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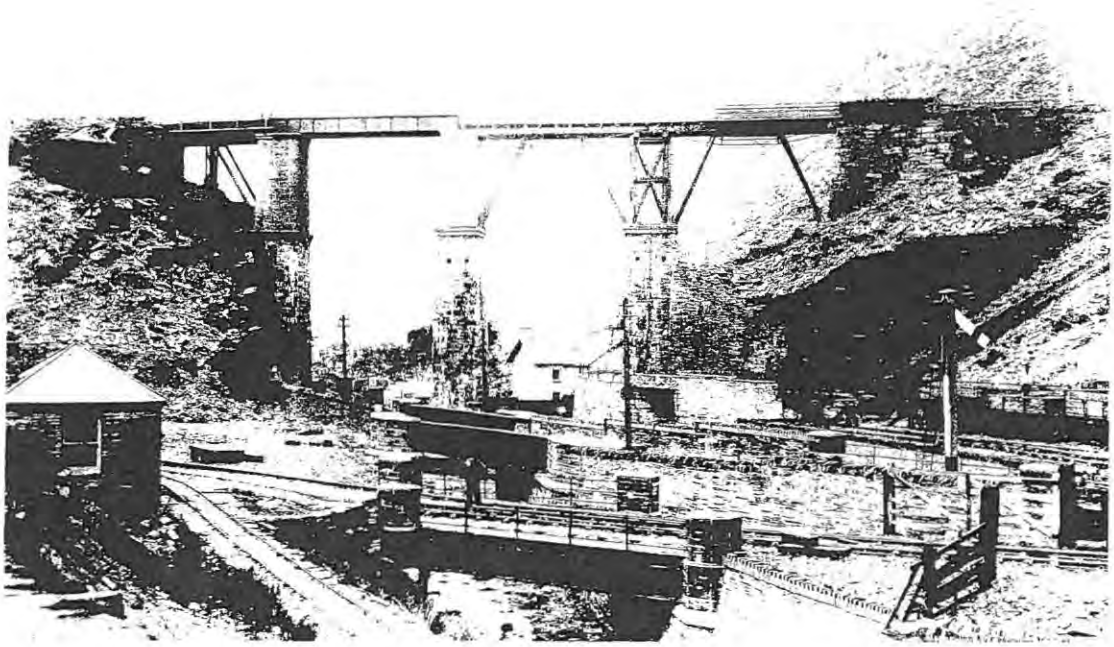

CONSERVATION MANAGEMENT PLAN FOR THE PANT YR AFON SITE LLECHWEDD SLATE MINE

On behalf of
J.W. Greaves and Sons Ltd,
April 2005

Report GC103

CONSERVATION MANAGEMENT PLAN: PANT YR AFON SITE

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Abbreviations: the following abbreviations are standard throughout this document:

BL: British Library

CMP: Conservation Management Plan.

CRO: Caernarfon Record Office, Gwynedd Archives Service

DRO: Dolgellau Record Office, Gwynedd Archives Service

HER: Historic Environment Record (formerly the Sites and Monuments Record) – maintained by Gwynedd Archaeological Trust

FR: Festiniog Railway (it should be noted that although Welsh orthography spells Ffestiniog with two fs, this is the official title of the railway through its act of parliament).

LNWR: London and North Western Railway

NLW: National Library of Wales

PRO: Public Record Office, Kew

WAG: Welsh Assembly Government

Executive summary:

The following document represents a first stage Conservation Management Plan for the Pant yr Afon exchange sidings and power station site at Blaenau Ffestiniog, Gwynedd, prior to consultation. It has been commissioned by J.W. Greaves and Sons Ltd, and carried out by Dr David Gwyn, an industrial archaeologist and a sessional lecturer in Heritage Management in the School of Business and Regional Development, University of Wales, Bangor, with specialist advice where necessary from Dr Gwynfor Pierce Jones, Morris Higham and Mark Roberts. The document concludes that the site is an important late-Victorian inter-modal transport site containing a very early hydro-power station, and that it has considerable regenerative potential as a visitor attraction. Appropriate measures for mitigation of any necessary intervention in the site and for its long-term conservation and management are set out.

Note: the sketches which accompany this document are by Falcon Hildred, a Blaenau artist who specialises in industrial scenes. They were specially commissioned for the present study. They are indicative only and are not intended to represent specific proposals for the Pant yr Afon site.

Front cover: Pant yr Afon in 1887, with Bont Goch in the background. Copyright the Festiniog Railway, by kind permission of Adrian Gray, FRCo. Archivist.

CONSERVATION MANAGEMENT PLAN: PANT YR AFON SITE

1 INTRODUCTION

1.1 Background to the present document

The present document constitutes a Conservation Management Plan (CMP) for the Pant yr Afon site at Blaenau Ffestiniog, Gwynedd. It has been commissioned by J.W. Greaves and Sons Ltd, the owners of the site, from Dr David Gwyn, an industrial archaeologist and a sessional lecturer in Heritage Management in the School of Business and Regional Development, University of Wales, Bangor, with specialist advice where necessary from Dr Gwynfor Pierce Jones, Dr Ron Fitzgerald of Structural Perspectives and Morris Higham BSc, BArch, MA, RIBA, AABC. It has been supervised by Mark Roberts, an independent planning consultant.

1.2 Methodology

Following discussion with the client, it was resolved to prepare the document as a first-stage Conservation Management Plan with a view to identifying priorities for the site, in the light of the likelihood of the present A470 road, which runs through the site, being re-aligned, by the various proposals published and put forward by the Welsh Assembly Government (WAG) and thereby have an impact on the site. It is anticipated that further documents will be prepared as necessary to identify specific mitigation measures in the light of threats to individual features to the site, as these have been identified by the present document. To this end, J.W. Greaves and Sons Ltd have also commissioned from Structural Perspectives a more detailed second-stage survey of the two listed bridges on the site, which should be read in conjunction with the present document.

2 SUMMARY DESCRIPTION OF THE PANT YR AFON SITE

2.1 Location

The Pant yr Afon sidings and the power station are situated at SH 697 569 C in the community (formerly civil parish) of Ffestiniog, Gwynedd, within an area and a cultural landscape extensively shaped by slate-quarrying and its associated transport needs over a period spanning the early nineteenth century to the early twenty-first.

2.2 Constituent elements of the site

The site includes:

- a listed Grade II* direct-current hydro-electric power station of 1904-5 and its associated hydraulic systems
- listed structures, including bridges, buildings and a crane, and the site of sidings to transfer slate from Greaves' narrow gauge railway to a standard-gauge railway, the former LNWR
- the site of an end-on junction between Greaves' railway and the Festiniog Railway (FR).

2.3 Landscape context of the site

Archaeologically and historically, the site and its various elements form a discrete and coherent whole within a broader cultural landscape.

3 OWNERSHIP

The site is presently (April 2005) owned by J.W. Greaves and Sons Ltd; see **APPENDIX 1, MAP 1**. J.W. Greaves and Sons Ltd was incorporated on 22 November 1900, in succession to a tontine partnership in force from 1846. Quarry Tours Ltd is a subsidiary of J.W. Greaves and Sons Ltd; this is the company which runs the visitor attraction at Llechwedd Slate Mine. Also relevant is Slate Heritage International Ltd, a wholly-owned subsidiary of Quarry Tours Ltd, a registered charity and company limited by guarantee not having a share capital of which the object is 'to advance at Llechwedd,

Blaenau Ffestiniog, Gwynedd, the education of the public in the history and heritage of the slate industry', and is empowered by its Memorandum of Association *inter alia* 'to arrange the care, maintenance, preservation, enhancement, expansion, interpretation, recording, publication and dissemination of such heritage in an archival study centre.'

4 MANAGEMENT OF THE SITE

4.1 Existing management

The exchange sidings have been disused since the 1960s and facilities associated with them have suffered from blight owing to long-term uncertainty as to the future improvement of the A470, though the owners were in discussion with the Welsh Office as early as the 1960s in this connection. The standard gauge rails have been removed, as have some of the narrow gauge lines. The power station is maintained by J.W. Greaves but is not currently producing electricity.

The site contains two listed bridges, a listed hydro-electric power-house, a listed crane, and a listed weighbridge-house with associated structure. J.W. Greaves, as owners of the site, are liable for the maintenance of the listed structures.

The area forms one of the identified non-statutory *Landscapes of Outstanding Historic Interest in Wales*. The citation reads as follows:

> **BLAENAU FFESTINIOG**
>
> **Contents and significance** The foremost slate mining and quarrying landscape in Wales, sited in an elevated natural basin and its tributary valleys in south Snowdonia, containing an undisputed wealth of industrial archaeological remains comprising visually imposing and extensive slate quarry and mine workings, waste tips, associated buildings, transport systems and settlements dating from the late 18th to the early 20th centuries. The area also includes the Tanygrisiau hydro-electric pumped storage scheme, the first of its kind in Britain.

4.2 Strategic vision

It is the intention of the owners to develop the site in a manner suitable for interpretation for visitors and for life-long learning, and to this end they have been in discussion over a considerable period of time with the FR over the possibility of reinstating the FR's rail access to the Pant yr Afon area and the incline into the mine. The owners have welcomed school, university and special interest groups to the power station and wish to make it more widely accessible. The present document therefore constitutes a first stage Conservation Management Plan which now published prior to consultation.

