Report On An Archaeological Excavation

Redwood Health Therapy 11 - 11A Bridge Street Winchester Hampshire SO23 0HL

Prepared for Clydesdale Maintenance Ltd

Planning Reference: 15/02586/FUL

Groundworks Archaeology

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Summary

Groundworks Archaeology was commissioned by Clydesdale Developments to undertake an archaeological evaluation on land to the rear of 11-11A Bridge Street Winchester. This evaluation was undertaken between the 17th and 22nd June 2016 and revealed the presence of at least two late 19th century muffle type clay pipe kilns. Although truncated, substantial structure was preserved including the muffle base. The archaeology was deemed to be of national significance and warranted a full excavation which was undertaken between 12th and 28th August 2016 which revealed the presence of a third kiln. A watching brief was maintained on the areas beyond the kiln during the ground works phase.

The site revealed the most complete pipe kiln to have been excavated in Great Britain to date. In addition, the sample of pipes recovered provides one of the most complete of its date to have been excavated. It not only allows the range and nature of the pipes produced in a small family run workshop to be explored, but affords a reference point for future finds from throughout the surrounding region.

1. Introduction

1.1 Groundworks Archaeology was commissioned by Clydesdale Developments to undertake an archaeological evaluation on land to the rear of 11-11A Bridge Street Winchester. This evaluation was undertaken between the 17th and 22nd June 2016 and revealed the presence of at least two late 19th century muffle type clay pipe kilns. Although truncated, substantial structure was preserved including the muffle base. The archaeology was deemed to be of national significance and warranted a full excavation which was undertaken between 12th and 28th August 2016. A watching brief was maintained on the areas beyond the kiln during the groundworks phase.

1.2 The work was carried out according to the requirements of an archaeological condition attached to the granting of planning consent for this development by Winchester District Council, acting on the advice of Ms Tracy Matthews in her capacity as archaeological advisor on planning issues to the Local Planning Authority. This is in accordance with the principles established in *NPPF: Planning for the Historic Environment: Historic Environment Planning Practice Guide* (Department of Culture, Media and Sport, 2010), and *Standard and Guidance for archaeological Evaluations and watching briefs* (CIFA, 2014).

2. Site Location and Description

2.1 The site (approx. 0.03 ha) is located off Bridge Street, at the base of the public trackway/footpath leading to St Giles Hill. It is within the Winchester District policy boundary in the St John's and All Saints ward, and the Winchester Conservation Area.

2.2 The site was previously home to a sprawling collection of buildings, which had commercial use D1 (Clinic) and were formally occupied by Redwood Health Therapies Ltd. The main two storey structures are located along the north and north-east boundaries, facing Bridge Street and the trackway/footpath.

2.3 Due to the site's location, it is cut into the slope of the hill side with substantial brick and flint retaining walls along the south and east boundaries. As a result, the ground level of the courtyard is significantly below the garden of neighbouring Prospect Cottage, which also dates from the late 19th century. At the southern boundary the land slopes dramatically forming a man-made embankment that was created during construction of the railway and the Station Approach access road during the 1880's. The disused Chesil Tunnel is still located at the far eastern end of the bank, which cuts through St Giles Hill. This bank contains many

mature trees and dense foliage and forms a natural barrier that is difficult to negotiate. At the top of the bank, the land levels off slightly and is planted with a line of fir trees that forms the boundary of the site. At the western boundary, a deep slot has been created by the development of Capitol House. This sunken area is accessible by Capitol House only, and is significantly below the ground level of No.11.

2.4 The underlying geology across the site is mapped as New Pit Chalk Formation with superficial deposits of river terrace sands and gravels (British Geological Survey).

3. Planning Background

3.1 Planning permission 15/02586/FUL, has been granted for the the demolition of a two storey extension and single storey outbuilding, with the erection of a two storey extension and single storey bin/bike store. Conversion of part of the property (currently used as a clinic) to residential use to form five one bedroom flats, one single bedroom house, and one two bedroom flat and associated works at 11-11A Bridge Street Winchester.

3.2 Condition 2 stated that “No development/demolition or site preparation shall take place until the applicant or their agents or successors in title has secured the implementation of a programme of archaeological mitigation work (to include a first phase of archaeological evaluation work) in accordance with a Written Scheme of Investigation that has been submitted to and approved by the Local Planning Authority in writing. No demolition/development or site preparation shall take place other than in accordance with the Written Scheme of Investigation approved by the LPA. The Written Scheme of Investigation shall include:

- The programme and methodology of site investigation and recording
- Provision for post investigation assessment, reporting and dissemination
- Provision to be made for deposition of the analysis and records of the site investigation (archive)

Nomination of a competent person or persons/organisation to undertake the works set out within the Written Scheme of Investigation

Reason:
To mitigate the effect of the development upon any heritage assets and to ensure that information regarding these heritage assets is preserved by record for future generations, in compliance with policy HE.1 of the Winchester District Local Plan Review."

3.4 Condition 3 stated that " Following completion of archaeological fieldwork a report will be produced in accordance with an approved programme including where appropriate post-excavation assessment, specialist analysis and reports and publication.

Reason:
To ensure that evidence from the historic environment contributing to our knowledge and understanding of our past is captured and made publicly available, in compliance with policy HE.1 of the Winchester District Local Plan Review."

4. Archaeological and Historical Background

4.1 Background research sources were consulted at the Hampshire Archives and Local Studies centre and Winchester City Council Historic Environment Record (HER). A search of the HER was conducted for archaeological sites, designated sites, findspots and previous archaeological investigations within the vicinity of the development site. A close study of find spots and monuments was conducted within a 200m radius of the site.

4.2 The HER data has been presented chronologically, however where events are multi period, the information can be found under previous investigations.

Prehistoric

4.3 There is little evidence within the immediate area of the site for Prehistoric activity. However, there was a chance find of a Neolithic polished stone axe on St John's Street, approximately 51m north-west of the site (EWC8702).

Roman

4.4 The Roman town of Venta Belgarum became the fifth largest town in Roman Britain. Its general layout and development through the Roman period is fairly well understood, however there is minimal evidence of its major public buildings. Extensive investigations have been undertaken over the town defences and extra mural cemeteries. There has been extensive investigation of its extra-mural cemeteries. The Roman

road from Winchester to Wickham (MWC3913) lies 75m west of the site. A Roman lead sarcophagus was discovered 78m north-west of the site in 1857 while digging out foundations at 10 St John's Street (EWC8677).

4.5 A possible inhumation burial accompanied by an 'urn' was discovered 97m south of the site during excavation of the railway cutting for the Southampton-Newbury railway (EWC8766). In 1927 an electricity cable trench revealed a complete inhumation burial 88m west-north-west of the site. A 'red ware' vessel and a coin of Tetricus I (270-3) were also found, which may have been associated with the burial, though this is not clear (EWC8737).

Saxon

4.6 There is much historical and archaeological evidence that the town was occupied in the post-Roman period. It is known that Winchester was an important Royal and ecclesiastical centre before the re-establishment of its streets and defences to form a late Saxon burgh, under King Alfred in the late 9th century. A watching brief in 1995 at 64 St John's Street, 39m north-west of the site revealed 3 pits pre-dating the Medieval building phase and were probably of late Saxon date. The watching brief also recorded a Medieval stone wall recorded with associated chalk floor layers (EWC10926).

Medieval

4.7 The site lies within the historic eastern suburb of Winchester, in an area forming part of the Medieval Bishop's Soke (area of administrative control). Remains of Late Saxon and Medieval structures and occupation deposits have been identified during previous archaeological investigations to the north and south-west of the application site.

4.8 Medieval documentary sources also indicate that this area was occupied during the Medieval period, however detailed property records are not known. There are references to a number of properties, including a cottage and garden and a 'Sellar House', possibly a Medieval stone building in the area.

Post-medieval

4.9 The existing main two storey structures within the site are located along the north and north-east boundaries, facing Bridge Street and the trackway/footpath. These buildings are traditionally constructed over two stories in a mixture of brickwork, render and vertical tile hanging, with clay tiles and slate for the roofs. These buildings appear to date from the late 19th and early 20th centuries, based on OS map data. The 1873 map clearly shows the main block in the north-west corner facing onto

Bridge Street. The site boundaries are also evident, as well as a number of small enclosures and structures within the site area. By 1896, after the construction of the DNSR railway, the main block is joined by an L-shaped block at the rear, along the south and east boundaries, together with a smaller structure bordering the western boundary. It is likely that these structures are associated with the clay pipe kiln. A further study of the property records reveals that Richard Goodall, pipemaker, was active on the site from the 1860s up until the early 20th century. By 1932 the arrangement of buildings on the site starts to look familiar. The L-shaped structure has been reduced to a single wing along the southern boundary. The two storey building in the north-east corner appears, and the main north-east block gains an extension in what is now the central courtyard. These main structures have been significantly modified throughout the latter half of the 20th century, most noticeably in the courtyard area, gaining a first floor walkway with new steps and conservatory.

Listed Buildings

4.10 DWC3186, The Rising Sun public house 40m south-west of the site dates back to the 16th century and contains an earlier stone barrel vaulted cellar with a double mullioned window and Tudor arched door. This late Medieval cellar formed part of the former Bishop's Court in the Soke and may have formed part of the Bishop's prison.

4.11 DWC2251, 1 Chesil Street, Old St. Peter's Rectory also known as Old Chesil Rectory (Grade II*) lies 72m south-west of the site. Dated 1459, but probably early 16th century. The building is of two storeys, timber framed and with plaster infill.

4.12 DWC2825, 3 Chesil Street, c81m south-west of the site is a late 18th century (Grade II) brick house with a very plain front altered in the 19th century to a shop front.

4.13 DWC2248, 4 Chesil Street 100m south-west of the site is an 18th century (Grade II) house constructed in brick with a tile roof and inserted early 19th century shop front to ground floor level. Internally a number of late 18th century features survive.

4.14 DWC2246, 6 Chesil Street, c100m south-west of the site is an 18th century (Grade II) house constructed in brick with a tile roof with a number of 18th century features surviving internally and externally. Two doorways (one to a modern chapel and one a rear external door to the cellar) are constructed of reused Medieval material.

Historic Parks and Gardens

4.15 St Gile's Hill, immediately adjacent to the east of the site is an historic public amenity.

Previous Investigations

4.16 EWC11806. Cricketers Public House, negative watching brief, 83m west-north-west of the site.

4.17 EWC8734. 12-13 Bridge Street, 1977. Alterations to lane at rear of 12-14 Bridge Street revealed a large bank of natural chalk. Cut into this was a 4.0m deep pit or well. Further work to the wall at the rear of No.14 Bridge Street exposed earlier phases of the wall, possibly dating to the 18th century. 47m south-west of the site.

4.18 EWC8774. South east aligned walls, tiles and coins were found 74m east of Chesil Brewery. No dating evidence provided.

4.19 EWC10654. Investigations in 1982 during re-development works along the west side of Chesil Street revealed a series of features. These included a possible timber building indicated by occupation deposits and a pit. Further work revealed a possible road suggested by an east-west aligned ditch with adjacent flint metalled surface possibly of late Roman date. Later Saxon occupation was also indicated by the presence of five cess/rubbish pits of varying sizes. Other recorded features included a chalk barrel vaulted cellar of uncertain date but may be Post- medieval.

4.20 EWC8676, In 1978 investigations were conducted at the junction of St John's Street and Bridge Street 44m west of the site. A trench cut for repairs to a gas main was observed by the Archaeology Section staff. The western section was recorded, revealing an undated sequence of deposits cut by several large features. The deposit sequence may be comparable with that found at No.1 St. John's Street 47m west of the site.

4.21 EWC10651. A series of small excavations/observations were carried out prior to and during alterations to No.'s 10-11 St John's Street, and partial redevelopment of No.'s 3-13 St John's Street, over the winter of 1981-2. This revealed a 19th century 'Muffle' type clay pipe kiln, found with associated pipe-making furniture. A barrel vaulted cellar constructed from roughly worked chalk blocks was also noted along with a chalk block lined well which was below a 19th/20th century brick cellar floor, 52m west of the site.

5 Aims and objectives of the project

5.1 The general aim of the archaeological excavation of the site was to ensure that sufficient information was generated to understand the construction and use of the kiln structure.

5.2 The Objectives of the project were:

To establish the extent of the surviving structure.

To determine the type, condition, nature, character, quality, function, and date of the kiln.

To establish the presence or otherwise of further associated structures and activity within the build footprint of the development.

To allow the preservation by record of archaeological deposits.

To interpret the archaeology of the site within its local, regional and national context.

5.3 Specific research questions included:

a) The phasing of activity within the site to identify if there is an earlier period of production.

b) Comparison with the St John's Street Kiln, a similar site from within close proximity which was last recorded in 1857. It is possible that the demise of this site allowed the establishment of the Bridge Street Kiln.

c) An establishment of what industrial processes were occurring within the site, for instance, the moulding and forming of the raw material, dressing, finishing and perhaps evidence for multiple manufacturers utilising the site.

d) Technical aspects of the kiln to establish how developed they are, for instance; muffles often have an orifice in the middle, later filled with fired clay. At present it is not certain if this is part of their construction or a feature of their use. Sometimes the fill of this hole has thin layers of clay wash over it, from relining the kiln (which was often done regularly, using white clay like a lime wash). Careful excavation and examination of the muffle base may shed further light on its use.

e) It is important to identify the design of the radial buttresses around the outside of the muffle, linking it to the kiln wall to give support and create flues in between for the rising gasses. These buttresses can vary in form, so it will be important to see how they are constructed and how they relate to the base of the muffle chamber itself. This will aid in understanding how the gaps for the flow of hot air from the combustion chamber were arranged.

f) To place the site within its wider context it may be possible to establish sources of raw material (clay), fuel and final market for the finished products. This would shed light on transport routes and trade networks.

6. Methodology

6.1 The archaeological excavation was carried out in accordance with a Written Scheme of Investigation (WSI) which was submitted to and approved by the the Winchester planning archaeologist. The project was also undertaken in accordance with *Standard and Guidance for Archaeological Excavation* (CIfA 2014) and Historic England *MoRPHE* guidance (2015).

6.2 Following removal of modern overburden and cleaning of archaeological features, the kilns were subject to initial recording and a pre-excavation plan. Full excavation was undertaken of the exposed structures to allow their full recording and recovery of suitable dating evidence for phasing of the site and preservation by record.

6.3 The records consisted of written context descriptions, plans, sections and elevations with photographs.

6.4 The drawn record was compiled on archive stable permatrace at scales of 1:10 and 1:20 with an overall site plan at a scale of 1:20. Representative sections were produced to demonstrate the sequence and depth of deposits while full elevations were recorded to interpret the structural elements. Vertical control was maintained via the use of a dumpy level tied into a spot height located on Bridge Street.

6.5 The photographic record was undertaken using black and white and colour slide film with a complimentary digital record. Metric scales were included in all feature photographs.

6.6 All significant finds were retained and bagged according to context. Modern finds were noted and discarded.

7. Results

7.1 Phase 1: Post-medieval quarry pit

7.1.1 The earliest activity identified within the site was a probable Post-medieval quarry pit which was present across the site. A sondage (section 1, plate 1 and section 2, plate 2) revealed a quarry backfill of soft light brown to buff silt with small fragments of chalk and Post-medieval tile fragments (405). This was overlain by further backfill deposits comprising (404) and a layer of redeposited chalk (416). The latest layer of quarry backfill was (403). This context was also identified in section 3 and 4.

7.2 Phase 2: Initial clay pipe kiln construction

7.2.1 The most significant features within the site were Richard Goodall's clay pipe kilns (figure 3) which were built over three phases (see plate 4). The earliest phase was the western most structure (100),a heavily truncated updraught kiln dating from the early 1860's. This structure had been previously impacted by the construction of a retaining wall for the adjacent property which had removed about half of the western side of the structure. Due to the presence of this retaining wall and the risk of undermining it, it was not possible to fully excavate this structure. However it was possible to record sufficient detail to identify its main construction points (see plate 7).

7.2.2 The kiln comprised a red brick double skinned retaining wall which presumably originally formed a square structure containing the fire chamber and stoke hole. The double skin was not bonded across its width and in fact comprised two separate, but abutting walls (101 outer and 102 inner). These abutting walls were bonded across the northern return of the wall, see figure 5, elevation 2. This wall enclosed a circular brick wall (103) formed of header bonded half bricks (plate 6). The corner space between the circular brick wall (103) and the inner retaining wall (102) was in-filled by a rubble core (104) where it was visible in plan. (103 abutted (102) at its eastern extremity).

7.2.3 The flue (103) did not contain any structural features and had been subject to demolition. It did however display a heavily vitrified surface (105). The flue and fire chamber was entirely filled with demolition material containing brick and clay pipe fragment. Although it was not possible to excavate this fill it was sampled to recover dating evidence.

7.3 **Phase 3: Construction of kiln 2**

7.3.1 At some point the kiln was expanded to include the largest and best preserved kiln, structure 200, a brick built updraught kiln (plate 5). The structure was truncated from above and to the north-east. However, what remained was well preserved with many diagnostic features including the base of the muffle in situ which is clearly visible in plates 5 and 8, (see also figure 8).

7.3.2 This kiln was built directly into the side of a disused quarry pit and abutted the pit's southern and eastern edge. A pit [407] was identified under the eastern kiln wall (figure 1, section 1 and plate 1) which contained many fragments of clay pipe dating from the 1860s to 1870's (408) and was presumably related to the first phase of production (Kiln 1, structure 100). This pit is recorded in section 1, figure 4 and can be seen in plate 1. This second kiln began with a rectangular double skinned retaining wall approximately 54cm wide with an opening on its northern side. This wall comprised a coursed red brick inner face (203) with a mixed brick and stone outer face (201) and mixed rubble core (204). The western side omitted the rubble core and comprised of (203) and (201) abutting and bonded across the northern return (see elevation 2). This difference in construction may be related to the presence of kiln 1 abutting to the west. A sondage along the eastern wall of the kiln demonstrated that the outer skin (201) was built on a foundation of re-used limestone blocks (202). The inner face of the wall was built directly onto the earlier quarry backfill (figure 4, section 1).

