

Unit Superheaters Engineering Swansea



Archaeological Evaluation Report



February 2008

**Client: Waterman CPM
on behalf of Unit Holdings Ltd
and DFWJ Ltd**

Issue N^o: 1
OA Job N^o: 3737
Planning Ref N^o: pre-application
NGR: SS 6595 9370

Client Name: Waterman CPM on behalf of Unit Holdings Ltd and DFWJ Ltd

Client Ref. No:

Document Title: Unit Superheaters Engineering, Swansea

Document Type: Evaluation

Issue Number: 1

National Grid Reference: SS 6595 9370

Planning Reference: pre-application

OA Job Number 3737

Site Code: SWUNIT 07

Invoice Code: SWUNIT EV

Receiving Museum: Swansea Museum (TBC)

Museum Accession No: TBC

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Date: 8th February 2008

Document File Location

Graphics File Location

Illustrated by

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SUMMARY

Oxford Archaeology undertook a field evaluation at the Unit Superheaters Engineering Works, Swansea on behalf of Unit Holdings Ltd and DFWJ Ltd. Two trenches were excavated revealing substantial standing structures relating to the historical use of the site and large volumes of dumped deposits that progressively raised the ground level. Significant quantities of kiln and pottery waste debris were recorded at depth in Trench 1 and, along with standing stone walls recorded within Trench 3, are likely to represent the preservation of the Cambrian Pottery works that occupied the site in the late 18th century - mid 19th century. Structural remains relating to the subsequent late 19th-century Patent Fuel works and later use of the site were encountered within Trench 1 cut into the upper levels of made ground but, significantly, these had not disturbed or truncated the remains of the pottery works. A photographic record undertaken in 1965 of the riverbank reclamation and historical North Dock Basin infilling, alongside the present assessment and recording of the current upstanding historical remains, demonstrate that the river wall, quays and docks all remain substantially intact within the site boundary. The dwarf stone wall at the eastern end of the northern factory unit also predates the current building and appears to originate as a boundary fronting the river side.

1 INTRODUCTION

1.1 Location and scope of work

1.1.1 Between 12th and 20th July 2007 Oxford Archaeology (OA) undertook a field evaluation at the Unit Superheaters Engineering works, Swansea for Waterman CPM on behalf of Unit Holdings Ltd and DFWJ Ltd. This was a pre-determination action designed to inform the planning submission for a mixed commercial and residential redevelopment of the site.

1.1.2 The archaeological work was undertaken in accordance with a Specification for Archaeological Field Evaluation set by Waterman CPM (2007a) through agreement and consultation with Neil Maylan, archaeological advisor to Swansea City Council. OA subsequently produced and submitted a Written Scheme of Investigation (WSI) detailing how the specification would be met prior to commencing the fieldwork (OA 2007).

1.2 Geology and topography

1.2.1 The site is centred on SS 6595 9370 to the north-east of Swansea city centre on the western side of the River Tawe (Fig. 1). It covers an area of 3.4 hectares and is currently occupied by large industrial buildings with areas of hard standing and some scrub-covered waste ground along the river bank. It is bounded to the south-west by New Cut Road, to the north-west by Morfa Road, to the north by Corporation Yard and to the east by the River Tawe.

1.2.2 The site lies within an area of unclassified urban soils according to the Soil Survey of England and Wales (SSEW) map sheet 1 (1983) at 7.5 m to 9.5 m above Ordnance Datum (aOD). The soils and geology in the area immediately to the east and south-east of Swansea include Palaeozoic sandstone and drift from Palaeozoic and Mesozoic sandstone and shale, which are overlain by soils characterised as well drained loamy and fine loamy soils (*Ibid.*). It is recorded that the site includes part of the former channel of the River Tawe, which was in-filled in the 1940s, and will therefore include a significant volume of made ground in its eastern sector.

1.3 Archaeological and historical background

1.3.1 The archaeological background to the evaluation has been the subject of a separate desk-based study by Waterman CPM in May 2007 (2007b), the results of which were summarised within the Specification (2007a) and repeated below. The original desktop study should be consulted alongside this document for further detail.

1.3.2 The Glamorgan-Gwent Archaeological Trust Sites and Monuments Record (GGAT SMR) does not contain any records of human activity within the site, or the 0.25 kilometre radius study area, of earlier than post-medieval origin. However, Taylor (1996) argues for the presence of a medieval watermill on the site of a mill that was depicted on a map of the town published in 1843 as part of the Cambrian Pottery works (Fig. 5a). This mill is also depicted in line drawn views of the Cambrian Pottery works in the late 18th century (Hughes 2005 figs. 24a and 25). The mill was used by the pottery works to crush flint for use in the production of its pottery.

1.3.3 The pottery works were preceded by, and made use of, the buildings of only the second copper works to be established in Swansea. The Cambrian Copperworks was founded in 1720 and was smelting copper until 1745 although the mill may have been used as a copper rolling-mill until as late as 1776 utilising the water mill as a source of power (*Ibid.*).

1.3.4 The Pottery Mill is also shown within the site on the 1852 plan of Swansea Harbour, close to the south west boundary of the development area (Fig. 5b). The Cambrian Pottery works lay near the centre of the site producing high quality earthenware and porcelain between 1776 and 1868 (*Ibid.*).

1.3.5 An archaeological excavation was undertaken in February 1983, on land to the south west of the site, beyond its boundary (Sell 1983). This identified remains of a large vaulted stone and brick structure, measuring 16 metres by four metres, which had been in-filled to a depth of c. 1.7 metres. This was interpreted as a pottery drying chamber belonging to the Glamorgan Pottery which lay adjacent to the Cambrian Pottery. The Glamorgan Pottery was opened in 1814. The remains were recorded at a depth of two metres below the existing ground level.

1.3.6 The site of the Pipe Quay is recorded in the north of the site on the 1852 plan of Swansea Harbour, whilst the Patent Slip was recorded in the east of it at the same date. A lock and a weir were also recorded near to the centre of the site on this map.

1.3.7 The 25" first edition Ordnance Survey map, produced in 1879, shows the south west area of the site as occupied by the Graigola Merthyr Works, which produced Patent Fuel (Fig. 5c). The map shows that all of the earlier pottery works buildings had been demolished, whilst the structures associated with the Graigola Merthyr Works were limited to a number of small sub-rectangular buildings, lengths of tramways running from works buildings to the south west of the site up to the former River Tawe and a length of dock running through the central western part of the site, which joined the former river to the canal to the west of the site. This length of dock appears to have incorporated the former course of the Burlais Brook, which had been canalised, whilst the lock made use of part of the former area of the mill pond.

2 EVALUATION AIMS

2.1 General

2.1.1 The evaluation aimed to establish the presence/absence, extent, date, nature, function, and phasing of any archaeological remains present within the development boundary. To achieve this it aimed to;

- Determine the thickness, depth and depositional history of any archaeological and environmental deposits
- Characterise the nature of the main stratigraphic units encountered in terms of their physical composition (stone, sand, gravel, organic materials etc.) and their archaeological formation (primary deposits, secondary deposits etc.)
- Assess the overall presence and survival of structural remains relating to the main periods of occupation revealed and the potential for the recovery of additional structural information given the nature of the deposits encountered (eg, extent of later disturbance etc.)
- Assess the overall presence and survival of the main kinds of artefactual evidence (including pottery, brick, tile, stone, glass, metal, bone, small finds, industrial residues etc.), its condition and potential given the nature of the deposits encountered
- Assess the overall presence and survival of the main kinds of ecofactual and environmental evidence (including animal bone, human bone, plant remains, pollen, peat, charcoal, mollusca, soils etc.), its condition and potential given the nature of the deposits encountered
- Appraise the relative value of the main stratigraphic units revealed in terms of their importance for preservation and conservation
- Determine the need for, and scope of, any further mitigation works, such as excavation or archaeological observation during groundworks, that may be required.

2.1.2 Whilst the final two listed aims above are listed it was only the intention of this evaluation to inform the subsequent consideration of these rather than provide detailed comment within this report.

3 EVALUATION METHODOLOGY

3.1 Scope of fieldwork

3.1.1 The evaluation comprised two excavated trenches (Trenches 1 and 3) although the original strategy proposed five locations in total (Trenches 1-5) (Figs. 2 and 3). Only Trenches 1 and 3 were accessible at the time of the fieldwork. Trench 1 was located within an open area at the southern end of the site and measured 22 m by 8 m at the current surface level. This was larger than the required 20 m by 2 m dimension due to the excavation method using sloped trench edges as described below. Trench 3 measured 10.5 m by 2 m and was restricted by the boundary of New Cut Road to its west and the standing building to its east.