5 CONTEXT FOR A CONSERVATION MANAGEMENT PLAN FOR THE PANT YR AFON SITE

The Pant yr Afon site was historically developed as an inter-modal transport link for the movement of slate as a marketable product and also for the hydraulic generation of electricity to facilitate the mining and quarrying of slate.

5.1 The slate industry

Landscape impact

Though slate is now only quarried to any significant degree at four locations in North Wales, of which J.W. Greaves's Llechwedd Slate Mine is one, the area probably accounted at the end of the 19th century for about three-quarters of the British output of roofing slate and one-half of world output. The industry dates to the Roman period, and enjoyed a modest expansion until the early nineteenth century, when slate came to be quarried or mined in well over 400 locations within the county of Gwynedd alone, varying from tiny trials which barely made the transition to commercial production through

middle-sized sites like Llechwedd Slate Mine to giants of the industry like the Penrhyn Quarry. The parish of Ffestiniog was one of the major productive areas, but because it was divided up among different owners, historically reserves of slate here were leased out by different estates to different tenants. Llechwedd went into production in 1849, one of the last hitherto-unexploited sites to be brought into use in the slate industry. Its neighbouring quarries to the west all formed part of the Oakeley estate, and were developed from the 1820s. Their expansion led to the landscape of slate rubble and of inclined planes which dominates the area to the west of the Pant yr Afon site, and to the remarkable bridge, 'bont goch', of which the pillars remain, built in 1852, which seems to owe its inspiration to I.K. Brunel.[1] Many of these transport features are carried on high slate retaining walls, which are a distinctive feature of the industry, and are seen to particularly good effect in the vicinity of Pant yr Afon. They are also a feature of the transport links that extend out from Blaenau Ffestiniog down the Dwyryd valley (for instance on the FR at Cei Mawr), and the Lledr valley (along the line of the A470).

By the end of the nineteenth century the slate industry in Gwynedd was employing in the region of 15,000 men, but the economics of the twentieth century were less favourable to the industry, and a long decline set in until the 1970s, when the industry enjoyed a new period of prosperity, thanks to the investment of major industrial organisations such as McAlpine's and the determination and financial management of the remaining Welsh managers.

Society and settlement

The development of the slate industry led in turn to new industrial settlements for quarrymen and their families, chiefly in the Ogwen valley, around Llanberis, the Nantlle valley, the Corris area and around the upper slopes (the *blaenau*) of the parish of Ffestiniog. These are now recognised as classic nineteenth-century industrial towns and villages in their own right (Carter 1989). The industry was, and to a great extent still is, conducted in the Welsh language, the only major capitalised British industry whose main language was not English. It traditionally sustained a remarkably sophisticated culture, centred on the chapel and the eisteddfod, which has contributed greatly to the present-day strength and vitality of the Welsh language.

Technology

The slate quarries of North Wales made a number of contributions to technical development. These included important early development of hydro-electric power and technology associated with narrow gauge railways. Topography made water-power eminently practical and distance from coal-fields made steam-power prohibitively expensive. The Blaenau-area quarries were pioneers in the development of hydro-powered electricity generation.

A significant feature of many quarries from the early 19th century to the late 20th was their use of narrow-gauge railways, typically to a gauge of 1' 11½", for internal traffic and frequently also for the transport of the finished product to harbour or to a main-line railway. The slate industry also called into being a number of statutory railways, of which the FR is one, opened in 1836 to connect the Ffestiniog quarries with the harbour at Porthmadog. Llechwedd made use of the FR from when it first moved into production in 1849, initially using pack-horses to cart slate down to the railhead. However, from 1854 it enjoyed direct branch rail access to the FR in the shape of a counter-balanced incline plane, of which the course is one of the archaeological elements of the Pant yr Afon site.

The FR and its associated mineral branch lines such as the Llechwedd incline are more than minor industrial railways of local consequence. The 'gauge question' had become controversial in the 1830s, when I.K. Brunel built the Great Western Railway to the 7' 0¼" gauge, requiring transfer of goods and people wherever it met Stephenson gauge (4' 8½") railways. The 1846 Gauge Act adopted the Stephenson gauge as standard, because of transfer problems. A Brunel-era transfer shed for the

[1] Charles Easton Spooner, the engineer of the FR, served his apprenticeship with Brunel at a time when the latter was building the Taff Vale Railway in Glamorgan. It is not confirmed that Spooner was the engineer of 'bont goch', though it is hard to see what other engineer locally would have been capable of such a design. Brunel is known to have been in the area 1848-1850 to observe the progress of the Britannia tubular bridge. See *Y Cymro*, 24 Medi 1852, Binding 1993, Buchanan 2002.

exchange of goods between the 7' 0¼"gauge and the 4' 8½" gauge has been conserved and re-erected at the Didcot Railway Centre.

It became controversial again in the 1870s, when conditions world-wide called for inexpensive secondary lines. Thousands of miles were built to gauges of between 2' and 3' 6" in Britain, Ireland, in the Isle of Man, the USA, New Zealand, India, France, Russia, Venezuela, South Africa, Uganda, Morocco, Bosnia, the Hercegovina, and elsewhere. Their effect on the economy of the developing world in the late nineteenth and early twentieth century is incalculable.

Two forms of practice informed these developments – Carl Pihl's adaptation of British technology for Norwegian narrow-gauge lines, and the success of the Festiniog Railway in adapting its horse- and gravity-operated mineral line into a locomotive-hauled system between 1860 and 1870. This was sealed by visits of several international delegations to the railway in 1870.

The growth of these systems rested on two assumptions; firstly that the costs of building a narrow-gauge line would be considerably less than the costs of a line built to a broader gauge; secondly that the costs of incompatibility with other railway systems were small enough to be justified by low initial construction costs. Rail-rail inter-modal transport links were therefore vital to the economy of many narrow-gauge railways.

Modern examples function wherever there is a change of gauge but few historic examples survive – see **Appendix 3**.

5.2 The Pant yr Afon site

History

Little is known of the Pant yr Afon area before the development of slate quarrying and mining and of transport links in the early to middle nineteenth century. A roadway of sorts is shown on a route approximating to the present A470 and to the pathway up to Llechwedd Slate Mine (31 on map) on the draft 2"/1 mile ordnance survey of 1818 and on the first 1" ordnance survey of 1839-41. This made its way to Tal Weunydd, and then on to Bwlch Gorddinan (the Crimea pass) and so to the Lledr valley. It is clear that a trackway to Bwlch Gorddinan ran immediately to the west of the Pant yr Afon site by 1863, when it is marked on DRO: Z/CD/171. This road does not seem to match the alignments shown on the I" OS, and presumably post-dates them; it may well date from 1854, when Llechwedd Slate Mine's historian, Ivor Wynne Jones, records that J.W. Greaves paid towards the cost of a bridge for the turnpike to cross the incline (Jones 1997). Under the auspices of the Portmadoc and Beaver Pool Turnpike Trust. a new road was engineered post-1863 on the alignment of the present A470 (DRO: Z/CD/171). It is clear from this document that the new road was not laid over any part of Llechwedd Slate Mine tip F (see below), but below the spread of the slate waste. Tip F has therefore not expanded to the west at this point to any significant degree since 1863.

The FR, as originally completed in 1836, seems to have extended to an upper terminus immediately to the north of the Pant yr Afon site, approximating to SH 6976 4694. Why this should have been so is unclear, since Llechwedd Slate Mine was not yet even at the trial stage but it is possible on map evidence (DRO: Z/DV/3/199) that this was where the track from the quarries on the Oakeley estate made its way down to the railhead. Once Llechwedd went into production in 1848, it made use of the FR, initially taking its material down by packhorse to Dinas until the incline was built in 1854 (Lewis 1988).

The LNWR railway reached Blaenau Ffestiniog in 1879; a temporary passenger terminus came into use by the mouth of the tunnel near Pant yr Afon on 22 July 1879, replaced by a long-term station in nearer the centre of the town on 1 April 1881. In the same year exchange sidings between the LNWR and Llechwedd Slate Mine's own railway system were brought into use at Pant yr Afon (DRO: Z/CD/47).

Though for the most part slate was transferred directly from wagons of one gauge to another at Pant yr Afon, for a number of years, the LNWR and Llechwedd Slate Mine made use of a system whereby narrow gauge wagons were 'piggy-backed' at Pant yr Afon for delivery on standard gauge wagons to a wharf on the mouth of the Conwy river at Deganwy. It has been suggested that this system was

introduced in 1886 and lasted until 1932 (IW Jones, 1997). 'Piggy-backing' of narrower-gauge rail vehicles on larger gauge rail vehicles was practiced in elsewhere in North Wales, and at Dowlais.

In 1904-5 a direct-current hydro-electric power station was erected on the site for the purposes of the mine's internal supply. This survives intact and in working order, though it does not currently produce electricity.

