Sylvester Gardens, Sheffield
South Yorkshire

Post-excavation Assessment and Updated Project Design

Planning Ref: 06/01918/FUL/17/00604/FUL
Ref: 118762.2
November 2019

wessexarchaeology

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Document Information

Document title	Sylvester Gardens, Sheffield, South Yorkshire
Document subtitle	Post-excavation Assessment and Updated Project Design
Document reference	118762.2
Client name	Wessex Archaeology
Address	Unit R6 Sheaf Bank Business Park Prospect Road Sheffield S2 3EN
On behalf of	Acreplan Sylvester Street Developments Limited
Address	11 Abermarle Road East Barnet Hertfordshire EN4 8EQ
site location	Sylvester Gardens, Sheffield
County	South Yorkshire
National grid reference (NGR)	435354 386506
Statutory designations	None
Planning authority	Sheffield City Council
Planning reference	06/01918/FUL/17/00604/FUL
Museum name	Museums Sheffield
Museum accession code	TBC
WA project code	118762
Date of fieldwork	1–23 October 2018, 9–25 January 2019
Fieldwork directed by	Emily Eastwood
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Quality Assurance

Issue & issue date	Status	Author	Approved by
1 Nov 2019	Draft submitted to client	EE	

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Summary

Wessex Archaeology was commissioned by Acreplan Sylvester St Developments Ltd. to carry out a programme of site investigation and recording in relation to a mixed use development at 'Site C', Sylvester Gardens, Sheffield. The proposed development included demolition of a standing building, known as the Grinding Workshop, and construction of an apartment block, other structures and associated landscaping. Sheffield City Council Development Services previously granted conditional planning consent for the re-development of Site C.

The archaeological remains were predominantly structural and related to industrial development of the site from the early to mid-19th-century through to the demolition of standing remains in 2018. In additional to industrial buildings, a series of stone foundations excavated in the north of Area 2a correlated to early or mid-19th-century worker's housing seen on historic mapping.

Two early stone structures (1156 and 2144) could not be dated and may relate to agricultural or other use of the site prior to industrial development.

The walls of a goit (a channel such as a mill-race) known from mid-19th-century maps were revealed. Fragmentary structural evidence survived of the original early/mid-19th-century Ward's Wheel, with its south-eastern stone foundations excavated in Area 3, as well as walls preserved within later phases of the Porter Island Works.

Three phases of the Porter Island Works grinding workshop were recorded including walls, floors and potentially the settings of grinding troughs. Some evidence for the use of belt power was identified. Grindstones had been reused structurally including as flooring. An associated boiler room was recorded to the north.

To the south of the grinding workshop, structures were recorded relating to a furnace marked on 20th-century maps. The type and function of the furnace could not be determined.

To the east of the grinding workshop was an area of 20th-century development, including walls, a lift shaft and a weighbridge.

The structures were constructed on natural alluvial deposits associated with the Porter Brook. Natural alluvial deposits were studied and shown to comprise material from a series of high-energy events.

The finds assemblage is of moderate size, and dates entirely to the post-medieval/modern period (probably all 18th-century or later). It is typical of assemblages recovered from the industrial centre of Sheffield, containing a mixture of domestic refuse alongside evidence for metalworking and cutlery handle manufacture; there is also some button-making waste. As is common in Sheffield, much of the artefactual assemblage may have been imported and may have little relationship with activity on site. Environmental sampling added little to our understanding of the site.

The archive resulting from the excavation is currently held at the offices of Wessex Archaeology in Sheffield. Museums Sheffield has agreed in principle to accept the archive on completion of the project, under an accession code to be assigned at the time of deposition. An OASIS form, wessexar1-358160 has been provisionally completed and will be finalised at the time of deposition.

Acknowledgements

Wessex Archaeology would like to thank Acreplan Sylvester St Developments Ltd, for commissioning the archaeological mitigation works, in particular Leon Russel. Wessex Archaeology is also grateful for the advice of Dinah Saich, Principal Archaeologist of South Yorkshire Archaeology Service (SYAS), who monitored the project for Sheffield City Council.

The fieldwork was directed by Emily Eastwood, with the assistance of Otis Gilbert, Jasmine Porter, Jonathan Landless, Jon Whitmore, Sabrina Sheffield, Callum Bruce, Chris Hirst, Matt Tooke, Richard Smith, Emma Metcalfe and Viktoria Halldorsdottir. This report was written by Emily Eastwood and edited by Ashley Tuck. The project was managed by Richard O'Neill on behalf of Wessex Archaeology.

The environmental samples were processed by Fiona Eaglesham and Morgan Windle. The flots were sorted by Fiona Eaglesham and assessed by Inés López-Dóriga. The sediments were described by Liz Chambers. The environmental report was written by Liz Chambers and edited by Inés López-Dóriga.

The finds were assessed by Lorraine Mepham with contributions from Lorrain Higbee (animal bone) and Rod Mackenzie (slag and metalwork).

Sylvester Gardens, Sheffield, South Yorkshire

Post-excavation Assessment and Updated Project Design

1 INTRODUCTION

1.1 Project and planning background

1.1.1 Wessex Archaeology was commissioned by Acreplan Sylvester St Developments Ltd. to carry out a programme of site investigation and recording in relation to a mixed use development at 'Site C', Sylvester Gardens, Sheffield. The proposed development included demolition of a standing building, known as the Grinding Workshop, and construction of an apartment block, other structures and associated landscaping. Sheffield City Council Development Services previously granted conditional planning consent for the re-development of Site C.

1.1.2 The development scheme had initially anticipated retaining the Grinding Workshop, however, an amended proposal was submitted under Section 73 (17/00604/FUL) which included demolition of the structure to ground floor level and its rebuilding a short distant to the south. Dinah Saich, Principal Archaeologist of South Yorkshire Archaeology Service (SYAS), on behalf of Sheffield City Council (SCC), recommended that an assessment of the likely archaeological impact of the amended proposal on both the standing building (a non-designated heritage asset) and on the below ground archaeology was carried out. As a result, archaeological excavation and recording was undertaken.

1.1.3 A WSI was prepared detailing the methodology to be used during the work (Wessex Archaeology 2018a). The WSI covered the need for recording of the upstanding structure, and it set out the proposals for strip, map and record excavation following demolition along with the methods and standards that were employed.

1.1.4 In form and content, the WSI conformed to current industry standards and guidance issued by the Chartered Institute for Archaeologists (CIFA 2014a–c). All work was undertaken in line with this guidance. The WSI was submitted to the South Yorkshire Archaeology Service (SYAS) for approval. SYAS were consulted at all stages of work and were kept aware of the progress of the project. Progress was also tracked by site visits made by SYAS, who approved any necessary alterations to the original project design.

1.2 Scope of document

1.2.1 This document will set out the results of the strip, map and record excavation of the four Areas (1, 2a, 2b and 3) along with the methods and standards that were employed and will assess the potential of the results to address the research aims outlined in the WSIs.

1.2.2 In format and content, it conforms to current best practice, as well as to the guidance in *Management of Research Projects in the Historic Environment* (MoRPHE, Historic England 2015) and the Chartered Institute for Archaeologists' (CIfA) *Standard and guidance for archaeological excavation* (CIfA 2014a).

1.3 Location, topography and geology

1.3.1 The site was an almost triangular plot of land of approximately 0.26 ha located approximately 700 m south of Sheffield city centre (NGR 435354, 386506; **Fig. 1**). The site was bounded by Sylvester Gardens to the north, a car park area to the west, with the Porter Brook running north-east to south-west forming most of the southern and eastern boundary.

1.3.2 The site was flat and situated at around 61 m above Ordnance Datum.

1.3.3 The site was until recently used as a car park; at the time of fieldwork, the ground surface was mainly hard standing formed from the demolition of former buildings.

1.3.4 The underlying geology of the site comprises Mudstone and Siltstone of the Pennine Lower Coal Measures Formation overlain by superficial deposits of alluvium (British Geological Survey online viewer 2019). Recent ground investigation (GI) works identified alluvium (ECUS 2018) at depths of between 1.07 m and 1.87 m below ground level (BGL). Bedrock was previously recorded between 3.4 m and 4 m below ground level across the site (GeoDyne 2007, GRM 2017).

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Introduction

2.1.1 The archaeological and historical background of the site was presented in previous documents submitted as part of the development (ARCUS 2009a, Wessex Archaeology 2018a, 2018b and 2019). A summary of this information is presented below.

2.2 Post-medieval

2.2.1 Cartographic records provide the key information about the development of the site, which comprised open land during the 18th century. The 1808 Fairbank map of Sheffield shows the Porter Brook with a series of reservoirs and goits supplying water power to Sylvester Wheel located approximately 50 m to the west of the site. Comparable depictions of the site and surrounding areas are shown on the 1822 Baines map and the 1823 Leather's map. Taylor's map of Sheffield issued in 1832 shows Sylvester Gardens with buildings between the road and a goit joining the Porter Brook which bisected the site across its east to west axis although turning slightly towards the south-east when re-joining the main course of the Porter Brook. The 1838 map of Sheffield published with White's History and Directory of Yorkshire is not very detailed although it shows a large building in the north-east corner of the site adjacent to the junction of a goit and the Porter Brook. The central area of the site is marked as 'Wheels' indicating the presence of a workshop. The Ordnance Survey Town Plan of Sheffield issued in 1853 shows the works consisting of a long structure running along the southern bank of the goit and marked as 'Ward's Wheel'. The majority of the buildings facing onto Sylvester Gardens appear to be houses although the north-eastern corner includes large structures with a courtyard which might represent industrial premises.

2.2.2 The Ordnance Survey map published in 1891 shows the site with limited alterations from the preceding edition. It is noteworthy, however, that the goit is no longer depicted implying that this may have been culverted or backfilled due to obsolescence. The main central works is now labelled 'Porter Island Works (Grinding)'. The Ordnance Survey map published in 1905 shows minor additions of the site including a series of structures along the northern bank of the Porter Brook.

2.2.3 Detail of the Porter Island Works is shown on the 1905 Goad Fire Insurance Plan, which is labelled as 'Vacant & ruinous'. In the north-east of the site, three parallel and adjoining single-storey buildings with glazed skylights and two chimneys is labelled as a 'Japanning House'. Moving west there are stores and a vacant plot. These buildings might have been workshops associated with a large works located on the opposite side of the Porter Brook, which were linked with two bridges. The name of the works is given on the earlier partial version of the Goad plan as 'BOSWELL HATFIELD & Co Ltd' (a cutlery works) and in the later fuller version as 'J. JACKSON & Co Ltd. STAY BUSK FAC.' (ie corsetry). In both cases the name is written over the two sections of merged buildings on both sides of the Porter Brook confirming the likely association of works on both sides of the river.

2.2.4 A 'Boiler Shed' is depicted on the updated 1905 Goad plan in the far west of the site adjacent to a chimney stack. A small building in the south is labelled as a 'Furnace'.

2.2.5 The subsequent Goad Fire Insurance Plan of Sheffield issued in 1937 encompasses the area around, and within, the site with numerous industrial premises throughout. The western side of the site contains a large steel-built garage facing Sylvester Gardens, a three-storey building immediately to the rear with brick arches and concrete floors, and another metal structure facing the Porter Brook labelled as 'SOHO FOUNDRY'. The central area of the site encompasses a series of structures which are part of the former 'A. R. HEATHCOTE & Co. Ltd. MACHINE KNIFE FAC. BERNARD WORKS'. The north-eastern area is depicted with a comparable layout from the preceding edition. Of note is that the merged buildings occupying the north-eastern corner plot are labelled as 'G. IBBOTSON SAW & TOOL HANDLES' with a 'GARAGE' and a 'GRINDING' building. It is also noteworthy that this series of workshops no longer appear to be associated with the industrial premises across the Porter Brook.

2.2.6 The Ordnance Survey map published in 1953 shows the site with a 'Garage' within the north-eastern corner plot and the remaining area is labelled as 'Machine Knife Works'.

2.2.7 The Goad Fire Insurance Plan of Sheffield published in 1959 depicts a comparable layout of the buildings within the site although with some alterations. The former Soho Foundry appears to have been replaced by a brick building labelled 'MACHINE SHOP' which appears to form part of the adjacent building to the north and behind the steel-built garage. The central Bernard Works appears to have been slightly remodelled and contains several structures of industrial interest such as a 'SMITHY' immediately south-east of the main garage, and a 'FURNACE' within a 'HARDENING' shop fronting Sylvester Gardens. The north-eastern corner plot is marked as 'PL. CARTER Ltd. CHAIR FAC. Under Alts [alterations] after fire 1937' which includes a 'MACHINE SHOP' and a large 'GRINDING' structure as well as the chimney stack towards the north-eastern end of the plot.

2.2.8 The Ordnance Survey map published in 1970 shows the site practically covered implying that most of the buildings were amalgamated and is marked as 'Bernard Works'.

2.3 Previous investigations related to the development

Building appraisal (2006)

2.3.1 A building appraisal of Site C was produced by the Trent and Peak Archaeological Unit (Sheppard 2006). The appraisal concluded that the site included structures identified as the surviving remains of the western end of the 19th-century Porter Island Grinding Wheel.

Historic Building Recording (2009)

2.3.2 Historic building recording and a structural watching brief of two structures within Site C was undertaken by ARCUS in 2009 (ARCUS 2009b). The report established that the standing building proposed to be dismantled to ground floor level and re-erected a short distant to the south was originally built as a grinding workshop, and although this activity had likely ceased by the beginning of the 20th century, the building continued to be used for industrial activities. The record produced is very comprehensive including photography, detailed phased floor plans, plans with photographic viewpoints, as well as description and discussion of the Grinding Workshop.

Archaeological evaluation (2017)

2.3.3 Archaeological trial trenching evaluation was previously undertaken across the site by Wessex Archaeology (2018b). A total of four trenches were excavated to evaluate the location of the former tail goit from the Sylvester Wheel (sited on adjoining land); the site of the first housing on the site, shown on an 1832 plan; the site of the former Ward's Wheel, first shown on the 1851 OS map, which was also known as the Porter Island grinding wheel; and the site of a new cut for the Porter Brook, shown on a plan of 1808. No structural evidence relating to former goits and waterways was encountered. Probable minerogenic floodplain alluvium was seen in the base of trenches 2, 3 and 4, overlying bedrock in trenches 2 and 3. Such material is inherently difficult to draw useful conclusions from, being extensively reworked and redeposited, and very difficult to date with any accuracy.

2.3.4 The earliest structure identified comprised a sandstone wall in Trench 2 which correlates with early- or mid-19th-century housing shown on historic maps. Two phases of early drains may be contemporary with this housing. Later machine-made brick structures truncating the 19th-century housing represent exterior walls and an unmapped interior wall of buildings depicted on a map from 1935. Trench 3 contained a series of structural remains possibly relating to a former early 20th century furnace marked on historic mapping. Machine-made brick structures found in Trenches 1 and 4 appeared to relate to internal divisions and features of a large early-20th-century building. One of the walls in Trench 4 correlated with the east end of the former Porter Island Works but was thought to be contemporary with the early-20th-century building.

Structural watching brief (2018)

2.3.5 A structural watching brief was carried out by Wessex Archaeology (2019) during the demolition of the Grinding Workshop.

2.3.6 The former Grinding Workshop originally represented a western extension to the Porter Island Grinding Wheel which included a long range constructed around the mid-19th-century whose westernmost area survived as an annex acting as a stairwell of the workshop including a later lift shaft. The construction of the Workshop consisted of fireproof jack-arches which were extant on the ground and first floors, the latter indicating that an additional floor would have originally been part of the integral construction.

2.3.7 The Grinding Workshop would have been divided into three grinding hulls, one on each floor with possible five or six grinding troughs. The grinding wheels are likely to have been powered by a steam engine as the goit had been culverted around the time the boiler depicted against the northern wall on the 1905 Goad plan was built. Little evidence survived as to the nature of power transmission, although there had presumably been line-shafting along the inside of the northern wall from which leather belts would have turned the grinding wheels.

2.3.8 Although the adjoining stair-tower annex had been much altered, it clearly pre-dated the main workshop and was likely a remnant of the mid-19th-century Ward's Wheel. The eastern gable of the structure was later in date and would have been constructed following the demolition of the rest of the works in the 1920s or early 1930s. Its retention is unusual and may reflect that the structure had contained a staircase necessary for accessing the workshop. The interior was significantly altered in the mid- to late-20th-century when a lift system was installed obscuring much of the evidence for its primary internal structure.

2.3.9 The structural watching brief identified some construction elements previously obscured by later fabrics including blocked windows, doorways, etc. as well as the original brickwork of the second floor, although mostly refaced with late bricks. During the demolition work the entire arrangement of the fireproof jack-arched structure was clearly exhibited.

3 AIMS AND OBJECTIVES

3.1 Aims

3.1.1 The general aims of the excavation, as stated in the WSI (Wessex Archaeology 2018a) and in compliance with the CIfA's *Standard and guidance for archaeological excavation* (CIfA 2014a), were:

- *to examine the archaeological resource within a given area or site within a framework of defined research objectives;*
- *to seek a better understanding of the resource;*
- *to compile a lasting record of the resource; and,*
- *to analyse and interpret the results of the excavation and disseminate them.*

3.2 Research objectives

3.2.1 Following consideration of the archaeological potential of the site the research objectives of the excavation defined in the WSI (Wessex Archaeology 2018a) were:

- *to determine the location, extent, date, character, condition, significance and quality of any archaeological remains within the site including: remains of the former grinding workshop (Sheffield Wire Mill), former housing, the former Ward's Wheel and Porter Island Works, and any evidence for former goits and waterways;*
- *to enhance understanding of the development, layout and construction of former buildings, but also to have regard for potential earlier phases of activity;*
- *to contribute to the understanding of the development of industry along the Porter Brook;*
- *to contribute to the understanding of the development of the cutlery and steel industry within Sheffield;*
- *to contribute to the understanding of the development of, and relationship between, residential and industrial premises in Sheffield;*

- *to assess the artefactual and environmental potential of the archaeological deposits encountered;*
- *to prepare a report on the results of the work;*
- *to disseminate the results of the work in a manner in keeping with their significance, eg through publication in a suitable journal; and,*
- *to deposit the resulting archive with a suitable museum.*

4 METHODS

4.1 Introduction

4.1.1 All works were undertaken in accordance with the detailed methods set out within the WSI (Wessex Archaeology 2018a) and in general compliance with the standards outlined in CIfA guidance (CIfA 2014a). The methods employed are summarised below.

4.1.2 It had originally been planned that the site would be divided into three separate areas for excavation. During machining it became apparent that certain areas were either contaminated, obscured by scaffolding or overlain with too great a depth of concrete. The proposed Area 2 was divided into two areas, located to the north-east and to the south of the standing grinding works. Area 3 was located to the east, and following demolition, Area 1 was located in the footprint of the grinding works and included areas intended to be excavated as part of Area 2 which previously had been unreachable due to safety concerns (**Fig. 1**).

4.2 Fieldwork methods

General

4.2.1 The excavation areas were set out using GPS, in the same positions as described above (**Fig. 1**). The topsoil/overburden was removed in level spits using a 360º excavator equipped with a toothless bucket, under the constant supervision and instruction of the monitoring archaeologist. Machine excavation proceeded in level spits until the archaeological horizon or the natural geology was exposed. Areas of deep concrete and contamination resulted in changes to the original proposals.

4.2.2 Where necessary, the surface of archaeological deposits and walls were cleaned by hand to aid visual definition. This process enabled the identification of structures and associated drainage across the excavated areas. Feature fills were excavated as appropriate to meet the objectives of the project.

4.2.3 Spoil derived from both machine stripping and hand-excavated archaeological features was visually scanned for the purposes of finds retrieval. A metal detector was also used. Where found, artefacts were collected and bagged by context. All artefacts from excavated contexts were retained.

Recording

4.2.4 All archaeological features and deposits were recorded using Wessex Archaeology's *pro forma* recording system. A complete drawn record of excavated features and deposits was made including both plans and sections drawn to appropriate scales (generally 1:20 or 1:50 for plans and 1:10 for sections) and tied to the Ordnance Survey (OS) National Grid. The Ordnance Datum (OD: Newlyn) heights of all principal features were calculated, and levels added to plans and section drawings.

4.2.5 A Leica GNSS connected to Leica's SmartNet service surveyed the location of archaeological features. All survey data was recorded in OS National Grid coordinates and heights above OD (Newlyn), as defined by OSGM15 and OSTN15, with a three-dimensional accuracy of at least 50 mm.

4.2.6 A full photographic record was made using digital cameras equipped with an image sensor of not less than 10 megapixels together with 35 mm Black and White negative film taken with a SLM camera. Digital images were subject to managed quality control and curation processes to ensure long term accessibility of the image set.

4.3 Artefactual and environmental strategies

General

4.3.1 Appropriate strategies for the recovery, processing and assessment of artefacts and environmental samples were in line with those detailed in the WSI (Wessex Archaeology 2018a). The treatment of artefacts and environmental remains was in general accordance with: *Guidance for the collection, documentation, conservation and research of archaeological materials* (CIfA 2014b) and *Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation* (English Heritage 2011).

4.4 Monitoring

4.4.1 Dinah Saich, the Senior Historic Environment Archaeologist monitored the excavations on behalf of the LPA.

5 STRATIGRAPHIC RESULTS

5.1 Introduction

Introduction

5.1.1 The following section forms a summary of information held in the site archive. A complete list of excavated contexts is included in Appendix 1.

Summary of archaeological features and deposits

5.1.2 Area 1 (**Fig. 2–5**) contained several phases of the Porter Island Works grinding workshop and associated boiler room. Outlying structures to the south corresponded with a 20th-century furnace marked on historic mapping. A single earlier stone wall was located to the west. The eastern end of the area was occupied by a later wall running north to south, a concrete slab and a possible weighbridge probably associated with the later phases of the grinding workshop.

