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Land at Green Lane, Eccles, Greater Manchester.
October 2015
V 1.0

Archaeological Evaluation

Project Code: A0067.1

Report no. 0069

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Archaeological Evaluation

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Project Code: A0067.1
Date: 16/10/2015
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REGISTERED ORGANISATION CIfA

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1.0 NON-TECHNICAL SUMMARY

Aeon Archaeology in partnership with Nexus Heritage was commissioned by Countryside Properties (UK) Ltd to carry out a programme of archaeological evaluation of a proposed residential development located on approximately c1.95 ha of land situated in the western part of Eccles, within the western part of Greater Manchester.

The archaeological evaluation has shown that around the fringes of the site, where the limits of the former foundry buildings stood, the preservation of buried remains at foundation level is relatively low. However, this level of preservation increases as one moves towards the centre of the foundry complex where preserved walls, chambers and floor surfaces have all been recorded.

The excavation of trench 1 showed that the southernmost part of the site in the vicinity of the former new machine shop had been disturbed almost within its entirety. The trench was for the most part excavated on to the natural glacial substrata because no archaeological remains were encountered. The exception to this was the discovery of two brick built columns which may have been girder bases, otherwise the trench was sterile of archaeology due to a phase of demolition and disturbance since 1989.

Likewise, the excavation of trench 2 showed that the southernmost part of the trench had been highly disturbed with very little remains preserved with the exception of a section of red-brick wall and two concrete machine anchors. The level of preservation changed however as the trench progressed northward where an intact brick floor surface was encountered.

Trenches 3, 5 and 6 were located more towards the central part of the foundry building and produced very well preserved features relating to the foundry core and cupola room. These features included brick walls, preserved floor surfaces, chambers, tanks, and a sub-level possibly related to the drying stoves room.

2.0 INTRODUCTION

Aeon Archaeology in partnership with Nexus Heritage was commissioned by Countryside Properties (UK) Ltd to carry out a programme of archaeological evaluation of a proposed residential development located on approximately c1.95 ha of land situated in the western part of Eccles, within the western part of Greater Manchester (**NGR: SJ 76258 98904**) (figure 1). The archaeological evaluation was undertaken as a condition of full planning permission (**14/65708/FUL**) for the construction of low-rise dwellings and associated works including vehicle and pedestrian access, circulation routes, and landscaping.

Salford Council, as advised by the Greater Manchester Archaeological Advisory Service (GMAAS), considers the site of potential archaeological interest and wishes to secure satisfactory treatment of the archaeological remains, as required by the National Planning Policy Framework. Accordingly, a condition relevant to archaeology has therefore, been applied to the permission for the development by the Council:

Condition 15.
No development shall take place until the applicant has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted to and approved in writing by the Local Planning Authority.

A written Scheme of Investigation (WSI) (ref: 3252.RO1a) was undertaken by Nexus Heritage in August 2015 which outlined the principle aims of the evaluation and the methods by which they would be met. This formed the basis of a method statement submitted for the work. The archaeological evaluation trenching was undertaken in accordance with this document and included the trench array as reproduced in figure 2.

An archaeological assessment (ref: 3243/RO1c) was undertaken by Nexus Heritage in September 2015 and provided to Aeon Archaeology. The assessment collated valuable data on remains dating from the early land-use history of the site from the medieval period until the present day with agricultural use to the west of the historic core of Eccles until the 19th century when the Bridgewater Foundry was constructed at the site between 1834 and 1837. In 1940 the factory was taken over by the Ministry of Supply and it became an engineering Royal Ordnance Factory, ROF Patricroft. The ROF occupied a large area, including the Site, which was used for light engineering, loading to the Canal and some office / administration functions.

In 1987 the Royal Ordnance Factories were bought by British Aerospace; and in 1989 the Patricroft engineering works was closed down. It is understood that the Site has been subject to a programme of phased demolition since the mid-1990s. However, some 19th century and mid-20th century buildings remain extant.

The assessment of the site through six archaeological evaluation trenches was deemed adequate for the purposes intended as represented in the trench array reproduced in figures 2 and 3. However the requirement to reposition some or all of the trenches due to the presence of buried utilities was considered a distinct possibility within the archaeological WSI.

The aim of this programme of archaeological evaluation was to establish the archaeological significance of the site, to assess the impact of the development proposals on surviving monuments or remains, and to help inform future decision making, design solutions and further potential mitigation strategies. This report includes an assessment of the potential for further investigative work if required, and where relevant give recommendations for an appropriate mitigation strategy.

This report conforms to the guidelines specified in the *CIfA Standard and Guidance for Archaeological Evaluation* (Chartered Institute for Archaeologists 2014).

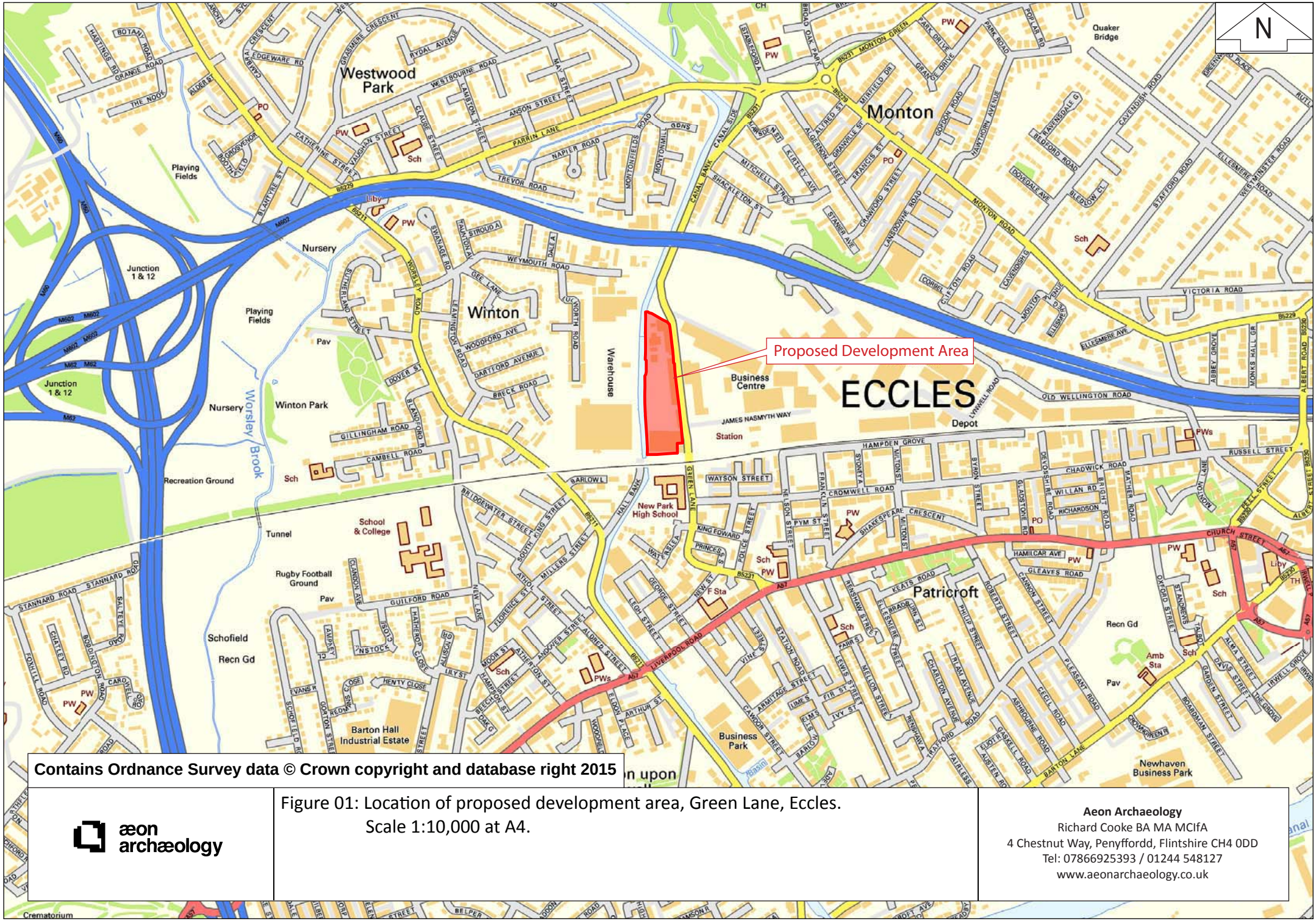

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Figure 01: Location of proposed development area, Green Lane, Eccles.
Scale 1:10,000 at A4.

