

PROPOSED NEW PRIMARY SCHOOL AT THE FORMER DRAKA COPPER WORKS SITE, LLANELLI, CARMARTHENSHIRE

ARCHAEOLOGICAL DESK BASED ASSESSMENT (NGR SS 5064 9919)



Prepared by Dyfed Archaeological Trust
For: Asbri planning,
on behalf of their client TRJ Ltd



DYFED ARCHAEOLOGICAL TRUST



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Gan / By
Fran Murphy

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Ymddiriedolaeth Archaeolegol Dyfed Cyf
Neuadd y Sir, Stryd Caerfyrddin, Llandeilo, Sir
Gaerfyrddin SA19 6AF
Ffon: Ymholiadau Cyffredinol 01558 823121
Adran Rheoli Treftadaeth 01558 823131
Ffacs: 01558 823133
Ebost: info@dyfedarchaeology.org.uk
Gwefan: www.archaeolegdyfed.org.uk

Dyfed Archaeological Trust Limited
The Shire Hall, Carmarthen Street, Llandeilo,
Carmarthenshire SA19 6AF
Tel: General Enquiries 01558 823121
Heritage Management Section 01558 823131
Fax: 01558 823133
Email: info@dyfedarchaeology.org.uk
Website: www.dyfedarchaeology.org.uk

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**PROPOSED NEW PRIMARY SCHOOL AT THE FORMER DRAKA
COPPER WORKS SITE, LLANELLI, CARMARTHENSHIRE:
ARCHAEOLOGICAL DESK BASED ASSESSMENT**

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**PROPOSED NEW PRIMARY SCHOOL AT THE FORMER DRAKA COPPER
WORKS SITE, LLANELLI, CARMARTHENSHIRE:
ARCHAEOLOGICAL DESK BASED ASSESSMENT**

SUMMARY

DAT Archaeological Services were commissioned by Asbri Planning on behalf of their client TRJ Ltd to prepare an Archaeological Desk Based Assessment of a proposed new primary school on land recently occupied by the Draka Copper Works site, Llanelli, Carmarthenshire. The aim of this assessment is to provide more information about the potential effects upon the historic environment by the development proposals. This report will be used by planners to help make an informed decision on the proposals in regards to archaeology and the historic environment.

The location for the proposed new primary school lies on a portion of c.8 ha of former industrial land (centred on NGR SS 5064 9919) formerly occupied by the Draka Copper Works that were demolished in 2010.

A study area of 250m around the boundary of the proposed development area was used to obtain information on the known archaeological and historical resource within the area. Four Listed Buildings lie within the study area but no Scheduled Ancient Monuments. A further 14 sites are recorded on the Regional Historic Environment Record within the study area, only one of which lies within the proposed development boundary, namely the former Llanelly Copperworks. An additional 6 sites are recorded on the National Monuments Record within the study area.

Of the sites recorded within the study area, all are of post-medieval or modern date and largely relate to the rapid growth of industry in Llanelli during the 19th century. The proposed new school will lie within the northern half of the site of the former Llanelly Copperworks (PRN 30666); reputed to have been the fourth largest copper smelting works in the world during the mid-19th century.

The copperworks site was redeveloped in the mid-20th century when most of the above ground original historic buildings were either demolished or incorporated into modern industrial sheds. The works – latterly owned by Draka – specialised in the production of copper wire, finally closed in June 2009. All of the remaining above ground buildings were demolished in 2010

From comparison with sites such as the Upper Bank Copper & Zinc Works in Swansea, where archaeological excavation revealed large scale survival of furnace bases, flooring, rolling mill loadings, machinery loadings, and standing walls beneath 20th century concrete floors, it is considered highly likely that an extensive subsurface archaeological resource relating to Llanelly Copperworks survives within the development area.

However, due to the history of extensive industrial use of the site, detailed laboratory analysis of ground/soil samples has revealed elevated levels of various contaminants to be present. Because of this the developer has proposed that no intrusive excavations into existing ground levels will be undertaken in order to minimise any impact on ground water and disturbance of contaminated material. As an alternative the existing ground levels on the site will be raised by a maximum of some 1000mm. This action will negate any foundation or drainage works being undertaken below existing ground levels and therefore cause no disturbance to archaeological remains or deposits associated with the copperworks.

Consequently it is recommended that no further archaeological mitigation is required on condition that no below ground works are undertaken within the development area.

If for any reason it proves necessary to undertake controlled ground works within the development area it is recommended that an archaeological watching brief as a minimum be carried out on any ground disturbance activities.

1 INTRODUCTION

1.1 Project Proposals and Commission

- 1.1.1 DAT Archaeological Services were commissioned by Asbri Planning on behalf of their client TRJ Ltd to provide a pre-determination archaeological desk based assessment for the site of a proposed new school on the site of the former Draka Copper Works, Llanelli, Carmarthenshire. The aim of the desk-based assessment is to provide enough information regarding the historic environment and potential impacts upon it to enable the planners to make an informed decision on the proposal as regards archaeological and historic environment issues.
- 1.1.2 The proposed school development is located on land (centred on NGR SS 5064 9918) within the Seaside area of Llanelli and covers an area of approximately 7 ha (Figure 1). The construction of the school will involve the construction of access roads as well as associated infrastructure, such as contractor's compounds and storage areas (Figure 3).
- 1.1.3 Most of the historic buildings associated with the Copperworks were demolished or incorporated within and replaced by modern structures in the later 20th century. More recently in 2010 any remaining structures, including modern ones, were demolished.
- 1.1.4 Prior to this Carmarthenshire County Council commissioned Atkins in 2010 to produce a report on the surviving structures in advance of final demolition. Atkins also assessed the potential for the presence of surviving below ground structures relating to the Copperworks and any other archaeological deposits in advance of further development.
- 1.1.5 Dyfed Archaeological Trust (DAT) Planning Services Section in their capacity as archaeological advisors to the planning authority advised that the Atkins 2010 report be updated to make sure it was relevant and that it should include any new information recorded since 2010. Therefore this report takes into account the work carried out by Atkins in 2010.

1.2 Scope of the project

- 1.2.1 The assessment comprised the examination and collation of available sources of information including:
- Information on known archaeological and historic sites recorded on the regional Historic Environment Record (HER) held and maintained by DAT, including a search of available cartographic and pictorial sources, published and unpublished works, aerial photographs and any relevant web-based information;
 - Relevant information held by the Royal Commission on Ancient and Historic Monuments in Wales (RCAHMW) via the COFLEIN online computer database and information on Conservation Areas or Historic Landscape Areas within or in the vicinity of the site area from information held by DAT and CCW (now Natural Resources Wales) Landmap website;
 - A search of Cadw's Listed Building records and Schedule of Ancient Monuments for designated buildings and sites of archaeological and historical importance lying on or in close proximity to the site;

- A site visit to determine the presence or absence of visible archaeology or evidence for previous ground disturbance within the proposed development area.

- 1.2.2 The results of the assessment contained in this report are intended to identify the extent and character of the known and potential archaeological resource, to assess the likely and potential impacts of any development on that resource and to outline a possible programme of further works to mitigate those impacts. The assessment should be seen only as the first stage of the archaeological process and does not preclude the possibility that further archaeological input may be required prior to, or during, any proposed development.
- 1.2.3 A study area of 250m around the perimeter of the main school development boundary was used to ascertain the known archaeological and historical resources.
- 1.2.4 A Written Scheme of Investigation was prepared by DAT Archaeological Services which outlined the methodology used in this report.

1.3 Abbreviations used in this report

- 1.3.1 All sites recorded on the regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Sites recorded on the National Monument Record (NMR) held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) are identified by their National Primary Record Number (NPRN). Scheduled Ancient Monument (SAM). Altitude is expressed to Ordnance Datum (OD). References to cartographic and documentary evidence and published sources will be given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

1.4 Illustrations

- 1.4.1 Photographic images are to be found at back of the report. Printed map extracts are not reproduced to their original scale.

1.5 Timeline

1.5.1 The following timeline is used within this report to give date ranges for the various archaeological periods that may be mentioned within the text (Table 1).

Period	Approximate date	
Palaeolithic –	c.450,000 – 10,000 BC	Prehistoric
Mesolithic –	c. 10,000 – 4400 BC	
Neolithic –	c.4400 – 2300 BC	
Bronze Age –	c.2300 – 700 BC	
Iron Age –	c.700 BC – AD 43	
Roman (Romano-British) Period –	AD 43 – c. AD 410	Historic
Post-Roman / Early Medieval Period –	c. AD 410 – AD 1086	
Medieval Period –	1086 – 1536	
Post-Medieval Period ¹ –	1536 – 1750	
Industrial Period –	1750 – 1899	
Modern –	20 th century onwards	

Table 1: Archaeological and Historical Timeline for Wales

2 SITE LOCATION AND TOPOGRAPHY

- 2.1** Carmarthenshire County Council proposes to build a new school within the site of the former Draka Copperworks. The site is located to the south of the town of Llanelli (Ordnance Survey Grid Ref SS 5064 9918) (Figures 1 and 2).
- 2.2** Most of the historic buildings associated with the copperworks were demolished or incorporated within and replaced by modern structures in the later 20th century. More recently in 2010 any remaining structures, including modern ones, were demolished.
- 2.3** Currently the site area is a large expanse of relatively level ground with no above ground structures visible. All that remains of the former buildings are concrete hard standings and the tarmacked roads that once gave access to them (Photos 2-7). Surrounding the expanse of concrete hard standing is the old boundary wall of the former copperworks. This wall has undergone several phases of rebuilding, and heightening (Photo 5). The main entrance to the copperworks was on the south side of the site, with a secondary entrance to the north.