7.3.3 A brick plinth (205) measuring 1.78 x 1.35m and of eight courses which was 0.6 m thick (figures 6,7,8 and plate 10) was built within the retaining wall. This plinth contained the fire pit and stoke hole for the kiln. This can be clearly seen on figure 6 and plate 10.

7.3.4 The circular flue (210), shown on figure 5 (plan 2) and plate 9, was constructed from header bonded red brick and built directly onto the plinth (205) (see figure 7 and plate 10). There was an opening for the stoke hole on the north side. A short passage led from this opening to the front wall (222) of the stoke hole. These walls were bonded together and contemporary. A slight offset between the front wall (222) and the plinth (205) demonstrates that the front wall (222) was built onto the plinth rather than as part of it. The corners between the front wall (222), the inner retaining wall(203) and the circular flue (210) were in-filled with rubble. A single brick of the arch (209) over the stoke hole survived in situ, springing from the front wall (222) clearly visible on figure 6.

7.3.5 Within the flue were six surviving brick supports (211-216) for the muffle; the seventh support had been destroyed by previous truncation (see figure 5, plan 3 and plate 9). These radial supports were in the form of vertical piers with half arches springing from them to support the base of the muffle. The piers were built directly onto the plinth base (205) and were spaced approximately 0.25m apart from each other. The supports abutted the flue lining (210) but were not directly bonded to it being held in place by lime mortar (see plate 11). The piers continued up the side of the muffle for two courses of brick to provide a stable support. The arches did not meet in the centre leaving a roughly circular hole 22cm across, which is clearly visible in plate 9 (see plan 3 on figure 5 and figure 8 for elevation).

7.3.6 The space between each brick support was filled by brick rubble and mortar (221) to provide a sloping surface from the fire chamber up and around the muffle thus improving gas flow. This is clearly visible in plate 12, as is the heavy vitrification on the surface.

The Muffle

7.3.7 The base of the muffle (217) was discovered in situ (plate 7). The muffle base was up to 13cm thick and the walls were up to 10cm thick. The construction of the muffle is typical and displays many common features with other known examples such as luted inner surfaces (a lute is an application of clay slip to surfaces within the kiln) and pipe stem reinforcing to the clay fabric of the muffle (Peacey 1996:15) which is clearly visible in plate 16. The outer surface of the muffle was heavily slagged, as is to be expected from the fixed position in relation to the fire (Peacey 1996:16).

7.3.8 The muffle (217) utilised a bar type buttresses (visible in plate 10) to brace it from the flue wall (210). This was essentially a radial extension from the outer surface of the muffle wall which act as supports bearing against the inner surface of the firing chamber. In the space bridged by these supports the fire was able to circulate around the muffle (Peacey 1996:17). The buttresses averaged 0.29m thick and like the muffle were reinforced with pipe stems.

7.4 Phase 4: Construction of kiln 3

7.4.1 The third phase of use at the site comprised the construction of a third kiln, structure 300 (plate 19) on the north-east side of kiln 2. This final structure had been truncated from above but survived to a similar height as kiln 2 and was clearly an updraught kiln of similar design.

7.4.2 As with kiln 2, this latest structure was built directly into the side of the disused quarry. The outer brick retaining wall (303) differed from kiln 2 in that it was solid brick without a rubble fill. It was constructed in English garden bond directly onto a rough mixed stone and brick rubble foundation (302). This overlay a levelling deposit (301) of rubble and ash mixed with discarded clay pipes, presumably debris from the earlier phases of the kiln site. The outer brick retaining wall (303) both abutted and was built over wall (203) of kiln 2 (see figure 4, section 2).

7.4.3 As with the second kiln, this outer wall contained a brick plinth (312) which contained the stoke hole and fire chamber. The plinth measured 1.10 x 1.15m and was six courses high (figure 10). The outer wall (303) surrounded the plinth on all three sides bar the opening for the stoke hole.

7.4.4 A double skinned circular flue (plate 19) was built directly onto the plinth and was constructed of header bonded half bricks (304) which were bonded into (305) providing an outer ring of brick to strengthen the structure (figure 10). The area between the outer retaining wall (303) and the circular flue (304/305) in the corners produced by the circular flue wall were filled with a rubble core (306). The inner face of the flue (305) retained evidence of vitrification (307). The west side of the flue opened out for the stoke hole and retained a segmental arch (309) which survived intact (figure 9). The inner face of the arch was rendered with pipe clay (310) which contained pre-fired pipe stems (figure 9).

7.4.5 No internal features were present within the flue and there was no evidence of a muffle or any supporting arches. The structure was filled with demolition material (314).

7.4.6 The front wall of this kiln (308) (illustrated on figure 9) was built onto the front of plinth (312) rather than on top. This facade was not directly bonded to the flue (305) or retaining wall (303), it abutted these structures and wall (203) of kiln 2.

7.5 Rake out deposits

7.5.1 Compacted rake out deposits were present within the area to the front of the kilns. These deposits extended across the area sloping up to the north-west from the stoke holes to the edge of the excavation. These deposits represent working floors building up over a period of use. Section 4 on figure 4 (also plate 3) shows the superimposition of three deposits (409,410 and 411) sloping up from the kiln openings. These silty deposits were generally very similar and all contained high percentages of ash and charcoal with fragments of pipe clay. These deposits overlaid (403) the

original quarry backfill (visible on plate 3) upon which the kilns were built. (see paragraph 9.1).

7.6 Phase 5: Demolition of kilns and 20th century use of the site

7.6.1 The kilns appear to have gone out of use early in the 20th century. Finds from the demolition material layer contained glass that was clearly of early 20th century origin (see 8.4). The surviving kilns upper structure was no more than 5cm below ground level. It would appear that these structures were partially demolished to level the site. The stoking area to the north-west of the kilns retained a deeper stratigraphic sequence which comprised (414) a dark greyish brown soft and friable clay, modern made ground which was up to 0.70m thick. This overlay (413) a mid greyish brown soft to friable clay silt which was also a modern 20th century make up deposit up to 0.68m thick. This overlay (412) an ashy rake out deposit which probably represents the last use of the kiln site. This sealed a thin rake out deposit (409) which sealed a compacted floor level (410). This lay directly over a redeposited layer of chalk (403) which represented early quarry backfill. Although the kilns themselves contained demolition rubble, the stoking area did not, and was in-filled with imported clay silt material directly overlying the compacted working floors. The absence of any kiln or pipe manufacturing debris from these deposits was extremely obvious suggesting a deliberate infilling with imported material.

8. Finds

8.1 All finds from archaeological contexts were retained for analysis.

Ceramic Building Material (CBM)

8.2 The quarry backfill (405) contained 12 sherds of dark reddish orange roof tile weighing 2.114Kg. These were identified as Post-medieval and likely to be of late 18th to early 19th century date.

Glass

8.3 The demolition fill of kiln 1 (106) contained a single dark green fluted glass inkwell typical of the mid to late 19th century .

8.4 The demolition fill of kiln 2 (219) contained three sherds of dark green bottle glass and a single HP sauce bottle typical of the early 20th century.

Clay pipes

8.5 A total of 1436 fragments of clay pipe were recovered from the site. These comprised 798 bowl, 679 stem and 259 mouthpiece fragments from nine separate contexts. These are dealt with in detail in appendix 1.

9. Environmental Sampling

9.1 Environmental samples were taken at the evaluation stage when a series of laminated layers were identified which were comparable to laminated Early Medieval floors found elsewhere in Winchester. It was later demonstrated that these were in fact 19th century trampled rake out deposits (409,410,411) associated with the kilns and thus not processed. These samples were only subject to basic analysis which was undertaken by Chris Pine. It was observed that the layers contained high concentrations of wood ash and charcoal which was identified as the likely source of fuel for the kilns.

10. Discussion and Conclusions

10.1 The site has produced what is the most complete pipe kiln to have been excavated in this country to date. The sample of pipes recovered provides one of the most complete of its date to have been excavated. It not only allows the range and nature of the pipes produced in a small family run workshop to be explored, but also provides a reference point for future finds from throughout the surrounding region.

Manufacturing History (Taken From Appendix 1)

10.2 Pipes were manufactured in Winchester from the 17th century onwards (Oswald 1975, 171-4) and, during the course of the 19th century, the local supply came to be dominated by the Baker family, who moved to Winchester in about 1820 (White and Higgins, forthcoming). Their kiln was in St John's Street, which joins into Bridge Street very near to the site of these excavations. The St John's Street business was run by Harry Baker, who died in 1854, when it passed to his widow, Martha. She passed away on 1 December 1856 leaving sons Charles and Frederick to carry on the business. Charles died a few months later in August 1857 and, by 1859, Frederick had moved to Upper Brook Street, where he briefly ran his own pipemaking business. This does not appear to have lasted long since he was a patient in the Royal Hospital, Fareham in 1861 (described as a labourer), before moving from the area to work as a pipemaker in Hastings by 1871.

10.3 The demise of the Baker business in Winchester clearly left a gap in the market and, on 3 March 1860, Richard Goodall of 2 The Green, Gosport, pipemaker, purchased the Bridge Street property (Winchester RO: Deeds W/F1/19/14). Richard had been baptised at Fareham on 14 May 1815, son of the pipemaker John Goodall. He came from a prolific pipemaking family, at least 16 of whom are known to have been pipemakers in the Portsmouth Harbour area. Richard, however, does not appear to have been buying the site for himself, but for his son (also called Richard), who had been baptised

at Fareham on 2 April 1837. Richard (Jr) would, therefore, have been aged about 23 at the time and setting up a new business on a site that had not previously been used for pipemaking. This would have necessitated building a kiln, which Richard (Sr) would no doubt have helped with. This would probably have been kiln 1, as found during the excavations. Richard (Sr) was clearly running a successful business to be able to set up his son in this way and, in the 1861 census, is listed as a pipemaker in Fareham employing 12 people (6 men, 3 women and 3 boys).

10.4 Richard (Jr) appears in the 1861 census as the head of the household at the Bridge Street premises, the other occupants there being Frederick Goodall, a 13-year-old apprentice, and John J. Colborn, a 23-year-old pipemaker, and his family. Both Frederick and John were also recorded as having been born in Fareham suggesting that they were previously known to Richard. From a cursory examination it might appear that this Frederick Goodall provides the key to the later F. Goodall pipes found in large numbers on the site (see below). In fact, it transpires that this Frederick was Richard (Jr's) cousin, the son of his uncle Edward, who was also a pipemaker. The F. Goodall pipes from the site were actually made for his brother Frederick, who was himself a tobacconist and pipemaker in Gosport.

10.5 Later in the same year (1861) Richard (Jr) married Eliza Newsam, boot binder, and the daughter of a victualler in nearly St John's Street, where the Baker pipe kiln had been. They do not appear to have had a particularly happy marriage since, in 1881, Eliza Goodall (still given as a boot binder) is listed as unmarried and living separately in Winchester with a 1-year-old daughter. She appears to have died during the 1880s since, by 1891, Richard is listed as a widower. He continues to appear as a pipemaker (and employer) at the Bridge Street site in the 1901 and 1911 census returns but does not appear to have remarried.

The Kiln Structure

10.6 The present kiln site is of three phases, perhaps demonstrating a need for continued expansion in the early years of operation. The fact that kilns 1 and 3 contained no evidence for internal features or a muffle might indicate a downsizing of the production facility towards the end of its operating life. The introduction of cigarettes in the late 19th century saw a reduction in the demand for clay pipes and this is probably what led to the abandonment of the kiln site in the early 20th century.

10.7 The three Bridge Street kilns were all of updraught type, typical of this period and of the same type as its predecessor at St John's Street. Updraught kilns represent the pinnacle of clay pipe kiln technology and these kilns represent the most developed form. The excavation only identified the kilns themselves, no ancillary structures such as workshops

were identified. This indicates two possibilities, that that these structures are under the later rear extension to 11 Bridge Street, or that this site was only for the firing process and the other industrial processes such as moulding and dressing were undertaken off site.

10.8 The lack of evidence for clay wads, rolls and thin sheets was particularly evident. These billets and rolls of clay which are so prevalent at other kiln sites were not present within the excavation area. These features are intricately involved in the production process of clay pipes, particularly the firing process and even though the exact function of these features is uncertain it is unlikely that had they been in use at the site that there would be no evidence within the excavated material. Their absence suggests that some new production method may have been employed.

10.9 In terms of fuel for the kilns, the rake out deposits only contained wood ash and charcoal, there was no evidence for coal. This seems somewhat unusual for this period where it might be expected that coal would form the primary fuel source. It is likely that charcoal was the primary fuel and it is likely that it was sourced locally as it would be uneconomic to transport over long distances.

Interpretation from the pipe analysis (taken from Appendix 1)

10.10 Analysis of the finds from this site have shown that at least 50 different patterns of pipe were produced here over the years, with nearly half of them bearing makers' marks. Despite this, there are only four or five of the designs that have the initials RG or the name R. Goodall to identify the individual known to have operated the site, and two of these give different places of manufacture, i.e., Gosport and Portchester. There is not a single pattern that gives the place name Winchester and, had this assemblage have been found elsewhere in the city, it would not have been possible to identify most of them as being local products. This underlines the importance of recovering kiln groups to establish the actual range and nature of the pipes being produced at any one site.

10.11 What appears to have happened is that Richard Goodall set up the pipe manufactory as a young man, with financial backing from his father. Rather than add to his initial expenses by commissioning new moulds, he appears to have used a number of old moulds, at least some of which were passed on to him by his father, Richard (Sr). These probably included the two churchwarden type moulds with RG heel marks as well as the two examples with full names on the stem and the work places of Gosport and Portchester. He may also have passed on the already reused Chamberlain mould with the PEACE/1856 modification. Other moulds with evidence of reuse are those marked RR and SW, neither of which match makers on this site (or known to have been connected with

the family), and the churchwarden mould with the deleted marks on the spur and stem.

10.12 Most of the pipes from the excavation come from demolition deposits overlying the structural remains and so, by their very nature, they may well contain material of mixed date and they are very likely to contain material from the latest phases of production. The only well-stratified earlier group comes from context 408, a pit fill cut by the construction of kiln 2. This group produced predominantly early looking styles within the date range of this site; long-stemmed varieties with either plain bowls or rib seams being the most common. There were very few shorter cutty designs and none of the F. Goodall pipes that appear to have been a mainstay of later production. At least four of the mould types that are likely to have been reused were present in this pit, supporting the view that early production was of 'traditional' designs and relying on an assortment of second-hand moulds, rather than expensive new ones.

10.13 As the site established itself, Richard does not appear to have been interested in promoting his own business by marking pipes with his own name and place of work, but rather he concentrated in supplying pipes for his brother Frederick in Gosport (despite the fact that Frederick is documented as a pipemaker in his own right). At least nine of the patterns produced on the site (18%) were specifically marked with Frederick's name and address, and these types are common amongst the later context groups. They do not, however, occur in the fill of kiln 1 and so it is possible that this went out of use and was filled in after kilns 2 and 3 were constructed and before the production of F. Goodall pipes has started. It is also worth noting that there are three different styles of F. Goodall mark, perhaps suggesting that the production range for his brother was built up in stages, with new moulds being added on three separate occasions.

10.14 All available pipe fragments were collected from the site, analysis of them has shown how important it is to collect large and complete samples of kiln waste. Large samples are needed to try and establish the full range of products manufactured on any given site. Even with over 1,400 fragments from these excavations, there are several varieties that are only represented by partial examples and a larger assemblage would almost certainly have produced additional types. A complete sample (in terms of collecting all the available stem and mouthpiece fragments and not just the bowls) is also necessary. It did not prove possible to reassemble individual pipes from the mixed demolition deposits, but it was possible to reconstruct many of the forms by using the stem and mouthpiece fragments recovered.

10.15 This study has shown that 11a Bridge Street was an important pipe manufacturing site in Winchester, with production documented for over 50 years from 1860 until at least 1911. The products from these kilns would not only have supplied the local markets in and around Winchester during this period but were also manufactured specifically for distribution from a relative's warehouse in Gosport, nearly 25 miles to the SSE. The network of family links revealed by this study is typical of the way these relatively small scale workshops appear to have operated during the 19th century. Richard came from a family with a long pipemaking history and one where there were many family links providing help and support. His father set him up in business and provided moulds to start him off, while he took on his cousin as an apprentice before going on to supply his brother with pipes. This provides a broader social context for the operation of this kiln, which was the last to carry on a centuries old trade in Winchester.

11 Acknowledgements

11.1 Groundworks Archaeology would like to thank Mr. Kevan Netherwood for commissioning this work. Grateful thanks are also extended to the Winchester Historic Environment Record, Ms Tracy Matthews and David Higgins for their kind assistance.

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Specification for an Archaeological Excavation Redwood Health Therapy 11 - 11A Bridge Street Winchester Hampshire SO23 0HL. Groundworks Archaeology 2016

Appendix 1: Pipe Report

Clay Tobacco Pipes from Excavations at 11a Bridge Street, Winchester

Dr D A Higgins
Second Draft - 6 April 2018

Introduction

This report deals with the clay tobacco pipes recovered by Groundworks Archaeology during the 2016 excavations of a former clay tobacco pipe manufactory at 11a Bridge Street, Winchester, prior to a redevelopment project. The site code used for this work was WINBS 16. The pipe fragments have been individually examined and, so far as possible, sorted into mould types so as to identify the range and nature of the pipes produced on this site. Summaries of the context groups and mould types have been logged onto Excel worksheets, copies of which form part of the site archive. The information on the worksheets has also been provided as tables in the following report.

Manufacturing History

Pipes were manufactured in Winchester from the seventeenth century onwards (Oswald 1975, 171-4) and, during the course of the nineteenth century, the local supply came to be dominated by the Baker family, who moved to Winchester in about 1820 (White and Higgins, forthcoming). Their kiln was in St John's Street, which joins into Bridge Street very near to the site of these excavations. The St John's Street business was run by Harry Baker, who died in 1854, when it passed to his widow, Martha. She passed away on 1 December 1856 leaving sons Charles and Frederick to carry on the business. Charles died a few months later in August 1857 and, by 1859, Frederick had moved to Upper Brook Street, where he briefly ran his own pipemaking business. This does not appear to have lasted long since he was a patient in the Royal Hospital, Fareham, in 1861 (described as a labourer), before moving from the area to work as a pipemaker in Hastings by 1871.

