

**BELMONT ROW GLASSWORKS,
BELMONT ROW,
EASTSIDE,
BIRMINGHAM,
WEST MIDLANDS**



ARCHAEOLOGICAL EXCAVATION REPORT

CP. No: 778/09

23/11/2009

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DOCUMENT TITLE: Belmont Row Glassworks, Belmont Row,
Birmingham, West Midlands

DOCUMENT TYPE: Excavation Report

CLIENT: Wardell Armstrong LLP/Birmingham City Council

CP NUMBER: CP778

SITE CODE: BGW-A

PLANNING APP. NO: -

OASIS REFERENCE: northpen3-63488

PRINT DATE: 23/11/2009

GRID REFERENCE: NGR SP 078 870

Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

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SUMMARY

In 2009, North Pennines Archaeology Ltd were commissioned by Wardell Armstrong LLP, on behalf of their clients Birmingham City Council, to undertake an archaeological excavation in advance of re-development at the site of the Former Belmont Row Glassworks, Belmont Row, Birmingham, West Midlands (NGR SP 078 870). University of Leicester Archaeological Services undertook an archaeological evaluation of the site in 2007 (ULAS 2007), following which an open area excavation was undertaken by Archaeological Project Services (Peachey 2008). This work identified a number of historic structures and features within the site and its environs which were likely to be impacted upon by the proposed development of the Birmingham Eastside Technology Park, most notably the remains of a circular brick-built structure interpreted as a glass-making cone. As a result, the Birmingham City Planning Archaeologist granted planning consent for the development, on the condition that a second phase of Archaeological Investigation was undertaken in advance of the proposed development.

The Archaeological Excavation was undertaken over 15 days between the 13th and 31st July 2009. The excavation uncovered and recorded the western half of the presumed cone structure, together with a series of later features and dump deposits. In addition, a series of walls and floors were recorded as part of the programme of strip and record. These related to the late 19th and early 20th century development of the site following the cessation of glass-making activities.

The results of the excavation have enabled a full record of the 19th and 20th century industrial structures on the site to be compiled prior to redevelopment. The archaeological structures, together with finds and samples recovered during the excavation, have highlighted the industrial processes that took place on the site. The preservation by record of these structures thus represents an important addition to the corpus of information regarding the industrial development of the City of Birmingham during this period.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank Helen Martin-Bacon, Principal Heritage Consultant for Wardell Armstrong LLP, for commissioning the project, and for all her assistance throughout the work. NPA Ltd would also like to thank Dr. Mike Hodder, Birmingham City Planning Archaeologist, for all his assistance throughout the project.

North Pennines Archaeology Ltd would also like to extend their thanks to Donna Heath of MACE, and all staff at the site for their help during this project.

The archaeological excavation was undertaken by Nigel Cavanagh, Tony Liddell, Mike McElligott and Shaun Johnson. The report was written by Nigel Cavanagh and the drawings were produced by Nigel Cavanagh, Mike McElligott and Natalie Ward. The ceramic assemblage and report was undertaken by Barbara Blenkinship. The project was managed by Martin Railton, Project Manager for NPA Ltd. The report was edited by Martin Railton, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

- 1.1.1 In July 2009, North Pennines Archaeology were invited by Wardell Armstrong LLP, on behalf of their clients, Birmingham City Council, to undertake an archaeological excavation at Belmont Row Glassworks, Eastside, Birmingham, West Midlands (NGR SP 078 870; Figure 1), in advance of groundworks associated with the development of the proposed Eastside Technology Park. Previous desk-based assessment (Cook 2001), archaeological evaluation (ULAS 2007) and excavation (Peachey 2008) had highlighted the survival of a number of historic structures and features within the development area that were likely to be impacted upon by the proposed development. As a result, Dr. Mike Hodder, Birmingham City Planning Archaeologist, requested that a further programme of archaeological investigation be implemented in advance of the development. This is in line with government advice as set out in the DoE Planning Policy Guidance on Archaeology and Planning (PPG 16).
- 1.1.2 All stages of the archaeological work were undertaken following approved statutory guidelines (IfA 2002), and were consistent with the Specification for Archaeological Investigation provided by Wardell Armstrong (Martin-Bacon 2008) and generally accepted best practice.
- 1.1.3 This report outlines the archaeological works undertaken on-site, the subsequent programme of post-fieldwork analysis, and the results of this scheme of archaeological works.

2 METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 A project specification was submitted by Wardell Armstrong LLP in response to a request by Birmingham City Council, for an archaeological excavation of the study area. Following acceptance of the project specification by Dr. Mike Hodder, Birmingham City Planning Archaeologist, North Pennines Archaeology Ltd was commissioned by Wardell Armstrong LLP to undertake the work. The project specification was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 THE ARCHAEOLOGICAL EXCAVATION

2.2.1 The work involved the initial stripping and recording of an area measuring 26m x 13m, followed by the targeted excavation of a 15m x 15m area that was focussed upon the remainder of the presumed glass-making cone that had previously been identified and partially exposed during excavation in 2007 (Peachey 2008).

2.2.2 The aims and principal methodology of the excavation can be summarised as follows:

- To provide a permanent record of the remains of the Belmont Row Glassworks prior to redevelopment;
- To provide a record of later archaeological or structural remains that may be disturbed by the development;
- To establish the date, nature and function of the cone;
- To disseminate the results of the excavation through an appropriate level of publication;
- To accurately tie the excavation area into the National Grid at an appropriate scale, with any archaeological deposits and features adequately levelled;
- To produce a photographic record of all contexts using 35mm colour slide and monochrome formats as applicable, each photograph including a graduated metric scale;
- To recover artefactual material, especially that useful for dating purposes;

- To produce a site archive in accordance with MAP2 (English Heritage 1991) and MoRPHE standards (English Heritage 2006).

2.3 THE ARCHIVE

- 2.3.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive will be deposited with Birmingham Museum and Art Gallery, with copies of the report sent to the Birmingham City Sites and Monuments Record, available upon request. The archive can be accessed under the unique project identifier NPA09, BGW-A, CP 778/09.
- 2.3.2 North Pennines Archaeology, and Birmingham City Council, support the **Online AccesS to the Index of Archaeological InvestigationS (OASIS)** project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, as a part of this national project.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

- 3.1.1 Belmont Row lies approximately 1.5km to the north-east of Birmingham city centre, in the Nechells district of the city (Figure 1). It is located immediately to the south of the A4540 Dartmouth Circus / A47 Jennens Road roundabout (Figure 2). The site lies at a height of approximately 117m AOD and is bounded to the south by Belmont Row, to the west by a landscaped area of mature trees (the site of the former Belmont Chapel) flanking the A47 Jennens Road, and to the west and north-west by open waste ground that was formerly occupied by industrial buildings. The Digbeth Branch Canal passes from south-west to north-east to the north of the site.
- 3.1.2 At the time of the excavation, the site consisted of a standing, derelict factory building (the former Co-Op building) facing Belmont Row, together with a large expanse of concrete slab to the north, which represented the floor of a second recently-demolished factory building (the former Northern Lights building). In the northern part of the building were the standing remains of a partially-demolished boundary wall, together with a large dump of brick rubble that had been taped-off due to the presence of Japanese Knotweed. To the west of the standing wall lay a World War II air-raid shelter, the entrance to which was partly silted up and obscured by mature trees and shrubs. The remainder of the site consisted of open waste ground, which was under a cover of weeds, brambles and wild flowers.
- 3.1.3 The underlying geology is Bromsgrove Sandstone with overlying Moranic Drift, glacial sand, gravel and Alluvium (SSEW 1984).

3.2 HISTORICAL CONTEXT

- 3.2.1 *Introduction:* this historical background is compiled mostly from secondary sources, and is intended only as a brief summary of historical developments specific to the study area.
- 3.2.2 *Glass-making Technology:* the development of the glass-making industry in the post-medieval period dates to the influx of migrant French glass-workers in the latter half of the 16th century. Although there is considerable variation between sites, the distinctive furnace type associated with this period is the “winged” furnace, in which the central melting furnace is flanked by either two or four annealing chambers (Crossley 1990, 229). During the 17th century, coal began to replace charcoal as a fuel and it is the requirement to create a strong forced draught within the coal-fired furnace that is thought

to have led to the development of the characteristic glass “cone” in circa 1700 (ibid.). The excavation of a circa 1740 cone at Gawber, Yorkshire, together with consideration of the standing cone at Catcliffe, Yorkshire, have demonstrated the way in which glass cones functioned. An arrangement of sub-floor flues drew air from the exterior of the kiln into the central furnace. The cone itself extended over the working area surrounding the furnace, the exterior wall of the cone being pierced by a number of openings to allow the glassworkers access. The cone was open at the top and, in the manner of a chimney, induced a massive draught that fired the furnace and which also helped to draw fumes and smoke away from the working floor.

- 3.2.3 *The Birmingham Glass Industry*: the history of glass production in Birmingham dates to the latter part of the 18th century, when the establishment of the canal system made it economic to bring bulk raw materials in to the city and to transport the finished products safely. The earliest documented glass-house was established in the city by Mayer Oppenheim in 1757. Thereafter, the production of flint glass became an important industry within the city, reaching its peak in the mid 1800s before declining in the face of cheaper foreign imports in the latter half of the century (Peachey 2008).
- 3.2.4 *Belmont Row Glassworks*: the Belmont Row Glassworks is thought to have been established in the early years of the 19th century. A significant entry in *Chapman’s Birmingham Directory* of 1803, lists George Madeley, a China and Earthenware Manufacturer, of Belmont (*sic*) Row, Ashted. An advertisement for glass cutter vacancies at Madeley, Hodson and Co.’s China, Glass and Earthenware Manufactory, Ashted, near Birmingham, appeared in *Aris’s Birmingham Gazette* of 7th July 1806, suggesting that the firm had diversified into glass production by that date.
- 3.2.5 A further reference to George Madeley is contained in the *London Gazette* of 7th April 1807 (Buckley 1927, 384). This notes the retirement of a G. Madeley from his partnership with ‘William Hodson, William Haywood, Phillip Frederick Muntz and Joseph Roberts of Birmingham, China and Glass Manufacturers trading under the firm Madeley, Hodson and Co.’ The remaining partners continued to trade under the name of ‘Haywood, Hodson and Co.’ for several months until, as reported in the *London Gazette* of 19th September 1807, the partnership was dissolved and William Hodson resolved ‘to carry on the business on his own separate account’ (Buckley 1927, 384). *Chapman’s Directory* of 1808 lists Hodson as ‘Hodgson [*sic*] Wm, Glass Manufacturers, Great Brook Street’ (now Jennens Road).