¹ The post-medieval and industrial periods are combined as the post-medieval period on the Regional Historic Environment Record as held by Dyfed Archaeological Trust

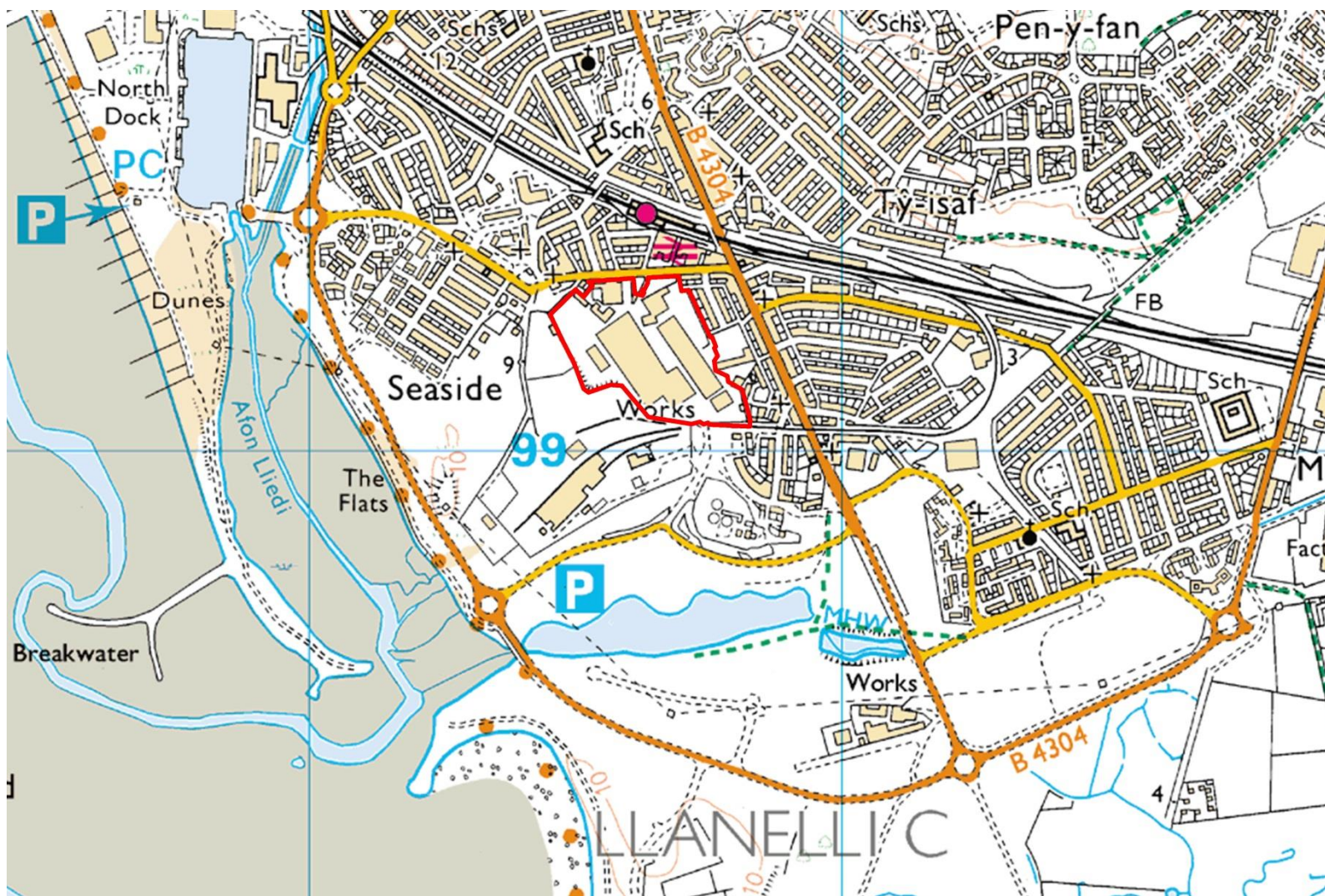
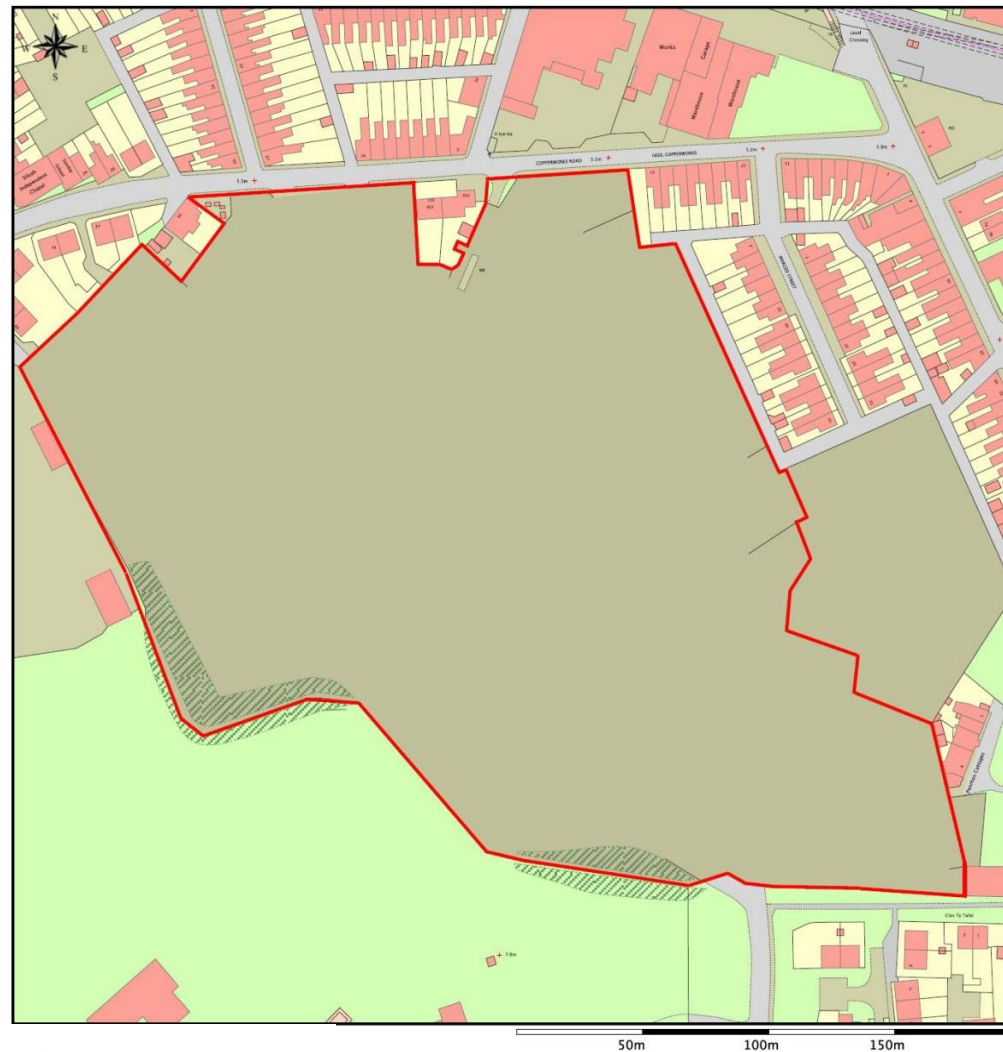


Figure 1: Location map based on the Ordnance Survey. Development area outlined in red.

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Figure 2: Development area location plan (supplied by Asbri Planning).

Proposed New Primary School at the Former Draka Copper Works Site,
Llanelli, Carmarthenshire:
Archaeological Desk Based Assessment



Figure 3: General proposed arrangement site plan (supplied by Asbri Planning 26/11/2014).

3 METHODOLOGY

3.1 This Archaeological Desk Based Assessment has been prepared using the following methodology which has been discussed and agreed with the archaeological advisors to the planning authority. A written scheme of investigation detailing this methodology was prepared and submitted for approval to the archaeological advisors to the planning authority.

3.2 A study area which comprised the main area of the school development itself and a 250m buffer zone around its boundary (as shown in Figure 5) was used to ascertain the extent of known archaeology within and in the vicinity of the site area.

Desk top study

3.3 The desk-based assessment has been prepared using the following sources of information:

- Dyfed Archaeological Trust Historic Environment Record data and other relevant information;
- National Monuments Record of Wales information as held by the Royal Commission on the Ancient and Historic Monuments of Wales in Aberystwyth (via the COFLEIN website);
- Bibliographic, cartographic and photographic information held at the Local Archives and the National Library of Wales;
- Identification of any Scheduled Ancient Monuments, Listed Buildings, Historic Landscape Character Areas or Conservation Areas within or in the vicinity of the site area;
- Relevant web-based information;
- Site visit and walkover survey;
- Assessment of the archaeological potential of the area; and
- Assessment of likely impacts on any identified remains (or potential remains) and likely requirements, if any, for further stages of archaeological work.

3.4 The report complies with the relevant Chartered Institute for Archaeologists (CIfA) standards and guidance.

Site walkover survey

3.5 A site visit was undertaken on Friday 17th October 2014. The visit comprised a walkover of the proposed new school site and views looking back to the site area from its surroundings. Photographs were taken and field observations recorded in note form. All areas of the site were accessible.

4 HISTORICAL, LANDSCAPE AND ARCHAEOLOGICAL BACKGROUND

4.1 Historic Background

4.1.1 The following has been summarised from various sources including the Desk Based Assessment undertaken by Atkins in 2010:

4.1.2 *At the beginning of the 19th century South Wales produced 90% of Britain's copper. Most of the smelting works were situated between Swansea and Neath. The heavy demand for coal for the smelting process often led to difficulties in supply with the result affects upon price. Therefore, Llanelli with its surrounding plentiful supply of coal became attractive to industrialists and Charles Nevill came to Llanelli from Swansea, forming the Llanelli Copperworks Company, and overseeing the construction of the copperworks in the Seaside area in 1805. Copper smelting began on site on the 20th September 1805 and the dock was constructed at the beginning of 1806 to receive copper ore from Cornwall.*

4.1.3 *The Llanelli? Copperworks Company continued to expand and were soon exporting coal as well as importing copper. In 1813, Lord Cawdor commissioned Charles Nevill to supervise the rebuilding of the disused Carmarthenshire leadworks. The leadworks was rebuilt near the copperworks and smelting at the Llanelli leadworks probably began early 1813. This in turn led to increased trade for the copperwork dock with increased imports of lead ore.*

4.1.4 *Slag, ashes and fire bricks from the smelting process were tipped on the foreshore between Pemberton Dock and Copperworks Dock, creating the land on which Catherine Street and Caroline Street were built. The embankments which were in due course faced with masonry to form the Pemberton and Copperworks Docks were formed by tipping copper slag (Figure 4).*

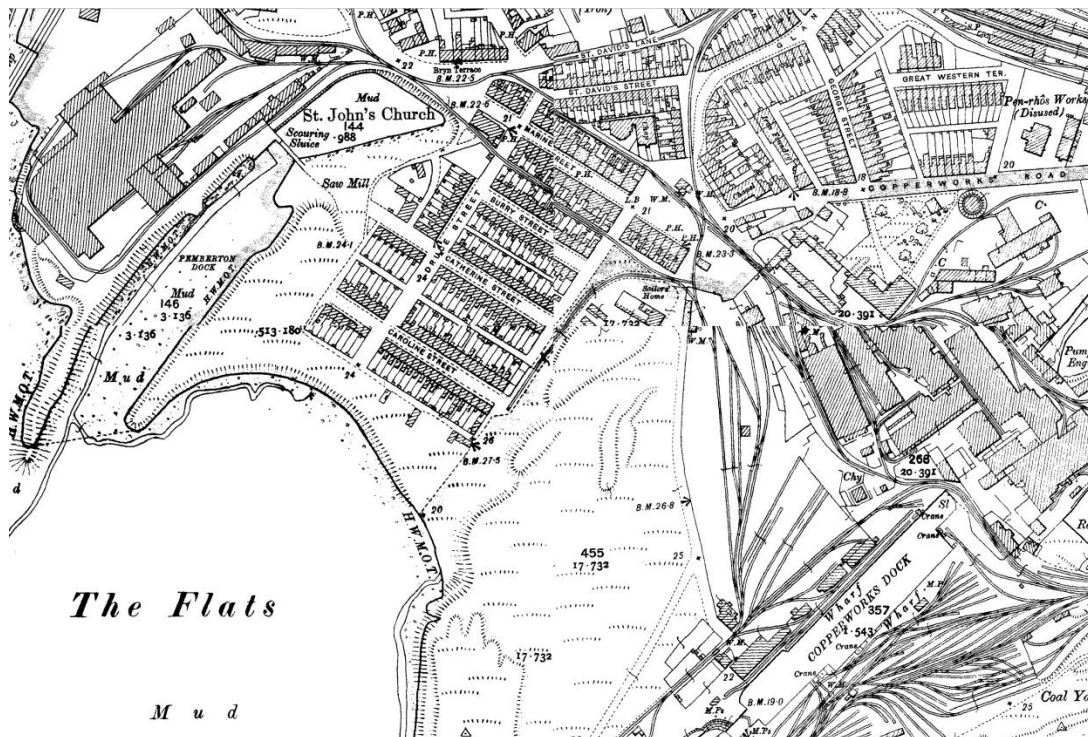


Figure 4: Extract of 1880 1:2500 scale Ordnance Survey map showing the area of land between Pemberton and Copperworks docks created by tipping slag and ashes on the foreshore.