The Pant yr Afon site continued to be used for the transhipment of slate until the 1960s. The incline from the mine passed its last run in 1964, and thereafter for a number of years Llechwedd's lorries brought slate to the site whenever a load needed to be delivered by rail (pers. comm., Llechwedd staff).

5.3 Conclusion

The Pant yr Afon hydro-electric power station is a rare example of an early twentieth-century hydro-electric power station, with most of its original machinery. The Pant yr Afon powerhouse is a structure of national importance (recognised by listing as grade II*) on a number of counts. The development of practical electrical power from c. 1850 onwards led to as fundamental a technological revolution as the harnessing of steam in 1750-1850. Important work was carried out in North-west Wales.

It is also a structure of national importance as a complete and functioning example of the early industrial use of water-power. It is believed to be the oldest functional industrial power-house where electricity is generated from turbines in the United Kingdom. As yet, no comprehensive gazetteer of such structures and machinery has been carried out and any claims advanced for it must be provisional. However, by any standards, the Pant yr Afon power house is an extremely early survivor.

It is a structure of national importance in the context of the history and archaeology of the North Wales slate industry. The quarries made ingenious use of water-power; the value of Pant yr Afon in this respect is enhanced by the survival of an earlier type of water-driven prime mover, the iron suspension water-wheel of 1870, the largest water-wheel in the United Kingdom, in its original location at the Welsh Slate Museum, Llanberis. This water-wheel is a Scheduled Ancient Monument

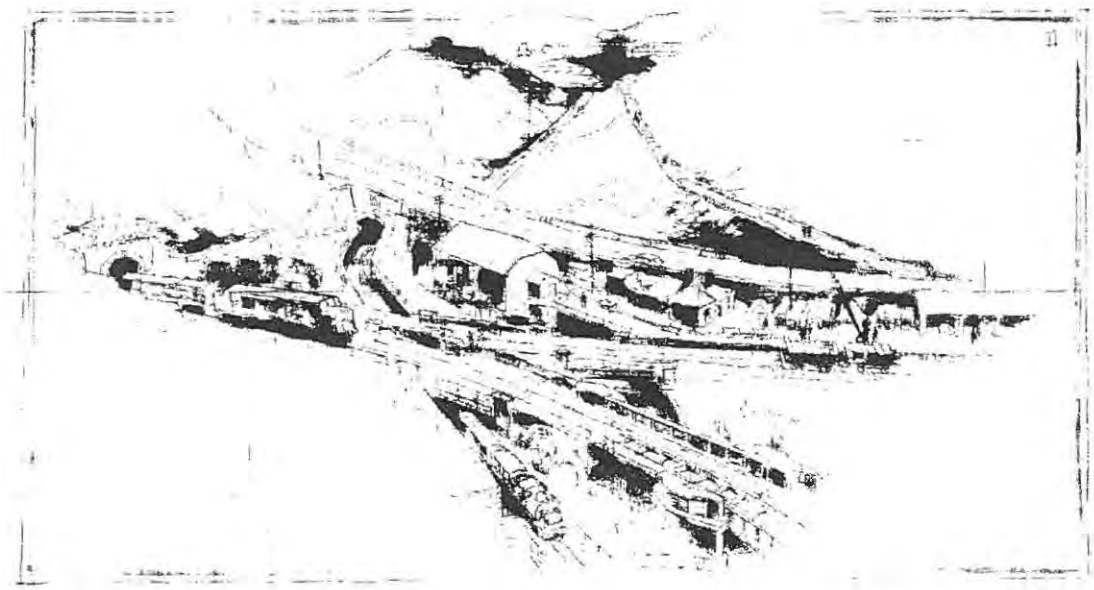
The Pant yr Afon power-house is a structure of national importance in the role of Blaenau Ffestiniog and its surrounding areas in developing water-generated electrical power. Experiments were being carried out at Llechwedd from the 1870s, and a power-station was established at the mine in 1890. Power station buildings survive regionally at Dolwen (1900), Croesor (1904), Cwm Dyli (1906) and Dolgarrog (1908); none retains its original, or in some cases any, machinery. Though it was left to Kellow, the engineer-manager of Croesor and Park slate quarries, to develop alternating current in a form which would be adopted world-wide, it is only at Pant yr Afon that original machinery from this crucial transitional period can be observed within a regional context.

The value of the site is enhanced by being a very rare surviving example of a rail-rail inter-modal transport link, as well as an example of early containerised transport in the form of 'piggy-backing'. There was precedent from 1843 on the Dinorwic Quarry railway in Gwynedd, engineered by Charles Easton Spooner of the Festiniog Railway; Spooner may have been inspired by the Dowlais system, which he is likely to have seen when apprenticed to Brunel. It was used on the Great Western Railway at Blaenau Ffestiniog for short-haul traffic. Pant yr Afon is the only site where archaeological evidence of this process survives in the United Kingdom.

Pant yr Afon therefore forms an element of, and contributes to, an outstanding cultural landscape of industry and transport. Understanding of this site is informed by its immediate environment, a cultural landscape which includes:

- The Festiniog Railway
- The standard gauge railway from Llandudno Junction to Blaenau Ffestiniog, including the tunnel, which made early use of compressed-air drilling, and the site of Blaenau's first standard-gauge station.
- The remains of the viaduct of c. 1854.
- The remains of 2' gauge railways and inclines in the former Llechwedd and Oakeley quarries
- The tips of slate waste from the Llechwedd and former Oakeley quarries

Narrow gauge public railways were extensively built in North-west Wales and in Ireland, though only very minimally in England or Scotland. Facilities to transfer goods and minerals between these systems and standard gauge railways were at one time to be found on many of these systems. A gazetteer of such sites forms **APPENDIX 3**.



Capriccio by Falcon Hildred – Pant yr Afon site

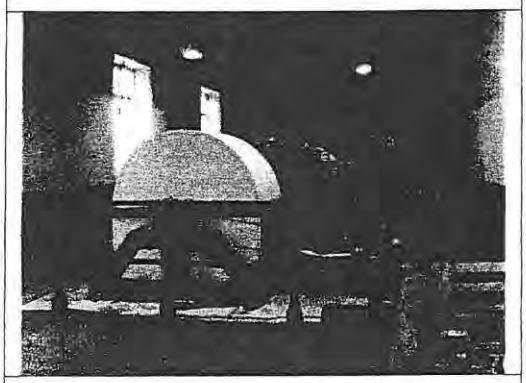
6 CONSERVATION PROGRAMME

Note: features are numbered as in WAG Environmental Statement, volume 2 Technical Appendix B.

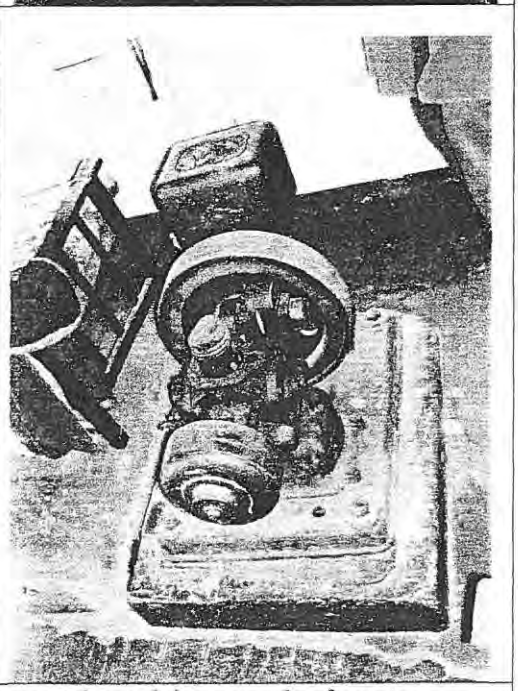
IDENTIFIER:	HYDRO-ELECTRIC POWERHOUSE	Gazetteer no.	1
Grid reference:	SH 6971 4688		

Description: This feature is believed to date from 1904-5. A single-storey building constructed of sawn slate blocks and some country rock with a slate roof, with slate ridging, orientated south-west to north-east; half-hipped gables and deep verges and eaves. There are four large small-paned wooden cross-windows on the long west-facing side. Along the east-facing longitudinal wall are three sliding doors. Single-storey entrance porch in the south-west gable with boarded door and half-hipped slated roof; weather-coursing at intersection with main block. The infilled remains of a lavatory block survive in the angle formed by the entrance porch and the southern gable. Woodwork is painted a distinctive shade of blue. Some Edwardian guttering remains, but some of the down-pipes have been replaced in plastic. Water is supplied by a 500mm pipeline.

The interior remains largely unaltered since its construction. The original twin system of turbines and generators remain. Turbines by Gilbert Gilkes and Co of Kendal, operating 175kw DC Johnson and Philips d.c. generators at 385 RPM. These are protected by a wooden fence of distinctively Edwardian design. General Electric switch-gear with meters by Lionel Robinson and Co. of Thames Ditton. 8-bay roof with plain bolted king-post trusses; contemporary 5 ton gantry crane. There was at one time an internal combustion unit within the building, which may have been powered by fuel in feature (30); the exhaust survives external to the building on the west side. A Petter oil-engine of 1920s design is set into the floor of the entrance porch, and aligns with a short length of line shafting.



The associated overhead wires and poles form distinctive features, with new aluminium wires and old insulators.