The demise of the Baker business in Winchester clearly left a gap in the market and, on 3 March 1860, Richard Goodall of 2 The Green, Gosport, pipemaker, purchased the Bridge Street property (Winchester RO: Deeds W/F1/19/14). Richard had been baptised at Fareham on 14 May 1815, son of the pipemaker John Goodall. He came from a prolific pipemaking family, at least 16 of whom are known to have been pipemakers in the Portsmouth Harbour area. Richard, however, does not appear to have been buying the site for himself, but for his son (also called Richard), who had been baptised at Fareham on 2 April 1837. Richard (Jr) would, therefore, have been aged about 23 at the time and setting up a new business on a site that had not previously been used for pipemaking. This would have necessitated building a kiln, which Richard (Sr) would no doubt have helped with. This would probably have been kiln 1, as found during the excavations. Richard (Sr) was clearly running a successful business to be able to set up his son in this way and, in the 1861 census, is listed as a pipemaker in Fareham employing 12 people (6 men, 3 women and 3 boys).

Richard (Jr) appears in the 1861 census as the head of the household at the Bridge Street premises, the other occupants there being Frederick Goodall, a 13-year-old apprentice, and John J. Colborn, a 23-year-old pipemaker, and his family. Both Frederick and John were also recorded as having been born in Fareham suggesting that they were previously known to Richard. From a cursory examination it might appear that this Frederick Goodall provides the key to the later F. Goodall pipes found in large numbers on the site (see below). In fact, it transpires that this Frederick was Richard (Jr's) cousin, the son of his uncle Edward, who was also a pipemaker. Cousin Frederick went on to make pipes at Fareham, where he is recorded working from at least 1871-1911. The F. Goodall pipes from the site were actually made for Richard Jr's younger brother Frederick, who was himself a tobacconist and pipemaker in Gosport.

Later in the same year (1861) Richard (Jr) married Eliza Newsam, boot binder, and the daughter of a victualler in nearly St John's Street, where the Baker pipe kiln had been. They do not appear to have had a particularly happy marriage since, in 1881, Eliza Goodall (still given as a boot binder) is listed as unmarried and living separately in Winchester with a one-year-old daughter. She appears to have died during the 1880s since, by 1891, Richard is listed as a widower. He continues to appear as a pipemaker (and employer) at the Bridge Street site in the 1901 and 1911 census returns but does not appear to have remarried.

It is not known exactly when Richard ended pipe production at the Bridge Street site, but his brother Frederick (for whom he was clearly supplying pipes) died on the 7 January 1914, aged 73 (and leaving a substantial estate of £1,764 0s 9d). Richard himself would have been around 77 in 1914 and so this may well have been a point at which he decided to retire. Although the date at which he actually fired the last kiln and ceased production is unknown, it is likely to have been during the First World War, or soon thereafter. The closure of this site marked the end of some 300 years of pipemaking in Winchester. Richard himself died on 2 August 1927, aged 90, leaving an estate of £96 10s.

The Pipe Assemblage

The WINBS 16 excavations produced a total of 1,436 fragments of pipe, comprising 498 bowl, 679 stem and 259 mouthpiece fragments from nine different contexts. The finds from this site are particularly important for three reasons. First, the site produced what is probably the most complete pipe kiln ever to have been excavated in this country. Second, this was the last pipemaking site in Winchester, bringing to a close some three centuries of pipe production in the city. Third, the pipes recovered provide one of the most complete samples of this date to have been excavated nationally. They not only allow the range and nature of the pipes produced in a small family run workshop to be explored, but also provide a reference point for future finds from throughout the surrounding region.

Methodology

The finds from each context group were sorted into bowls, stems and mouthpieces using the definitions outlined in ***Guidelines for the Recovery and Processing of Clay Tobacco Pipes from Archaeological Projects*** (Higgins 2017a). The stems were all laid out in the same

orientation (i.e., with the thicker (bowl) end facing one way and the thinner (mouthpiece) end the other), and assessed to see if joins were present with other bowl or mouthpiece fragments (see Higgins 1982 for the methodology for reassembling pipes). Despite most of the contexts having produced large, fresh looking pieces of pipe, extremely low levels of joins were found. In contrast, it was often possible to use decoration or small surface flaws visible with a lens to find overlapping fragments that could be used to reconstruct the complete form of the original pipes. Detailed comparison of mould flaws was also used to identify the individual mould types present and these were given temporary numbers to identify them during sorting. These were later sorted into a sequence for the final report that endeavoured to place similar types together to aid comparison and identification of examples from elsewhere. The temporary numbers were converted to figure numbers, with each of the first 50 figure numbers representing an individual mould type that is likely to have been used on the site (i.e., the first 50 figure numbers and the 50 mould type numbers are now the same). Tables have been prepared to show the numbers of examples recovered and the distribution of the different mould types/marks both within and between contexts. The results of this detailed analysis are presented below. The occurrence of each of the mould types by context is given in Appendix 1.

The Context Groups

The following sections describe the pipes from each of the context groups, with the context number or description being given first, followed by the numbers of bowl, stem and mouthpiece fragments present (in that order), followed by the total. Thus "106 (144/116/111 = 371)" indicates that context 106 contains 144 bowl, 116 stem and 111 mouthpiece fragments making a total of 371 in total. The evidence from each context group is described below, with the information relating to each being summarised in Appendix 2.

106 (144/116/111 = 371) This group of pipes was collected from the demolition fill within kiln 1 and is by far the largest group to have been collected from the excavations, comprising 371 fragments in total. Many of the bowls are complete and the material appears to have been in a fresh condition when it was deposited. A total of twelve different mould types is represented with the context group being dominated by an RAOB cutty with a plain stem and moulded milling around the bowl rim (Fig 32; 87 examples). Somewhat oddly, this occurs in two distinct versions with ten of the bowls having been made while the mould was in a good, sharp, condition but the majority (77 examples) having been made when the mould surface had become very scratched and worn, resulting in a poor finish. This suggests that the pipes were made at very different times, since the mould would have been made of cast iron and only worn very slowly. One possible explanation is that these RAOB pipes were damaged examples being discarded from stock that was being sorted out, the container for which included some broken pieces from early production that had had lain undisturbed at the bottom for a number of years.

Three other patterns were relatively common in this context, being represented by between ten and twenty-one examples each; a plain, spurless, pattern (Fig 10; 21 examples); a cutty with branch heel spur and the bowl decorated with lines and dots (Fig 23; 11 examples), and a fluted bowl that was probably a long-stemmed variety (Fig 49; 10 examples). The remaining eight patterns were all represented by four or fewer examples each. These include

some designs that probably had short stems, but the majority appear to have been long-stemmed patterns, including two types marked RG and one marked RR on the sides of the heel or spur (Figs 41-43). Perhaps significantly, there are none of the types marked F. GOODALL on the stem, despite this being by far the most numerous mark from the site as a whole and this being the largest context group to have been recovered.

219 (41/100/37 = 178) This group of pipes was recovered from demolition material within the surviving muffle structure of kiln 2. Sixteen different bowl designs are represented, with a further three being evident from surviving stems. The fragments are generally well preserved with long, fresh looking, stem fragments and many complete bowls. The most striking division, however, is between the normal white fragments and those that have been highly fired to a stoneware state and discoloured to a variable yellowish brown colour. These vitrified pieces all have fired clay particles adhering to their outer surfaces and are all either stems (32 examples, up to 130mm in length) or mouthpieces (one nipple type and three with cut ends) – there are no overfired bowl fragments at all. There are not any 'intermediate' stems in terms of vitrification or surface encrustation – the fragments are either normal in appearance or highly fired/discoloured. Finally, almost all of these overfired and encrusted fragments are from long-stemmed pipes. It is clear that one group of stems have been selectively encrusted with clay and exposed to much more heat than the other pieces. It is almost certain that these would have been long pieces of broken stem (and so primarily from 'churchwarden' types of pipe) that have been used for muffle construction. They are presumably pieces that have fallen out of the muffle during demolition of the kiln.

The remaining pipes are generally typical of those found elsewhere on the site, but with a high proportion of short-stemmed pipes, many of which are marked 'F.GOODALL / GOSPORT'. These are likely to represent some of the latest styles produced on the site, since they come from demolition deposits within the muffle. One thin, curved, stem fragment has the unbordered incuse lettering '…DALL / GOSPO…' on it (Fig 35). No other marked stems of this style were found during the excavations and so it is uncertain whether this was an F Goodall or an R Goodall mark. This context also produced four thin curved stems terminating with rounded moulded mouthpiece, which may well have come from the same pattern of pipe. This would have been some sort of a 'straw', a thin stemmed pipe that was always regarded as being better quality since they were more difficult to make and easier to break – hence they always sold for a little more.

220 (80/43/20 = 143) This group of pipes was recovered from demolition material within the stoking/firebox area of kiln 2, beneath the muffle. This context included 16 different patterns of pipe the most common being the RAOB cutty with a plain stem and moulded milling around the bowl rim (Figure 32 with 42 examples, representing just over a half of all the bowls present). None of the other patterns was represented by more than seven examples and most were only represented by just one or two. These included a wide range of styles, very few of which were marked. There were single examples of stems marked 'DERRY' (Fig 39) and 'J. CHAMBERLAIN' (Fig 45) and four bowls of the type that had an RR spur mark (Fig 43). As with context 106, there were no examples of F. Goodall stem marks, although one bowl with RAOB decoration is of type that would have had such a mark originally (Fig 30).

314 (27/38/31 = 96) These pipes were recovered from within the demolition fill of kiln 3. Quite a number of the fragments are discoloured a blotchy grey from having been burnt in a

low temperature smoky environment, perhaps from burning rubbish in the kiln at the end of its life rather than as a result of the production process itself. A wide range of patterns were recovered, with fourteen different bowl styles being present, and a further four being represented by stem fragments only. Most of these are short-stemmed cutty styles with decorated bowls as opposed to longer stemmed churchwarden types. This dominance of short types is evident from the high proportion of nipple type mouthpieces (27) as opposed to those with moulded round ends or simple cut ends (two examples each). There are also a lot of stems with F. Goodall marks (40 fragments) as opposed to just two examples of other types (one heel marked SW and part of a J. Chamberlain stem). What is odd, however, is the uneven representation of different types/parts of the various pipe patterns. Quite a number of the F. Goodall stems come from designs that are not represented by any bowls at all in this group. Conversely, there are very few of the mouthpieces of the type that should be associated with the most common bowl from this group (a plain F. Goodall pattern with moulded milling, represented by ten examples; Fig 37). Despite the mismatch between bowl and stem fragments of the various designs, the overall pattern is clear, with this group containing a very high proportion of short-stemmed cutty pipes, most of which have nipple mouthpieces and 'F.GOODALL / GOSPORT' on the stem. Although from demolition deposits filling the kiln, these designs are likely to have been typical of the final phase of production on the site prior to it being cleared. It is notable that none of the pipes present was marked RG or R. Goodall.

408 (73/144/15 = 232) These pipes were recovered from the fill of pit 407, which had been cut by the construction of the eastern wall of kiln 2. This material is the stratigraphically earliest deposit to have produced pipes and presumably relates to an early phase of production on the site, when just kiln 1 was in use and before the construction of kiln 2. The nature of the pipes recovered supports this, with longer stemmed patterns of pipe (that are stylistically earlier) dominating the assemblage. Likewise, all the stem marks have relief lettering, which is also an earlier style. There are 16 patterns of pipe represented in this sample, with the 'PEACE / 1856' pattern being the most numerous (Fig 45; 18 examples). There were five other patterns with spurs or heels under the bowl; three with plain bowls (one of which is marked SW; Fig 44) and two decorated. One of the decorated types has a fluted bowl with leaf seams (Fig 50) and the other has the bowl modelled as an acorn in its cup, with a small acorn for a spur (Fig 46). The acorn pattern has the maker's name 'R.GOODALL / GOSPORT' on the stem, and so may have been an old mould given to Richard Junior by his father when he set up the business in Winchester. The 'PEACE / 1856' mould was also an old one, with the original maker's name, 'J.CHAMBERLAIN / LANDPORT', largely erased from the stem. All of these patterns are likely to have had long stems.

The remaining ten patterns are all spurless varieties and, like those with heels or spurs, would mainly have had long stems. The most common patterns are those with raised rib seams, with four very similar types present, the three most numerous of which total 35 examples, about half of all the pipes in the group as a whole (Figs 2, 3 and 5). The other seven spurless designs are only represented by single examples each, and include both plain types (one of which is a thick-walled Irish style (Fig 38)), as well as more ornately decorated examples (a rose/thistle/shamrock design and two varieties of claw; Figs 14, 19 and 20). One or two of these less common patterns probably had short stems, as represented by three chunky stems with a rounded tip (all from the same mould – a spurless cutty with a plain bowl and moulded

milling; Fig 11) and one nipple mouthpiece. Short-stemmed or 'cutty' pipes were only introduced around the middle of the nineteenth century and so these examples can be seen as stylistically newer introductions to a production range still dominated by longer-stemmed types. Given the stratigraphically early nature of this deposit and the style of the pipes (and marks) that it contains, this group seems likely to date from the 1860s or 1870s. It is notable that there are no pipes marked F. Goodall in this deposit.

The final point to note about this group is the presence of a few stems that are either badly overfired or that have traces or fired clay adhering to them, most likely from use in muffle construction. There are also five stem fragments with small areas of slaggy concretion adhering to them, similar to that which occurs when slag/stem laminate is used to seal the muffle chamber during firing. Material of this type was notable by its absence amongst the other excavated groups and these pieces, while not being sufficiently diagnostic to provide conclusive evidence, may indicate the use of this technique in the earliest phases of production on this site.

409 (42/69/21 = 132) These fragments were recovered from a thin ashy rake out deposit in front of the kilns, which overlay a compacted floor surface (410). Sixteen different bowl types were recovered, with a further four types being represented by stem fragments. Most of these types were only represented by a small number of examples, the most numerous being a plain spurless bowl with moulded rim milling and an 'F.GOODALL' mark on the stem (13 examples; Fig 37). There were 24 stems with 'F.GOODALL' marks in total, representing at least six different patterns of pipe. This represents quite a high percentage of the pipes recovered and makes it clear that these patterns of pipe were being produced on the site, since they occur directly in the rake out deposits from the kilns. Furthermore, this production is likely to have been at the very end of the site's use, since this rake out layer was the last deposit on top of 410, a more compacted surface representing the longer-term use of the stoking area.

410 (5/90/6 = 101) This context comprised a compacted ashy floor surface in front of the kilns, made up of trampled waste that had accumulated during their use. As would be expected, the pipes from this deposit are much more broken up that from most of the other areas, with a large number of small stem fragments and only three complete bowls. Some of the stems have discolouration or encrustation from having been exposed in the kiln, and a couple have fired clay adhering, as if used in the muffle. One stem fragment is badly warped, which appears to have happened before it was quite dry, since it is not otherwise overfired. The bowl fragments are all from different patterns of pipe and there is nothing particularly distinctive in terms of the pipes represented, although it is worth observing that none of the stems is marked F. Goodall. The most notable fragment is a cut mouthpiece on a curved stem that has traces of a red tip coating surviving. This is the only example of a coated tip from the site and is perhaps more likely to represent a pipe that was being smoked while tending the kiln rather than necessarily reflecting the type of tip finish actually being used on the pipes produced here.

Demolition Overburden (7/79/17 = 103) This group of finds was collected from amongst the demolition deposits covering the site. There are no complete bowls but all seven bowl fragments found come from different patterns and a further two designs are represented by stem fragments. The stems themselves are often of a reasonable length, with one mouthpiece

fragment being 105mm long. There is one complete stem from a cutty pipe with a maker's name on it (F.GOODALL) and quite a number of fragmentary examples with this same name on. As might be expected from this type of deposit, the types represented are very mixed. One design with a large, plain, spurless bowl had the incuse stem mark 'R.GOODALL / [PORT]CHESTER' (Fig 38). The other stems are a mixture of short-stemmed cutty types, many of which are marked 'F.GOODALL / GOSPORT', and long-stemmed 'churchwarden' types. The mouthpieces reflect this, with a mix of simple cut ends and nipple types. Some of the cutty styles appear to have had slightly bent stems, and the longer churchwarden styles certainly did. Quite a number of stem fragments from the 'J.CHAMBERLAIN / LANDORT' mould (Fig 45) are present (eight) as well as the only identifiable piece to have certainly been made off-site, which is marked '[J].SANTS / BATH' (Fig 51). This was made by Joseph Sants, who is recorded working from 1837-71 (Lewcun 1984, 12). This style of mark has been found in closely dated deposits of kiln waste that was discarded by Sants in Bath ***c***1867-1869 (Lewcun 1984, 12). Evidence for manufacture is evident from a few of the fragments that have a mottled grey colouration from being in a low temperature smoky environment, very similar to many of the fragments from the fill of kiln 3 (context 314). A few pieces also have traces of adhering clay, as if used in muffle construction, and one piece certainly has some layers of white clay luting from lining a muffle adhering to it. There is one fragment from a long stemmed pipe with a curved stem that had been broken and the narrower end rounded off, most likely for reuse in a broken state. A small proportion of used pipes is normal on a kiln site, reflecting smoking amongst the workforce during manufacture.

Unstratified (79/0/1 = 80) This group almost entirely comprises complete bowls that were selectively retained during earthmoving operations, etc. A wide range of bowl types is represented (20 different types), most of which occur in relatively small numbers and two of which are of types that were not recovered from any of the other contexts. It is notable that none of the nine F. Goodall varieties identified from other contexts occurred amongst the unstratified material.

The Pipe Marks

Analysis of the pipe fragments has identified a total of 50 different patterns of pipe that were probably made on the site, plus one type that was certainly made elsewhere but discarded on the site. Twenty of these patterns have makers' names or initials on them, in addition to which there are two types with symbol marks only. Finally, there is one type where traces of a former mark that has been erased can be seen. The 22 pipes with visible marks represent 43% of the 51 designs in total and are described below. All of the marks are mould imparted. There are three different styles of F. Goodall mark, which have been distinguished as FG1, FG2 and FG3.