5.1.3 The relationship between the eastern end of the structures visible in Area 1 and those in Area 2 was unclear due to truncation by a modern lift shaft and contaminated soil deposits to the north-east. A strip of contaminated land running east to west across the southern edge of the grinding house has also obscured any relationships between this structure and the possible furnace to the south.

5.1.4 Due to the constraints of the standing building during the first phase of excavation, Area 2 was dug as two separate parcels of land. The northern parcel has been referred to as Area 2a, the southern as Area 2b (**Fig. 1**). The earliest features in Area 2a (**Fig. 6**) included a short, narrow sandstone structure and two parallel stone-built walls of a possible goit running east to west. To the north of the area, the early- or mid-19th-century sandstone walls uncovered in the previous evaluation (Wessex Archaeology 2018b) were

exposed over a wider extent, as were later brick structures truncating the 19th-century housing. These later structures included the remains of wooden floorboards and the base of a possible stairwell.

5.1.5 The southern end of Area 2a was heavily truncated by modern concrete footings and services, and large areas were contaminated. The structures in this area are most likely unmapped internal partitions of the Porter Island Works.

5.1.6 Area 2b (**Fig. 7**) was located in the area of evaluation Trench 3 (Wessex Archaeology 2018b) and expanded slightly on the previous findings. The southern edge of the 20th-century furnace was recorded at the northern limit of excavation (the remainder excavated as part of Area 1) whilst to the east, a shallow channel and associated firebricks survived amongst a network of modern ceramic drainage pipes and manholes.

5.1.7 During the second phase of works a sondage was dug across the west end of the area to identify possible water channels which may have crossed the site. This work was hindered by contaminated ground. The sondage recorded a sequence of alluvial deposits but no channels were identified.

5.1.8 Area 3 (**Fig. 8**) incorporated evaluation Trench 4 and the southern end of Trench 1 (Wessex Archaeology 2018b). The area was heavily contaminated and as such the central areas were excavated to a maximum depth of 0.60 m below ground level. The archaeology was mostly concentrated along the eastern edge of the area and consisted of the south-eastern corner of the Ward's Wheel and a later flue and walls.

Phasing

5.1.9 A uniform system of phasing has been used across all excavation areas as summarised in **Table 1** below.

Table 1 Phasing concordance

Phase	Date	Area 1	Area 2a	Area 2b	Area 3
Unphased		Early structure 1156	Early structure 2034		
1	Early 19th C.		Goit		
2	Early/mid 19th C.	Ward's Wheel	Early housing		Ward's Wheel
3	Mid 19th C.	Porter Island Works phase 1	Porter Island Works		
4	Late 19th/early 20th C.	Porter Island Works phases 2 and 3; Boiler House phases 1 and 2; Furnace	Porter Island Works	Described under Area 1	Flue
5	Early 20th C.		Later structures		
6	20th C.			Flue and other structures	
7	Modern	Porter Island Works later additions		Described under Area 1	Drains

Methods of stratigraphic assessment and quantity of data

5.1.10 All hand written and drawn records from the excavation have been collated, checked for consistency and stratigraphic relationships. Key data has been transcribed into an Access database for assessment, which can be updated during any further analysis. The excavation has been preliminary phased using stratigraphic relationships and the spot dating from artefacts, particularly pottery.

5.1.11 **Table 2** (below) provides a quantification of the records from the excavation.

Table 2 Quantification of excavation records

Type	Quantity
Context records	508
Context registers	20
Graphics (A4 and A3)	44
Graphics registers	4
Environmental sample registers	2
Environmental records	14
Photograph registers	49
Digital photographs	3005

5.2 Soil sequence and natural deposits

5.2.1 Alluvial sand and clay deposits were encountered across Areas 2a, 2b and 3 at a height of 62.15 m aOD. These deposits overlaid alluvial gravel deposit seen in Area 2b. A monolith sample through the alluvial deposits (**Pl. 1**) was taken from a 2.70 m x 2.45 m x 1.20 m deep sondage that was machine excavated in an archaeologically blank area at the western end of Area 2b.

5.2.2 No evidence of former water channels was encountered.

5.3 Area 1

Introduction

5.3.1 Area 1 (**Fig. 2–5**) targeted the footprint of the former Porter Island Works grinding workshop. The grinding workshop was still standing until the last phase of the archaeological works on site and was the subject of a structural watching brief carried out during the demolition of the building in December 2018 (Wessex Archaeology 2019).

Early structure

5.3.2 The earliest feature in Area 1 may have been sandstone wall 1156 located in the west of the area (**Fig. 3**). The wall was 2.20 m long and 0.60 m wide and was excavated to a depth of 0.33 m exposing five courses of rough-cut sandstone blocks, randomly coursed and bonded with lime mortar. The wall was probably truncated in the east during construction of later structures.

Phase 2 Ward's Wheel

5.3.3 During the structural watching brief (Wessex Archaeology 2019) it was noted that:

> *Although the adjoining stair-tower annex had been much altered, it clearly pre-dated the main workshop and was likely a remnant of the mid-19th-century Ward's Wheel. The eastern gable of the structure was later and would have been constructed following the demolition of the rest of the works in the 1920s or early*

1930s. Its retention is unusual and may reflect that the structure had contained a staircase necessary for accessing the workshop. The interior was significantly altered in the mid-late 20th century when a lift system was installed obscuring much of the evidence for its primary internal structure.

5.3.4 The below-ground archaeological evidence supports these observations. Two early walls (1060 and 1057; **Fig. 4**) evidenced a 3.20 m x 2.60 m rectangular brick annex. Walls 1060 and 1057 were keyed into each other and were butted by later wall 1302 which formed part of the main external structure to the grinding workshop, suggesting that 1060 and 1057 formed part of an earlier range of buildings. These earlier walls (1060 and 1057) were truncated to the north by a later lift shaft, and to the east by the later gable wall observed during the structural watching brief.

5.3.5 Wall 1060 ran for 2.70 m on a north to south alignment. It was two skins wide and five courses deep. Wall 1060 was constructed of white lime mortared handmade red brick, laid stretcher bond. There was evidence of a later central repair using black ash mortar.

5.3.6 Wall 1057 ran east to west for 3.45 m and at its west end was keyed into wall 1060. Wall 1057 was three skins wide and more than nine courses high constructed of white lime mortared handmade red brick. There was damage visible at its western end where a later ceramic pipe had been inserted through the wall leaving the original structure unstable.

5.3.7 Fragments of early internal walls (1062) were seen in the area enclosed by 1060 and 1057 but due to the nature of the later truncations it is difficult to determine any original form or function.

Phase 3 Porter Island Works

5.3.8 Following demolition of the standing structure, the first phase of the grinding workshop associated with the Porter Island Works was visible as a rectangular brick footprint. (**Fig. 3**). These structures were constructed in construction cuts (eg 1276) that truncated alluvial deposit 1187, a mid-greyish green silty sand visible in the north-western extent of the interior of the building.

5.3.9 The grinding workshop (1012, 1014, 1015, 1214, 1207, 1265 and 1273) measured 13.40 m x 8.00 m with walls excavated to a depth of 1.30 m. It was built in an English garden bond with handmade red bricks. It was four skins thick and survived in places up to fourteen courses high.

5.3.10 Wall 1014 (= 1012; **Fig. 9**) was the most intact and unaltered of the four exterior grinding workshop walls. It formed the northern wall of the grinding workshop, and the southern wall of the later boiler house (see below). Wall 1014 was 17.80 m long suggesting it once formed part of a larger range of buildings of which the Grinding House was one element. Wall 1014 had a series of five alcoves regularly spaced along its length (**Pl. 2**). These were defined with bullnose bricks on either side and were one skin narrower than the rest of the wall. At the western end of the wall, these alcoves were in line with a series of narrow parallel brick walls which formed possible grinding troughs (**Pl. 3**). This process would have required natural light; it is possible that these alcoves lined up with windows at a higher level. Between these alcoves were relatively regularly spaced joist mortises on which a wooden floor would have sat (**Fig. 9**).

5.3.11 The eastern wall of the grinding workshop (1273 and 1302) was heavily impacted by later phases of work including internal alterations and the addition of an external lift shaft (1054). A 6 m length survived which was keyed into the main east to west running exterior

wall (1014) at its northern end, and at its southern end (1302) formed the northern half of a doorway. The door had later been bricked up by a single skin frogged red brick wall (1264) bonded with black ash mortar.

5.3.12 The western wall (1015) was 7.30 m long and was keyed into both the northern and southern east to west running walls (1014 and 1214).

5.3.13 The southern wall (1207, 1210, 1214 and 1265) ran for 13.40 m and had several later alterations (**Fig. 10**, **Section 1.2**). The western end (1265) formed the southern half of a doorway which was later bricked up (1264).

5.3.14 Several internal structures from this phase remained in the north-west corner of the building. Two parallel single skin walls 0.80 m apart (1185 and 1274) ran south for 1.30 m from wall 1015. Walls 1185 and 1274 comprised four courses of handmade red brick, bonded with a white lime mortar in a stretcher bond. These lined up with the first alcove at the western end of 1014. The alignment of walls 1185 and 1274 with the alcove suggests that some specific activity (presumably grinding) took place here.

5.3.15 A shorter section of wall (1186) extended south for 1.30 m from wall 1014 and butted the western edge of 1274. This section of wall was three skins wide and five courses high. It was constructed from handmade red brick laid in a stretcher bond and bonded with white lime mortar. There was a single bullnose brick opportunistically used in the centre of the structure, suggesting re-use of materials. Wall 1186 may have provided support to 1274.

5.3.16 Parts of a similar structure (1184) remained 1.75 m to the east of wall 1185. Wall 1184 was parallel to, and of the same size and construction as structure 1086. The rest of wall 1184 was heavily truncated by later building phases, but it appears that the same or similar sets of structures were periodically repeated across the southern face of wall 1014.

Grindstones

5.3.17 Between walls 1274 and 1185 was a light brownish orange fine silty sand (1282). The most notable aspect of this deposit was the inclusion of over 15 discarded grindstones. These predominantly had a circular central hole of variable size and ranged from 0.40 m to 0.45 m in diameter, with thicknesses between 0.15 m and 0.30 m. Two of the grindstones instead had square central holes 0.08 m square and 0.1 m square respectively. The smaller square-holed grindstone was 0.33 m in diameter and 0.12 m thick, and the larger was 0.50 m in diameter and 0.30 m thick. The two square-holed grindstones would have been fitted to an arbour by means of wooden wedges, a method that was prone to splitting the wheel. Later round-holed wheels were held in place by iron plates (eg Symonds 2002, 91). As such these square-holed grindstones are likely to pre-date the round-holed grindstones. The grindstones appear to have been left to accumulate where they were used, perhaps due to the effort of moving them (**Pl. 3**).

Phase 4.1 Porter Island Works

Introduction

5.3.18 A second phase of construction of the Porter Island Works was marked by a change from the use of white lime mortar to black ash mortar, and by a change from handmade brick to frogged machine brick.

External wall

5.3.19 Changes were made to the south and east of the Grinding Workshop (**Fig. 3** and **Fig. 10**, **Section 1.2**). In the south-west, a stone floor (1213) comprised flagstones and whole and

broken grindstones laid flat on their sides. A brick fireplace (1211) was built into the south wall of the Grinding Works (here 1210 and 1214) and partially overlay floor 1213. The fireplace was relatively small, 0.90 m long by 0.60 m wide, suggesting a heating rather than industrial function. Central to the southern wall (here 1207 and 1210), another brick structure (1209) was also added (**Pl. 4**). This was 1.00 m long and flush to the original wall. Frogged brick and ash mortar repairs seem to have been made to the adjacent original brickwork at the same time. The purpose of this structure was unclear but may have been associated with some machine. It had a 0.30 m x 0.30 m central recess at floor level, with a possible joist mortise at its base.

Power and transmission

5.3.20 The structural watching brief report (Wessex Archaeology 2018b) stated:

> *Little evidence survives as to the nature of power transmission, although there had presumably been line-shafting along the inside of the northern wall from which leather belts would have turned the grinding wheels.*

5.3.21 The archaeological evidence confirmed the presence of belt power; two wooden and iron wheels (1227 and 1228; 1228 not illustrated in plan) were present along the inside of the northern wall. Wheel 1228 had a surviving fragment of leather belt on its exterior surface (**Pl. 5**; **Fig. 10**, **section 1.2**). The two wheels sat within five parallel brick walls (1183 = 1200, 1136, 1137, 1138 and 1139) extending for 1.50 m at right angles from the main northern wall 1014. These walls were all three skins wide, constructed from machine made red brick laid in an English bond with black ash mortar. These walls were up to nine courses high, each with a central notch two courses lower and 0.42 m long. These central notches would most likely have held a drive shaft running parallel to the northern wall turning the wheels and providing power to the machines sat within the building (**Pl. 6**).

5.3.22 There was evidence of brick structures below the wheels, but these could not be investigated due to the height of the standing wall 1014 and due to the presence of ground water. One wall was recorded (1198), a single skin thick and curved. It appeared to line up with one edge of a channel from the boiler house, perhaps a drain.

Internal structures

5.3.23 As mentioned above, there were remnants of a flag and grindstone floor (1213) in the south-west of the building that had been heavily truncated by later construction. The eastern half of the building was mostly floored in bricks (1246). Brick surface 1246 contained four stone machine bases (1242, 1257, 1256 and 1244) one of which was a repurposed 1.60 m diameter grindstone.

Phase 4.1 Boiler House

5.3.24 A rectangular brick-built structure (**Pl. 7**) on the north side of the Grinding Workshop corresponded with an area keyed on the 1905 Goad Insurance Plan as a steam boiler (**Fig. 13**). Construction techniques and materials including the use of black ash mortar and frogged brick indicate that the excavated remains of the boiler house were contemporary with the second phase of the Grinding Workshop (Phase 4.1). The power source used by the first phase of the Grinding Workshop is unknown.

5.3.25 The existing north wall of the Grinding Workshop (1014), also formed the south wall of the boiler house. At the east of the boiler house structure was brick surface 1144 (**Fig. 3** and **3**). This surface was 5.85 m long by 1.20 m wide. Due to the constraints of the edge of excavation and the presence of contamination, the north and east walls of the boiler

house were not fully excavated, however the exposed part of the east wall (1051) was three skins wide and up to eight courses high.

5.3.26 The south edge of surface 1144 butted a linear brick structure (1142) that was 5.80 m x 0.70 m x 0.70 m high. It was constructed of a random assortment of frogged machine brick and pale yellowish white firebricks and bonded with a black ash mortar. The bricks at the western end were heavily heat damaged and had become very degraded. The staining on the brick wall behind suggests that there was a deliberate, gradual slope down over the western 0.80 m of the surface to accommodate the shape of the boiler.

5.3.27 Between structure 1142 and wall 1014 was a single skin of firebricks (1149) up to 13 courses high positioned to protect the main structure of the grinding workshop from the heat of the boiler.

5.3.28 At the western end of 1144 were two square brick chambers (1025, 1148, 1147, 1152). The northernmost internal space was 0.70 m square and contained the base of a cast iron pipe (1153) with a 0.10 m wide aperture. The pipe continued beyond the edge of excavation to the north and most likely supplied water to the boiler.

5.3.29 A 0.65 m-wide rubble deposit (1154) separated the eastern boiler structure (1144 etc) from structures to the west. The height of wall 1014 at this point made it unsafe to excavate and so the relationship between the two halves of the boiler house was not determined. However, the materials used in structures on either side of deposit 1154 were similar and it is likely that both sets of structures are contemporary.

5.3.30 Directly to the west of rubble deposit 1154 was a 0.50 m-wide stone-capped drain (1155, 1161) filled with a dark blackish brown silty clay with occasional well dispersed gravel and degraded brick (1220). The drain ran south under the Grinding Workshop wall (1014), and beyond the edge of excavation to the north. The edges of the drain comprised machine brick walls two skins wide and over five courses high (1155). The western edge also supported stone surface 1162, which extending to the west. Stone surface 1162 was constructed from two large sandstone slabs measuring 0.80 m x 0.60 m to 0.70 m wide and 0.07 m high, and in the west from smaller setts laid in a regular pattern.

Phase 4.2 Porter Island Works

5.3.31 The third phase of the Porter Island Works Grinding Workshop (**Fig. 2**) was marked by an introduction of the use of concrete. Machine bricks and black ash mortar continued to be used.

5.3.32 A red brick-built ramp (1016) and stone door lintel (1017) were added to the centre of the in the west wall (1015). The ramp was 1.65 m wide and rose 0.24 m over 1.00 m. A metal pipe (1303) was also inserted at some point through the north end of wall 1015.

5.3.33 The eastern half of the interior of the Grinding Workshop was largely unaltered, although the previous surface (1246) was repaired. It is possible that the eastern doorway (1302 and 1265) was bricked up (1264) during this phase as the blocking structure (1264) was built on floor 1258. The eastern entrance was probably decommissioned when the western entrance (ramp 1016 and threshold 1017) was added.

5.3.34 The western floor level was raised with rubble/made ground (1024) and a poured concrete surface (1010) was added (**Fig. 2**). A 2.0 m x 1.70 m x 1.00 m high concrete machine base contained with three square holes for mounting a machine (1008). Concrete surface

1010 had several other integral machine mounting points and brick platforms indicating a continued use of heavy machinery within the Grinding Workshop.

5.3.35 A brick surface (1011) in the north-west of the Grinding Workshop measured 3.00 m x 0.70 m and was contemporary with concrete surface 1010.

Phase 4.2 Boiler House

5.3.36 The west end of the Boiler House underwent major renovation or rebuilding. A north to south aligned wall (1026) was built butting up to wall 1014 5.90 m from its western end. This wall was 1.75 m long, four skins wide and fifteen courses high, built of frogged machine brick laid in an English bond and bonded with a black ash mortar.

5.3.37 Once wall 1026 was built, the surrounding ground level was raised. East of 1026, dark brown sandy silt with frequent broken brick and mortar fragments (1034, not illustrated) buried structures 1162, 1144 etc. West of 1026, similar dark sandy deposits were laid down (1038 and 1035) were used to the west. A brick surface (1175) was laid on top of made ground deposit 1035 and 1038. Five grindstones (1029 = 1040) were laid flat and reused as a surface overlying 1038 (**Fig. 3**).

5.3.38 A small channel was incorporated into the western end of wall 1014 connecting the new floor levels on either side, possibly designed to hold a drainage pipe. This suggests that the second phase of development of the Boiler House described here was contemporary with the third phase of the Grinding Workshop.

Phase 4 Furnace

5.3.39 At the south of Area 1 (**Fig. 5**) were a series of brick structures that corresponded to a furnace marked on the 1905 Goad Fire Insurance Plan of the area (**Fig. 13**). The use of black ash mortar and frogged brick, along with the historic map suggest they were roughly contemporary with the later phases of the Grinding Workshop and the boiler house.

5.3.40 The area was heavily disturbed by contaminated deposits, modern drainage and concrete foundations. The surviving structures had two distinct phases. The first being a brick floor surface (1090, 1103 and 1111) laid randomly with whole and broken red brick and bonded with black ash mortar.

5.3.41 This surface was later cut through and two rooms (1094, 1109 and 1124) roughly 1.80 m square were built with frogged red brick and bonded with black ash mortar sat on concrete foundations. At the southern edge of the western of the two rooms were two smaller brick-built boxes (2099 and 2100) excavated during the Area 2b excavation (**Pl. 8**). These both measured 0.80 m x 0.30 m x 0.40 m deep. Whilst their exact purpose is unclear the series of deposits within them was clearly heat affected.

5.3.42 Further brick structures were also recorded (see **Fig. 5**); these could not be interpreted further and are fully documented in the site archive.

5.3.43 The nature of the furnace depicted on the Goad Plan was not determined by the results of the excavation.

Phase 7 Porter Island Works later additions

5.3.44 The structural watching brief (Wessex Archaeology 2018b) recorded the addition of an eastern gable wall:

The eastern gable of the structure was later and would have been constructed following the demolition of the rest of the works in the 1920s or early 1930s. Its retention is unusual and may reflect that the structure had contained a staircase necessary for accessing the workshop. The interior was significantly altered in the mid-late 20th century when a lift system was installed obscuring much of the evidence for its primary internal structure.

5.3.45 Five courses of the east gable end wall (1058; **Fig. 4**) ran for 13 m through Area 2b to the southern limit of excavation. The wall (1058) was five courses high and four skins thick laid in a header bond. The bricks were bonded with black ash mortar but in parts there was evidence of a white lime mortar remaining suggesting the materials were reused. The wall was sat on a concrete foundation.

5.3.46 To east of the south end of wall 1058 there was a 2.45 m square corrugated metal plate with a smaller 0.75 m x 0.30 m rectangular hole in its north-western corner (1299, **Fig 5**). The metal plate was at the eastern end of a 2.4 m wide, 16 m long strip of heavily compacted ground with a high iron and black ash mortar content (1095). This was heavily contaminated with diesel-like hydrocarbons suggesting that it may have been a trackway for vehicles leaving and entering the site with the metal plate perhaps forming a weighbridge at its far end.

5.3.47 At the north end of wall 1058, the base of the lift shaft (including wall 1064) was exposed but due to health and safety concerns this was left unexcavated.

5.4 Area 2a

Introduction

5.4.1 Area 2a (**Fig. 6**) incorporated evaluation Trench 2 (Wessex Archaeology 2018b) and was positioned to further explore the range of buildings fronting on to Sylvester Gardens, identify any remains of former water management (goits) and to explore the remains of the eastern end of the Porter Island Works.