Statement of significance: Of international significance as an early surviving example of a water-powered electricity generating station containing most of its original machinery and for its group value with associated features.	
Statutory protection:	Listed Grade II* - Cadw record: 44/H/38(1); Record Number: 16884
Designations:	Outstanding Historic Landscape
Condition:	Generally the building is in excellent condition, though a crack is evident in

	the structure of the entrance porch. The machinery is out of commission and has suffered damage. The more northerly set has suffered damage to the generator; the more southerly has an earth leak. Otherwise both the building and the machinery are in good condition, carefully maintained by J.W. Greaves. Slate. The station is not currently producing electricity. CCTV has been introduced and some modern plastic rain-water goods have been installed
Vulnerability:	General vulnerability: Decay in stone work and pointing; lack of industrial use; vandalism; pressures from adaptation for visitor enjoyment and interpretation. Specific vulnerability: loss of landscape context from WAG published scheme; disruption of visual relationship with surroundings from proposed Alignment C. Alignments A and B would less deleterious impact than the WAG published scheme, but would be less beneficial than proposed Alignment C.
Potential:	This feature has the potential to interpret the development of hydro-electric power within the context both of the Welsh slate industry and of electricity supply more generally. It also offers the possibility of incorporation in a water-power themed series of linked sites within the area *eg* Pandy Moelwyn and the Llyn Ystradau pumped storage scheme.
Strategy:	Detailed specification for future use; adaptation in light of policy and best practice to incorporate interpretation facilities including disabled provision; restoration of existing machinery to full working order following agreed specification, under supervision of appropriately qualified conservation expert; sympathetic maintenance and restoration of structure, both internal and external; detailed record of any structural or mechanical intervention; immediate identification and preservation of redundant machine parts (to be identified with brass tags and kept in a suitable environment); a photographic record should be undertaken of all work done, and hard copies produced of all digital images. One copy should be lodged with Slate Heritage International, one with the HER and another at the DRO.
References:	IW Jones; listing description
Illustrations:	Isherwood

IDENTIFIER:	ROAD BRIDGE	Gazetteer no.	2
Grid reference:	SH 6972 4688		

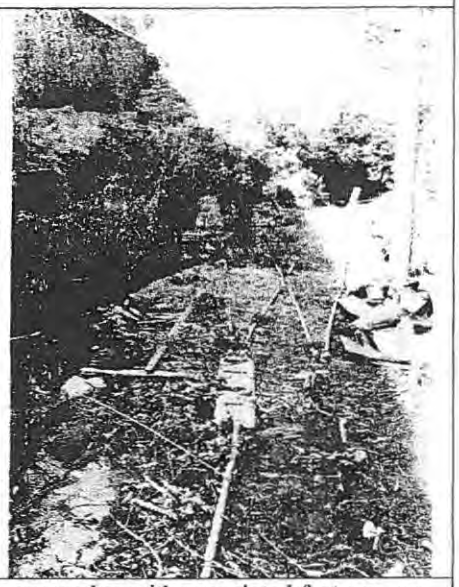
Description: A road bridge carrying the A470 (32) over 1'11½" gauge railway (4) from the incline (6) to the loading wharf (14). The skew arch is formed of bricks and is of a distinctively flat design.

Statement of significance: Of international significance for its group value with associated features.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	Some internal sagging observed in brickwork of arch, some dislodged brickwork.
Vulnerability:	Further decay; need for complete rebuilding in the event of adoption of WAG published route; need for complete rebuilding in the event of adoption of Alignment C.
Potential:	Potential to illustrate industrial-period use of narrow gauge railways.
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs. Rebuilding as much as possible on the scale and in the materials of the original. A photographic record should be undertaken of all work done, and hard copies produced of all digital images. One copy should be lodged with Slate Heritage International, one with the HER and another at the DRO.
References	OS maps
Illustrations:	Unknown

IDENTIFIER:	RAILWAY BRIDGE	Gazetteer no.	3
Grid reference:	SH 6975 4691		

Description: A railway bridge comprising both steel girders and wooden beams, with wooden cross-decking, carrying the 1'11½" gauge railway (4) over the Afon Barlwyd.



Statement of significance: Of international significance for its group value with associated features, as exemplifying narrow-gauge railway technology and for its association with the internationally-significant FR.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	In poor condition; much of the timber-work has rotted away, and the northern end is overgrown.
Vulnerability:	Further collapse; adoption of either WAG Alignment or Alignment C will result in the road being rebuilt immediately adjacent, or possibly, over this feature.
Potential:	Potential to illustrate industrial-period use of narrow gauge railways.
Strategy:	A specification for recording should be agreed with Cadw before any intervention occurs. Reconstruction in steel, in safety-compliant form; relocation as near as possible to original when road is re-aligned. A photographic record should be undertaken of all work done, and hard copies produced of all digital images. One copy should be lodged with Slate Heritage International, one with the HER and another at the DRO.
References	OS maps
Illustrations:	Not known

IDENTIFIER:	RAILWAY	Gazetteer no.	4
Grid reference:	SH 6977 4694 – SH 6972 4675		

Description: The remains of a length of 1'11½" gauge railway from the incline (6) to the loading area (14). It appears from photographic and map evidence that the system underwent little visible change between 1881 and 1964, with the exception of the removal of facilities for loading the narrow gauge wagons bodily on to standard gauge wagons. This involved wagon turntables at strategic points along the edge of the transfer dock. Most of the rails have now been removed, but their course is clear from documentary evidence. A quarry-type stub-point remains *in situ* at SH 6974 4691.

Statement of significance: Of international significance for its group value with associated features, as exemplifying the development of narrow-gauge railway technology and for its association with the internationally-significant FR.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	Some rails have been removed, and the course of the railway is heavily overgrown with *rhododendron ponticum* between (3) and (6).
Vulnerability:	All the proposed re-alignment will have an impact on the part of this railway which passes under the road.
Potential:	In view of the constricted nature of the site, the narrow-gauge rails can not be restored as a working railway. The railway should therefore be restored as near as possible like-for-like to illustrate the process of transfer as a static exhibit.
Strategy:	A specification for recording should be agreed with Cadw before any intervention occurs. New or second-hand flat-bottom rails of an appropriate weight (*eg* 20lbs/yard) should be laid spiked to wooden sleepers, on the site (as far as can practically be determined) of the pre-1964 rails. Re-alignment may be necessary where the road extends over the course of the railway. As an option, the 'piggy-backing' facility can be recreated using specially-made components *eg* wagon turntables. These should be based on existing turntables in the Quarry Tours complex. New pointwork should be specially fabricated on the pattern of the existing stub-point. All new items should be sourced from an acknowledged engineering conservation unit. Existing rails and other track components need not be preserved if their condition has deteriorated to such an extent that they are no longer suitable for even static exhibit use. The existing point, however, should be carefully conserved either *in situ* or on the re-aligned route, and restored to working order. Rails should be ballasted up to the rail top, both to preserve the Victorian/slate quarry ambience of the site and to minimise the danger to the visiting public of tripping. A photographic record should be undertaken of all work done, and hard copies produced of all digital images. One copy should be lodged with Slate Heritage International, one with the HER and another at the DRO.
References	Boyd 1986; Boyd 1965; Bleasdale; OS maps.
Illustrations:	Isherwood

IDENTIFIER:	ROAD BRIDGE	Gazetteer no.	5
Grid reference:	SH 6974 4692		

Description: A road bridge carrying the present A470 over the Dinas branch of the FR and the Llechwedd railway (16). On the west side a round arch with a rough stone voussoirs and a plain keystone are evident. On the east side the entrance is visible as a slab lintel. There have been several changes in the bridge's structure, including the introduction of wrought-iron roof supports, and both concrete and steel girders, to support a flat concrete roof, on which the date '1935' has been painted.

Statement of significance: Of international significance for its group value with associated features.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	Good
Vulnerability:	All proposed re-alignment of the road will have a direct impact on this feature; until the various construction details are known, we are unable to assess the comparative impacts.
Potential:	The bridge has the potential to secure for future use a rail link between the currently operational part of the FR and the Quarry Tours operation.
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy should be lodged with Slate Heritage International, one with the HER and another at the DRO. The western arch should be retained or replaced like-for-like; as the road is widened, the rail access should be retained. Consideration should be given to opening out the clearances for rail vehicles to allow possible second-generation rail access to Llechwedd.
References	OS maps
Illustrations:	Not known

IDENTIFIER:	RAILWAY INCLINE	Gazetteer no.	6
Grid reference:	SH 6977 4694 – SH 6996 4701		

Description: The course of a 1' 11½" double-track counter-balanced incline begun in 1852 and completed in 1854 to take finished roofing slate from the main Llechwedd quarry complex on floor 3 to the FR, with which it made end-on junction, and, from 1881, to deliver roofing slates to the loading area (14). Last used in 1964 and dismantled in 1970. The course of the incline is largely clear, though it is in places overgrown with *rhododendron ponticum*.