- 4.1.5 *Whilst other industrialists suffered severe financial difficulties in the 1820s, the Llanelly Copperworks Company was able to withstand the economic uncertainties. In 1823 the company drew up plans to convert the Copperworks Dock into a floating dock; the first to be built in Wales and by 1830 the company began to dominate the industry of Llanelli for the better part of the 19th century.*
- 4.1.6 *In 1849 The Llanelly Copperworks Company took over the disused Cambrian Copperworks and converted it into a lead and silver smelting works. The Copperworks also extended the works to include mills for rolling copper and brass. In 1861 Llanelli's tallest chimney was constructed on the site to take away fumes. Known as the 'Stac Fawr' the stack was 320 feet high. Its foundation was some 80 feet across, the base of the stack was 33 feet in diameter and at the top was some 12 foot across the outside. At the time it was claimed to be the tallest chimneystack in Europe. By this time the Copperworks was importing ore from Chile, Peru, Spain, the Cape of Good Hope and Newfoundland.*
- 4.1.7 *By the beginning of the 20th century copper smelting in Wales was declining. The Llanelly Copperworks felt the effects of the changing economy as well as increasing American and German competition. During the 1920s the general economic depression caused a slump in trade and the Copperworks closed in 1925.*
- 4.1.8 *The copperworks site was redeveloped in the mid-20th century when most of the original historic buildings were either demolished or incorporated into modern industrial sheds. The works – latterly owned by Draka – specialised in the production of copper wire and finally closed in June 2009. All of the remaining buildings were demolished in 2010, apart from the boundary wall.*

4.2 Historic Landscape Character Areas

- 4.2.1 The proposed school development does not lie within the boundaries of any Historic Landscape Character (HLC) areas recorded on the Register of Landscapes of Outstanding Historic Interest in Wales (Cadw 1998).

4.3 LANDMAP

- 4.3.1 The proposed school development lies within the Llanelli landscape area recorded on the National Resources Wales (NRW) LANDMAP database. LANDMAP is a GIS (Geographical Information System) based landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated into a nationally consistent data set.
- 4.3.2 The proposed school development lies within the Llanelli Historic Landscape Aspect Area CRMRTL39585 which is summarised as follows:
Major urban development of Llanelli. Significant archaeological interests include Buried-dry, Relict-Stone Monuments, Industrial Archaeology, Relict-Earthworks and Buildings & Structures.
- 4.3.3 The Llanelli Cultural Landscape Aspect Area CRMRTCL024 description is as follows:
Former prominent industrial town now undergoing wholesale regeneration. The town of Llanelli developed as a direct result of the coal and metal industries. The town also has one of the elite European rugby

clubs, the Llanelli Scarlets. Llanelli and its surrounding area supports the greater proportion of the population of the study area, and over time has been subject to a wider range of external influences than many other parts of Carmarthenshire. The Millennium Coastal Park is the largest land reclamation project in Britain.

- 4.3.4 Finally the proposed new school site lies within the Llanelli Visual and Sensory Landscape Aspect Area CRMRTVS378 which is described as follows:

Largest urban area in Carmarthenshire, strong industrial past now being re-developed especially around coast - Millennium Coastal Park etc. Also contains a scattering of historic buildings that reflect the areas prosperous past.

4.4 Known Archaeological Sites

- 4.4.1 The following information is taken from Cadw Schedule of Ancient Monuments, Listed Building information, regional Historic Environment Record data and RCAHMW National Monuments Record. Archaeological and historical significance is ascribed to the sites according to the following criteria:

Site Category (SC)	Definition of Site Category
A	Features of national importance - Scheduled Ancient Monuments, Listed buildings Grade I and II*, well preserved historic landscapes, registered parks and gardens and historic battlefields
B	Non-scheduled sites of regional or county importance. Listed Buildings Grade II, reasonably preserved historic landscapes
C	Features of district or local importance but generally common features at a national or regional level
D	Minor sites or sites so badly damaged that too little now remains to justify their inclusion in a higher grade
U	Features about which insufficient is known to attribute them to a higher rank, or which cannot be sufficiently accurately located to justify their consideration

Table 2: Site category definitions

Scheduled Ancient Monuments

- 4.4.2 There are no Scheduled Ancient Monuments within a 250m search area around the proposed school boundary.

Listed Buildings

- 4.4.3 There are four listed buildings within 250m of the proposed school development, the closest of which (PRN 16160) lies c.44m to the northwest of the proposed school development. The buildings are all Grade II listed apart from the Old Castle Iron and Tinplate works that are Grade II* listed and lie c.140m to the southwest (Figure 5). The Cadw listing records that *'The Tinhouse forms an integral part of a virtually complete early C20 tin-plate works, one of a very few to survive in the former heartland of the industry and is of special interest by virtue of the completeness of its survival, and as a rare example of an industrial complex of transitional constructional type, in which the use of steel frame and brick alongside masonry structures is of particular significance'*.

LB Ref	PRN	NPRN	Site Name	Summary	Period	NGR	SC
11910 Grade II	16160	6427	Siloah Independent Chapel	Congregational Chapel, stucco Italianate Classical with pedimented end facade, 2-storey elevations and slate roof.	Post-medieval	SS5045799327	B
11925 Grade II	60857	12093	Bethel Baptist Chapel	Chapel built in 1850 in the Classical style with a gable entry plan.	Post-medieval	SS5039499374	B
11932 Grade II	60864	6433	Caersalem Baptist Chapel	1893 Chapel in Italianate Classical style.	Post-medieval	SS5080599518	B
18657 Grade II*	61030		Old Castle Iron and Tinplate works	A remarkably well-preserved Tinhouse, one of only 2 known to retain original tinning bays. Operated from 1866 to 1957.	Post-medieval	SS5049499006	A

Table 3: Listed buildings within the study area of 250m around the proposed school development boundary and shown in Figure 5.

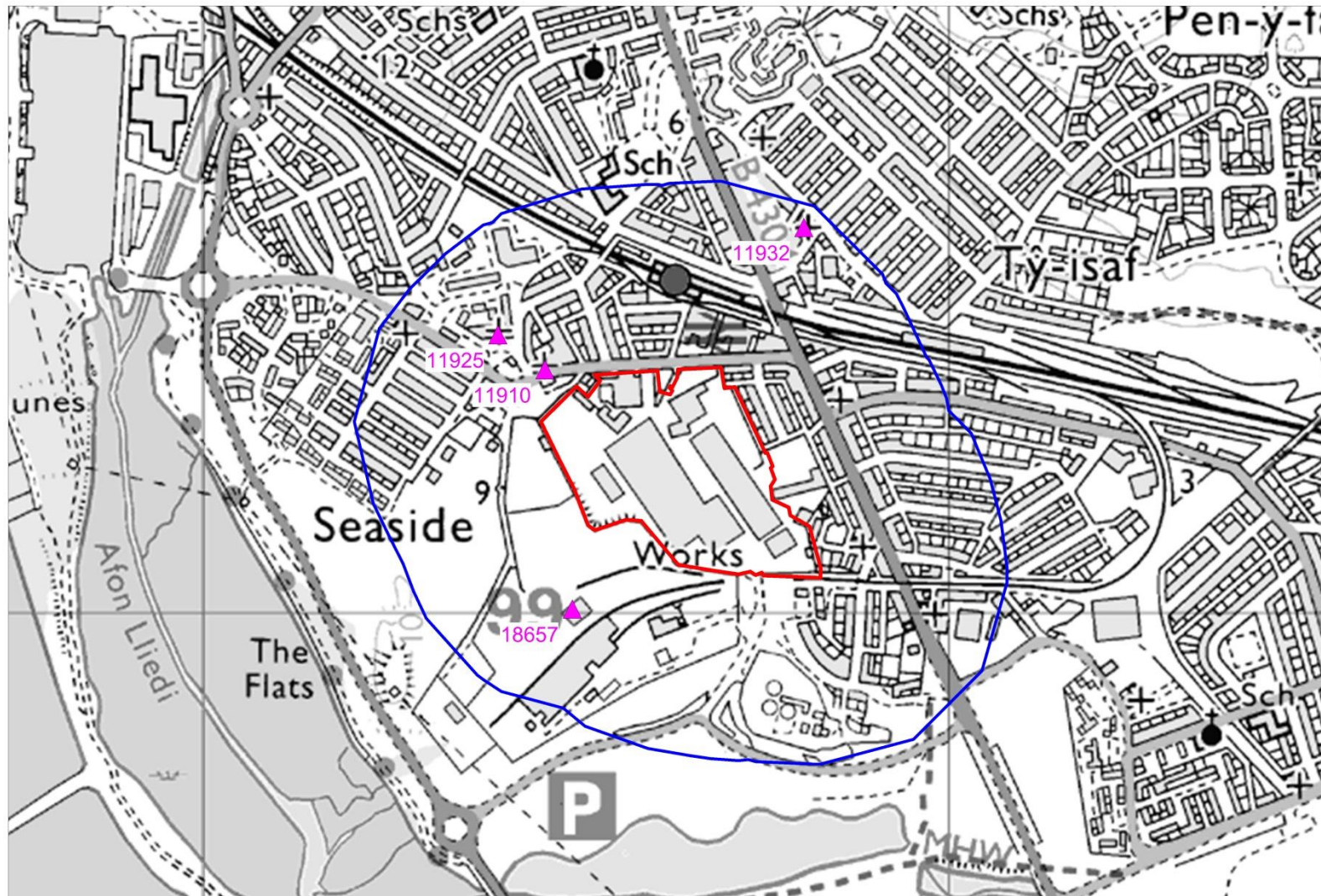


Figure 5: Map showing Listed Buildings (pink triangle) within the 250m search area around the proposed school development (red boundary)
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Historic Environment Record

- 4.4.4 The following 14 sites are recorded on the Regional HER within a 250m search area around the boundary of the proposed school site. All the sites within the search area are of industrial date (Table 4). There are no recorded sites on the Regional HER within the search area from the prehistoric, Roman or medieval periods. Sites listed in bold lie within the boundary of the proposed school development. Locations are shown on Figure 6.

