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	HOUSE
Shown on OS map	1953
Status grade	
Description	Domestic dwelling probably built in the inter-war period comprising two buildings: one with a hipped roof (including brick chimney), the other a ridged roof. Potentially partly prefabricated. Much altered windows.
Category	D





PRN	33352	
Sitename	Hay Barn, Cwm Prysor	
NGR	SH7364036345	
Unitary Authority	Gwynedd	
Corrugated theme	Agricultural	
Sitetype	HAY BARN	
Shown on OS map	1953	
Status grade		
Description	Prefabricated corrugated iron hay barn. Oxide red.	
Category	С	
Management Observation		



PRN	33353
Sitename	Hay Barn, Henblas
NGR	SH8012070770
Unitary Authority	Conwy
Corrugated theme	Agricultural
Sitetype	HAY BARN
Shown on OS map	1953
Status grade	
Description	Prefabricated corrugated iron hay barn painted black. Maker - W H Smith & Co Ltd, Whitchurch
Category	C
Management Observation	



PRN	33354	
Sitename	Agricultural Complex, Hendre Wen Farm	
NGR	SH8100078125	
Unitary Authority	Conwy	
Corrugated theme	Agricultural	
Sitetype	AGRICULTURAL BUILDING	
Shown on OS map	1953	
Status grade		
Description	Excellent group of buildings including 2 curved roof hay barns of Hill & Smith Ltd (Type 700), 1 Nissen hut apparently moved here from Conwy Morfa Camp post-war and one 1940s chicken shed.	
Category	В	

Category Management Observation



PRN	33355
Sitename	House, Clynnog
NGR	SH4157649793
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	HOUSE
Shown on OS map	1953
Status grade	
Description	Pitched roof building
Category	С
Management Observation	



PRN	33356
Sitename	House, Dolbenmaen
NGR	SH5051243149
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	HOUSE
Shown on OS map	1953
Status grade	
Description	Pitched roof building
Category	С
Management Observation	



PRN	33357
Sitename	House, Pontllyfni
NGR	SH4334052375
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	HOUSE
Shown on OS map	1953
Status grade	
Description	Pitched roof building
Category	С
Management Observation	



PRN	33358
Sitename	Min y Ceiri, Llanaelhaearn
NGR	SH3823344558
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	HOUSE
Shown on OS map	1953
Status grade	
Description	Corrugated iron house with later additions
Category	С
Management Observation	



PRN	33359
Sitename	Hangars, Llanbedr
NGR	SH56802660
Unitary Authority	Gwynedd
Corrugated theme	Military
Sitetype	HANGAR
Shown on OS map	1953
Status grade	
Description	Group of hangars including 1 Bellman (The Meteor Hangar) and 2 T2s.
Category	В
Management Observation	

PRN	33360
Sitename	Garage, Llanbedrog
NGR	SH3254031750
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	GARAGE
Shown on OS map	1953
Status grade	
Description	Roadside corrugated iron building of a commercial nature set within old quarry.
	Recently altered (2010?) and repainted (red walls with white pitched roof) commercial building – garage. Single storey, 4 bay structure with much altered east gable and inserted up-and-over modern garage door in west gable end. Small lean-to range to rear (south) and blocked window openings on north elevation. Probably a reused building, perhaps of military origin, although now much altered.
Category	D

Management Observation



PRN	33361
Sitename	English Wesleyan Methodist Church, Llanfairfechan
NGR	SH6814274904
Unitary Authority	Conwy
Corrugated theme	Meeting Place
Sitetype	CHURCH
Shown on OS map	1900
Status grade	
Description	Prefabricated pitched roof building made from corrugated iron. Of gable entry type. Painted blue.
Category	A
Management Observation	



PRN	33362
Sitename	Garage, Llanrug
NGR	SH5418563260
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	GARAGE
Shown on OS map	1900
Status grade	
Description	Pitched roof garage building of two parts. Very early and possibly with different use.
Category	С
Management Observation	