3.1.2 In addition to the excavated trenches, two separate areas of visible standing wall relating to the historical structures predating the existing factory were also photographically recorded (Fig. 2). East of Trench 1 the eastern side of the North Dock Basin partly remains above the current ground level. To the north of the site, at the eastern end of the existing factory, surviving masonry also remains forming the foundation and wall to the standing superstructure of the factory.

3.2 Fieldwork methods and recording

3.2.1 Trench 1 was located in relatively open ground and was intended to be excavated as a stepped trench. This necessitated the larger surface dimension to be able to investigate an approximate 20 m by 2 m trench at an anticipated depth of 4 m. In the event the structures and deposits encountered within the upper levels were not sufficiently stable to allow for stepped excavation. Therefore, once these had been recorded, they were removed and the trench edges were sloped to the increased 4 m depth.

3.2.2 Following excavation of Trench 1 to its maximum 4 m depth, and after consultation with Chris Cox (Waterman CPM) and Neil Maylan, a small machine excavated sondage was excavated immediately before backfilling. This attained a maximum depth of c. 5 m below the current ground level to investigate the stratigraphic units below 4 m.

3.2.3 Trench 3 was excavated as a single width trench utilising shoring to provide safe access. The trench measured 10.5 m long by 2 m wide and was limited to a depth of 4 m to comply with the engineering guidelines for the structural stability of the adjacent building and its foundations.

3.2.4 The trenches were excavated by a 360° mechanical excavator. A toothless bucket was utilised when possible but otherwise, where hard ground and concentrated rubble deposits were encountered, a toothed bucket and a breaker were employed.

3.2.5 Both trenches were excavated to the surface of any significant archaeological horizon, the natural geology or the maximum safe excavation depth (4 m) depending on which

was encountered first. As described above in the case of Trench 1, the uppermost structures and deposits were recorded prior to removal to gain access to the earlier deposits at greater depth.

- 3.2.6 The stratigraphy of each trench was recorded including where no archaeological deposits were identified.
- 3.2.7 All machine excavation of deposits was under archaeological supervision and the trenches were back-filled following approval from Neil Maylan.
- 3.2.8 Where deposits or features were encountered that warranted detailed investigation, these were cleaned and excavated by hand where health and safety considerations made this possible. However, in the event, relatively little hand excavation and entry into the deep trenches was required other than to record the structures revealed in the upper part of Trench 1. Each of the encountered features and structures were recorded in plan and section where required at scales of 1:50 and 1:20. Photographic record was also made using colour slide and black and white print film. Recording followed procedures laid down in the OAU Fieldwork Manual (ed. Wilkinson 1992).
- 3.2.9 Summary written and photographic records were also made of the extant visible remains of the historical structures predating the existing factory complex. Detailed elevation records were not undertaken.

3.3 **Finds**

- 3.3.1 No finds were recovered Trench 3. Within Trench 1 a sondage excavated by machine below the 4 m level encountered large quantities of pottery and kiln furniture from which a sizeable and representative sample was recovered.

3.4 **Palaeo-environmental evidence**

- 3.4.1 No deposits suitable for palaeo-environmental sampling and analysis were encountered during the evaluation project.

3.5 **Presentation of results**

- 3.5.1 This report outlines the findings from each trench through description and relevant illustrations of plans and sections where archaeological deposits and features were encountered. An inventory of all finds and contexts (which includes measurements not presented within the text) is provided in Appendix 1. Where relevant these details are also mentioned in the descriptions below.

4 RESULTS

4.1 Trench 1

- 4.1.1 The earliest deposit observed in Trench 1 was revealed in a small test sondage machine excavated below the arbitrary 4 m level at the base of the trench (Fig. 4 section 100). This was a silty grey layer (113) containing fragments of slag, clinker and a significant quantity of pottery and kiln furniture. The pottery was mostly of early to mid 19th century date and comprised fragments representing the various stages of production from the decoration and firing sequence. The deposit was greater than 0.5 m thick and extended below the c. 5 m below current ground level depth attained at the base of the sondage. Standing water was encountered at this depth and it was decided not to excavate below this level.
- 4.1.2 A 1.5 m thick deposit of made ground (110) sealed the pottery-bearing horizon throughout the length of the excavated trench. This consisted of a friable grey brown sandy silt with fragments of brick and gravel lenses throughout indicating it derived from a series of tip layers that had been levelled off at its surface. The only finds recovered encountered within this were four sherds of pottery in a creamware fabric that are likely to be residual. A subsequent deposit of made ground (109) overlay the lower tip layers (110). This deposit consisted of a dark yellowish brown silty clay with lenses of reddish brown clay containing fragments of tile, brick and stone. This was 0.75 m thick throughout the length of the trench and had been similarly levelled across its surface.
- 4.1.3 Standing structures constructed of two types of materials were cut into the surface of levelling deposit 109. These comprised two separate, but likely to be related, Pennant Sandstone structures (103/104 and 106) and a reinforced concrete structure (105) (Fig. 3). They appear to be broadly contemporary with the concrete structure respecting the layout of the stone walls (103 and 104). However, wall 103 was clearly replaced by the concrete structure suggesting that this was a later alteration or addition.
- 4.1.4 Both walls 103 and 104 were 0.85 m wide and constructed from roughly dressed blocks of Pennant Sandstone with occasional reused yellow fire bricks bonded in cement. These were aligned NNE to SSW at the NE end of the trench and were arranged parallel to each other 2.50 m apart. Both were truncated and survived to a height of 1.30 m constructed in shallow foundation trenches cut into layer 109. Wall 104 had a slate tile damp course constructed into its lower courses.
- 4.1.5 To the SW of walls 103 and 104 was sub-circular structure (106) with a short wall spur extending off it to the NNE on the same alignment as the walls to the NE. This was constructed of the same materials as 103 and 104 although it was bonded with a lime mortar. The sub-circular part of the structure had an external dimension of 5.00 m x 5.75 m and internal space of 3.50 m x 4.00 m. A squared wooden beam was situated across the internal space with fixings on each face of the central part of the beam held in place with large iron bolts.

- 4.1.6 The large reinforced concrete structure (105) was also constructed above the levelling layers. This was built within a foundation trench 0.80 m deep (107) truncating layers 109 and 110 and partly over wall 103. It also appears to have removed or altered the SW end of wall 104. The concrete structure had a flat base/floor 2.50 m wide with parallel wall sides raised approximately 2.5 m high from the floor with imprints from the wooden shuttering remaining on the surface of the concrete. This formed a vertical sided box or channel that was aligned ESE to WNW across the trench. A slight hint for the former presence of a roof to enclose the channel was recorded although the uppermost parts of the side walls were truncated making it impossible to establish if this was a roofed channel at this level or if the walls were raised higher.
- 4.1.7 The concrete channel was infilled by two deposits (112 and 111). The primary fill (112) comprised a sticky dark reddish brown silty clay with occasional clinker, tile and brick inclusions with conspicuous iron staining throughout. A loose dark grey silt deposit (111) containing frequent clinker and coal dust with some reinforced concrete fragments infilled the remainder of the structure. This was essentially the same as deposit 102 described below.
- 4.1.8 A 2.25 m thick layer of dark grey silt containing frequent clinker and coal dust was present throughout the upper levels of the trench butting against the concrete structure and walls 103/104. This levelled the area to the truncated height of the demolished concrete remains. Overlying this was compacted layer of crushed stone and concrete (101) forming the foundation for the current tarmac car park (100).

4.2 Trench 3

- 4.2.1 A series of made ground deposits, two walls and a brick culvert were encountered within Trench 3. This was excavated to a maximum depth of 4 m at which point the shoring was inserted. With this in place it was subsequently difficult to study the sections in detail and, even with shoring, the loose deposits encountered made safe working in the base difficult. Due to this, the exact stratigraphic relationships between walls 306 and 307 and the lower deposits were not conclusively established. However, the following description appears most likely based upon the recorded and historical evidence. The relevance and reliability of this description is discussed in detail in Section 5.
- 4.2.2 The two walls (306 and 307) are potentially the earliest features encountered within the trench. Their exact relationship with the lower deposit (305) was not firmly established although the main layer of made ground (304) above 305 clearly butted against both walls (Fig. 4 section 300 please note that only wall 306 was recorded in the drawn section). The walls are of near identical construction with roughly hewn and coursed facing blocks of Pennant Sandstone and a rubble core bonded with lime mortar. Occasional orange-red bricks were also present within the face courses although it was not clear if these were later repairs/additions or part of the original build. The walls were 0.80 m wide and appeared to continue below the excavated base level of the trench suggesting a standing height of *c* 3.00 m. The walls were parallel to

each other 1.20 m apart and aligned WNW to ESE across the southern end of the trench with the facing blocks visible to the full excavated depth suggesting that these were formerly part of the upstanding walls and not the foundations.