- 3.2.6 The Belmont Row Glassworks is thought to have been acquired by the Birmingham glassmakers Thomas and Rice Harris. In the early 19th century, the Harrises operated a glassworks near Fazeley Street, their firm of Harris, Thomas and Hawkes being listed in the 1803 edition of *Chapman's Directory*. In June 1811 they obtained the lease on 'Belmont Glass House' which *Aris's Birmingham Gazette* of 8th April 1811 reported as being put up for sale or lease by its current owners, P. F. Muntz and W. Haywood. This is thought to have been the site marked on the 1889 map as "Belmont Glass Works". However, it is possible that the Belmont Row site was also acquired by the Harrises at this time, since *Aris's Birmingham Gazette* of 23rd September 1811 refers to the site as 'lately occupied by Messrs. Madeley, Hodson and Company,'
- 3.2.7 The Harrises continued to operate from the Belmont Glassworks site under a number of different names and with a number of partners until 1829, when *Wrightson's Directory* records the site as 'William Gammon and Co., Belmont Glassworks, Great Brook Street'. The Gammon family retained control of the glassworks until its eventual closure in circa 1897.
- 3.2.8 *Later Site History- Circa 1852:* The 1852 Piggott Smith map (Figure 3) shows a number of buildings on and in the vicinity of the site. In particular, a large circular structure is shown to the north-east of the site, together with two somewhat smaller circular structures in the northern part of the site. The most likely interpretation of these structures, given the history of the site and its environs, is that they represent glass-making cones. To the north-east, the large circular structure is surrounded by a complex arrangement of ancillary buildings, whilst the two smaller circular structures appear to be incorporated into an L-shaped range of buildings. The map thus appears to depict two distinct glass-making complexes, and although the picture is by no means clear, it is probable that the map depicts the buildings of the Belmont Glassworks to the east and those on the site of the former Belmont Row Glassworks (by 1852 incorporated into the Belmont Glassworks) to the west.
- 3.2.9 The map depicts the southern part of the site as relatively open, consisting of a series of rectangular buildings arranged around open courtyards. These probably represent small workshops or industrial buildings.
- 3.2.10 *Later Site History- Circa 1889:* the 1889 Ordnance Survey map (Figure 4) shows a very mixed pattern of land use in and around the vicinity of the site. To the north of the site is an irregular-shaped yard, marked "Court No. 1", with an access way leading to Prospect Row. On the eastern side of the court is a double range of small buildings which appear to be a terrace of domestic "back to back" houses. To the east of the terrace is a small yard area, which is bounded to the east by a north-to south-aligned boundary wall. To the

east of the boundary wall is an open area, and to the east of this lie the buildings of the Belmont Glass Works.

- 3.2.11 To the west of "Court No. 1" lie a series of small buildings which front Prospect Row. These probably represent a mix of small workshops and residential properties; one building is marked "Smithy". To the south of the "smithy" lies a large rectangular building which fronts Belmont Row. This is "Belmont Chapel", marked "Wesleyan Methodist, seats for 1000". A room at the rear of the chapel is marked "Class Rooms".
- 3.2.12 To the north-east of the chapel is a large L-shaped building, with two small yards to the east. To the south of the building lies an apparent boundary wall, and to the south of this is a complex of small workshops and yards which extends over the remainder of the site. Two of the buildings are marked "Corn Mill" and "Safe Manufactory", whilst to the east of the site, a building marked "Model Lodging House" again emphasises the diverse nature of late 19th century land use in this part of Birmingham.
- 3.2.13 *Later Site History- Circa 1905:* the 1905 Ordnance Survey map (Figure 5) shows the plan of the existing office building which fronts Belmont Row. This structure is marked with an "1899" date stone. To the rear (north) of the office building, the majority of the site is occupied by a large factory building. At the northern end of the site, an extension has been built onto the eastern end of the L-shaped building noted on the 1889 map.
- 3.2.14 To the north and north-west of the site, the pattern of land occupation appears to be relatively unchanged from that depicted on the 1889 map. However, to the east, the site of the Belmont Glassworks has largely been cleared and is now marked "Timber Yard". The north-eastern part of the current site is still depicted as open land, bounded to the west by the wall noted on the 1889 map and to the east by the boundary wall of the timber yard.
- 3.2.15 *Later Site History- Circa 1918:* the general pattern of land use depicted on the 1918 map (Figure 6) is again similar to that shown on the 1905 map. The main point of interest is that a large building has been constructed on the area of open ground in the north-eastern part of the site. The western wall of this structure appears contiguous with the north-to south boundary wall noted on the 1889 map, whilst the eastern wall extends into the area of the former timber yard. To the south of the new building, there appear to have been some re-alignment and consolidation of the property boundaries, together with some redevelopment of the buildings fronting Belmont Row to the east of the current site.
- 3.2.16 *Later History- Circa 1946:* the 1946 Ordnance Survey map (Figure 7) shows some alterations in the plan of the factory buildings. In essence, the northern

building has been extended to form a single structure with the office block. In the process of this, the western wall of the northern building has been re-established somewhat to the east of its original line. The building itself is now marked "*Bedstead Works*". On the eastern side of the building lies a courtyard containing some small outbuildings, which is accessed via a covered entranceway from Belmont Row.

- 3.2.17 At the northern end of the site, the L-shaped building noted on the 1889 map has been demolished and a new boundary wall established on the western limit of the site.
- 3.2.13 The large building that was established in the north-eastern part of the site by 1918 is now marked "*Bakery*". To the west of the site, the Belmont Chapel building is no longer marked as such, and is thus probably out of use. The site to the east of the current site is now marked as "*Corporation Yard*". Other buildings in the vicinity of the site are marked "*Suffolk Works (Paint and Varnish)*", "*Saw Mills*", "*Belmont Metal Works*", "*Electric Car Works*" and "*Lamp Works*".

3.3 PREVIOUS WORK

- 3.3.1 A desk-based assessment was undertaken in 2001, which highlighted the probable survival of below-ground features associated with glass-making in the vicinity of the site (Cook 2001).
- 3.3.2 An archaeological evaluation was conducted in 2007 by University of Leicester Archaeological Services. This focused upon the site of the Belmont Row Glassworks, together with the sites of the Belmont Glassworks and the Ashted Pumping Station to the east (ULAS 2007). The evaluation confirmed the presence of features thought to be associated with the Belmont Row Glassworks. An archaeological excavation was subsequently carried out on the site by Archaeological Project Services, identifying the eastern half of a circular brick structure that was thought to represent the remains of a glass-working cone (Peachey 2008). Finds recovered during the excavation included fragments of glass-working crucibles and ceramic material that was indicative of pottery manufacture (ibid.).

4 ARCHAEOLOGICAL EXCAVATION REPORT

4.1 INTRODUCTION

4.1.1 An archaeological excavation took place at the site of the former Belmont Row Glassworks, Belmont Row, Birmingham, from the 13th to the 31st July 2009. The work was undertaken for Wardell Armstrong LLP on behalf of Birmingham City Council and involved the initial stripping and recording of an area measuring 26m x 13m, followed by the targeted excavation of a 15m x 15m area that was focussed upon a circular brick structure that was identified and partially exposed during a previous excavation (Peachey 2008). In the following text, context numbers in round brackets () refer to deposits, square brackets [] to cuts and angled brackets < > to structures.

4.2 PHASE 1: EARLY 19TH CENTURY (FIGURE 8)

4.2.1 The earliest archaeological activity encountered during the excavation consisted of the remains of a circular brick-built structure <1107> (Plate 1) that represented the western half of the presumed glass-working cone that had been exposed and recorded immediately to the east of the current excavation area (Peachey 2008). The structure had a diameter of 10.50m and was set within a vertical-sided construction cut [1088]=[1085]=[1096] that had been excavated into the underlying natural sand and clay deposits (1056).

4.2.2 <1107> consisted of three distinct sections of wall foundations, <1059>, <1094> and <1097>, the upstanding portion of the structure having been demolished down to foundation level. All three foundations were constructed of moulded, unfroged red bricks that measured 230mm x 110mm x 80mm in size, arranged in alternate courses of headers and stretchers.

4.2.3 The depth of the foundations varied considerably. <1094> was nine courses deep, whilst <1097> was estimated to have been seven courses deep. Three courses of <1097> remained in-situ, the four upper courses having been robbed out and the cut [1085] backfilled with rubble (1086). The southern end of <1059> was again eight courses deep, whilst the central portion was fourteen courses deep. The transition from the shallow to the deeper foundation was identified 2.10m from the southern end of <1059>, there being a clear vertical edge marking the limit of the deeper foundation courses (Plate 2).