5.4.2 The area was heavily truncated by modern concrete footings and impacted by contaminated ground, particularly in the south. Features were covered by a made ground deposit (2002) which was capped by a concrete slab (2001). A yellowish-brown sandy clay alluvial deposit (2144) was encountered to the north at 62 m aOD.

Early structure

5.4.3 The earliest structure in this area may have been a single run of upright sandstone slabs (2034) pushed into the natural alluvial deposit 2144. The individual slabs were 0.09 m x 0.31 m x 0.04 m forming a short wall which ran east to west for 1.95 m before being truncated at its eastern end by modern disturbance. It is of unknown purpose or date.

Phase 1 Goit

5.4.4 In the centre of the area, two parallel stone walls (2008 and 2031) ran north-east to south-west, constructed of undressed fine-grained sandstone with untidy random coursing bonded with pale grey lime mortar. The southern wall (2008) was 5.20 m long and 0.56 m wide; the northern wall (2031) was 8.10 m long and 0.45 m wide. Together they marked the course of a goit visible on the 1853 OS map of Sheffield (**Fig. 11**).

5.4.5 A sondage into a clinker-rich ashy deposit (2151) that backfilled the goit was machine excavated to a depth of 1.50 m below ground level. The sondage quickly began to fill up with contaminated water necessitating the abandonment of the excavation.

Phase 2 Early housing

5.4.6 Structure 2156 was the earliest in the north of Area 2a, with walls measuring up to 8.10 m long and 0.45 m wide and constructed of rough sandstone blocks in three irregular courses and bonded with chalky white lime mortar (**Pl. 9**). The structure consisted of a long east to west running element with three shorter walls extending at right angles to the north. Elements of this structure were identified during the evaluation (Wessex Archaeology 2018b; context 209). Structure 2156 matched the back wall of housing shown on the 1853 OS map (**Fig. 11**) with the walls running to the north most likely forming internal divisions. A later brick structure (2155, described below), truncated structure 2156.

Phase 3 Porter Island Works

5.4.7 In the south of Area 2a, group 2164 comprised two lime-mortared sandstone and brick walls (2024 and 2025; **Fig. 6**; **Fig. 10**, **section 2.1**). Wall 2024 was 0.47 m wide and approximately three courses (0.36 m) deep. This wall turned a right angle, running for 1.6 m south-west to north-east, and 2.20 m south-east to north-west. At the point at which it turned, four broken bricks were present, bonded to the stone wall (2024) with white lime mortar. A unfrogged machine brick and lime mortar wall (2025) butted 2024, running for 2.20 m north-west to south-east and three skins wide and made of white lime mortar and unfrogged red brick laid in a stretcher bond. Group 2164 was cut by later drainage which in turn was cut by concrete footings. Group 2164 may have formed an unmapped internal partition of the Porter Island Works (**Fig. 13**).

5.4.8 Further north, a fragment of a stone wall (2113) was probably a continuation of wall 2024. The remains measured 0.70 m x 0.45 m x 0.10 m high and comprised two courses of randomly coursed stone with no visible bonding material. Wall 2113 was overlain by later structures 2112 and 2114 (see below).

Phase 4 Porter Island Works

5.4.9 The south-east side of goit wall 2008 was butted by a small stone and brick surface (2009). The chronology of surface 2009 was unclear. To the south-east of surface 2009 was a wall (2010) parallel to goit wall 2008. Wall 2010 was 2.35 m long and 0.24 m wide and built with reddish brown unfrogged bricks with occasional, randomly placed pale firebricks. The top course was alternate header and stretcher, the second course mostly headers and the third mostly stretchers. It was bonded with a mid- to dark ash mortar and was two skins thick.

5.4.10 Slightly to the east of 2010 was another east to west aligned wall (2014) that was a few centimetres north of the continuation of the alignment of 2010. Wall 2014 was a single skin brick machine brick wall with a dark grey ash mortar. The east end of 2014 was truncated by a concrete footing, however the wall appeared to continue to the east as 2112. Wall 2112 was cut into made aground layer (2117) and overlay wall 2113 (described above). Brick wall 2112 ran for 3.40 m east to west. It was three courses high with the lower two courses laid stretcher bond and the top laid in a header bond, all bonded with a black ash mortar. Also sat on top of wall 2113 and curving roughly perpendicular to it, was a 1.00 m long single skin of stretcher bonded bricks (2114) forming a three-course high curvilinear wall.

5.4.11 Walls 2010, 2014 and 2112 match a persistent boundary recorded on historic maps throughout the 19th century (**Fig. 11–13**). Although part of the boundary originated with Ward's Wheel, the surviving structures comprise materials suggestive of a later date and the surviving walls likely comprise elements of the Porter Island Works.

5.4.12 South of wall 2010, a short wall with two openings (2017) ran south-west to north-east and was built with unfrogged machine bricks and mid-grey ash mortar. Wall 2017 was a maximum of three courses high and two skins thick. The threshold of one of the openings in 2017 was formed from brick (2023). The 0.35 m to 0.40 m wide openings in 2017 were later blocked up with two single skin unfrogged machine brick and dirty greyish pink lime mortar (2018, 2019). An additional skin was added to part of the structure (2022). A further brick wall (2020, not illustrated) ran parallel to this western section at the limit of excavation. A soot deposit present on the inside surface of 2017 suggests the 2017 and 2020 were two sides of an exhaust flue.

5.4.13 A sub-square black ash mortar and machine brick structure in the middle of the area (2005) was 1.60 m wide and was probably a cistern or inspection chamber. A drain (2033) ran east to west immediately south of goit wall 2032.

Phase 5 Later structures

5.4.14 The early housing (group 2156) was cut by a stone and brick built structure (group 2155). Structure 2155 consisted of a 9.30 m long, 0.50 m wide sandstone foundation (2068) irregularly coursed and bonded with black ash mortar which ran east to west, with three shorter walls (2037, 2074 and 2077) running at right angles to the north. On top and bonded to the sandstone with black ash mortar was a red brick wall. The main east to west aligned wall (2068) carried of a single course of up to five skins of a fragmentary wall (2075). The bricks were of mixed types, including handmade bricks with remnants of lime mortar indicating re-use and frogged and unfrogged machine bricks. The structure was bonded with black ash mortar. The wall (2037) atop the westernmost foundation (2070) survived with four courses and four skins wide at its base, with a step in to three skins after the first course. This step provided a ledge for supporting wooden floorboards 2036 (**Pl. 10**).

5.4.15 In the north-west corner of structure 2155 was a roughly square brick stanchion (2038, 2039 and 2041) measuring 0.90 m by 1.00 m, comprising machine-made red brick bonded with black ash mortar. The stanchion was 5 courses and 0.45 m deep and probably formed part of some larger building.

5.4.16 In the north-east corner of Area 2a, structure group 2157 consisted of two skins forming a ‘U’-shaped brick wall two courses high, laid header bond. This brick wall was bonded with black ash mortar and provided a base for a robust cast iron structural element (2105) which appeared to encase a brickwork floor which had been mostly removed. A made ground deposit (2148) between the wall and ironwork included a square-holed grindstone (2106).

5.4.17 Wall 2109 ran along the north-east limit of excavation and formed a major boundary. It comprised machine brick and mortar and was 7 m long and two skins (0.24 m) thick.

5.4.18 In the south-west of Area 2a, goit wall 2008 was partially reused as a foundation for later machine brick and grey ash mortar structure 2007, a 2.40 m long, 0.50 m wide wall or surface.

5.4.19 On the basis of the materials used in their construction these structures may represent late 19th to early 20th-century redevelopment of the area of the earlier housing.

5.5 Area 2b

Introduction

5.5.1 Area 2b (**Fig. 7**) targeted the area of evaluation Trench 3 (Wessex Archaeology 2018b) and was placed to determine the function of the structure recorded on the Goad Insurance Plan (**Fig. 13**) as a 'furnace' and its relationship to structures to the north and east. A further objective was to explore early water channels. Little information was revealed during this phase of works that has not previously been discussed under Area 1 above. The continuation of wall 1058 from Area 1 was recorded (**Fig. 7**), as was the continuation of the furnace structures in the south of Area 1 (eg 2099, 2100 etc.) See Area 1 above for description of these structures.

5.5.2 Features were sealed with a made ground deposit (2002) and capped with a poured concrete slab (2001). Alluvial sand and clay deposits (2043) were encountered at 60.30 m aOD.

5.5.3 Modern sewage pipes, an inspection chamber and concrete foundations truncated the archaeological remains.

Phase 6 Flue

5.5.4 At the eastern end of Area 2b, a construction cut (2045) for a flue measured over 0.80 m wide, over 1.60 m in length and 0.40 m deep (**Pl. 11**). The feature was cut into natural 2043. A few bricks remained *in situ* (2065) and the fill of the cut contained firebrick voussoirs which may have formed the vaulting of the flue. The cut had a primary fill of clay (2072). The main fill of the cut was demolition debris comprising mid-reddish brown and black sand silt with slag and probable asbestos-containing materials indicating a recent date for the demolition of the flue. The presence of asbestos suggests that these structures were 20th-century in date. There were further minor structures in this area that could not be interpreted further and are fully detailed in the site archive.

5.5.5 To the south-west, wall 2103 was associated with a drain and may have been 20th-century in date.

5.6 Area 3

Introduction

5.6.1 Area 3 (**Fig. 8**) targeted the area of evaluation Trench 4 (Wessex Archaeology 2018b) with the aim of identifying any further remains of the eastern end of the Porter Island Works, the easternmost area of the former goit and Ward's Wheel. A large area of the centre of Area 3 was heavily contaminated by hydrocarbons, and as such the maximum depth of excavation was limited to 0.50 m–0.80 m. Two concrete pads (3013 and 3014) were left in situ to avoid disturbing surrounding remains.

Phase 3 Ward's Wheel

5.6.2 The earliest structures in the area were two sandstone walls (3031 and 3033) that formed a right angle in the south-eastern corner of the trench. Walls 3031 and 3033 were aligned west-north-west to east-south-east and north–north-east to south–south-west respectively. They were 0.60 m high and 0.50 m wide, consisting of four randomly arranged courses with traces of the eroded lime mortar remaining. They were cut by 3032, a square sandstone-built structure which was random and uncoursed with small amounts of black ash mortar remaining (**Pl. 12**).

5.6.3 Walls 3031 and 3033 correspond to the south eastern end of the early/mid 19th century Ward's Wheel as depicted on the 1853 map (**Fig. 11**). They were heavily truncated by later features and excavation was compromised by contaminated deposits.

Phase 4 Flue

5.6.4 Structure group 3040 consisted of the remains of a brick-built flue aligned north-west to south-east. The flue walls (3005 = 3006 and 3007 = 3008) were was two skins wide and up to seven courses high, built of frogged machine-made red brick, in an English garden bond with black ash mortar and smooth regular jointing. The base of the flue was unmortared and was 0.62 m wide.

5.6.5 Wall 3012 was constructed in the same materials as 3040 but ran north-north-east to south–south-west. The relationship of wall 3012 to flue 3040 was unclear (**Fig. 12**) but the structures are thought to be contemporary.

Phase 7 Drains

5.6.6 A late drain (group 3030) at the southern limit of excavation comprised two small brick walls and a ceramic drain. running roughly north to south, towards the river.

5.6.7 A second drain (3011) truncated flue 3040 and was associated with a brick inspection chamber (3038).

6 ARTEFACTUAL EVIDENCE

6.1 Introduction

6.1.1 The finds assemblage is of moderate size, and dates entirely to the post-medieval/modern period (probably all 18th-century or later). It is typical of assemblages recovered from the industrial centre of Sheffield, containing a mixture of domestic refuse alongside evidence for metalworking and cutlery handle manufacture; there is also some button-making waste. The assemblage described here includes the very small quantity of material recovered during the previous evaluation stage of fieldwork.

6.1.2 Finds were recovered from all three areas of the site, the majority coming from Area 1, the area of the former grinding workshop (34 of the 54 contexts producing finds), with smaller quantities from Area 2 (14 contexts) and Area 3 (6 contexts). Within these areas, finds came from made ground, demolition and levelling deposits, and deliberate backfill layers – all contexts in which finds are likely to have been redeposited, and not necessarily from use within the area of the site, although some at least are likely to have resulted from activity in the Porter Island Works and/or other workshops on the site, or from the domestic housing facing on to Sylvester Gardens. Relatively few finds came from cut features (channels, construction cuts, drain, cistern).

6.1.3 All finds have been quantified by material type within each context, and the results are presented in **Table 3**.

Table 3 All finds by context (number / weight in grammes)

Context	Animal Bone	Clay Pipe	Glass	Leather (no.)	Metal (no.)	Pottery	Slag (wt.)	Other Finds
313						1/56		
322	2/43	3/7				4/97		
1042				12	18	1/136	363	1 wood

Context	Animal Bone	Clay Pipe	Glass	Leather (no.)	Metal (no.)	Pottery	Slag (wt.)	Other Finds
1044				1	2			
1054	1/33	1/3		4	2			1 wood; 2 w/bone
1055			1/24		2	1/6		
1056	3/56	1/2			5			1 stone; 1 w/bone
1066			2/38		1	1/27		
1067					2			
1086		1/6	1/4					
1134	1/2	24/85		4	4			1 shell
1135	1/33							1 w/bone
1136								
1149							78	
1157						2/112		
1159	1/4					1/2		1 shell
1160					4			1 shell; 1 stone
1174		2/5	1/1			14/29		
1178						2/8		
1180						1/3	756	
1188					6	1/7	7411	1 crucible
1189		5/12			1	2/4		
1195	1/10	4/4	1/13			13/28		
1226	1/2		1/561		4			1 CBM
1227								1 wood
1228				4	2			13 wood
1266		1/1	2/77		24			
1267	1/2		2/12	24	69			
1272	1/21	3/10	1/9			5/43		
1282					18			
1283							3371	
1287		2/2	5/31		3	8/74		
1288								4 wood
1289					7			11 wood
2002		8/14	1/18			36/534		
2006	2/16	2/4	2/5			46/702		99 shell
2029			1/2					
2030								1 stone
2047		1/4				4/23		
2071		1/5			1			2 stone; 1 w/bone
2091		1/1				10/78		1 w/bone
2092	1/5							
2117		3/8				5/141		
2142								
2145					100		519	

Context	Animal Bone	Clay Pipe	Glass	Leather (no.)	Metal (no.)	Pottery	Slag (wt.)	Other Finds
2146							431	
2151			1/79			1/6		
2152	1/5	14/20	1/10			27/305		
3009			1/12		1			
3011		4/9	5/66		1	16/553		1 wood
3016						1/7	490	1 wood
3021						1/7		1 w/bone
3022		6/25						
3028		2/8						
unstrat								2 w/bone
Total	**17/232**	**89/235**	**29/962**	**49**	**277**	**204/2988**	**13419**	

Key: CBM = ceramic building material; w/bone = worked bone

6.2 Pottery

6.2.1 The pottery assemblage amounts to 204 sherds (weighing 2988 g). The whole assemblage is of post-medieval/modern date; the potential date range spans the period from 16th century onwards, but the likelihood is that all could be accommodated within the range of 18th–20th century.

6.2.2 The assemblage is in fair to poor condition; sherds are relatively small, and a number show signs of slight burning or other discolouration. There are a few conjoining sherds, but few reconstructable profiles. Mean sherd weight is 14.7 g, and this is skewed by the small group of redwares, which tend to be from larger, thicker-walled vessels; without these, the mean sherd weight falls to 9.1 g.

6.2.3 The assemblage has been quantified (sherd count and weight) by ware type within each context. Details of identifiable vessel form (where known) and decoration have also been recorded. Estimated Vessel Equivalents (EVEs) have not been used due to the scarcity of rim sherds for which the diameter is measurable; as an alternative means of quantification, the maximum Number of Vessels (MNV) has been used, counting each non-joining sherd as a separate vessel (the extreme fragmentation of the assemblage is reflected in the total MNV, which is 182). The level of recording accords with the 'basic record' advocated for the purpose of characterising an assemblage rapidly (Prehistoric Ceramics Research Group *et al.* 2016, section 2.4.5). **Table 4** summarises the data by context; full details are held in the project archive.

Table 4 Pottery by context

Context	Ware	No.	Wt. (g)	MNV	Comments
313	Redware	1	56	1	body sherd, brown-glazed
322	Redware	1	67	1	body sherd, brown-glazed
322	Refined whiteware	3	30	3	transfer-printed body sherds
1042	Redware	1	136	1	squared rim, flared bowl, brown glazed int
1055	Refined whiteware	1	6	1	saucer rim, transfer-printed (brown)
1066	Porcelain	1	27	1	small pot lid, ink-stamped label 'Boots the Chemists'
1157	Pearlware	1	2	1	body sherd, transfer-printed (brown)

Context	Ware	No.	Wt. (g)	MNV	Comments
1157	Yellow ware	1	110	1	jug handle
1159	Notts-type stoneware	1	2	1	body sherd, rouletted dec
1174	Pearlware	1	6	1	plate rim, blue feathered edge
1174	Refined whiteware	13	23	7	4 plain body sherds (1 plate); 9 transfer-printed body sherds (7 sherds poss all 1 vessel, ?saucer)
1178	Notts-type stoneware	1	5	1	plain body sherd
1178	Redware	1	3	1	brown glaze int
1180	Refined whiteware	1	3	1	transfer-printed, dish/bowl rim
1188	Tinglazed earthenware	1	7	1	all glaze gone
1189	Pearlware	2	4	2	transfer-printed, cup rim
1195	creamware	2	4	2	body sherds
1195	Developed creamware	2	4	1	conjoining sherds, handle
1195	English stoneware	1	3	1	handle stump
1195	Pearlware	1	1	1	plain body sherd
1195	Porcelain	3	1	3	body sherds, lustre dec
1195	Refined whiteware	1	6		partial small sphere (as 2117 but unglazed)
1195	Refined whiteware	2	1	2	transfer-printed; 1 saucer rim, 1 body sherd
1195	Yellow ware	1	8	1	banded dec, hollow ware body sherd
1272	Pearlware	3	9	3	transfer-printed; 1 cup rim, 2 body sherds
1272	Refined whiteware	1	8	1	saucer rim
1272	Yellow ware	1	26	1	flat-rimmed chamberpot
1287	Refined whiteware	8	74	4	3 transfer-printed body sherds (all hollow wares); 5 rim/body, almost certainly all 1 vessel; jug (wash-stand), hand-painted & lustre dec
2002	English stoneware	2	34	2	1 bowl rim; 1 body (salt-glazed ext, feldspathic glaze int)
2002	Pearlware	2	61	2	flow blue, jug (wash-stand?) rim; plain footring base
2002	Redware	3	106	3	1 white-slipped int; 2 brown glaze int
2002	Refined whiteware	28	317	26	4 blue banded dec (rim/body, flared bowls); 3 sponged dec (2 flared bowl rim; base); 2 moulded dec (hollow ware); 9 transfer-printed (1 mug base, 1 cup rim, 4 flatware, 2 hollow ware); 2 flatware rims with moulded dec; 8 plain (1 flared bowl rim, 1 handle stump, 1 footring base, 2 plate rim; 3 bodies)
2002	Rockingham-type ware	1	16	1	teapot handle
2006	Bone china	7	39	7	cup base & rim; 3 saucer rims (2 hand painted, 1 plain); 2 body sherds
2006	Creamware	1	10	1	plate rim
2006	Pearlware	2	23	2	flow blue transfer print, flatware rim; footring base
2006	Redware	6	403	6	2 convex jar rim, 4 body sherds, all brown glazed int

Context	Ware	No.	Wt. (g)	MNV	Comments
2006	Refined whiteware	27	186	27	15 transfer printed (1 saucer rim; 1 plate rim, 1 cup rim; 12 misc base/body); 5 blue banded bodies (prob all bowls); 1 moulded dec (figure?); 2 sponged dec (jug spout, small rim); 3 plain bodies
2006	Rockingham-type ware	2	39	2	body sherd + spout
2006	Yellow ware	1	2	1	plain body sherd
2047	Refined whiteware	4	23	2	3 conjoining, cup base (handle stump); cup rim with lustre dec
2091	Pearlware	1	36	1	base
2091	Refined whiteware	8	36	8	1 transfer-printed jug handle (water-worn); 7 body sherds (2 transfer-printed, 5 plain)
2091	Yellow ware	1	6	1	body sherd with banded dec (hollow ware)
2117	Pearlware	1	53	1	footring base
2117	Redware	1	63	1	squared rim, flared bowl, brown glaze int
2117	Refined whiteware	2	17	2	1 body; 1 footring base
2117	Refined whiteware	1	8		object: roughly half of a small sphere, glazed
2151	Refined whiteware	1	6	1	blue banded, rim (?jug)
2152	Developed creamware	3	13	2	body sherds, 2 conjoining
2152	English stoneware	3	40	2	body sherds, 1 with strap handle stump (jug), prob same vessel (inc dec); 1 plain body
2152	Pearlware	3	63	3	1 flange rim dish, blue feathered edge; 1 chamberpot rim, transfer-printed; 1 plain body
2152	Redware	4	120	3	1 flowerpot rim; 2 clubbed rim, unglazed (prob same vessel, also horticultural?); 1 black-glazed base
2152	Refined whiteware	10	32	10	7 transfer-printed (1 cup, 6 misc body/rim sherds); 2 saucer rims, hand painted; 1 carinated body
2152	Tinglazed earthenware	1	11	1	plate rim, blue dec
2152	Yellow ware	3	26	3	1 flared bowl rim; 2 bodies (1 banded dec)
3011	English stoneware	4	89	3	1 cylindrical jar/bottle base; 3 body sherds
3011	Notts-type stoneware	2	39	1	flared bowl rim
3011	Pearlware	2	21	2	serving dish rim, blue feathered edge; small plate rim, moulded dec
3011	Redware	1	151	1	chimney pot rim? Blackened int
3011	Redware	2	213	2	body sherd + base (thick-walled, narrow); black glazed int
3011	Refined whiteware	4	29	4	2 transfer-printed (bodies); 1 flared bowl rim (banded dec); 1 plain plate body
3011	Yellow ware	1	11	1	plain body sherd
3016	Redware	1	7	1	trailed slip on black ground, open form
3021	Refined whiteware	1	7	1	plate rim, transfer-printed (green)

6.2.4 Utilitarian redwares make up only a very small proportion of the assemblage (22 sherds). Most are brown- or black-glazed and appear to derive mainly from robust bowls (flared,

with squared rims) or convex jars. The exceptions are three sherds from context 2152 which include one flowerpot rim and a second unglazed vessel, probably also horticultural; and a possible chimneypot rim from context 3011. While the redwares have a potential date range extending back into the 16th or 17th century, these vessels appear to consist entirely of 18th-century or later vessels rather than the earlier vernacular tradition and, given the known history of the site, are more likely to date to the 19th or 20th century.