- 4.2.3 Layer 305 observed across the base of the trench comprised a loose dark grey sandy silt containing significant quantities of brick and rubble debris. This was at least 0.70 m thick and extended below the excavated depth of the trench. The relationship between this deposit and the walls (306 and 307) was not firmly established. An attempt was made to machine excavate a small sondage below this level immediately prior to backfilling. However, standing water was encountered at approximately 4.20 m to 4.50 m below the current ground level making the trench even more unstable and severely hindering the archaeological visibility. Therefore this was abandoned and backfilled without adding to the recorded archaeological sequence.
- 4.2.4 Layer 305 was sealed by a substantial volume of made ground (304) of a similar composition to that of the lower deposit. Layer 304 was present throughout the trench with a thickness of 1.75 m and comprised a very loose black deposit of fine sand and silt containing a large quantities of stone and brick. This very clearly butted up against the walls and raised the ground level from *c* 5.45 m aOD to *c* 7.10 m aOD. A further layer of similar made ground (303) overlay this sealing the top of walls 306 and 307 adding a further 0.60 m to the depth of the made ground.
- 4.2.5 The sequence of substantial made ground deposits raising the ground level was interrupted by a 0.30 m thick band of coal dust and clinker (302) that overlay deposit 303 throughout the extent of the excavated trench.
- 4.2.6 A brick vaulted culvert (308) was just exposed at the northern corner of the trench. This is aligned roughly parallel to the walls, trench built to a height of 1.20 m and cut through layer 302 and into 303 below.
- 4.2.7 A very mixed and compacted made ground layer (301) overlay the coal dust deposit (302) and sealed the brick culvert forming a foundation for the current tarmac car park surface (300) which completed the sequence within this trench.

4.3 **Historical walls**

- 4.3.1 Two areas of standing wall remains were recorded alongside the intrusive evaluation (see Fig. 2 for general locations and photo viewpoints). Approximately 50 m to the east of Trench 1, to the river side of the standing factory building, stand the remains of the eastern side of the North Dock Basin (Plate 1). This was faced with neatly dressed and coursed blocks of Pennant Sandstone topped by large capstone slabs with a bullnose leading edge. This stood approximately 1 m above the ground level to the west and ran for approximately 75 m representing the near complete length of the eastern side of the historical North Dock Basin. At its SW end this turned at a right angle to the NW reflecting the location of the SE pier supporting the Pottery Bridge and the entrance to the main area of the North Dock (see Fig. 5b-e for the layout of the dock and bridge). To the NE the level of the surrounding ground gradually sealed the

remains although its visible end approximately corresponds to the end of the dock wall and the location of a late 19th century pumping house (see Fig. 5). This is discussed further below alongside photographic records of the infilling of the North Dock Basin in 1965.

- 4.3.2 Two individual, but clearly associated, sections of standing wall were also recorded at the eastern end of the northern factory within the current arrangement. These form dwarf wall bases to the current standing factory building. Both sections (Plates 2 and 3) are constructed of Pennant Sandstone roughly coursed and dressed blocks and are approximately 3.00 m long and stand 1.00 m high with brick quoins built into modern entrances that appear to pierce the wall. Each wall is approximately 0.80 m thick and aligned NE/SW.

4.4 Finds

Pottery

by John Cotter

- 4.4.1 A total of 331 sherds of pottery weighing 4251 g. were recovered from two contexts. This is all of 18th- and 19th-century date. These totals include domestic pottery, pottery wasters, pottery kiln furniture and a piece of glazed wall tile (128 g.) included here for dating purposes. All the pottery was examined and spot-dated during the present evaluation stage. For each context the total pottery sherd count and weight were recorded, followed by the context spot-date which is the date-bracket during which the latest pottery types in the context are estimated to have been produced or were in general circulation. Comments on the presence of datable types were also recorded, usually with mention of vessel form (jugs, bowls etc.) and any other attributes worthy of note (eg. decoration etc.).
- 4.4.2 The pottery assemblage is in a good but fragmentary condition although the sherds are large and fresh. A few complete vessel profiles, saucers and plates mostly, have survived or can be reconstructed. Ordinary domestic pottery types are represented as well as clear evidence for pottery production in the form of pottery wasters and kiln furniture (Plate 4). The types present are summarised below with further details and descriptions presented in the accompanying table.
- 4.4.3 All but four sherds of the pottery were recovered from context (113), the lowest stratified unit in Trench 1. Pottery types here, including wasters, would mostly appear to date to the first half of the 19th century with the latest pieces probably of mid 19th-century date and a minority of pieces dating to the 18th century. However the latest piece in this context is a glazed *art nouveau* wall tile dating most probably to c. 1890-1900. A large element of the domestic pottery and wasters is comprised of mass-produced refined white earthenwares ('willow' pattern etc.) identical to Staffordshire wares of the same period. These are all tablewares - plates, bowls, cups and saucers. The domestic pottery alone comprises 86 sherds or 26% of the context total of 326 sherds. Besides refined white earthenwares, some of which were probably produced

on this site, there is also a surprisingly large quantity of imported Chinese porcelain (66 sherds) including fragments of high quality early to mid 18th-century porcelain with polychrome painting and gilding but also a few cruder heavier blue and white pieces dating as late as *c.* 1800. The presence of so much Chinese porcelain is rather puzzling. It could be that it was used to provide ideas and inspiration for the famous Swansea porcelain produced at this site *c.* 1814-1817, although no definite examples of the latter occur in this assemblage. Otherwise it could represent a private collection of Chinese porcelain derived from a private dwelling on the site or - and perhaps most likely - it could represent a stock of Chinese porcelain intended for sale as a sideline alongside home-produced white earthenwares and porcelain. Other domestic pottery includes a few pieces of Creamware which is known to have been produced here *c.* 1790-1830 and a sherd of 18th-century Nottingham stoneware. The only non-tableware item is the base of a coarse red earthenware jar possibly of local or regional origin.

4.4.4 Pottery wasters in refined white earthenware and pottery kiln furniture also form a significant proportion of the assemblage and provide clear evidence for pottery manufacture on or near the site. These derived from the Cambrian Pottery which was operational here 1764-1868 (Hughes 2005, 11-16) and the pieces here appear to be 19th century. The wasters are distinguished by the fact that they are all unglazed but none is otherwise distorted or over-fired. Wasters comprise 110 sherds or 34% of the context assemblage. They would appear to derive from a stock of vessels ready for glazing and re-firing but broken before this could take place. Forms include plates, saucers, carinated teacups, mugs and sugarbowls and larger bowls with turned footring bases. Most pieces are plain but a few have transfer-printed decoration - probably in cobalt blue but here in unfired form appearing dark grey. Other pieces have hand-painted decoration - simple floral designs with black stems and very faint leaves and flowers in green and pink. One carinated sugarbowl waster is decorated externally with horizontal bands of black and blue-coloured slip while another mug rim has lathed recessed bands or grooves which were probably intended to have a coloured slip infill. Neither wasters or domestic pottery bear any makers' marks.

4.4.5 Pottery kiln furniture, intended to support and separate vessels in the kiln, comprises 130 sherds or 40% of the context assemblage. This is all made from white pipeclay mostly with a thin clear glaze resembling a Creamware glaze. These include 67 pieces of three-armed trivets one of which is complete (diam. 94 mm.). Others have measurable diameters varying between 48 mm. and 120 mm. There are six small 'cockspur' trivets shaped a little like pyramids with projecting corners and with diameters in the 16-28 mm. range. There are four neatly-made setter rings of rectangular and triangular section with diameters in the 80-103 mm. range. The remainder of the kiln furniture assemblage mostly consists of pipeclay rods (some flattened), squeezed and dented rods and sausage-like pieces of pipeclay. One larger lump of pipeclay which is crudely hand-formed and squeezed into shape may be something like a seal for a saggar lid. There is also a piece of a saggar (a coarse drum-shaped vessel which protected delicate wares from direct contact with flames

and soot). This is probably from the base of the saggar and is 14 mm. thick and made from coarsely crushed pieces of fired pipeclay (grog) cemented together. The outside is a matt dark brown colour while the inside has a clear yellow glaze. One of the grog inclusions appears to be a tiny piece of recycled pottery with a cobalt blue glaze.