- 4.2.4 No original internal features survived within Structure <1107> other than the badly truncated remains of an in-situ burnt deposit (1068). (1068) was 0.30m deep and consisted of heat-affected, fired natural sand. Fragments of burnt red brick were noted on the upper surface of the deposit and the likelihood is that (1068) represented the bedding layer for a brick-built furnace or kiln floor that had subsequently been removed or demolished. Following other examples excavated by the author (cf Hightown Glassworks, Castleford), the heat damage to (1068) is likely to have occurred by convection acting through the kiln floor, rather than by direct heating.
- 4.2.5 No evidence of sub-floor features, such as furnace flues, remained within <1107>. However, given the apparent demolition of the structure to sub-floor level and the subsequent extensive disturbance of the interior of the structure by later features (see below) it is not possible to say with certainty that no sub-floor flues originally existed.
- 4.2.6 Although no diagnostic structures remained within <1107>, the fact that the circuit of foundations appeared to be discontinuous, together with the varying depth of the foundations, gave an indication to the original function of the structure. In the case of the Catcliffe Glass Cone, which stands to its full height, the outer circuit of the cone is pierced by a series of large arched openings at ground level, which give access to the central furnace and the glass-working area (Crossley 1990). Following this example, it is likely that the deeper parts of the foundations of <1107> were designed to bear the load of solid brickwork above, whilst the shallower parts were situated below openings in the structure.
- 4.2.7 Given that the circuit of <1107> was pierced by a number of large openings, it follows that the structure was most likely to have been a glass cone, rather than a "bottle" kiln producing pottery. Whilst glass cones exhibit pierced, open sides, "bottle" kilns generally only have one or two small entrances through which the kiln is loaded. In all standing examples (e.g. Gladstone Pottery, Staffordshire, see Cossons 1975) the circuit of the wall is continuous, and the foundations may therefore be expected to be of a uniform depth in order to distribute the weight of the solid walls evenly. This differing morphology reflects the ways in which the structures functioned. In the glass cone, the glass furnace is a relatively small structure set in the centre of the cone, the remaining area within the cone acting as a sheltered, ventilated working space for the glass-makers. In the "bottle" kiln, the entire space encompassed by the walls is stacked with pottery and heated, there being no requirement, or indeed possibility, of human access to the centre of the structure whilst firing was taking place.



Plate 1: Structure 1107, Foundation 1059. Facing North.



Plate 2: Detail of Foundation 1059, showing stepped brickwork. Facing North.

- 4.2.8 Situated immediately to the south of <1094> were the remains of a small brick-built structure <1080>. <1080> was 2.0m long, 0.80m wide and had a keyhole-shaped plan. It survived to a maximum of three courses in height and was constructed of unfrosted red bricks that measured 230mm x 80mm x 110mm. A brick floor <1081> survived in the northern part of <1080> and was overlaid by a thin deposit of ash (1083). <1080> butted <1107> and may represent a small glass-annealing furnace (Plate 3).
- 4.2.9 To the west of <1080> the natural sands and clays were cut by a linear feature that ran from north to south [1089]. [1089] was 8.60m long and 2.50m wide, with a well-defined vertical western edge and a much more amorphous, shallow sloping western edge. The likelihood is that the feature represented a robbed-out foundation cut for an outbuilding or external structure associated with <1107>. The silty backfill (1053) contained quantities of ash and charcoal.



Plate 3: Structure 1080. Facing North-east.



Plate 4: Structure 1057. Facing West.

4.3 PHASE 2: MID 19TH CENTURY (FIGURE 8)

- 4.3.1 Two later structures, <1060> and <1057>, were located within the interior of <1107>. <1060> butted the inner face of Cone Foundation <1059> and was rectangular in plan, with dimensions of 2.61m x 0.82m. It was formed from unfrosted red brick and survived to a height of five courses. The structure incorporated two narrow parallel brick-lined troughs or flues that were filled with ash (1061).
- 4.3.2 <1060> was cut to the north by a brick-built trough-like feature, <1057> that also cut through Foundation <1059>. <1057> was 1.04m long, 0.50m wide and had a brick base (Plate 4). The base of the structure appeared to be heat-affected, whilst the interior was filled by an ashy deposit (1058).
- 4.3.3 Owing to later truncation, it was not possible to discern the full extent and function of <1057> and <1060>. However, the evidence of heat-affected brickwork and the ashy fills of the features suggest that they may have been part of a later kiln structure, established after the demolition of <1107>.

- 4.3.4 The interior of <1107> was crossed by two fragments of wall, <1050> and <1051>, that ran on a parallel east to west alignment. Both walls were constructed from unfroged bricks that measured 240mm x 110mm x 80mm, arranged in alternate courses of headers and stretchers. The eastern ends of these walls were recorded as Walls 133 and 134 during the APS excavation (Peachey 2008), where they were dated on cartographic evidence to circa 1850 to 1855 (ibid.).
- 4.3.5 The western ends of <1050> and <1051> were cut away by later features, so their true extents could not be determined. No other features or structures encountered during the excavation appeared to be associated with the walls.
- 4.3.6 <1051> and <1050> were succeeded by a later structure, the archaeological evidence for which consisted of five massive brick-built stanchions:- <1063>, <1064>, <1071>, <1076> and <1079>. Each stanchion was constructed upon a 0.30m deep concrete bedding layer and was set into an individual rectangular foundation cut:- [1103], [1105], [1065], [1074] and [1077] that were cut through (1068) into the underlying natural sands. The stanchions were rectangular in plan, with the courses of bricks being stepped, the base of each stanchion being 1m square, whilst the surviving upper part measured 0.75m x 0.75m (Plate 5). The bricks themselves were large blue/black machine-moulded froged and unfroged bricks that measured 230mm x 110mm x 80mm. One example, a froged brick from <1076>, was marked "B B". No other bricks of this type or size were noted in any of the other excavated or recorded structures.
- 4.3.7 The linear arrangement of the stanchions suggests that they may have acted as pile foundations for a substantial east to west aligned wall. However, no trace of this structure survived, suggesting that it had subsequently been demolished down to ground level. The likely date range of this structure is from circa 1855 to 1880, there being no evidence of a building at this location on the 1889 Ordnance Survey Map.
- 4.3.8 <1071>, <1076> and <1079> were sealed by a sequence of shallow demolition deposits (1067) and (1055). (1055) was cut by an east-to west aligned vertical-sided cut, [1054], that contained a large glazed ceramic drain set in concrete <1072>.



Plate 5: Site working shot showing Stanchions 1063, 1064, 1071, 1076 and 1079. Facing South.

4.4 PHASE 3: LATER 19TH CENTURY (FIGURE 10)

- 4.4.1 [1054] was sealed by a mixed dump deposit (1048) that extended over the Phase 1 and 2 features. To the west, (1048) was cut by a 1.0m square brick-lined soakaway <1044>. This feature was constructed from hand-moulded, possibly re-used red bricks that measured 240mm x 100mm x 70mm and was filled by a silty sand deposit (1045) that contained ash and slag. In the north-eastern part of the excavation area, a 0.75m x 2.50m x 0.20m deep deposit of sand, ash and clinker, (1047), formed a discrete dump above (1048). (1047) was of interest in that it contained visible glass-working residues.
- 4.4.2 <1044> and (1047) were sealed by a second mixed dump deposit (1042) that extended over the entire excavation area.
- 4.4.3 (1042) was cut by a vertical-sided, north to south-aligned foundation cut [1069] that contained a massive brick boundary wall <1032>. <1032> was made from machine-moulded red bricks laid in English bond. At the

northern limit of the excavation area, the wall survived to its full height of approximately 4m above ground level. [1069] was backfilled by a silty sand deposit (1090) that was remarkable in that it contained quantities of obvious diagnostic glass-working waste.

- 4.4.4 <1032> represents a north to south boundary wall that is shown on the 1889 Ordnance Survey map.
- 4.4.5 To the west of <1032>, (1042) was cut by a number of features. A fragment of brick wall <1043> was located towards the southern end of the excavation area. <1043> ran for 2.0m in a north to south alignment before returning towards the east for a distance of 1.0m. The wall survived to a height of 5 courses and was formed from unfrosted hand-moulded bricks that were 100mm x 90mm x 220mm in size. <1043> was laid in English Bond and was bonded with a sandy lime mortar.
- 4.4.6 A 4.2m x 5.10m fragment of brick flooring <1033> was situated 0.88m to the north of <1043>. <1033> was constructed of worn, edge-laid unfrosted hand-moulded bricks that measured 230mm x 60mm x 100mm (Plate 6). The floor was divided from east to west by a single course of bricks <1034> that appeared to represent the remains of a partition wall. Both the floor and dividing wall were covered by a deposit of ash and clinker (1046).
- 4.4.7 Situated to the west of <1033> was a section of curvilinear walling <1036>. <1036> survived to only one course of brickwork in height and probably represented the remains of a small structure, such as a coal bunker.
- 4.4.8 The relationship between <1036> and <1033> was obscured by a later robbed-out wall foundation cut [1035]. [1035] was 0.50m wide and ran for 7.0m in a north to south direction, before returning to the east for a further 3.40m. The eastern end of the feature appeared to butt <1032>.
- 4.4.9 <1043>, <1034>, <1036>, <1033> and [1035] all lie in an area marked on the 1889 Ordnance Survey map as an open yard. They are therefore likely to represent the remains of outbuildings or other small temporary structures, rather than industrial facilities.
- 4.4.10 In the southern part of the site, a series of foundations were uncovered which were cut into Deposit 1042. In essence, these consisted of two long parallel east to west walls, <1012> and <1017>, together with a series of associated north-to-south <1006>, <1007>, <1008>, <1009>, <1010>, <1014>, <1019> and east-to-west <1011>, <1013>, <1016>, <1018> dividing walls. All the walls were constructed of similar hand-moulded unfrosted red bricks that measured 240mm x 110mm x 80mm.
- 4.4.11 The eastern end of <1017> respected <1032> whilst the structure itself coincides with an east-to west boundary wall shown on the 1889 map. The

remaining walls appear to relate to a series of apparent workshop buildings located to the south of the boundary wall. <1012>, <1013>, <1014> and <1016> in particular all form good correlations with building walls shown on the 1889 map.

- 4.4.12 To the north of <1017>, two fragments of wall <1020> and <1021> formed a right-angled return that correlated to the south-eastern corner of a large L-shaped building shown on the 1889 map. The walls were laid in alternate header and stretcher bond and were constructed from unfrogged bricks that measured 220mm x 100mm x 60mm. A brick floor <1108> was partially exposed in the angle between the walls.
- 4.4.13 A series of shallow tile and brick-laid drains [1040], [1039] and [1038] ran in a south-easterly direction from building <1020>/<1021>. All three drains were open, rather than sealed, and probably represented surface water yard drains.



