

**Results of Archaeological Assessment at
Chwarel-y-Fedw Quarry Bridge and Causeway
Scour Protection Scheme**

NGR SH 74522 52695



Report Number CR183b-2019



CR ARCHAEOLOGY

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On Behalf of Cadarn Consulting Engineers

Summary

CR Archaeology have been instructed by Cadarn Consulting Engineers to conduct an Archaeological Desk Based Assessment at the bridge and causeway to former quarry at Chwarel-y-Fedw associated with a proposed Scour Protection Scheme. The bridge is a late C19 clapper-built causeway, originally carrying a narrow-gauge rail-link from the Chwarel-y-Fedw slate Quarry to the Prince Llewelyn Quarry. The bridge is a Grade II Listed Building (Cadw Id 18250).

This Desk Based Assessment examines the historic context, archaeological potential and statutory protections in place at the site.

Crynodeb

Mae Archeoleg CR dan gyfarwyddyd gan Beirianwyr Ymgynghorol Cadarn i ymgymryd Asesiad Wrth Ddesg at y bont a chawsai i chwarel blaenorol yn Chwarel-y-Fedw yn gysylltiedig gyda Chynllun Amddiffyniad Sgwrfa. Mae'r bont yn cawsai adeiledig-clepiâu 19C hwyf, yn wreiddiol yn cario rheilffordd gul o Chwarel llechan Chwarel-y-Fedw i Chwarel Tywysog Llewelyn. Mae'r bont yn Adeilad Cofrestredig Gradd II (Cadw Id 18250).

Mae'r Asesiad Wrth Ddesg hon yn archwilio'r cyd-destun hanesyddol, potensial archeolegol ac amddiffyniadau statudol mewn lle ar safle hon.

Results of Archaeological Works at Chwarel-y-Fedw Quarry Bridge and Causeway Scour Protection Scheme

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1.0 Introduction

1.0.1 CR Archaeology were instructed by Cadarn Consulting Engineers to conduct an Archaeological Desk Based Assessment at the proposed site of a Scour Protection Scheme (figure 1). The proposed works involve removing the bridge section spanning the river, rebuilding the abutments to match existing, and providing protection to the abutments (either gabion baskets or concrete apron). The bridge will then be reinstalled.

1.0.2 The proposed works will affect the Chwarel-y-Fedw bridge site and along the riverside immediately adjacent to both sides of the bridge.

1.0.3 The bridge is a Grade II Listed Building (Cadw Id 18250).

1.0.4 This document has been prepared to supply the client and statutory bodies including Cadw and the Local Planning Authority Archaeologist with information as to the archaeological potential, impact and constraints on the aforementioned scheme.

1.0.5 It is intended that the results of this work will inform decisions as to the nature of any additional heritage considerations/consultations which the scheme must be afforded and archaeological mitigation strategies or evaluation methodologies which may be required.

1.0.6 This Desk Based Assessment examines the historic context and archaeological potential of the proposed development area and determines the possible impact of the development on the setting of the local area.

2.0 Project Aims & Objectives

2.0.1 This programme of works for the development site aimed to undertake a Desk Based Assessment and site visit during which a photographic record was compiled.

2.0.2 The aim of this scheme of works was to undertake desk based historical research exploring the history/archaeology of the site. This information includes a map progression and archival research in order to compile a coherent narrative history of the site and its environs.

2.0.3 The Gwynedd Historic Environment Record (HER), the Royal Commission on the Ancient and Historical Monuments Wales (RCAHMW) database, Cadw database, Conwy Archives, Bangor University Archives, Gwynedd Archives and relevant publications were consulted to compile a record of known archaeological sites in the vicinity. Aerial photographs were also examined.

2.0.4 It is intended that this document be utilised to inform further archaeological planning decisions, conditions and considerations at the site. It will also inform the design/nature of works at the site.

2.0.5 The objectives of this programme of works were:

- To make full and effective use of existing information to establish the archaeological significance of the site
- To assess the impact of the development proposals on surviving sites, monuments or remains both within the development area and in the surrounding landscape
- To help inform future decision making, design solutions, further evaluation & mitigation strategies.