Post Medieval Period

PRN	NPRN	Site Name	Summary	Period	NGR	SC
4667	34194	COPPERWORKS DOCK	The Copperworks (or Nevill's) Dock was initially constructed as a tidal dock by the Llanelly Copperworks Company in 1805 for the import of copper ore and the export of smelted copper and coal. It was provided with lock gates by 1824 making it, reputedly, the first floating dock in Wales. It remained in constant use until 1951. Recently filled in and area landscaped but remaining features include entrance and lock gate.	Post medieval	SS50509900	C
4952	40403	GLANMOR FOUNDRY	John Powell, born in 1824, started up his own business in a workshop in Copperworks Road in 1850 as an iron founder, chain and chain cable manufacturer and general ships' smith for the busy shipping port nearby. In 1873 he acquired land alongside the Great Western railway, west of the station, where he erected a small foundry and machine shop that became the Glanmor Foundry. It closed in 1979. Entire area re-landscaped and developed.	Post medieval	SS50409951	D
8445	34725	LLANELLI STATION RAILWAY SIGNAL BOX	Constructed in c.1877, it is the only surviving Great Western Railway Type 2 signal box in Wales.	Post medieval	SS50809940	C
8446	34723	LOUGHOR RAILWAY BRIDGE	The Loughor railway viaduct is a railway viaduct carrying the West Wales Line across the River Loughor. The structure is adjacent to the Loughor road bridge. The recently replaced 1880 structure was Grade II listed.	Post medieval	SS50659945	D
8854		SCALEHOUSE	Possible scale house associated with the copperworks industry.	Post medieval	SS50469931	D
16156	6450	TRINITY CHAPEL	The chapel is an 1867 rebuild of the original, built in 1852 as a Calvinistic Methodist chapel.	Post medieval	SS50859929	C
16157	12584	ST DAVID'S CHURCH	The former St David's Church built in 1892 was erected as a	Post	SS50899909	D

			chapel of ease to St Paul's Church (demolished in the 1980s). It has now been converted into dwellings.	medieval		
16158	6436	EMMANUEL CHAPEL	Emmanuel English Baptist Church was built in 1894 in the Vernacular style with a gable entry plan.	Post medieval	SS50979900	C
30663		LORD CAWDOR'S LEADWORKS; LLANELLY LEADWORKS	1813 Lord Cawdor commissioned the rebuilding of the disused Carmarthenshire leadworks. The leadworks was rebuilt near the Llanelly copperworks and smelting at the probably began early in 1813. This in turn led to increased trade for the Copperworks Dock with increased imports of lead ore. Now demolished.	Post medieval	SS509989	D
30666		LLANELLY COPPERWORKS CO.	Llanelly Copperworks founded in 1804 by Charles Nevill (died 1813) and developed by his son Richard Janion Nevill. It was the third largest copper smelting works in the world in the mid-19th century and was Wales' longest lasting works, closing in 2009. The buildings were demolished in 2010.	Post medieval	SS506991	D
30713		WELLFIELD GALVANISING CO.	Opened 1908, closed 1940. Shown on the 1921 Ordnance Survey 6" map.	Post medieval	SS503990	D
30718		COPPERWORKS BRICKWORKS	Former small, unnamed brickworks shown on 1 st edition Ordnance Survey 25" map. Associated with Llanelly Copperworks (PRN 30666).	Post medieval	SS50869913	D
30724		STANLEY BRICKWORKS	Brickworks shown on the 1921 Ordnance Survey 6" map.	Post medieval	SS505989	D
34033		COAL YARDS	Coal yards with extensive tramway systems, depicted on 1st and 2nd edition Ordnance Survey maps. Entire area re-landscaped and developed.	Post medieval	SS50599898	D

Table 4: Archaeological and historical sites recorded on the Regional HER within the search area of 250m around the proposed school boundary and shown in Figure 6

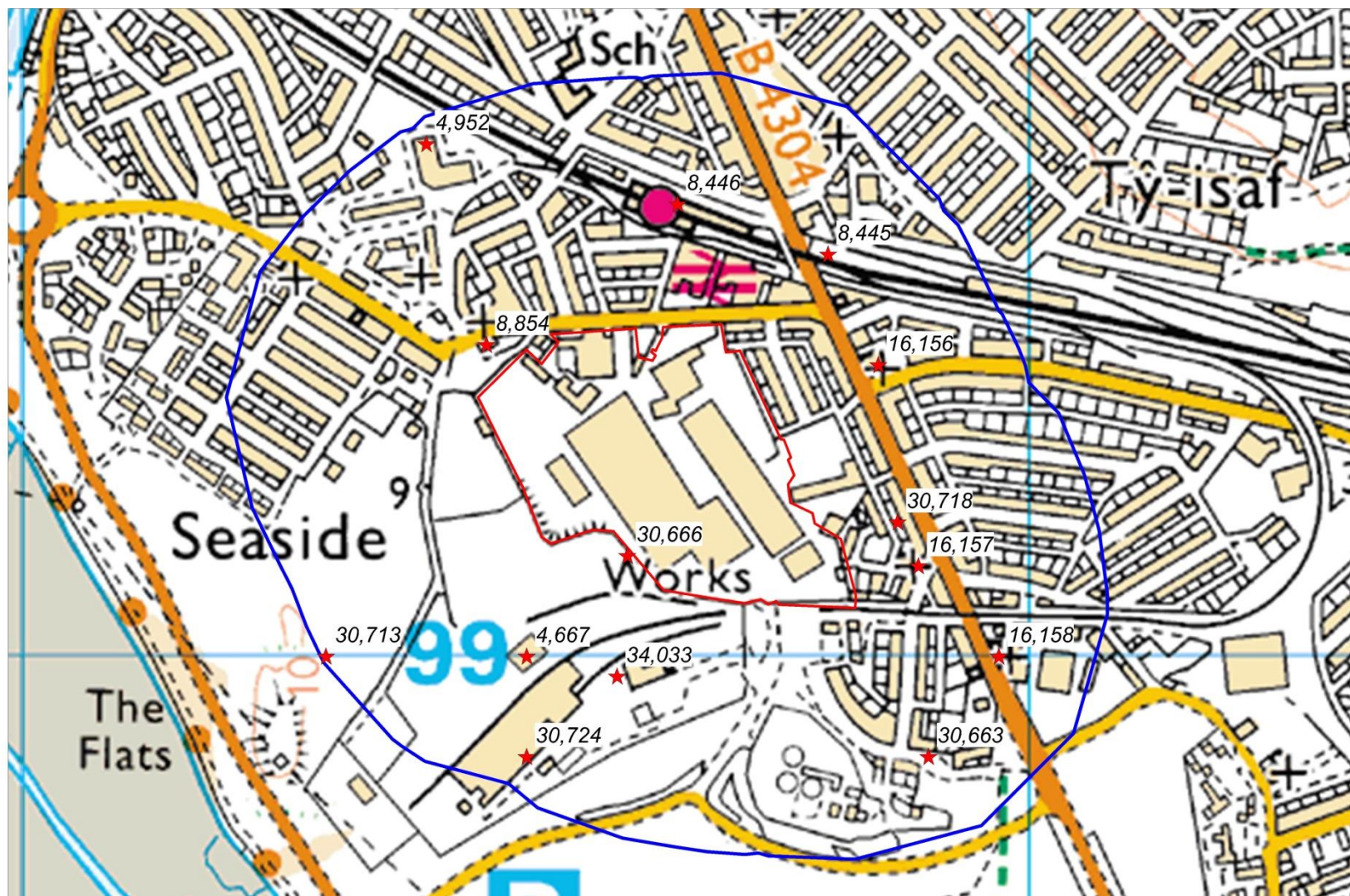


Figure 6: Map showing HER sites within the 250m search area (blue boundary) around the proposed school site (red boundary).
Reproduced from the Ordnance Survey 1:25,000 scale Explorer Map with the permission of The Controller of Her Majesty's Stationery Office,
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RCAHMW NMR Records

4.4.5 The following archaeological or historical sites within the 250m search area are those recorded on the RCAHMW NMR that have not already been listed on the Regional HER. Locations are shown on Figure 7.

NPRN	Site Name	Summary	Period	NGR	SC
466	New BrewerY	New Brewery shown on the 1 st edition Ordnance Survey 25" map but marked disused by the 2 nd edition. Now demolished.	Post medieval	SS5084999460	D
12092	St Johns Church	St John's Church, situated at the junction of Druce Street and Marine street, was erected as a chapel of ease to St Paul's Church. The church dates to 1887 and consists of a plain nave and chancel, with a bell lantern over the porch. Stained glass in its east window dates to 1974. The church was closed and sold in 2010.	Post medieval	SS5027599377	D
17791	Scale House		Post medieval?	SS5083199033	D
34402	Wern Canal	Entire area re-landscaped and developed.	Post medieval	SS50409893	D
97262	Church Of Latter Day Saints, Morfa, Llanelli	This Chapel was opened in 1996 and therefore is of a late 20 th c. design; long-wall entry type. Its present status is as a Chapel.	Modern	SS506995	D
411069	Llanelli Iron Foundry	An Iron Foundry is shown on the first edition Ordnance Survey map of 1880. Sometime after 1978 the site was demolished and cleared. In 1979 the gable end of a building standing approximately 15 feet high was the only visible surviving feature. Entire area re-landscaped and developed.	Post medieval	SS5094098840	D

Table 5: RCAHMW NMR sites within the 250m search area around the boundary of the proposed new school site and shown in Figure 7.