Plate 6: Floor 1033. Facing West.

4.5 PHASE 4: 20TH CENTURY (FIGURE 11)

- 4.5.1 The cartographic evidence indicates that an extensive phase of development took place on the site at around the turn of the century, involving the

construction of the existing office building facing Belmont Row (the former Co-op building) and the construction of an attached factory building to the north (the former Northern Lights building). These are both shown on the Ordnance Survey map of 1905. The buildings represented by <1006> to <1014>, <1016>, <1018> and <1019> were all superceded by the new factory building and were demolished to foundation level.

- 4.5.2 <1017> was retained and formed the northern wall of the new factory building, whilst a new wall, <1004>, represented the eastern limit of the building. A new north to south aligned wall <1003> was also probably constructed at this time, representing an internal wall within the new building. A well-preserved brick floor <1005> survived within the room delineated by <1003> and <1004> (Plate 7).
- 4.5.3 A series of concrete and brick-built stanchions towards the western limit of the site:- <1026>, <1027>, <1028> and <1029> probably represented roof supports for the new factory building. An infilled, brick-built inspection pit <1015> also probably dates from this period.
- 4.5.4 The cartographic evidence indicates that the factory building was remodelled during the period 1918-1946. <1001=1002>, <1004> and <1031> represent the exterior walls of this latter structure. Four large concrete stanchions:- <1022>, <1023>, <1024> and <1025> represent supports for the roof of the later building, whilst the floor was formed by a concrete slab <1030> that sealed <1005> and the foundations of <1017>.
- 4.5.5 The final phase of development consisted of the demolition of the L-shaped building to the north represented by <1020> and <1021> and the construction of a large, semi-sunken air raid shelter <1000> during World War II. Shelter <1000> (Fig. 13) measured 17.20m x 10.40m and was constructed of 0.32m thick steel reinforced concrete, the reinforcing bars being 10mm and 20mm thick. It was set into a large vertical-sided construction cut [1098] that was clearly visible running along the southern edge of the structure. The eastern edge of the foundation cut was defined by <1032>, the concrete of the eastern wall of the shelter being poured directly against the upstanding brickwork of <1032>. The imprints of timber planks were visible on all the other concrete faces of the shelter, indicating that the concrete had poured into a system of timber shuttering. The foundation cut itself was estimated to be circa 3m deep.
- 4.5.6 The interior of the shelter was divided into four chambers, separated by east-to-west aligned blast walls, with a further two offices or storerooms located along the eastern wall. The exterior walls and the southern-most internal wall were constructed of 0.30m thick steel reinforced concrete, whilst the two blast walls and the office partition walls were built of 0.22 m

wide brick. Access was via a ramp on the southern side of the structure, which led to a covered portico and doorway.

- 4.5.7 The removal of the roof of the shelter showed it to have been used as a workshop and store-room during the post-war years. All of the artefacts visible within the shelter (storage shelves, a lighting test rig, an electrical heater and machine parts) appeared to relate to the post-war re-use of the structure, rather than being original surviving World War II features. The shelter appeared to have fallen into disuse relatively recently, the entrance ramp being subsequently backfilled with old tyres and refuse (Plate 8).

4.6 DISCUSSION AND CONCLUSION

- 4.6.1 The archaeological excavation uncovered the remains of a probable glass-working cone (Structure 1107) together with the badly-truncated remains of a probable later kiln (Structures 1060 and 1057). Dump deposits which sealed these features contained both glass-working residues and pottery wasters. Leaving aside the possibility that the material was imported into the site, it would appear that both glass and pottery production took place on the site. However, the volume of pottery and glass residues recovered was relatively small, reflecting the post-deposition movement of material across the site, the targeted nature of the excavation, and the relatively short period of production.
- 4.6.2 Whilst the differing depths of the foundations of <1107> were in accordance with the pierced outer wall of a glass-making cone, no original features, such as flues, floor or a furnace base, survived within the circuit of the wall. Nevertheless, the partial survival of an in-situ sub-floor burnt deposit was conclusive evidence that a furnace had indeed been situated within the structure.
- 4.6.3 Very little survived of <1060> and <1057>. However, the fact that both contained large quantities of fuel ash reinforced the interpretation that they formed part of a later kiln structure.
- 4.6.4 The Belmont Row glassworks is thought to have been founded in circa 1806. The 1852 Piggott Smith map shows the distinctive outline of two cone structures, the southernmost of which is located approximately 10m to the north of <1107>. Although the theory has been put forward that structure <1107> may be a pottery kiln of "bottle" type (Peachey 2008) the likelihood is that it represents an early 19th century glass-making cone that had been superseded by those shown on the map. An east to west-aligned building is shown on the map, its footprint extending over the northern part of <1107>. Since this is also the area where later probable kiln features <1060> and <1057> were located, it is possible that the building represents part of a small

pottery works that was established over the remains of <1107> by the mid 19th century.

- 4.6.5 The 1889 Ordnance Survey map shows that by that date the eastern half of the site had been cleared of all the structures shown on the 1852 map. All glass and/or pottery production is likely to have ceased by this time. By 1889 the western part of the site as occupied by a series of small buildings representing small workshops. These were succeeded by an integrated factory and office complex in circa 1899. The results of the excavation and programme of Strip and Record thus highlighted a complex sequence of development of the site during the later 19 and 20th centuries.



Plate 7: Floor 1005. Facing North.



Plate 8: Entrance to Air Raid Shelter 1000. Facing East.

5 FINDS

5.1 FINDS ASSESSMENT

5.1.1 A total of 299 finds from eight different contexts were recovered during the excavation. These included 230 sherds of post-medieval pottery, which were mostly recovered from dump deposits. Other finds included fragments of kiln furniture, clay tobacco pipe and tile (Table 1).

5.1.2 The finds were cleaned and packaged according to standard guidelines, and recorded under the supervision of F.Giocco (NPA Ltd Technical Director). The metalwork was placed in a stable environment and was monitored for corrosion.

Context	Material	Quantity	Weight (kg)	Period
1042	Pottery	20	5.9	Post Medieval
1042	Pottery	14	1.13	Post Medieval
1042	Pottery	23	1.15	Post Medieval
1042	Tile	6	0.9	Post Medieval
1042	Glass	6	0.012	Post Medieval
1042	Glass, Waste Lump	1	0.52	Post Medieval
1042	Clay Pipe	4	0.011	Post Medieval
1042	Pottery	81	1.25	Post Medieval
1048	Crucible	1	1.773	Post Medieval
1048	Saggar	1	0.427	Post Medieval
1048	Fused Glass Waste	1	0.356	Post Medieval
1049	Pottery	15	0.55	Post Medieval
1049	Tile	2	1.676	Post Medieval
1066	Clay Pipe	9	0.042	Post Medieval
1066	Pottery	11	0.036	Post Medieval
1066	Crucible	4	0.939	Post Medieval
1055	Pottery	19	0.178	Post Medieval
1055	Clay Pipe	7	0.015	Post Medieval
1055	Tile	2	0.1	Post Medieval
1055	Crucible	1	0.499	Post Medieval
1055	Glass	1	0.016	Post Medieval
1084	Pottery	39	0.965	Post Medieval
1048	Kiln Peg	1	0.028	Post Medieval
1048	Clay Pipe	1	0.004	Post Medieval
1048	Pottery/ Kiln waste	5	0.044	Post Medieval
1052	Pottery	2	0.06	Post Medieval
1052	Clay Pipe	1	0.005	Post Medieval
1043	Pottery	5	0.077	Post Medieval
1042	Kiln Waste/ Slag	1	0.12	Post Medieval
1053	Pottery	1	0.278	Post Medieval
1053	Pottery	10	0.053	Post Medieval
1053	Clay Pipe	4	0.022	Post Medieval
1053	Tile	2	0.378	Post Medieval
1053	Crucible Fragment	1	0.127	Post Medieval

Context	Material	Quantity	Weight (kg)	Period
1053	Pottery	2	0.106	Post Medieval
1053	Pottery	7	0.108	Post Medieval
1053	Pottery	2	0.771	Post Medieval
1053	Glass Waste/Slag	2	0.757	Post Medieval
1086	Tile	4	4.014	Post Medieval

Table 1: Finds Table of Artefacts Recovered from the excavation.

5.2 CERAMIC VESSELS

- 5.2.1 A total of 230 fragments of post-medieval ceramic vessels were recovered. This report identifies the types of ware found in each context and, where possible, provides an accurate date range for each group. In some cases that date range may be very wide where a type of ware was made for many decades and no diagnostic features exist.
- 5.2.2 Much of the material found was coarse redware with a black glaze. This type of ware was in general use by the start of the 17th century throughout an area extending from Yorkshire in the north to Herefordshire in the west and Kent in the south-east. It continued to be made until the end of the 19th century but the term Midlands Blackware is usually reserved for pots made during the 17th century, which are of certain specific forms. The South Staffordshire area tended to continue the pottery traditions of the 17th century longer than elsewhere but the shapes and types of blackware found at Belmont are mainly from the 18th century. The history of Midlands Yellowware runs from late 16th to the early 18th centuries; a small amount was included in the assemblage and probably dates to the latter period. Yellowware is made from buff-coloured clay covered with a warm honey coloured glaze (Brears, 1971).
- 5.2.3 In the descriptions which follow, many sherds are described as creamware, pearlware or whiteware. These terms are generally understood to follow the chronological development of fine earthenware in the Potteries. Creamware was refined and developed by Josiah Wedgwood about 1760. At first it had a rich creamy colour but, following refinement of the fabric, it became lighter in tone by the early years of the 19th century. The popularity of creamware eventually gave way to pearlware, which had been introduced about 1775. Pearlware used basically the same fabric as later creamware but with some slight modifications to produce a whiter base ready for the application of a bluish glaze which is easy to spot where it pools in crevices and round the inner foot ring. In the second half of the 19th century pearlware declined and was replaced by a colourless glaze over a white earthenware body, referred to as whiteware (Elliot 1986).
- 5.2.4 In cases where it has not been possible to attribute manufacture to any particular district, an attempt has been made to indicate the shape and

purpose of the original vessel, together with the colour of the fabric and visible inclusions.