Table 1: Summary of pottery by context

Context	Spot-date	No. of Sherds / Weight	Comments
110	c1780-1830	4 / 22g	Creamware, incl 2 dish bases. 1 badly spalled
113	c1890-1900	1 / 128g	CBM not pot. Dater for this context. Wall tile frag with quartered Art Nouveau design showing vine or lily leaves and tendrils in opposite quarters and plain green in other quarters. Max date c1880-1915, prob c1890-1900
113	c1890-1900	86 / 1653g	POTTERY. Chinese porcelain = 66sh. Creamware (all plain) = 9sh incl complete cylindrical mug base w moulded foot, plain cylind mug base, plate bss, footring dish/bowl, jar rim, hollow pedestal ?vase base, cylindrical ?drug jar rim (much paler). Pearlware = 1sh footring ?saucer base w polychrome chinoiserie. Transfer-printed refined white earthenware = 3sh incl flanged deep bowl/dish rim w copeland-style blue ground & ?peonies etc int & Greek-style border band ext, prob c1825-60, delicate cup or jug rim w pale blue-grey dendritic shrub/tree dec ext & as rim border int, bs large ?subrectang dish poss w European architectural dec. Plain refined white earthenware = 1sh curved bs poss undec area. White earthenware with colour-banded decoration = 1sh plain sugarbowl rim w ext banded dec in blue, dark brown and grey slip. Blue colour-bodied earthenware = 1 scalloped dish rim with moulded bead border - mid 19C. Brown glazed buff-bodied earthenware = 1sh ?lid-seated teapot rim. Nottingham stoneware = 1sh prob 18C thin-walled jar/jug rim (damaged). Common glazed earthenware - 1sh poss N. Devon, Somerset or local - plain jar base in coarse orange-buff fabric with int greenish-brown glaze & ext cream self-slip
113	c1800-1850?	110 / 1809g	POTTERY WASTERS. Refined white earthenware. All unglazed. A few transfer-printed with 'willow pattern' scenes - tranfer looks dark grey-brown but may be unfired cobalt blue? A few hand-painted with floral stems in black and v faint leaves & flowers in green and red/pink. Forms incl carinated teacups, sugarbowls, larger hemispherical bowls. bases are all turned footrings - several complete. 1 teacup handle. 1 colour-banded sugarbowl waster (carinated) with unglazed banding in black and blue (central). 1 cylind mug rim waster with lathed recessed bands or grooves prob intended for colour slip infill. some saucer profiles with painted dec int. Poss ?mocha dec on on 1 or 2
113	L18-19C?	130 / 639g	KILN FURNITURE (PIPECLAY). Three-armed trivets = 67 frags, these of triangular section, mostly clear-glazed. 1 trivet complete w max diam 94mm, other w diams of 120mm, smallest and crudest w diam 48mm. Cockspurs = 6 all virtually complete, c16-28mm diam. Setter rings = 4 frags. largest unglazed & of triangular section like a bracelet, 103mm diam. Others rectangular section & glazed. Smallest diam is 80mm. Misc = all remaining pieces - mostly rod-section and flatened rods (max length 105mm) and squeezed and dented rods and sausage-like pieces of pipeclay. 1 larger lump of pipeclay hand-formed - poss a seal for a sagger etc. 1x frag from the floor of a ?saggar (14mm thick) clear yellow glaze int, dark brown matt ext. The int has a tiny speck of cobalt blue. The saggar is made from crushed pipeclay & includes a tiny chip of cobalt-blue glazed pottery (grog)

Slag and other metal working debris*by Luke Howarth*

4.4.6 All of the material examined and presented in the table below derives from one context (113). The majority of the material is no greater than 20mm in diameter with the exception of a few larger fragments. Clinker is the most common component of the assemblage indicating coal was used as fuel. Fragments of slag make up the second most common component. Many of the fragments of slag have different properties which represent heterogeneities in the slag itself rather than differences in the smelting process. Included within the slag and occasionally fused with it are fragments that probably represent fabric of the furnace and any associated structures. Only one small fragment of slag shows any indication of flow suggestive of tapping with the majority of the assemblage generally not being diagnostic of specific actions. The composition of the assemblage as a whole is consistent with furnace ‘rake out’.

Table 2: Summary of slag by context

Context	No. of frags. / Weight	Identification	Description
113	29 / 28g	cinder/clinker	Black to dark grey in colour. Highly vesicular. Some remnant structure of coal.
113	2 / 6g	Undiagnostic slag	Two fragments of slag. Metallic lustre, pale grey colour. Few vesicles. Weakly magnetic. No diagnostic form.
113	1 / 7g	Mortar	Pale white fragment. A calcareous conglomerate of chalk frags, flint, some clinker and possibly a small fragment of slag held in calcareous cement. Marine gastropod shell in the mortar.
113	3 / 8g	Partly vitrified CBM and shale + slag.	Mixture of material. Two fragments of semi vitrified CBM, reddish colour. The third fragment is a combination of slag and a partly vitrified shale fragment.
113	3 / 51g	Undiagnostic Slag of mixed origin.	Metallic lustre. Bright red to maroon patina. Sporadic patches of vesicular slag. Moderately magnetic. One fragment is glassy with a ‘ropey’ microstructure on the surface. Inclusions in all three fragments are rare, some fragments of other slag. No diagnostic structure.

Small finds

4.4.7 No small finds were encountered within the evaluation.

4.5 Palaeo-environmental remains

4.5.1 No deposits suitable for the recovery and analysis of palaeo-environmental remains were encountered within the evaluated sequence of deposits.

5 DISCUSSION AND INTERPRETATION

- 5.1.1 The evaluation has provided a range of evidence from clear data as to the physical levels of made ground present to the more inconclusive results regarding the true nature of the archaeological remains. However, the archaeological evidence provided by the deposits and structures recorded in each trench can be more fully understood alongside the sequence of historical maps (Fig. 5).
- 5.1.2 Within Trench 1 a series of clear structural and made ground deposition episodes are evident. The most significant discovery here is the substantial deposit (113) of debris encountered at the base of the trench deriving from the operation of the Cambrian Pottery in the 19th century. This is sealed by a substantial made ground debris layer prior to the construction of later structures with the surface of the pottery layer laying at 4.58 m aOD; 4.50 m below the current ground level. The date of the pottery largely falls within the mid 19th century which, considering the closure of the works in 1868, suggests that this layer dates from that period. Due to the substantial depth of the excavation it was not possible to investigate below this level although the dumped appearance of the deposit leaves the likelihood that earlier remains are preserved below. This may include structural remains or other archaeological deposits relating to the pottery works and the early copper works. Comparison of the trench location to the contemporary historical maps point to this being an open area adjacent to the River Tawe, although it should be noted that an early barge dock off the former course of the river is also located within close proximity. This is shown on the 1843 map at the southern end of 'Foundry Quay' but was infilled by 1852 following the construction of the new river walls, docks and quays. This area will have a much greater depth of made ground within it and would have been ideal for disposing of waste material although it is not possible to say if the pottery deposit encountered within Trench 1 represents this or, alternatively, seals earlier structures or deposits.
- 5.1.3 The upper levels of made ground and structures within Trench 1 seem most likely to relate to the Graigola Merthyr Patent Fuel Works. The fact that these do not truncate the lower pottery waste deposit (113) indicates that this period of site use may not have significantly disturbed the earlier horizons choosing to raise the ground level instead. Indeed, the evidence from Trench 3 appears to confirm this over the larger area with two significant standing walls (306 and 307) sealed by deep levels of similar made ground. Although the exact stratigraphic point of construction of the walls was not established nor was an associated floor horizon encountered within the base of the trench, it does appear that these were standing at least 3 m tall with neatly faced courses of sandstone present for the full depth. Again, comparison to the historical maps is helpful as this places the walls on the exact alignment of the buildings adjacent to the pottery kilns. The sequence within Trench 3 did not provide any dating evidence although, with the walls being sealed by substantial make up layers, it is reasonable to suggest that these are also related to the Cambrian Pottery factory. Also, during the subsequent period when the Patent Fuel Works occupied the site, this

specific area was used as a wharf (see Fig. 5c) indicating it was a substantially open loading/unloading area not occupied by buildings.