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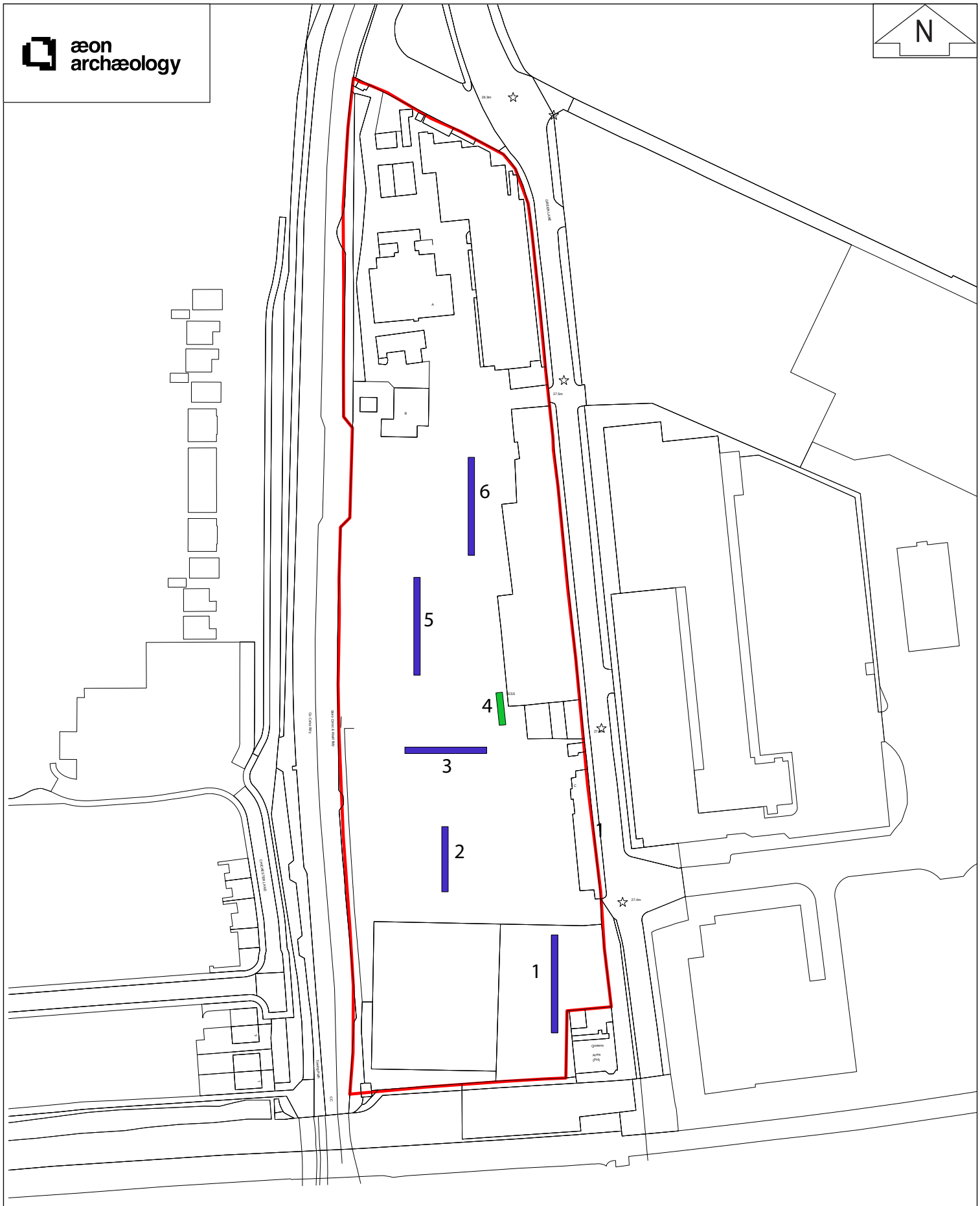

Figure 02: Location of archaeological trenches at Green Lane, Eccles (Excavated trenches shaded blue; unexcavated trenches shaded green). Scale 1:1500 at A4.

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3.0 PROJECT AIMS

The aim of the evaluation works was to characterise the known, or potential, archaeological remains uncovered during the excavation of the archaeological evaluation trenches.

The broad aims of the archaeological evaluation trenches were:

- To determine, as far as is reasonably possible, the location, extent, date, character, condition, significance and quality of any surviving archaeological remains on the site, the integrity of which may be threatened by development at the site.

- To establish the nature and extent of existing disturbance and intrusion to sub-surface deposits and, where the data allows, assess the degree of archaeological survival of buried deposits of archaeological significance.

- To enable the client to establish a schedule for archaeological risks.

- To report on the work and determine the need, if any, for further archaeological mitigation. This may consist of attempts to preserve significant remains in situ or, if this is not possible, more extensive excavation work and reporting. Less sensitive remains may require a watching brief. Any such further work may be secured by amendment to the condition.

The detailed objectives of the archaeological evaluation trenches were:

- Insofar as possible within methodological constraints, to explain any temporal, spatial or functional relationships between the structures/remains identified, and any relationships between these and the archaeological and historic elements of the wider landscape.

- Where the data allows, identify the research implications of the site with reference to the regional research agenda and recent work in Greater Manchester.

The broad characteristics of the number, size, orientation and distribution of the trenches were considered to be appropriate and were agreed with the Senior Planning Archaeologist at GMAAS (Dr. A. Myers). The trench array was proposed as part of the WSI prepared by Nexus Heritage and was designed to determine feature presence/absence, with a contingent trenching facility designed for site characterisation should features be present, the characteristics of which are insufficiently resolved within the core trenching provision. Contingent trenching was optional, upon the discovery of archaeological artefacts, deposits, features or structures the characteristics of which could only be sufficiently determined upon further spatial investigation.

The basic targeted objectives of the trenches were as follows:

Trench 1 - targeting the eastern bays of the foundry building (35.0m x 2.0m)
Trench 2 - targeting the southern half of the foundry building (20.0m x 2.0m)
Trench 3 - targeting the central portion of the foundry building (25.0m x 2.0m)
Trench 4 - targeting the southern portion of the smaller foundry building (10.0m x 2.0m)
Trench 5 - targeting the north/central of the foundry building (30.0m x 2.0m)
Trench 6 - targeting the north-eastern part of the foundry building (30.0m x 2.0m)

The management of this project has followed the procedures laid out in the standard professional guidance *Management of Archaeological Projects* (English Heritage, 1991), *Management of Research Projects in the Historic Environment Project Manager's Guide* (English Heritage 2006), and in the

CIFA Standard and Guidance for Archaeological Evaluation (Chartered Institute For Archaeologists, 2014). Five stages are specified:

Phase 1: project planning
Phase 2: fieldwork
Phase 3: assessment of potential for analysis and revised project design
Phase 4: analysis and report preparation
Phase 5: dissemination

The current document reports on the phase 4 analysis and states the means to be used to disseminate the results. The purpose of this phase is to carry out the analysis identified in phase 3 (the assessment of potential phase), to amalgamate the results of the specialist studies, if required, with the detailed site narrative and provide both specific and overall interpretations. The site is to be set in its landscape context so that its full character and importance can be understood. All the information is to be presented in a report that will be held by the Greater Manchester Historic Environment Record and the OASIS database so that it can be accessible to the public and future researchers. This phase of work also includes archiving the material and documentary records from the project.

4.0 METHODOLOGY

Before the evaluation trenching commenced an agreed programme of excavation timing, siting, duration, surface re-instatement and health and safety protection measures were agreed with the Client, Nexus Heritage and the Greater Manchester Archaeological Advisory Service.

4.1 Evaluation trenches

The evaluation trenching array was designed to investigate areas that may contain archaeological features. There was latitude on the location of each trench and slight repositioning to take account of buried services and other constraints was acknowledged as a possibility within the WSI.

An eight ton tracked excavator with hydraulic ground breaker was used initially to remove the upper surface of modern reinforced concrete after which a toothless ditching bucket was used to open the trenches under constant archaeological supervision. Topsoil and overburden were to be removed by machine in spits down to archaeological deposits or natural sub-soils, whichever were encountered first. All uncovered archaeological features were to be excavated by hand.

A written record of the deposits and all identified features in each evaluation trench was completed via Aeon Archaeology pro-formas. All subsurface remains were to be recorded photographically, with detailed notations. The photographic record was completed using a digital SLR camera (Canon Eos 550D) set to maximum resolution.

Contingency provision was made for the following:

- Additional excavation of up to 100% of any given feature should the excavated sample prove to be insufficient to provide information on the character and date of the feature.

- Expansion of trench limits, to clarify the extent of features equivalent to an additional 20% of the core area.

The archaeological works were surveyed with respect to the nearest Ordnance Survey datum point and with reference to the Ordnance Survey National Grid. The trenches and archaeological features within them were accurately located on a site plan prepared at the most appropriate and largest scale. All excavations were backfilled with the material excavated and upon departure the site was left in a safe and tidy condition.

4.2 Data Collection from Site Records

A database of the site photographs was produced to enable active long-term curation of the photographs and easy searching. The site records were checked and cross-referenced and photographs were cross-referenced to contexts. These records were used to write the site narrative and the field drawings and survey data were used to produce an outline plan of the site.