5.2.5 The material within each context has been separated into groups of similar ware to make description easier and avoid repetition. A descriptive catalogue is presented in Table 2 below:-

Context	Description
1042	<p>20 sherds from a large, convex-sided storage pot with a base diameter of 25.5 cm and a height of 30.6 cm. The external width at the wide flat rim is approximately 43 cm. The inside is washed with a black glaze, the outside including the top of the rim is unglazed. Mid 18th century.</p> <p>16 pieces of a two handled brown stoneware storage pot with a base diameter of 23 cm and a neck diameter of 20 cm. The convex sides are decorated with rows of meandering dots and beads made with a rouletting tool. These designs were in use on dated pieces from 1783 and continued, undated, into the 19th century (Oswald, Hildyard & Hughes 1982). There is a recess for a matching lid but no shards from this were present. Probably made in Derbyshire or Nottinghamshire.</p> <p>One large sherd of a shallow basin with a wide, flat rim, glazed on the interior only with a fine quality black glaze over an orange/red body tempered with red clay grog and tiny, seed-like rounded grit. 18th century.</p> <p>Two pieces of brown salt-glazed stoneware bottles. They are unglazed inside and are likely to be pre-1850, after this date most were covered with a liquid glaze inside and out.</p> <p>One sherd from a stoneware vessel with a turned footring and signs of having had decorative turning around the body.</p> <p>Two large sherds from a blackware storage pot, possibly from the same pot as the larger shard in 1053. Both the light orange fabric and the glaze are similar and the method of firing upside down is identical. The rim sherd has a missing section caused by it having to be forcibly separated from the pot on which it had stood during firing. Excess glaze had run down when molten and welded the two together. The form of the rim suggests that it was used as a butter pot. There is no provision for a recessed lid but instead an exterior convex roll under the rim, as well as providing strength, provides an ideal place to tie down a muslin cover with string. This is an early form dating to the later 17th or early 18th century.</p> <p>81 pieces of biscuit-fired porcelain which are semi-translucent. They are portions of at least six oval trays with flutes on the interior rims. These stands or under-trays were intended to protect a polished table from the heat of a teapot. The teapots had matching fluted sides in a style is known as "Hamilton Flute" which was fashionable for about ten years, Circa 1796-1806 (Emmerson, Coalport China Museum.pers. comm.)</p> <p>A fragment of the side and base of a blackware vessel, probably a bottle. This is difficult to date without the neck and rim but probably mid 18th century.</p> <p>Four sherds of 19th century glazed whiteware; one is the undecorated base of a small bowl or jug and is unidentifiable. The other three pieces are transfer printed in blue and one carries the backstamp of Elkin, Knight & Co. who worked at the Foley Potteries, Fenton from 1822 to 1826.</p> <p>Three pieces of glazed cream coloured earthenware, two are from flatware and one is a portion of the footring of a bowl. The plate(s) have clear evidence of utensil marks on the upper surface and wear to the base so had been in use for some time before being discarded.</p>

	<p>One sherd from an early creamware plate, signs of wear. 1760-70.</p> <p>4 small pieces of glazed blackware which are too small to identify or date.</p> <p>Two sherds of very highly fired red earthenware, probably parts of a jug. The glaze is a lustrous brown/shaded black. Probable Early 18th century.</p> <p>Two sherds of a hollowware vessel that join together. The thick glaze is known as mottled ware. This effect is produced by covering fine buff coloured ware with a yellowish lead glazed which is spotted or streaked with powdered manganese (Philpott 1985)</p>
1043	<p>Part of a large biscuit fired whiteware plate, very thickly potted. (See 1049)</p> <p>Two creamware shards, one a plate rim shard and the other from a bowl. Circa 1800.</p> <p>Two pieces of white salt-glazed stoneware. 18th century.</p>
1048	<p>The major portion of a large sagger peg with a deposit of cream coloured glaze on the inner end which supported a plate during firing. The glaze has run and caused the plate to stick to the peg leaving a parting scar on the top edge and the loss of the end of the peg. The plate would also have been discarded. 18th century.</p> <p>One fragment of a sagger pot with an estimated circumference of 40cm and a full height of 11cm. Mottled, mixed, slightly vitreous grey clay fabric, with frequent inclusions of grit, quartz and charcoal. Circa 1800.</p> <p>One section of the rim of a yellowware basin or pancheon, one piece of black glazed redware, one piece of unidentifiable whiteware and two pieces of extruded pipeclay used for clamping between the stacked saggars (Adams & Thomas 1996). Probably Circa 1800.</p>
1049	<p>Two pieces of a large, thickly potted, biscuitware platter without a foot ring (matches 1043)</p> <p>Two sherds from the base of a small tankard or jug having a clear glaze inside and sgraffito with applied blue decoration on the outside. Circa 1800</p> <p>A section of a creamware bowl rim which conjoins with the bowl rim section in 1043.</p> <p>A section of the outward curled rim of a creamware storage jar, probably intended for use in a dairy. Some loss of glaze on the outer surface under the rim. Early 19th century.</p> <p>Section of a yellowware pancheon rim.</p> <p>Three sherds of whiteware transfer printed with the willow pattern. All 1850+</p> <p>Two sherds of black glazed redware, the larger is a portion of the rim of a pancheon or basin, the other from a smaller bowl. Probably 18th century.</p> <p>Two sherds of Staffordshire ware; part of the rim of a saucer decorated with pink lustre and part of the rim of a small bowl glazed in green over a cream fabric and moulded with grapes and vine leaves. Both 19th century.</p> <p>A section from a small lid which has been dipped in blue glaze then engine turned to expose the white body beneath. This type of ware, now commonly known as Mochaware, is described in contemporary records as dipp'd ware. It was first produced in Staffordshire in the 1770's and was at it's height of popularity around 1830. It continued to be made right up to the end of the nineteenth century (Rickard 2006).</p>
1052	<p>Two sherds of blackware, one glazed on one side only over a light buff fabric with inclusions identical to those in the larger shard in 1053-9. (18th century.)</p> <p>The second sherd is of much finer, red bodied ware with laminations of yellow clay typical of Buckley ware, covered entirely with a very fine black glaze. Possibly 17th century.</p>
1053	<p>Nine sherds of a plate with a creamware glaze and plain rim. Four of the pieces fit together to form part of the plate well. There is no foot ring. 1780-1800.</p> <p>One sherd from an 18th century pearlware saucer painted in blue with a chinoiserie landscape scene. This particular design is known as the 'Umbrella Roof' pattern as the second storey of the pagoda is shaped like an umbrella. The maker is, as yet, unknown (Roberts 2006).</p>

	<p>Two sherds of a drinking vessel with buff fabric and a mottled glaze. Mottled ware was made in Staffordshire from the late 17th to the middle of the 18th century. The ware produced towards the end of this period becomes noticeably lighter in colour so the first quarter of the 18th century seems likely for these sherds.</p> <p>Part of a ribbed, extruded handle from a stoneware tankard. 18th century.</p> <p>One very small sherd of tin glazed earthenware decorated in blue with a floral design on a bluish glaze. 18th century.</p> <p>A portion of the foot ring and wall of a 19th century whiteware bowl. The foot ring shows signs of wear and the whole sherd appears to have been exposed to fire.</p> <p>Two sherds of black glazed redware. Impossible to date accurately.</p> <p>Fragments of the base and side of two black glazed earthenware pots. The smaller, straight-sided vessel has an 18 cm diameter base, fine redware fabric and is very well glazed on the inside and upper half of the outside. The larger vessel has a 25 cm diameter base and has a much coarser yellowish fabric with inclusions of crushed, fired red earthenware and white quartz. Like 1042, it has been placed in the kiln upside down and glaze from the vessel above has run on to the base and down the walls when the glaze fluxed during firing. However, the glaze on the base and sides of this pot is mottledware not blackware.</p>
1055	<p>Four sherds of coarse redware glazed on one side only, two of these conjoin.</p> <p>Four sections of ball clay setting pieces similar to that seen in 1066. Kiln furniture.</p> <p>Three sherds from a creamware plate without foot ring and one section of handle from a pearlware jug.</p> <p>One sherd each from a thick porcelain plate and from very fine one; also two small sherds of biscuit-fired porcelain.</p> <p>One sherd of a glazed white earthenware tea-bowl decorated with a chinoiserie pattern. There are faults in the glazing on the inner and outer surfaces which might indicate that this was a waster. Mid 19th century.</p> <p>One sherd of a white earthenware teacup with a pearlware glaze and the remains of the lower terminal of a handle.</p> <p>One sherd of biscuit fired white earthenware, possibly a plate rim.</p>
1066	<p>Three creamware sherds from separate hollow ware vessels. The smallest sherd is very finely thrown with an everted rim. 18th century.</p> <p>Same type as 1042 but thinner in section. This sherd is probably part of the rim of a saucer moulded with Hamilton Flutes as above.</p> <p>Eight pieces of kiln furniture which are all typically used in the manufacture of creamware:-</p> <p>a) Two hand-finished cockspurs, one with three legs and the other with four, and a section of a triform plate support with a diamond-shaped profile. These three items all show traces of glaze that has been transferred to their surface during firing.</p> <p>b) One short length of extruded clay with a profile of a five-pointed star, used as a saggur pin. Four pieces of white clay support which were originally 1cm in diameter before use. All these horizontal bars were used to suspend flatware in the saggars and were also made from creamware as any difference in colour might leave a noticeable scar where kiln furniture had touched the material (Barker 1990). Circa 1800-1840</p>
1084	<p>19 biscuit-fired sherds of several 22.5cm diameter earthenware plates with plain rims and bases turned to form a foot ring. The fabric colour of these shards is much lighter and they may have been intended for use with a cream-coloured or a pearlware glaze. Early 19th century.</p> <p>One small sherd of biscuit-fired white earthenware with a rim in the shape known as Royal.</p> <p>Four sherds of a biscuit-fired cream coloured earthenware dish or plate with a deep well and</p>