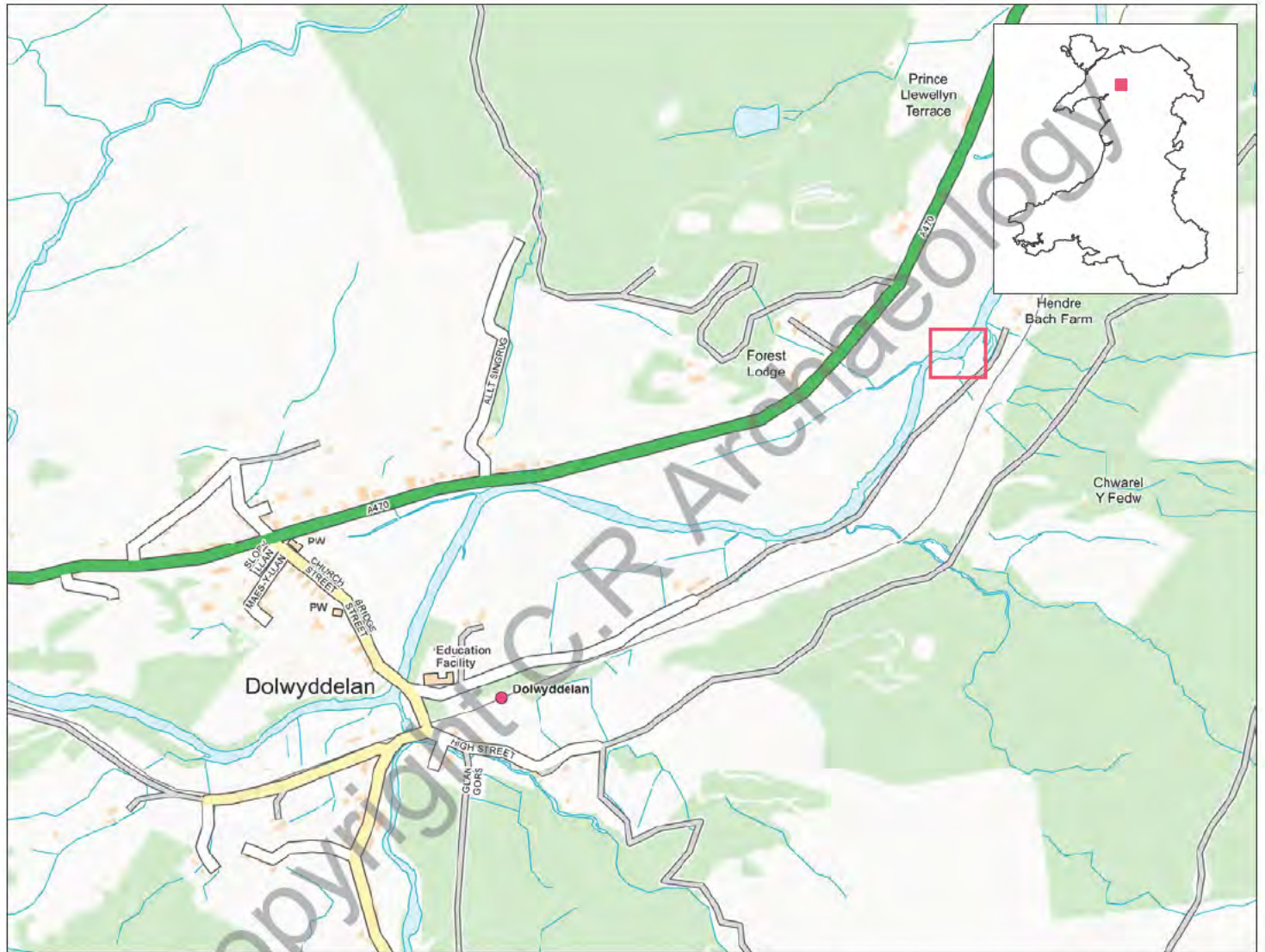


Figure 1. Site Location Map - Source: OS Open Data
(Contains Ordnance Survey data © Crown copyright and database right 2019)

3.0 Scheme of Works - Methodology

3.0.1 The archaeological works were conducted in three sections and each is detailed separately below.

3.1 Desk Based Research

3.1.1 A complete and coherent history of the site was compiled utilising material sourced from Conwy Archives, Bangor University Archives and Gwynedd Archives. This allowed as comprehensive a history as possible to be compiled. A full map progression of the area was undertaken, and the archive information was supplemented with information from the HER, Cadw & RCAHMW databases and specialist interest websites & journals.

3.1.2 In order to identify the character of archaeological remains in the vicinity of the proposed development site a search of the Gwynedd HER was conducted covering a 500m search radius. The RCAHMW database and aerial photographs of the site were examined. The information collected is discussed within the main report text.

3.1.3 The works were carried out accordance with the CIfA Standards and Guidance for historic environment desk-based assessment (CIfA (Revised 2014)).

3.1.4 This material forms the historical background for an archaeological report which includes the results of the site visit.

3.2 Walk Over Survey

3.2.1 A site visit was conducted, and a photographic record was compiled detailing the bridge structure, it's setting and environs and illustrating the general topography of the site. The location and direction of all photographs are noted on a site plan (included as Appendix A).

3.2.1 Equipment

3.2.1.1 Survey photographs were undertaken using a 20 mega-pixel Sony A58 digital camera with an 18-55mm lens. Images were captured in RAW format for later processing into high resolution JPG and TIF files.

3.3 Timetable for Proposed Works

3.3.1 The walkover survey was undertaken on the 16th July. Time has been allotted for archive research, report compilation and site archiving.