All paper field records were scanned to provide a backup digital copy. The photographs were organised and precisely cross-referenced to the digital photographic record so that the Greater Manchester Historic Environment Record (HER) can curate them in their active digital storage facility.

4.3 Artefact Methodology

All artefacts were to be collected and processed including those found within spoil tips. Finds numbers would be attributed and they would be bagged and labelled as well any preliminary identification taking place on site. After processing, all artefacts would be cleaned and examined in-

house at Aeon Archaeology. If required artefacts would be sent to a relevant specialist for conservation and analysis.

The recovery policy for archaeological finds was kept under review throughout the evaluation trenching. Any changes in recovery priorities would be made under guidance from an appropriate specialist and agreed with the Client, Nexus Heritage and the Greater Manchester Archaeological Advisory Service. There was a presumption against the disposal of archaeological finds regardless of their apparent age or condition.

4.4 Environmental Samples Methodology

The sampling strategy and requirement for bulk soil samples was related to the perceived character, interpretational importance and chronological significance of the strata under investigation. This ensured that only significant features would be sampled. The aim of the sampling strategy was to recover carbonised macroscopic plant remains, small artefacts particularly knapping debris and evidence for metalworking.

Advice and guidance regarding environmental samples and their suitability for radiocarbon dating, as well as the analysis of macrofossils (charcoal and wood), pollen, animal bones and molluscs would be obtained from Oxford Archaeology if required.

4.5 Report and dissemination

A full archive including plans, photographs and written material resulting from the project was prepared. All plans, photographs and descriptions were labelled, and cross-referenced.

Upon approval from the Client copies of the report will be sent to the Greater Manchester Historic Environment Record, the Greater Manchester Archaeological Advisory Service, and the OASIS online database.

5.0 SITE LOCATION

Eccles is situated within the western conurbation of Salford, with the Site centre at approximately, National Grid Reference SJ 76258 98904.

The Site is an approximate rectangle in plan form and is accessed via Green Lane, on the central eastern boundary of the site. The Bridgewater canal runs adjacent to the western boundary of the site. The eastern boundary is formed by Green Lane. The southern portion of the Site is occupied by a recently built plastics factory. The central parts of the Site have been cleared of all above ground structures, but hardstanding surfaces and evidence of foundations remain in-situ. The Site is relatively level and approximately 50% of the Site is occupied by buildings, 45% by hardstanding and 5% by soft cover (E3P 2014).

The British Geological Survey (BGS) map for the site, (Sheet 085, 1:50,000, Manchester, Solid & Drift edition) characterises the bedrock at the Site as Chester Pebble Beds Formation which is anticipated to comprise sandstone. The drift geology beneath the Site comprises (north) Devensian Till in the form of clay, sands and gravel and (south) Glaciofluvial Sheet Deposits in the form of sand and gravel.

A geotechnical ground investigation was undertaken in July 2014 (E3P 2014) and comprised x6 machine excavated test pits to a maximum depth of 3.6m and x13 window samples to a maximum depth of 3.7m.

In summary the ground investigation has confirmed made ground of mixed composition exists across the entire Site to depths between 0.30m and 2.10m. The made ground typically comprises concrete, relict brick-built foundations and black sandy-gravel with frequent cobbles. Orangey-red gravelly sand was located at a minimum of 0.35m below surface level and a maximum of 3.60m. Clay was recorded at a minimum of 0.5m below surface level and a maximum of 2.50m. Solid bedrock was not recorded during the geotechnical investigation.

6.0 HISTORY OF THE SITE

There are no registered World Heritage Sites, Archaeological Areas, Scheduled Ancient Monuments, or Registered Battlefields wholly or partly within the Site. There are 17 archaeological assets recorded in the vicinity of the Site two of which are recorded within the Site.

The Site corresponds with the location of now (mostly) demolished Bridgewater Iron Foundry. The foundry was established by Nasmyth, Gaskell and Company between 1834 and 1837. In 1940 the factory was taken over by the Ministry of Supply and it became an engineering Royal Ordnance Factory, ROF Patricroft. The ROF occupied a large area, including the Site, which was used for light engineering, loading to the Canal and some office / administration functions.

In 1987 the Royal Ordnance Factories were bought by British Aerospace; and in 1989 the Patricroft engineering works was closed down. It is understood that the Site has been subject to a programme of phased demolition since the mid-1990s. However, some 19th century and mid-20th century buildings remain extant.

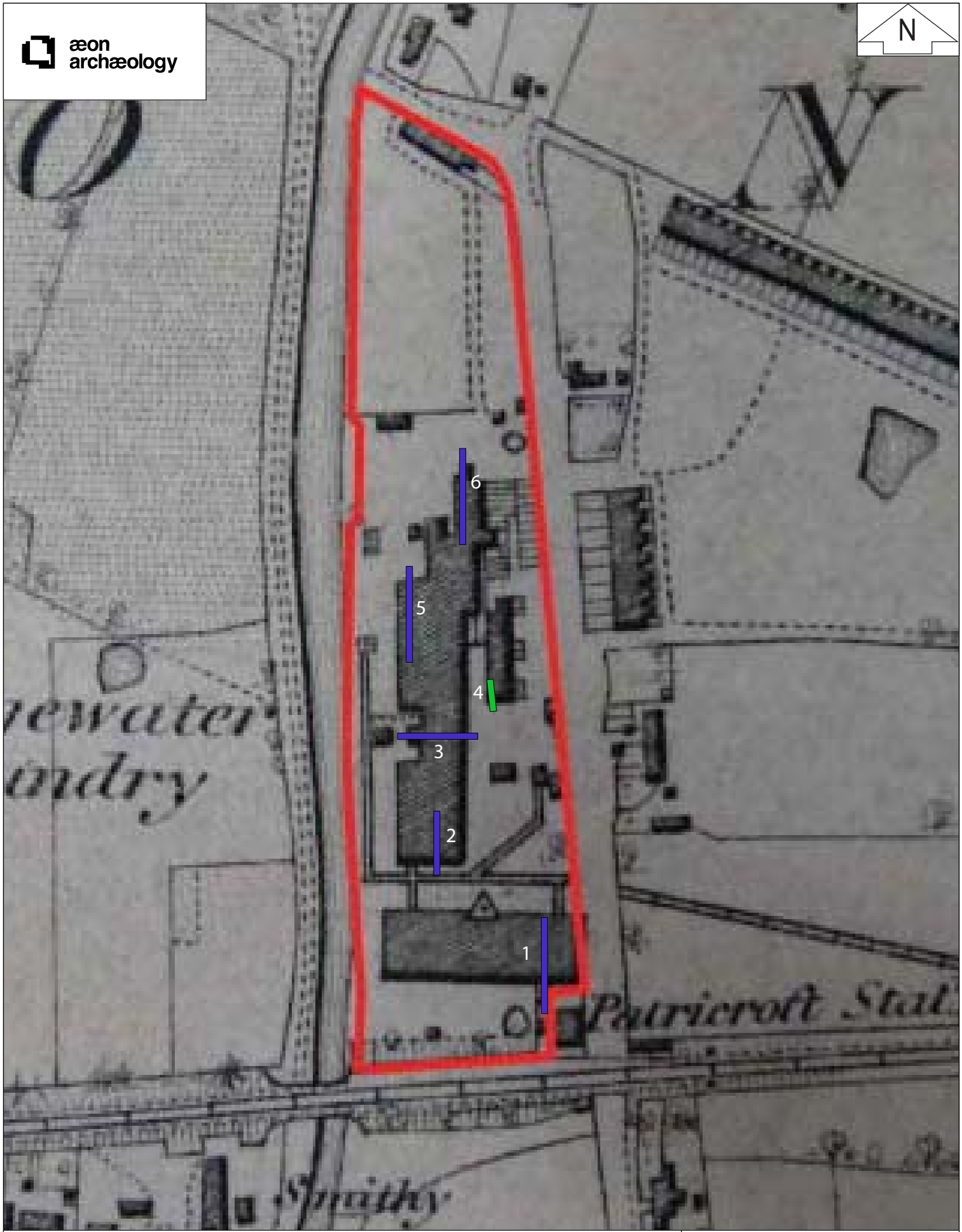

Figure 03: Location of archaeological trenches at Green Lane, Eccles overlain on the 25" County Series Ordnance Survey map of 1848 (Excavated trenches shaded blue; unexcavated trenches shaded green).