PRN	33363
Sitename	Slate Mill, Llechwedd
NGR	SH7025046730
Unitary Authority	Gwynedd
Corrugated theme	Industrial
Sitetype	SLATE MILL
Shown on OS map	1953
Status grade	
Description	Long double-pile range. Single-storey corrugated iron construction.
	<ul> <li>History: The Maenofferen quarry opened in the early C19 and was developed and expanded by J W Greaves in the 1850s. In 1882 there is a recorded output of 8,494</li> <li>tonnes (8,360 tons) of slate with 238 men employed. By the 1890s this had risen to an average of 1,422 tonnes (1,400 tons) and 400 men. The huge twin slate mills on the Maenofferen level are not shown on the 1888 O.S map, though graffiti exists from 1896, thereby allowing for a fairly close dating. Originally water-powered, the mills were converted to electric power c1906; the complex is still partly in use.</li> <li>Exterior: Long twin-mill building (approximately 60m).</li> <li>Thought to date to the 1920s or 1930s. The nearby late 19th century stone built slate mill of similar type is listed at grade II*.</li> </ul>
Category	В

Category Management Observation



PRN	33364
Sitename	Corrugated Iron Cottages, Llithfaen
NGR	SH3622943230
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	HOUSE
Shown on OS map	1953
Status grade	
Description	Semi-detached corrugated iron cottages
Category	С
Management Observation	



PRN	33365
Sitename	Garage, Llithfaen
NGR	SH3586043190
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	GARAGE
Shown on OS map	1953
Status grade	
Description	Inter-war corrugated iron roadside garage. Oxide red. Very worn sign stating 'T.G.Thomas'.
Category	D
Management Observation	



PRN	33366
Sitename	Maelgwyn Public House, Llandudno Junction
NGR	SH7982577750
Unitary Authority	Conwy
Corrugated theme	Commercial
Sitetype	PUBLIC HOUSE
Shown on OS map	1953
Status grade	
Description	Flat roofed prefabricated building.
Category	С
Management Observation	



PRN	33367
Sitename	Maritime shed, Menai Bridge
NGR	SH5592572130
Unitary Authority	Gwynedd
Corrugated theme	Industrial
Sitetype	SHED
Shown on OS map	1900
Status grade	
Description	Single-storey pitched roof structure
Category	В
Management Observation	



PRN	33368
Sitename	Minafon, Pont Llangwnnadl
NGR	SH2117532740
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	HOUSE
Shown on OS map	1953
Status grade	
Description	Domestic dwelling probably built in the inter-war period in an unusual two storey style. Built from corrugated iron the building is of gable-entry type with a large double door entrance, two 6-pane fixed timber windows either side and a casement window above. Original purpose unknown but most likely not a house. Formerly a post office.
Category	С
Management Observation	



PRN	33369
Sitename	Mission Hall, Nant Gwynant
NGR	SH6266050402
Unitary Authority	Gwynedd
Corrugated theme	Meeting Place
Sitetype	MISSION HALL
Shown on OS map	
Status grade	
Description	Small, single cell prefabricated corrugated iron mission hall of uncertain date.
	The building is in good condition though its original windows have been recently replaced. The tongue and groove timber interior is retained as well as good external appearance. Typologically the building appears to date to the early 20th century and is probably Edwardian (retaining horned sashes until recently), however it has not been recorded on any of the early 20th century maps (probably due to its size and/or its temporary nature).
Category	В

Category Management Observation



PRN	33370
Sitename	Mission Room, Ganllwyd
NGR	SH7263224305
Unitary Authority	Gwynedd
Corrugated theme	Meeting Place
Sitetype	MISSION HALL
Shown on OS map	1900
Status grade	
Description	A well preserved, early prefabricated corrugated iron mission room of gable entry type with lean-to entrance lobby.
	The building is in excellent condition retaining well preserved timber windows and tongue and groove interior as well as original external appearance.
	The building is gothic in design with contrasting black corrugated iron roof and elevations (both of the 3" profile) with white detailing on barge boards, window and door openings. The main hall has a cast iron decorative ridge.
	This property is owned and managed by the National Trust and is very well maintained on behalf of the community.
Category	Α

Management Observation

Excellent condition



PRN	33371	
Sitename	Nev's Garage, Graig	
NGR	SH8045574715	
Unitary Authority	Conwy	
Corrugated theme	Commercial	
Sitetype	GARAGE	
Shown on OS map		
Status grade		
Description	Corrugated iron garage.	Pitched roof painted white
Category	С	
Management Observation		