	<p>no foot ring. (This shape was made by both Spode and Wedgwood and possibly others). One sherd, which formed part of the well of one plate, is impressed with a capital "M". No record has been found of the use of this mark on this type of ware. Circa 1800-1810.</p> <p>Twelve pieces of kiln furniture of the type described in 1066-3.</p> <p>One sherd from a blackware bowl and another from a finer bowl of white earthenware that has been double-dipped in an iron-rich slip.</p> <p>One small, white earthenware sherd from the rim of a teacup or bowl which is decorated with a hardened-on blue transfer print. Circa 1830.</p>
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Table2: Descriptive pottery catalogue by context

- 5.2.6 The ceramic assemblage contains a mixture of fragmentary finished vessels (representing the dumping of worn and used material), together with kiln furniture and ceramic material in various stages of manufacture. These latter categories of material are clearly indicative of pottery production on or near the current site. However, all the material is from secondary dump deposits that in a number of cases also yielded glass-working residues, and so it is difficult to identify the sequence and location of production from the ceramics assemblage alone. It is clear that the pottery could not have been produced in the same kiln as glass due to the fact that, whilst porcelain vitrifies at about 1400°C, the same temperature as that needed to melt glass, it is heated and cooled at a controlled rate during the firing process. In contrast a glass kiln operates at the constant temperature necessary to maintain the molted glass at the correct viscosity.
- 5.2.7 The porcelain wasters recovered from the site are made of hybrid hard-paste porcelain which has been biscuit fired only. They are moulded in a shape known as "*Hamilton Flute*" (produced circa 1805-1810). The trays are of a size which fits a teapot of "*Old Oval*" shape (made between 1800-1805). Manufacturers of both "*Hamilton Flute*" and "*Old Oval*" teapots in hybrid hard-paste porcelain between 1800 and 1820 include the Staffordshire firms of Miles Mason (Lane Delph and Fenton) and the "Pattern Book" factory (thought to have been Wolfe and Hamilton of Stoke), and the Coalport firms of John Rose and Anstice, Horton and Thomas Rose.
- 5.2.8 If it were not for supporting documentary evidence, the small amount of kiln furniture and wasters is not sufficient to suggest that any ceramics were being manufactured on the site.

5.3 CLAY TOBACCO PIPE

- 5.3.1 A total of 16 fragments of clay tobacco pipe were recovered during the excavation. These were recovered from Deposits (1042), (1048), (1052), (1053) and (1066). Diagnostic pieces included a complete bowl from Deposit (1042), a substantially complete bowl from Deposit (1066), a bowl fragment from Deposit (1053) and a decorated bowl fragment from Deposit (1066). The

bowl fragment from Deposit (1066) has ribbed moulding on the rear seam and an initial on each side of the spur. The initials are difficult to decipher due to their small size and the iron staining on one side, but the clearer appears to be a cursive capital "W", whilst the other is probably a cursive capital "N", although it may have been distorted when it was removed from the mould.

- 5.3.2 All of the bowl fragments appear to date from the early to mid 19th century (cf Crossley 1990).

5.4 METAL OBJECTS

- 5.4.1 Two metallic artefacts were recovered during the excavation. Both were found within dump Deposit (1042). One object was a cast, decorated, looped copper alloy fitting that may have been the fastening of a pocket-watch chain or similar decorative item. The other was a tin alloy commemorative mourning badge or brooch that featured the cameo profile of an as-yet unidentified man. The back of the badge was of stamped metal, with the cameo, background and decorative surround being made of cut black glass in imitation of Whitby jet. The cheap nature of the materials suggests that this was a mass-produced item that was probably made in order to commemorate the death of a public figure. Pending the identification of the figure in the cameo, a nominal mid to late 19th century date is assigned to this artefact.

5.5 VESSEL GLASS

- 5.5.1 A single fragmentary glass vessel was recovered from dump Deposit (1042). This was a clear sherry or possible sundae glass, which stood to a height of 111mm. The vessel appeared to have been hand-blown, then cut and faceted along its sides; there was no surviving evidence of any mould lines or marks. The knop appeared to be integral with the bowl of the glass, whilst the foot was formed from a separate fused disc of glass. The fabric of the vessel was in a poor condition and suffering from surface lamination. The vessel is of probable 19th century date.

5.6 CRUCIBLES

- 5.6.1 A total of seven crucible fragments were recovered during the excavation. The most complete example came from Deposit (1048), representing the base and the sides of a flat-based, vase-shaped vessel. The base had a diameter of 90mm and the sides survived to a height of 270mm. The diameter of the crucible at its upper limit was 130mm, the sides being approximately 15mm

thick. A large lump of aerated, glassy residue adhered to the exterior of the crucible, and there were traces of a vitreous residue in the interior.

- 5.6.2 Deposit (1055) yielded the almost complete base of a second crucible, with a diameter of 110mm and a thickness of approximately 15mm. The interior contained traces of a metallic-looking residue. The remaining crucible fragments were body sherds from which it was not possible to reconstruct the dimensions of the complete vessels. Nevertheless, all contained industrial residues, with that from Deposit (1053) being coated in a glassy residue on its interior and exterior surfaces, whilst the sherds from Deposit (1066) contained aerated glassy residues that were notable for patches of a rich green colour, probably indicative of a high copper content.
- 5.6.3 The crucible fragments and associated residues appear consistent with the production of glass within a glass cone furnace of late 18th or 19th century date.

6 INDUSTRIAL RESIDUE ANALYSES

6.1 INTRODUCTION

- 6.1.1 During the excavation ten contexts were considered for industrial residue sampling. Each sample was recovered from stratified deposits. Samples <1> (1045), <5> (1053), <7> (1058), <8> (1066), <9> (1083) and <10> (1090) were all fill deposits. Samples <2> (1046), <3> (1047), <4> (1048) and <6> (1055) were discrete dump deposits. All ten of the samples were selected for processing in order to assess their industrial residue potential. This will help provide further information as to the industrial processes involved in their formation. The methodology employed required that the samples be broken down and split into their various components. This was achieved by a combination of water sieving and flotation. The recovered remains were then assessed for content.
- 6.1.2 Flotation separates the organic, floating fraction of the sample from the heavier mineral, artefact and waterlogged material content. Heavy soil and sediment content falls through the retentive mesh to settle on the bottom of the tank. Flotation produces a 'flot' and a 'residue' or 'retent' for examination, whilst the heavier sediment retained in the tank is discarded. The method relies purely on the variation in density of the recovered material to separate it from the soil matrix, allowing for the recovery of ecofacts and artefacts from the whole earth sample. Normally a whole sample would be flotted in one flot tank using a 1mm mesh. The purpose of conducting flotation on these samples was to extract industrial residues and potential archaeobotanical material that might provide further information as to the activities which were undertaken on the site. Following information from other glassworks sites such as Silkstone glassworks, Yorkshire (Dungworth and Cromwell 2006), it was felt that certain important residues would be lost if samples were processed in the normal way (specifically the fine hair-like glass threads indicative of glass-working). In particular, the crushed brick present in most samples had the potential to act as an abrasive agent during the floting process, damaging potential evidence of glass-working. In this case, it was felt that each sample should be wet sieved through a 4mm sieve to separate each sample into a coarse element and a fine element. This created two samples (one finer, one coarser), each of which was processed separately (creating two flots and two retents, where normally one flot and one retent would be produced). The coarse element was flotted through a 1mm mesh and the finer element was processed through a 0.5mm mesh. Although processed in two parts, each sample will

be discussed as a single unit as the two-part processing was primarily undertaken to protect delicate residues and aid analysis.

6.1.3 The retent, like the residue from wet sieving, will contain any larger items of bone, industrial residues or artefacts. The flot or floating fraction will generally contain organic material such as plant matter, fine bones, cloth, leather and insect remains, though in this case the potential for industrial residues to be trapped in the flot was also recognised. A rapid scan at this stage will allow further recommendations to be made as to the potential for further study by entomologists or palaeobotanists, with a view to retrieving vital economic information from the samples. Favourable preservation conditions can lead to the retrieval of organic remains that may produce a valuable suite of information in respect of the depositional environment of the material, which may include anthropogenic activity, seasonality and climate and elements of the economy. Nomenclature follows Stace (1997).

6.1.4 The contents of the samples are listed below in Table 3.

TABLE 3: ENVIRONMENTAL ANALYSIS FOR Belmont Lane Glassworks, Birmingham

Sample	1	2	3	4	5	6	7	8	9	10
Context	1045	1046	1047	1048	1053	1055	1058	1066	1083	1090
<i>Volume processed (litres)</i>	10	10	10	10	10	10	10	10	10	10
<i>Volume of retent >4mm (ml)</i>	1600	3500	5400	2300	1800	3400	4200	1600	1500	5500
<i>Volume of retent <4mm (ml)</i>	2500	2000	2000	1300	1200	2000	1300	1400		1800
<i>Volume of flot >4mm (g)</i>	70	32	70	300	214	152	195	43	43	57
<i>Volume of flot <4mm (g)</i>	66	7	12	30	103	42	18	7		9
<i>Residue contents (relative abundance)</i>										
Glass fragments	1	1	1	1	-	1	-	1	-	2
Glass filaments	-	-	1	1	-	-	-	-	-	1
Fuel Ash	3	3	3	3	3	3	3	1	3	3
Slag	1	-	-	1	-	-	-	-	-	1
Brick/building material fragments	-	2	1	2	1	1	-	2	1	2
Magnetic Residue	2	1	1	1	-	1	1	2	-	1
Vitrified material	1	-	-	-	1	1	-	1	1	2
Pottery/Ceramics	1	1	-	-	1	-	-	-	1	1
Stones/coarse sand	-	-	1	2	-	1	1	2	-	1
Metal Objects	1	1	-	-	1	-	-	-	-	-
Non-magnetic industrial residues	-	-	1	-	-	1	1	-	1	2
Bone/teeth, burnt bone	-	-	1	-	1	-	-	-	-	-
<i>Flot matrix (relative abundance)</i>										
Cereal/grass stalks - modern	-	-	-	-	-	-	-	-	-	-
Fuel Ash	3	3	3	3	3	3	3	3	3	3
Modern roots	2	2	2	2	2	-	-	2	-	-
Small twigs	-	-	-	-	-	-	-	-	-	-
Magnetic Residue	2	1	1	1	1	1	1	1	1	2
Bone/teeth, burnt bone	-	-	1	-	-	-	-	-	-	-

Key to tables: Contents assessed by scale of richness 0 to 3. 0 = not present, 1 = present, 2 = common, 3 = abundant.