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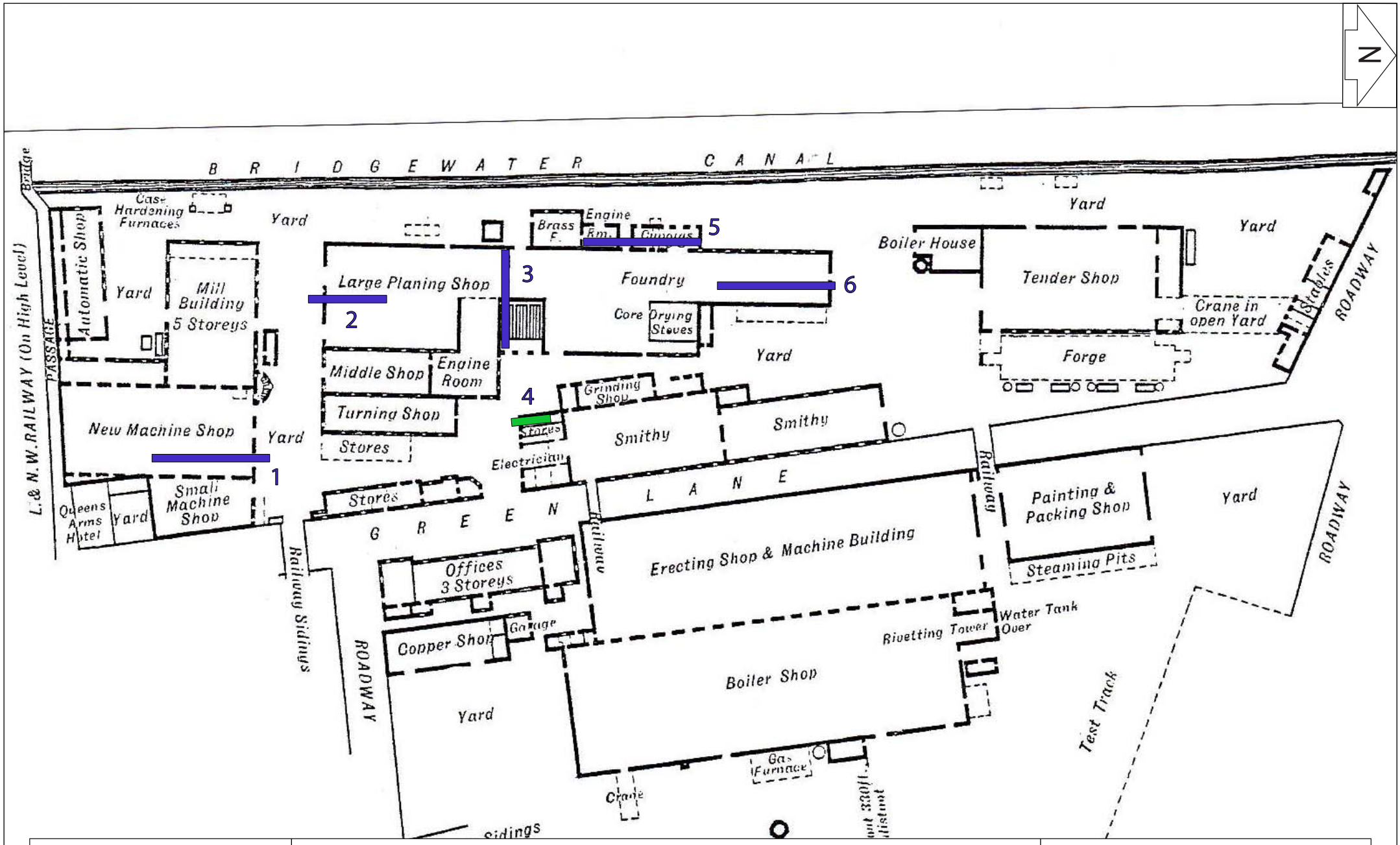

Figure 04: Approximate location of evaluation trenches overlain on the General Plan of the Bridgewater Foundry c.1913 (The Railway Gazette, 1913).

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7.0 QUANTIFICATION OF RESULTS

7.1 The Documentary Archive

The following documentary records were created during the archaeological evaluation trenching:

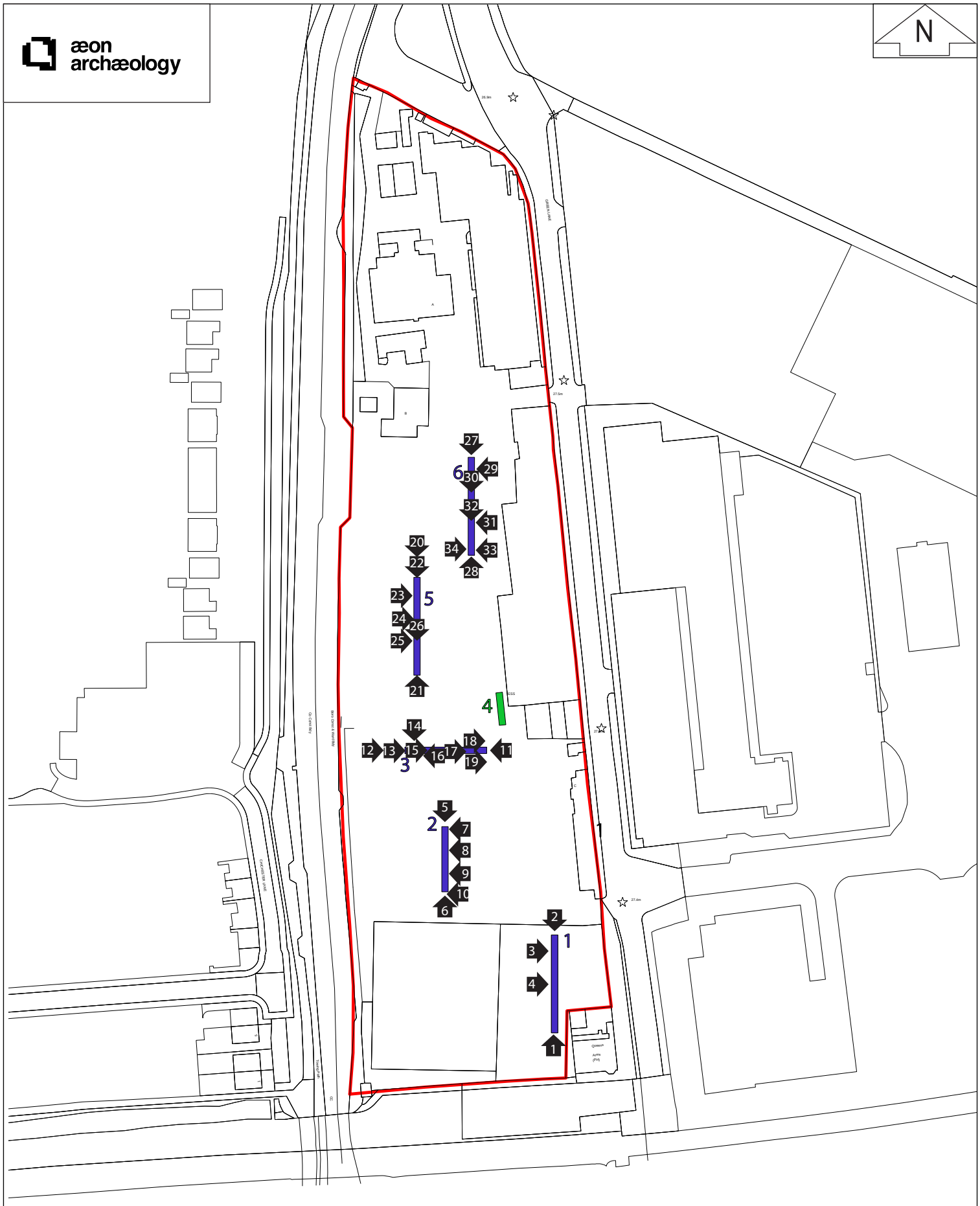
Trench sheets	6
Digital photographs	86
Context Sheets	21
Drawings	4 on 4 sheets

7.2 Environmental Samples

No environmental samples were taken as part of the evaluation trenching as no suitable deposits or fills were encountered.

7.3 Artefacts

Several metal artefacts were recovered unstratified from trench 5 including two shell cases, a file, a punch, and several iron weights/ presses. These artefacts are currently retained by Aeon Archaeology and will be submitted to a specialist for analysis upon conclusion of the mitigatory programme.



Contains Ordnance Survey data. Promap 12 month licence 09/10/2015

Figure 05: Location and orientation of photographs (numbered arrows refer to plate numbers). Scale 1:1500 at A4.

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8.0 RESULTS OF THE ARCHAEOLOGICAL EVALUATION TRENCHES

The evaluation trenches were designed to evaluate and characterise the known, or potential, archaeological remains. Each trench is described and discussed separately. The location of the trenches can be found on figure 2 and are overlain on the Ordnance Survey 25" County Series map of 1848 on figure 3 and a 1913 map of the foundry on figure 4. The location and orientation of photographs is shown on figure 5.