PRN	33372
Sitename	Former Hospital, Penhesgyn Hall, Menai Bridge
NGR	SH5330074000
Unitary Authority	Ynys Mon
Corrugated theme	Domestic
Sitetype	HOSPITAL
Shown on OS map	1914
Status grade	
Description	Early 20th century complex consisting of 5+ prefabricated corrugated iron buildings.
	These buildings were erected in 1912 as the Open Air (King Edward VII Welsh National Memorial) Hospital for sufferers of tuberculosis. They are all of pitched roof design and are modified domestic and utility buildings, all of single-storey type.
	The eastern buildings were connected by a small link corridor on the Ordnance Survey 1914 map but have since been divided into two buildings. The east building has been converted and is unrecognisable as a corrugated iron building whilst the west unit comprises a 4 bay pitched roof hall building with south facing sun lounge lean-to. A small decorative vent in the roof and a formal entrance lobby on the north west corner. The building retains its rain-water goods and although greatly neglected is in a fair condition.
	Both the hall building and Curlew Cottage (the western most building of the group) retain much original glazing including some iron Crittal windows. They retain oxide red roofs and pale elevations with half timber style gable ends of an Edwardian, mock-Tudor type.
	They are a unique group with an interesting historical association but have been allowed to fall into a state of disrepair. The eastern most building was rendered with cement in the 1960s and is now crumbling on an inadequate foundation slab. The northern most building has completely collapsed whilst the other buildings are in a poor state of repair. Water ingress via dilapidated bargeboards appears to be a significant factor in their demise. The hall is the only building which survives in a reasonable state.
Category	В

Calegory	
Management	<b>Observation</b>

Poor condition



PRN	33373
Sitename	Slate Mills, Penrhyn Quarry
NGR	SH62066554
Unitary Authority	Gwynedd
Corrugated theme	Industrial
Sitetype	SLATE MILL
Shown on OS map	1953
Status grade	
Description	A group of corrugated iron slate mills of uncertain date.
Category	C
Management Observation	

PRN	33374
Sitename	Garage, Pentraeth
NGR	SH5236578378
Unitary Authority	Ynys Mon
Corrugated theme	Commercial
Sitetype	GARAGE
Shown on OS map	
Status grade	
Description	Pitched roof corrugated iron garage with sliding wooden doors
Category	D
Management Observation	



PRN	33375
Sitename	Hangars, Saunders Roe Flying Boat Station, Beaumaris
NGR	SH60757753
Unitary Authority	Ynys Mon
Corrugated theme	Military
Sitetype	HANGAR
Shown on OS map	1953
Status grade	
Description	T2 & B2 Hangars. VR2 Hangar demolished
Category	В
Management Observation	



PRN	33376
Sitename	Siop Newydd, Rhiw
NGR	SH2264027935
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	BUILDING
Shown on OS map	
Status grade	
Description	Not on any map but probably dating to the first half of the 20th century. Small single cell ridged roof. Retaining two 6-pane fixed lights in south elevation. Original purpose unclear but more recently converted to a domestic garage by the insertion of an up-and-over door in gable end.
Category	D
Management Observation	



PRN	33377
Sitename	Spar, Aberdaron
NGR	SH1733526455
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	SHOP
Shown on OS map	1953
Status grade	
Description	Ridged roof building on roadside. Elevations painted grey. Original purpose not known but now much altered.
Category	D
Management Observation	



PRN	33378
Sitename	Stermat, Caernarfon
NGR	SH4813562690
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	SHOP
Shown on OS map	
Status grade	
Description	Urban pitched roofed building
Category	D
Management Observation	Map evidence unclear



PRN	33379
Sitename	Workshop, Trawsfynydd
NGR	SH7088535250
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	WORKSHOP
Shown on OS map	1914
Status grade	
Description	Roadside workshop with pitched roof. Retains original timber four pane fixed windows with glazing bars. An early example of a corrugated workshop building. Oxide red.
Category	В
Management Observation	
PRN	33380
------------------------	---
Sitename	Cottage, Trefor
NGR	SH3749546608
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	COTTAGE
Shown on OS map	1953
Status grade	
Description	Detached corrugated iron cottage. Single storey prefabricated structure with brick chimney.
Category	C
Management Observation	



PRN	33381
Sitename	Hay Barns, Tremadog
NGR	SH5553739847
Unitary Authority	Gwynedd
Corrugated theme	Agricultural
Sitetype	HAY BARN
Shown on OS map	1953
Status grade	
Description	2 prefabricated corrugated steel hay barns. Iron framed. Painted green.
Category	C
Management Observation	



PRN	33382
Sitename	Hangars, RAF Valley
NGR	SH31037575
Unitary Authority	Ynys Mon
Corrugated theme	Military
Sitetype	HANGAR
Shown on OS map	1953
Status grade	
Description	2 Bellman and 1 Gaydon Hangars
Category	В
Management Observation	