J.CHAMBERLAIN / LANDPORT One of the most common designs represented on the site has a long stem with the relief moulded lettering 'J.CHAMBERLAIN / LANDPORT' running along it, flanked by decorative curves at each end (Fig 45). The bowl has leaf seams and a symbol mark of a small shield on either side of the heel. There is a decorative collar on the stem before the bowl and there are large shields on each side of the bowl containing the lettering 'PEACE' on the left and '1856' on the right. These shields clearly commemorate

the ending of the Crimean War in that year. Beneath the large shields are foliage motifs including the rose, thistle and shamrock to represent England, Scotland and Ireland.

This particular mould appears to have a quite long and complex history. The mould originally appears to have been made with just leaf decorated seams to the bowl (which was otherwise plain), small shields on the heel, and J. Chamberlain's name on the stem (Fox and Hall 1978, Fig 8.55). Chamberlain is not recorded as a pipemaker in Fox and Hall's list but his life history has now been outlined by the author (Appendix 3). James Chamberlain was born in about 1824 and married at Landport in 1848, aged about 24. He was described as a pipemaker at the time of his marriage and the named pipe stem clearly shows that he must have run his own business for a period. By 1851, however, he was working at Southampton and he subsequently seems to have moved frequently, suggesting that he was working as a journeyman, but he has not been recorded again at Landport. The original mould can, therefore, be dated to a brief attempt to establish his own business in the late 1840s and it was presumably sold by 1851 when he moved on to Southampton. By 1856 a subsequent owner had attempted to remove Chamberlain's name by filing down the stem lettering. Further alterations were also made by adding the stem collar and the bowl decoration, including the 'PEACE / 1856' shields. The Richard Goodall who ran the Winchester pipe works would only have been about 19 in 1856 and so is unlikely to have been in a position to buy/modify moulds at that time. Perhaps the change was made by his father (also Richard) who certainly appears to have given Richard (Jr) some of his old moulds when we set him up at Winchester in 1860 (see below). However this mould came into Richard (Jr's) possession, it appears to have been one of the most popular designs produced at Winchester, with at least 28 examples having been recovered from the excavations, where they occurred in all the contexts apart from 106 and 219.

DERRY / DERRY One pattern of pipe has the unbordered incuse moulded lettering DERRY on each side of the stem (Fig 39). The bowl is a thick-walled Irish style with a plain bowl and moulded milling. There is a symbol mark comprising a small hatched shield on either side of the heel. The term 'Derry' is a pattern name for this particular style of pipe and has nothing to do with where it was made or the particular maker. It is a generic term used by many different makers for pipes of this general style. The remains of three bowls of this type were found during the excavations (contexts 106, 220 and 409), but only one example of the stem mark was recovered.

…DALL / GOSPO… One thin and slightly curved stem with the partial incuse moulded inscription '…DALL / GOSPO…' was found in context 219 (Fig 35; bowl form unknown). While the place name is clearly Gosport, it is not known if this is an F. Goodall or R. Goodall mark. Unlike the other F. Goodall marks (see below), this mark is in a serif script, which stylistically is usually earlier. Given that it does not match the F. Goodall, it is perhaps more likely to relate to an old R. Goodall mould given to Richard (Jr) by this father when he set up on the site.

F.GOODALL / GOSPORT (FG1) This style of mark is characterised by unbordered incuse lettering with F.GOODALL on one side of the stem and GOSPORT on the other. Two different styles of cutty pipe were identified with this mark; one is a spurless thorn design (Fig 25) and the other a 'Bulldog' pattern pipe, where the stem has a diamond section between the mark and the bowl (Fig 34). Evidence of how far pipes from this site were

traded is provided by an example of this 'Bulldog' pattern that was found at Putney in Wandsworth, south-west London (Atkinson Notebook in the National Pipe Archive; LIVNP 2012.06.227, page 15).

F.GOODALL / GOSPORT (FG2) The second style of F. Goodall mark also comprises the unbordered incuse lettering F.GOODALL on one side of the stem and GOSPORT on the other, but each inscription is contained within a relief moulded border that includes a small loop at either end. Five different designs were identified with this style of mark (one of which is assumed to be this type, but only the loops at the end of the border survive, not the name itself). These are: a rusticated or wood design (Fig 28); a thorn pattern (Fig 26); a football design (plain bowl with boot kicking a ball underneath; Fig 29); an RAOB design with a lozenge shaped symbol mark on either side of the heel (Fig 31) and a thorn design with horse's hoof spur (Fig 27; this last type being the one with only the very end of the stem mark surviving). It is possible that the thorn and horse's hoof design goes with the rounded mouthpiece shown in Figure 52. The pipes with the FG2 style stem marks are all common designs for late nineteenth century cutty pipes.

F.GOODALL / F.GOODALL (FG3) The third style of F. Goodall mark also has unbordered incuse lettering but this time the wording F.GOODALL is repeated on both sides of the stem. Like the second style, the inscription is contained within a relief moulded border but, with this style, the border terminates in a sharp point at each end, without any loop. There are two patterns of pipe that have this style of mark. One is an RAOB style with an unmarked heel (Fig 30) and the other is a plain spurless bowl with moulded milling (Fig 37).

RG There are two patterns of pipe with the relief moulded initials RG on the heel or spur. Both types have plain bowls and are likely to have been long-stemmed or 'churchwarden' varieties. One type has a slightly forward leaning bowl and the initials set very low on the spur (Fig 41), while the other has a more upright bowl and the initials set in a more normal central position (Fig 42).

GOSPORT / R.GOODALL There is one pattern of pipe with the relief moulded stem mark 'GOSPORT / R.GOODALL', surrounded by a relief moulded beaded border (Fig 46). This pipe had the bowl modelled in the form of a large acorn, with leaf seams and a small acorn-shaped spur, and it was probably a medium length style of pipe. An example from the Portsmouth Harbour area is illustrated by Fox and Hall (1979, Fig 17.122) and another has been recovered from allotments at Farnham in Surrey (Higgins 2008, 30). Two examples of this type were found during the excavations, both of which came from the early pit fill (408), which probably dates from the 1860s or 1870s.

R.GOODALL / PORTCHESTER One pattern of pipe with the incuse moulded stem lettering 'R.GOODALL / [PORT]CHESTER' was found (Fig 38). This is a spurless style with a large, thick-walled, bowl form and moulded milling in a broadly Irish style.

RR At least six examples of a large plain bowl form with the initials RR relief-moulded on the spur sides were recovered (Fig 43). This would almost certainly have been a long-stemmed churchwarden style of pipe. A possible candidate for the original owner of this mould is Richard Russell, who baptised children at Portchester between 1813 and 1816, and is recorded at Portsmouth in the 1841 census, aged 55 (Fox and Hall 1979, 48-9).

R- One pattern of pipe with a retrograde initial '**Я**'on the left hand side of the spur was found (Fig 47; the right hand side is chipped away). This was probably a long-stemmed pattern of pipe and has leaves and acorns decorating the front seam (the seam facing the smoker is plain).

[J].SANTS / BATH One stem with the unbordered incuse moulded lettering '[J].SANTS / BATH' was found (Fig 51). This is the only fragment from the excavations that was almost certainly made off-site. It is a product of Joseph Sants, who is recorded working in Bath from 1837-71 (Lewcun 1984, 12).

SW One pattern of pipe with a plain bowl and the initials SW relief moulded on the sides of the heel was recovered (Fig 44). This was probably a long-stemmed pattern of pipe, the original manufacturer of which has not been identified (there are no known Hampshire makers with these initials either Fox and Hall 1979 or Oswald 1975).

DELETED MARKS One pattern of long-stemmed pipe with deleted marks was present on the site, with at least 14 examples being present (Fig 48). This pattern has a plain bowl with traces of initials on either side of the spur (only parts of the serifs survive). There is also a clear mark from a blanked out panel on the left hand side of the stem, where lettering would formerly have been. While the original owner has not been identified, this is clearly a re-used mould that was in production at this site.

Shields Two of the pipes have symbol marks comprising little cross hatched shields on the sides of the heel. In both cases the shield is placed upright and both pipes also have other marks on them (see above). One is the J. Chamberlain pipe (Fig 45) and the other the Irish style with 'DERRY' on either side of the stem (Fig 39).

Lozenges Three patterns of pipe have a symbol mark comprising four small raised squares placed close together so as to form a larger lozenge design on each side of the heel. All three examples occur on cutty pipes with an RAOB motif on the bowl (Figs 31-33), which suggests that the lozenge mark was regularly used as an integral part of this design. Two of the pipes are otherwise unmarked, but the third also has a type three 'F.GOODALL' mark on the stem (see above; Fig 31).

Discussion

Analysis of the finds from this site have shown that at least 50 different patterns of pipe were produced here over the years, with nearly half of them bearing makers' marks. Despite this, there are only four or five of the designs that have the initials RG or the name R. Goodall to identify the individual known to have operated the site, and two of these give different places of manufacture, i.e., Gosport and Portchester. There is not a single pattern that gives the place name Winchester and, had this assemblage have been found elsewhere in the city, it would not have been possible to identify most of them as being local products. This underlines the importance of recovering kiln groups to establish the actual range and nature of the pipes being produced at any one site.

What appears to have happened is that Richard Goodall set up the pipe manufactory as a young man, with financial backing from his father. Rather than add to his initial expenses by commissioning new moulds, he appears to have used a number of old moulds, at least some of which were passed on to him by his father, Richard (Sr). These probably included the two churchwarden type moulds with RG heel marks (Figs 41-42) as well as the two examples with full names on the stem and the work places of Gosport and Portchester (Figs 38 & 46). He may also have passed on the already reused Chamberlain mould with the PEACE/1856 modification (Fig 45). Other moulds with evidence of reuse are those marked RR and SW (Figs 43-44), neither of which match makers on this site (or known to have been connected with the family), and the churchwarden mould with the deleted marks on the spur and stem (Fig 48).

Most of the pipes from the excavation come from demolition deposits overlying the structural remains and so, by their very nature, they may well contain material of mixed date and they are very likely to contain material from the latest phases of production. The only well-stratified earlier group comes from context 408, a pit fill cut by the construction of kiln 2. This group produced predominantly early looking styles within the date range of this site; long-stemmed varieties with either plain bowls or rib seams being the most common. There were very few shorter cutty designs and none of the F. Goodall pipes that appear to have been a mainstay of later production. At least four of the mould types that are likely to have been reused were present in this pit, supporting the view that early production was of 'traditional' designs and relying on an assortment of second-hand moulds, rather than expensive new ones.

As the site established itself, Richard does not appear to have been interested in promoting his own business by marking pipes with his own name and place of work, but rather he concentrated in supplying pipes for his younger brother Frederick in Gosport. Frederick had been born in about 1840 and started life as a shipwright (1861 and 1871 census returns). By 1881 he had moved to 16 North Cross Street, Alverstoke, Gosport, where he was initially listed as a tobacconist (1881 and 1891), then as a tobacconist and pipe manufacturer (employer) in 1901, and finally as a clay pipes and whiting manufacturer (employer) and retail tobacconist in 1911. He may well have been using pipes to promote his tobacconist's business from around 1880 onwards, and he clearly moved into pipemaking as well, although perhaps continuing to get additional supplies from his brother in Winchester. The pipes made at the Bridge Street site are, therefore, likely to date between about 1880 and 1914, when Frederick died.

At least nine of the patterns produced at the Bridge Street site (18%) were specifically marked with Frederick's name and address, and these types are common amongst the later context groups. They do not, however, occur in the fill of kiln 1 and so it is possible that this went out of use and was filled in after kilns 2 and 3 were constructed and before the production of F. Goodall pipes has started. It is also worth noting that there are three different styles of F. Goodall mark, perhaps suggesting that the production range for his brother was built up in stages, with new moulds being added on three separate occasions.

While a good sized sample of pipes was collected from the excavations, analysis of them has shown how important it is to collect large and complete samples of kiln waste. Large samples are needed to try and establish the full range of products manufactured on any given

site. Even with over 1,400 fragments from these excavations, there are several varieties that are only represented by single specimens or partial examples and a larger assemblage would almost certainly have produced additional types. A complete sample (in terms of collecting all the available stem and mouthpiece fragments and not just the bowls) is also necessary. It did not prove possible to reassemble individual pipes from the mixed demolition deposits, but it was possible to reconstruct many of the forms by using the stem and mouthpiece fragments recovered – but only for the shorter 'cutty' patterns and not for the longer stemmed varieties.

The other variable that it is important to establish is the chronology of production over time. This site was used for over 50 years and yet there were only really two periods of production represented amongst the excavated material – an early pit group from the 1860s or 1870s and the later material primarily relating to the early twentieth century demolition of the site. This is not a criticism of the excavation, merely an observation about the nature of the excavated deposits that were encountered during it. If there is an opportunity to carry out further work on the site in the future, then deposits cut by the various phases of kiln construction or deposited elsewhere on the site during its five decades of use should be targeted for excavation. This should give greater precision to the range of products made on the site and their evolution over time.

This study has shown that 11a Bridge Street was an important pipe manufacturing site in Winchester, with production documented for over 50 years from 1860 until at least 1911. The products from these kilns would not only have supplied the local markets in and around Winchester during this period but were also manufactured specifically for distribution from a relative's warehouse in Gosport, nearly 25 miles to the SSE. The network of family links revealed by this study is typical of the way these relatively small scale workshops appear to have operated during the nineteenth century. Richard came from a family with a long pipemaking history and one where there were many family links providing help and support. His father set him up in business and provided moulds to start him off, while he took on his cousin as an apprentice before going on to supply his brother with pipes. This provides a broader social context for the operation of this kiln, which was the last to carry on a centuries old trade in Winchester.

Illustrations

Illustrations have been prepared of all the different mould types identified amongst the excavated material. Most of these are composite illustrations, prepared from a number of overlapping fragments that have been identified as coming from the same mould. So far as possible, these have been arranged so as to keep similar types together for ease of comparison with future finds. Figures 1-50 represent the 50 individual mould types identified from the site and the figure number is the same as the mould number. Figure 51 shows a pipe fragment made elsewhere and Figures 52-53 show mouthpiece fragments that cannot be associated with their respective bowl forms.

It is not possible to date the production of the various types with any accuracy because the majority were simply recovered from demolition deposits. In broad terms the site was probably used from ***c***1860-1920 and the long-stemmed styles were probably in production from the start, with spurless rib seam types being particularly popular during the 1860s to

1880s. The demand for long pipes would have dwindled towards the end of the century and the shorter cutty styles are likely to have been progressively added to the range during this time. Those with the F. Goodall stem marks probably date from ***c***1880-1914.

Just over half of the patterns recovered from the site as a whole were spurless forms, which were a new style for the home market, having come into vogue around the middle of the century. These can be divided into two broad groups. The first are those with rib seams (Figs 1-9). Sometimes the rib is plain (e.g., Figs 1-2) but usually it is decorated with small leaves. One example of mould type 3 was found with a large letter 'A' carved into the right hand side of the bowl before firing; the left side is unaltered (Fig 3a). This was probably a bit of idle doodling by one of the employees at the workshop. Sometimes there is also a large acanthus leaf underneath the bowl (Figs 5-7). Figure 7 shows an unusual decorative motif with a glass on the left hand side of the bowl, a bottle on the right and a cornucopia on the back of the bowl facing the smoker. None of these types with rib seams appears to have been marked and no complete forms could be identified. There are likely to have been long-stemmed patterns of pipe with cut tips and this style is likely to have been most popular during the first part of the site's use, from around the 1860s to the 1880s.

The second group (Figs 9-25 & 37-38) do not have rib seams and range from completely plain bowls (Figs 9-10) to those with ornate decoration, such as the claw bowls (Figs 19-20). One style with a small 'branch heel' (Fig 23) has been included here because it fits into a group of bowls with dot or thorn decoration (Figs 22-27). About half of these forms could be completely restored, showing that they were short-stemmed or 'cutty' pipes. Most of the incomplete examples were probably also of this form, although one or two, for example those with the rose, thistle and shamrock motifs (Figs 14-15) could have been longer. The final two spurless examples have been placed later in the sequence because they have stem lettering. One cutty type is marked F. GOODALL / GOSPORT (Fig 37) while the other, a thick-walled Irish style, is marked R. GOODALL / PORTCHESTER (Fig 38).

The remaining patterns have heels or spurs underneath the bowl and, once again, they can be divided into two broad groups, the first of which have incuse moulded stem lettering. There is some overlap with the spurless types, but Figures 25-39 (excluding 32 and 33) all have stem lettering. Most of the lettering includes the name F. Goodall and, as noted above, these marks fall into three styles, perhaps suggesting three dates at which new moulds were added to the range between about 1880 and 1914, when these pipes are likely to have been produced. The only exceptions are one Irish style bowl with the stem lettering 'DERRY' (this name being part of the design; Fig 39) and two examples that may be old moulds from Richard Goodall senior (Figs 35 and 38). Most of these examples had normal heels but there is one with a horse's hoof (Fig 27) and two with a football boot kicking a ball for the heel (Figs 28-29). Quite a number of these forms with stem lettering could be reconstructed and they were typically short cutty pipes with nipple tips. There was also at least one type that has a rounded end to the stem (Fig 52), perhaps the thorn design with horse's hoof heel (Fig 27). All of the styles represented are typical products of the late nineteenth or early twentieth century, with the RAOB design (Royal Antediluvian Order of Buffaloes) being particularly common on this site (Figs 30-33).

None of the final group of pipes could be reassembled, since these are all likely to have been long-stemmed varieties (Figs 40-50). One long mouthpiece/stem fragment was recovered

(Fig 53) showing that these forms would probably have had gently curved stems, with 15" being a typical length for 'common long' pipes and the best 'churchwardens' being even longer. These long-stemmed types were 'traditional' styles that were increasingly being confined to use in smoke rooms and for special occasions as the short stemmed cutty rose in popularity for everyday smoking. The range found generally reflects those that had been in vogue since the late eighteenth century with either plain bowl forms (Figs 40-44 & 48) or just leaves and/or flutes (Figs 47, 49 & 50). Two less usual varieties are the 'PEACE/1856' design made for the end of the Crimea War (Fig 45; discussed above) and the acorn design (Fig 46). These longer stemmed pipes would probably all have had simple cut ends to form the mouthpiece, which may then have been coated in some sort of paint or wax before sale to prevent them sticking to the smoker's lips (an example of a red tipped mouthpiece was found in context 410).