Where relevant context numbers have been assigned and are shown enclosed within brackets. Details of all contexts used can be found in appendix I

Trench 01 (Plates 1-4, figure 6)

Discussion

Trench 1 measured 35.0m in length by 2.0m in width and was located at the southern part of the site targeting the eastern bays of the foundry building shown on the 1848 map, centred on NGR SJ 76290 98778.

The trench was excavated through a 0.2m deep reinforced concrete layer and a 0.3m deep mixed demolition deposit of dark-grey silt-clay with firm black cinder concretions and red-brick fragment inclusions. This lay above a mottled light yellow and orange clay-sand natural glacial substrata.

Two columns (1020) and (1021) constructed from unfrogged red-brick bonded by mortar were located towards the northern half of the trench against the eastern limit of excavation, measuring 1.0m long by 0.6m wide by 0.75m high, and 0.7m long by 0.35m wide by 0.75m high respectively, and with individual bricks measuring 0.22m by 0.11m by 0.07m. Both of these columns had central apertures measuring 0.4m square and are likely to be girder bases. No other archaeological remains were located within trench 1.

The trench was recorded using digital photographs, context sheets and a trench sheet pro-forma. Measurements were taken by hand and a scale plan of the trench produced as shown in figure 6. The trench was backfilled using the excavated material.

Interpretation

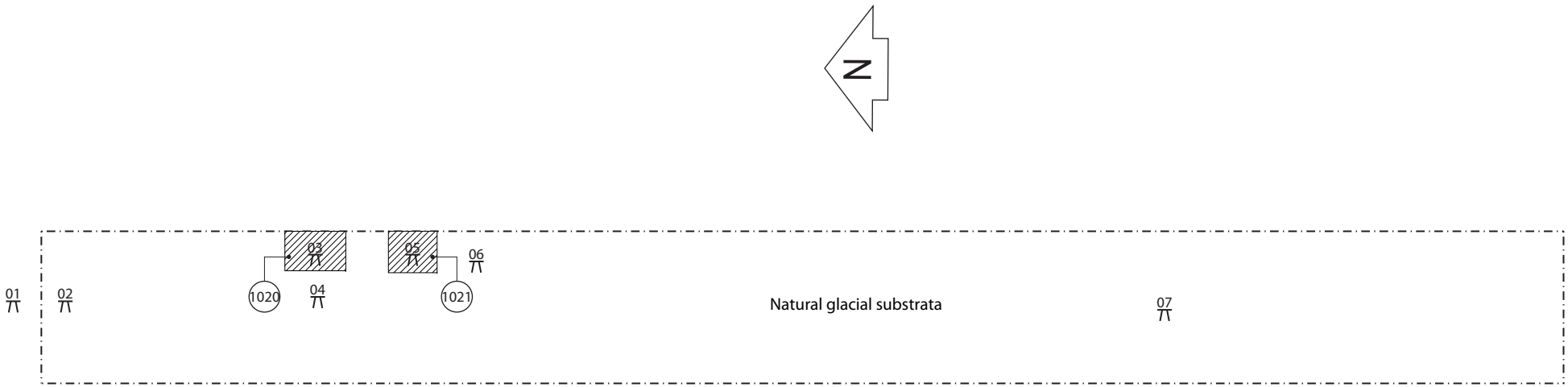
Trench 1 was targeting the stand-alone building at the southern end of the site which is depicted on the 1913 map as the new machine shop, and shown as a relatively large rectangular building orientated north to south. This building supplemented the existing heavy machine shop and immediately joined the mill building to the west.

The new machine shop consisted of two bays each 35ft by 140ft with a height of 23ft and each equipped with a 5-ton electric crane. On one side of this building was a small machine shop, 70ft by 38ft with a height of 15ft and an auxiliary gas engine drive to enable this part of the works to remain operative during holiday periods and breakdowns. When the Bridgewater Foundry was first built all of the tools and equipment were made on the premises and a considerable trade was conducted in the sale of machine tools, forge and foundry apparatus (Cantrell, J. 2005, p32, 33).

The area of trench 1 had clearly seen a phase of disturbance represented by a general demolition deposit spread across the entirety of the trench. This deposit overlaid the natural substrata and had been capped by a layer of modern reinforced concrete, which functioned as the current hardstanding. This disturbance almost certainly occurred once the foundry buildings had gone out of use in 1989 and the trench results suggest that the area of the new machine shop had been destroyed, almost in its entirety, beyond foundation level.

The exception to this destruction was the discovery of the two red-brick structures (1020) and (1021) which appear to be girder bases, possibly for the vertical upright steels that supported the electric crane. However, other than the preservation of these two features the area to the south of the proposed development area appears to have been highly disturbed and the potential for preserved buried remains of the foundry surviving at foundation level appears to be low within this area.

Contexts
1020 = Red-brick girder base 1021 = Red-brick girder base



0 5m

1:100 at A4

Located on figure 02

Levels OD (m) (approx)
1 = 25.87 2 = 24.83 3 = 25.76 4 = 24.86 5 = 25.77 6 = 24.88 7 = 24.80

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Figure 06: Plan of trench 01 showing girder bases (1020) and (1021).

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Plate 01: Trench 1, from the south. Scale 1.0m.

Plate 02: Trench 1, from the north. Scale 1.0m.

Plate 03: Trench 1 western section, from the west. Scale 1.0m.

Plate 04: Trench 1 showing brick-built girder bases (1020) and (1021), from the west. Scale 1.0m.

Trench 02 (Plates 5-10, figures 7)

Discussion

Trench 2 measured 20.0m in length by 2.0m in width and was located at the southern part of the site targeting the southern half of the foundry building shown on the 1848 map, centred on NGR SJ 76256 98815.

The trench was excavated through a 0.2m deep layer of reinforced concrete and a 0.25m deep deposit of general demolition comprising a dark-grey silt-clay with red-brick fragment inclusions. Beneath this lay a 0.5m deep deposit of black-grey silt-clay which lay above a light orange-yellow sand natural substrata.

At the northern end of the trench a 2.0m by 1.0m laid floor surface (1016) of unfrogged yellow brick was located, which appeared to continue northward beyond the limits of excavation. To the immediate west of this the brick surface butted up against a small section of concrete with frequent red-brick fragments which may have been a machine anchor.

The trench was machined down onto the natural substrata for its majority interspersed with modern intrusions of concrete and steel. Towards the centre of the trench a 1.0m by 0.25m concrete base (1019) with frequent red-brick fragment inclusions was located, which almost certainly represented a machine anchor base. At the southern end of the trench a similar base measuring 1.0m by 0.25m was located (1017) which had steel anchor bolts in-situ showing that it had also functioned as an anchor block.

At the southernmost end of the trench and along the western limit of excavation a 1.0m wide unfrogged red-brick wall bonded by mortar was located, which appeared to represent part of a wall or possibly a buttress. This small section of wall was orientated north to south and appeared to sit within a foundation cut into the natural substrata. The red bricks utilised measured 0.22m by 0.11m by 0.07m.

The trench was recorded using digital photographs, context sheets and a trench sheet pro-forma. Measurements were taken by hand and a scale plan of the trench produced as shown in figure 6. The trench was backfilled using the excavated material.

Interpretation

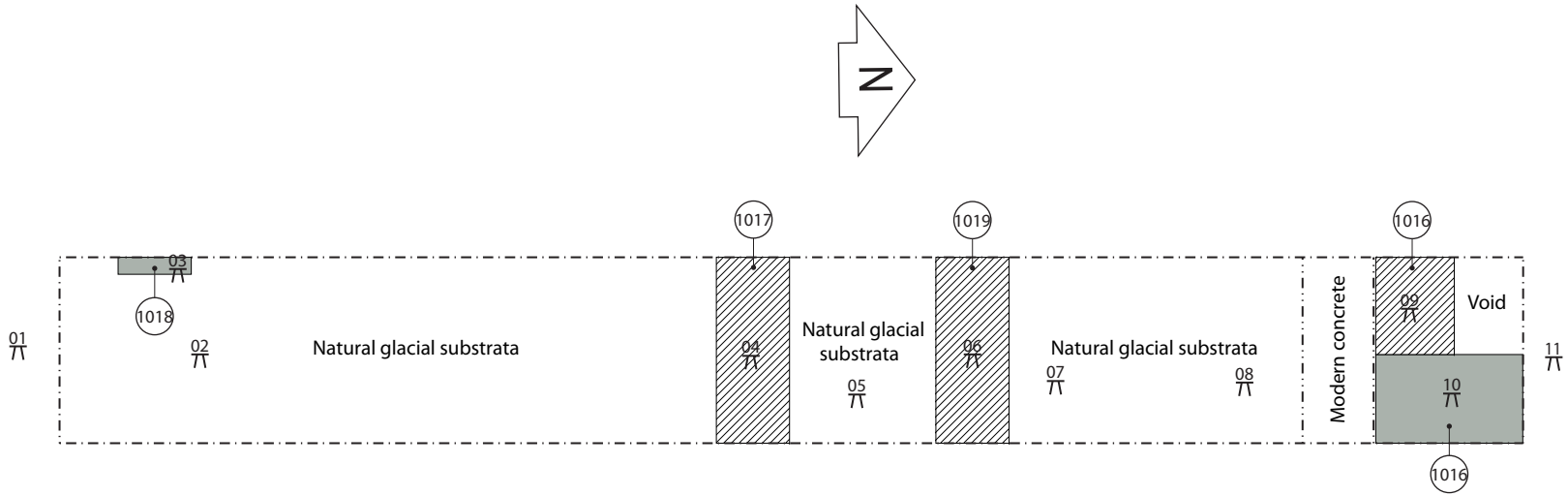
Trench 2 was targeting the southern half of the foundry building towards the southern end of the site which is depicted on the 1913 map as the large planing shop, and shown as forming the southern range of the main foundry building.