6.2.5 Other utilitarian vessels (for food preparation and storage) are provided by stonewares. All are of English manufacture and include some possible Nottinghamshire-type wares. Stonewares are seen here in various bowl forms, with one jug and one cylindrical jar/bottle. Again, these wares are likely to span the period from 18th century onwards although in all likelihood dating to the 19th or 20th century.

6.2.6 The date range of 19th-/20th-century suggested for the assemblage is supported by the almost complete absence of other wares that might be dated to the 18th century: there are only two sherds of tinglazed earthenware (both certainly residual here) and none of white salt glaze. Eight sherds of creamware are mostly of the 'developed' type with a less pronounced cream colour. Porcelain consists of British/European types rather than oriental imports. Instead, the assemblage is dominated by factory-produced wares of 19th-/20th-century date: whitewares, pearlwares, buff/yellow wares and bone china. These supplied tea- and tablewares (cups, saucers, plates, teapots), and also some kitchen wares (buff/yellow and whiteware bowls with blue banded decoration) and sanitary wares (chamberpots). There are also two small partial spherical objects (diameters around 20mm) in whiteware, one glazed and one unglazed; these are of unknown function, although they could have functioned as knob handles.

6.2.7 In terms of distribution, the pottery mainly occurred in very small groups in various contexts. Most sherds were found in Area 2, across part of the former Porter Island Works and an area of early housing (134 sherds, including 5 sherds from evaluation Trench 3), with smaller groups from Area 1, in the area of the grinding workshop (52 sherds) and Area 3, across the eastern end of the Works and the former goit (18 sherds). The largest context groups (and the only ones to yield more than 25 sherds) came from made ground 2002 (36 sherds), the backfill of brick cistern 2005 (46 sherds) and the cut for goit wall 2154 (27 sherds). It is difficult to provide any meaningful comment on such small groups; they are unlikely to represent deposits of primary refuse, but rather the incidental incorporation of redeposited waste. The character of the assemblage is entirely domestic, and although this would not preclude the its use for food consumption on industrial premises, it more probably derives from domestic use elsewhere (none related to the early housing identified in Area 2b).

6.3 Other ceramics

6.3.1 Other ceramics comprise one fragment from a (used) metalworking crucible from context 1188, and a brick fragment (coarse fabric, overall form/dimensions unknown) from 1226.

6.4 Clay tobacco pipe

6.4.1 The assemblage of clay pipe amounts to 89 fragments and is relatively poor condition: fragments are relatively small, and a high proportion of them appear burnt or otherwise discoloured. **Table 5** gives the breakdown of the assemblage by pipe part and by context.

Table 5 Clay tobacco pipes by context

Context	Stem	Bowl	Decoration	Comments
322	2	1	wheat-ear dec on seams	1 stem/spur; bowl frag undiagnostic

Context	Stem	Bowl	Decoration	Comments
1054	1			
1056	1			
1086	1			
1134	20	4		burnt & discoloured; 1 stem/spur frag; 2 bowl frags (1 heavily burnt) undiagnostic; 2 complete bowls (London types 28, 1820-40, & 33, 1840+)
1174	2			
1189	5			
1195	2	2	fluted	bowl frags undiagnostic
1266	1			
1272	3			
1287	2			burnt
2002	5	3		bowl frags undiagnostic
2006	2			plain stems
2047	1			plain stem
2071	1			plain stem
2091	1			plain stem
2117	2	1		1 stem/spur; bowl frag with spur, burnt
2152	2	12	fluting + 'swags'; wheat-ear dec on seams	11 bowl frags poss 1 pipe (spurred bowl, dec); 1 incomplete bowl with moulded seams
3011	4			1 burnt
3022	5	1	wheat-ear dec on seams	bowl frag, spurred, burnt (London type 27, 1780-1820)
3028	2			

6.4.2 Of the total recovered, 65 clay pipe fragments are plain stems, three of them retaining part of a spurred bowl. There are only three datable bowls. All are spurred pipes and, as for many late 18th-century and later pipes, correspond to London types. The earliest, from context 3022, is a pipe with a squared spur and moulded 'wheat-ear' decoration up the bowl seams, dated *c*. 1780–1820 (Atkinson and Oswald 1969, type 27). The other two, both from context 1134, comprise one bowl dating *c*. 1820–40 (*ibid*., type 28), and one dating to the 1840s or later (*ibid*., type 33); both these bowls were missing their spurs.

6.4.3 Eleven bowl fragments from context 2152 could belong to a single pipe, featuring moulded 'swags' above vertical fluting; again, this is a spurred pipe of late 18th or 19th-century date, as is another incomplete bowl from the same context, with moulded 'wheat-ear' decoration. Other bowl fragments are undiagnostic.

6.5 Glass

6.5.1 The glass (total 29 fragments recovered) includes vessel and window glass, and one object (see **Table 6**). Vessel glass consists almost entirely of bottle fragments. There is one complete green beverage (beer) bottle, with a rubber screw stopper intact (context 1226). The bottle belongs to John Marples & Co of Market Street, Sheffield; the company were based in Market Street from the 1880s, and the company was acquired by John Smith's in 1907. Three other body fragments of green glass also come from beverage bottles (beer or wine). The base of a narrow bottle in pale blue glass (context 1066) once held Henderson's Relish, a well-known local condiment made in Sheffield from the early 1880s. A smaller narrow bottle in clear glass, long-necked with a cracked-off rim (for a cork closure), may also have held a sauce or condiment of some kind. Other fragments

are from bottles of uncertain function (beverages, foodstuffs, pharmaceutical products, etc). The only other vessel fragment is a from a clear vessel of uncertain form.

6.5.2 The window glass includes thick-walled reinforced fragments likely to be from industrial rather than domestic buildings.

6.5.3 The single object is a short, narrow tube with one rounded end, like a very small test tube but with the rounded end perforated. It is of uncertain function.

Table 6 Glass by context

Context	Vessel	Window	Other	Additional Comments
1055	1			clear bottle neck (cork closure)
1066	2			conjoining; pale blue, narrow cylindrical bottle, base: [HENDE]RSONS / [RELI]SH / [SHEFF]IELD
1086		1		
1174		1		
1195	1			green bottle
1226	1			complete green bottle: JOHN MARPLES & CO / 2 MARKET ST / SHEFFIELD; (on rear) BIRD & FENBY'S PATENT; internal screw closure (in situ)
1266		2		reinforced window
1267		1		
1267		1		
1272	1			green bottle
1287		5		1 reinforced window
2002	1			aqua bottle neck, flat rim
2006	1			clear vessel (form unknown)
2006		1		
2029			1	thin glass tube
2151	1			complete small bottle, narrow cylindrical, long neck, cracked-off rim; embossed 347, and B in diamond, underside of base
2152	1			green bottle
3009	1			pale green bottle
3011		5		3 reinforced window

6.6 Stone

6.6.1 Five fragments of worked stone were recovered. Two small joining fragments from levelling layer 2071 are from a thin slab with one drilled perforation; its function is uncertain. The other three objects (made ground 1056 and 1160, demolition layer 2030) are all fragments from small grinding wheels, with original dimensions ranging from 220 mm to 600 mm.

6.7 Metalworking residues

6.7.1 Just over 134 kg of slag was recovered. The majority of this consists of undiagnostic slag or fuel ash slags. Without supporting and specific archaeological evidence, it is impossible to assign these types of slag to a particular source, or to determine when and where the material originated. In at least some cases, the slag appears to have been brought in to the site as backfill material or made ground.

6.7.2 There is, however, one item of interest. This is a plano-convex slag cake from backfill layer 1188. Initial inspection suggests that this may be a slag cake from the base of a

coke-fuelled smithing hearth. The piece weighs 515 g and measures approximately 125 mm across and 55 mm in depth. The history of the site and presence of coke inclusions within the slag suggest that it is likely to date from the post-medieval period.

6.8 Metalwork

6.8.1 A total of 277 metal objects was recovered, mostly ferrous (of which 100 comprise tiny fragments recovered from a sieved soil sample taken from fill 2145 in channel 2150). The assemblage includes unfinished and finished objects (cutlery, tools), probably structural metalwork, and a few personal items (buckles, buttons).

6.8.2 As expected, given the history of the site, cutlery is well in evidence, represented by at least ten knives, all apparently round-bladed table knives, and one fork. There is also one triangular-sectioned file and a chisel. One item of particular interest is a fragment from a casting of a table knife from made ground 1287. The piece measures approximately 60 mm long and includes a short section of tang, the bolster and part of the blade. What is unusual about this piece is that it appears to have been cast from a lead-based alloy.

6.8.3 Structural items include two possible door/window frame fragments and a few nails. There is also a gasket, two other possible machinery parts, and other fragments (such as short lengths of rod or wire) may also relate to machinery.

6.8.4 Other identifiable objects include a stamped deal (IMPERIAL STANDARD 4lb) and a perforated drain cover. Other objects comprise miscellaneous fragments of uncertain function.

6.9 Leather

6.9.1 Forty-nine items of leather were recovered. Most of these comprise items or fragments of footwear (see **Table 7**). The date range is likely to be 19th to 20th century.

Table 7 List of leather objects

Context	Material	Count	Additional Comments
1042	Shoe	12	2 heels, 1 toe, 2 sole, 7 misc frags
1044	Belt	1	Short length of ?industrial belt (w 190mm); perforated down both sides
1054	Shoe	4	near-complete shoe, lace-up; nailed heel & sole (clog sole)
1134	Shoe	3	shoe upper with leather laces in situ, insole fragment
1134	Shoe	1	Shoe upper (toe end)
1228	Uncertain	4	Misc frags (not shoe?)
1267	Shoe	1	Sole fragment
1267	Shoe	17	misc boot fragments, lace-up (all 1 item?), all upper
1267	Uncertain	2	Tapering strips, end perforated
1267	Belt?	1	Rectangular piece – [part of industrial belt?
1267	Shoe	1	near-complete shoe, lace-up (left, adult male); nailed heel and sole (clog sole)
1267	Shoe	2	2 shoe heels (clog soles)

6.9.2 Two shoes are near-complete, with soles and most of the uppers (made ground 1054, backfill deposit 1267). Both are adult lace-up shoes with nailed clog soles. There were two further heel fragments from clog-soled shoes from 1267, and parts of similar shoes from dump layer 1042 and layer 1134. Layer 1134 also produced the upper from a lace-up shoe, with laces still *in situ*, while a number of fragments from one or more lace-up boots came from 1267.

6.9.3 Two items may represent parts of industrial belts – rectangular strips, one with perforations down each side (made ground 1044 and backfill deposit 1267). Four other fragments from structure 1228 are of uncertain function, but do not appear to represent footwear.

6.10 Wood

6.10.1 Thirty-three pieces of wood were recovered. The condition is generally poor; some pieces were found dried out and some damp. A few pieces have adhering metal traces. All of the wood is presumed to be of structural origin (and possibly belonging to previous buildings on the site) although, with the exception of parts of a possible window or door frame (layer 1289) their precise function is uncertain.

6.11 Worked bone

6.11.1 The worked bone assemblage amounts to nine objects, which includes two finished objects, three blanks, and four other items of waste from bone- and antler-working (**Table 7**). All are likely to relate to the manufacture of cutlery handles and illustrate the various stages in their manufacture.

Table 8 List of worked bone objects

Context	Material	Count	Additional Comments
1054	Handle	1	scale knife handle blank; cattle
1054	Handle	1	scale knife handle, cattle, incised decoration; rivet hole with iron rivet in situ
1056	Handle	1	scale knife handle blank
1135	Handle	1	scale knife handle blank
2071	Waste	1	antler tine tip, sawn
2091	Waste	1	off-cut, cattle long bone shaft
3021	Handle	1	scale knife handle, antler, incised decoration, rivet hole at one end
unstrat	Waste	2	probable off-cuts/waste from handle manufacture; long bone shaft

6.11.2 The finished objects are two complete ‘scales’ from scale tang handles, one made from a cattle metapodial (made ground 1054) and the other from antler (construction cut 3021). Both have incised line decoration across the surface and small rivet holes. Knife handles formed from riveted pairs of bone or antler scales, usually with incised decoration to improve the grip, are the most common form recovered from post-medieval and early modern assemblages of cutlers’ waste; they are ubiquitous finds on industrial sites in Sheffield. Scale tang handles were usual for table knives until the later 19th century (Unwin 2014, 124).

6.11.3 Bone blanks or roughouts for three further handle scales were also recovered (made ground 1054 and 1056, layer 1135). These were also made from cattle metapodials and have rivet holes, including one example where the holes are countersunk. Cattle

metapodials were the favoured material for the manufacture of handle scales; after removal of the ends, narrow segments of bone were sawn off vertically in sections (Unwin 2014, 126).

6.11.4 The assemblage also includes three small off-cuts from the early stages of the manufacturing process and the sawn tip of a deer antler tine. It is possible that three sawn rib sections (quantified with the unworked animal bone) also represent cutlery handle-making waste, as these bones were suitable for the production of scale handles for folding knives (Unwin 2014, 126).

6.12 Animal bone

6.12.1 Seventeen fragments (or 232 g) of animal bone came from deposits of early modern date. The bones are is good condition and rodent gnaw marks were apparent on one long bone. The assemblage was assessed following current guidelines (Baker and Worley 2019) and basic information recorded and quantified.

6.12.2 The identified bones include part of a cattle vertebra and three sawn sections of rib, a sheep/goat radius, femur and metatarsal, a pig mandible and three rabbit bones.

6.13 Marine shell

6.13.1 One hundred and two fragments of shell were recovered. One of these, from the backfill of cistern 2005, is a complete oyster shell (right valve). The remainder comprises the waste from mother-of-pearl button manufacture; most of this also came from the cistern backfill, with three fragments from made ground in Area 1.

6.13.2 As for the better-known Birmingham button industry (White 1977), this is likely to have used imported shells from various far-flung sources. The waste material seen here comprises various fragments of cut shell, including some small rectangular plates, and some fragments showing the removal of multiple circular blanks (Bevan et al. 2009, fig. 8.7), and a few of the blanks themselves, although the majority are irregular small fragments. Pearl button manufacture in Sheffield, Birmingham and elsewhere in Britain was hit by the cessation of trade with the United States after the American Civil War in the 1850s, and the subsequent rise of the button industries of America, Paris and Vienna, and it was further affected by the growing popularity of other raw materials, such as corozo nut (a form of vegetable ivory), horn and later plastic (the earliest plastic was patented in 1862).

6.1 Conservation

6.1.1 Objects in potentially unstable condition, and therefore possibly in need of conservation treatment, comprise the metalwork, leather and wood. The ironwork in particular is in poor condition and heavily corroded. The metalwork is currently packed in as stable a condition as possible, in airtight polythene tubs with drying agent (silica gel). The leather is packed waterlogged, in airtight plastic tubs, and kept in dark conditions. The wood is packaged according to condition: dry pieces in airtight containers with buffering silica gel; wet pieces kept damp, double-wrapped and stored in dark conditions.

7 ENVIRONMENTAL AND INDUSTRIAL SAMPLE EVIDENCE

7.1 Introduction

7.1.1 Ten bulk sediment samples were taken from a range of post-medieval/industrial layers and deposits associated with a former grinding house (such as rooms and channels). Of

each of these, a 10-litre subsample was processed in order to assess recovery potential and preservation of the environmental evidence. Two monolith samples, taken through alluvial sequences, were described and assessed for microfossil potential. A kubiena sample was taken through a sequence of industrial layers.

7.2 Aims and methods

7.2.1 The purpose of this assessment is to determine the potential of the environmental remains preserved at the site to address project aims and to provide data valuable for wider research frameworks. The nature of this assessment follows recommendations set up by Historic England (Campbell et al. 2011).

Macrofossils

7.2.2 The size of the bulk sediment samples varied between 1.3 and 40 litres. When subsampled the average volume was around 8 litres. The samples were processed by bucket flotation methods; the flot retained on a 0.25 mm mesh, residues fractionated into 5.6 mm and 1 mm fractions. The coarse fractions (>5.6 mm) were sorted by eye and discarded. The environmental material extracted from the residues was added to the flots. The flots were scanned using stereo incident light microscopy (Leica MS5 microscope) at magnifications of up to x40 for the identification of environmental remains. Different bioturbation indicators were considered, including the percentage of roots, the abundance of modern seeds and the presence of mycorrhizal fungi sclerotia (eg *Cenococcum geophilum*) and animal remains, such as burrowing snails or earthworm eggs and insects, which would not be preserved unless anoxic conditions prevailed on site. The preservation and nature of the charred plant and wood charcoal remains, as well as the presence of other environmental remains such as terrestrial and aquatic molluscs, animal bone and, was recorded. Preliminary identifications of dominant or important taxa are noted below, following the nomenclature of Stace (1997). Abundance of remains is qualitatively quantified (A*** = exceptional, A** = 100+, A* = 30-99, A = >10, B = 9-5, C = <5) as an estimation of the minimum number of individuals and not the number of remains per taxa.

Sediments

7.2.3 The monolith samples were cleaned prior to recording and standard descriptions were used (following Hodgson 1997 and Troels-Smith 1955), including Munsell colour, texture, structure and nature of boundaries.

7.3 Results

Macrofossils

7.3.1 The flots from the bulk sediment samples were generally small (**Appendix 3** and **4**). There were generally low numbers of roots and modern seeds that may be indicative of some stratigraphic movement and the low possibility of contamination by later intrusive elements.

7.3.2 Charred material comprises varying degrees of preservation. Wood charcoal was noted in small quantities and is both roundwood and mature. No other environmental evidence is preserved in the bulk sediment samples however, several of the flots contain slag, hammerscale, coal and vitrified material, as evidence of industrial activity. One flot, from 1150, also contains a small amount of animal bone.

7.3.3 The main element of the bulk sediment samples are the remains of wild plant species, but they could also include a small amount of the remains of cereal plants. The wild plant taxa

include knotgrasses (Polygonaceae), meadow-grasses (Poaceae) and indeterminate charred seeds. A possible cereal plant taxon is oat (*Avena* sp.), although the identification is tentative and based only on the size of the grain, which seems too large for a wild species; identification to species level in the genus *Avena* cannot be definite in the absence of chaff (lemma bases).

Sediments

7.3.4 Monolith sample 101 was taken from a series of alluvial and gravel deposits in the southern part of Area 1 and shows, what was interpreted on-site as, made ground, which overlies alluvium and gravels. Monolith sample 2001 was taken from a sondage in the northern part of Area 2 and shows alluvial deposits.

7.4 Discussion

Macrofossils

7.4.1 Sylvester Gardens is an industrial site. The industry practised on this site (cutlery grinding) would not have produced large amounts of charcoal and few environmental remains would be expected. The charred plant remains could represent edible plants, however the poor preservation makes identification to genus impossible on morphological grounds. The layering of the recorded deposits on site suggests they may be alluvial in origin and, as such, the charred plant remains may not originate from the local area. It is equally likely that they were transported by the workers in the grinding house. This, and the small quantities, make interpretation of intentional usage impractical.

Sediments

7.4.2 The underlying geology of this site is recorded as Pennine Lower Coal Measures Formation, with the superficial geology being Alluvial clays, silts, sands and gravels (BGS online). Sylvester Gardens is located less than 20 m from the Porter Brook river and, therefore, alluvial deposits may be derived from any time during the Holocene. The deposits do not allow speculation as to whether they derive from multiple channels, but deposition processes can be investigated.

7.4.3 In monolith sample 101 we have evidence of episodic depositional events. High energy fluvial gravels, overlain by lower energy finer grained deposits of clay, silt and sand. The variable fine to coarse nature of the sediments indicates that alluvial deposition alternated between high and low energy, incorporating localised lithic inclusions. Iron staining and concretions observed within the alluvial deposits indicate the effects of redoximorphism caused by repeated post-depositional waterlogging of the deposits over an extended period.

7.4.4 Monolith 2001 has, what appear to be, several depositional events (as indicated by the laminations in the sediment). The occurrence of charcoal in the alluvium may indicate industrial processes were carried out in the catchment area. The deposits in Monolith 2001 also exhibited the effects of redoximorphism.