6.2 ASSESSMENT RESULTS

- 6.2.1 Sample <1> (1045) produced 1600ml of coarse retent and 2500ml of fine retent when processed. This consisted of fuel ash, brick fragments and small rounded stones. Small amounts of glass and ceramic fragments were recovered from the retent, as well as medium amounts of iron fragments, lumps of slag (possibly blast furnace slag) and vitrified material. The presence of large amounts of fine magnetic residues, particularly spheroidal hammer slag suggests iron working in the vicinity of this deposit, though the slag may also suggest primary smithing took place in the area. The flot consisted of fuel ash, modern roots magnetic residue. Notably the fine flot produced a large amount of magnetic material, almost universally spheroidal hammer slag.
- 6.2.2 Sample <2> (1046) produced 3500ml of coarse retent and 200ml of fine retent. This consisted of ash with low amounts of brick fragments and mortar. Four small fragments of ceramic were recovered (two cream glazed and two brown/black glazed), as well as three fragments of window-pane glass. Low amounts of fine magnetic material were extracted, and this was in a poor state of preservation, shown high levels of degradation/rusting. This may suggest the magnetic material was exposed to moist aerobic conditions for a period after its creation, or this material formed a working floor which for a period of time allowed the ferrous material access to moisture/oxygen.
- 6.2.3 Sample <3> (1047) consisted of 5400ml of coarse retent and 2000ml of fine retent. This material consisted mainly of fuel ash with a minor element of brick fragments, small stones and glass fragments. Fragments of vitrified material, probably a pipe c.30cm in diameter were recovered from the coarse retent. Several large fragments of bottle glass (brown and clear) were recovered. Finer glass fragments were also recovered, as well as glass filaments. Miscellaneous non-magnetic spheroidal residues were also recovered. These may reflect evidence of some of the chemical processes undertaken at this site. Fine magnetic material consisted of hammer scale and a medium density of spheroidal hammer slag. Flots consisted of fuel ash, 2 bone fragments (<5mm) and very low amounts of magnetic material. The presence of glass filaments and the various spheroids of chemical residue suggest that elements of this deposit originated from a glass working area.
- 6.2.4 Sample <4> (1048) consisted of 2300ml of coarse retent and 1300ml of fine retent. This material consisted mainly of fuel ash with a minor element of brick fragments, small stones, glass fragments and a slag like material. Glass filaments were recovered, along with fragments of glass. Fine magnetic material occurred with relative frequency and consisted mainly of hammer scale with a low element of spheroidal hammer slag. The flots consisted of

fuel ash material with a low density of magnetic material, which occurred as iron filing type material.

- 6.2.5 Sample <5> (1053) consisted of 1800ml of coarse retent and 1200ml of fine retent. This material consisted mainly of fuel ash with a minor element of brick fragments, small stones and mortar. 20grams of rusted ferrous material was recovered, possibly from steel nails. A clay pipe fragment, a fragment of cream coloured pottery, a fragment of a copper alloy and some vitrified material and small amounts of burnt and unburned bone were also recovered. Fine magnetic material consisting of hammer scale and low amounts of spheroidal hammer slag was also recovered. Flots consisted of fuel ash material with infrequent magnetic material (in the form of iron filing type material).
- 6.2.6 Sample <6> (1055) consisted of 3400ml of coarse retent and 2000ml of fine retent. This material consisted mainly of fuel ash with a minor element of brick fragment and mortar fragments, small stones and glass fragments. Fragments of a lightly magnetic material were also recovered from the retent. This was interpreted as degraded ferrous objects/fragments. A yellow residue was observed on many of these fragments which may be indicative of a past process undertaken on this site. Finer magnetic material consisted of frequent hammer scale with a medium density of spheroidal hammer slag. A minor element of this material was degraded/rusted suggesting a stable relatively anaerobic depositional environment. Flots consisted of fuel ash material with occasional modern roots and a very low density of fine magnetic material.
- 6.2.7 Sample <7> (1058) consisted of 4200ml of coarse retent and 1300ml of fine retent. This material consisted mainly of fuel ash with infrequent small stones. Both fine magnetic material and industrial residue were very infrequent. The flots consisted of fuel ash type material, again with very infrequent inclusions of an iron filing type material.
- 6.2.8 Sample <8> (1066) consisted of 1600ml of coarse retent and 1400ml of fine retent. This material consisted mainly of brick fragments with occasional vitrified material. Approximately one third of this retent material consisted of low to medium fragments of magnetic material. Finer magnetic material from this sample contained hammer scale with infrequent examples of spheroidal hammer slag, though the bulk of this material was in a heavily degraded state. Miscellaneous glass fragments and ceramic fragments (all <1cm) were recovered. Flots consisted of fuel ash material with occasional root inclusions.
- 6.2.9 Sample <9> (1083) consisted of 1500ml retent. The sample was processed in the fine mesh and not wet-sieved to separate the fine and coarse fraction.

The retent material consisted mainly of fuel ash with a minor element of brick fragments and mortar. Occasional fragments of ferrous material, ceramic fragments and vitrified material was also recovered from the retent. The flot consisted of fuel ash with infrequent fine magnetic material (of the iron filings type).

- 6.2.10 Sample <10> (1090) consisted of 5500ml of coarse retent and 1800ml of fine retent. This material consisted mainly of fuel ash with a medium element of brick fragments, small stones and slate fragments. Glass residues were very common in this sample and consisted of heavily vitrified material, lumps of opaque glass (c.10cm+ diameter), non-magnetic slag like material and frequent glass fibres. Finer magnetic material occurred infrequently. Flots consisted of fuel ash like material with low densities of fine magnetic material.

6.3 DISCUSSION

- 6.3.1 It was clear that the samples did contain relevant industrial residues in sufficient quantities to allow some inferences to be made regarding the development and functioning of the site. For this reason, whilst samples were assessed for archaeobotanical material, the focus of recovery was aimed at the industrial residues which would be contained mainly in the retent.
- 6.3.2 Whilst all the samples produced industrial residues of some sort, ranging from a few grams for some samples to several kilos for others, it can be stated that a number of samples produced material of greater significance in understanding the function of this site, particularly during the glass-working phase. Samples <3> (1047), <4> (1048) and <10> (1090) all produced glass fibres which are indicative of glass-working activities. Should more work be required to assess the remains of glass-working on the site then further work should focus on these samples to recover more examples of these fine glass fibres. Samples <1> (1045), <4> (1048) and <10> (1090) all produced slag like material, which may indicate metalworking on the site (though slags were also commonly used as a paving material for paths and roadways). Of these samples <1> (1045) is notable as it produced a high amount of spheroidal hammer slag, particularly in the flot material. Sample <8> (1066) is also notable as it produced a very high density of fine magnetic residue (over 35% of the sample).
- 6.3.3 Other samples were notable for their lack of industrial residues. In particular samples <7> (1058) and <9> (1083) produced very low amounts of magnetic residue. These can be coupled with sample <5> (1053) which produced a medium amount of fine magnetic material, but like Samples <7> (1058) and

<9> (1083), produced no evidence of glass, either as broken fragments of finished glass or glass fibres. Though these samples can be considered low in industrial residues they are clear evidence that there are differing depositional sectors across the site.

6.4 DATING

6.4.1 It was not thought necessary to carry out any scientific dating methods for the contexts recovered from this site, as the information retrieved from the archaeological features was limited. Also, as the site existed in the 19th century and is documented in historical records the date range provided by radiometric or other means would not aid the interpretation of activity on this site.

6.5 MAGNETIC RESIDUES

6.5.1 Magnetic material from this site can be divided into coarse material and finer material. The coarse element originated from waste or discarded iron and generally appears to represent rusted nails or bar iron. The finer material was extracted from the <4mm retent and is a mixture of naturally magnetic mineral, hammer scale and spheroidal hammer slag from iron working and some fuel ash which appears to have become magnetic through association with iron objects in the surrounding deposit.

6.5.2 Many deposits produced amounts of magnetic material though samples <1> (1045) and <8> (1066) are notable due to the very high density of hammer scale and spheroidal hammer slag produced, particularly in the flot. This material can be produced by either primary smithing as slag is being expelled from the bloom or from secondary smithing during welding processes.

6.6 VERTEBRATE BONE

6.6.1 Vertebrate bone recovered from this site was limited to a small number of small (<1cm) fragments limited to two contexts <3> (1047) and <5> (1053). No further work is recommended on this material.

6.7 CONCLUSIONS AND RECOMMENDATIONS

6.7.1 This study has identified the presence of elements such as glass fibres, industrial and magnetic residues. There is potential for undertaking further work on the samples from this site. In particular:

(a) Work could be undertaken on the chemical properties of the glass waste in order to identify the type of glass produced and the methods of production.

(b) Analysis of the magnetic residues and slags could be undertaken to assess whether they are associated with glass production works or whether they represent a later phase of metal working/smithing on the site.