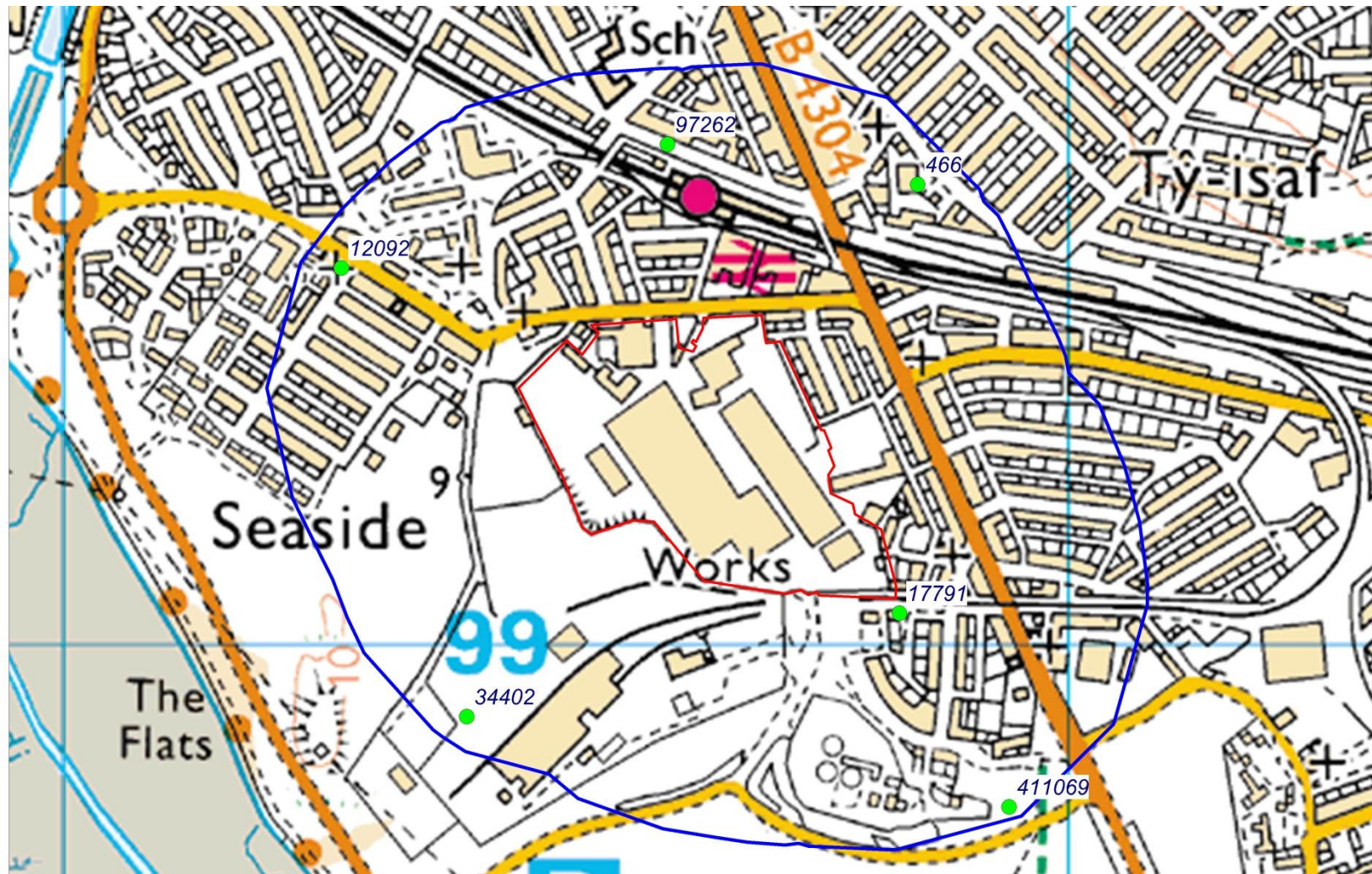


Figure 7: Map showing RCAHMW NMR sites within the 250m search area (blue boundary) around the proposed school site (red boundary).

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4.5 Cartographic Sources

- 4.5.1 A number of earlier cartographic sources were used to ascertain the development and use of the proposed development area in the past. No relevant estate maps or other cartographic sources pre-dating the early 19th century were found during the research for this project.
- 4.5.2 The earliest map available showing the site area is the 1813 Original Surveyor's drawing map (Figure 8). This shows the extent of some of the copperworks buildings and the completed copperworks dock. However, there is little development surrounding the copperworks at this stage and the village of Llanelli is still a nucleated settlement, with St Elli Parish church at its core unconnected to the industry on the estuary.
- 4.5.3 The tithe map of Llanelli (Llanelli) Parish of 1842 (Figure 9) shows a similar settlement pattern to that of the 1813 drawing and highlights a lack of buildings and structures around the copperworks site, although this is misleading as we know the Llanelli Leadworks, railway line, sidings and associated structures were all constructed by this period. However, the purpose of a tithe map was to record ownership of land within the parish for the collection of taxes. Therefore information not pertinent to this purpose was often excluded from the map or appears in varying detail and accuracy.
- 4.5.4 The Apportionment (1841) that accompanies the Tithe map displays field names from which little information can be ascertained and does not list specifics of land use.
- 4.5.5 In contrast to earlier maps the 1st and 2nd edition (1880 and 1916) Ordnance Survey 1:2500 maps (Figures 11 and 12) show an extraordinary transformation in the area with the rapid expansion of industry throughout the 19th century. As is the case for many of the small coalfield communities in Wales, Llanelli experienced unprecedented growth during the second half of the nineteenth century and its delineation on the tithe map contrasts significantly with its present form. The 1880 1:500 scale Ordnance Survey Town Plan of Llanelli, shows in great detail the Copperworks site at its apogee in the late 19th century (Figure 10).
- 4.5.6 In 1830 the population of Llanelli and district numbered some 17,000. By 1900 it had grown to 36,000 and today totals some 40,000. Llanelli's growth derived predominantly from the presence of tinsplate works and allied industries. The one hundred year dominance of metal production in the town began to gain momentum from the mid nineteenth century with the construction of the Dafen and then the Morfa tinsplate works. By 1880 the town had seven tinsplate works, earning it the name 'Tinopolis'.
- 4.5.7 Thousands of people from rural communities flocked to work in the burgeoning tinsplate, steel and iron works and in response to this growth in population grew the houses, shops, chapels, churches, schools, hospitals, new roads, tramways and accompanying infrastructures that we see in Llanelli today.
- 4.5.8 By the mid-20th century the Copperworks were much in decline. The Ordnance Survey 1:10560 scale 1952 map (Figure 13) shows the former furnace houses have now become a wire works as well as an engineering works and a number of the buildings appear to be in semi-ruin.

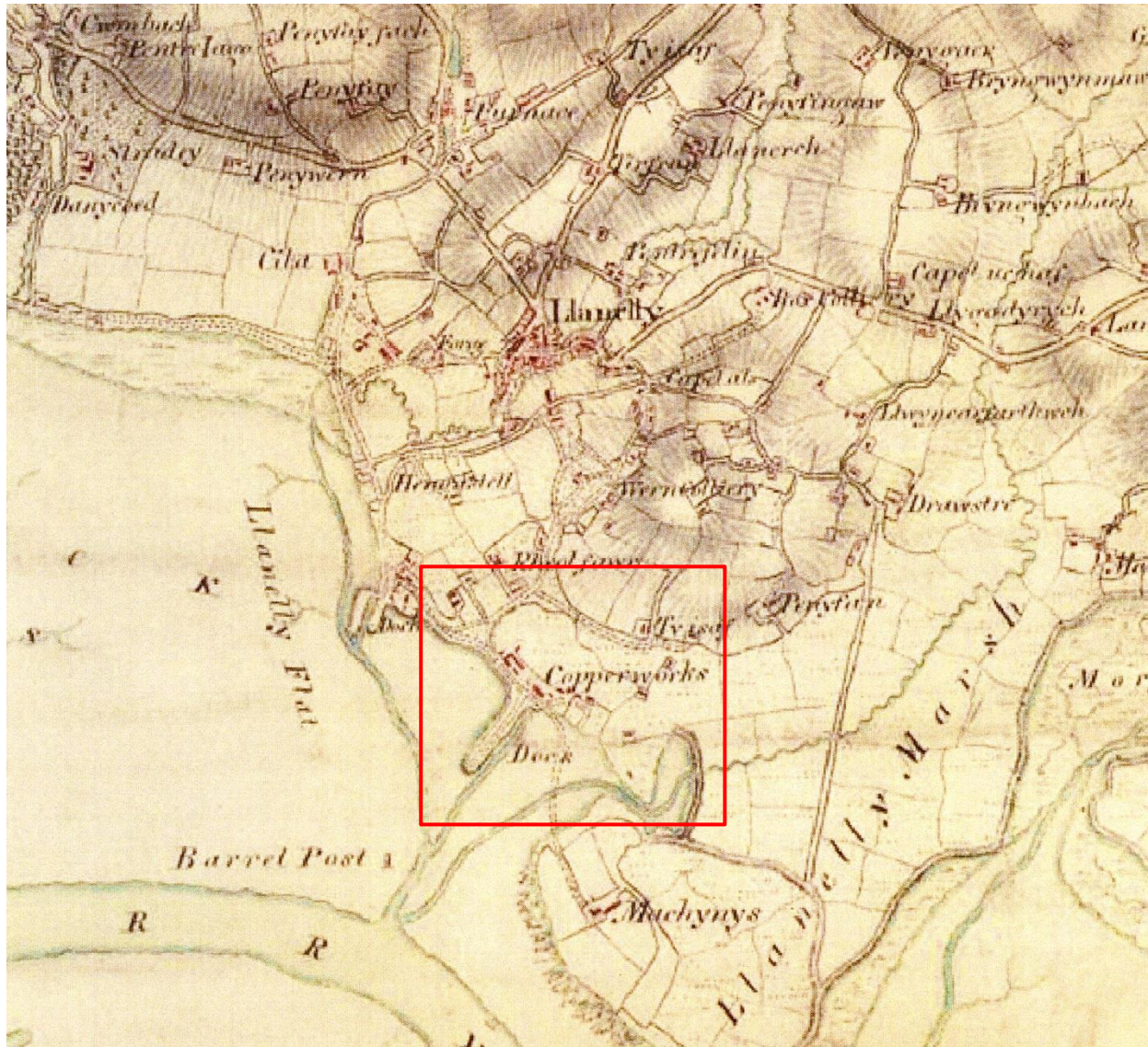


Figure 8: Extract from the 1813 original OS surveyors drawings. Within the red box can be seen the labelled locations of the Copperworks and the Copperworks Dock.



Figure 9: Extract of 1841 Llanelli Tithe Map. Within the red box is the location of the Cooperworks and Copperworks dock is shown as an outline.



Figure 10: Extract of 1880 1:500 scale Ordnance Survey Town Plan of Llanelli, showing detail of the Copperworks site at its apogee in the late 19th century. Named on the map is the ore furnace house, six other furnace houses, two rolling mills, ore courts and a nail house. Copperworks dock is shown at the bottom of the picture as are the network of trackways that supplied the coal yards. The development area is outlined in red.