7.4.5 The alluvial deposits in both monoliths were overlain by made ground.

8 STATEMENT OF POTENTIAL

8.1 Stratigraphic potential

8.1.1 The stratigraphy has been subjected to a high level of examination; there is limited scope for further analysis.

8.1.2 The current understanding of the site stratigraphy meets several of the original project aims including;

- *to determine the location, extent, date, character, condition, significance and quality of any archaeological remains within the site including: remains of the former grinding workshop (Sheffield Wire Mill), former housing, the former Ward's Wheel and Porter Island Works, and any evidence for former goits and waterways;*

- *to enhance understanding of the development, layout and construction of former buildings, but also to have regard for potential earlier phases of activity; and,*

- *to contribute to the understanding of the development of industry along the Porter Brook.*

8.2 Finds

Industrial residues

8.2.1 The range and variety of metalworking evidence (steelmaking crucible fragment, metalworking slag, metal objects) is typical of assemblages from other similar sites in Sheffield (eg Wessex Archaeology 2016). The quantity is small, the bulk of metalworking slag is not diagnostic of any specific industrial process. A proportion of the assemblage is likely to have been imported to the site as backfill or made ground (Cumberpatch 2005). This part of the assemblage, therefore, has limited archaeological or archaeometallurgical potential. The slag cake is of intrinsic interest, but the research potential of this object is limited by the redeposited context in which it was found.

8.2.2 The fragment of knife casting is also quite unusual, and despite the less than secure provenance (from made ground), some limited further investigation is warranted, to determine the metal composition, which will inform a further understanding of the cutlery industry of Sheffield.

8.2.3 Evidence for the manufacture of bone and antler knife handles is also typical of Sheffield, where the use of bone in the cutlery industry was so widespread that items representing various stages of the handle production process (off-cuts, blanks, finished handles) are ubiquitous (Unwin 2014, 126). Quantities seen here are very small, and the assemblage has very limited archaeological potential.

8.2.4 Evidence for button manufacture is not as well documented, but is nevertheless known from Sheffield, although not on the same scale as in Birmingham. Although the evidence seen here is very small-scale, and none is necessarily related to the site itself, it nevertheless warrants a brief comment.

Other finds

8.2.5 Other finds comprise a minimal amount of structural material (brick fragment, nails, window glass, wood) and a slightly larger assemblage of domestic refuse, most of which consists of pottery, with a little animal bone, vessel glass, clay tobacco pipe, metal clothing accessories (buckles and buttons) and leather shoes. The leather shoes warrant a more detailed specialist catalogue and a brief comment, but overall this part of the assemblage has very limited further potential, by virtue of the small quantities involved, and their redeposited provenance.

8.3 Environmental potential

Macrofossils

8.3.1 The generally poor preservation and small quantities of the plant remains, in addition to their uncertain provenance, means that any results will have questionable value as interpretive tools. The assemblages recovered so far have little potential and require no further analysis. As such, the flots and residues and unprocessed sample fractions are recommended for discard.

Sediments

8.3.2 The minerogenic nature of the sediments in both monolith samples precludes the gathering of any meaningful results from microfossil analyses. Radiocarbon dating from charcoal present in monolith sample 2001 could provide a date for the wood but this will have been redeposited and will not date the sediment. Therefore, no subsampling is recommended for these monoliths. As no further work is proposed, discard is recommended for the monolith samples.

8.3.3 The kubiena sample was collected at the request of the Historic England Regional Science Advisor (Samantha Stein), the South Yorkshire Archaeologist (Dinah Saich) and the metallurgy specialist (Rod Mackenzie). The sample is recommended for specialist analysis to assess the formation/derivation of the layers to address questions of industrial practices.

8.4 Summary of potential

The original research aims, as detailed in the WSI (Wessex Archaeology 2018a) were;

- *to determine the location, extent, date, character, condition, significance and quality of any archaeological remains within the site including: remains of the former grinding workshop (Sheffield Wire Mill), former housing, the former Ward's Wheel and Porter Island Works, and any evidence for former goits and waterways;*
- *to enhance understanding of the development, layout and construction of former buildings, but also to have regard for potential earlier phases of activity;*
- *to contribute to the understanding of the development of industry along the Porter Brook;*
- *to contribute to the understanding of the development of the cutlery and steel industry within Sheffield;*
- *to contribute to the understanding of the development of, and relationship between, residential and industrial premises in Sheffield;*
- *to assess the artefactual and environmental potential of the archaeological deposits encountered;*
- *to prepare a report on the results of the work;*
- *to disseminate the results of the work in a manner in keeping with their significance, e.g. through publication in a suitable journal; and,*
- *to deposit the resulting archive with a suitable museum.*

8.4.1 The archaeological works undertaken at Sylvester Gardens have determined the location, extent, date, character, condition, significance and quality of the archaeological remains within the site. The well-preserved remains of the former Grinding Workshop and Porter Island Works survive across three distinct phases and incorporate structural remains of the former Ward's Wheel. Heavily truncated remains of the south-east corner of Ward's Wheel survive at the south eastern extent of the site. Foundations of former housing survive at the northern extent of the site, and the walls of a former goit survive in the centre of the site.

8.4.2 The location of the structures at Sylvester Gardens, close to the Porter Brook, and the gradual change and development of the Porter Island Works and associated grinding workshop are typical of the Sheffield metalworking industries in the 19th and 20th centuries. Grinding wheels still standing in the city (such as Butcher's and Seller's wheels) have been well documented and as such the site does not shed any new light on grinding practices or the development of the industry within the city.

8.4.3 A large proportion of the artefactual assemblage was derived from levelling material. In Sheffield, levelling material for construction was often imported from distant depots (Cumberpatch 2005) and as such these finds may have little relationship with activity on the site. Although a large proportion of the finds were domestic, this does not provide secure evidence for domestic activity on site. Secure evidence for domestic activity is limited to structural remains in Area 2a and historic maps.

8.4.4 The documented recording of the standing Grinding Workshop (Wessex Archaeology 2019) followed by the excavation of the below ground remains has contributed to the understanding of the development, layout and construction of former buildings, and has identified earlier phases of activity on the site relating to the Ward's Wheel and goits.

8.4.5 The evidence for Ward's Wheel is fragmentary with the stone foundations being heavily truncated in the south east of the site, and partially preserved within later phases of the Grinding Workshop in the west. As such, these structural remains do not greatly contribute to the understanding of the development of industry along the Porter Brook.

8.4.6 The artefactual potential of the archaeological evidence is small as the assemblage recovered is typical of that found across other brownfield sites in Sheffield and as such adds little to our understanding of the site with a few exceptions outlined above.

9 UPDATED PROJECT DESIGN

9.1 Summary of recommendations for analysis

Finds

9.1.1 The knife casting will be submitted for scientific analysis by X-Ray Fluorescence (XRF), and a brief comment made on the results.

9.1.2 A small number of metal objects have been selected for X-radiography, to clarify details of their form (maximum 5 objects). The existing catalogue entries for these objects will be enhanced as appropriate with any additional details. Archive photography is recommended for all objects with the exception of miscellaneous unidentifiable fragments. A selection of knife blades could be illustrated in the publication report as a representative sample (group photograph).

9.1.3 No further analysis of the bone knife handles and waste is proposed, but their presence should be noted in the discussion of the site (using the information presented in this report), and the finished handle scales could be illustrated (group photograph).

9.1.4 No further analysis of the button-making waste is proposed, but its presence should be noted in the discussion of the site (using the information presented in this report), and a small selection could be illustrated (photograph).

9.1.5 The leather footwear should be submitted for specialist cataloguing and brief comment on the styles of shoe represented.

9.1.6 No further work is proposed for any other finds categories. Information presented in this report could be incorporated in the publication report as appropriate.

Conservation

9.1.7 On the basis of the condition of the metal objects, their nature, date range and provenance, no conservation work in terms of cleaning and/or stabilisation is proposed. A small selection of objects has been selected for X-radiography, and all objects for archive photography (see above), and these will act as a basic record for the metal objects, for which selective retention is proposed: see below, **Storage and Curation**).

9.1.8 No further conservation treatment is proposed for the leather or wooden objects, and these items are not recommended for retention (see below, **Storage and Curation**); the catalogue will form the archive record, together with archive photography of the more complete items of leather footwear, and of the worked wood.

Industrial sample

9.1.9 The kubiena sample is recommended for specialist analysis to assess the formation/derivation of the layers to address questions of industrial practices.

9.2 Updated project aims

9.2.1 The significance and potential of the archaeology of South Yorkshire is currently being addressed through the production of the South Yorkshire Archaeological Research Framework (SYAS forthcoming), and a draft document relating to the industrial period has been produced (SYAS 2018). This has been consulted in order to identify research goals to which the excavated data may usefully contribute. The following works were also consulted, although some of these were less immediately relevant:

- East Midlands Historic Environment Research Framework N.D. East Midlands Historic Environment Research Framework: Interactive Digital Resource.
- English Heritage 2010 English Heritage Thematic Research Strategies: a thematic research strategy for the historic industrial environment. Swindon, English Heritage
- Gomersall, H 2005 Research Agenda: Industrial Archaeology. Wakefield, West Yorkshire Archaeology Advisory Service
- Palmer, M 2005 Understanding the Workplace: A Research Framework for Industrial Archaeology in Britain, Industrial Archaeology Review, 27:1, 9-17

9.2.2 Further analysis of the deposits preserved within the Kubiena sample may clarify the industrial practices responsible for their formation. This conforms with recommendations

10.2 Preparation of the archive

Physical archive

10.2.1 The complete physical archive, which includes paper records, graphics, artefacts and ecofacts, will be prepared following the standard conditions for the acceptance of excavated archaeological material by Museums Sheffield, and in general following nationally recommended guidelines (SMA 1995; CIfA 2014c; Brown 2011).

10.2.2 All archive elements will be marked with the accession code, and a full index will be prepared. The physical archive currently comprises the following:

- 10 cardboard boxes or airtight plastic boxes of artefacts and ecofacts, ordered by material type
- 3 files/document cases of paper records and A3/A4 graphics

10.2.3 The archive quantities, particularly for finds, will reduce significantly following implementation of the proposed selection policy (see below).

Digital archive

10.2.4 The digital archive generated by the project, which will include born-digital data (survey data, databases and spreadsheets, photographs and reports), will be deposited with the Archaeology Data Service (ADS) to ensure its long-term curation. Digital data will be prepared following ADS guidelines (ADS 2013 and online guidance) and accompanied by full metadata.

10.3 Selection policy

10.3.1 Wessex Archaeology follows national guidelines on selection and retention (SMA 1993; Brown 2011, section 4), with the aim of retaining only those finds which are considered to have further research potential, or which fulfil other criteria within the Museum's collecting policy.

10.3.2 In this instance, the following selection policy is proposed, which is heavily influenced by the small size of the assemblage, the general poor condition of many items, and the largely redeposited provenance:

- *Pottery:* a small assemblage, and not in very good condition, this nevertheless has further research potential as a supplement to the existing dataset for Sheffield. Retain all.
- *Clay tobacco pipes:* small assemblage, in poor condition, with few datable pieces; little further research potential. Retain none.
- *Other ceramics:* only two items (brick and crucible fragments), little or no further research potential. Retain none.
- *Glass:* small assemblage, fragmentary, no items of intrinsic interest; little or no further research potential. Retain none.
- *Stone:* very few items (mostly parts of small grinding wheels); little or no further research potential. Retain none.

- *Metalworking residues:* small assemblage, largely undiagnostic of specific processes; little further research potential, but one item of interest. Retain slag cake only.

- *Metalwork:* small assemblage, mostly ferrous and in poor, corroded condition, vulnerable to further deterioration. Some items informative of industrial processes, and one item of intrinsic interest, but generally little further research potential. Retain small selection of identifiable objects only, including knife casting and representative sample of other cutlery items, and small selection of other identifiable objects.

- *Leather:* small assemblage, waterlogged (and therefore unstable); little further research potential; retain none.

- *Wood:* small assemblage, waterlogged (and therefore unstable); little or no further research potential. Retain none.

- *Worked Bone:* small assemblage, of some interest in illustrating industrial process; some further research potential as addition to dataset for Sheffield. Retain all.

- *Animal Bone:* very small assemblage; no further research potential. Retain none.

- *Marine shell:* small assemblage including button-making waste; of some interest in illustrating industrial process; some further research potential as addition to dataset for Sheffield. Retain all except unworked oyster shell.

10.3.3 The selection policy will be agreed with the museum and will be fully documented in the project archive. All finds already have been, or will be, recorded to an appropriate archive level before any selection procedure is implemented.

10.4 Security copy

10.4.1 In line with current best practice (eg, Brown 2011), on completion of the project a security copy of the written records will be prepared, in the form of a digital PDF/A file. PDF/A is an ISO-standardised version of the Portable Document Format (PDF) designed for the digital preservation of electronic documents through omission of features ill-suited to long-term archiving.

10.5 OASIS

10.5.1 An OASIS online record (http://oasis.ac.uk/pages/wiki/Main) has been initiated, with key fields completed. A .pdf version of the final report will be submitted upon completion of the project. Subject to any contractual requirements on confidentiality, copies of the OASIS record will be integrated into the relevant local and national records and published through the Archaeology Data Service ArchSearch catalogue.

11 COPYRIGHT

11.1 Archive and report copyright

11.1.1 The full copyright of the written/illustrative/digital archive relating to the project will be retained by Wessex Archaeology under the *Copyright, Designs and Patents Act* 1988 with all rights reserved. The client will be licenced to use each report for the purposes that it was produced in relation to the project as described in the specification. The museum, however, will be granted an exclusive licence for the use of the archive for educational purposes, including academic research, providing that such use conforms to the *Copyright*

and Related Rights Regulations 2003. In some instances, certain regional museums may require absolute transfer of copyright, rather than a licence; this should be dealt with on a case-by-case basis.

11.1.2 Information relating to the project will be deposited with the Historic Environment Record (HER) where it can be freely copied without reference to Wessex Archaeology for the purposes of archaeological research or development control within the planning process.

11.2 Third party data copyright

11.2.1 This document and the project archive may contain material that is non-Wessex Archaeology copyright (eg, Ordnance Survey, British Geological Survey, Crown Copyright), or the intellectual property of third parties, which Wessex Archaeology are able to provide for limited reproduction under the terms of our own copyright licences, but for which copyright itself is non-transferable by Wessex Archaeology. Users remain bound by the conditions of *the Copyright, Designs and Patents Act* 1988 with regard to multiple copying and electronic dissemination of such material

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APPENDICES

Appendix 1: Context summary

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
1005		Layer		Dark reddish brown silty clay
1006		Layer		Light yellow sandy clay
1007		Layer		Light yellowish brown sand and gravel
1008		Concrete slab		White/grey, few inclusions
1009		Concrete slab		Red, soft, occasional white concrete inclusions
1010		Concrete		Mid grey concrete floor
1011		Brick floor		Unfrogged red brick with black ash mortar
1012		Red brick wall		
1013		Concrete blocks		Three regular concrete blocks with lime moratar laying ontop of 1011
1014		Wall		Red brick with lime mortar
1015	1276	Wall	Construction cut	Red brick with black ash mortar
1016		Wall		Red brick black ash mortar
1017		Threshold		Sandstone block with black ash mortar
1018		Wall		Red brick with black ash mortar
1019	1021	Backfill/dump	Cut	Dark greyish black crushed concrete
1020		Wall		Red brick with black ash mortar
1024		Layer		Dark yellowish brown sand
1025		Brick surface		Red brick with black ash mortar
1026		Wall		Machine made red brick with black ash mortar
1027		Wall		Red brick with black ash mortar
1028		Wall		Red bricks
1029		Surface		Red brick and sandstone with black ash mortar
1030		Surface		Flagstones with black ash mortar
1031		Foundation		Black ash mortar with brick and slag fragments
1032		Floor		Red brick with black ash mortar
1033		Rubble dump		Dark greyish black with some mid redish brown hue slag and brick rubble
1034		Wall		Red brick with black ash mortar
1035		Dump of demolition material		Dark greyish brown sand with inclusions of brick rubble
1036		Slag dump		Dark yellowish black slag with mid orangy red hue, inclusions of clinker and rubble
1037		Surface		Regular red brick with black ash mortar
1038		Deliberate dump of rubble and industrial waste		Dark brownish black corse sand with inclusions of rubble and burnt material
1039		Metal sheet		
1040		Concrete		Mid yellowish grey
1041		Wall		Irregular concrete and sandstone blocks with lime mortar bonding
1042		Dump layer		Dark greyish black sand with inclusions of ash, rubble and occasional slag
1043		Made Ground		Dark greyish black sand and crushed slag
1044		Made Ground		Dark yekllowish brown sandy clay
1045		Made Ground		Mid greyish orange silty sand
1046		Surface		Mixed fire brick and red brick
1047		Surface		Red brick bonded with black ash mortar
1048		Boiler house floor		Fire brick and red brick bonded with black ash mortar
1049		Wall		Fire brick bonded with black ash mortar
1050		Surface		Red brick bonded with black ash mortar

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
1051		Wall		Red brick bonded with concrete
1052		Internal wall of boiler house		Red brick bonded with cement
1053		Foundation		Concrete block with crushed brick
1054		Made Ground		yellow sandy clay with red brick
1055		Made Ground		Dark grey sand clay with brick
1056		Made Ground		Brown sandy clay
1057		External wall		English Garden course, rough faced red brick with lime mortar bonding
1058		External wall		Header style rough faced red brick with black ash mortar bonding
1059		Wall		Rough and smooth faced red brick with black ash mortar bonding
1060		Internal wall		Red brick with black ash mortar bonding
1061		Wall		Rough faced red brick with black ash mortar bonding
1062		Wall		Rough faced red brick with black ash mortar bonding
1063		Wall		Red brick with black ash mortar
1064	1298	southern wall for elevator shaft	Construction cut	English Garden coursed smooth faced red brick with white lime mortar bonding
1066	1065	Backfill	Cut	Dark blackish grey silty sand with moderate inclusions of slag and charcoal
1067	1070	Backfill	Cut	Mid oorangy brown sandy clay with sparse charcoal inclusions
1068	1070	Backfill	Cut	Compact layer of charcoal
1069		Surface		Sandstone cobbles
1071	1072	Fill	Cut	Mid redish brown silty sand with inclusions of crushed brick
1073		Backfill		Light greyish brown silty sand
1075	1065	Ceramic drainage pipe	Cut	
1077		Concrete slab		Reddish concrete
1079		Foundation		Black ash mortar
1080		Platform		Red brick with black ash mortar bonding
1081		External southern wall of grinding house		Red brick with black ash bonding
1082		Structure		Red brick with cememnt bonding
1083		Colomn. roof support.		Steel cylindrical colomn
1084		Surface		Concrete
1085		Surface		Flagstones
1086	1078	Backfill	Cut	Black coal dust and clinker
1087		Concrete slab		Cut by 1077
1088		Made Ground		Made ground
1089		Made Ground		Sand
1090		Surface		Red brick with black ash mortar bonding
1091		Concrete slab		
1092		Foundation		Red brick with black ash mortar
1093		Structure		Red brick with black ash mortar
1094		Wall		Red brick with black ash mortar
1095		Surface		Black ash mortar and slag fragments
1096		Wall		Red bricks with black ash mortar bonding
1097		Foundation		Stone masonary block with Black ash mortar
1098		Surface		Metal plate
1099		Foundation		Single masonry block

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
1100		Surface		Black ash mortar with red brick underneath bonded with black ash mortar
1101		Foundation		Red brick with black ash mortar
1102		Wall		Red brick bonded with black ash mortar
1103		Surface		Red brick bonded with black ash mortar
1104		Industrial waste		Reddish purple sand
1105		Surface		Red brick bonded with black ash mortar
1106		Foundation		Red brick bonded with black ash mortar
1107		Wall		Red brick bonded with black ash mortar
1108		Wall		Red brick bonded with black ash mortar
1109		Foundation		Red brick bonded with black ash mortar
1110		Foundation		Black ash mortar with bricks
1111		Foundation		Red brick bonded with black ash mortar
1112		Ceramic drain pipe		
1113		Structure		Reddish mortar surface with metal pin
1114		Foundation		Red brick bonded with black ash mortar
1115		Structure		Masonry block and fired bricks bonded with black ash mortar
1116		Surface		Flagstones
1117		Structure		Concrete
1118		Wall		Red brick bonded with black ash mortar
1119		Lintel		Metal plate
1120		Ramp		Red brick bonded with black ash mortar
1121		Surface		Metal plate
1122		Wall		Red brick bonded with black ash mortar
1123		Wall		Red brick bonded with black ash mortar
1124		Wall		Red brick and fire brick bonded with black ash mortar
1125		Wall		Red brick bonded with black ash mortar
1126		Drain		Metal pipe bonded with black ash mortar
1127		Wall		Red brick and metal pin bonded with black ash mortar
1128		Wall		Red brick bonded with black ash mortar
1129		Wall		Red brick bonded with black ash mortar
1130		Wall		Red brick bonded with black ash mortar
1131		Foundation		Black ash mortar
1132		Foundation		Black Ash Mortar
1133		Foundation		Red brick bonded with black ash mortar
1136		Wall		Red brick bonded with black ash mortar
1137		Wall		Red brick bonded with black ash mortar
1138		Wall		Red brick bonded with black ash mortar
1139		Wall		Red brick bonded with black ash mortar
1140		Wall		Red brick bonded with black ash mortar, same as 1272
1141		Backfill		Orange brown sandy silt
1142		Wall		Red brick bonded with black ash mortar
1143		Surface		Red brick bonded with black ash mortar
1144		Surface		Red brick bonded with black ash mortar
1145		Surface		Red brick bonded with black ash mortar
1146		Surface		Red brick bonded with black ash mortar
1147		Wall		Red brick bonded with black ash mortar
1148		Wall		Red brick bonded with black ash mortar
1149		Backfill		Greyish brown-purple silty sand
1150		Wall		Red brick bonded with black ash mortar
1151		Wall		Red brick bonded with black ash mortar
1152		Wall		Red brick bonded with black ash mortar