3.4 Staffing

3.4.1 The project was managed and undertaken by Catherine Rees (BA (Archaeology), MA (Archaeology) Postgraduate Diploma (Historic Environment Conservation) & Matthew Jones (BA (Archaeology), MA (Archaeology)).

3.4.2 All staff have a skill set equivalent to the CIfA ACIfA/MCIfA level. C.Vs for all staff employed on the project can be provided on request. All projects are carried out in accordance with CIfA *Standard and Guidance* documents.

3.5 Health and Safety

3.5.1 A risk assessment was conducted prior to the commencement of works and site staff were familiarised with its contents. A first aid kit was located in the site vehicle.

3.5.2 All staff were issued with appropriate Personal Protective Equipment (PPE) for the site work. This consisted of:

- Hi-visibility vests (EN471)
- Mobile Telephone (to be kept in site vehicle)
- Suitable Walking Boots & Waterproofs

3.5.3 All staff have passed at least a CITB health and safety test at least operative level and will carry a Construction Related Organisation (CRO) White Card for Archaeological Technician (Code 5363).

3.6 The Report

3.6.1 The report clearly and accurately incorporates information gained from the programme of archaeological works. It presents the documentary evidence gathered in such a way as to create a clear and coherent record. Where possible this includes illustrations of cartographic/pictorial sources. The report contains a site plan showing the locations of any photographs taken.

3.6.2 The desk-based assessment considered the following:

- the nature, extent and degree of survival of archaeological sites, structures, deposits and landscapes within the study area
- the significance of any remains in their context both regionally and nationally
- the history of the site
- the potential impact of any proposed development on the setting of known sites of archaeological/historic importance
- the potential for further work with appropriate recommendations

3.6.3 The report also includes:

- a bilingual summary
- a location plan
- a full bibliography of sources consulted
- a digital copy of the report and an archive compact disc/USB file

3.6.4 It is intended that this report will inform decisions as to the necessity and nature of any further archaeological mitigation strategies which may be required. It is also intended that this report will inform the design/development of the project.

3.6.5 A copy of the report in Adobe PDF format will be sent to the appropriate monitoring archaeologist for approval before formal submission. A bound paper copy and PDF digital copy of the report will be submitted to GAPS as part of the formal submission. A digital Adobe PDF version and a bound paper copy of the final report and will be lodged with the Gwynedd Historic Environment Record within six months of completion of fieldwork.

3.6.1 Copyright

3.6.1.1 C.R Archaeology and sub-contractors shall retain full copyright of any commissioned reports, tender documents or other project documents, under the Copyright, Designs and Patents Act 1988 with all rights reserved; excepting that it hereby provides a licence to the client and the local authority for the use of the report by the client and the local authority in all matters directly relating to the project as described in the Project.

4.0 Topographical and Geological Background

4.1 Topography

4.1.1 The application site is located crossing the Afon Lledr on the outskirts of the mining town of Dolwyddelan. It is crossed by a footbridge which has replaced an earlier tram bridge which linked the Chwarel-y-Fedw and Prince Llewelyn quarries. The site is part of a low-lying floodplain area.

4.2 Geology

4.2.1 The bedrock geology at the site is recorded as “*Cwm Eigiau Formation - Mudstone and Siltstone. Sedimentary Bedrock formed approximately 453 to 455 million years ago in the Ordovician Period. Local environment previously dominated by shallow seas. These sedimentary rocks are shallow-marine in origin. They are detrital, ranging from coarse- to fine-grained (locally with some carbonate content) forming interbedded sequences*” (www.bgs.ac.uk).

4.2.2 The superficial geology of the site is recorded as “*Alluvium - Clay, Silt, Sand and Gravel. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by rivers. These sedimentary deposits are fluvial in origin. They are detrital, ranging from coarse- to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river*” (www.bgs.ac.uk).

5.0 Historical Background

5.1 History of Dolwyddelan and Chwarel-y-Fedw Bridge and Causeway

5.1.1 The village of Dolwyddelan stands on the Afon Lledr, within the Lledr Valley. It is aptly described as being situated at “*the junction of many tracks at the beginning of the C19, but without a proper road to the outside world*” (Haslam et al 2009: 363). The village is reputed to take its name from St. Gwyddelan, approximately translating as Gwyddelan’s Meadow – although alternative etymologies have been suggested including an association with the Sarn Helen or Sarn y Llung (road of the legions) Roman Road. A church built around 1500, and dedicated to the saint, is located within the village. Sir John Wynn of Gwydir recorded that the present church was built by his ancestor Maredudd ap Ieuan, who acquired Dolwyddelan Castle in 1488. It is claimed that the church was rebuilt as he feared being ambushed at the more remote old church. The felling-date range of 1471-1501 obtained for the nave roof is consistent with this tradition (www.coflein.gov.uk/en/site/43742/details/st-gwyddelans-church).