PRN	33383
Sitename	Wally & Co Ltd, Slate Quay, Caernarfon
NGR	SH4793062585
Unitary Authority	Gwynedd
Corrugated theme	Commercial
Sitetype	WORKSHOP
Shown on OS map	
Status grade	
Description	Curved roofed corrugated iron building on Slate Quay
Category	В
Management Observation	Map evidence unclear



MA Historic Environment Conservation

PRN	33384	
Sitename	Women's Institute, Llanfairpwllgwyngwll	
NGR	SH5313371540	
Unitary Authority	Ynys Mon	
Corrugated theme	Meeting Place	
Sitetype	MEETING HALL	
Shown on OS map	1953	
Status grade		
Description	Pitched roof building made from corrugated iron and attached to the tollhouse. Llanfairpwll was the birthplace of the WI but not at this building. A small cottage nearby was the founding venue in 1915. The WI transferred to this building during the inter-war period.	
Category	С	
Management Observation		



PRN	33385
Sitename	Workshop, Mor Awelon
NGR	SH5183179442
Unitary Authority	Ynys Mon
Corrugated theme	Commercial
Sitetype	WORKSHOP
Shown on OS map	
Status grade	
Description	Corrugated iron workshop. Painted green. Two storeys to east end.
Category	C
Management Observation	



PRN	33386
Sitename	Workshop, Tudweiliog
NGR	SH2358536510
Unitary Authority	Gwynedd
Corrugated theme	Domestic
Sitetype	WORKSHOP
Shown on OS map	1900
Status grade	
Description	Early example of a prefabricated corrugated iron workshop. Large windows running the length of the north east side of the building. Painted black and of gable-entry type. Original purpose unknown.
Category	В

Category Management Observation



PRN	33387	
Sitename	Youth Centre / Military buildings, Llandudno Junction	
NGR	SH7964577960	
Unitary Authority	Conwy	
Corrugated theme	Military	
Sitetype	YOUTH CLUB	
Shown on OS map	1953	
Status grade		
Description	Large-scale pitched asbestos roof building retaining original windows.	
Category	С	
Management Observation		



# 5.2 Appendix 2 – On site recording form

### **Taken from Walker 2004**

TAN 29 CORRUGATED IRON AND OTHER FERROUS CLADDING

# 4.0 ON-SITE RECORDING

#### 4.1 Basic Information

#### xiv) Condition

It is useful to collect the basic information on a special card or printed form which can be used as a check list on completion of the survey to ensure that all available information has been collected or identified.

The information should include:

- i) County or City
- ii) Parish or Town
- iii) OS Grid Reference
- iv) Postal address including postcode

In remote situations it may be necessary to give a brief description as to how to get to the site, linked to national road numbers, distance to nearest prominent feature such as church, village or crossroads, and so on.

- v) Personnel involved
- vi) Date of Survey
- vii) Film number or image file reference
- viii) Persons interviewed
  - · Possible source of records
  - Owner
  - Tenant
- ix) Brief description of building or structure
- x) Orientation
- xi) Degree of exposure
- xii) Uses present, recent, past
- xiii) Materials roof

- walls

- floors
- foundations
- doors
- windows
- shutters
- verandah
- ventilators
- chinneys

- xv) Finishes
- xvi) Colour present, previous
- xvii) Repeat sections xiii-xvi for interior
- xviii) Wall filling
- xix) Account of known history
- Manufacturer's name nameplate may be attached to the structure (if so, identify location)
- sxi) Type of corrugated sheet
  - guuige
  - profile
  - pitch of corrugations

#### 4.02 Detailed information

- 1) Measured survey
- ii) Detailed description of basic structure
- Detailed description of jointing system for basic structure
- iv) Detailed description of construction
- v) Detailed description of materials
- vi) Detailed description of fixing devices
- vii) Assess condition of all elements
- viii) Non-intrusive investigation of all cavities:
  - roof space
    - -wall cavities
    - floors
    - solum
- (x) Availability and condition of services.
  - electricity
  - gus
  - telephone
  - water
  - drainage

- x) Photographic record
- xi) Check site against 1st and 2nd editions of OS Maps

#### 4.3 Cladding assessment and recording

- i) Material(s)
- ii) Finish
  - externalinternal
  - colours

It may be necessary to perform paint analysis to establish the above: check whether base metal is galvanised or not, and look for traces of other primer types.

iii) Gauge of metal

- iv) Pitch of corrugations
- v) Depth of corrugations
- vi) Detail of corrugation profile
- vii) Amount of side lap one, one-and-n-half or two corrugations

à

- viii) Amount of end lap
- ix) Presence of cover straps and the like.