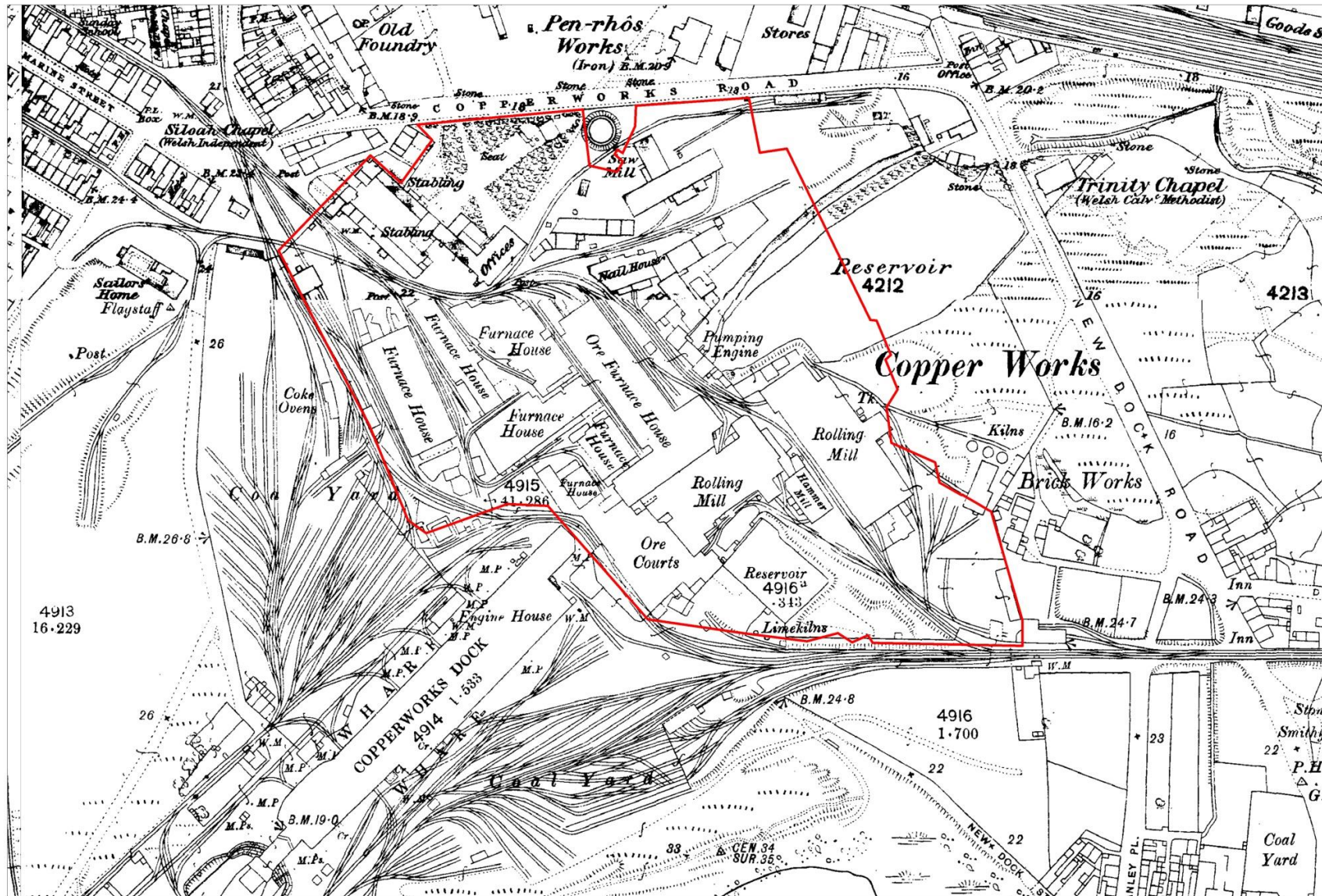


Figure 11: Extract of 1880 1:2500 scale Ordnance Survey map show the extent of the Copperworks at its apogee in the later 19th century. The development area is outlined in red.

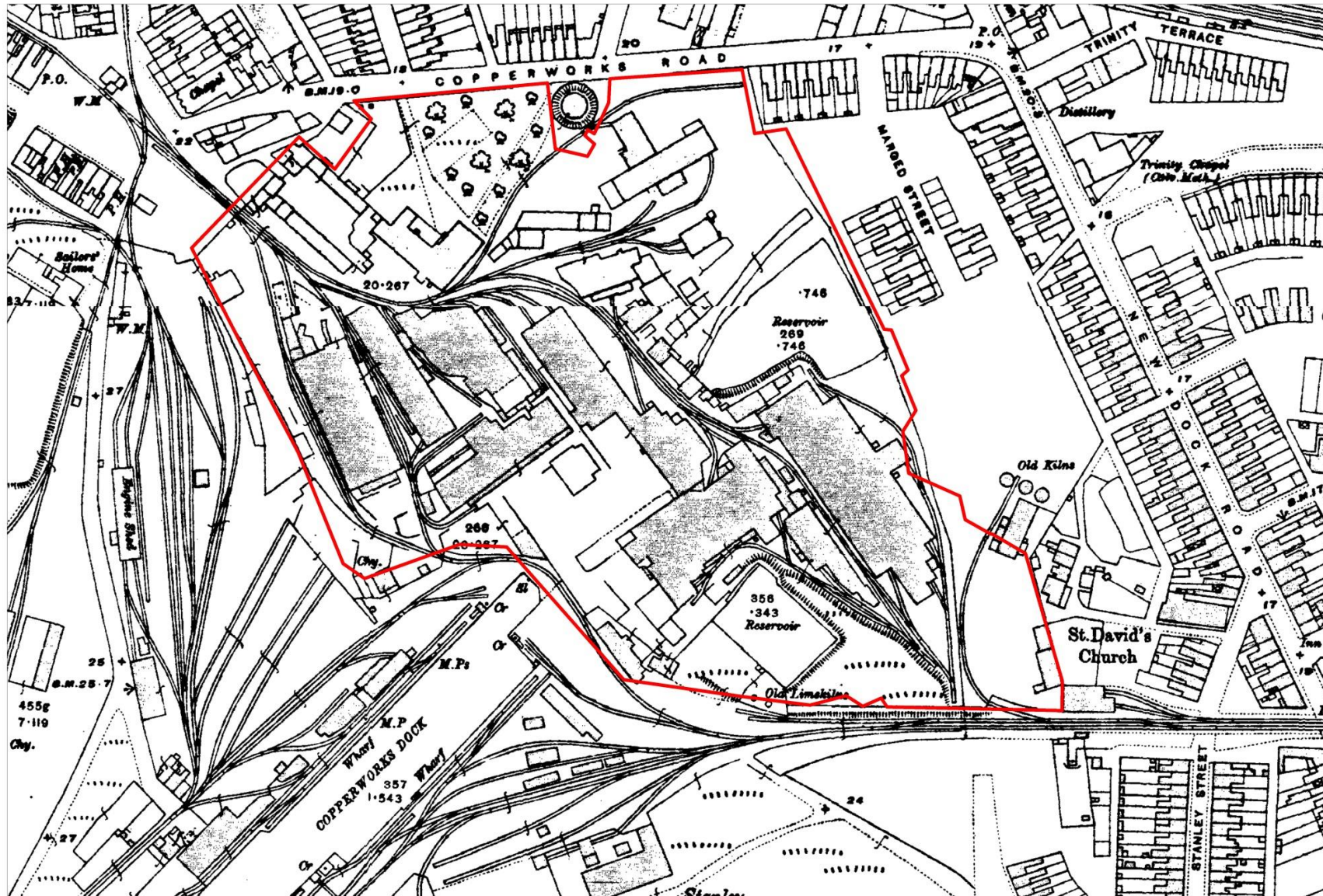


Figure 12: Extract of 1916 1:2500 scale Ordnance Survey map shows the encroachment of housing on the eastern side of the Copperworks site.

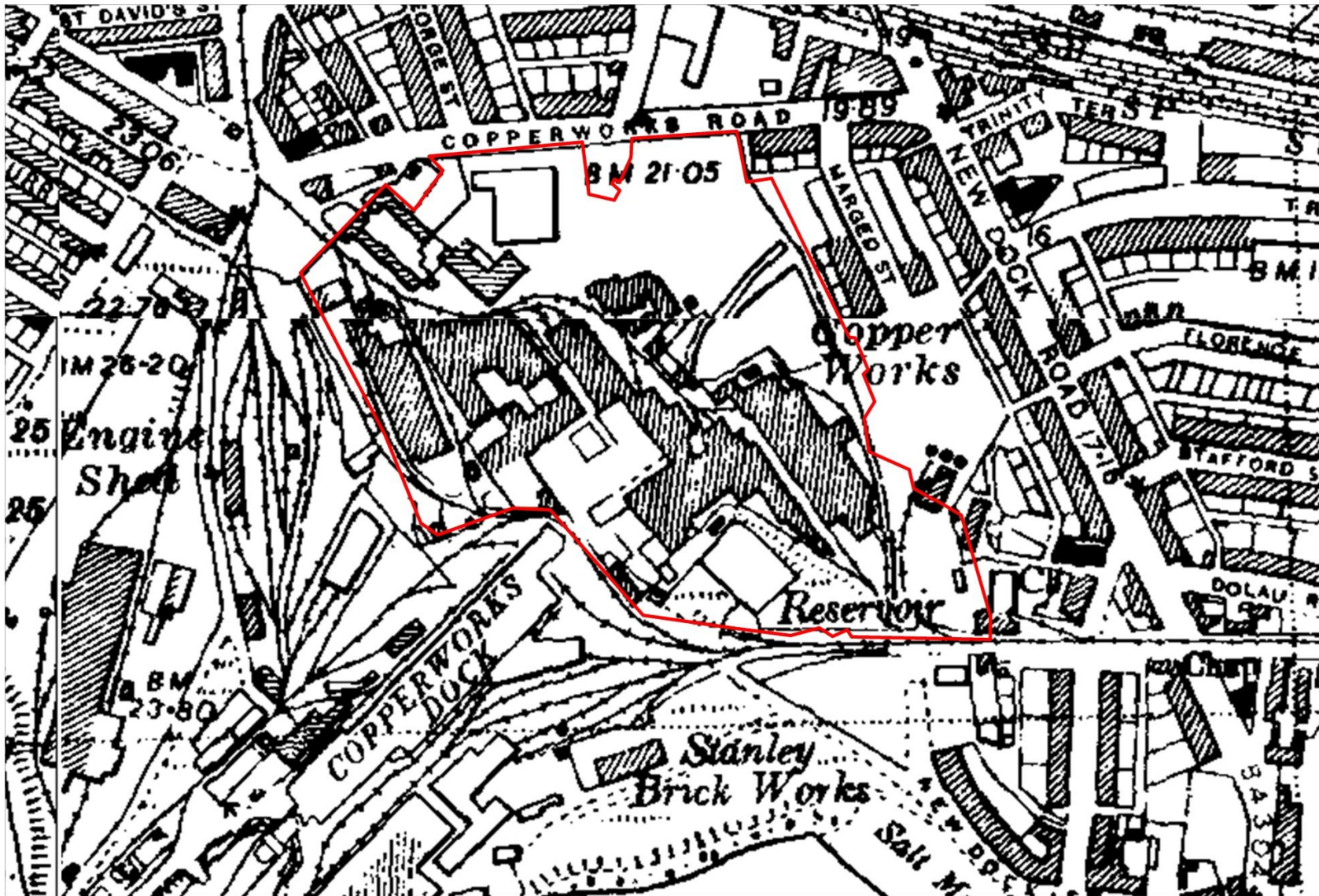


Figure 13: Extract of 1952 1:10560 scale Ordnance Survey map. By this date the Copperworks were much in decline. The former furnace houses have become a wire works and an engineering works and a number of the buildings appear to be in semi-ruin.