The illustrations have not been individually catalogued since they are almost all composite drawings made up of fragments derived from a number of different contexts. The finds from each context have been sorted into types and bagged accordingly, and the distribution of each type between contexts can be seen in Appendix 1. The marks and other salient features have been described above. A sample of stem bores was measured and it was found that most fragments had bores of 4/64" or 5/64", with occasional pieces of 6/64". There did not appear to be any correlation between bore size and mould type, with pipes from the same mould often having bores of both 4/64" and 5/64". This size range is typical for stem bores of the period.

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Appendix 1.1 – The distribution of mould types by context. Each of the 50 mould types identified as likely to have been produced on this site has been allocated a number (which is the same as the figure numbers 1-50) and the number of examples of each type listed by context. To avoid skewing the numbers by adding stem fragments as well, some of which are much easier to identify to mould type than others, only the bowls fragments are totalled here. Where stem fragments could be identified from contexts where a particular bowl type did not otherwise occur, then these have been added in brackets to indicate the presence of this type, but not added to the line and column totals.

Fig	106	219	220	314	408	409	410	U/S	O/B	Tot	Notes
1	1									**1**	
2		1			15		1	6	1	**24**	Also a stem fragment of this type from 408 and another from 410.
3					15		1	10	1	**27**	One example (Fig 3a; U/S) has had a large letter 'A' cut into the right hand side of the bowl prior to firing.
4	3	2		1						**6**	
5					5					**5**	
6					1			1		**2**	
7		4								**4**	
8			1			(1)				**1**	Also one stem from 409.
9			1		1					**2**	
10	21	5	7					4		**37**	Also two stems in 106; one in 219.
11					1	1		4		**6**	Also three mouthpieces in 408.
12			2	2		1				**5**	One of the examples from 314 looks as if the mould has become very worn and/or has been roughly filed to try and remove the rim milling.
13				2		3				**5**	Also a mouthpiece from 314.
14		1			1				1	**3**	
15	2	1	1	2			1	2		**9**	The single surviving rims on examples 106, 219 and 220 are slightly taller and with a clear mould line around them, suggesting that the mould has been repaired and a plate inserted across the trimming slot when compared with the examples from 314 and U/S. Another stem of this type from 410.
16	4	(1)	5	1		7				**17**	Also three stems and a mouthpiece from 106; one stem from 219; one stem and four mouthpieces from 314; one stem from 409.
17								1		**1**	
18						1				**1**	
19					1					**1**	
20					1			5		**6**	
21						1				**1**	
22		6	1					1		**8**	Also two stems and a mouthpiece in 219.
23	11	3	6	1				1		**22**	A further seven mouthpieces and four stems (one joining a mouthpiece) from 106; another mouthpiece in 314.
24		1						1		**2**	Also two stems and a mouthpiece in 219.
25		1		1		4				**6**	Also 2 stem fragments from 409; 2 mouthpiece fragments from 314; two stems and two mouthpieces from 219.
26				(5)						**0**	There are 5 mouthpieces of this type from 314, but no bowl fragments survive.
27						2				**2**	The two bowl fragments from 409 join, so only one pipe is actually represented. Only the very end of a name cartouche survives - but almost certainly this would have been an F. GOODALL / GOSPORT type.
28				(6)		1			(2)	**1**	There are also two stem fragments of this type from 409; 6 stem fragments from 314 (representing six different pipes) and 2 joining stem fragments from O/B.
29						1			(1)	**1**	Also one stem from O/B.
30			1	2		2				**5**	Also a stem in 314.
31				1					1	**2**	Context 314 also contains two further stems of this type.
32	10		2							**12**	Mould type 32 in fresh, crisp, condition.
32	77	8	40	1		1		17		**144**	Mould type 32 in very worn, damaged, state.
33		4	2			1				**7**	
34		2		(2)		(1)				**2**	Also two stems and three mouthpieces from 219; two stems from 314; one stem from 409. [One of the bowl fragments was initially allocated mould type T47 in the first draft report, but T47 and T48 were later considered to represent the same pipe and so have been amalgamated into one mould type here].
35		(1)								**0**	Only one stem fragment of this type. Thin (straw) type with curve - bowl form unknown.
36		(1)							(1)		Marked stems only recovered - bowl type unknown.

37				10		13				**23**	Also two further stems from 314 and two from 409. Two of the bowl fragments from 314 join.
38				1	1				1	**3**	Also another stem from O/B.
39	1		1			2				**4**	The two bowl fragments from 409 join, so only one bowl is actually represented. The same context has a 'DERRY' stem that is presumed to be from this pattern of pipe.
40					2					**2**	
41	2	1				1		2		**6**	
42	1							3		**4**	
43	1	1	4							**6**	
44				1	1			8	1	**11**	
45			1	(1)	18	(2)	1	7	1	**28**	Also 1 stem fragment from 314; 13 stem fragments from 408; 2 stems from 409; 5 stems from 410 and 7 stems from O/B.
46					1					**1**	Also two marked stems from 408, one of which joins the bowl.
47								1		**1**	
48		(1)	4		7		1	2		**14**	Two of the bowl fragments from 408 join. One stem of this type also identified from 219; another from 220 and another from 408.
49	10		1	1		(2)		2		**14**	Also 2 stem fragments from 409.
50					1			1		**2**	
-					1					**1**	One plain bowl rim from 408.
	144	**41**	**80**	**27**	**73**	**42**	**5**	**79**	**7**	**498**	

*Appendix 1.2 – **The first seven columns show the numbers of pipe fragments recovered from each context (Cxt) subdivided into bowl fragments (B), stem fragments (S), mouthpieces formed by a single cut across the stem (Cut), rounded mouthpieces formed by a shaped end to the mould (RM) and nipple mouthpieces formed by a shaped end to the mould (NM). There is then a column totalling all the fragments from each context (Tot). The following columns quantify the number of fragments recovered with each of the various makers' marks on them (as described in the text). The J. Chamberlain marks (JC) were hard to quantify since the mark is very faint, having been largely deleted, and it also occupies a long stem length, so that one mark could potentially break into a number of pieces. Only fragments with actual lettering surviving (as opposed to the flanking decoration) have been counted here. The three types of F. Goodall mark (FG1-FG3) are described in the text and the RG(G) and RG(P) columns relate to the R. Goodall marks from Gosport and Portchester respectively**.*

Cxt	B	S	Cut	RM	NM	Tot	JC	DERRY	GOODALL	FG 1	FG 2	FG 3	RG	RG (G)	RG (P)
106	144	116	48		63	**371**							3		
219	41	100	6	5	26	**178**			1	10	7	2	1		
220	80	43	14		6	**143**	1	1				(1)			
314	27	38	2	2	27	**96**	1			7	19	14			(1)
408	73	144	11	3	1	**232**	17								(1)
409	42	69	12		9	**132**	2			14	4	6	1	2	
410	5	90	4		2	**101**	5								
O/B	7	79	9		8	**103**	8			1	7				2
U/S	79				1	**80**	1						5		
Tot	**498**	**679**	**106**	**10**	**143**	**1436**	**35**	**1**	**1**	**32**	**37**	**22**	**10**	**2**	**2**

Appendix 1.3 – Biography of James Chamberlain

The following biography has been compiled using information from census returns and parish records that are readily available online on Ancestry.com or Findmypast.co.uk. Estimated dates of birth derived from sources such as census records are prefixed with a '***c***'. Approximate birth years are also given in brackets following an age stated in a document. All references have been compiled from either scans of original documents (where available) or transcripts of them. Unverified material from private family trees has not been used.

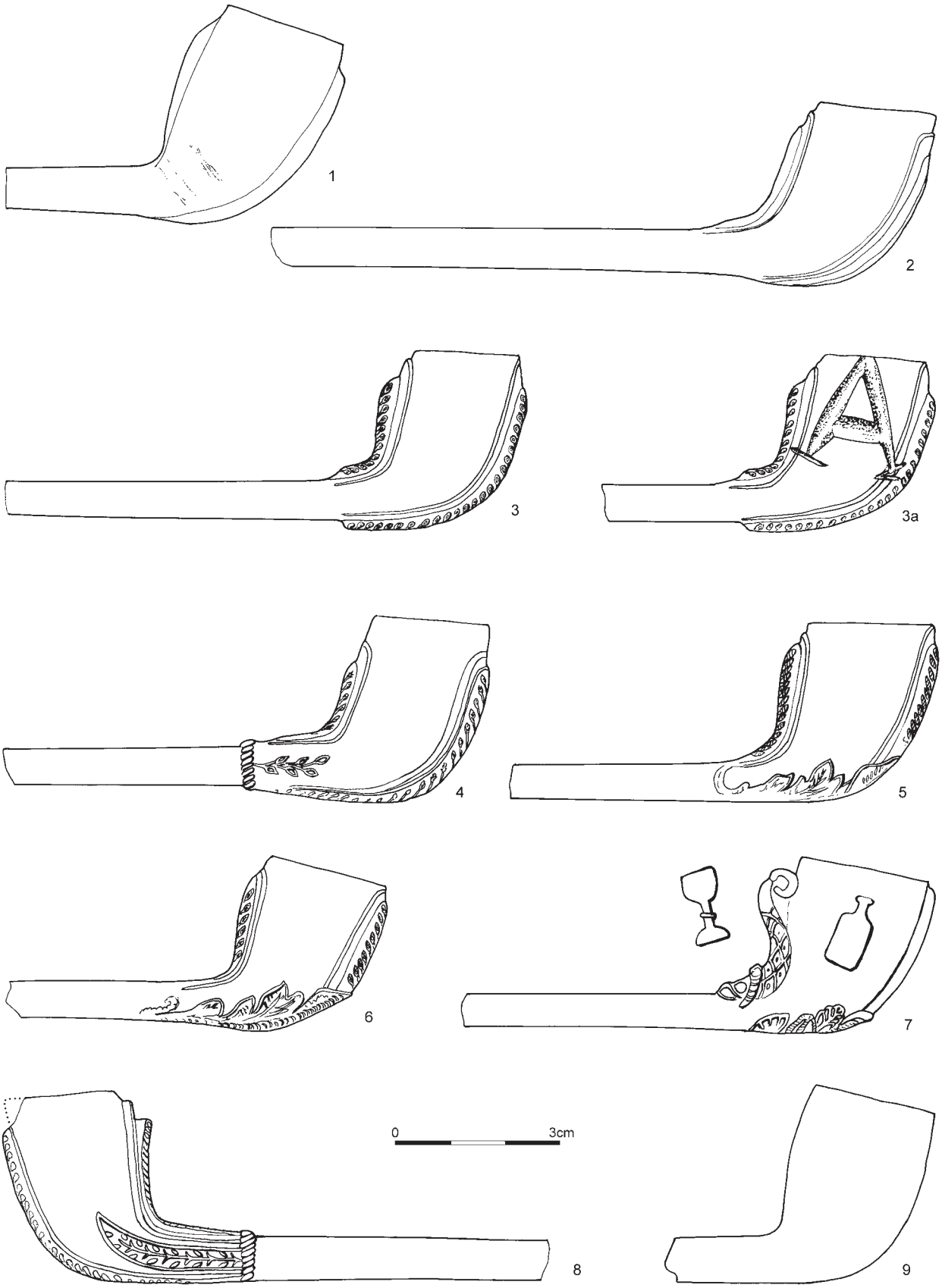
CHAMBERLAIN, James (*c*1824-*c*1875)
Recorded as a pipemaker: 1848-1871
Likely to have been pipemaking: ***c***1840-1875
Born: ***c***1824 at Portsea, son of John (block maker) and Sarah Chamberlain
Married: (I) Martha Weeks (1848); (II) Mary Ann Lock (1868)
Children: James (***c***1849), John (***c***1851), George (***c***1853), Lucy (***c***1867), Jessie/Jane (***c***1870), Sydney (***c***1872), Elizabeth (***c***1875)
Died: Between 1875 and 1878 (and probably in the last quarter of 1875**)**

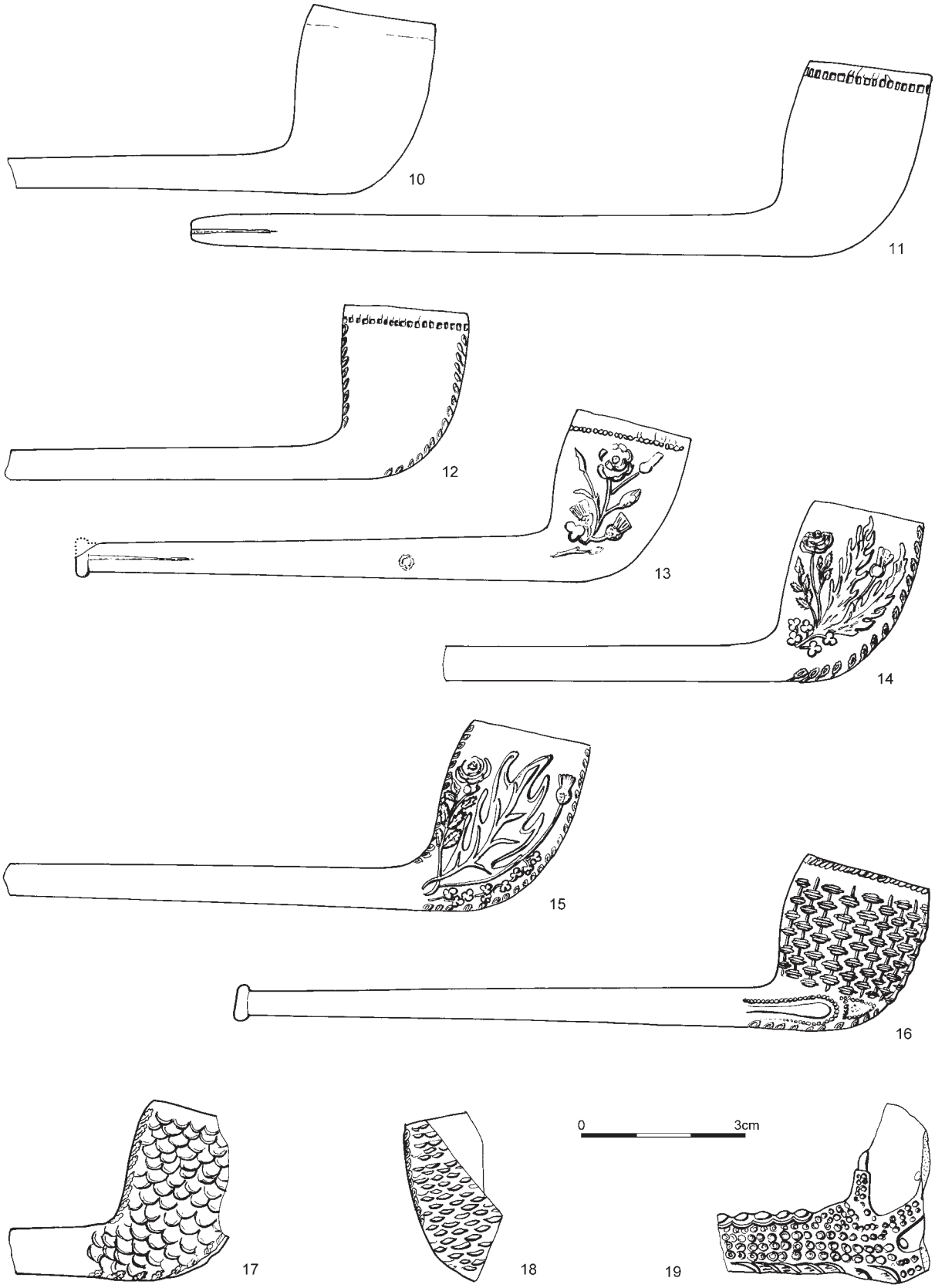
1825 – Baptised James William Chamberlain on 25 December at St Mary's Portsea, son of John and Sarah.
1841 – Listed as an apprentice (trade not specified), age 15 (***c***1826), living with his family at Cottage View, Portsea (a pipemaking area). His father John (40) was a block maker and his mother was called Sarah (40). He had four siblings; Henry (13), Eliza (10), George (6) and Emma (2).
1848 – Married Martha Weeks at St James, Portsea, on 7 March, when he was given as a pipe maker living at Pipe Kiln Row, Landport. Both signed with a cross. Witnesses were Harriet Holmes and Edward Tutt. Martha appears to have been the daughter of a carpenter, William Weeks, and his wife Martha.
1851 – Listed as a pipe maker, 27 (1824), at 13 Cross Street, Southampton with wife Martha, 21 (1830) and sons James, 2 (1849) and John, 9 months (1850). All were born in Portsmouth.
1853 – Son George born; St Mary's, Southampton (1861 census).
1855 – James and Martha were both witnesses at the wedding of James's sister Eliza at St Mary's, Portsea, on 23 December 1855 (no occupations given).
1861 – Listed as a pipe maker, 37 (1824) at 1 Wallington Hill, Fareham, with wife Martha (33, pipe maker's wife) and three sons, James (12, pipe maker), John (10, scholar) and George (8, scholar). All born at Portsmouth apart from George, born St Mary's, Southampton (1853). By 1871 his son James had moved to work as a pipemaker on the Isle of Wight, where he spent the rest of his life (Higgins 2017b, 204-5).
1864 – Wife Martha of Daniel Street buried at St Mary, Portsea, on 23 October, age 35 (1829).
1868 – James William Chamberlain, widower, pipe maker, 40 (1828), son of John Chamberlain, block maker (?deceased), married Mary Lock, spinster, 26 (1842), son of William Lock, brick burner, at St Mary's, Portsea, on 16 November. Both were given as of Cottage View. Mary Ann Lock and James Chamberlain (presumably James's 20-year-old pipemaking son) were witnesses.
1870 – Name given as William James Chamberlain, pipe maker, when he and wife Mary Ann baptised daughter Jessie at Portchester (4 September).
1871 – Listed as a pipe maker, 47 (1824), at West Street, Fareham, living with wife Mary, 28 (1843, born Fareham) and daughters Lochisn? (transcribed as Louisa in 1871, but clearly written as Lucy in 1881), 4 (1867, born Havant) and Jessie, 1 (1870, born Portchester).