5.1.2 It most notable monument in the area is the aforementioned Dolwyddelan Castle which is reputed to be the birthplace of Llewelyn ap Iorwerth (Llewelyn Fawr). There is however no evidence for any building work at Dolwyddelan Castle prior to the early 13th century when Llewelyn took control of the area. Together with Dolbadarn and Castell Y Bere, Dolwyddelan dominated the principle routes through Snowdonia (www.coflein.gov.uk/en/site/95299/details/dolwyddelan-castle).

5.1.3 The castle also functioned as a stronghold for Llewelyn ap Gruffydd, grandson of Llewelyn ap Iorwerth, and was captured by the English in 1283. Following its capture, Edward I garrisoned the castle and an English presence was maintained until 1290, when the castle was abandoned. The castle was reoccupied briefly in the 15th century by a local nobleman, Maredudd ap Ieuan and was extensively restored in the 19th century by Lord Willoughby de Eresby (ibid).

5.1.4 Settlement of the Valley is predominantly represented by small cottages and farms. The Reverend Bingley records of his tour of North Wales (undertaken 1798 – 1801) that “*The village itself is composed of little else than small cottages; for I only observe one house of tolerable size in the place*” (Bingley 1804: 439).

5.1.5 In his roughly contemporary Description of Caernarvonshire (undertaken 1809-1811), Edmund Hyde Hall records 115 houses within the parish along with two mills (one a fulling mill and one a corn mill). Hyde Hall also notes that an ale house has recently been opened within the village (Hyde Hall 1952: 138).

5.1.6 Of particular relevance within Hyde Hall's writing is a single mention of quarries in the village. He writes "*several roads meet in the village, and they are all steep, channelled, rough and laid down without regard to convenience. The one last made from the slate quarry to the public road shows somewhat more science in its construction, but it is still very indifferently made*". Although this does not specifically refer to either of the quarries linked by the Chwerel-y-Fedw it does provide evidence of quarries being worked in the area at this time (ibid).

5.1.7 Of the roads passing through Dolwyddelan, there are two routes which have been proposed as being part of the Roman Road network between Tomen y Mur - Bryn y Gefelïau – Canovium and are marked as Sarn Helen Roman Road on early Ordnance Survey maps. Work by David Hopewell on the Roman Roads of North Wales has concluded that it not possible to identify Roman features along these roads due to the presence of later roads utilising the same route, although they cannot be discounted as possible Roman routes (Hopewell 2013).

5.1.8 Hyde Hall describes two bridges in the town – one of which had been recently constructed. This bridge is clearly Pont-y-Llan (Grade II Listed Cadw ID 3186) which built in 1808 and a second smaller bridge named Pont y Pant (Hyde Hall 1952: 138). Pennant (Volume II: 292-3) names this same bridge as Pont y Pair and describes it in detail. He writes "*a most singular bridge, flung over the Llugny, consisting of five arches, placed on the rude rocks, which form most durable piers. These rocks are precipitous, and in high floods exhibit to the passenger most awful cataracts below the bridge. The scenery beyond, of rocky mountains, fringed with woods, is very striking. This bridge was built from the following circumstance: one Howel, a mason from Penllyn, having occasion, about the year 1468, to attend the Meirioneddshire assizes, then held at Conny, had his passage over the Lleder obstructed by floods. This determined him to remove to the spot, where he built a bridge, at his own expense and received no other gratuity than what resulted from the spontaneous generosity of passengers. He afterwards moved to the Llugny, and began that of Pont y Pair, but died before he completed his work*". There is no mention of a third bridge and there is no such structure shown on the Tithe Map of the area.

5.1.9 Fenton, writing in 1810, also mentions two bridges in Dolwyddelan and comments on a considerable quarry being situated to the westwards of Dolwyddelan Castle. He notes it is owned by Lord Gwydir who owns the parish. He does not mention other quarries in the area, but this is not to presume that they were not in operation (Fenton 1917: 188).

5.1.10 Post Medieval Industry in Dolwyddelan was centred around quarrying, and two quays were opened in Trefriw in 1809 to accommodate slate coming from Dolwyddelan and Crafnant. In 1835 Conwy expanded its quay due to increased demand from this area (Dodd 1968). The precise date at which the quarry working at Chwarel-y-Fedw commenced is unclear, and the Tithe record for the village (c.1840, figure 3) does not give sufficient detail of land use within any of the plots to establish which quarry areas were in use at this time. There is no bridge or crossing place marked on this document, nor on the 1770 Gwydir Estate map (figure 2) which predates it allowing us to determine that the study site postdates the production of this document. The Tithe Map shows a large field named Bwlch Cynnyd which is occupied by William Jones to the north of the river, whilst situated on the opposite side of the bridge area is a large plot named Fedw. It is occupied by Williams Pierce, Roberts Griffith. The Landowner is "Willoughby de Eresby The Right Honble. Peter Robert Drummond Lord".