- 5.1.4 The history of creating made ground was continued in more recent periods with the land reclamation and infilling of the former North Dock Basin and the western bank of the River Tawe. A photographic record of this was made by the Unit Works in 1965 (Plates 5 to 8) providing useful information as to the likely state of preservation of the historical river structures. Within the current site the eastern side of the North Dock Basin remains clearly visible from the location of the former 'Pottery Bridge' to the south to the point where it is buried near its northern entrance. Plates 5 and 6 show the northern end of this as it was being backfilled with the wooden lock gates *in situ* and the dock/river walls being buried in a complete state. Plate 5 also shows the standing remains of the late 19th century pumping station behind the JCB, during its demolition. Plates 7 and 8 similarly show the former western side of the river quay constructed in Pennant Sandstone with the extant entrance to the Jersey Dock just visible to the immediate north of the Unit Works (Plate 8). These views also confirm that the dwarf walls recorded at the eastern end of the north factory unit are situated back from the river quay making them likely to be related to former warehouse or other structures that may have fronted the river. Indeed, this wall closely matches the location of a boundary present onwards from the 1843 map.

APPENDICES

APPENDIX 1 ARCHAEOLOGICAL CONTEXT INVENTORY

<i>Trench</i>	<i>Ctxt</i>	<i>Type</i>	<i>Width (m)</i>	<i>Thick. (m)</i>	<i>Comment</i>	<i>Finds</i>	<i>Date</i>
01							
	100	Layer		0.08	Tarmac surface	-	
	101	Layer		0.20	Make up layer	-	
	102	Layer		2.25	Make up layer	-	
	103	Structure	0.32	1.50	Wall	-	
	104	Structure	0.82	1.50	Wall	-	
	105	Structure	2.40	2.96	Concrete structure	-	
	106	Structure	4.50	1.80	Sub-circular structure	-	
	107	Cut	3.00	0.80	Construction cut	-	
	108	Fill		0.50	Fill of construction cut	-	
	109	Layer		0.75	Make up layer	-	
	110	Layer		1.50	Make up layer	Ceramics	19th/20th C
	111	Fill		2.00	Fill of concrete structure	-	
	112	Fill		0.90	Fill of concrete structure	-	
	113	Layer		0.50	Buried soil horizon	Ceramics	19th C
03							
	300	Layer		0.10	Tarmac surface	-	
	301	Layer		0.70	Make up layer	-	
	302	Layer		0.30	Make up layer	-	
	303	Layer		0.60	Make up layer	-	
	304	Layer		1.75	Make up layer	-	
	305	Layer		0.70	Make up layer	-	
	306	Structure		0.80	Wall	-	
	307	Structure		0.80	Wall	-	
	308	Structure	1.20	0.80	Culvert	-	

APPENDIX 2 BIBLIOGRAPHY AND REFERENCES

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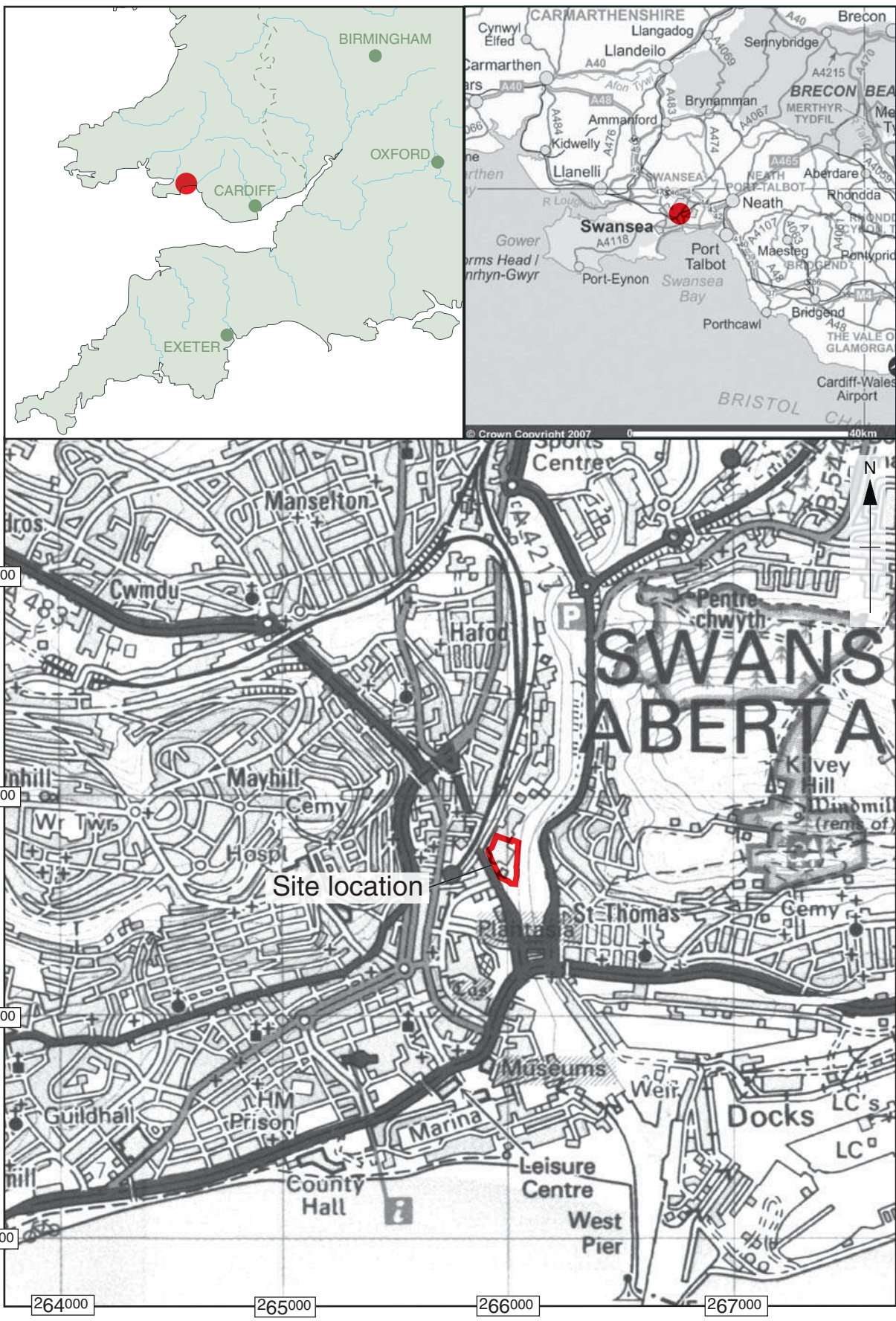
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APPENDIX 3 SUMMARY OF SITE DETAILS**Site name:** Unit Superheaters Engineering, Swansea**Site code:** SWUNIT 07**Grid reference:** SS 6595 9370**Type of evaluation:** Two trenches measuring 10.5 m x 2 m and 22.0 m x 8 m.**Date and duration of project:** 12th to 20th July 2007**Area of site:** 3.4 ha**Summary of results:**

Oxford Archaeology undertook a field evaluation at the Unit Superheaters Engineering Works, Swansea on behalf of Unit Holdings Ltd and DFWJ Ltd. Two trenches were excavated revealing substantial standing structures relating to the historical use of the site and large volumes of dumped deposits that progressively raised the ground level. Significant quantities of kiln and pottery waste debris were recorded at depth in Trench 1 and, along with standing stone walls recorded within Trench 3, are likely to represent the preservation of the Cambrian Pottery works that occupied the site in the late 18th century - mid 19th century. Structural remains relating to the subsequent late 19th-century Patent Fuel works and later use of the site were encountered within Trench 1 cut into the upper levels of made ground but, significantly, these had not disturbed or truncated the remains of the pottery works. A photographic record undertaken in 1965 of the riverbank reclamation and historical North Dock Basin infilling, alongside the present assessment and recording of the current upstanding historical remains, demonstrate that the river wall, quays and docks all remain substantially intact within the site boundary. The dwarf stone wall at the eastern end of the northern factory unit also predates the current building and appears to originate as a boundary fronting the river side.

Location of archive: The archive is currently held at OA, Janus House, Osney Mead, Oxford, OX2 0ES, and will be deposited with Swansea Museum (to be confirmed) in due course.