1875 – The death of a James William Chamberlain, 44 (1831) is recorded at Southampton in the October to December quarter. The age does not fit well with that of the known pipemaker, but no other obvious record of his death has been found.
1878 – James's widow, Mary Ann Chamberlain, 37 (1841) of Church Path, married William Cooper, bachelor, 40 (1838), at Portsea parish church on 11 November. He was listed as a labourer in 1881 when they still had four of James's children living with them: Lucy 14 (1867), Jane 11 (1870, Sydney 9 (1872) and Elizabeth 6 (1875).

James Chamberlain appears to have come from a woodworking background, with his father being a block maker and his first wife's father a carpenter. He was born in Portsea and grew up in Cottage View, which was a pipemaking area. He was an apprentice by the age of 15 in 1841, but the trade is not specified. He was, however, certainly working as a pipemaker by the time of his first marriage in 1848. The records show that he moved about the Portsmouth Harbour area frequently, suggesting that he might have primarily been employed as a journeyman. He is recorded at Landport in 1848; Portsmouth in 1850; Southampton from 1851-53; Fareham in 1861; Portsea in 1864-68; Portchester in 1870 and Fareham in 1871. His last four children were given in the 1881 census as having been born in Havant (***c***1867) and Portchester (***c***1870, ***c***1872 and ***c***1875). His eldest son, also James, was living with the family and working as a pipe maker by the age of 12 in 1861 but, by 1871, had moved to work in the trade on the Isle of Wight. James (senior) was working in Fareham in 1871, and had children born as late as 1875, but had died by 1878 when his widow remarried. The death of a James William Chamberlain was registered in Southampton at the end of 1875, but the age of 44 given (1831) is a poor match for the known pipemaker.

A pipe with 'J. CHAMBERLAIN / LANDPORT' on the stem (Fox and Hall 1979, Fig 8.55) is known, showing that James must have run his own business for at least a short period. This is probably the same mould that was later modified with additional stem decoration and shields on the bowl sides reading 'PEACE / 1856' to mark the end of the Crimean War. If so, then the original mould must date from before 1856, which would fit with James's recorded place of residence (Landport) at the time of his first marriage in 1848. Perhaps he briefly attempted to run his own business around the time of his marriage, before moving to Southampton by 1851. The modified mould was subsequently obtained by Richard Goodall, who clearly used it quite extensively in Winchester, since numerous examples were found amongst his kiln waste dating from the 1860s or later. The original name and stem decoration are very faint on the examples produced by Richard, most likely as a result of attempts to remove the original maker's name from the mould by filing the stem section smooth.


1
2
3
3a
4
5
6
7
0
3cm
8
9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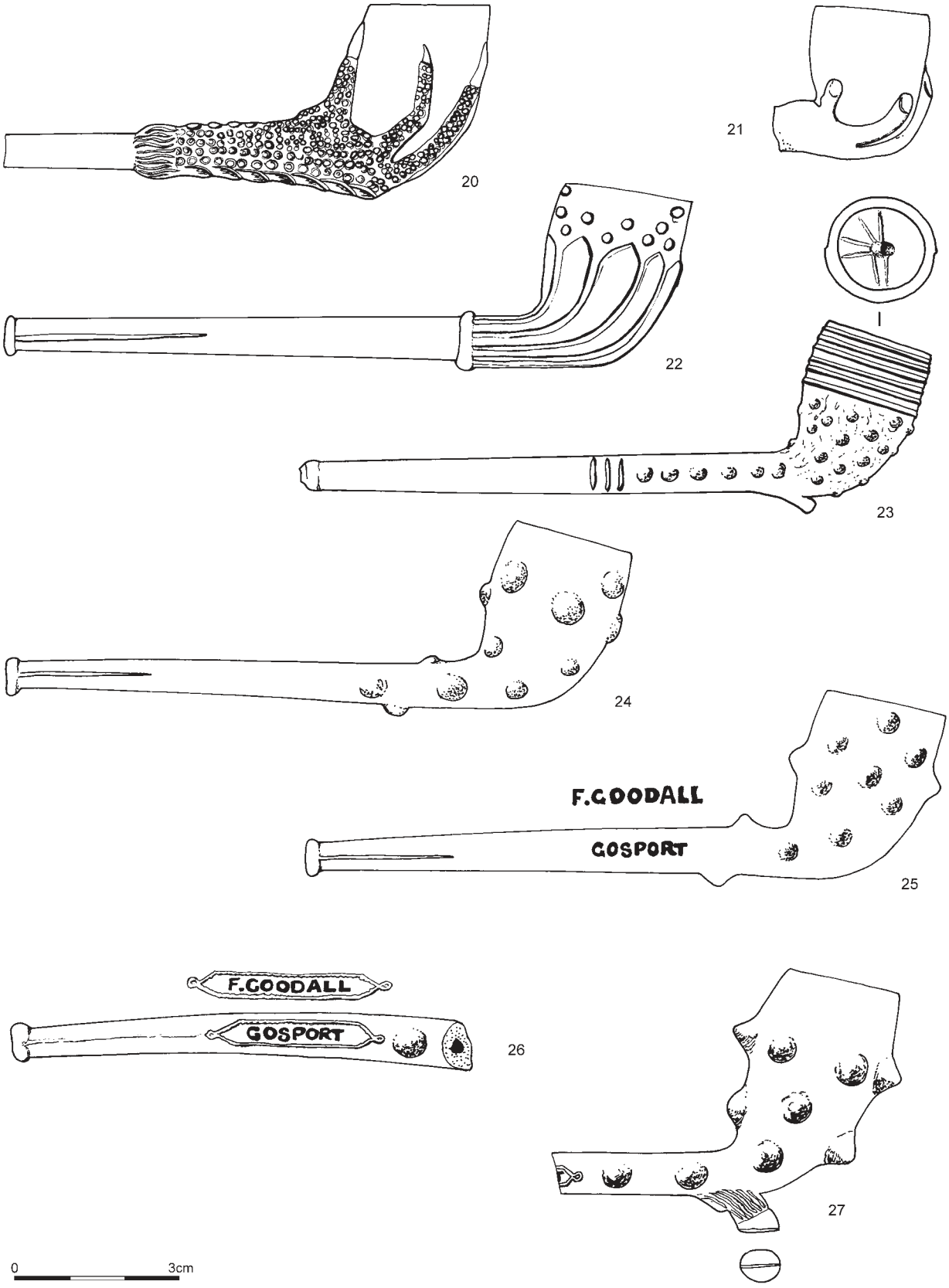
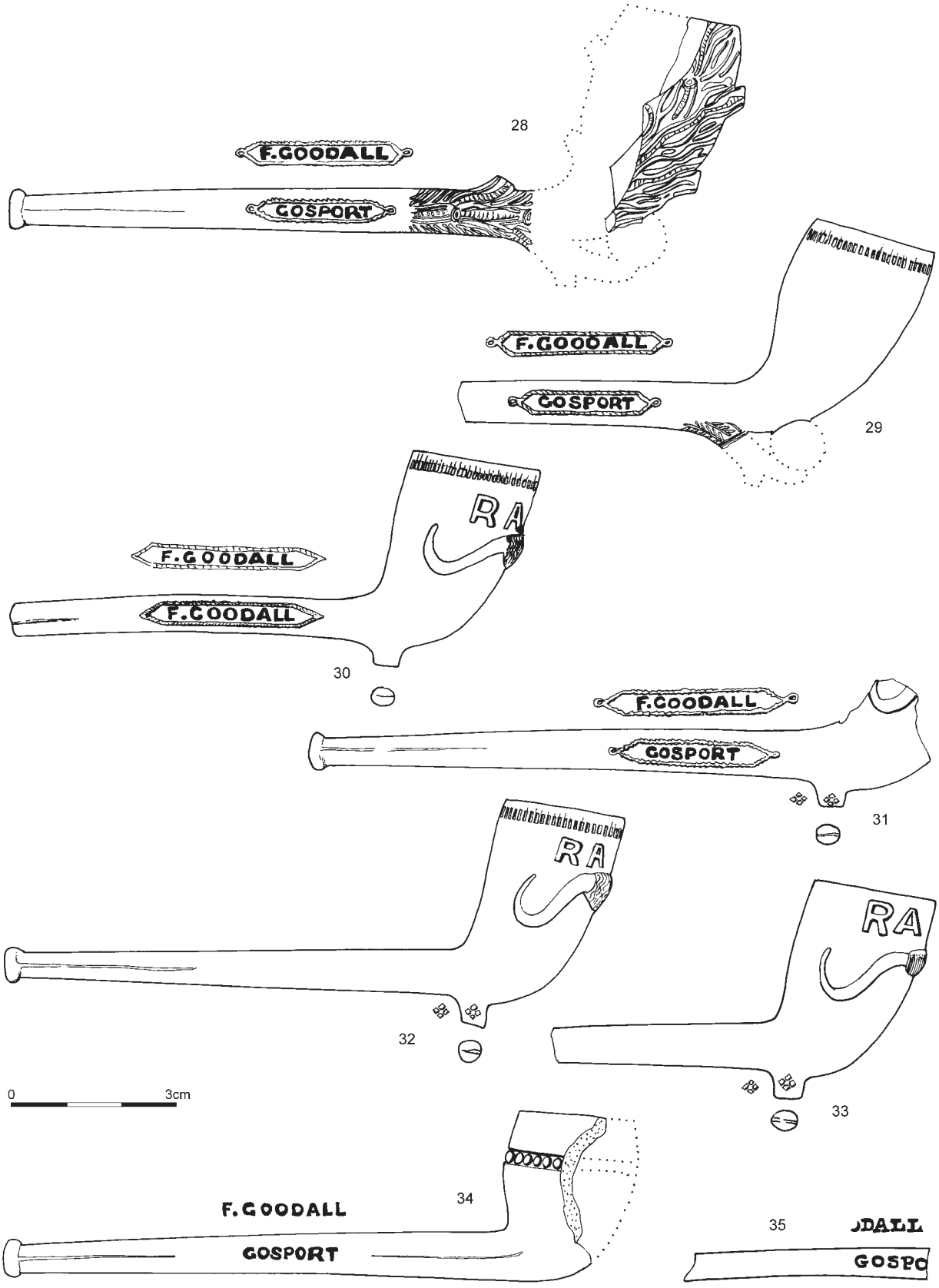
11
12
13
14
15
16
17
18
0
3cm
19


20
21
22
23
24
F.GOODALL
GOSPORT
25
F.GOODALL
GOSPORT
26
27
0
3cm


28
F.GOODALL
GOSPORT
29
F.GOODALL
GOSPORT
30
RA
F.GOODALL
F.GOODALL
31
F.GOODALL
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RA
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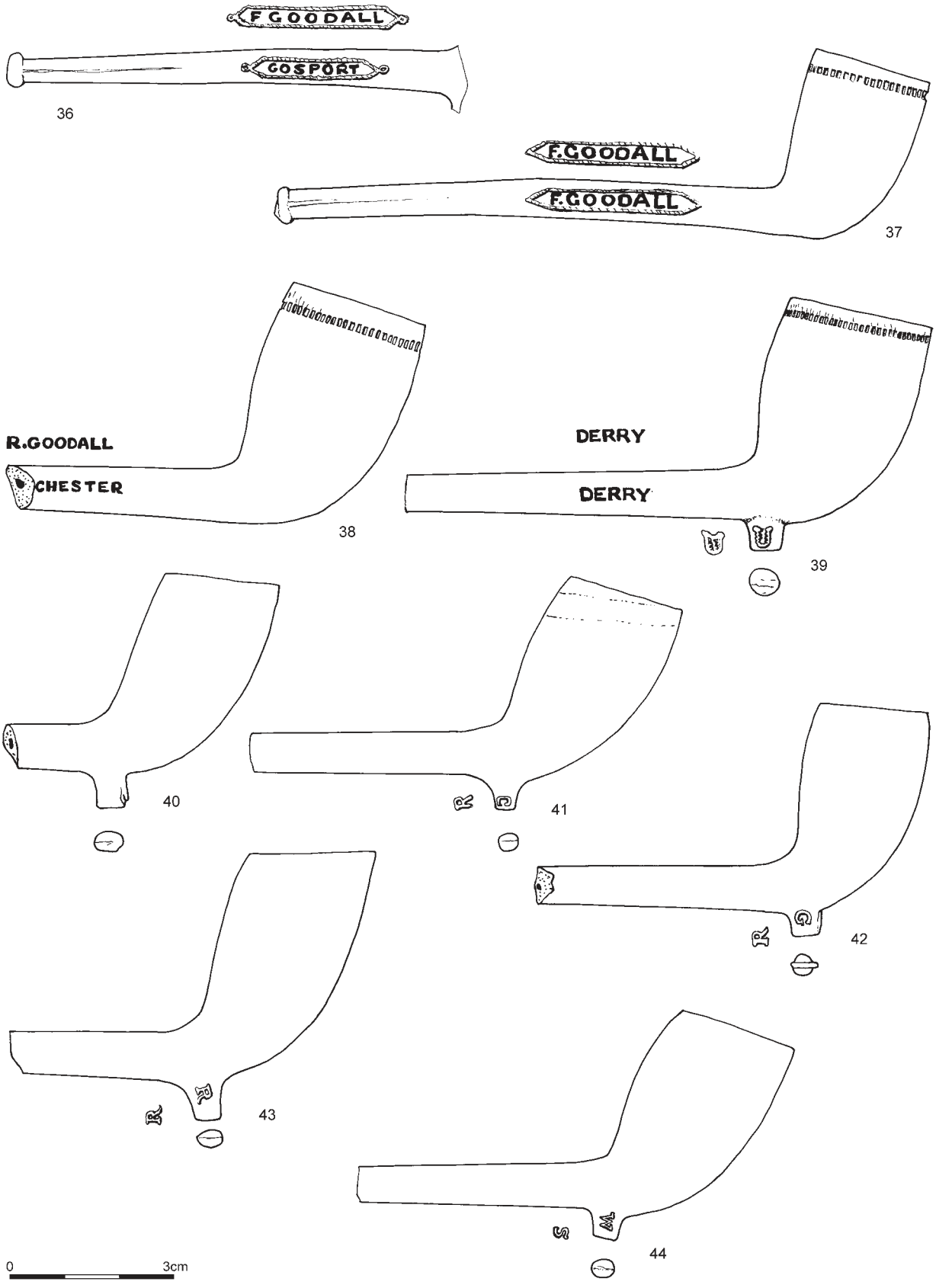
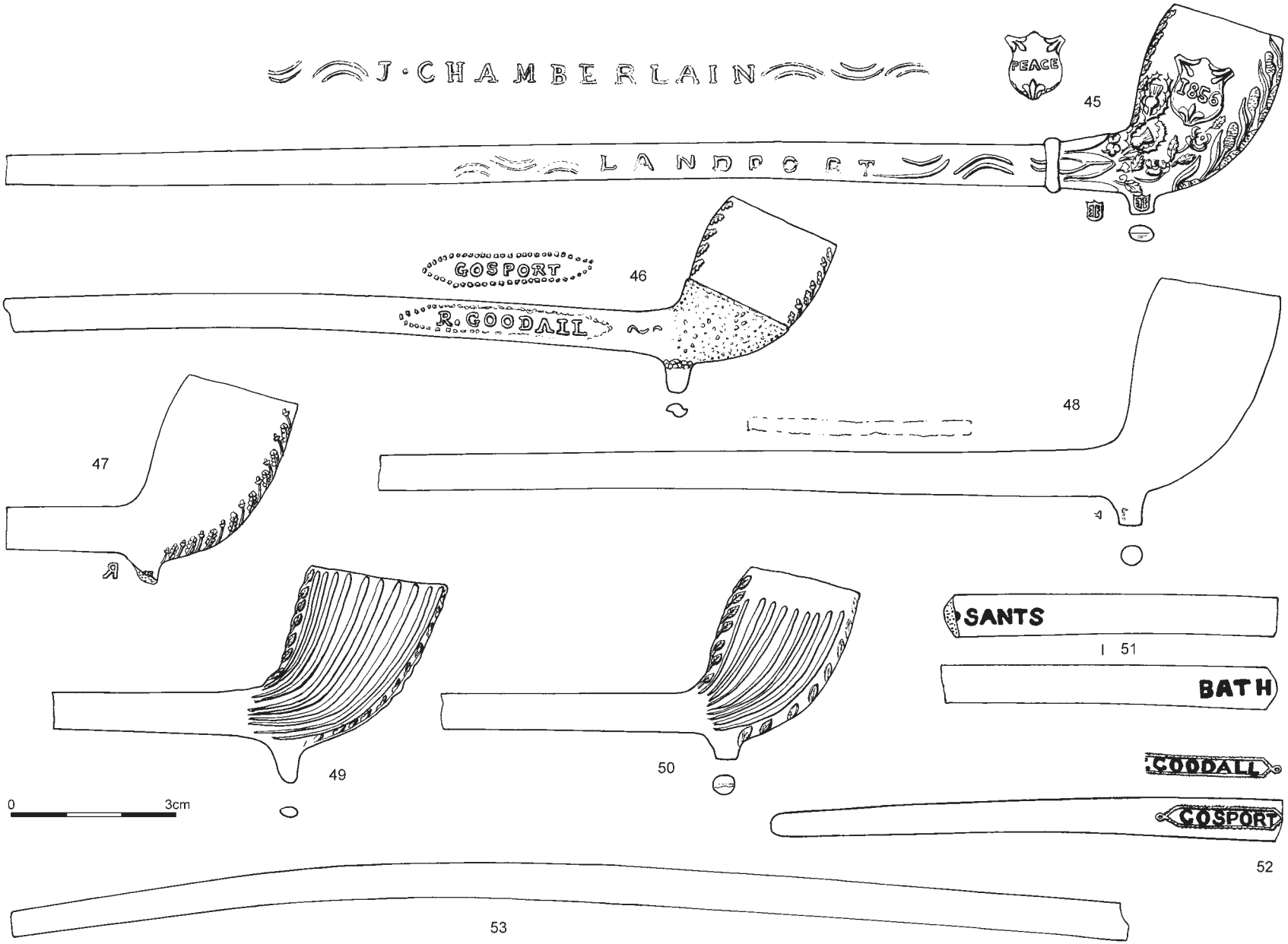
0
3cm
34
F.GOODALL
GOSPORT
35
GOSPO