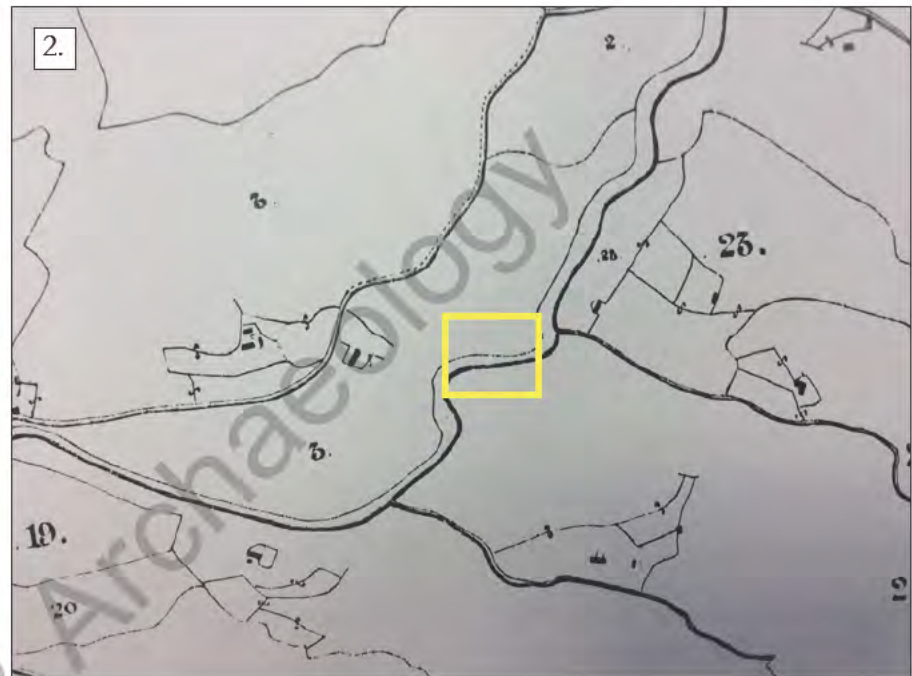
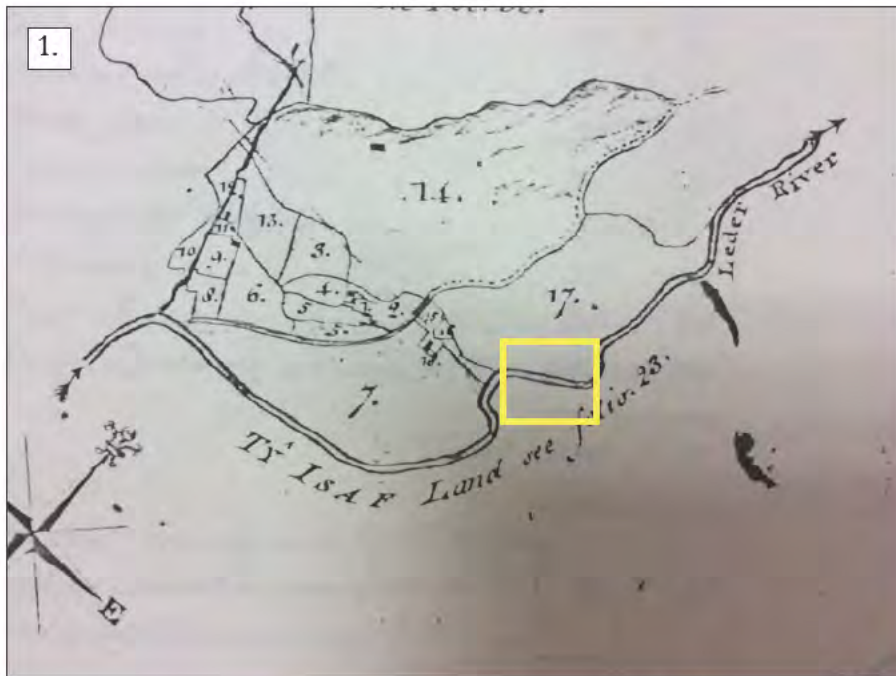


Figure 2 (Above Left). 1770 Gwydir Estate Map
(Source: Conwy Archives CX252/22)

Figure 3 (Above Right). 1840 Tithe Map
(Source: Conwy Archives)

Figure 4 (Below Left). 1894 Gwydir Estate Map
(Source: Denbigh Archives DD/PO 2229)

5.1.11 As with many of the smaller quarries, archive resources available are limited and the precise details of start date are unknown. Exploitation could have potentially been conducted on a very small scale from an early date, but this is unproven, and it is described by Richards as an early open working site (Richards 2007: 91). The site is not shown in detail on any cartographic sources prior to the first edition Ordnance Survey map of 1888 when the quarry is marked as disused. The incline plain and tramway including the bridge (marked as a viaduct) are clearly shown linking Chwarel-y-Fedw to the larger Prince Llewelyn Slate Quarry. The Prince Llewelyn site is shown as a far more developed site with a processing complex positioned alongside the road.