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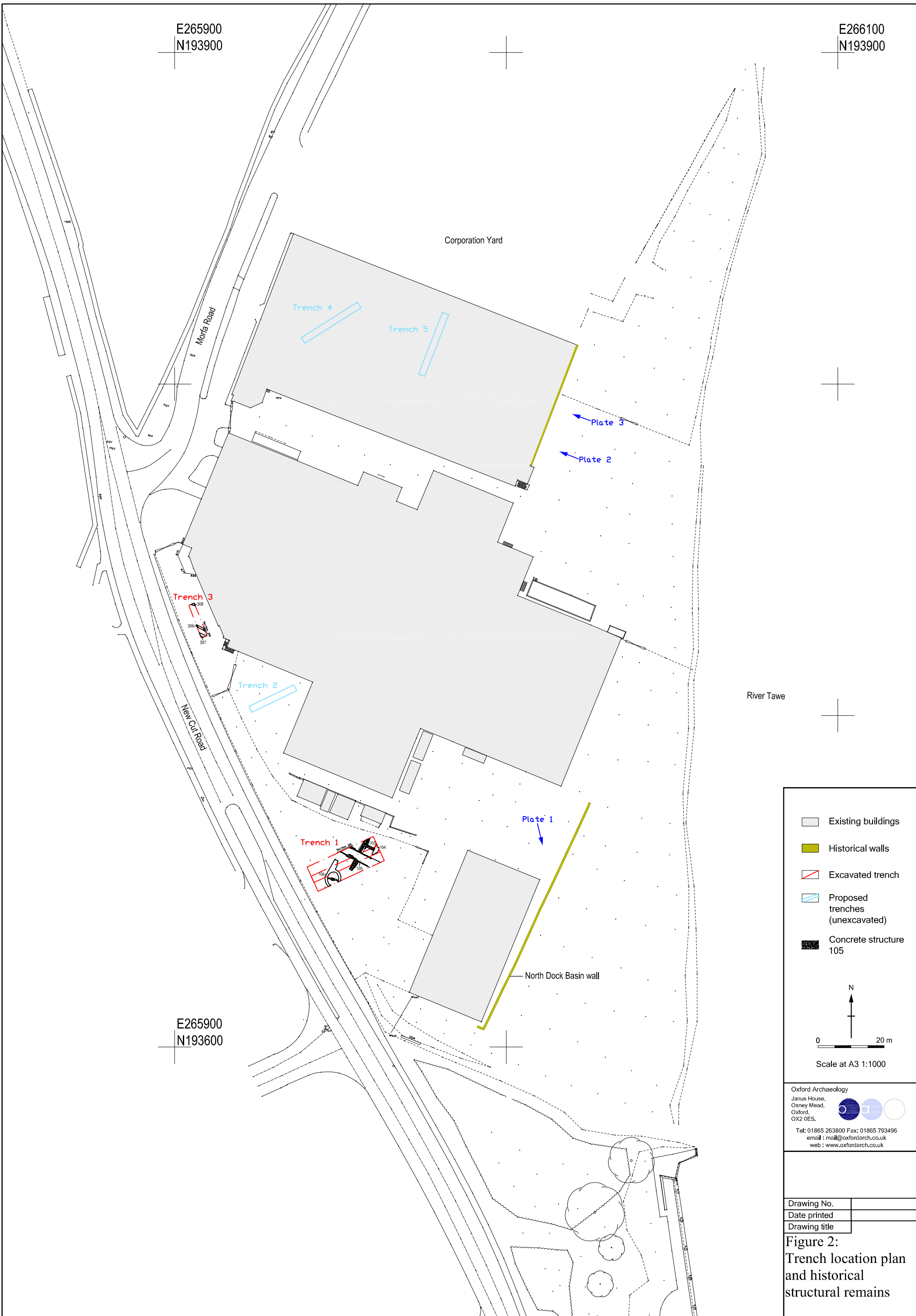
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Figure 1: Site location

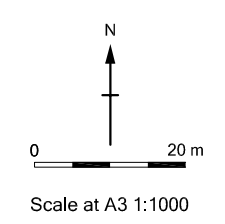
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- Existing buildings
- Historical walls
- Excavated trench
- Proposed trenches (unexcavated)
- Concrete structure 105

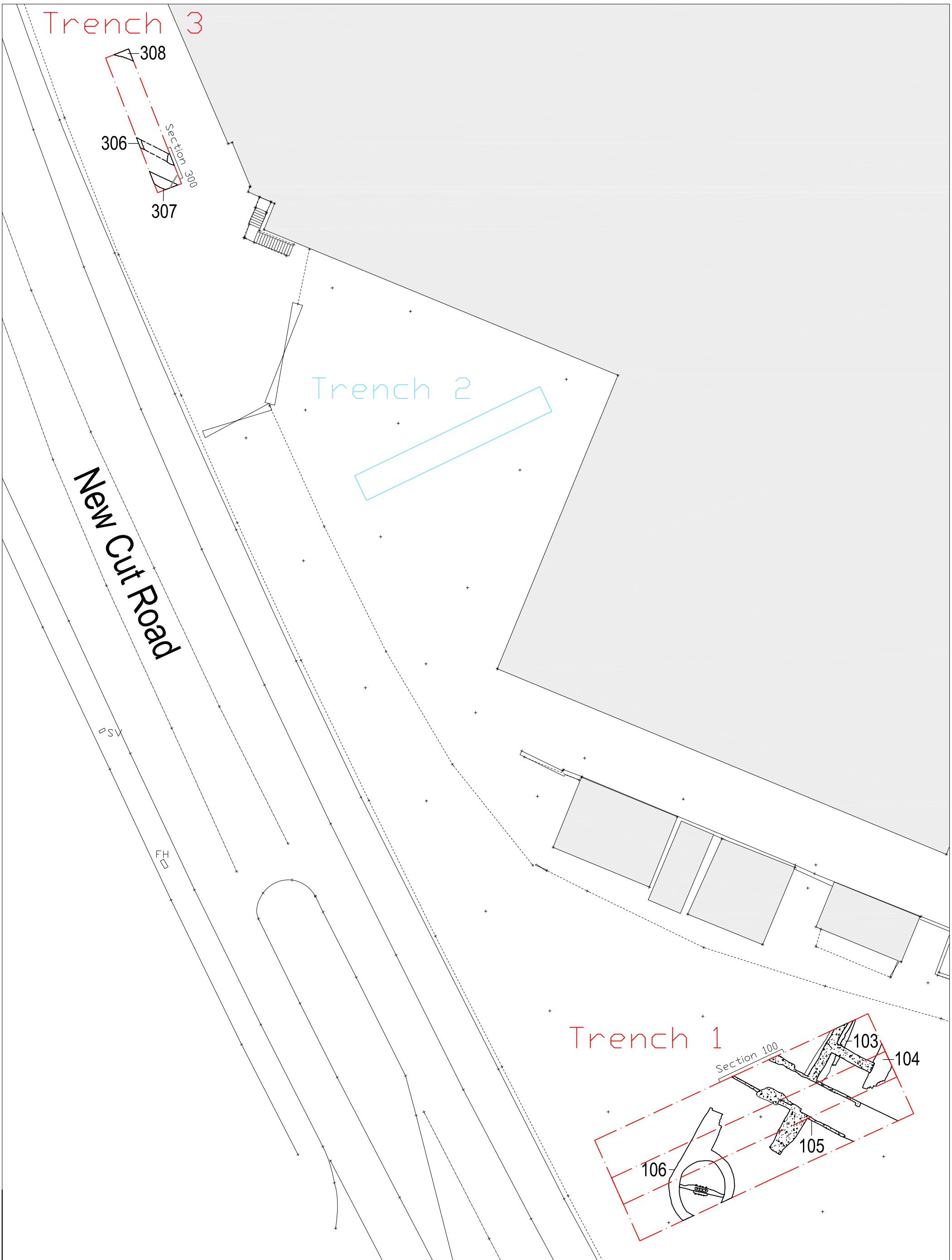


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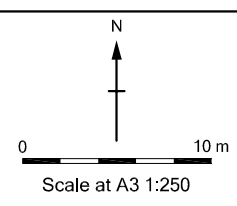
Figure 2:
Trench location plan
and historical
structural remains

CHECKED BY:



- Concrete structure 105
- Excavated trench
- Existing buildings
- Proposed trenches (unexcavated)