There is no available description of the large planing shop at the Patricroft foundry, however the building appears to have been rectangular in shape, orientated north to south and situated in the south-western corner of the main foundry building complex. It is likely that the room was not sub-divided and that the side planers, shears, punches, drills and rollers were set out along the edges of the room to craft the newly cast iron into the required components.

The floor surface (1016) almost certainly represents the working floor of the planning shop, and it is likely that the two concrete bases (1017) and (1019) represent anchor blocks for the planing machines themselves. Moreover, the small section of red-brick wall (1018) found at the southern end of the trench may well relate to one of the two large openings into the southern end of the building as shown on the map of 1913.

The area of trench 2 had seen a phase of disturbance represented by a general demolition deposit spread across the entirety of the trench. This deposit overlaid a black-grey silt-clay deposit and the natural substrata and had been capped by a layer of modern reinforced concrete, which functioned as the current hardstanding. This disturbance almost certainly occurred once the foundry buildings had gone out of use in 1989 and despite a relatively high level of disturbance at the southern end of the trench, the northern part showed that the preservation of structures associated with the planning shop were in fact high. As such it is believed that the potential for preservation of remains at this part of the site are moderate to high.

Contexts
1016 = Red-brick surface and concrete 1017 = Concrete anchor base 1018 = Red-brick wall / buttress 1019 = Concrete base



Levels OD (m) (approx)
1 = 25.38 2 = 24.41 3 = 25.06 4 = 25.10 5 = 24.44 6 = 25.27 7 = 24.22 8 = 24.46 9 = 25.16 10 = 25.14 11 = 25.57

0 5m

1:100 at A4

Located on figure 02

Figure 07: Plan of trench 02.

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Plate 05: Trench 2, from the north. Scale 1.0m.

Plate 06: Trench 2, from the south. Scale 1.0m.

Plate 07: Trench 2 showing brick floor surface (1016), from the east. Scale 1.0m.

Plate 08: Trench 2 showing concrete base (1019), from the east. Scale 1.0m.

Plate 09: Trench 2 showing concrete anchor block (1017), from the east. Scale 1.0m.

Plate 10: Trench 2 showing red-brick wall/buttress (1018), from the east. Scale 1.0m.

Trench 03 (Plates 11-19, Figure 8)

Discussion

Trench 3 measured 25.0m in length by 2.0m in width and was located towards the centre part of the site targeting the central portion of the foundry building shown on the 1848 map, centred on NGR SJ 76256 98848. The trench was excavated through a 0.25m deep layer of reinforced concrete and a 1.5m deep deposit of general demolition comprising a dark-grey silt-clay with red-brick fragment inclusions. Beneath this lay a light orange-yellow sand natural substrata.

At the western end of the trench a wall (1006) of unfrogged red-brick bonded by mortar and measuring >3.3m in length by >1.2m wide by 1.5m high (7 courses) ran from east to west against the northern limit of excavation. At the northwest corner of the trench this wall butted up against two laid sandstone blocks which appeared to represent an entranceway.

Further to the east a second wall (1007) of unfrogged red-brick bonded by mortar and measuring 5.1m in length by 1.0m in width by 0.5m high (5 courses) ran from east to west, in line with wall (1006) and separated from it by a gap of 3.0m. This wall appeared to continue into the northern limit of excavation. Both of these walls utilised red bricks measuring 0.22m in length by 0.11m in width by 0.07m in depth.

During the excavation of the trench an area to the immediate south of wall (1007) appeared to have a concentration of red-brick that was thought maybe a vaulted cellar (1009), however this feature collapsed in upon itself almost immediately and thus could not be recorded.

Towards the centre of the trench a feature constructed from unfrogged red-brick bonded by mortar ran from north to south and appeared to be a brick built drain (1010). The feature measured >2.0m in length by 1.8m in width with a central gulley measuring 0.55m in width and 0.11m in depth (1 course). As with the red-brick walls, this feature had been constructed from bricks measuring 0.22m in length by 0.11m in width by 0.07m in depth.

To the immediate east of drain (1010) and butting up against it was a single course laid surface of red bricks (1011) measuring 5.4m in length by >2.0m in width, orientated east to west and continuing into both the northern and southern limits of excavation. The bricks appeared unbounded and for the most part unfrogged, although several frogged bricks had been used to repair the floor.

Beyond this and at the eastern end of the trench the laid red-brick surface suddenly terminated and gave way to a 0.5m wide area of demolition which may have been a north-south orientated wall that had been demolished in its entirety. To the immediate east of this was a laid surface of mid/dark grey unfrogged bricks (1012) measuring 2.0m in length by 1.5m in width orientated north to south and which appeared to represent an external floor surface.

The easternmost limit of the trench was dominated by a modern inspection chamber.

The trench was recorded using digital photographs, context sheets and a trench sheet pro-forma. Measurements were taken by hand and a scale plan of the trench produced as shown in figure 6. The trench was backfilled using the excavated material.

Interpretation

Trench 3 was targeting the central portion of the foundry building towards the centre of the site which is depicted on the 1913 map as the subdivision between the foundry core in the north and the planing shop in the south, and shown as forming the central range of the main foundry building.

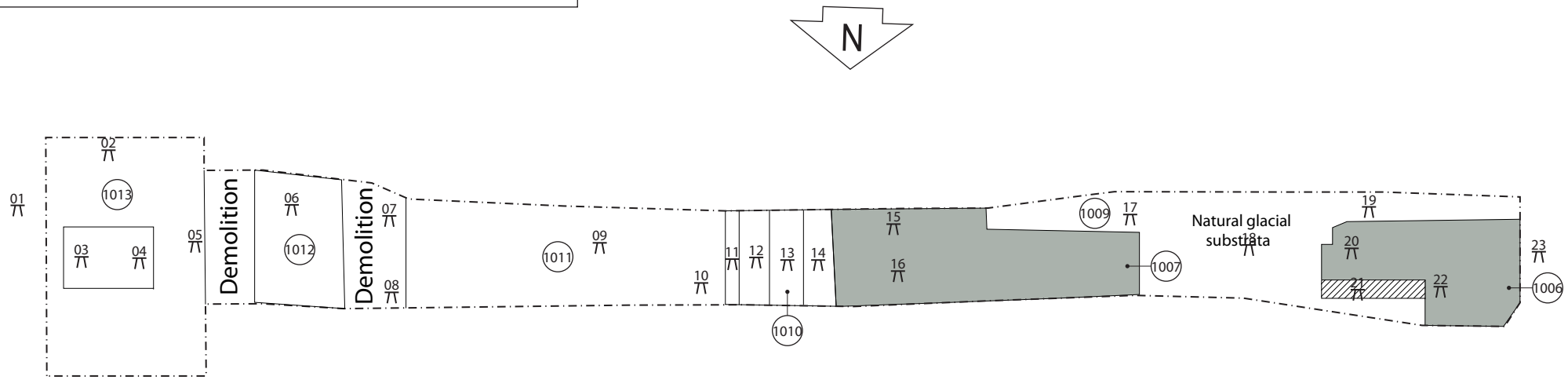
The foundry was located in a rectangular building measuring 84ft long by 71ft wide with walls 25ft high supporting a wooden roof. A principle feature was a set of four large wrought-iron pillar cranes, each of which was capable of carrying 20 tons and was placed within the building in symmetrical position so as to form the four corners of a smaller rectangular figure inscribed within the plan of the building parallel to its outer walls. The jib of each crane turned in a circle covering the quarter of the foundry in which it was placed and all four jibs could be brought together towards the centre of the foundry (Cantrell, J. 2005, p24).

The two red-brick walls running east to west at the western end of the trench appear to represent the internal division between the foundry core and the planing shop as depicted on the map of 1913. Both of these walls were large, measuring approximately 1.2m in width, and show that despite the fact that the central foundry building was sub-divided into different workshops these divisions were substantial. This was almost certainly a deliberate attempt at isolating the hot and noisy areas of the foundry away from the crafting and finishing areas of the production process. However, it does appear from the two laid sandstone blocks in wall (1006) that access between the foundry core and planing shop was possible.