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
1153		Pipe		Ferrous metal pipe
1154		Backfill		Blackish Brown sandy silt with red brick
1155		Wall		Red brick bonded with black ash mortar
1156		Wall		Sandstone masonary bonded with lime mortar
1157		Made Ground		Yellow brown sandy clay
1158		Made Ground		Blackish Brown sand with coal
1159		Made Ground		Greyish brown sandy clay
1160		Made Ground		Orange sand and lime mortar
1161		Surface		Sandstone flags
1162		Surface		Sandstone flags
1163		Drain		Mortar or concrete
1164		Surface		sandstone flags
1165	1181	Wall	Construction cut	Red brick bonded with black ash mortar
1166		Surface		sandstone flags
1167		Secondary fill		Blackish brown sandy silt
1168		Surface		sandstone flags
1169	1171	Wall	Construction cut	Red brick bonded with black ash mortar
1170		Backfill		Blackish brown sandy silt
1174		Made Ground		Yellowish brown silty clay with stone and CBM
1175		Foundation		Red brick bonded with black ash mortar
1176		Surface		Black ash mortar
1177		Surface		sandstone bonded with lime mortar
1178		Made Ground		Yellow sandy clay
1180	1179	Backfill	Construction cut	Redish black sand and clinker
1182		Foundation		sandstone and black ash mortar
1183		Wall		Red brick bonded with black ash mortar
1184		Wall		Red brick bonded with lime mortar
1185		Wall		Red brick bonded with lime mortar
1186		Wall		Red brick bonded with lime mortar
1187		buried soil		Greyish green silty sand
1188		Backfill		Black gravel, mortar, coal dust
1189		Backfill		losse grey lime mortar
1190		Backfill		Greyish green silty sand
1191		Made Ground		losse grey lime mortar
1192		Made Ground		Brownish green sandy silt
1193		Made Ground		orangish brown silty sand with grindstones
1194		Surface		concrete slab, same as 1086
1195		Made Ground		Greyish brown silty clay
1196		Made Ground		Orangey brown silty clay
1197		Structure		Metal possible sluice gate
1198		Wall		Curving wall Red brick bonded with black ash mortar
1199		Made Ground		Yellowish brown sandy clay
1200		Wall		Red brick bonded with black ash mortar
1201		Wall		Red brick bonded with black ash mortar
1202		Wall		Red brick bonded with black ash mortar
1203	1222	Foundation	Construction cut	Red brick
1204		Wall		Red brick bonded with black ash mortar
1205		Foundation		Fire brick, red brick and sandstone, bonded with black ash mortar
1206		Wall		Red brick bonded with black ash mortar
1207		Wall		Red brick bonded with lime mortar
1208		Pipe		Ferrous metal pipe
1209		Wall		Red brick bonded with black ash mortar
1210		Wall		Red brick bonded with lime mortar
1211		Structure		Red brick bonded with black ash mortar

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
1212		Surface		Sandstone flags
1213		Surface		Flagstones and grindstones
1214		Wall		Red Brick bonded with lime mortar, same as 1209
1215		Surface		Red brick
1216		Wall		Red brick
1217		Surface		Sandstone flag
1218		Surface		Grey concrete with crushed red brick
1219		Surface		Sandstone flags
1220		Secondary fill		Blackish brown silty clay
1221		Wall		Red brick bonded with black ash mortar
1223		Layer		Yellowish Brown silty clay
1224		Layer		Yellowish brown silty clay
1225		Layer		Black sand
1226		Backfill		Yellow sandy clay
1227		Structure		Wood and iron wheel
1228		Structure		Iron and wood wheel
1229		Backfill		Yellowish brown sandy clay
1230		Foundation		sandstone flags
1231		Backfill		Greyish brown silty sand
1232		Wall		Red brick bonded with black ash mortar
1233		Layer		Blackish brown sandy silt
1234		Wall		Red brick bonded with black ash mortar
1235		Foundation		Sandstone masonary bonded with lime mortar
1236		Foundation		Concrete block
1237		Bedding		metal bolts bonded with poured lead x 3
1238		Surface		sandstone flags bedded in sand
1239		Surface		Red brick
1240		Surface		Large flagstone with ferrous pin
1241		Surface		Red brick bonded with black ash mortar
1242		Surface		Machine base, Concrete
1243		Wall		Red brick bonded with black ash mortar
1244		Surface		Machine base grindstone with 4 iron pins
1245		Surface		sandstones bonded with lime mortar
1246		Surface		Red brick
1247		Wall		Red brick bonded with black ash mortar
1248		Wall		Red brick bonded with black ash mortar
1249		Wall		Red brick bonded with black ash mortar
1250		Wall		Red brick bonded with black ash mortar
1251		Wall		Red brick bonded with black ash mortar
1252		Surface		Yellow sand
1253		Surface		flagstone bonded to 1212 with black ash mortar
1254		Foundation		stone block bonded to 1260 with black ash mortar
1255		Bedding		Ferrrous bolts with poured lead x3
1256		Surface		Stone block with ferrous pins
1257		Surface		Concrete machine base
1258		Surface		Flagstones
1259		Surface		lime mortar and hardcore
1260		Wall		Walls of poss. Grinding trough, Red brick bonded with black ash mortar
1261		Surface		Ferrous metal plates
1262		Foundation		sandstone flags
1263		Wall		Red Brick bonded with black ash mortar
1264		Wall		Red brick bonded with black ash mortar, filled in entrance
1265		Wall		Red brick, same as 1206
1266		Made Ground		yellow grey sand clay with clinker and red brick

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
1267		Backfill		Blank clinker and coal dust with red brick
1268		Surface		yellow sandy lime, possible lining of 1259
1270		Natural		possible natural yellow brown silty sand
1271		deliberate backfill		Possible burnt matireal, Blackish grey sandy silt
1272		Made Ground		Greyish brown silty sand
1273		Wall		Red brick bonded with black ash mortar
1274		Wall		Red brick bonded with black ash mortar, part of channel with 1184
1275		Surface		Concrete
1277		Wall		Red brick bonded with black ash mortar
1278		Wall		Red Brick boned with lime mortar
1279		Post		Red brick bonded with lime mortar
1280		Surface		concrete slab
1281		Surface		Red brick
1282		Secondary fill		Orange yellow sand
1283		Made Ground		Orange sand and lime mortar, same as 1159
1284		Wall		Red brick bonded with black ash mortar
1285		Surface		Red Brick lining top of posthole
1286		Wall		Red brick bonded with black ash mortar
1287		Made Ground		Yellow brown made ground
1288		Wall		Red Brick bonded with black ash mortar
1289	1300	Post	Posthole	wooden post
1290		Made Ground		Yellowish Brown sandy clay
1291		Made Ground		Blackish grey sandy clay
1293		Made Ground		Yellowish Brown sandy clay
1294		Foundation		concrete with mortar and sandstone
1295		Backfill		Greyish brown silty sand with red brick
1297		Made Ground		Yellowish brown silty clay
1299		Foundation		Concrete foundation for 1057

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
2001		Concrete slab		
2002		Made Ground		
2004	2003	Fill	Construction cut	Reddish brown sandy loam, brick rubble, stone fragments, broken slate, ash/shale, mortar, pottery
2005		Structure		Rectangular brick cistern, NE-SW, unfrogged, mould made brownish brick, hard fabric, dark grey ash and lime mortar.
2006		Fill		Infill of 2005, grey brown/black sandy silty loam, brick rubble, mortar, ash, clinker, broken slate, stone, pottery, pearl button, bone.
2007		Surface		Rectangular brick surface, E-W, unfrogged reddish brown mould made brick, grey ash and lime mortar, E-W, linear.
2008		Wall		Sandstone, fine grained, undressed, grey lime mortar with charcoal flecks, E-W, linear.
2009		Surface		Stone and brick wall or floor, brick as later repair, E-W, linear, worked sandstone, some grey lime/ash mortar.
2010		Wall		Unfrogged reddish brown mould made brick, grey lime/ash mortar, E-W, linear.
2011		Wall		Part of wall 2008, E-W, sand or limestone, re-used stone,
2013	2012	Fill	Cut	Orange brown
2014		Wall		Red brown mould made brick, E-W, linear, grey ash/lime mortar.
2015		Surface		Stone wall or surface, possibly E-W, worn/rounded undressed sandstone.

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
2016		Structure		Sandstone block, part of possibly base of water wheel, NNW-SSE, rectangular.
2017		Wall		One side of curved brick flue, E-W, linear-curved, unfrogged mould made red-brown brick, grey lime/ash mortar with some charcoal.
2018		Structure		Brick blocking, E-W, linear, red unfrogged, mould made brick, grey/pink lime mortar.
2019		Structure		Brick and stone blocking, E-W, linear, unfrogged red-brown mould made brick with some stone, pink lime mortar.
2020		Wall		Red-brown mould made brick, pitted and worn, N-S, dirty white lime mortar.
2021		Fill		Infill of structures 2017 and 2020, flue, greyish black gritty ashy sand and loam.
2022		Wall		Original side of wider flue, unfrogged, red-brown, mould made brick, E-W, linear-curved, greyish pink lime mortar.
2023		Structure		Possible brick step, unfrogged, red-brown mould made brick, E-W, linear.
2024		Wall		Sandstone and brick wall, L-shaped, N-S, E-W, lime mortar.
2025		Wall		Red brick, lime mortar, N-S, linear.
2026		Drain		Modern ceramic drain, N-S, linear.
2028	2027	deliberate backfill	Cut	Blackish brown gritty sand, charcoal, broken bricks
2029		Layer		Purple brown sand, broken bricks, charcoal, glass.
2030		Layer		Greyish black gritty sand, demolition layer.
2031	2159	Wall	Construction cut	Stone wall, possibly foundation for 2032, sandstone, rubble, loose and random, E-W, linear.
2032		Wall		Red-brown unfrogged mould made brick, E-W, linear, grey ashy lime mortar.
2033		Structure		Brick drain or flue, E-W, linear, 3 brick types: unfrogged, mould made, frogged with cruved recess, frogged with square recess and stamped "Gregory", all red-brown, grey ashy lime mortar.
2034		Structure		Line or edge of set stone or stone partition, E-W, linear,, undressed, flat sandstone, similar to thackstones
2035		Fill		Infill of flue 2033, grey, gritty ashy sandy soil,
2036		Structure		Wood, floor boards
2037		Wall		Red and black brick, black grey ash mortar, NW-SE to SW-NE, irregular linear, a
2038		Structure		Possible brick steps, red machine brick, black ash mortar, E-W rectangular
2039		Wall		Red machine brick, black ash mortar, three courses visible, header bond
2040		Surface		Floor surface, deliberate, greyish brown clayey sandy silt, very compact, brick fragments, charcoal flecks, subangular gravel
2041		Surface		Sandstone slab surface between walls 2038, 2039, 2037, rectangular, abundant black ash mortar
2042		Fill		Same as 2047? Reddisch brown and black concreted metal debris, compact, occasional small charcoal pieces, fill of possible flue or channel
2043		Layer		Natural deposit, brownish orange silty sandy clay, compact, occasional subangular stones
2044		Layer		Levelling layer, backfill, E-W, brown sandy silt, friable
2046	2045	Fill	Cut	Reddish brown very compact sandy silt with black mottling
2047	2045	Fill	Cut	Mottled reddish brown and black concreted sandy silt, metal working debris, occassional small charcoal pieces, slag, arched fire bricks

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
2049	2048	Fill	Cut	Black ashy sandy silt, frequent very small coarse gravel
2051		Structure		Red brick, black mortar, u-shaped
2052		Structure		Concrete block, linear, probably part of drainage system
2053	2050	Fill	Construction cut	Brownish orange silty sand, occassional small subangular gravel, backfill of construction cut 2050
2054		Structure		Ceramic drain pipe, E-W
2055	2045	Fill	Cut	Blackish purple silty sand, friable
2056		Structure		Sandstone flagstone below grindstone 2057
2057		Structure		Half of grindstone
2058	2059	Backfill	Cut	Blackish brown sandy silt, small subangular gravels, singel piece of shaped stone in fill, rectangular
2061		Structure		Concrete foundation of RB wall 2062
2062		Wall		RB wall in section
2063	2060	Fill	Construction cut	Backfill, dark brown sandy clayey silt
2064		Layer		Brown silt, charcoal, visible in S-E section
2065		Fill		Dark brown silty sand, infill of 2051
2066	2073	Fill	Construction cut	Highly mixed silty clay, later industrial backfill
2067		Wall		Red machine bricks in black brick layer, black ash mortar, english bond,, linear
2068		Foundation		Rough sandstone, black ash mortar, E-W, linear, weathered, irregular,
2069		Wall		Rough sandstone, chalky lime mortar, weathered, irregular, T-shaped
2070		Foundation		Rough sandstone blocks, black ash mortar,
2071		Layer		Levelling layer, resulting from demolition of 2069, to provide base for 2068, 2070, 2040. Brownish grey sandy silt, frequently small gravels
2072	2045	Fill	Cut	Clay lining, yellowish grey clay
2074		Wall		Unfrogged, mould made red brown brick, grey ash and lime mortar, N-S, linear three courses: top header, mid stretcher, low header, three skins,
2075		Wall		Brick, three types: unfrogged, hand-made, unfrogged, mould made, red-brown, machine-made with surface pattern, re-brown, E-W linear, grey ash and lime mortar,
2076		Wall		Stone and brick, hand-made and mould made red-brown brick, grey ash and lime mortar, stone could be reused, E-W linear,
2077		Wall		Stone, undressed sandstone, possibly reused, same as 2076, N-S, linear,
2078		Wall		Stone, unworked sandstone slab, fragmented, greyish white lime mortar, E-W linear,
2079		Wall		Stone, unworked sandstone, slabs and blocks, off white lime mortar, N-S, linear,
2080		Wall		Stone, unworked sandstone blocks and slabs, grey lime mortar, N-S linear,
2081		Wall		Single block of cut sandstone, possibly part of wall, E-W linear,
2082		Wall		Stone, sandstone slabs over hand-made red-brown brick, N-S linear, grey lime and ash mortar,
2084	2083	Fill	Cut	Greyish brown sand and silt, gravel, lime mortar, charcoal, ash, not excavated
2086	2085	Fill	Construction cut	Greyish brown sandy silt, stone fragments, brick fragments, mortar, charcoal, not excavated

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
2087		Layer		Industrial backfill, greyish brown-black sandy silt, moderate coarse gravel and cobbles, charcoal, bricks, SW-NE,
2088		Layer		SW-NE, Grey-silver silty sand with coal
2089		Layer		Brownish green clayey sand, stone fragments and gravel, brick fragments, pottery, charcoal, l
2090		Layer		Grey-black coal layer, SW-NE, length 0.75 m, deliberate backfill
2091		Layer		Greyish purple silty sand, SW-NE, sparse gravel, charcoal, slag, coal, red brick fragments,
2092		Layer		Greyish purple silty sand, moderate small cobbles, red brick fragments , coal, modern pottery,
2093		Layer		Clayey silt, SW-NE, length 1.10 m, abundant charcoal, deliberate backfill
2094		Layer		Yellow silty sand, rare gravel, red brick fragments, rare charcoal, , deliberate backfill
2095		Layer		Brown clayey sand, flecks of orange clay, SW-NE, length 0.50 m, sparse gravel, red brick fragments, charcoal, coal, deliberate backfill
2096		Layer		Yellowish brown silty sand, flecks of yellow clay, sparse medium gravel, brick fragments, rare charcoal, , deliberate backfill
2097		Structure		Metal structure, possibly part of furnace, possibly iron, SW-NE linear,
2098		Structure		Red brick, two frogged, NW-SE linear, dark greyish brown lime and sand mortar,
2099		Structure		Unfrogged brick, one brick frogged, SW-NE, rectangular, dark brownish grey lime and sand mortar,
2100		Structure		Orange-reddish froggend and unfrogged brick (90%), limestone (10%), dark brown mortar, SW-NE rectangular,
2101		Structure		Red frogged brick, SW-NE linear, dark grey sandy lime mortar, one course
2102		Structure		Red unfrogged bricks, SW-NE rectangular, dark brownish grey lime mortar.
2103		Wall		Red brick, dark greyish brown sandy lime mortar, N-S linear, two courses, lenth 2.53 m, width 0.24 m, height 0.15 m
2104		Wall		Red-brown hand and mould made brick, linear, mid grey ash and lime mortar, header bond.
2105		Structure		Ferrous structure, part of entrance, stairways, cast iron plate, lime mortar along S-W edge.
2106		Structure		Grinding stone wheel, reused, sandstone
2107		Wall		Hand made, unfrogged brick, grey-black ash and lime mortar.
2108		Wall		Brick and stone, unfrogged brick and roughly worked sandstone, lime mortar and grey ash mortar fragments.
2109		Wall		Stone foundation with brick wall, N-S, unfrogged hand-made brick, occasional frogged brick, grey cement mortar.
2110		Natural		Alluvium
2111		Structure		Manhole, NW-SE, rectangular, stepped sides, at least 3 different types of machine made bricks, lime and ash mortar
2112		Foundation		Brick, at least two different types, some reused, lime ash mortar, rectangular, NE-SW.
2113		Foundation		Limestone foundation, NW-SE linear, stepped sides.
2114		Wall		Brick, lime ash mortar, NE-SW, linear.
2115		Layer		Grey silt clay, layer of lime and ash mortar.
2116	2118	Fill	Cut	Orange clay,

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
2117		Layer		Construction material, grey brown silty clay, occasional stones and construction debris
2119		Layer		Yellow silty sand, sparse gravel, deliberate backfill.
2120		Wall		Stone part of brick wall, lime stone, lime ash mortar, NE-SW, linear
2121	2118	Fill	Cut	Redeposited, same as 2116, orange brown clay
2122		Layer		Concrete sealing ceramic pipe, E-W linear
2123		Structure		Ceramic pipe, drain or sewage, E-W linear.
2124		Layer		Levelling layer, grey-black sandy silt, compacted, small fragments of grit.
2125		Layer		Brown sandy clay, occasional coal fragments and small stones, compacted
2126		Layer		Levelling layer, Grey-black sandy silt, compacted, small grit fragments.
2127		Layer		Levelling layer, white grey sandy mortar, compacted, occaisonal brick fragments.
2128		Layer		Levelling layer, greyish brown sandy silt, compacted,.
2129		Layer		Levelling layer, pale red sand, occasional coal fragments,.
2130		Layer		Levelling layer, dark red sand, occasional coal fragments, width 0.4 m, thickness.
2131		Layer		Yellow compacted sand, industrial levelling layer.
2133	2134	Fill	Cut	Greyish brown sandy clay, frequent CBM
2135	2143	Fill	Cut	Brownish grey sandy clay.
2136	2143	Fill	Cut	Orange sandy clay., fill of channel
2137	2143	Fill	Cut	Yellowish brown, silty clay, CBM.
2138	2143	Fill	Cut	Greyish brown sandy clay, CBM, .
2139	2143	Fill	Cut	Reddish brown sandy clay,.
2140	2143	Fill	Cut	Dark greyish black silty clay.
2141	2143	Fill	Cut	Mid greyish brown silty clay.
2142	2143	Fill	Cut	Greyish brown silty clay, alluvial
2144		Fill		Yellowish brown sandy clay, occasional coal flakes, alluvial deposit.
2145	2150	Fill	Cut	Orange yellowish brown sand and slag deposit, compact,.
2146	2150	Fill	Cut	Dark orange to greyish brown slag residue with sand inclusions, compacted slag residue from industrial process
2147		Layer		Made ground, dark brown to greyish black, occasional small stone fragments, unfrogged brick fragments,.
2148		Layer		Geyish brown-black silty sand, occasional small stone fragments, brick fragments, slate and clinker fragments
2149		Layer		Same as 2148, greyish brown-black silty sand, occasional stone fragments, high slate content, occasional brick and clinker fragments
2151	2153	Fill	Cut	Contaminated hydro-carbon material, glass
2152	2153	Fill	Cut	
2154	2153	Structure	Cut	Stone structure of goit wall
2160	2159	Backfill	Construction cut	Light to mid grey layer of deliberate backfill

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
3003		Layer		Mid greyish brown sandy clay
3004		Layer		Light greyish grey sandy clay
3005		Wall		English Garden wall bone brick (machine made) dark ashy-lime mortar
3006		Wall		Brick (machine made), dark grey ash-lime mortar

Fill	Cut	Fill Interpretation	Cut Interpretation	Description
3007		Wall		Brick (machine made) dark grey ash-lime mortar
3008		Wall		Brick (machine made) dark grey ash-lime mortar
3009		Deliberate backfill		Very dark grey sandy silt
3011	3010	Deliberate backfill	Cut	Dark brownish grey sandy silt
3012		Wall		Brick (machine made), dark grey ash-lime mortar
3013		Modern Feature		Concrete slab
3014		Modern Feature		Concrete
3015		Layer		Possible burnt layer
3016		Deliberate backfill		dark orange grey silty sand
3018	3017	Wall	Cut	English Garden bonding of smooth red brick, dark grey ash mortar
3019	3017	Wall	Cut	English Garden bonding of smooth red brick, dark grey ash mortar
3020	3017	Drain	Cut	Ceramic drain pipe
3021	3017	Fill	Cut	Dark grey brown sandy silt
3022		Layer		Dark bluish black metallic sand
3024	3023	Fill	Cut	Mid orange brown loamy sand
3025		Layer		Light yellowish brown with a blue hue, silty clay
3026		Structure		Yellow sandstone with soft black ash mortar
3027		Structure		Varying types of brick
3028		Structure		yellow sandstone with black ash mortar
3031		Wall		Random coursed rough sandstone greyish clay bonding
3032		Structure		Uncoursed sandstone bonded with black ash mortar
3033		Wall		Random coursed rough sandstone bonded with greyish clay with white chalk inclusions
3034		Layer		Mid reddish brown sandy clay
3035		Layer		Mid reddish brown sandy clay
3037	3036	Fill	Pit	Dark black brown silty sand
3038		Structure		Smooth red fire brick with ash mortar
3039		Layer		Light orange brown silty sand