.

# 5.3 Appendix 3 – Select extracts from Hill & Smith Ltd Sales Catalogue





Design No. 838.

The above is a photograph of part of an extensive Loading Shed. It consists of the right hand Span which is 25 feet (7.62a) wide, the middle Span 33 feet (10.05a) wide and the left hand Span with skew end against the middle Span, which is curved along its entire length. Over the Filhead is a Curved Root 46 feet long (14.02a)  $\times$  39 feet wide (11.88a). Each Shed is lighted through the Root which is partly glazed with fight. (4.76am) Rolfed Ribbed Glass ; the covering being No. 22 E.W.G. Galvanized Corrugated Sheets.

Prices for Rools to cover the most complicated plans (which, if in this country, will be surveyed free of charge by Hill & Smith, Ltd.), will be submitted on application.



#### No. 839.

The Building in the above view comprises an Engineering Workshop manufactured and erected by Hill & Smith, Ltd., for the Motor Car Industry. It covers 14,400 square leet (1,340 square metres) and is 80 feet long (24,38x) having 6 spans 25 feet (7,62a) wide, with Northern Lights and one span 80 (set wide (9,14a)) with a Petched Root. The Sides, Ends, and the Root are covered with Galvanized Corrugated Sheets No. 22 B.W. Gauge. The Northern Lights and Skylights on the Pitched Roof are glazed with  $\frac{1}{16}$  inch (4,76ux) Roled Ribbed Glass. The internal Stanchions are placed 20 feet (6,09a) apart supporting Rolled Steel Girdes 10 inches × 5 inches (253a × 126a) on which the Principals rest at 10 feet (3,04a) certies. Two large Skiding Doors are provided on the lar side, and one small one in the left hand span as shown, also 16 from Windows in two ends. Cast: Iron Valley Gutters are provided between each span also Eaves, Gutters and Downpipes. The Roof Sheets are fixed on Patent Condensation Saddles to prevent drip.



# 5.4 Appendix 4 – Categories of importance

# Based on the Design Manual for Roads & Bridges (DMRB) categories:

## Category AA – Sites of international importance

World Heritage Sites, Scheduled Ancient Monuments and Grade I listed buildings. All such sites must be preserved in situ.

## Category A – Sites of national importance

Scheduled Ancient Monuments and listed buildings of grade II\* and above as well as those that would meet the requirements for scheduling, or listing, or both. All such sites must be preserved in situ.

## Category B – Sites of regional or county importance

Grade II listed buildings and those sites which would not fulfil the criteria for scheduling or listing but which are nevertheless of regional importance. All such sites should be preserved in situ.

# Category C – Sites of district or local importance

Sites which do not meet the criteria for designation should be preserved in situ where possible. Wherever this is not possible and such sites are under threat, detailed recording should be undertaken.

## Category D – Minor and damaged sites

Sites of minor importance or that have been so significantly damaged that they cannot be categorized at a higher level.

## Category E – Sites of unknown importance

Sites, the importance of which is a yet undetermined and which further investigation is required before they can be allocated to categories A - D.

# 5.5 Appendix 5 – Welsh Office Circular 61/96 Annex C

#### ANNEX C

### LISTED BUILDINGS - PRINCIPLES OF SELECTION

1. The following are the main criteria which the Secretary of State applies in deciding which buildings to include in the statutory lists:

- architectural interest: the lists are meant to include all buildings which are of
  importance to the nation for the interest of their architectural design, decoration
  and craftsmanship; also important examples of particular building types and
  techniques (e.g. buildings displaying technological innovation or virtuosity) and
  significant plan forms;
- historic interest: this includes buildings which illustrate important aspects of the nation's social, economic, cultural or military history;
- close historical associations with people or events of importance to Wales;
- group value: especially where buildings contribute an important architectural or historic unity or are fine examples of planning (e.g. squares, terraces or model villages).