Statement of significance: Though counter-balanced inclines were a common feature of the Welsh slate industry, and more nearly complete examples survive, this feature is internationally-significant for its group value with associated features and for its relationship with the internationally-significant FR.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	Partly overgrown
Vulnerability:	No impact.
Potential:	The course of the incline has the potential to be re-used as part of a second-generation cable-hauled rail system which would enable visitors to reach the Quarry Tours complex from near the Pant yr Afon site.
Strategy:	A specification for recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. The course of the incline should be maintained as a linear feature and checked for stability with a view to eventual re-use as a second-generation cable-hauled rail system.
References	I.W. Jones, 1997
Illustrations:	Not known

IDENTIFIER:	ROAD BRIDGE	Gazetteer no.	7
Grid reference:	SH 6976 4690		
Description: the bridge which carries the A470 over the Afon Barlwyd. The rounded arch is formed of dressed stone quoins and has a prominent keystone. The arch itself probably dates from the re-construction of the Portmadoc and Beaver Pool turnpike on its 1863 alignment, but it is likely that the raised embankment above it on which the road runs is a later construction, possibly of more than one phase.			
Statement of significance: Of international significance for its group value with associated features and as exemplifying the development of transport technology.			
Statutory protection:	None		
Designations:	Outstanding Historic Landscape		
Condition:	Good		
Vulnerability:	The bridge will require rebuilding both all the routes.		
Potential:	The bridge has the potential to illustrate transport and bridging technology of the nineteenth century.		
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. The western arch should be retained or replaced like-for-like; a new eastern arch should respect the historic character of the road.		
References	OS map		
Illustrations:	Not known		

IDENTIFIER:	RAILWAY BRIDGE	Gazetteer no.	8
Grid reference:	SH 6977 4694		
Description: A bridge consisting of five steel girders with wooden cross-decking which carried the quarry incline (16) over the Afon Barlwyd. The bridge appears to be in its original location but has been partly covered with slate rubble at its south-western end.			
Statement of significance: Of international significance for its group value with associated features, as exemplifying the development of narrow-gauge railway technology and for its association with the internationally-significant FR.			
Statutory protection:	None		
Designations:	Outstanding Historic Landscape		
Condition:	Poor – partly covered with slate rubble		
Vulnerability:	This feature is vulnerable to collapse and to construction of any new alignment. There is little space for water underneath and the course of the channel has changed.		
Potential:	In that the incline (16) has the potential to furnish a second-generation rail access from the FR to the Quarry Tours complex, this feature is a potentially important part of that link.		
Strategy:	A specification for recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. The existing bridge girders, decking and abutments should be monitored for structural weakness; replacement, when carried out as part of a replacement rail access, should respect historic character but need not be like-for-like, and should be sufficiently strong to carry whatever passenger rolling stock is envisaged, as well as conformable to the requirements of Her Majesty's Railway Inspectorate in all other respects. A photographic record should be undertaken of all work done, and hard copies produced of all digital images. One copy should be lodged with Slate Heritage International, one with the HER and another at the DRO.		
References	OS maps		
Illustrations:	Not known		

IDENTIFIER:	PIPELINE	Gazetteer no.	9
Grid reference:	SH 6974 4689 – SH 7068 4692		

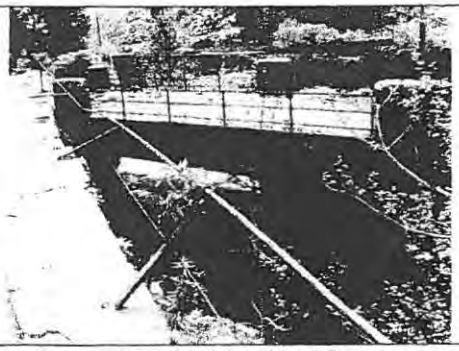
Description: A segmented steel pipeline which conducts water to the hydro-electric power house. It is likely that this is in essence a replacement, perhaps of the 1970s, and not the original installation of 1904-1906.

Statement of significance: Of international significance as a related element of the internationally-significant hydro-electric power station it serves.

Statutory protection:	Listed as part of the curtilage of the Grade II* listed hydro-electric power station.
Designations:	Outstanding Historic Landscape
Condition:	This feature is maintained by J.W. Greaves staff, and is monitored for faults.
Vulnerability:	Though a simple and robust construction, it is liable to cracking and corrosion.
Potential:	The pipeline is essential to the continued operation of the hydro-electric power station.
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. The pipeline should be maintained in good condition and working order; any replacement should be like-for-like.
References	DRO: Z/DAF/2515
Illustrations:	Not known

IDENTIFIER:	RAILWAY BRIDGE	Gazetteer no.	10
Grid reference:	SH 6969 4685		

Description: A cast-iron railway beam bridge, constructed 1881 when the Llechwedd quarry established its interchange facilities. The bridge crosses the Afon Barlwyd at an angle and is approximately 6m long. It originally carried a single-track siding from the LNWR Blaenau Ffestiniog to Llandudno Junction branch line railway; the rails have now been removed over this feature.



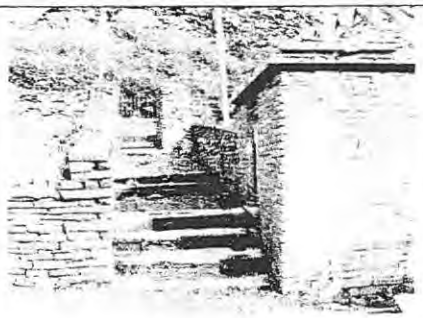
Statement of significance: Of international significance for its group value with associated features.

Statutory protection:	Listed structure Grade II; Cadw Reference: 44/H/40(1); Record Number: 16886
Designations:	Outstanding Historic Landscape
Condition:	In accordance with report prepared by Structural Perspectives.
Vulnerability:	In accordance with report prepared by Structural Perspectives.
Potential:	In accordance with report prepared by Structural Perspectives.
Strategy:	In accordance with report prepared by Structural Perspectives.
References	OS maps, report by Structural Perspectives.
Illustrations:	Bleasdale; Isherwood

IDENTIFIER:	WEIGHBRIDGE HOUSE	Gazetteer no.	11
Grid reference:	SH 6970 4684		

Description: A building in two phases. The weighbridge house was built in all probability as part of the original complex in 1881. It is shown in the Bleasdale album, of which the photographs were taken in August 1887. The mono-pitch roofed extension on the east is post-1887 in date; this has the remains of wooden louvred windows, suggesting that it was a transformer house, perhaps for a light circuit. The weighbridge-house contains the remains of a typical weighing device of the late nineteenth century built by Henry Pooley & Son of Liverpool, a major producer of weighbridges; parts of the steelyard are missing. The cast-iron fragments immediately outside the weighbridge to the west are not part of the weighing mechanism but are pieces of pointwork; the table lies underneath wagon parked outside. Fragments of the flue and the dripstone cap of the chimney are evident on the floor. One hinge for the shutter on the north-facing wall of the weighbridge house survives.

Immediately to the north of the weighbridge and abutting it, is an attractive set of steps leading down from a nineteenth-century style wrought-iron gate.



Statement of significance: Of international significance for its group value with associated features.

Statutory protection:	Listed Grade II; Cadw Reference: 1; Record Number: 25850
Designations:	Outstanding Historic Landscape
Condition:	This building is in poor condition. It is becoming dilapidated, and most slates are missing from the roof.
Vulnerability:	General vulnerability: further collapse and dilapidation; lack of industrial use; vandalism; pressures from adaptation for visitor enjoyment and interpretation. Specific vulnerability: loss of landscape context from WAG published schemes; dimunition of visual relationship with surroundings from proposed Alignment C. Alignments A and B would less deleterious impact than the WAG published scheme, but would be less beneficial than proposed Alignment C.
Potential:	This feature has the potential to interpret the Pant yr Afon site as an inter-modal transport area.
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. Reconstruction of the building should be like-for-like. The weighbridge itself should also be reconstructed like-for-like, and the weighing machinery should be reconstructed. The extension building should be rebuilt externally on a like-for-like basis.
References	OS maps
Illustrations:	Bleasdale; Isherwood

IDENTIFIER:	STRUCTURE	Gazetteer no.	12
Grid reference:	SH 6970 4681		

Description: The site of an open-sided mono-pitch roof store shed, built between 1901 and 1919, on map evidence. Its function is unclear but it may have been built to afford a dry shelter for goods required by the quarry and brought in on the LNWR, though photographs also show slate stacked in it. It had at least six open bays. It was largely demolished above ground level after it fell into disrepair as a consequence of the blighting effect of the road proposals, except for the back wall, which forms the boundary between the site and the A470, and parts of the gables at the northern and southern ends.