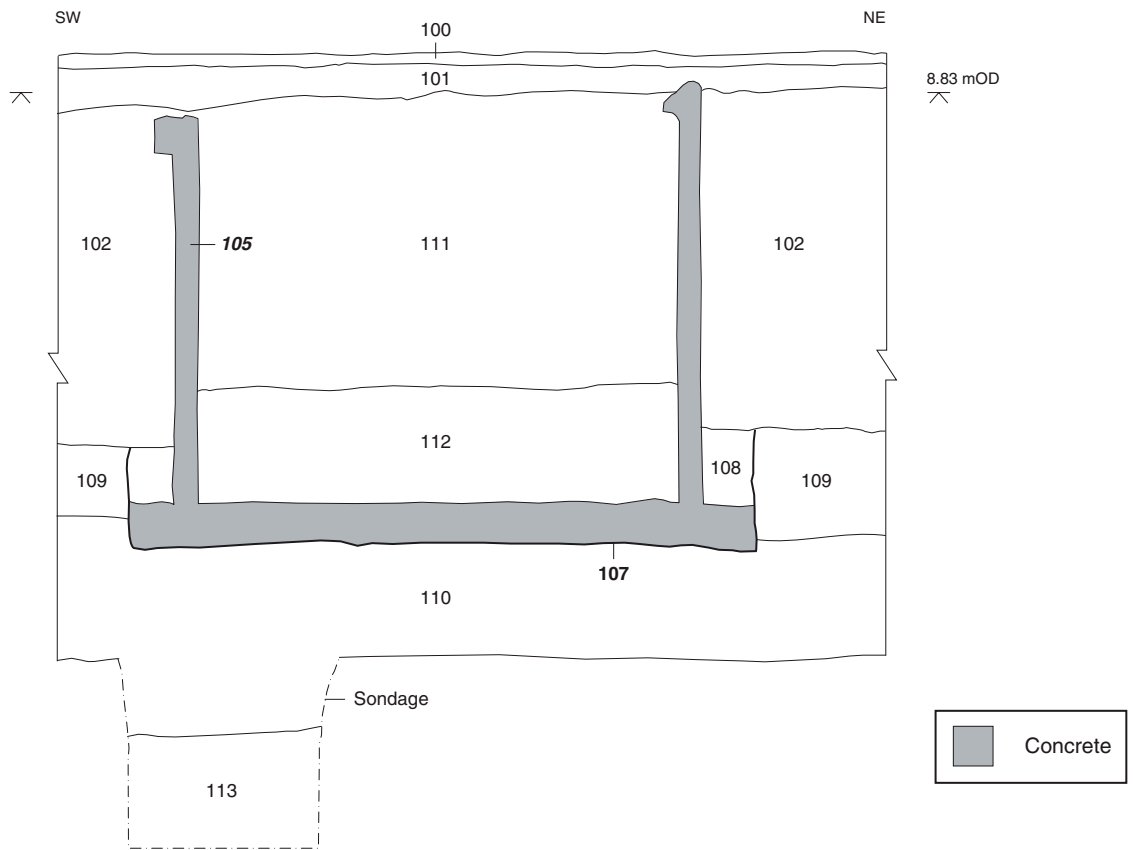
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Figure 3: Trenches 1 and 3	

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Trench 1 Section 100



Trench 3 Section 300

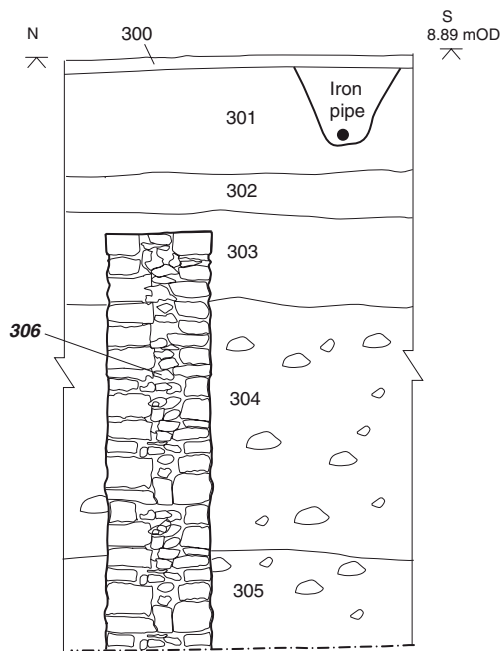
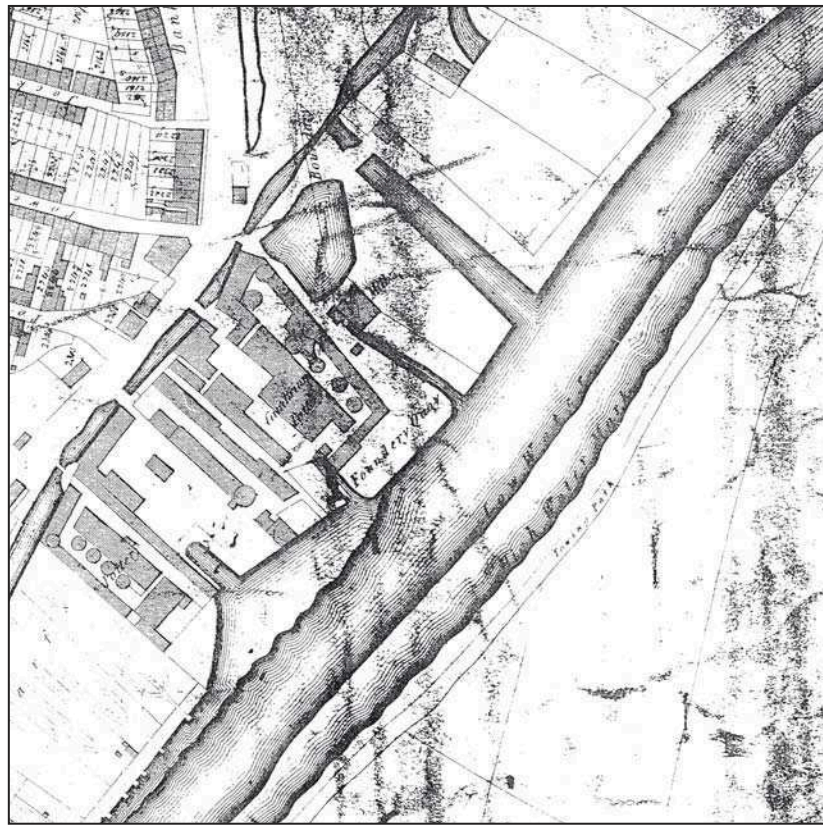
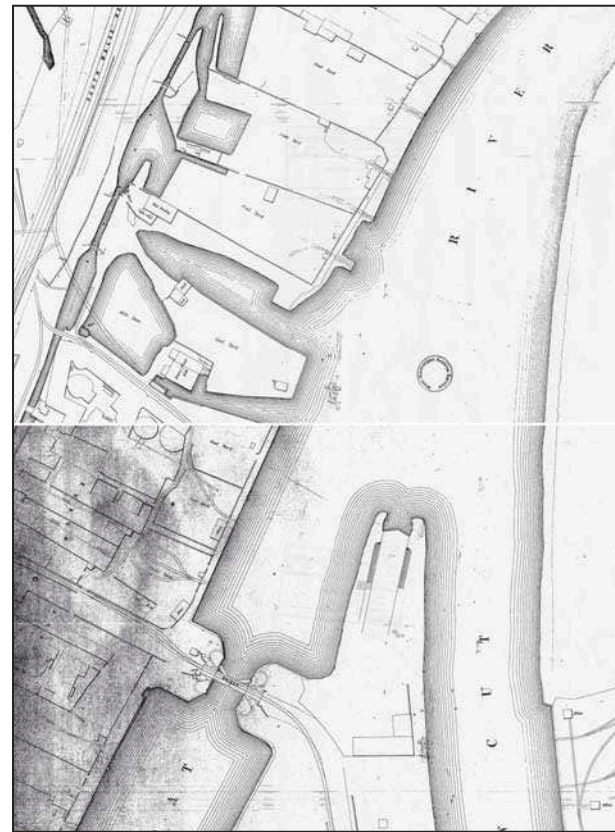