The map of 1913 depicts an area to the east of the foundry core that appears to be an enclosed platform or loading area but is not annotated. This part of the map appears to correspond with the red-brick surface seen in trench 3. Moreover, the easternmost part of the trench is shown on the 1913 map as being outside of the foundry building which corresponds with the grey brick surface seen in the trench and identified as an external yard between the foundry buildings in the north and smithy buildings in the south.

The results of trench 3 have shown that the preservation of buried deposits relating to the central part of the foundry building at the site is high. Walls and floor deposits appear to be well preserved and as such the potential for preserved remains within this part of the site also appears to be high.

Contexts
1006 = Red-brick wall 1007 = Red-brick wall 1009 = Possible cellar 1010 = Red-brick drain 1011 = Red-brick floor surface 1012 = Brick surface 1013 = Modern insepction chamber



Levels OD (m) (approx)	
1 = 27.01	12 =26.61
2 = 27.15	13 =26.6
3 = 26.32	14 = 26.48
4 = 26.32	15 = 26.46
5 = 27.08	16 = 26.52
6 = 26.72	17 = 25.20
7 = 26.52	18 = 24.83
8 = 26.52	19 = 26.43
9 = 26.63	20 = 26.27
10 = 26.74	21 = 26.38
11 = 26.71	22 = 26.59
	23 = 26.75

0 5m

1:100 at A4

Located on figure 02

Figure 08: Plan of trench 03.

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Plate 11: Trench 3, from the east. Scale 1.0m.

Plate 12: Trench 3, from the west. Scale 1.0m.

Plate 13: Trench 3 showing red-brick wall (1006), from the west. Scale 1.0m.

Plate 14: Trench 3 northern facing trench section, from the north. Scale 1.0m.

Plate 15: Trench 3 showing red-brick wall foundations (1008), from the west. Scale 1.0m.

Plate 16: Trench 3 showing possible collapsed cellar (1009), from the east. Scale 1.0m.

Plate 17: Trench 3 showing red-brick drain (1010), from the west. Scale 1.0m.

Plate 18: Trench 3 showing red-brick surface (1011), from the west. Scale 1.0m.

Plate 19: Trench 3 showing external brick surface (1012), from the west. Scale 1.0m.

Trench 04 (Figures 2, 3 and 4)

Discussion

Trench 4 was located at the eastern end of the site and was targeting the southern portion of the smaller factory building shown on the 1848 map, centred on NGR SJ 76274 98861. This trench was however not excavated due to the detection of multiple electrical cables at this point.

Interpretation

The smaller factory building at the eastern end of the site, but still on the western side of Green Lane, operated as the two smithy buildings and their associated stores.

There are no detailed contemporary descriptions of these workshops though an account of the factory dated 1887 refers to the smithy, which at that date was divided into two parts, the top and the bottom shop. The latter contained sixteen fires and several steam hammers some of which could deliver 280 blows per minute. The top smithy, for the heavier class of work, contained three steam hammers and fifteen fires (Cantrell, J. 2005, p26).

As the archaeological evaluation trench could not be excavated within this area, and indeed because much of the site of the former smithy now lies beneath a modern industrial unit, the preservation of foundation remains within this area is currently unknown.

Trench 05 (Plates 20-26, Figure 9)

Discussion

Trench 5 measured 30.0m in length by 2.0m in width and was located towards the northern part of the site targeting the north/central portion of the foundry building shown on the 1848 map, centred on NGR SJ 76248 98886.

The trench was excavated through a 0.2m deep layer of reinforced concrete and a 0.5m deep mixed demolition deposit of dark-grey silt-clay with firm black cinder concretions and red-brick fragment inclusions. This lay above a light brown-orange clay-sand natural substrata.

At the northern end of the trench a brick and concrete tank (1001) measuring 4.5m in length by 2.5m in width was located. This had a deeper tank at the southern end and a downward sloping overflow heading north to a drainage hole, most likely representing a quenching tank for the foundry. To the immediate south of this was an area of general demolition which gave on to a laid section of red-brick floor (1002). This measured >2.0m in length by 1.2m in width and continued into the eastern and western limits of excavation. The surface appeared to be only one course thick and utilised unbonded unfrogged red bricks measuring 0.22m in length by 0.11m in width by 0.07m in depth.

To the immediate south of this was a chamber (1003) constructed from unfrogged yellow bricks bonded by mortar and measuring 2.7m in length by 1.9m in width orientated north to south. The east and west sides of the chamber sloped towards a central gulley measuring 0.7m in width and running north to south for 1.9m in length. This chamber was filled with a very firm concreted black cinder-rich deposit and produced several blank artillery shells.

To the immediate south of this chamber an area of modern disturbance on to the natural clay separated a second chamber (1004) identical to the first in appearance, form and dimensions. This chamber was however emptied to a depth of 0.6m to reveal a base of mortared yellow brick identical to that of the side wall construction.

The southern half of the trench was dominated by a well preserved laid surface (1005) of unfrogged red and yellow bricks with occasional frogged brick repairs. This surface measured >13.75m in length by >2.0m in width and appeared to be at least two courses deep in places. The bricks did not appear to be bonded in any way but measured 0.22m in length by 0.11m in width by 0.07m in depth.

Interpretation

Trench 5 was targeting the north/central portion of the foundry building towards the north of the site which is depicted on the 1913 map as the cupolas and engine room to the immediate west of the foundry core.

The foundry was served by six cupolas and could melt up to 7 tons of cast iron per hour. A report dated 1894 stated that the foundry was still equipped with Nasmyth's safety ladle, with nothing better having as yet been designed (Cantrell, J. 2005, p24).

The concrete and red-brick tank at the northern end of trench two appears to date to the foundry building rather than any later industrial buildings at the site, and appears to have functioned as a water retaining tank with overflow to the north. This was possibly utilised as a quenching tank to serve the cupolas located to the south.

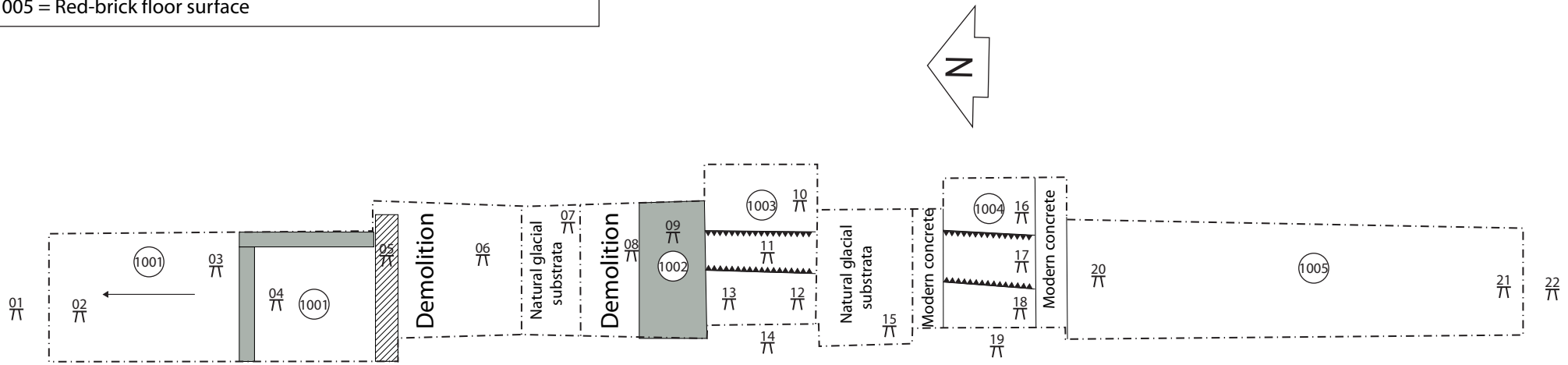
The function of the two yellow brick chambers located towards the centre of the trench is unclear. The construction of these features using yellow brick suggests that they held very hot or molten material, a theory supported by the presence of a very firm concreted black cinder-rich deposit within both

chambers. The presence of an in-situ yellow brick wall to the immediate north of chamber (1004) shows that despite modern disturbance between the two chambers they originally functioned as separate features and were never linked. This part of the foundry housed the six cupolas however no parallels with the chambers have been thus far found linking them to the melting process, and it may be that they were in fact a later addition linked with the Royal Ordinance manufacture.

The red-brick floor surface at the southern end of the trench appears to correspond with the floor of the cupola house and engine room locations, however no internal wall division between these two was uncovered raining the possibility that the trench may have been sited slightly further eastward into the foundry core.

The results of trench 5 have shown that the preservation of buried deposits relating to the central part of the foundry building at the site are high. Chambers, tanks and floor deposits appear to be well preserved and as such the potential for preserved remains within this part of the site also appears to be high.