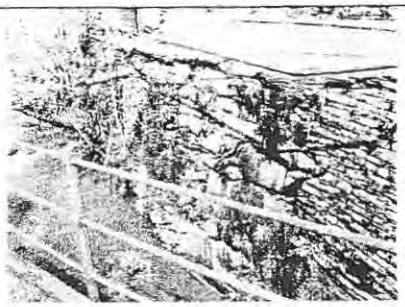
Statement of significance: Of international significance for its group value with associated features.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	Demolished above ground level. Part of the structure may survive in the boundary wall with the A470.
Vulnerability:	General: This structure is vulnerable to further dilapidation. Specific vulnerability: This structure will be completely obliterated if the WAG published scheme is adopted; there will be a risk of further dilapidation during construction works if Alignment C is adopted. Alignments A and B would less deleterious impact than the WAG published scheme, but would be less beneficial than proposed Alignment C.
Potential:	A reconstructed building on this site might assist the visitor experience by offering dry shelter in inclement weather, by providing a locale for interpretative material and by providing office space for on-site staff/guides.
Strategy:	A specification for recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. Any building constructed here should be built on the footings of the old, though it need not extend to the full length. Reconstruction should respect the historic character of the original and should be built of slate blocks and roofed with slate, but need not be like-for-like. Revealed glass front and doorways may be erected in the bays to provide office/interpretation space.
References	Bleasdale, Isherwood, OS maps
Illustrations:	Bleasdale, Isherwood

IDENTIFIER:	CRANE	Gazetteer no.	13
Grid reference:	SH 6970 4682		
Description: A hand-operated cast-iron crane with a wooden jib, made by W&J Galloway of Manchester, installed post-1887. The crane is typical of late nineteenth century goods yard practice, and swivels on a cast-iron base. A ratchet and pawl arrangement prevents slippage of the winding drum. Most of the break mechanism survives, though the handle has been broken off. The wooden jib has most recently been painted blue but traces of an earlier red paint are evident underneath. The jib is in good condition except for near the base. The cable, hoist block and the handle are missing.			
Statement of significance: Though many of these features survive, they are becoming progressively rarer. This structure is of international importance for its group value within the site and the surrounding cultural landscape and as exemplifying the process of transfer to and from different railway systems.			
Statutory protection:	Listed Grade II; Cadw Reference: 1A; Record Number: 25851		
Designations:	Outstanding Historic Landscape		
Condition:	Good		
Vulnerability:	Further decay; vandalism; obliteration of base-site in the event of adoption of WAG published schemeroute.		
Potential:	The crane has the potential to articulate the history of transfer between different modes		
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. Repair under the supervision of an acknowledged industrial conservation expert following agreement with Cadw. Research should be undertaken in the Galloway archive for plans.		
References	Isherwood		
Illustrations:	Bleasdale		

IDENTIFIER:	LOADING AREA	Gazetteer no.	14
Grid reference:	SH 6971 4680		

Description: A raised platform built into the hillside which provides a level base for (1), (2), (13) etc. and ensures equivalent levels for narrow- and standard gauge wagons during the process of transfer. The walls are made up of varying materials, including small slate 'rags' and some very substantial blocks, and are edged with slate coping stones cut with circular saws – some of them bear the distinctive striations of a Hunter patent saw. Some copings have been removed though they remain on site.



Statement of significance: Of international significance as exemplifying the process of transferring materials between different railway systems.

Statutory protection:	This falls within the curtilage of the listed buildings (the Pant yr Afon powerhouse – (1), and the weighbridge-house – (2) and the listed structure (the crane - 13).
Designations:	Outstanding Historic Landscape
Condition:	This is a robust feature, however, some of the copings have been removed and there is the possibility of stone-movement in the vicinity of the power station (southern gable).
Vulnerability:	General vulnerability: this feature is liable to further collapse, to removal of the copings and to vandalism. Specific vulnerability: if the WAG published route is adopted, this feature will be largely obliterated with complete loss of group value and landscape character; if Alignment C is adopted, there will be some slight dimunition of its visual relationship with its surroundings. Alignments A and B would less deleterious impact than the WAG published scheme, but would be less beneficial than proposed Alignment C.
Potential:	This feature has the potential to illustrate inter-modal rail transfer technology.
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. This feature should be consolidated in order to demonstrate the means by which materials were transferred between wagons of different gauge. Any new components *eg* slate rags or shaped stones, should as far as possible be in keeping with the original components of this feature. Any additional copings should be sawn with a Greaves saw rather than a diamond saw. Existing copings should be restored as far as possible. The restored platform should retain the look of an industrial feature insofar as this is compatible with Health and Safety requirements, *eg* an edge-of-platform marker.
References	Bleasdale; Isherwood; OS maps
Illustrations:	Bleasdale; Isherwood; OS maps

IDENTIFIER:	SIDINGS	Gazetteer no.	15
Grid reference:	SH 6969 4689 – SH 6971 4674		

Description: The remains of a standard (4' 8½") gauge railway system where main-line railway wagons were loaded with slate and in which main-line wagons had narrow-gauge wagons loaded bodily on to them. Documentary evidence indicates a single siding extending from the Llandudno Junction to Blaenau Ffestiniog railway which divided into a loop to allow locomotives to run round wagons; this is confirmed by the archaeological evidence, *eg* sleeper impressions. This system crossed the Festiniog Railway on a bridge (25) and the Afon Barlwyd on a bridge (10), and passed through a gate (27). The system underwent little visible change between 1881 and 1964.

Statement of significance: Of international significance as exemplifying the process of transferring materials between different railway systems.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	The formation is in good condition, and some sleepers and sleeper impressions are evident, though otherwise none of the trackwork survives.
Vulnerability:	General vulnerability: This feature is robust. Specific vulnerability: This feature will be severely damaged by the construction of the temporary diversion which forms part of the WAG published Alignment; the main route of the WAG published Alignment will also remove the landscape context for this feature; Alignment C will lead to some dimunition of its visual relationship with Tip F. Alignments A and B would less deleterious impact than the WAG published scheme, but would be less beneficial than proposed Alignment C.
Potential:	In view of the fact that there is no identifiable prospect of J.W. Greaves wishing to export split roofing slate down the branch-line railway, this feature should be restored like-for-like to illustrate the process of transfer.
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. Second-hand bull-head rails of an appropriate weight (*eg* 84lbs/yard) should be laid in chairs screwed to wooden sleepers, on the site (as far as can practically be determined) of the pre-1964 rails insofar as J.W. Greaves property extends. Renewed pointwork should respect the original location of the points. The existing point lever should be carefully conserved *in situ* and restored to working order. Rails should be ballasted up to the sleeper level to indicate the traditional technology of chaired main-line track. The wooden buffer-beam should be replaced like-for-like. A photographic record should be undertaken before any intervention occurs and at all stages of work done, and hard copies produced of all digital images. One copy should be lodged with Slate Heritage International, one with the HER and another at the DRO.
References	Boyd; Bleasdale; OS maps
Illustrations:	Boyd; Bleasdale; OS maps

IDENTIFIER:	RAILWAY	Gazetteer no.	16
Grid reference:	SH 6977 4694 – SH 6970 4685		

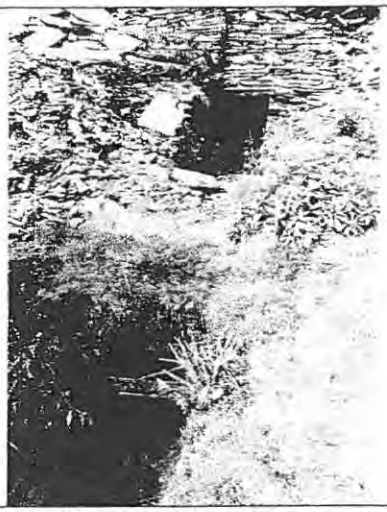
Description: The course of a 1' 11½" gauge railway system connecting the foot of the incline (6) with the FR. For much of its course this railway runs in a shallow slab-lined cutting and the formation is overgrown.

Statement of significance: Of international significance as exemplifying the manner of moving slate products by narrow gauge railway and for its associated with the internationally-significant FR.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	This feature is overgrown but is otherwise in good condition.
Vulnerability:	This feature is fundamentally robust but is liable to damage from the construction of the temporary diversion.
Potential:	This feature has the potential to be re-used as the formation for a second-generation rail-system which would enable Quarry Tour visitors to reach the main quarry complex from a re-laid section of the FR.
Strategy:	A specification for recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. Monitoring of cutting for stability; consideration for long-term re-use for rail access.
References	Boyd
Illustrations:	Boyd

IDENTIFIER:	DRAINAGE ADIT	Gazetteer no.	18
Grid reference:	SH 6977 4701		

Description: the Llechwedd quarry floor 'A' drainage adit. The mouth is a slate-built structure.



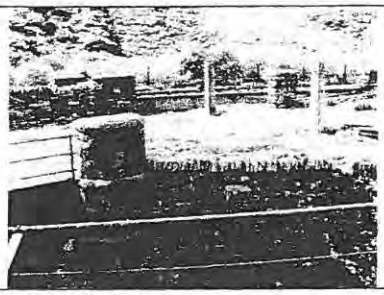
Statement of significance: Of regional importance as an example of an important feature in slate-mining.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	This feature is maintained by J.W. Greaves.
Vulnerability:	This feature is under no apparent threat.
Potential:	This feature has no apparent potential in conservation terms.
Strategy:	Maintenance of this feature on existing basis. A specification for recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO.
References	OS maps
Illustrations:	Not known

IDENTIFIER:	RAILWAY BRIDGE	Gazetteer no.	25
Grid reference:	SH 6969 4687		
Description: A cast-iron railway beam bridge, constructed in 1881 to carry a single track siding from the LNWR branch lie to the transfer area. It spans the railway (16) from the incline (6) to the FR. The rails have been removed.			
Statement of significance: Of international significance for its group value with associated features.			
Statutory protection:	Listed Grade II; Cadw Reference: 44/H/40(1); Record Number: 16886.		
Designations:	Outstanding Historic Landscape		
Condition:	In accordance with report prepared by Structural Perspectives		
Vulnerability:	In accordance with report prepared by Structural Perspectives		
Potential:	In accordance with report prepared by Structural Perspectives		
Strategy:	In accordance with report prepared by Structural Perspectives		
References	OS maps, report by Structural Perspectives.		
Illustrations:	Bleasdale; Isherwood		

IDENTIFIER:	GATE	Gazetteer no.	27
Grid reference:	SH 6969 4686		

Description: The site of a wooden gate. Two concrete pillars remain, but the gate itself has been removed.