5.1.12 Richards has collated more detailed information about the Prince Llewelyn site and records “opened in the 1820’s as a hillside quarry, deepened into a pit with some later underground working. A steam mill erected c1850 and 4 sand-saws, but power sawing may predate this. The mill also dealt with blocks from Chwarel Fedw. The steam engine was replaced by a 30’ water-wheel, but steam was retained for pumping. The 1890s mill that brought the total of machines to 9 saw-tables and 3 planers was water turbine driven. Output in 1882 was 1685 tons (mainly slab) with 74 men, (may have been more in earlier years), making it the largest in the Dolwyddelan area. Closed 1934. Product carted originally to Trefrim, later to Dolwyddelan station. May have been the very last user of sand-saws” (Richards 2007: 108).

5.1.13 Very little information specifically related to the tram bridge and causeway itself could be located and the following snippet from a local newspaper records repairs to the structure in 1884. “DOLWYDDELEN, *The Parish Bridges.* We are happy to state that Lady Willoughby de Bresby has caused the Roman Bridge to be thoroughly repaired, and given orders to have the **Fedw Bridge, which is in a most dilapidated and dangerous condition, rebuilt at once**” (The North Wales Chronicle January 26th 1884).

5.1.14 The second edition Ordnance Survey edition of 1899 shows that the tramway is out of use by this date. The Chwarel Fedw quarry continues to be marked as disused, and the incline is labelled “Old Incline” and the tramway as “Old Tramway”. The bridge itself is now marked as a footbridge.

5.1.15 During visits to both Conwy and Bangor University archives it was apparent that the map books for the area were missing, and it was therefore not possible to include images in this report. Digitised images are held at by the National Museum Scotland and can be viewed at <https://maps.nls.uk/view/101606781> (1888 edition) and www.maps.nls.uk/view/101606778 (1899 edition).

5.1.16 A sale catalogue for lands including the Chwarel Fedw quarry was issued in 1894 which included a modified extract from the 1888 Ordnance Survey map (figure 4.) This document shows salmon pools along the river, including at the bridge and slightly downstream. The description of the plot describes the Fedw area as arable, pasture and meadow and including an abandoned quarry.

5.1.17 The accompanying schedule describes the Fedw plot as “a most desirable holding, comprising good grazing and excellent meadow land. The dwelling house and some of the outbuildings are comparatively new, and a considerable length of wire fencing has within recent years been erected. It is situate close to Dolwyddelan Village and Railway Station. Part of the land is suitable building ground. There is good grouse shooting and salmon and trout fishing. The fishing includes a moiety of the salmon pools of Bryn Tavel, Ty Isaf, Four Yards, Fedw Bridge and Fedw Meadow. The slates and all minerals under the part of this lot, as shown by strong dotted lines and crossed diagonally with double lines on plan, together with the right to enter thereon to search for, work and get, and carry away the same, and the right to use the land for quarry buildings, tramways, tip, and other purposes in connection with the working of the Penllyn Quarry, also the right to all existing quarry buildings and conveniences,

are reserved to the Vendor, but such reservation will be subject to proper provisions for compensating the Purchaser for any damage to the surface done in working the said slates and minerals, or in exercise of the rights before mentioned. The tenant of this lot is entitled to the annual sum of £7. 10s. payable by the lessee of Penllyn Quarry under the lease granted to Mr. Thomas Mandle for 60 years, from 1st November 1892, for damage caused to Dolfenw farm by the past workings of the Quarry” (Source Denbigh Archives Gwydir Estate Map DD/PO 2229).

5.2 Current Records of the Chwarel-y-Fedw Tramway Bridge and Causeway

5.2.1 The Chwarel-y-Fedw Tramway bridge and causeway is recorded as Dolwyddelan Tram Bridge PRN 19682 in the Gwynedd Historic Environment Record. It is described as “*now footpath. The tramway is a linear raised feature running for approximately 200m across the valley bottom, linking Chwarel y Fedw to Prince Llewelyn Quarry. Slate piers carry the tramway across the floodplain of the Afon Lledr thus avoiding both flooding and steep gradients.*”

5.2.2 *It is likely that the tramway was constructed around 1865, when Samuel Clift and Company leased the quarry of Chwarel y Fedw and is suggested that it went out of use in 1889 when the road was built over it” (Kenny 2001: 3).*

5.2.3 The structure is also a Grade II Listed Building (Cadw ID 18250). It is described as “*Mid-late C19 clapper-built causeway, originally carrying a narrow-gauge rail-link from the Chwarel-y-Fedw slate Quarry to the road; modern timber-faced, steel framed bridge over the Afon Lledr. The railway completed in 1879 apparently post-dates it.*”

5.2.4 Exterior

Slate-rubble causeway, approximately 230m long, and stretching in an arc from the road, across the river Lledr and on, terminating at the railway line. The first stretch, to the river is the longest, approximately 180m; this has a 9-span clapper section at the river end; constructed of large slatestone slabs, and with cutwaters to the upstream, convex side. The opposite side of the river has a similar 10-span clapper section; these rise slightly in the middle and are joined across the river by a modern timber bridge. The causeway is approximately 1.2m high and 1.8m wide; it is of dry-built, random rubble construction and has a metalled footpath and (in part) a C20 wire fence.