Contexts
1001 = Concrete tank 1002 = Red-brick surface 1003 = Brick chamber 1004 = Brick chamber 1005 = Red-brick floor surface



0 5m

1:100 at A4

Located on figure 02

Levels OD (m) (approx)	
1 = 25.87	12 = 25.45
2 = 24.86	13 = 25.45
3 = 2.30	14 = 1.55
4 = 2.86	15 = 26.05
5 = 1.54	16 = 25.51
6 = 1.80	17 = 24.64
7 = 23.96	18 = 25.46
8 = 25.47	19 = 25.88
9 = 25.61	20 = 25.46
10 = 25.49	21 = 25.53
11 = 25.19	22 = 25.85

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Figure 09: Plan of trench 05.

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Plate 20: Trench 5, from the north. Scale 1.0m.

Plate 21: Trench 5, from the south. Scale 1.0m.

Plate 22: Trench 5 showing concrete and brick tank (1001), from the north. Scale 1.0m.

Plate 23: Trench 5 showing concrete red-brick surface (1002), from the west. Scale 1.0m.

Plate 24: Trench 5 showing brick chamber (1003), from the west. Scale 1.0m.

Plate 25: Trench 5 showing brick chamber (1004), from the west. Scale 1.0m.

Plate 26: Trench 5 showing brick surface (1005), from the north. Scale 1.0m.

Trench 06 (Plates 27-34, Figures 2, 3 and 4)

Discussion

Trench 6 measured 30.0m in length by 2.0m in width and was located towards the northern part of the site targeting the north-eastern portion of the foundry building shown on the 1848 map, centred on NGR SJ 76265 98923.

The trench was excavated through a 0.25m deep layer of reinforced concrete and a 0.5m deep deposit of black charcoal rich silt with frequent cinder concretions which in turn lay above a 0.2m deep general demolition layer. This lay above a 0.5m deep dark-grey clay deposit which in turn laid above a orange-yellow clay natural substrata.

The north-eastern part of the trench was occupied by modern utilities and towards the centre of the trench a single railway track rail ran from northwest to southeast across the trench. This had three degraded sleepers in place suggesting that it lay in-situ, although the sleepers and rail appeared to sit upon a made ground of general demolition shedding some doubt on this.

Towards the centre of the trench a wall (1015) measuring 2.0m long by 0.5m wide by 0.75m in height and constructed from unfrogged red and yellow bricks bonded by mortar ran from east to west across the trench and was capped with a layer of concrete with frequent red-brick fragment inclusions. This appeared to be an internal wall division.

Towards the southern part of the site two large modern concrete tanks were located which extended beyond the level of the natural substrata suggesting that they had removed all archaeological remains at this point. At the southern end of the trench however a cellar measuring 1.8m in depth and 2.0m square was found directly beneath the modern concrete surface. This had been constructed from unfrogged red-brick bonded by mortar and was rendered on all but its eastern face. On the western face a single entranceway was located that had been in-filled with demolition material.

Interpretation

Trench 6 was targeting the north-eastern portion of the foundry building towards the north of the site which is depicted on the 1913 map as the foundry core.

The foundry was located in a rectangular building measuring 84ft long by 71ft wide with walls 25ft high supporting a wooden roof. A principle feature was a set of four large wrought-iron pillar cranes, each of which was capable of carrying 20 tons and was placed within the building in symmetrical position so as to form the four corners of a smaller rectangular figure inscribed within the plan of the building parallel to its outer walls. The jib of each crane turned in a circle covering the quarter of the foundry in which it was placed and all four jibs could be brought together towards the centre of the foundry (Cantrell, J. 2005, p24).

It is unclear from the trench results whether the railway track and sleepers were in fact in-situ, and the high amount of disturbance and demolition deposits at the northern end of the trench would suggest that this was not the case. Moreover, aside from the red-brick wall which may be that of the northern wall of the drying stoves room shown on the 1913 map, the majority of the trench had been disturbed resulting in the poor preservation of foundation remains related to the foundry.

The exception to this was the discovery of a cellar at the southern end of the trench which was particularly well preserved and appeared to continue westward outside of the trench limits. It would

be unusual for the foundry core to have a sub-level raining the possibility that this trench actually lies slightly more to the east than shown on the 1913 map, perhaps over the drying stoves room.

The results of trench 6 have shown that much of the northern part of the foundry building has been demolished and disturbed in its entirety, however the preservation of buried remains increases dramatically at the southern end of the trench where an apparent sub-level is preserved in its entirety. Therefore it is considered that the potential for preserved buried remains within this part of the site is low at the northern limits of the former foundry building, but high as one moves into the area of the former foundry core.

Plate 27: Trench 6, from the north. Scale 1.0m.

Plate 28: Trench 6, from the south. Scale 1.0m.

Plate 29: Trench 6 eastern section, from the east. Scale 1.0m.

Plate 30: Trench 6 showing rail tracks, from the north. Scale 2x1.0m.

Plate 31: Trench 6 showing red-brick wall (1015), from the east. Scale 2x1.0m.

Plate 32: Trench 6 showing red-brick wall (1015), from the north. Scale 2x1.0m.

Plate 33: Trench 6 showing cellar (1014), from the east. Scale 2.0m.

Plate 34: Trench 6 showing cellar (1014), from the west. Scale 2.0m.

9.0 CONCLUSION

The archaeological evaluation at Green Lane, Eccles has shown that around the fringes of the site, where the limits of the former foundry buildings stood, the preservation of buried remains at foundation level is relatively low. However, this level of preservation increases as one moves towards the centre of the foundry complex where preserved walls, chambers and floor surfaces have all been recorded.

The excavation of trench 1 showed that the southernmost part of the site in the vicinity of the former new machine shop had been disturbed almost within its entirety. The trench was for the most part excavated on to the natural glacial substrata because no archaeological remains were encountered. The exception to this was the discovery of two brick built columns which may have been girder bases, otherwise the trench was sterile of archaeology due to a phase of demolition and disturbance since 1989. It is unclear however whether this level of disturbance continues westward into the area of the former mill building and beneath the current modern industrial units.

Likewise, the excavation of trench 2 showed that the southernmost part of the trench had been highly disturbed with very little remains preserved with the exception of a section of red-brick wall and two concrete machine anchors. The level of preservation increased however as the trench progressed northward where an intact brick floor surface was encountered. This surface almost certainly once formed the working floor of the large planing shop and the machine anchors most likely retained the planers.

Trench 3 produced very well preserved foundation remains of the sub-dividing wall between the large planing shop and the foundry core. This high level of preservation persisted throughout the trench with a laid red-brick floor surface, drain, and external brick yard which existed to the immediate east of the former foundry building.

Trench 4 was not excavated due to the presence of numerous modern utilities within proximity of the trench. Moreover, the trench could not be relocated to avoid these utilities as the remainder of the former smithy building that was being targeted continued beneath a modern industrial building.

Trench 5 produced very well preserved remains of the foundry floor surface and chambers and tanks, probably related to the six cupolas that melted scrap iron before being delivered into the foundry core.

Trench 6 showed that the northern fringe of the site had been highly disturbed with virtually no intact archaeological remains until the southern limit of the trench, where a well preserved sub-level was identified possibly belonging to the drying stoves room.

The archaeological evaluation at Green Lane, Eccles can be seen as having fulfilled the spirit and intent of part of the phased assessment and mitigatory response to the archaeological condition. It has confirmed the presence of preserved foundation remains of the former Patricroft foundry building towards the centre of the site and has also shown that the fringes of the former complex have been demolished, for the most part, within their entirety. As such the findings of this evaluation report should be utilised to produce an informed mitigatory response to the potential impact of the proposed development upon the archaeological resource.

10.0 SOURCES

OS Maps

OS 1:10 000 Series sheet SJ 79 NE, SJ 79 SE, SJ 79 SW and SJ 79 NW.

Promap Mastermap Data: 12 month licence.

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APPENDIX I – DETAILS OF ARCHAEOLOGICAL CONTEXTS

Context	Trench	Description
1001	5	Concrete and brick quenching tank with overflow.
1002	5	Red-brick floor surface.
1003	5	Yellow brick chamber.
1004	5	Yellow brick chamber.
1005	5	Red-brick floor surface.
1006	3	Red-brick wall foundations, E-W.
1007	3	Red-brick wall foundations, E-W.
1008	3	Unused.
1009	3	Possible red-brick vaulted cellar.
1010	3	Red-brick drain, N-S.
1011	3	Red-brick floor surface.
1012	3	External grey-brick floor surface.
1013	3	Modern inspection chamber.
1014	6	Red-brick sub-floor cellar.
1015	6	Red-brick wall, E-W.
1016	2	Yellow-brick floor surface.
1017	2	Concrete anchor block.
1018	2	Red-brick wall or buttress.
1019	2	Concrete anchor block.
1020	1	Red-brick column, possible girder base.
1021	1	Red-brick column, possible girder base.