2. Age and rarity are relevant, particularly where buildings are proposed for listing on the strength of their historic interest. The older a building is, and the fewer the surviving examples of its kind, the more likely it is to have historical importance. Thus, all buildings built before 1700 which survive in anything like their original condition are listed, and most buildings of about 1700 to 1840 are listed, though some selection is necessary. After about 1840, because of the greatly increased number of buildings of definite quality and character are listed. Buildings which are less than 30 years old are normally listed only if they are of exceptional quality and under threat. The approach adopted for twentieth century listing is to identify key examples for each of a range of building types – industrial, educational, hospitals, etc – and to treat these examples as broadly defining a standard against which to judge proposals for additions to the lists.

#### Selectivity

3. Where a building qualifies for listing primarily on the strength of its intrinsic architectural quality or its group value, the fact that there are other buildings of similar quality elsewhere is not likely to be a major consideration. The listing of buildings primarily for historical reasons is to a greater extent a comparative exercise, and, where a substantial number of buildings of a similar type and quality survive, needs to be selective. In such cases the Secretary of State's aim will be to list the best examples of the type.

#### **Aesthetic Merits**

4. The external appearance of a building – both its intrinsic architectural merit and any group value – is a key consideration in judging listing proposals, but the special interest of a building, for example those which are important for reasons of technological innovation, or as illustrating particular aspects of social or economic history, will not always be reflected in obvious visual quality.

#### Historical Associations

5. Well documented historical associations of a building's importance to Wales will increase the case for its inclusion in the statutory lists. They may justify a higher grading than would otherwise be appropriate, and may occasionally be the deciding factor. But in the Secretary of State's view normally there should be some quality or interest in the physical fabric of the building itself to justify the statutory protection afforded by listing. Either the building should be of some architectural merit in itself, or it should be well preserved in a form which directly illustrates and confirms its historical associations (e.g. because of the survival of internal features). Where otherwise unremarkable buildings have historical associations, the Secretary of State's view is that normally they are best commemorated by other means (e.g. by a plaque), and that listing will be appropriate only in exceptional cases.

MA Historic Environment Conservation

# 5.6 Appendix 6 – Listed Building Description – Arenig Quarry Workers' Cottages

UNITARY_AU	Gwynedd	GRADE	п
NATIONAL_P	Snowdonia	DATE_LISTE	10/22/01
COMMUNITY	Llanycil	LAST_AMEND	10/22/01
LOCALITY	Arenig	Grid Ref	283390 339320
POST_CODE		RECORD_NUM	25813
NAME	Pair of former Quarry Workers' Cottages		
STREET_NUM			
STREET_SID			
LOCATION	On the roadside, in the hamlet of Arenig.		
	cottages were erected as p This was founded in 1905 continued here until c198 building, as well as paving commonly employed in th prefabricated material was throughout the then Empi however becoming scarce several originally built to	orivisional accommodation for work by Evan Jones as the Arenig Granit 0. It provided granite chippings for g setts. Such temporary corrugated i he later C19 and early C20. This ch e sepacially suited to industrial, mili re; good surviving late C19 and earl . This pair of cottages is the last su serve the former quarrying commun	ters at the Arenig Quarty. te Co. Ltd., and quarrying railway ballast and road iron architecture was eap, adaptable and tary and pioneering use y C20 examples are, viving one of apparently ity at Arenig.
EXTERIOR	Single-storey pair of two former quarry-workers' cottages, arranged as a reflected pair. Of timber-framed construction with corrugated iron cladding on a rubble plinth; continuous slate roof with plain wooden bargeboards. The cottages are sited on the roadside and are built out over a steep gradient to the rear. Shared squat central chimney of red briek, with comicing and paired ceramic pots. Each unit has a central projecting porch with catslide roof and entrance to the E (R) return; that to the R has a 6-panel door of late Victorian type, the door to the L unit is missing. Flanking the porch are single windows to each unit, relating to a 2-room interior arrangement; both right-hand windows retain their 9-pane sashes, whilst those to the L have been blocked-up.		
INTERIOR	The interior was not inspe	ected at the time of survey.	
REASON	Listed for its special socio-historic interest as a scarce surviving example of a corrugated iron-clad designed pair of early C20 quarry workers' cottages.		
REFERENCE	Jones W L, Cofio Tryweryn, 1988, p12.		

# Listing Query

MA Historic Environment Conservation

# 5.7 Appendix 7 – Example information leaflet – INFORM Historic Scotland





Ironbridge Institute, University of Birmingham MA Historic Environment Conservation 2009-2010

Candidate No. 1062396