6.7.2 Should further work be considered then analysis should focus on samples <1> (1045), <3> (1047), <4> (1048) and <10> (1090), with <10> (1090) of particular note due to the high density of potentially highly diagnostic material recovered.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

- 7.1.1 The excavation at Belmont Row has addressed many of the academic aims set out in the original project design, and has enabled a full record of the 19th and 20th century industrial structures on the site to be compiled prior to the redevelopment of the site. The preservation by record of these structures represents an important addition to the corpus of information regarding the industrial development of the City of Birmingham during this period.
- 7.1.2 The archaeological remains have facilitated the construction of a broad chronological framework into which the development of the site can be placed. In turn, this will allow the significance of the site to be considered in terms of the wider context of local, regional and national industrial development during the 19th century.
- 7.1.3 Finds and samples recovered during the excavation have highlighted the industrial processes that took place on the site and form an important resource for further study.
- 7.1.4 The excavation has highlighted a number of issues regarding the past use of the site for glass and possible pottery manufacture. Further work is needed in order to fully characterize the excavated remains, including detailed analysis of the glass-making residues recovered from the site. There was evidence for pottery manufacture near the site, associated with creamware production in the early 1800s. However, this evidence was limited in quantity and was recovered from secondary dumped deposits. Whilst no further work is recommended on the pottery, further documentary research could provide further information regarding this activity.
- 7.1.5 In order to bring the results of the excavation to a wider audience, it is proposed that the results of this excavation and the previous phase of work be published together with the results of this analysis in the Transactions of the Birmingham and Warwickshire Archaeological Society.

7.2 POTENTIAL FOR FURTHER WORK

- 7.2.1 This report serves as a MAP2 Assessment and Level 3 archive report for the current site. The primary written, drawn and photographic archive records have been checked, ordered and appropriately stored.
- 7.2.2 To take the report to publication level would require significant editorial work and further research on regional and local comparisons. The material

recovered from the site also requires additional work, before the report can be successfully published.

- 7.2.3 Further work based on the glass-making residues recovered from the site should aim to fully determine the nature of activities undertaken at the site during the post-medieval period.
- 7.2.4 The structural and stratigraphic data from the various phases should form the basis of a synthesized report, which will include any additional data gathered from further documentary, residue and artefact studies.
- 7.2.5 The following section provides an updated project design for the proposed work to be undertaken for the completion of the publication report.

8 UPDATED PROJECT DESIGN

8.1 INTRODUCTION

8.1.1 This section presents the outline of an updated project design based on the results of the assessment. The work modules required for completion of the post-excavation programme are also set out in relation to a series of identified objectives.

8.2 OBJECTIVES

8.2.1 Following on from the assessment it is possible to set out a number of objectives that will be addressed by the final post-excavation programme:

[1] To finalise, in conjunction with further documentary research including a consideration of the publication report produced by APS, the stratigraphic sequence of the site.

[2] To better define the nature of land use and industrial processes on the site and how this changes over time.

[3] To utilise the industrial residues and finds to provide further evidence for changing social and economic activities on site.

[4] To define the position and significance of the site, concurrently with the earlier phase of excavation (Peachey 2008), within its local, regional and national context.

8.3 METHODS OF ANALYSIS

8.3.1 To achieve the Belmont Row post-excavation programme's aims and objectives, the following methods will be used. Each dataset and the relevant objectives and work modules to which it relates are set out below.

8.3.2 *Stratigraphic data:* further stratigraphic analysis will involve the quantification and description of the archaeological sequence in the light of documentary and map research. The context data will be reappraised and feature groups revised where necessary. Comprehensive interpretive text has already been produced, but where applicable the documentary evidence will be integrated into this text. Period text will be written to provide a chronological overview of the development of the site in conjunction with the earlier phase of excavation. Illustrations will be produced, including digitisation of key plans and section drawings.

Fulfil objectives: [1,2].

8.3.3 **Glass-making residues:** for a report providing a full analysis of the industrial residues for publication, the following tasks will be required:

- Laying out and sorting the glass-making waste.
- Checking all information and plans are available.
- Sorting the glass waste into diagnostic/process specific types and recording.
- Incorporate categories of sorted material into the catalogue and make any necessary adjustments to catalogue.
- Compile descriptive catalogue of material.
- Consider all associated finds and investigate the crucible.
- Search for and consider comparable material from other sites in the region and nationally.
- Look for dating evidence for similar material.
- Consider results of residue analysis and interpret.
- Write report with analysis and interpretation of investigations.
- Parcel up and return glass-making waste.

Fulfils objectives: [2,3].

8.3.4 **Documentary research:** further documentary research is required in order to provide background information in support of the interpretation of the excavated evidence. This will include a visit to the Birmingham Record Office, in order to obtain copies of relevant maps and plans of the Belmont Row site, and details from Trade Directories.

Fullfills objectives: [1].

8.3.5 **Report Synthesis, Preparation and Publication:** the conclusions drawn from the final elements of analysis will be summarised and included in a coherent descriptive text. Final site and interpretative illustrations will be produced, in conjunction with the earlier phase of excavation. The completed article will be edited internally and submitted to the client for approval, before being submitted for publication.

Fullfills objectives: [1-4].

8.3.6 **Archiving:** the site and research archives will be prepared and deposited in Birmingham City Museum.

8.4 STAFFING AND RESOURCES

8.4.1 The final post-excavation programme and publication will be completed by staff from North Pennines Archaeology with the input of an external specialist for work on the glass-making residues. It is proposed that the following staff will be involved in the project to undertake the following areas of work:

Stratigraphic Data: Nigel Cavanagh, NPA Project Officer

Glass-making Residues: David Dungworth, English Heritage

Documentary Research: Nigel Cavanagh, NPA Project Officer

Report Synthesis: Nigel Cavanagh, NPA Project Officer

Illustration: Tony Liddell, NPA Illustrator

Management & Publication: Martin Railton, NPA Project Manager

Academic Editing: David Crossley, Sheffield University

Archiving: Natalie Ward, NPA Project Assistant

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APPENDIX 1: CONTEXT TABLE

Table 4: List of Contexts issued during excavation

Context	Type	Description
1000	Structure	Air Raid Shelter
1001	Structure	Wall
1002	Structure	Wall
1003	Structure	Wall
1004	Structure	Wall
1005	Structure	Floor
1006	Structure	Wall
1007	Structure	Wall
1008	Structure	Wall
1009	Structure	Wall
1010	Structure	Wall
1011	Structure	Wall
1012	Structure	Wall
1013	Structure	Wall
1014	Structure	Wall
1015	Structure	Brick-built Inspection Pit
1016	Structure	Wall
1017	Structure	Wall
1018	Structure	Wall
1019	Structure	Wall
1020	Structure	Wall
1021	Structure	Wall
1022	Structure	Stanchion Base
1023	Structure	Stanchion Base
1024	Structure	Stanchion Base
1025	Structure	Stanchion Base
1026	Structure	Stanchion Base
1027	Structure	Stanchion Base
1028	Structure	Stanchion Base
1029	Structure	Stanchion Base
1030	Structure	Concrete Slab Floor
1031	Structure	Wall
1032	Structure	Wall
1033	Structure	Brick Floor
1034	Structure	Wall
1035	Cut	Building Foundation
1036	Structure	Wall
1037	Structure	Brick Floor
1038	Structure	Tile Drain
1039	Structure	Tile Drain
1040	Structure	Tile Drain
1041	Deposit	Topsoil
1042	Deposit	Dump Layer
1043	Structure	Wall
1044	Structure	Brick Soakaway
1045	Deposit	Fill of 1044
1046	Deposit	Ash Layer sealing 1033
1047	Deposit	Dump Deposit- Glass-working Residue
1048	Deposit	Dump Layer
1049	Deposit	Fill of 1054

Context	Type	Description
1050	Structure	Wall
1051	Structure	Wall
1052	Deposit	Dump Deposit
1053	Deposit	Fill of 1089
1054	Cut	Filled by 1072
1055	Deposit	Dump Deposit
1056	Deposit	Naturally-formed sand subsoil
1057	Structure	Probable Kiln/Flue
1058	Deposit	Ash Fill of 1057
1059	Structure	Wall Foundation part of 1107
1060	Structure	Probable Kiln/Flue
1061	Deposit	Ash Fill of 1060
1062	Cut	Foundation Cut for 1057
1063	Structure	Brick Stanchion Base
1064	Structure	Brick Stanchion Base
1065	Cut	Foundation Cut for 1071
1066	Deposit	Backfill of 1066
1067	Deposit	Fill of 1080
1068	Deposit	Burnt/Scorched sand Deposit
1069	Cut	Foundation Cut for 1032
1070	Deposit	Backfill of 1057
1071	Structure	Brick Stanchion Base
1072	Structure	Drain Within 1054
1073	Deposit	Concrete Sealing 1072
1074	Cut	Foundation Cut for 1076
1075	Deposit	Backfill of 1074
1076	Structure	Brick Stanchion Base
1077	Cut	Foundation Cut for 1079
1078	Deposit	Backfill of 1077
1079	Structure	Brick Stanchion Base
1080	Structure	Probable Kiln
1081	Structure	Brick Floor of 1080
1082	Deposit	Sand Floor of 1080
1083	Deposit	Fill of 1080
1084	Deposit	Fill of 1080
1085	Cut	Foundation Cut for 1097
1086	Deposit	Backfill of 1085
1087	Cut	Foundation Cut for 1060
1088	Cut	Foundation Cut filled by 1053
1089	Cut	Foundation Cut filled by 1059
1090	Deposit	Backfill of 1089
1091	Cut	Tree Bole/Root Disturbance
1092	Deposit	Fill of 1091
1093	Deposit	Fill of 1080
1094	Structure	Wall Foundation part of 1107
1095	Deposit	Backfill of 1095
1096	Cut	Foundation Cut for 1094
1097	Structure	Wall Foundation part of 1107
1098	Cut	Foundation Cut for 1097
1099	Deposit	Backfill of 1098
1100	Structure	Building Master No.
1101	Structure	Building Master No.
1102	Deposit	Backfill of 1089
1103	Cut	Foundation Cut for 1063
1104	Deposit	Backfill of 1103
1105	Cut	Foundation Cut for 1064

Context	Type	Description
1106	Deposit	Backfill of 1103
1107	Structure	Master Number for Glass Cone
1108	Structure	Brick Floor

APPENDIX 2: FIGURES