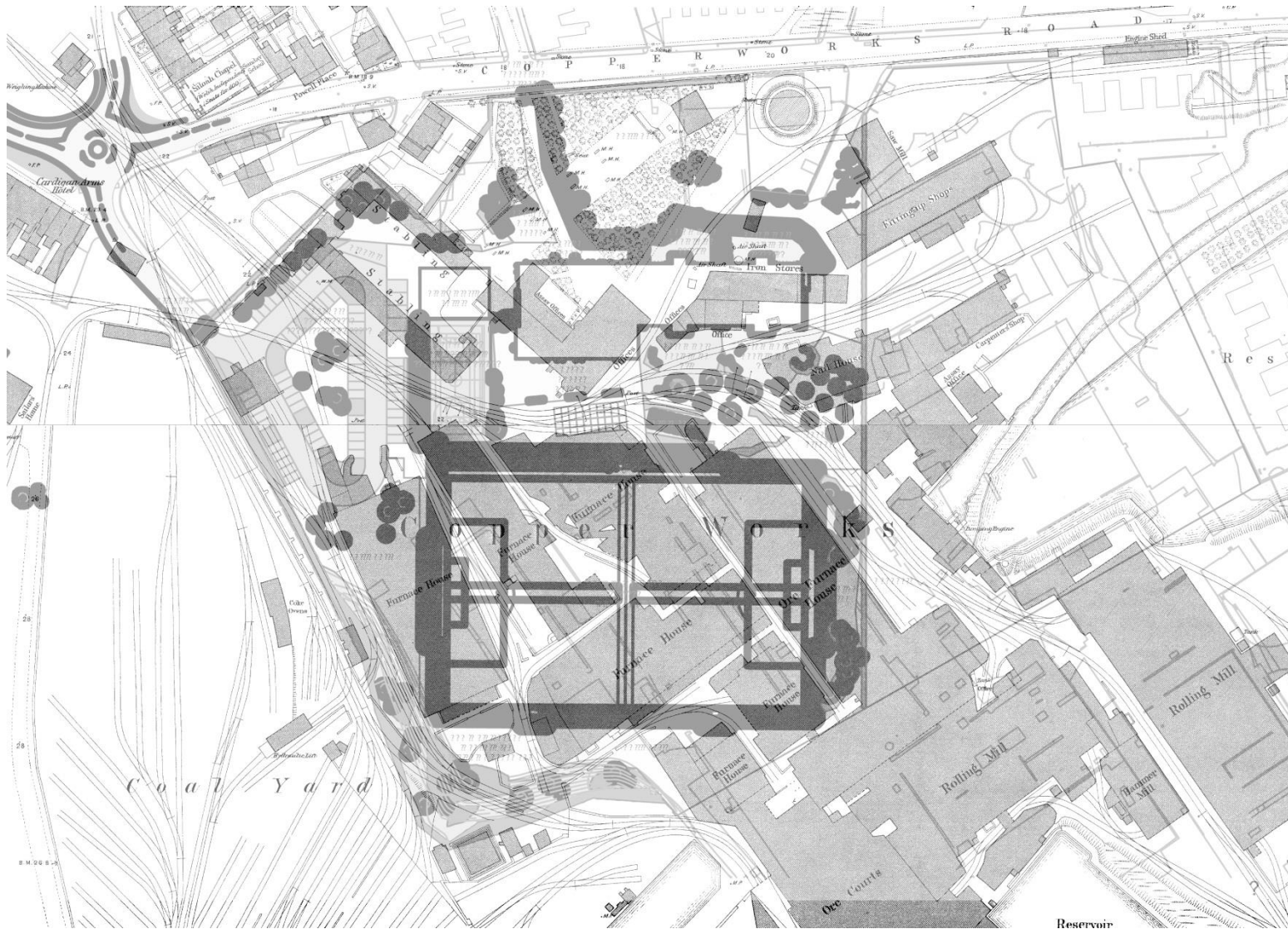


Figure 14: Extract of 1880 1:500 scale Ordnance Survey Town Plan of Llanelli, showing detail of the Copperworks site at its apogee in the late 19th century over which has been overlain the latest design (26/11/2014) of the new school development

4.6 Site Walkover Survey

- 4.6.1 A site walkover was undertaken on 17/10/14 on a clear day in fine weather. The whole of the site area was accessible.
- 4.6.2 No above ground structures were visible. All that remains of the former buildings are concrete hard standings and the tarmacked roads that once gave access to them (Photos 2-7).
- 4.6.3 The boundary wall of the former copperworks survives although it has obviously had several phases of rebuilding, and heightening (Photo 5).

4.7 Aerial Photographic Information

- 4.7.1 The DAT oblique aerial photographic collection was searched for any photographs of the site area. The earliest photographs in the collection that cover this area are the RAF 1946 large scale sortie photographs. Photo 1 shows the Copperworks were in serious decline in 1946, as both rolling mill buildings are open ruins. Some of the buildings including the ore furnace house have been replaced with newer more modern structures but the Copperworks Dock is still visible and appears full of water.

4.8 Previous Archaeological Work

- 4.8.1 To date no intrusive archaeological work has been undertaken within the area of the current proposed development.

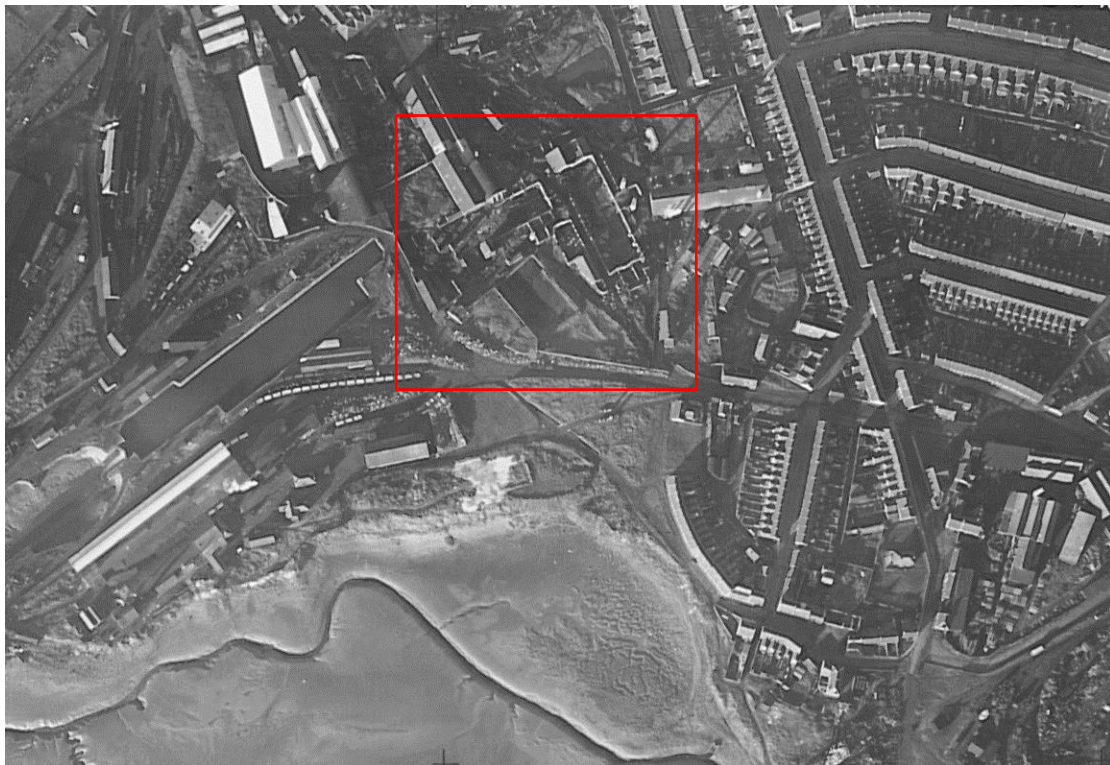


Photo 1: Extract from a RAF 1946 vertical aerial photograph, showing the Llanelli Copperworks. Two rolling mills are now open ruins (within red box).

5 POTENTIAL IMPACTS OF THE PROPOSED NEW SCHOOL DEVELOPMENT ON THE HISTORIC ENVIRONMENT

5.1 Previous Impacts to Development Site

- 5.1.1 The historical and cartographic record indicates that the proposed development site has been extensively developed since the founding of the copperworks in 1805. The construction of the furnaces/smeltering houses, rolling mills, docks and reservoirs would have required considerable ground disturbance. The redevelopment of the site in the later 20th century led to the removal of most of the above ground historic structures associated with the 19th century copperworks. The site was laid to hard standing on which the modern buildings were constructed. The extent to which below ground remains were disturbed at this time is unknown. The demolition works undertaken in 2010 were non-ground intrusive and related only to upstanding structures.

5.2 Potential for Archaeological Remains

- 5.2.1 The archaeological desk-based assessment has shown that there is a single known archaeological site within the area of the proposed new school build, which is the site of the former Copperworks constructed in 1805 (PRN 30666).
- 5.2.2 There are no known archaeological remains of national significance within the proposed development area, or within a study area of 250m from the boundary of the development area.
- 5.2.3 There are four listed buildings within 250m of the proposed school development, the closest of which (PRN 16160) lies c.44m to the northwest of the proposed school development. The buildings are all Grade II listed apart from the Old Castle Iron and Tinplate works that are Grade II* listed and lie c.140m to the southwest (Figure 5).
- 5.2.4 The site walkover did not identify any upstanding archaeological remains within the area of the new school development. The area is defined by concrete hard standings of 20th century industrial buildings and tarmacked roads. The works boundary wall remains largely in situ and bears evidence of several phases of rebuilding.
- 5.2.5 In terms of other archaeological remains it is not known if any earlier sites of archaeological significance were located within the area of the proposed development prior to the construction of the copperworks in 1805. There are no records of any finds or sites on the Dyfed HER. It is likely that if any such sites existed they were destroyed during the construction of the copperworks and its associated docks, railway lines and accompanying infrastructure.
- 5.2.6 Therefore the potential for remains of Palaeolithic, Mesolithic, Neolithic, Bronze Age, Iron Age, Roman, Early Medieval and medieval date to be present within the site area is considered to be very low to negligible as no such remains have been recorded within the study area, and are known to be scarce in the wider area. If found to be present such remains would be considered to be of regional to national importance.
- 5.2.7 The existing settlement pattern is a result of the rapid industrialisation of Llanelli during the 19th century. Prior to this the study area would almost definitely have been used as agricultural and estuarine land, with the nearest settlement being Llanelli. Agricultural remains would be of low archaeological importance.