Appendix 2: OASIS form

OASIS ID: wessexar1-358160

Project details

Project name	Sylvester Gardens (Site C), Sheffield, South Yorkshire
Short description of the project	Mitigation work was carried out at the area surrounding the Grinding Workshop at Site C, Sylvester Gardens as part of planning application No. 06/01918/FUL. Initially it was anticipated to retain the Grinding Workshop however a subsequent proposal under planning application No. 17/00604/FUL was made to demolish the Grinding Workshop and relocate it to the south. This led to the archaeological works being spread over two phases, one pre-demolition in the area surrounding the building and one post-demolition in the footprint of the building. The areas in phase one were placed over the location of evaluation trenches that had been done as part of previous works (Wessex Archaeology, 2017) while the areas in phase two were placed in the footprint of the building and an extension to a previous area excavated in phase one.
Project dates	Start: 01-10-2018 End: 25-01-2019
Previous/future work	Yes / No
Any associated project reference codes	118761 - Contracting Unit No.
Any associated project reference codes	118762 - Contracting Unit No.
Any associated project reference codes	06/01918/FUL - Planning Application No.
Any associated project reference codes	17/00604/FUL - Planning Application No.
Type of project	Field evaluation
Current Land use	Industry and Commerce 1 - Industrial
Monument type	CUTLERY WORKSHOP Post Medieval
Significant Finds	BONE WORKING DEBRIS Post Medieval
Significant Finds	BUTTON MAKING DEBRIS Post Medieval

Project location

Country	England
Site location	SOUTH YORKSHIRE SHEFFIELD SHEFFIELD Sylvester Gardens (Site C)
Postcode	S1 4AX
Study area	0.26 Hectares
Site coordinates	SK 35381 86563 53.374474379694 -1.468127549465 53 22 28 N 001 28 05 W Point
Lat/Long Datum	WGS 84 Datum

Project creators

Name of Organisation	Wessex Archaeology
Project brief originator	Acreplan Sylvester Street Developments Limited
Project design originator	Wessex Archaeology
Project director/manager	Richard O'Neill
Project supervisor	Emily Eastwood
Type of sponsor/funding body	Commercial
Name of sponsor/funding body	Acreplan Sylvester Street Developments Limited

Project archives

Physical Archive recipient	Museums Sheffield
Physical Archive ID	118761/118762
Physical Contents	"Ceramics","Metal","Worked bone","other"
Digital Archive recipient	Museums Sheffield
Digital Archive ID	118761/118762
Digital Media available	"Database","GIS","Images raster / digital photography","Spreadsheets","Survey"
Paper Archive recipient	Museums Sheffield
Paper Archive ID	118761/118762
Paper Media available	"Context sheet","Diary","Drawing","Matrices","Plan","Report","Section"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Sylvester Gardens, Sheffield, Post-excavation Assessment and Updated Project Design
Author(s)/Editor(s)	Eastwood, E
Other bibliographic details	118762.2
Date	2019
Issuer or publisher	Wessex Archaeology
Place of issue or	Wessex Archaeology North

publication	
Description	A4 laser printed report
Project bibliography 2	
Publication type	An article in published serial
Title	Excavations at Sylvester Gardens, Sheffield
Serial title	CBA Forum Yorkshire
Author(s)/Editor(s)	Eastwood, E.
Serial or multi-article editor(s)	Kroeebl, C.
Issuer or publisher	CBA
Description	Mid-sized softback journal
Entered by	Ashley Tuck (a.tuck@wessexarch.co.uk)
Entered on	5 August 2019

Appendix 3: Sediment descriptions

Location: 118761 Sylvester Gardens Monolith sample: 101		Drawing: 101	Comments: Alluvial and gravel deposits in Area 1	
Depth	**Context**	**Sediment description**	**Interpretation**	
0-0.10m	1005	Fairly friable mixed (5YR 3/3 dark reddish brown) slightly sandy clay silt, (7.5YR 4/4 brown) sandy clayey silt, and (7.5YR 2.5/1 black) silty sand. Occasional-moderate small-medium sub-rounded sandstone pebbles, very occasional medium sub-rounded/laminar sandstone stone. Clear, wavy lower boundary. Troels-Smith classification: Ag2, As2, Ga+ Nig.3; Str.0; Elas.1; Sicc.3	Mixed deposit suggests either very high energy event or human intervention	Made ground
0.10-0.50m	1006	Friable 2.5Y 5/3 light olive brown, fine sand. Moderate small-medium sub-rounded sandstone pebbles, very occasional medium rounded sandstone stone, occasional-moderate coal flecks and fragments. Moderate iron staining. Troels-Smith classification: Ga4, Ag+ Nig.1; Str.0; Elas.2; Sicc.3; Lim.0	Inclusions indicate fairly high energy event(s). Coal within deposit suggests catchment from area of 'industrial' activity. Redoximorphic features - iron staining (indicates fluctuating water levels)	**Alluvium**
0.50m	1007	Medium sub-rounded sandstone cobble	Start of gravel deposit	**Gravels**

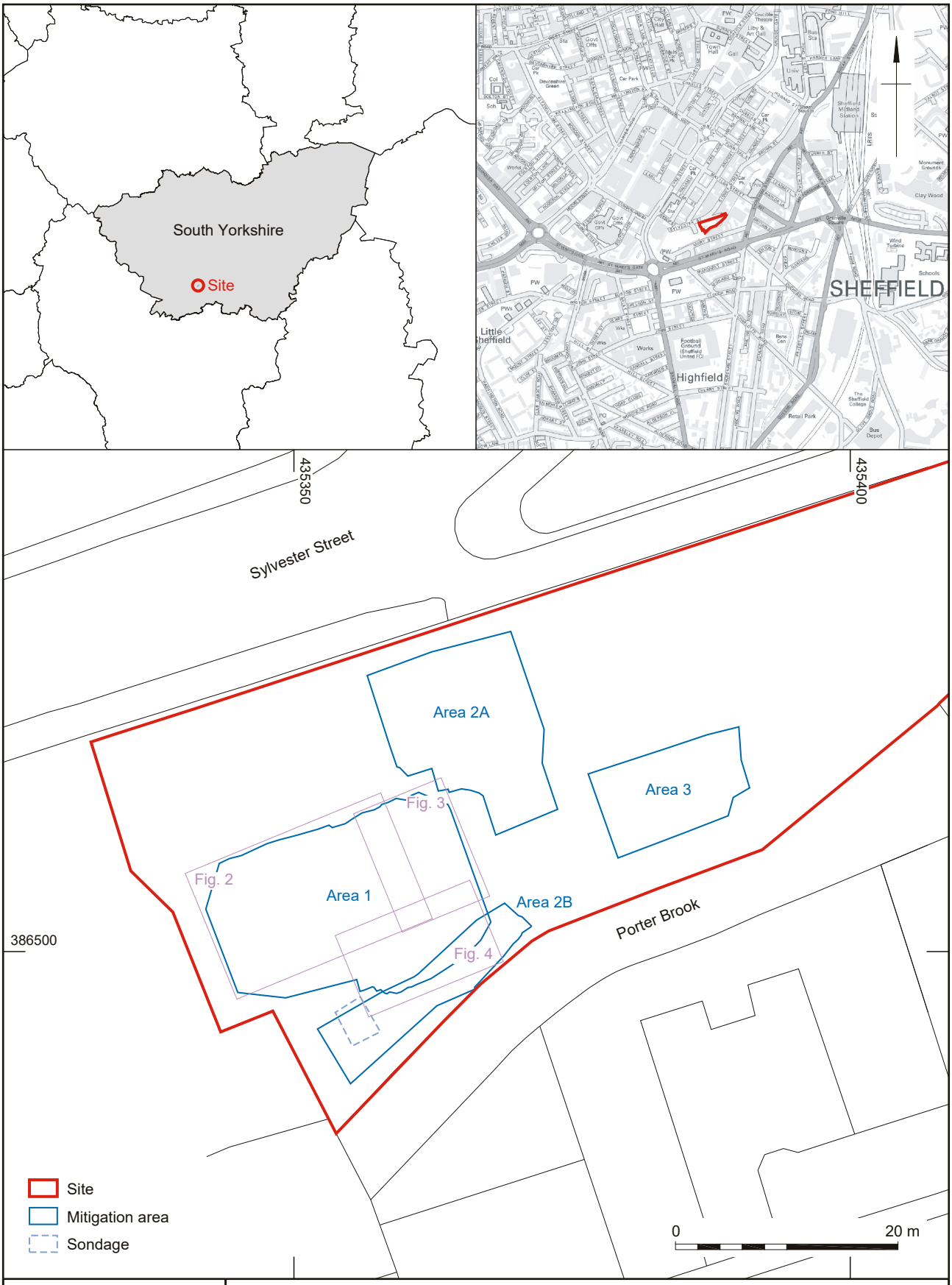
Location: 118762 Sylvester Gardens Monolith sample: 2001		Drawing: none	Comments: Alluvium in Area 2	
Depth	**Context**	**Sediment description**	**Interpretation**	
0-0.20m	2144	Friable 10YR 3/3 dark brown, slightly sandy clay silt. Occasional charcoal flecks and fragments towards base of unit. Faint laminations from 0.10m, frequent iron staining from 0.10m. Troels-Smith classification: Ag2, As2, Ga+ Nig.1; Str.1; Elas.2; Sicc.3	Charcoal suggests catchment includes area(s) of possible industrial activity Laminations and iron staining indicate fluctuating water levels/episodic deposition	Alluvium

Key: Sediment properties - Argilla steatodes (As), Argilla granosa (Ag), Grana arenosa (Ga) 0=absence of, 4=maximum. Physical properties – Nigror (Nig.) 0=white, 4=black; Stratificatio (Str.) 0=homogeneous, 4=strong laminations; Elasticitas (Elas.) 0=clay, 4=peat, Siccitas (Sicc.) 0=water, 4=dry; Limes superior (Lim.) 0=>1cm, 1=<1cm and >2mm, 2=<2mm and >1mm, 3=<1mm and >0.5mm, 4=<0.5mm

Appendix 4: Assessment of the environmental evidence

Site Code	Context	Sample	Vol (l)	Flot (ml)	Bioturbation proxies	Grain	Chaff	Cereal Notes	Charred Other	Charred Other Notes	Charcoal >2mm (ml)	Charcoal	Other	Comments (Preservation)
118761	1149	102	8	35	0.05	-	-	-	-	-	<1	Mature	Vitrified slag (B), bone (C)	
118761	1226	103	1.3	7	30%, C, I	-	-	-	-	-	1.5	Mature	Slag (C)	
118761	1187	104	10	63	70%, C	-	-	-	-	-	11.5	Mature, roundwood		Fair
118761	1282	105	10	11	5%, C	-	-	-	-	-	1	Mature		
118761	1283	106	10	18	0.1	-	-	-	-	-	<1	Mature		
118762	2144	2002	10	8	10%, C, F	-	-	-	-	-	<1	Mature	Coal (A)	-
118762	2145	2003	2.3	40	C	-	-	-	-	-	-	-	-	-
118762	2142	2006	5	20	1%, C, F	-	-	-	C	Polygonaceae, indet.	1.5	Mature	Coal (A*), vitrified material (C), hammerscale (C)	Poor
Site Code	Context	Sample	Vol (l)	Flot (ml)	Bioturbation proxies	Grain	Chaff	Cereal Notes	Charred Other	Charred Other Notes	Charcoal >2mm (ml)	Charcoal	Other	Comments (Preservation)
118762	2142	2007	10	7	20%, C, F	C	-	*Avena* sp.	C	Polygonaceae, indet.	1.5	Mature	-	Heterogeneous
118762	3039	3001	8	37.5	60%, A, I, F	C	C		C	Poaceae	4.5	Mature, roundwood	Slag (C), hammerscale (C)	Heterogeneous

Key: Scale of abundance: A*** = exceptional, A** = 100+, A* = 30-99, A = >10, B = 9-5, C = <5; Bioturbation proxies: Roots (%), Uncharred seeds (scale of abundance), F = mycorrhizal fungi sclerotia, E = earthworm eggs, I = insects.



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Site location

Figure 1

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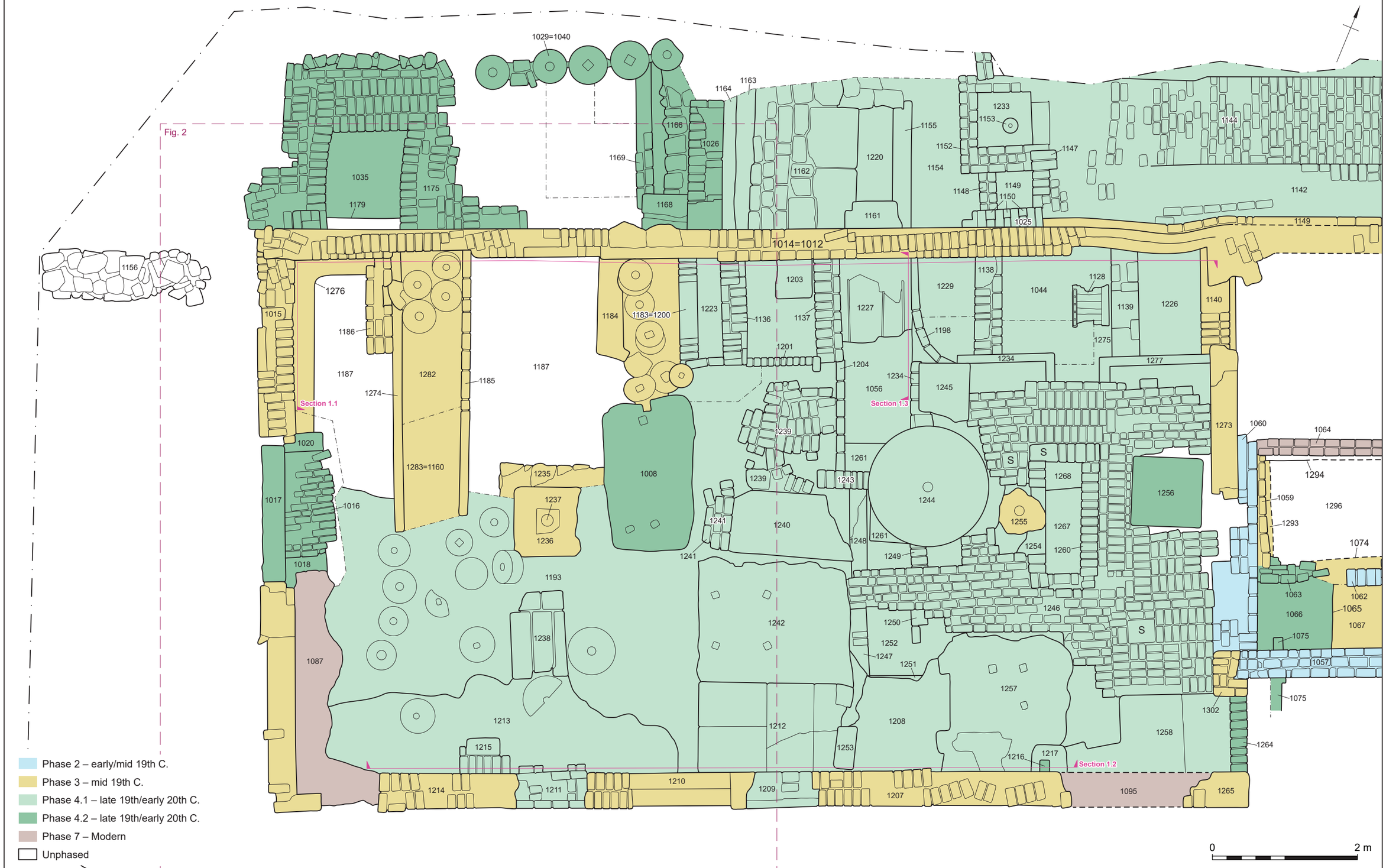
Area 1 – overlying structures

Figure 2



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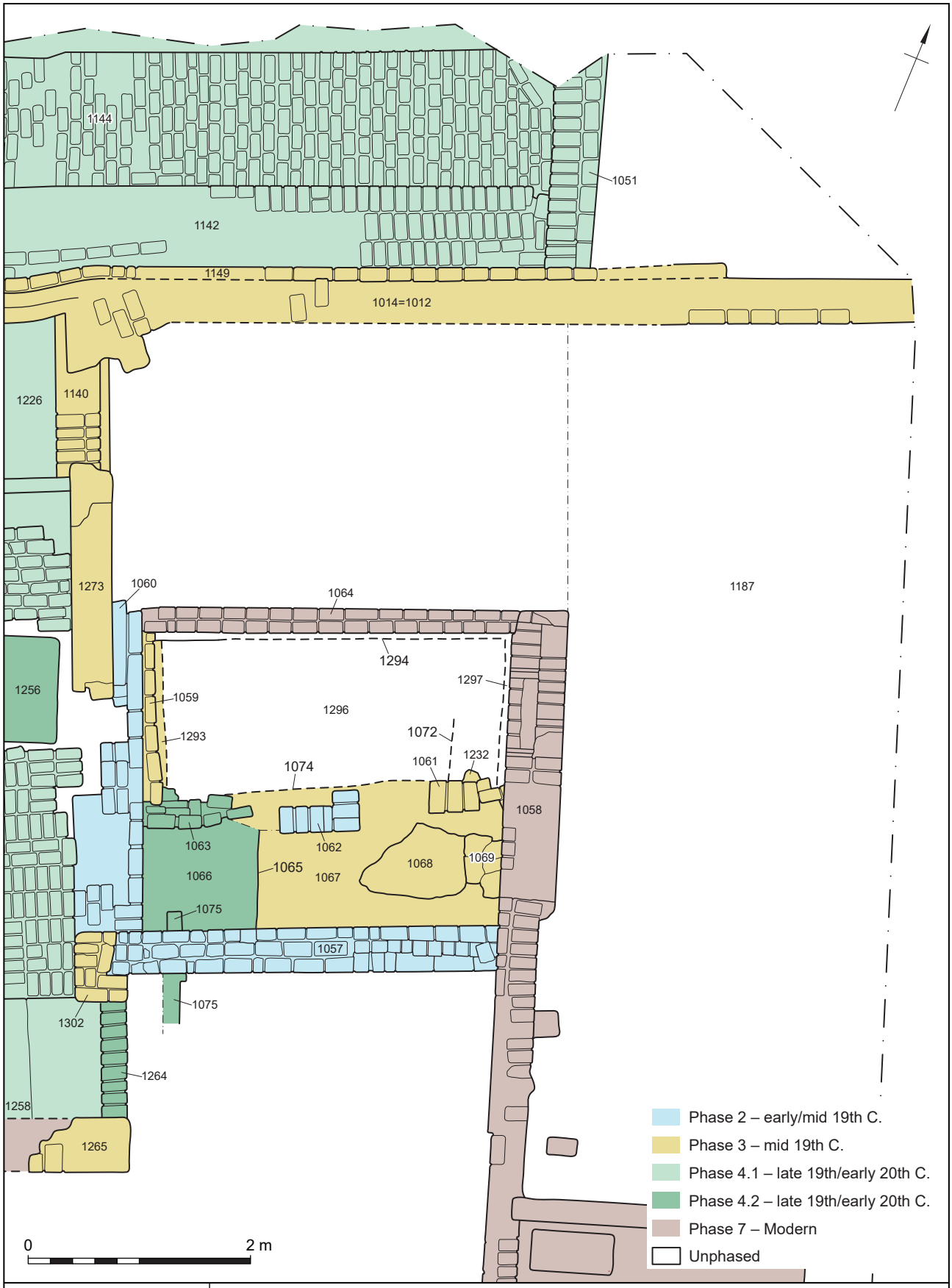
Area 1 – part 1

Figure 3



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Area 1 – part 2

Figure 4

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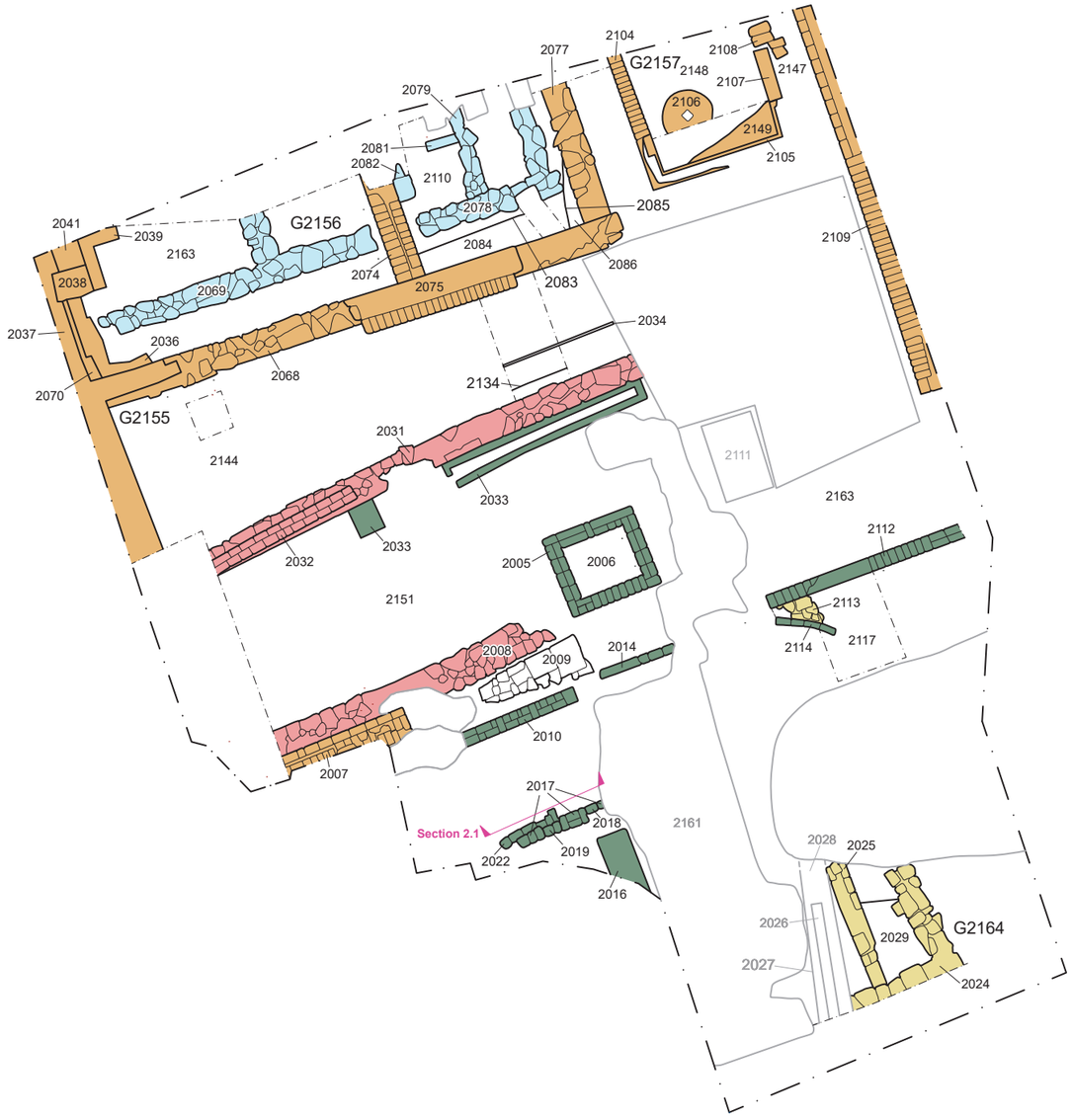
Area 1 – part 3

Figure 5

435350
435360
435370
435380
386530
386520
386510



Phase 1 – early 19th C.
Phase 2 – early/mid 19th C.
Phase 3 – mid 19th C.
Phase 4 – late 19th/early 20th C.
Phase 5 – early 20th C.
Disturbance
Unphased

0 5 m

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Area 2A

Figure 6

435350

435360

435370

435380

386500

386490

2047
2044
2046
2049
2048
2072
2050
2043
2053
2062
2061
2066
2055
2052
2065
2043
2063
2060
2054
2056
2059
2045
2054
2073
2058

2098
2102
2100
2099
2101
2103

1058

Phase 4 – late 19th/early 20th C.
Phase 6 – 20th C.
Phase 7 – Modern
Disturbance
Unphased
Sondage

0 5 m

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Area 2B

Figure 7

386520

435380

435390

3003

3013

3012

3015

3005

3015

3007

3011

3019

3006

3008

3014

3033

3038

3032

3031

3020

3031

3026

3025

3020

3018

386510

3028

Phase 2 – early/mid 19th C.