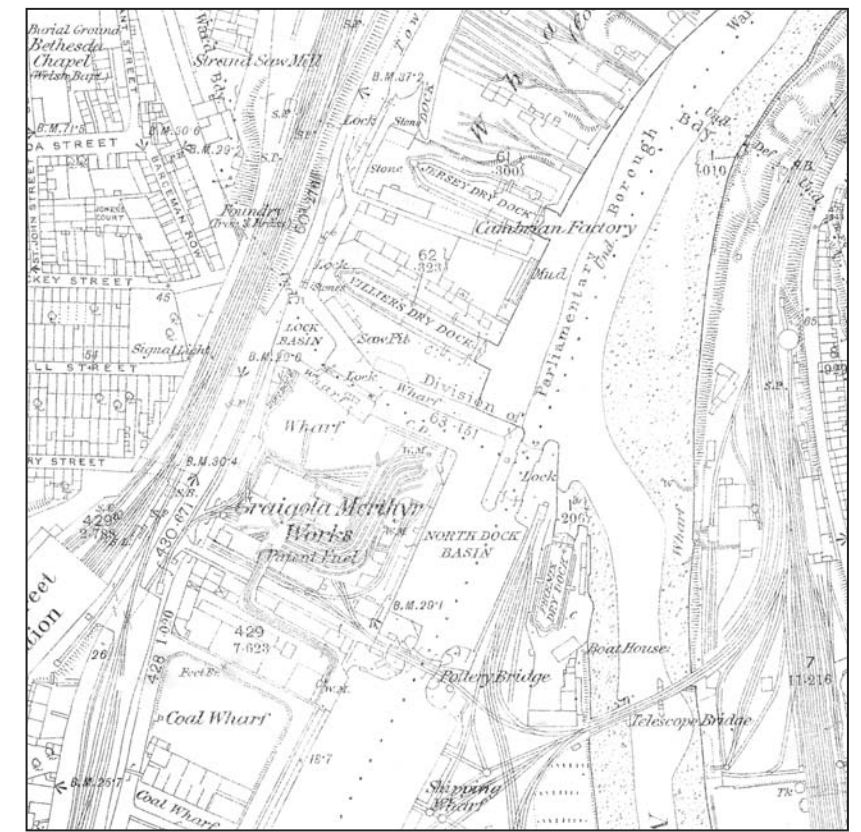
Figure 4: Trench 1 and 3 sections



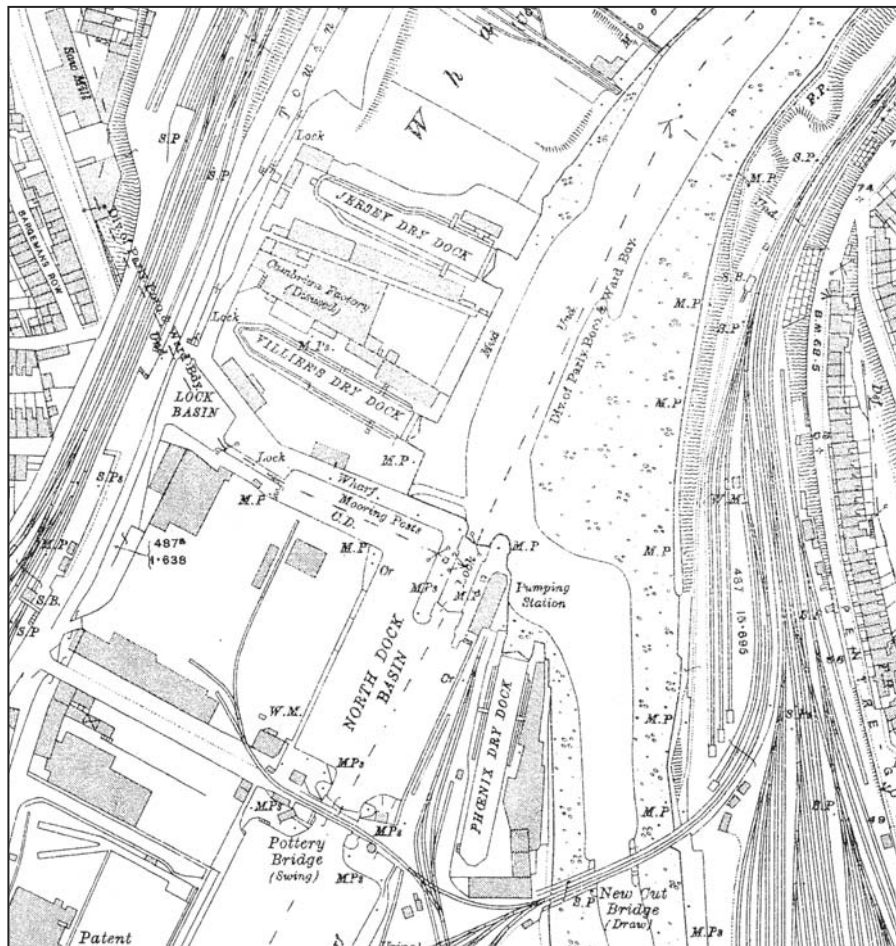
a. Plan of the Town of Swansea, Glamorganshire 1843



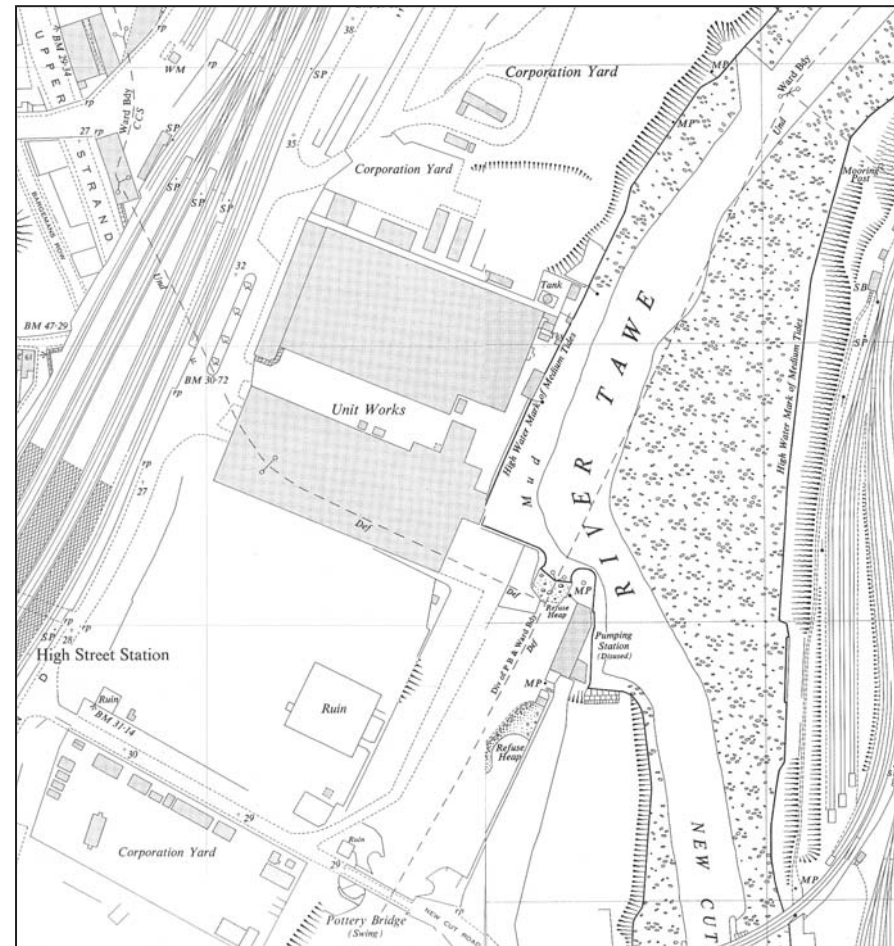
b. Swansea Local Board of Health, Survey of the Borough of Swansea, 1852



c. First Edition Ordnance Survey Map, 1879



d. Third Edition Ordnance Survey Map of 1919



e. New Series Ordnance Survey Map of 1949/1950

Figure 5: Historic maps (courtesy of Waterman CPM)



Plate 1: General view south of the North Dock Basin (east side)



Plate 2: General view of the stone dwarf wall at the eastern end of the factory



Plate 3: General view of the stone dwarf wall at the eastern end of the factory



Plate 4: Kiln furniture and pottery from deposit 113



Plate 5: 1965 reclamation and backfilling of the North Dock Basin (courtesy of USE)



Plate 6: 1965 reclamation view south along the River Tawe (courtesy of USE)



Plate 7: 1965 view of the former river wall (courtesy of USE)



Plate 8: 1965 reclamation view NW with the extant Jersey Dock entrance in the near background (courtesy of USE)



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