F.GOODALL
GOSPORT
36
F.GOODALL
F.GOODALL
37
R.GOODALL
CHESTER
38
DERRY
DERRY
39
40
41
42
43
44
0
3cm


J·CHAMBERLAIN
PEACE
1856
45
LANDPORT
GOSPORT
46
R. GOODAIL
47
48
SANTS
51
BATH
COODALL
GOSPORT
52
49
50
0
3cm
53

Appendix 2: Context Descriptions

Context No.	Type	Description
101	Str	Brick wall forming outer boundary wall to kiln 1. The bricks are stretcher bonded and measure 220x105x60mm.
102	Str	Brick inner boundary wall of kiln, abuts 101 but not bonded. Bricks are stretcher bonded with a lime mortar, bricks measure 220x105x60mm
103	Str	Brick inner kiln wall (flue). It is constructed of a header bond with lime mortar. The bricks measure 120x105x60mm. The bricks are eroded by heat and heavily vitrified.
104	Str	Mixed brick and stone rubble core fill between inner wall 102 and kiln wall 103, only visible in the south-east corner, the rest of the upper structure is truncated.
105	Dep	Vitrification on the inner face of flue (103).
106	Dep	Demolition material filling flue of kiln 1
201	Str	Brick outer wall of kiln 2, Bricks are bonded in a random fashion although mostly stretcher bonded and measure 220x105x60mm.
202	Str	Limestone blocks forming outer wall of foundation layer to wall 201. Blocks vary in size from 270x145x180 to 320x130x170mm.They are roughly hewn and are probably re used.
203	Str	Brick wall forming inner boundary wall of kiln 2.
204	Str	Mixed brick tile and stone rubble core, fill between outer wall 201 and inner wall 203.
205	Str	Brick structure forming plinth for kiln, contains fire chamber with stoke hole (upon which superstructure is built). Bricks are stretcher bonded and measure 220x105x60mm.
206	Str	Rubble infill of mixed brick and stone between contexts 203 and 210/222.
209	Str	Single brick spring of arch over stoke hole, bonded into and part of 205.
210	Str	Brick inner kiln wall (flue), it is constructed of a header bond with lime mortar. The bricks measure 105x110x60mm and have been split in half. The bricks are eroded by heat and heavily vitrified.
212	Str	Brick radial support for muffle, springs from 205
213	Str	Brick radial support for muffle, springs from 205
214	Str	Brick radial support for muffle, springs from 205
215	Str	Brick radial support for muffle, springs from 205
216	Str	Brick radial support for muffle, springs from 205
217	Str	Muffle of kiln 2, constructed from a pipe clay matrix with pre fired pipe stems incorporated. The base survived in situ with stub walls surviving. The base is 13cm thick while the wall is 10cm thick (where preserved at the base).

218	Dep	Layer of vitrification adhering to 210,212,213,214,215,216,217.
219	Dep	Demolition deposit sitting within the muffle, contains mixed brick and stone. Probably from the demolition of the superstructure.
220	Dep	Demolition deposit within the stoke hole, same as 219 and dropped down flue into firing chamber.
221	Str	Rubble fill between radial supports of muffle, bonded to brick plinth 205 and inner flue wall 210. Designed to provide a smooth sloping passage for gasses up and around the muffle.
222	Str	Front brick retaining wall of kiln 2. Bricks are stretcher bonded and measure 220x105x60mm.
301	Dep	Rubble deposit of stone and brick, probably a levelling deposit.
302	Str	Mixed stone and brick rubble foundation for Kiln retaining wall.
303	Str	Brick outer wall of Kiln 3, two courses thick and in English garden wall bond. The bricks measure 220x105x60mm.
304	Str	Brick wall forming a bonding layer for 305. The bricks are 220x105x60mm
305	Str	Brick inner wall, curved inner face of kiln 3, bricks are header bonded. Badly eroded by heat and severely damaged. Much vitrification is present. These bricks are bonded into 304. Every other course with half bricks in between.
306	Str	Rubble core fill between 303 and 305.
307	Dep	Layer of Vitrification.
308	Str	Front wall of kiln 3.
309	Str	Brick arch over stoke hole of kiln 3. Comprises red brick measuring 220x110x60mm with some half bricks and occasional sections of tile as packers.
310	Str	Pipe clay render to support brick arch 309, contains pre fired clay pipe stems (similar to muffle material).
311	Str	Broken Millstone sitting over rake out deposits, probably used to firm up working floor.
312	Str	Brick structure forming plinth for kiln, contains fire chamber with stoke hole (upon which superstructure is built). Bricks are stretcher bonded and measure 220x105x60mm.
314	Dep	Demolition deposit filling interior of kiln 3. Contains fragments of brick, pipe and kiln furniture.
403	Layer	Soft light buff silt with small fragments of chalk 5% with 1% charcoal flecking, essentially a dirty natural probably representing the final layer of quarry backfill upon which the kilns were built.
404	Dep	Quarry backfill of soft light brown to buff silt with small fragments of chalk c.5%.
405	Layer	Light yellow to buff sandy chalk deposit containing a Post-medieval peg tile.

407	Cut	Cut of pit, sharp break of slope to top, shallow concave sides with a rounded base, only partially seen in section of sondage.
408	Fill	Fill of [407], dark brown loose silt with 5% chalk fragments and charcoal flecking. The pit contaned a high concentration of clay pipes.
409	Layer	Dark orangish brown silt with c.20% chalk, a compacted floor surface made up of rake out deposits.
410	Layer	Compact light grey soft and friable silt with small fragments of chalk c.2% and small fragments of charcoal c.25% with CBM flecking. Compact floor comprised of rake out deposits.
411	Layer	Compact light grey to buff soft silt with small fragments of chalk c.3% and c25% charcoal flecking. Compact floor comprised of rake out deposits.
412	Layer	Light grey soft and friable rake out deposit. Probably represent the final use of the kiln.
413	Layer	Mid greyish brown soft to friable clay silt, a modern 20th century make up deposit.
414	Layer	Dark greyish brown soft and friable clay, modern made ground.
415		Void
416	Layer	Redeposited natural, friable compacted chalk.

Appendix 3: Plates

Plate 1: Section 1 sondage east facing facing

Plate 2: Section 2: sondage south facing

Plate 3: section 4 east facing, through rake out deposits

Plate 4: General shot of kilns under excavation, looking south

Plate 5: Kiln 1 (right) and kiln 2 (left) looking south

Plate 6: Kiln 1, vertical photo showing flue and outer wall

Plate 7: Kiln 1 looking south

Plate 8: Kiln 2 looking north-east

Plate 9: Kiln 2 vertical photograph of flue showing radial arches

Plate 10: Eastern elevation of kiln 2 showing plinth at the base

Plate 11: showing radial arch (216) built onto plinth 205 and abutting the flue wall

Plate 12: rubble infill between radial supports 216 and 215 (216 removed)