5.2.5 Reason for designation

Listed for its special historic interest as an unusually long clapper-built bridge and causeway serving a former slate quarry” (www.cadwpublicapi.azurewebsites.net/reports/listedbuilding/FullReport?lang=&id=18250).

5.3 Results of Historic Environment Record Search of Surrounding Area

5.3.1 A search of the Historic Environment Record returned 27 results within a 500m search radius, and 81 within a 1000m search radius (reflecting the increased proximity to the village). Within a 500m search radius there were 25 entries were of Post Medieval date, with 2 entries recorded as of unknown date but which are almost certainly also of Post Medieval date. These sites reflect the proximity of the site to the Chwarel-y-Fedw and Prince Llewelyn quarries with 9 of the entries categorised as industrial.

5.3.2 When the search is expanded to 1000m the majority of the results continue to be of Post Medieval date. At 1000m there were 2 Prehistoric entries, and a single entry of Roman date.

5.3.3 The first Prehistoric entry (PRN 634 Ffynnon Elen Holy Well) is dedicated to the local saint, St. Gwyddelan. It is recorded as a “*small rectangular basin now dry 9ft by 7ft with walls of earth-mortared rubble, on ground sloping steeply to the S. The S wall is 1ft 6ins thick and 1ft high; the remaining walls are revetments only, that on the N reaching a height of 4ft; water emerging outside the S wall is now collected in a*”

drinking trough. The name has also been applied to a natural spring about 100 yards to the NW". "The well - reputed to have healing properties - is dedicated to the Celtic Saint Gwyddelan after whom, most probably, the village itself is named. As far back as the second half of the nineteenth century, if not earlier, comments had been made about the ramshackle state of the well". It is unclear as to why this well has been assigned a Prehistoric rather than a Medieval/Early Medieval date.

5.3.4 PRN 633 records a Platform House at Afon y Felin. The entry states "Platform house on the E bank of the Afon y Felin, on a small level platform in ground falling to the SSW. The house is a small rectangular building axis NNE-SSW c.30ft by 18ft; the walls survive as slight grassy banks but a few large stones remain in the lower end wall. A few yards to the E is a roughly circular enclosure c.60ft in diameter, bounded by a grassy bank; a gap 6ft wide on the SW may represent an entrance. There is an additional description for an "*impressive hillfort was investigated in 1905 by Hughes (1906), who identified at least 16 stone roundhouses in the interior*" but this is believed to be an error in the record.

5.3.5 The Roman entry (PRN 17696) records a possible stretch of Roman Road described as "*the main route of the Roman road from Pont-y-pant is thought to have approached Dolwyddelan along the S bank of the river close to the railway which has partly obliterated it although part remains in use as a lane*".

5.3.6 In addition to the Tramway itself there are 9 Grade II Listed Buildings within a 1000m radius of the proposed development site. Due to the position/location of the proposed works at river level there will be no impact on the setting of any of these structures.

5.4 Previous Archaeological Works in the Vicinity of the Proposed Development

5.4.1 A detailed recording of the bridge and causeway was carried out by Gwynedd Archaeological Trust in 1999 as part of A470 Dolwyddelan to Pont- Yr Afanc Improvement Scheme GAT Report 345. The stretch was photographed in 2m sections and the archive held by the Trust.

5.4.2 Prior to the commencement of works a description of the site was compiled. It recorded the bridge and causeway as "*a section of the well-preserved raised tramway running across the river from Prince Llewelyn Slate Quarry. The tramway is a linear raised feature running for approximately 200m across the valley bottom linking Chwarel y Fedw to Prince Llewelyn Quarry. Slate piers carry the tramway across the immediate floodplain of the Afon Lledr thus avoiding both flooding and steep gradients. The river crossing itself has been replaced by a modern metal bridge. The tramway has now been converted to a footpath and a narrow tarmac path runs along its centre.*

5.4.3 *The tramway adjacent to the road is revelled on both sides by a 10m high wall constructed from poor quality slate, much of which has decayed into a very soft product. The road revetment to the north-east appears to be of a similar construction and no definite straight joint or discontinuity could be seen between the two walls. There is however a semi-collapsed area of facing close to the road where the wall changes direction somewhat abruptly which may mark the point where the two walls meet. The raised area of the tramway is 2.6m wide. A modern field access has been constructed at a point 21m from the road by slightly reducing the height of the revetment walls and adding rough ramps to both sides of the tramway" (Hopewell 1999).*

5.4.4 Having determined that the revetment wall was related to the tramway it was recorded prior to works to make the area safe which were undertaken in 2000 (Kenney 2000).