Statement of significance: Significant for its group value with associated features.

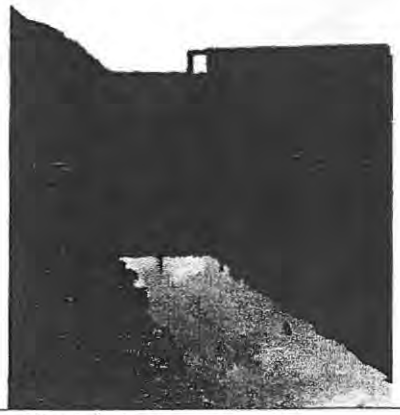
Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	Largely destroyed
Vulnerability:	The concrete pillars are liable to damage during construction of the WAG's temporary diversion
Potential:	Restoration of the gate will indicate the various patterns of ownership and the distinction between public and private railway systems, as well as recreating the ambience of the site.
Strategy:	The gate should be restored on a like-for-like basis as much as is possible. A photographic record should be undertaken of all work done, and hard copies produced of all digital images. One copy should be lodged with Slate Heritage International, one with the HER and another at the DRO.
References	Boyd, Bleasdale, Isherwood
Illustrations:	Boyd, Bleasdale, Isherwood

IDENTIFIER:	STRUCTURE	Gazetteer no.	28
Grid reference:	SH 6972 4675		
Description: A structure built of both sawn and unsawn slate blocks, which now survives to a maximum height of 2m. Believed latterly to have functioned as a garage.			
Statement of significance: Significant for its group value with associated features.			

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	Poor; the structure has suffered extreme dilapidation.
Vulnerability:	The structure is vulnerable to further dilapidation unless remedial work is carried out.
Potential:	Should the need arise, a building could be erected on the original footings. However, this end of the site is well adapted to provide a road access should Alignment C be adopted. The site of this structure would be obliterated by the WAG's preferred alignment.
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. Photographic evidence of the original building should be sought. A building erected on its footings should be as much as possible like-for-like in terms of building materials and roofline. If, however, a private means of access for road vehicles has to be constructed here, the remains of the building may be removed. In either case, a detailed drawn and photographic record should also be undertaken of all work done, one copy to be lodged with Slate Heritage International, one with the HER and another at the DRO.
References	OS maps
Illustrations:	None known.

IDENTIFIER:	STRUCTURE	Gazetteer no.	29
Grid reference:	SH 6971 4674		

Description: A structure is marked here on DRO: Z/DAF/2518. Its function is unknown. The remains of a wooden buffer-beam survive in the wall.



Statement of significance: Significant for its group value with associated features.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	Some of the walls enclosing (15) may have formed part of the structure. Otherwise, there is no apparent surface evidence of this building.
Vulnerability:	The site of this structure would be obliterated by the WAG's preferred alignment, and would be retained by Alignments A, B and C.
Potential:	Should the need arise, a building could be erected on the original footings.
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. Photographic evidence of the original building should be sought. A building erected on its footings should be as much as possible like-for-like in terms of building materials and roofline. If, however, a private means of access for road vehicles has to be constructed here, the remains of the building may be removed. In either case, a detailed drawn and photographic record should also be undertaken of all work done, one copy to be lodged with Slate Heritage International, one with the HER and another at the DRO.
References	OS map, DRO: Z/DAF/2518
Illustrations:	None known.

IDENTIFIER:	TANK	Gazetteer no.	30
Grid reference:	SH 6970 4685		

Description: A wrought-iron riveted tank on a three parallel concrete plinths on a wall of slate blocks. Two adjacent concrete plinths formerly supported a second tank. Immediately to the south of the tank is a small shelter, within which are two holding-down bolts. The purpose and function of the tank is unknown. Despite its superficial resemblance to a locomotive water tank, it does not ever seem to have served as such since there is no record of a locomotive ever having been used to shunt the narrow gauge lines at Pant yr Afon. The tank appears to have been re-used, as its construction appears to predate its introduction at Pant yr Afon – it is not marked on the 1919 OS maps. It may have supplied fuel to the internal combustion engine formerly located in (1).

Statement of significance: Of international significance as a constituent element of the Pant yr Afon power house.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	This feature is in good condition.
Vulnerability:	General vulnerability: dilapidation and further rusting. Specific vulnerability: this feature will lose its landscape context if the WAG's preferred route is adopted; it will suffer some dimunition of its visual relationship with Tip F if Alignment C is adopted.
Potential:	This feature has the potential to illustrate the role of energy and fuel supply with an industrial context.
Strategy:	A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. The tank should retain the appearance of a sturdy industrial structure.
References	OS map.
Illustrations:	Not known

IDENTIFIER:	FOOTPATH	Gazetteer no.	31
Grid reference:	SH 6972 4686 – SH 6988 4697		

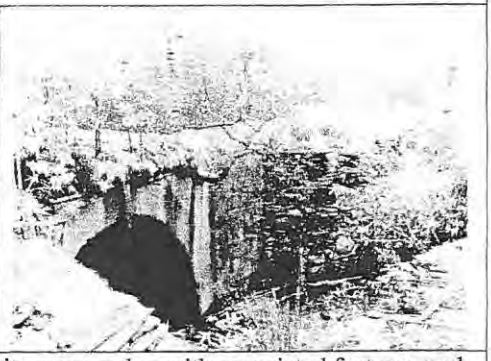
Description: A footpath extending from the A470 into Llechwedd quarry. This was once a major pedestrian access for quarrymen and may reflect the course of a trackway indicated on both the 1818 draft 2"/1 mile ordnance survey of 1818 and the 1838-1841 1"/1 mile ordnance survey. It was certainly an established feature in 1887 when the Bleasdale photographs were taken. The feature partly made up of large sawn ends of slate and stone setts.

Statement of significance: Of international significance for its group value with associated features, and as exemplifying pedestrian transport as compared to road and rail movement of goods.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	This feature is largely in good condition but the retaining wall adjacent to the water-pipe serving the listed power-house has collapsed across the path.
Vulnerability:	General vulnerability: further collapse of retaining wall, deterioration of path above. Specific vulnerability: the lower part of this feature will be at risk from construction work if the WAG's preferred route is adopted. There will be some loss of the lower part of this feature if Alignment C is adopted.
Potential:	This feature has the potential for controlled pedestrian access from the quarry to the Pant yr Afon site. Clearance of vegetation on path.
Strategy:	A specification for recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. Maintenance as private footpath subject to Health and Safety requirements; protection of feature by a rock capture ditch and boundary wall as per Groundsense proposals. To be restored northwards parallel to A470 to give access to (2).
References	Draft OS map of 1818; OS maps; Groundsense letter to J.W. Greaves, IGJ/GSL/1003/107-2, 8 July 2004.
Illustrations:	Bleasdale

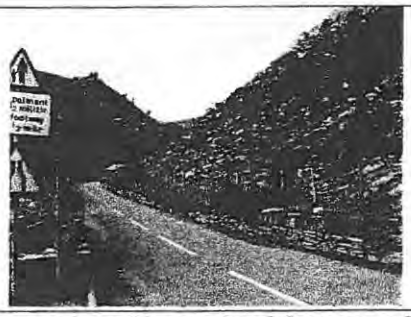
IDENTIFIER:	ROADWAY/CAUSEWAY	Gazetteer no.	32
Grid reference:	SH 6971 4681 C		

Description: The A470 road, which has its origins in the Portmadoc and Beaver Pool Turnpike. The road appears to be largely on the alignment indicated in the 1863 map, but may well have been raised, in that to the east, in the vicinity of features (2), (3), (5), (7) and (8) a linear feature is evident as a shelf below the present road level. It may that this represents the 1863 alignment and that the road was raised at a later date. Along the road itself are 1m high slate walls with sawn ends as copings. It is clear from map evidence that the road was built below the foot of tip F, on the natural ground level.