- 5.2.8 From comparison with sites such as Upper Bank Copper & Zinc Works in Swansea where archaeological excavation in 2006-2008 revealed large scale survival of furnace bases, flooring, rolling mill loadings, machinery loadings, and walls standing to a couple of metres height beneath 20th century concrete floors, it is considered highly likely that an extensive subsurface archaeological resource relating to Llanelli Copperworks survives within the development area and that recording would enable recovery of the detailed layout of the works including changes and evolution of smelting furnaces, rolling mills and other plant over the course of the 19th century.
- 5.2.9 Advice was sought from Robert Protheroe Jones, curator of the Heavy Industry Collections at the National Museum, Cardiff. He suggested that the reuse of the copperworks as a copper wire drawing works would not have overly disturbed the subsurface archaeological resource, as wire drawing machinery sits on top of level floors and does not require excavation of pits and voids. Thus it is extremely likely that earlier structures were only levelled to floor level when smelting and rolling ceased, and hence survive beneath the levels of 20th century concrete floors.
- 5.2.10 He ventured that there is a lack of detailed information concerning the layout of Welsh 19th century copper smelting works, which is a notable gap in industrial archaeological knowledge when the internationally pre-eminent status of the Welsh copper smelting industry is considered. The Upper Bank excavations found that the copper smelting furnaces had been extensively disrupted by the construction of the later zinc smelting furnaces, so the amount of detailed information from that site from its copper smelting phase was significantly less than from its zinc smelting phase. At Llanelli, as the copper smelting phase was directly followed by wire drawing, there is (as noted above) no expectation that the subsurface would have been disrupted in the manner seen at Upper Bank.

5.3 The Potential Impacts from the Proposed Development

- 5.3.1 The most recent design scheme for the proposed new school comprises new school buildings, parking areas, play spaces and an all-weather full sized sports pitch, shown in Figure 3.
- 5.3.2 No designated sites (Scheduled Ancient Monuments and Listed Buildings) will be affected by the proposed development.
- 5.3.3 The most recent scheme design for the proposed school site (Figure 3) indicates that the proposed school site will occupy the northwestern part of the former copperworks site. Using the 1880 1:500 map (Figure 14) as a guide it would appear that the proposed school buildings will overlie the locations of several ancillary buildings associated with the copperworks, including offices, stabling and iron stores but that the construction of an all-weather sports pitch would extend across the former locations of the furnaces, including the main ore furnace house.
- 5.3.4 Despite the lack of obvious above-ground remains there is still high potential for below-ground remains. Such evidence could range from large structural remains and other features common to large 19th century industrial sites, through to more ephemeral remains associated with copper working processes and surrounding tram or rail-roads.

5.3.5 Any of the following activities that might be associated with the proposed development of the site area could therefore expose, damage or destroy any such remains:

- Enabling works, such as installation of contractor's compound, construction of access roads, parking areas, storage areas, borrow pits and associated services;
- Landscaping and terracing works;
- Topsoil stripping;
- Foundation excavation;
- Construction of roads and infrastructure; and
- Service installation.

6 DISCUSSION

6.1 General Conclusions

- 6.1.1 The archaeological assessment has shown that the proposed new school development lies within a former industrial landscape containing very limited archaeological information for all periods excluding those of the post-medieval and modern periods. This limited knowledge may be as a result of a lack of previous archaeological work undertaken within the area.
- 6.1.2 Cartographic evidence suggests that the development area has been used as agricultural land and remained undeveloped prior to the construction of the Llanelli Copperworks in 1805. As such the potential for remains prior to the post-medieval period for anything other than agricultural related remains is considered low.
- 6.1.3 The redevelopment of the site in the later 20th century led to the removal of most of the above ground historic structures associated with the 19th century copperworks. The site was laid to hard standing on which the modern buildings were constructed. The extent to which below ground remains were disturbed at this time is unknown. The demolition works undertaken in 2010 were non-ground intrusive and related only to upstanding structures.
- 6.1.4 From comparison with sites such as the Upper Bank Copper & Zinc Works in Swansea, where archaeological excavation revealed large scale survival of furnace bases, flooring, rolling mill loadings, machinery loadings, and standing walls beneath 20th century concrete floors, it is considered highly likely that an extensive subsurface archaeological resource relating to Llanelli Copperworks survives within the development area.
- 6.1.5 Llanelli Copperworks was the joint fourth largest copper smelting works in the world in the mid-19th century. Apart from the Upper Bank Copper & Zinc works in Swansea, where the later zinc works had destroyed much of the earlier copper workings, no other Welsh 19th century copper works have been professionally excavated and recorded. Most other sites have only benefitted from no more than cursory photographic recording
- 6.1.6 Appropriate recording of Llanelli would add materially to knowledge of this internationally pre-eminent industry that contributed so enormously to the history of Wales and beyond and offers the potential to recover detailed knowledge of a major and typical 19th century copper smelting works of national importance.
- 6.1.7 In terms of visual impact to surrounding heritage assets and Historic Landscape Character areas, the impact is considered to be low. The boundary wall if kept in the school design will maintain the former definition of the copperworks. This will preserve the relationship of the works with its surrounding terraced workers houses that are still occupied today.

6.2 Design Mitigation

- 6.2.1 Due to the site's long industrial history, in late 2014 the developers commissioned a detailed intrusive ground investigation report to detail current site specific factors regarding ground stability and contamination. Comprehensive laboratory analysis of ground/soil samples has revealed elevated levels of various contaminants to be

present which has informed the construction methodology of the site, given the constraints of its location in proximity to the 'Carmarthen Bay & Estuaries European Marine Site' which is a collective name for three European 'Natura 2000' designated areas.

- 6.2.2 Due to the high levels of contaminants it has been deemed that no intrusive excavations into existing ground levels will be undertaken in order to minimise any disturbance of contaminated material and minimise impact on ground water. In terms of the proposed scheme the developer has advised that the existing ground levels on the site will be raised by a maximum of some 1000mm where necessary which will negate any foundation and drainage works being undertaken below existing ground levels.

6.3 Archaeological Mitigation

- 6.3.1 There is very high potential for the survival of buried remains relating to Llanelli Copperworks to exist within the proposed development area. Such remains are considered to be of national importance and are therefore worthy of preservation through archaeological record, should they be revealed, damaged or destroyed as a result of the proposed development.
- 6.3.2 In ordinary circumstances further investigation into the survival and condition of these potential buried remains would be required before a full mitigation strategy can be devised, as at present the condition of any archaeological remains within the development area is unknown. However, the developer's proposal to raise current ground levels to minimise any disturbance of contaminated material has the equal and added benefit of protecting buried archaeological deposits from disturbance.
- 6.3.3 Consequently it is recommended that no further archaeological mitigation is required on the basis of the developer's proposals to significantly raise the ground surface to negate any foundation or drainage works being undertaken; works that would damage or destroy important archaeological remains and deposits.
- 6.3.4 If for any reason it proves necessary to undertake ground works within the development area during the proposed project it is recommended that as a minimum an archaeological watching brief be carried out on any ground disturbance activities.
- 6.3.5 These recommendations for archaeological mitigation are based on the design proposals at the time of writing the report and may need to be reassessed if substantial changes in the development's design are proposed.

7. SOURCES

Published

Cadw 1998. *Register of Landscapes of Outstanding Historic Interest in Wales*.

Unpublished

Atkins 2010, *Former Copperworks Site, Llanelli, Carmarthenshire. Desk Based Heritage Assessment*

Database

Dyfed Archaeological Trust Historic Environment Record, housed with Dyfed Archaeological Trust in The Shire Hall, Llandeilo, Carmarthenshire, SA19 6AF

RCAHMW Coflein Database <http://www.coflein.gov.uk/>

LANDMAP GIS Database <http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/landmap>

Cartographic

Llanelly Tithe Map 1842 and Apportionment 1841

Ordnance Survey 1813 Original Surveyors Drawings

Ordnance Survey 1880 *1:500 Ordnance Survey Town Plan of Llanelly*

Ordnance Survey 1880 *1:2500 1st edition Carmarthenshire*

Ordnance Survey 1916 *1:2500 2nd edition Carmarthenshire*

Ordnance Survey 1952 *1:10560 Carmarthenshire*

Aerial Photographs

Next Perspectives – digital aerial photographs held by the Dyfed Historic Environment Record.

RAF Aerial Photographs 1946 – large scale sortie Ref: CPE/UK/2419 – numbers 5109-5120

Photographs



Photo 2: The main south gate of the former Draka works in 2014. The Draka company, manufacturers of copper wire, was the last occupier of the former copperworks and finally closed in June 2009.



Photo 3: View of the development area looking north showing the area cleared of all above ground structures. All that remains are the hard standings of the former buildings and the tarmacked roads that once connected them.



Photo 4: View of the development area looking roughly northwest showing the area cleared of all above ground structures.



Photo 5: View of the surviving boundary wall towards the northwest side of the site.



Photo 6: View of the development area looking southeast presenting the total demolition of all above ground structures.



Photo 7: View of the development area looking southwest presenting the total demolition of all above ground structures.

PROPOSED NEW PRIMARY SCHOOL AT THE FORMER DRAKA COPPER WORKS SITE, LLANELLI, CARMARTHENSHIRE

ARCHAEOLOGICAL DESK BASED ASSESSMENT

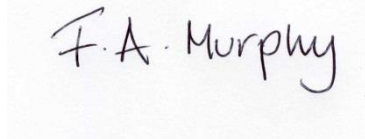
RHIF YR ADRODDIAD / REPORT NO. 2014/41
RHIF Y DIGWYDDIAD / EVENT RECORD NO. 107511

Ionawr 2015
January 2015

Paratowyd yr adroddiad hwn gan / This report has been prepared by:
Fran Murphy

Swydd / Position: **Project Manager DAT Archaeological Services**

Llofnod / Signature



Dyddiad / Date 07/01/2015

Mae'r adroddiad hwn wedi ei gael yn gywir a derbyn sêl bendith

This report has been checked and approved by:
James Meek

ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.
on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position: **Head of DAT Archaeological Services**

Llofnod / Signature



Dyddiad / Date 07/01/2015

*Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadau
sydd gennych ar gynnwys neu strwythur yr adroddiad hwn*

*As part of our desire to provide a quality service we would welcome any
comments you may have on the content or presentation of this report*