5.4.5 In 2001 the north western section of the tramroad, adjacent to the A470 was demolished under watching brief conditions as it had become unsafe (Kenney 2001). Demolition took place in sections, with each section being demolished and rebuilt before the next section was started.

5.4.6 The demolition did not reveal any new features but did provide further insight into the construction of the tramway and the relationship between the tramway, road and road revetment. *“The information revealed in the watching brief has, therefore, led to a reinterpretation of the sequence of development of the site. The revetment wall is the earliest feature, the tramway was constructed against and over it, and finally the road was built along the top of the revetment, presumably causing the tramway to go out of use. As the revetment wall was not originally constructed to carry the road it must have had another function. This seems most likely to have been as a revetment to the eastern edge of the Prince Llewellyn Quarry tips and yards. The revetment was built when the road continued around the western side of the quarry, and when the road was moved to its present line it was constructed over the revetment wall”* (Kenny 2001: 4).

5.4.7 *“The revetment was the first of these structures to be built, probably in the early 1860s or before as a revetment to the quarry tips. The tramway was constructed over and against the revetment, probably around 1865. Finally, the road was built over the top at some time before 1889.”* (Kenny 2001: 3).

5.4.8 In 2014 Elis-Williams published the results of his work into the Medieval Geography of Dolwyddelan which postulated that there were three lakes in the village – a permanent upper and lower lake named Llyn Dolwyddelan and Llyn Lledr, a temporary lake within the area now occupied by the proposed site. This is an interesting proposal and it is possible that evidence to support this theory could be uncovered during works at the site.

6.0 Results of Site Visit

6.0.1 A site visit was undertaken on 16th July 2019 and a photographic record of the bridge, its environs, setting and key views compiled. These images are included as plates 1 – 20. The location and direction of these photographs is recorded in Appendix A.

7.0 Conclusion

7.0.1 The Chwarel-y-Fedw tram bridge and causeway is a Grade II Listed Building and is an important surviving element in the slate quarrying landscape of Dolwyddelan. Although the bridge structure itself is a modern addition, Listed Building Consent will be required to carry out works to the bridge and adjoining monument. Any works to the structure should consider the impact on its setting and character.

7.0.2 Works undertaken by Gwynedd Archaeological Trust in the vicinity of the proposed scheme have highlighted the potential for archaeological discoveries to be made during works in the vicinity of the bridge - particularly discoveries related to its construction including phases of repair/modification and rebuilding. In addition to the erection of the structure and the modern bridge, the river itself has been modified in this area through the construction of large stone revetments along the riverbank and the creation of salmon pools shown on figure 4. This is likely to have significantly reduced the potential for encountering surviving buried archaeological deposits during work (including the potential for the survival of waterlogged remains). The possibility that they may survive cannot however be completely dismissed. All groundworks and works to the structure itself must be conducted under an appropriate programme of archaeological mitigation.



Plate 1. Approach to Chwarel-y-Fedw Quarry Bridge and Causeway



Plate 2. Chwarel-y-Fedw Quarry Bridge and Causeway



Plate 3. River Revetment Associated with Chwarel-y-Fedw Quarry Bridge and Causeway



Plate 4. River Revetment Associated with Chwarel-y-Fedw Quarry Bridge and Causeway



Plate 5. Chwarel-y-Fedw Quarry Bridge



Plate 6. Chwarel-y-Fedw Quarry Bridge



Plate 7. Chwarel-y-Fedw Quarry Bridge and Causeway



Plate 8. Shingle Bank Adjacent to Chwarel-y-Fedw Quarry Bridge and Causeway



Plate 9. Chwarel-y-Fedw Quarry Bridge Stone Pier



Plate 10. Chwarel-y-Fedw Quarry Bridge Stone Pier and Slab



Plate 11. Chwarel-y-Fedw Quarry Bridge and Causeway Stone Pier



Plate 12. Shingle Bank Adjacent to Chwarel-y-Fedw Quarry Bridge and Causeway



Plate 13. Chwarel-y-Fedw Quarry Bridge and Causeway



Plate 14. Land Adjacent to Chwarel-y-Fedw Quarry Bridge



Plate 15. Land Adjacent to Chwarel-y-Fedw Quarry Bridge



Plate 16. Chwarel-y-Fedw Quarry Bridge in Background. River Revetment in Foreground



Plate 17. Chwarel-y-Fedw Quarry Bridge and Causeway Revetment



Plate 18. Land Adjacent to Chwarel-y-Fedw Quarry Bridge



Plate 19. Land Adjacent to Chwarel-y-Fedw Quarry Bridge



Plate 20. Land Adjacent to Chwarel-y-Fedw Quarry Bridge

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1840 Tithe Map

1770 Gwydir Estate Map CX252/22

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1894 Gwydir Estate Map – DD/PO 2229

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Appendix A. Location and Direction of Photographic Plates

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Appendix A. Location and Direction of Photographic Plates - Source: OS Open Data
(Contains Ordnance Survey data © Crown copyright and database right 2019)