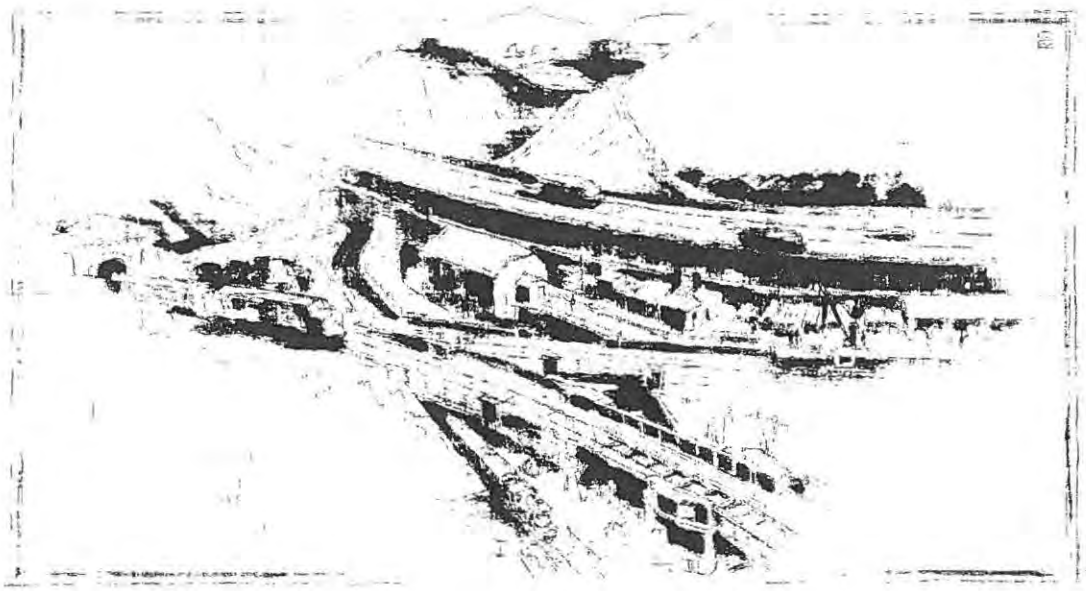


Statement of significance: Of international significance for its group value with associated features and as exemplifying the growth of road transport.

Statutory protection:	None
Designations:	Outstanding Historic Landscape
Condition:	The road is maintained by WAG Transport Directorate. Some of the distinctive coping stones have been removed.
Vulnerability:	This feature will be extensively rebuilt whether the WAG's preferred route is adopted or if Alignment C is adopted. The WAG's preferred route would radically disrupt the historic character of the cultural landscape of which the road forms part; Alignment C would respect the historic route and would reinforce the historic character by the introduction of a further retaining wall.
Potential:	The road illustrates the importance of the dense and multi-period transport routes through the Pant yr Afon area and the continued development of road technology in an historical period increasingly dominated by the railway as the emerging transport system.
Strategy:	Adoption of Alignment C. A specification for detailed recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. A detailed drawn and photographic should also be undertaken of all new work done, and similarly deposited. Any raised embankments or retaining walls should be in historic character. Consideration should be given to retaining the roadside footpath on its present alignment and on its present level, i.e. below the level of the road in Alignment C, as has been carried out recently on the Porthmadog cob.
References	DRO: Z/CD/171
Illustrations:	Bleasdale; Isherwood

IDENTIFIER:	SLATE TIP	Gazetteer no.	Slate tip F
Grid reference:	SH 6980 4680 C		
Description: A tip of slate waste, reflecting quarrying activities at Llechwedd Quarry from the 1840s to 1863. It contains waste from levels 2-6 and had achieved its present profile at this point by 1863. It contains mainly of unworkable rock from both open and underground workings with some mill waste.			
Statement of significance: Of international significance for its group value with associated features and for its landscape impact.			
Statutory protection:	None		
Designations:	Outstanding Historic Landscape		
Condition:	This feature is generally stable; there is no danger of substantive failure.		
Vulnerability:	General vulnerability: The WAG's preferred alignment would barely affect the tip in plan but would lead to significant disruption of its landscape context, of its visual relationship to the Pant yr Afon site and of the cultural landscape of the immediate area as a whole. Alignment C would cover a larger part of this feature but would only minimally diminish the visual relationship between the Pant yr Afon site and tip F.		
Potential:	The tip emphasises the enclosed nature of this industrial landscape; it forms an impressive feature for road travellers along the A470 and for railway passengers on the Blaenau Ffestiniog to Llandudno Junction branch line.		
Strategy:	A specification for recording should be agreed with Cadw before any intervention occurs; one copy of the record should be lodged with Slate Heritage International, one with the HER and another at the DRO. Other than changes consequent upon the building of the new road alignment, the tip should be left as it is, and no attempt made to speed up the process of vegetation. A photographic record should also be undertaken of all new work done, and similarly deposited.		
References	OS maps; Groundsense letter to J.W. Greaves, IGJ/GSL/1003/107-2, 8 July 2004.		
Illustrations:	Untitled water-colour by 'A.H.S.B' in private possession; CRO: LNWR/Plans/6; CRO: M/759/1.		

GENERAL STRATEGIES: PANT YR AFON SITE	
Grid reference:	SH 697 569 C
Description: A slate mine railway yard and hydro-electricity generating station dating from the late nineteenth and early twentieth century, within a broader landscape of industrial archaeology.	
Statement of significance: An internationally-important archaeological site, which includes evidence for inter-modal (rail-rail) transport and early electricity generation; its value is increased by its near proximity to the remains of bont goch, other transport features, including the FR, and the outstanding landscape of slate-quarrying and –mining which surrounds it, as well as by its proximity to the remarkable industrial town of Blaenau Ffestiniog.	
Statutory protection:	Some listed features
Designations:	Outstanding Historic Landscape
Condition:	Generally good.
Vulnerability:	General vulnerability: this site is vulnerable to a variety of pressures, including dilapidation, collapse and vandalism. Specific vulnerability: the site is vulnerable to change introduced by upgrading and re-aligning of the A470 road. The WAG's preferred alignment would lead to significant disruption of its landscape context, of its visual relationship to the Pant yr Afon site and of the cultural landscape of the immediate area as a whole. Alignment C would cover a larger part of this feature but would only minimally diminish the visual relationship between the Pant yr Afon site and tip F.
Potential:	The Pant yr Afon site has the potential for conservation as a gateway site to the town of Blaenau Ffestiniog, in view of its location and its proximity to transport links. It has the potential for development as an element in the broader visitor attraction managed by Quarry Tours, for a link with the FR and for incorporation in a town trail, and to assist in the regeneration of the area.
Strategy:	The adoption of Alignment C is much to be preferred to the alignment favoured by the WAG; though it will lead to some dimunition in the visual relationship between certain of the constituent features of the site and of the broader landscape, it will preserve the internationally-significant features in their appropriate landscape context, and materially assist the regeneration of the area. The creation of a new retaining wall will recreate the sense of enclosure which historically defined this site and perpetuate the way in which the road has developed. The site as a whole has the potential for restoration to its early condition. Proposals to recreate the site must be welcomed. The survival of archival evidence, including early railway track arrangement plans, makes it possible to do so in an informed manner. Conservation and reconstruction of the Pant yr Afon site will restore an internationally-important inter-modal transport site associated with the Festiniog Railway. Conservation of the hydro-electric power station will extend the life, and acknowledge the national importance, of this internationally-important feature.



Pant yr Afon site from the west, showing the A470 on Alignment C; by Falcon Hildred

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7.1 Primary sources

7.1.2 Visual and cartographic primary sources

Private possession: Untitled water-colour by 'A.H.S.B', 243mm X 150mm in frame, dated 1881, in private possession R. Hefin Davies esq., reproduced in **Appendix 2.**
CRO: LNWR/Plans/6 – LNWR Additional Powers, session 1871, map including Llechwedd quarry.
CRO: M/759/1 – plan of incline to floor 5, Llechwedd quarry, June 1867.
DRO: Z/CD/170 – book of reference to accompany Z/CD/171 below.
DRO: Z/CD/171 – sheet 2, plan of Portmadoc and Beaver Pool turnpike, deposited 30 November 1863 reproduced in **Appendix 2.**
DRO: Z/DV/3/199 – map of upper terminus of FR, 1836.
DRO: Z/CD/47 – land required at Blaenau Ffestiniog under the LNWR Additional Powers Act (session 1881).
DRO: Z/DAF/2518 – plan of Pant yr Afon site based on 1919 25"/1 mile, undated between 1919 and 1922.
DRO: Merionethshire 25"/1mile ordnance survey, 1899-1901, 1919 (note that first edition 1887-9 is not available)
PRO: RAIL 410/1403/A159 – photograph of Pant yr Afon area, 1879 (reproduced p. 104 of Reed **7.2** below)
NLW: JTC012 – photographic view of Rhiwbryfdir, 1879; wet collodion negative
Reprint of the first edition of the one-inch ORDNANCE SURVEY of England and Wales: HARLECH & BARDSEY (original surveyed 1838-9, published 1838-41; reprint Newton Abbott: David and Charles reprint, second impression, 1982).
BL: draft 2"/1 mile ordnance survey of 1818.

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Hilton GW: *American Narrow Gauge Railroads* (Stanford: Stanford UP, 1990).

7.3 Specialist reports

Ron Fitzgerald (Structural Perspectives): *Bridges 67 and 68, Llandudno Junction to Blaenau Ffestiniog line* (report commission by J.W.Greaves and Sons, April 2005).

8 ACKNOWLEDGEMENTS

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