Phase 4 – late 19th/early 20th C.

Phase 7 – Modern

Disturbance

Unphased

0 2 m

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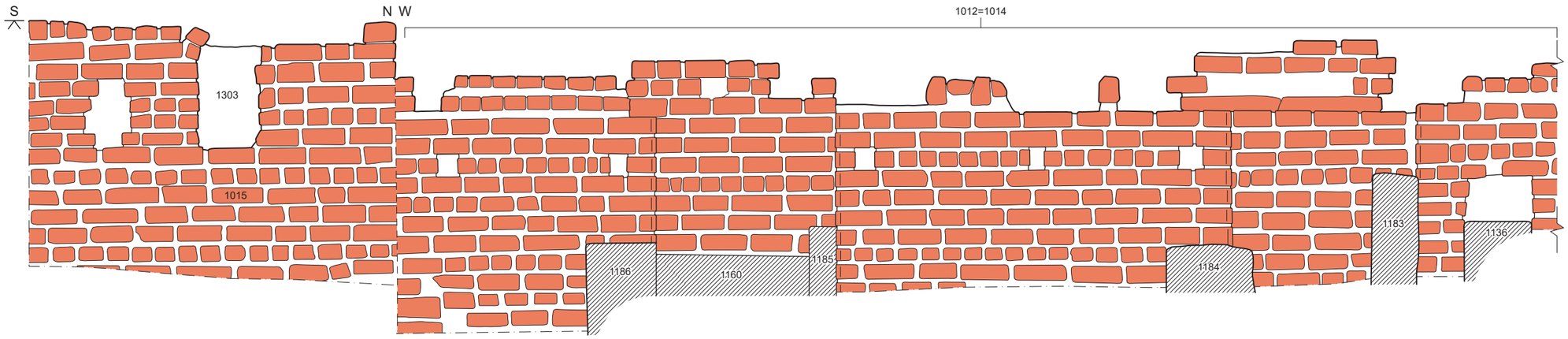
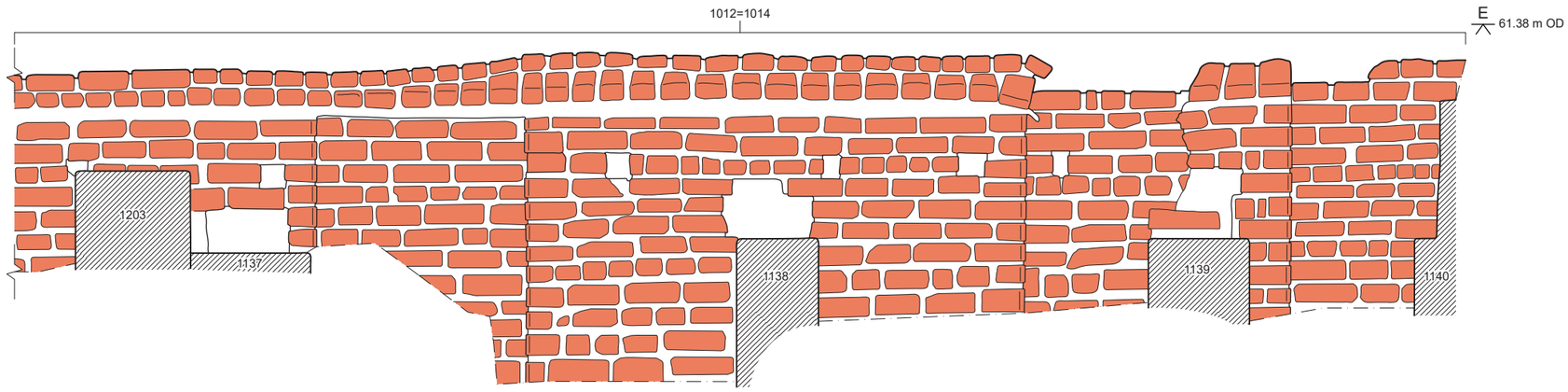
Area 3

Figure 8

Section 1.1





Brick

0 1 m

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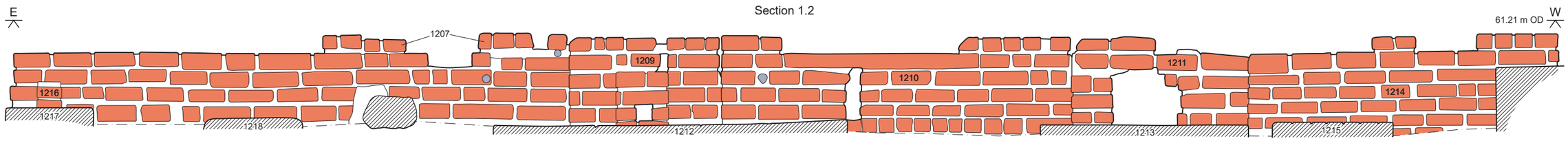
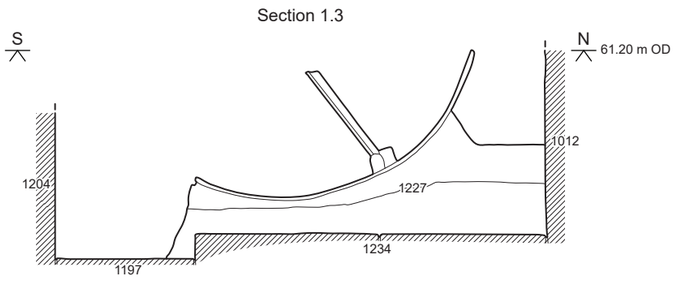
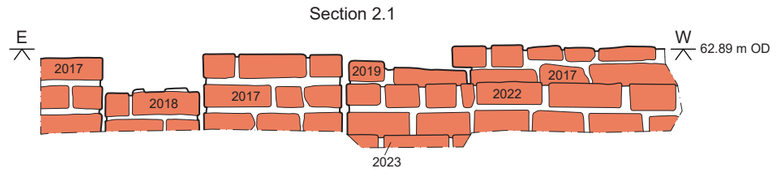
Area 1 – section

Figure 9







Metal
Brick
0 1 m

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Areas 1 and 2 – sections

Figure 10

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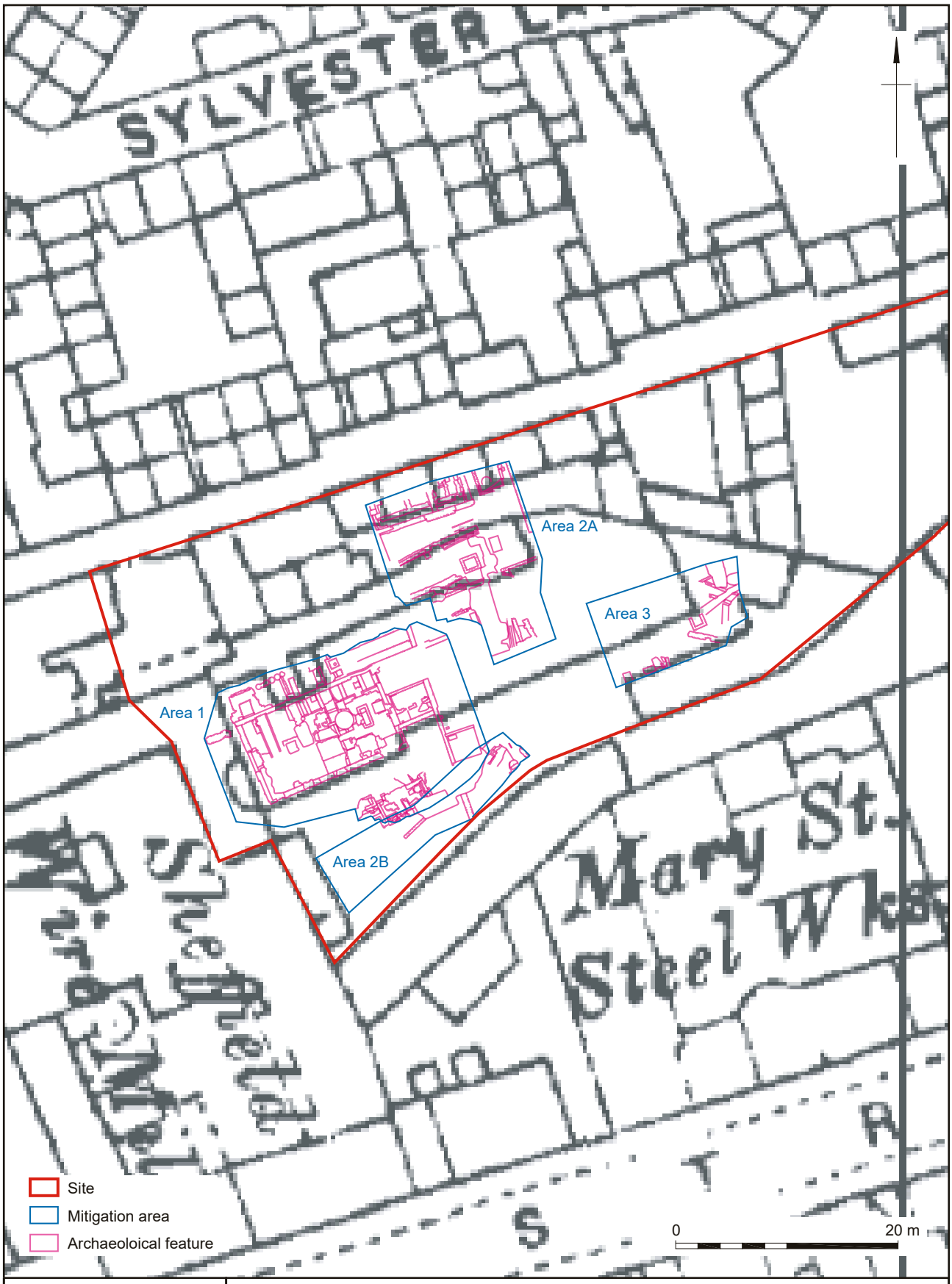
Mitigation areas overlying the Ordnance Survey map of 1853 Figure 11



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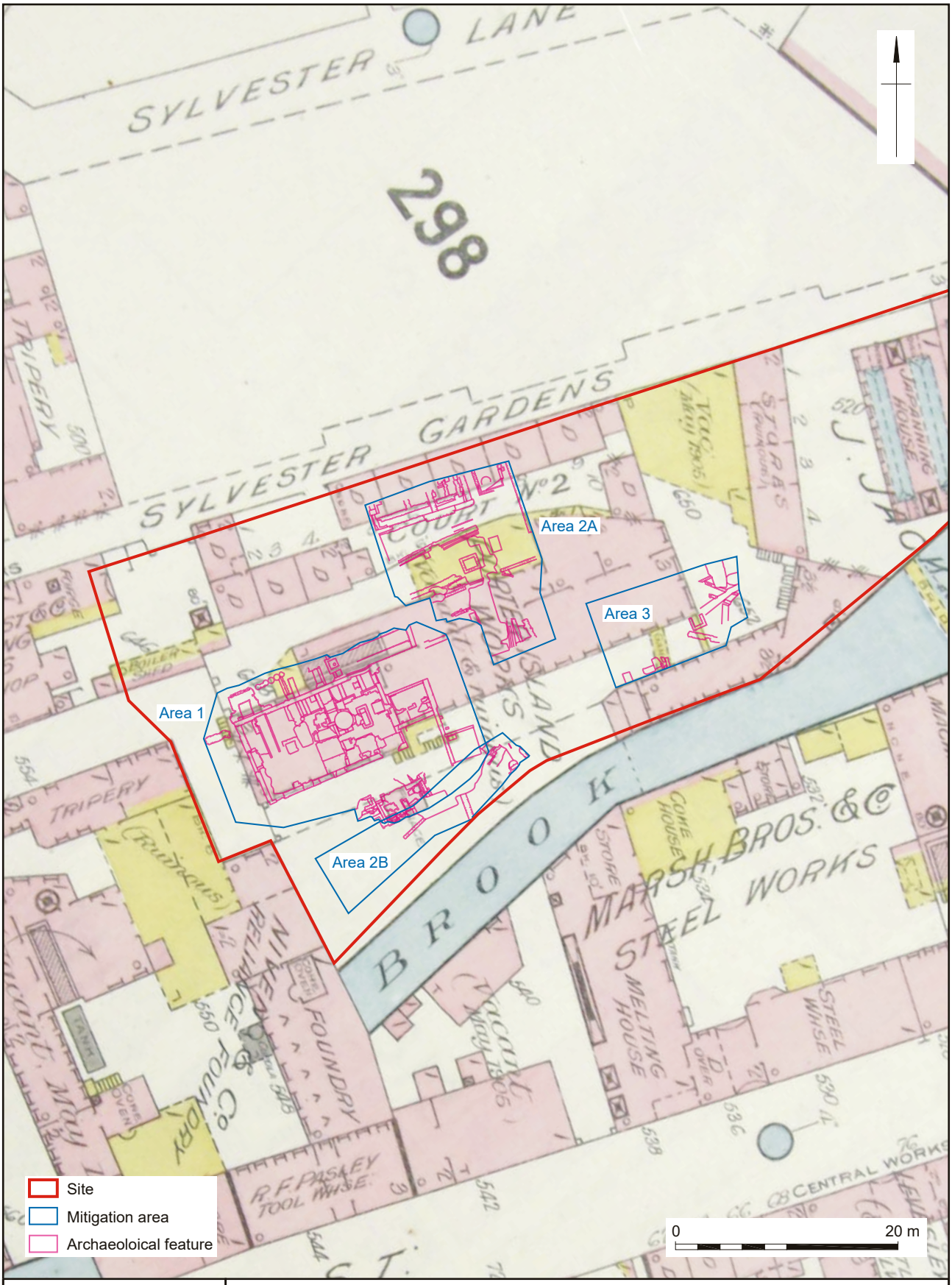
Mitigation areas overlying the Ordnance Survey map of 1894 Figure 12



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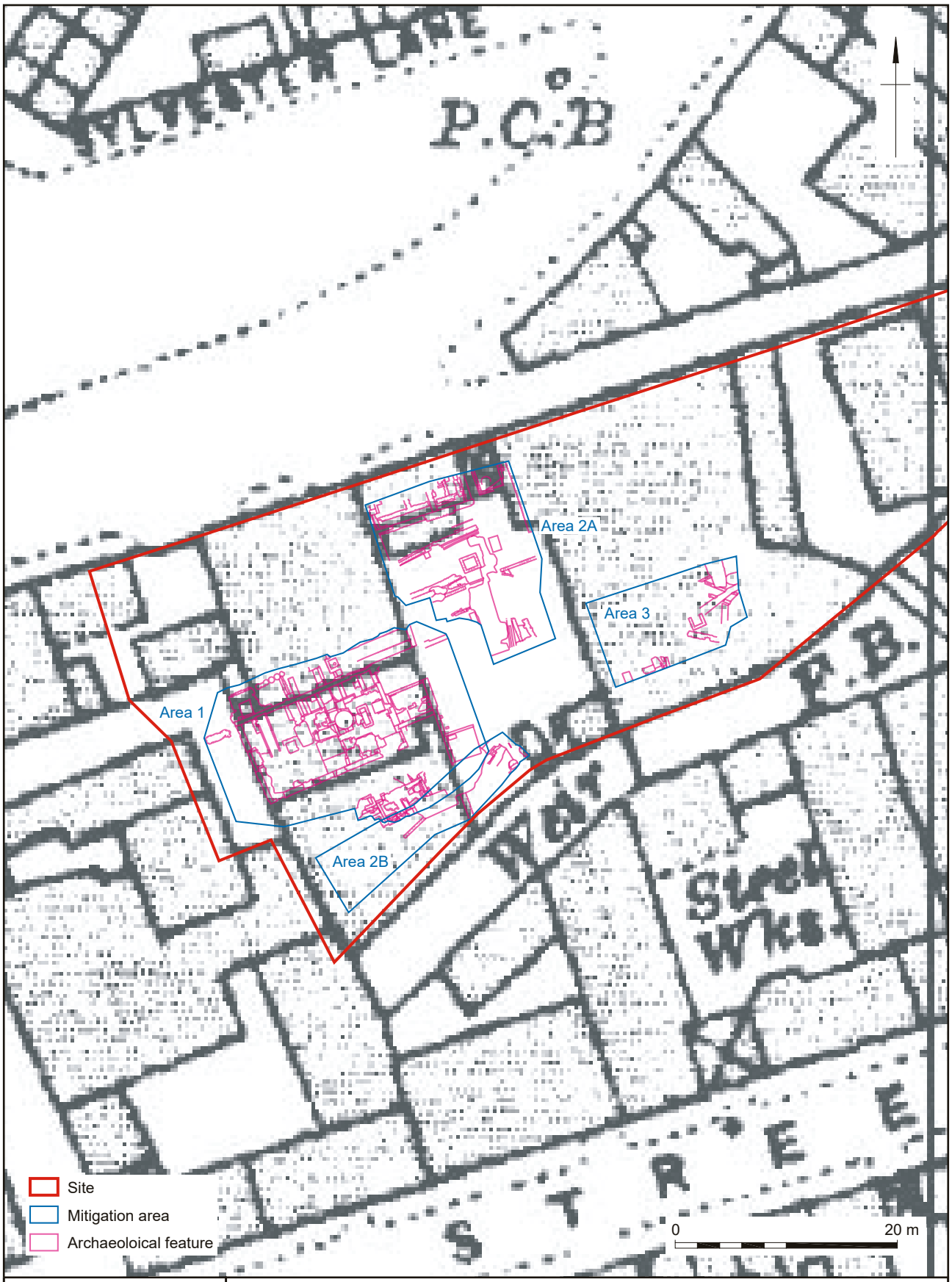
Mitigation areas overlying the Goad insurance plan of 1905 Figure 13



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Mitigation areas overlying the Ordnance Survey map of 1935 Figure 14

Plate 1: East facing section of sondage showing monolith in situ.

Plate 2: South facing elevation of 1014.

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Plate 3: South facing elevation of 1014, 1185 and 1186.

Plate 4: North facing elevation of 1209.

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Plate 5: Plan photo of wheel 1228 from the west, showing leather belting.

Plate 6: Looking east along drive shaft ‘notch’ along north wall 1014.

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Plate 7: Phase one boiler house showing internal features, facing south–east.

Plate 8: South facing elevation of brick-built furnace boxes 2093 and 2100.

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Plate 9: Structure groups 2156 and 2155 looking west.

Plate 10: Structure 2155 looking west.

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Plate 11: Clay lined channel 2045 and associated modern drainage truncations, looking south-west.

Plate 12: Walls 3031, 3032 and later drainage, looking south-east.

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