Plate 13: Kiln 2 showing radial arches

Plate 14: radial arches from below

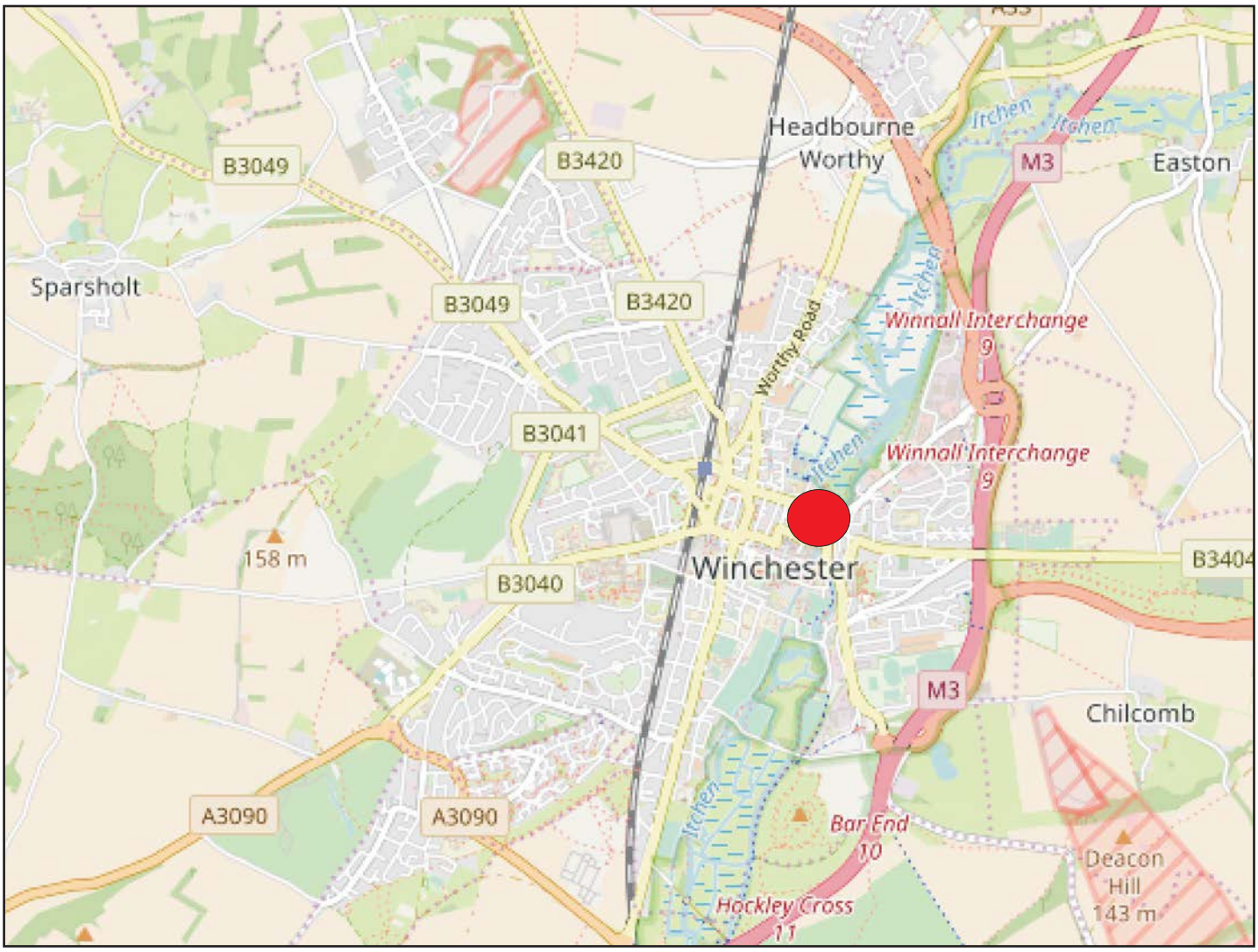
Plate 15: radial arches from above

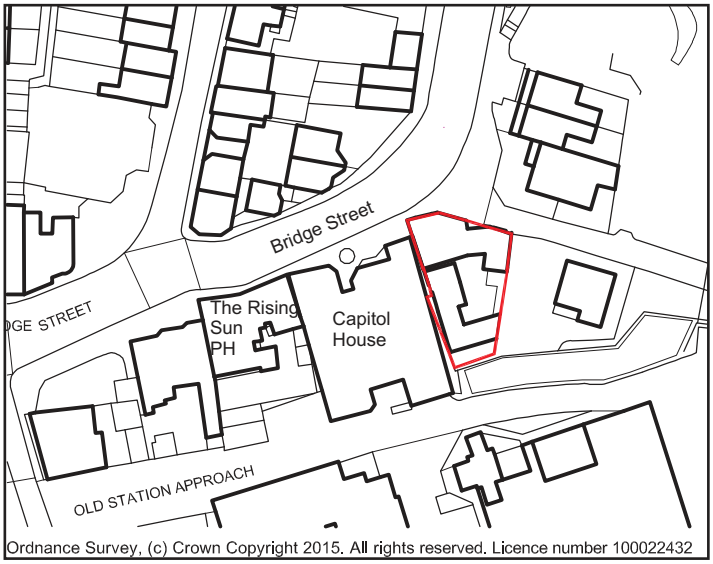
Plate 16: Muffle in situ kiln 2

Plate 17: Detail of muffle kiln 2

Plate 18: West facing elevation of kiln 3

Plate 19: Kiln 3 looking south



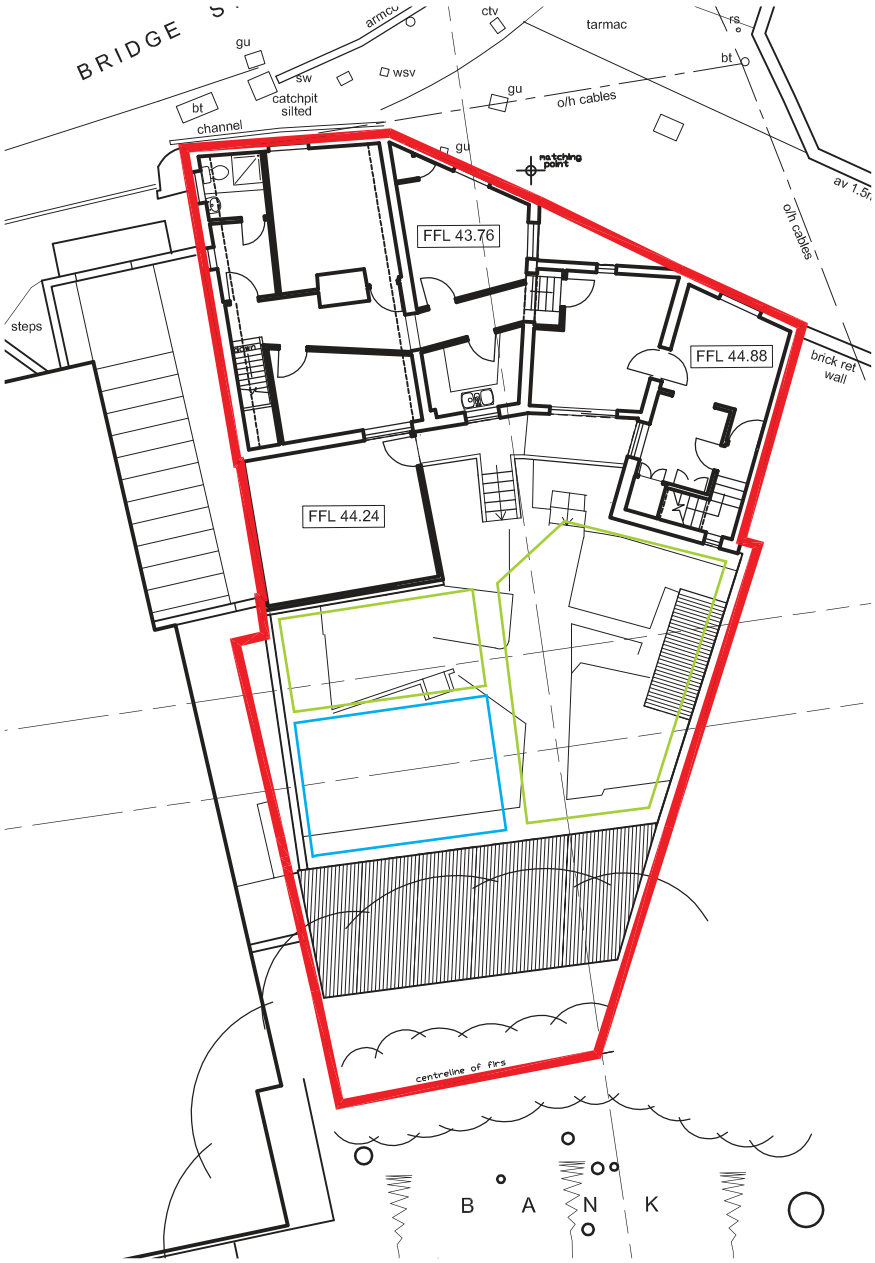


0m 50m

1:1250

N

Figure 1: Site Location



Site Code: WINBS17

N

SITE BOUNDARY

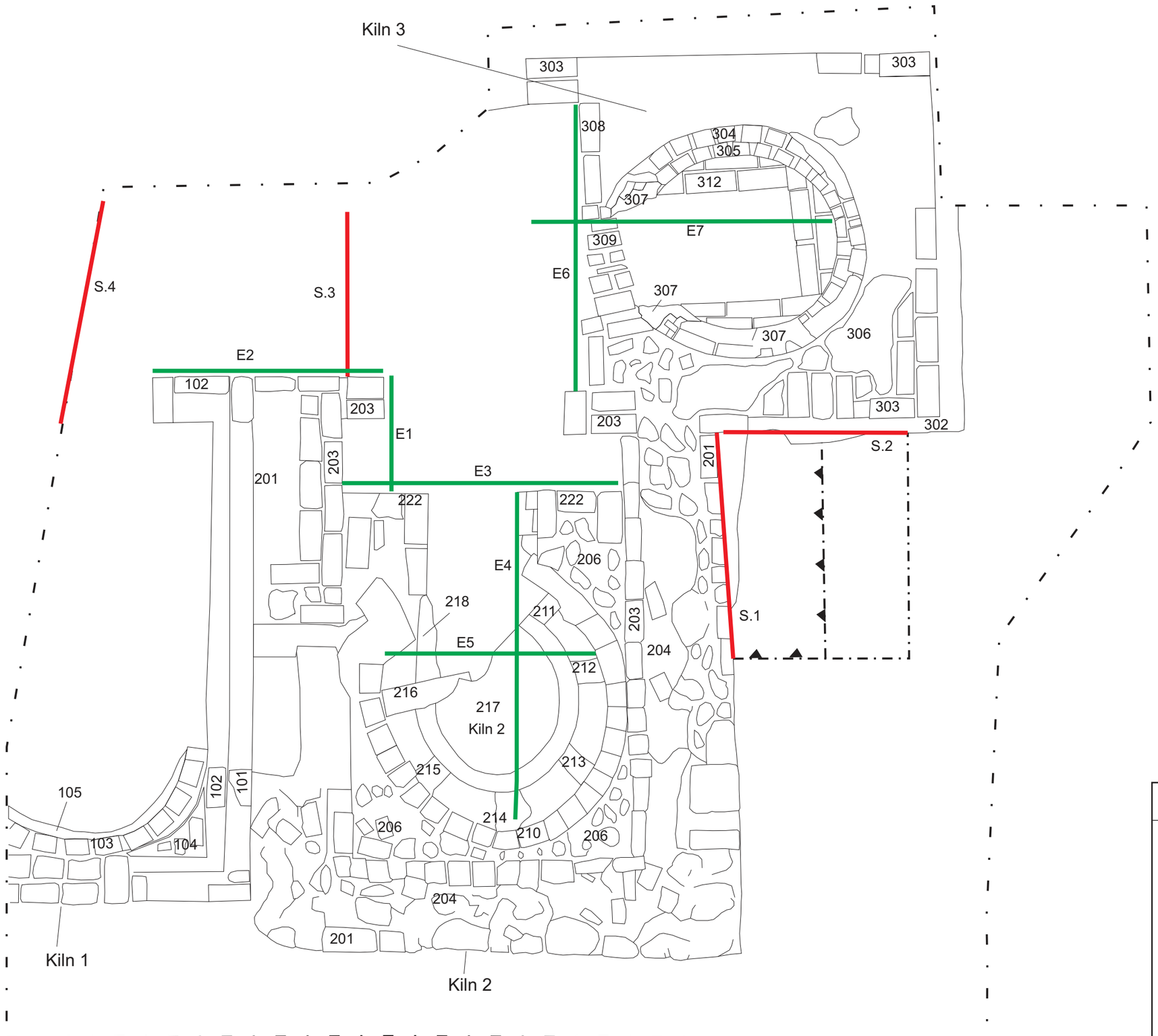
EXCAVATION AREA

WATCHING BRIEF AREA

0m 10m

1:200

FIGURE 2: Site layout



Site Code: WINBS16

N

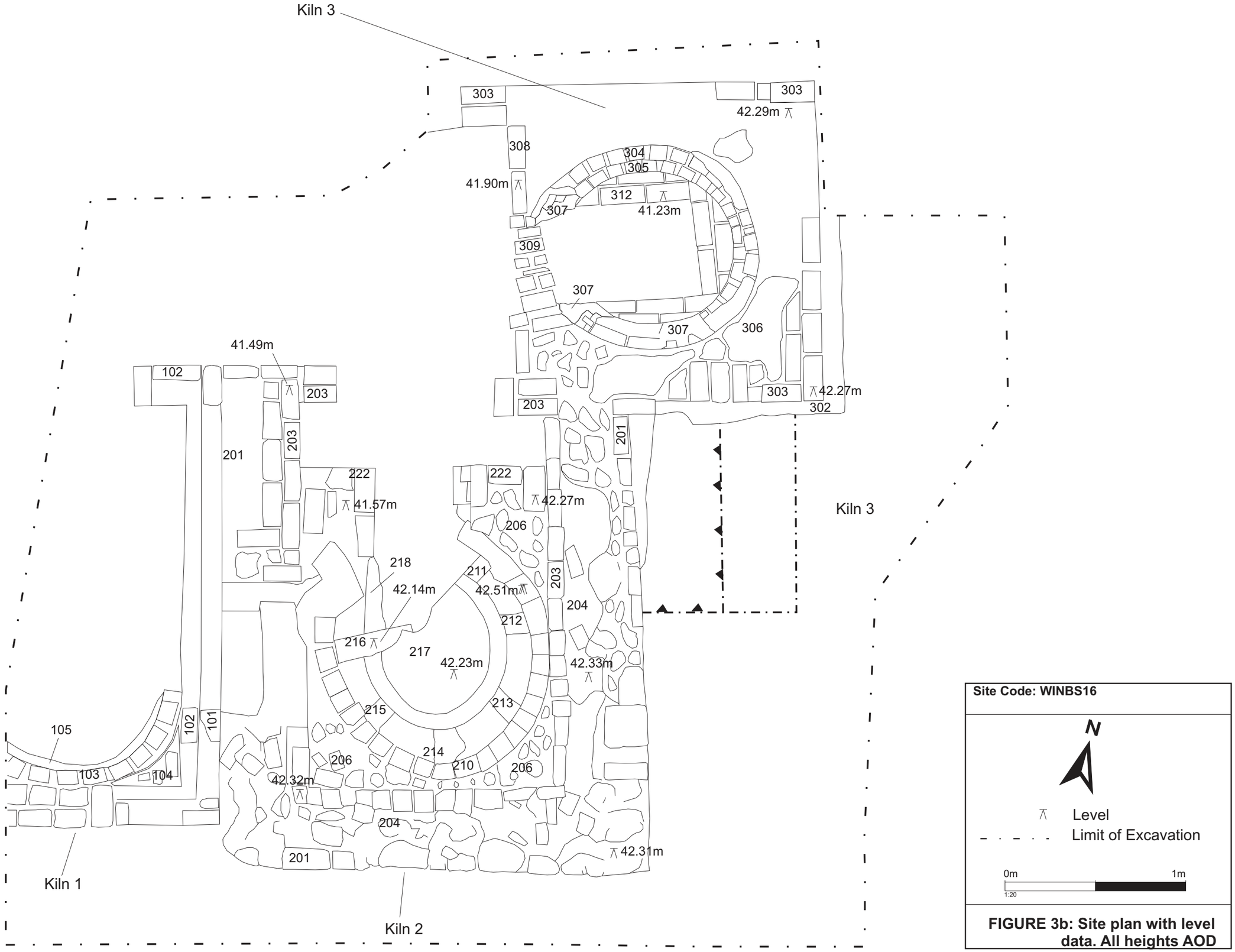
Sections

Elevations

0m 1m

1:20

FIGURE 3a: Site plan showing sections and elevations



Site Code: WINBS16

N

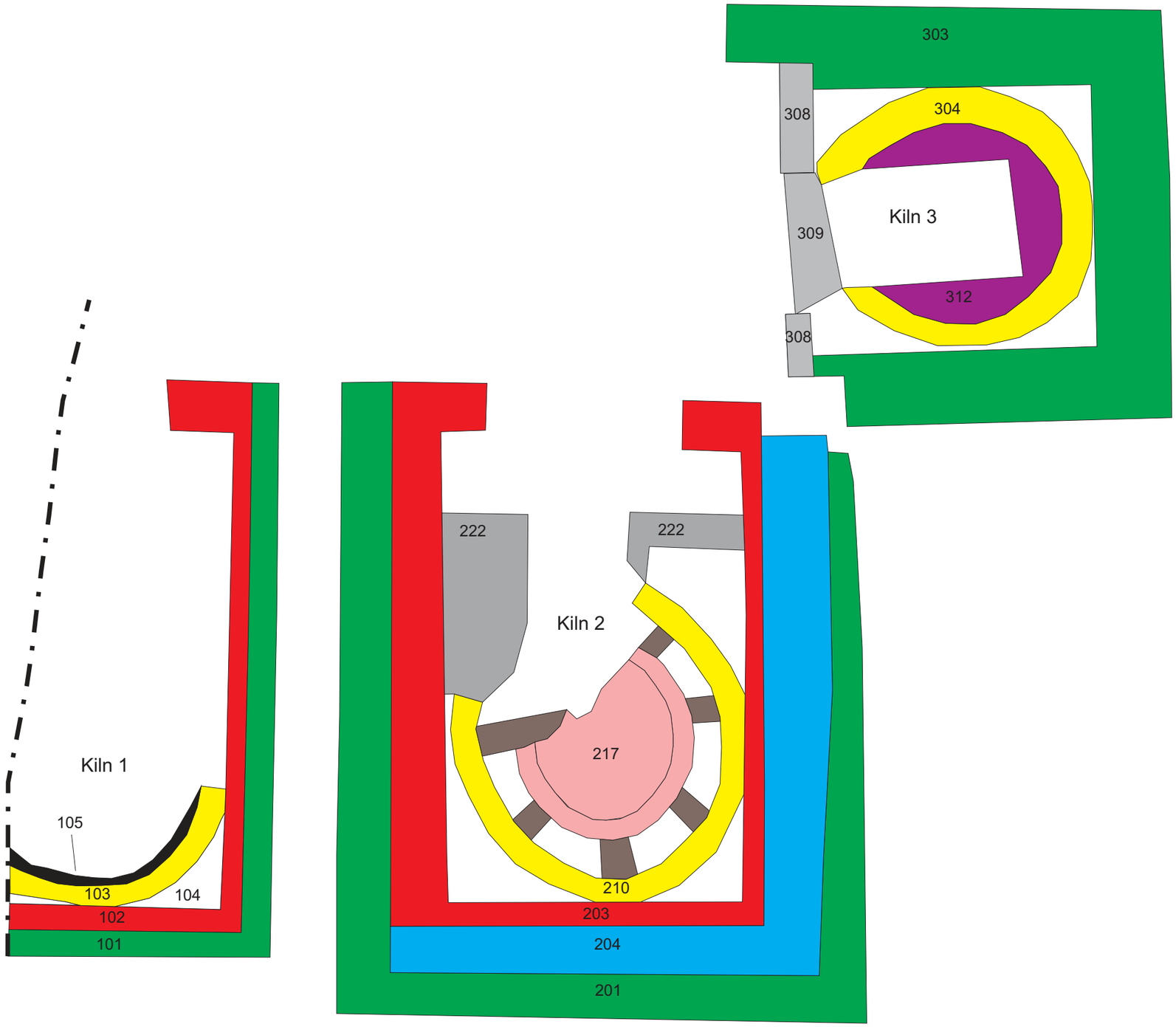
Level

Limit of Excavation

0m 1m

1:20

FIGURE 3b: Site plan with level data. All heights AOD



Site Code: WINBS16

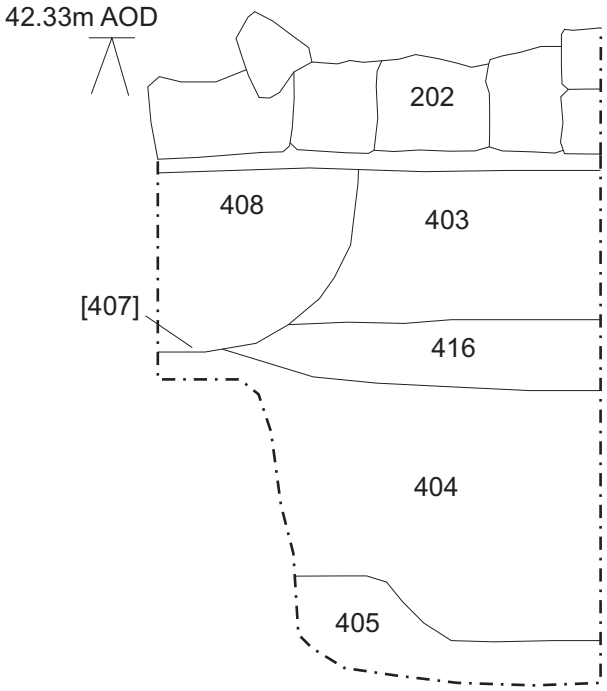
N

OUTER WALL OF KILNS
RUBBLE FILL
INNER WALL OF KILNS
FLUE WALL
FRONT WALL OF KILNS
PLINTH
RADIAL SUPPORTS
MUFFLE
VITRIFICATION

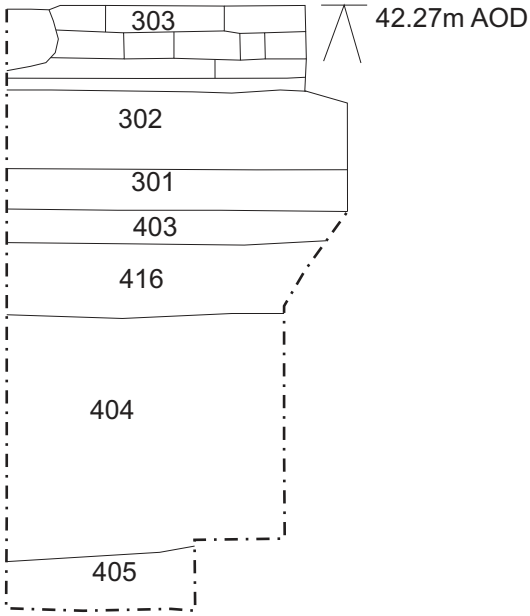
0m 1m
1:20

FIGURE 3c: Kilns coloured by main structural context

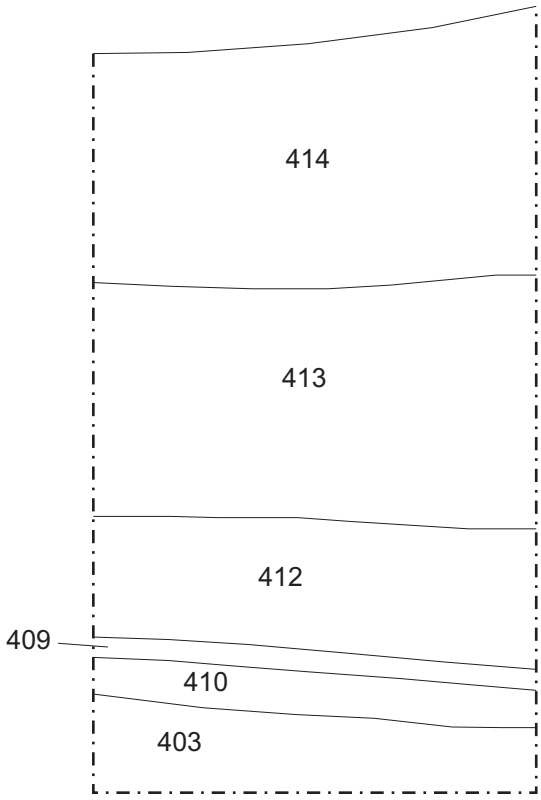
Section 1: East side of structure 200
1:20 east facing



Section 2: South side of structure 300
1:20 south facing



Section 3: West boundary of
excavation area,
east facing, 1:20



Section 4: Through rake out deposits and
compacted floors, east facing, 1:10

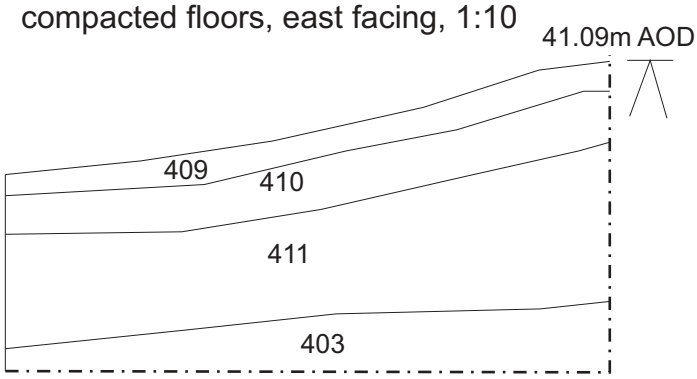
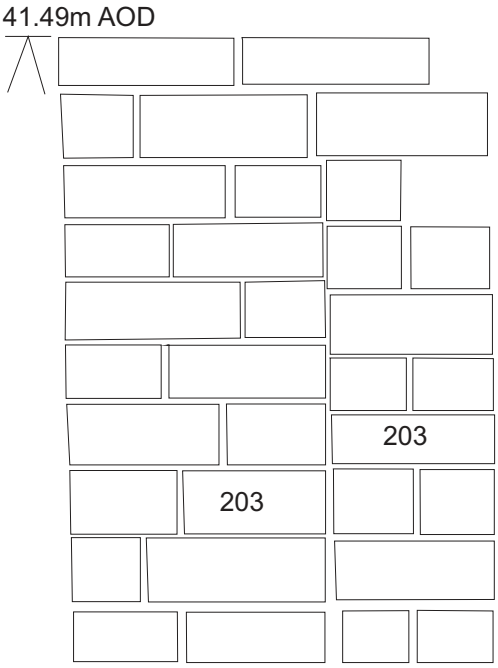
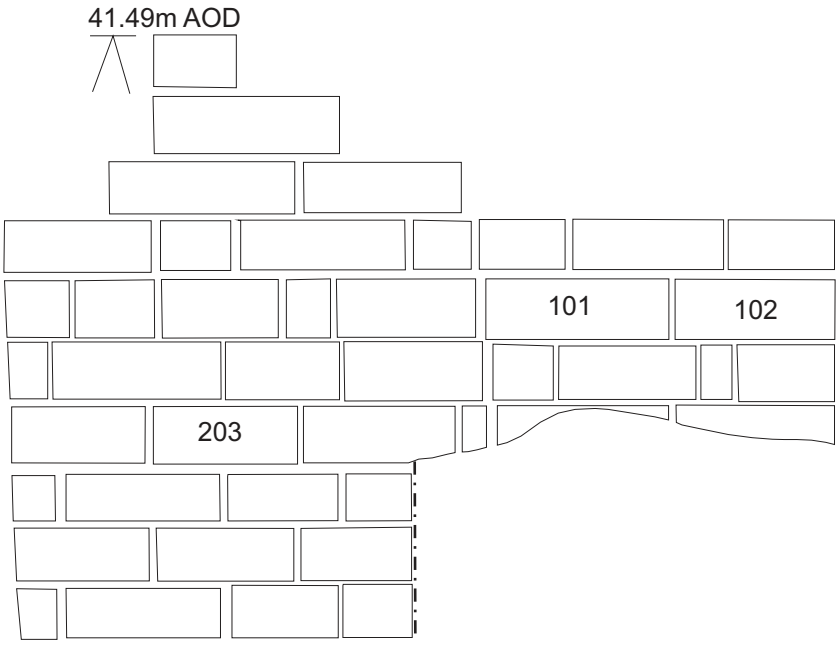


Figure 4: Sections

Elevation 1, Kiln 2: 1:10



Elevation 2, Kiln 2: 1:10



Plan3, Kiln 2 flue showing radial supports post removal of muffle

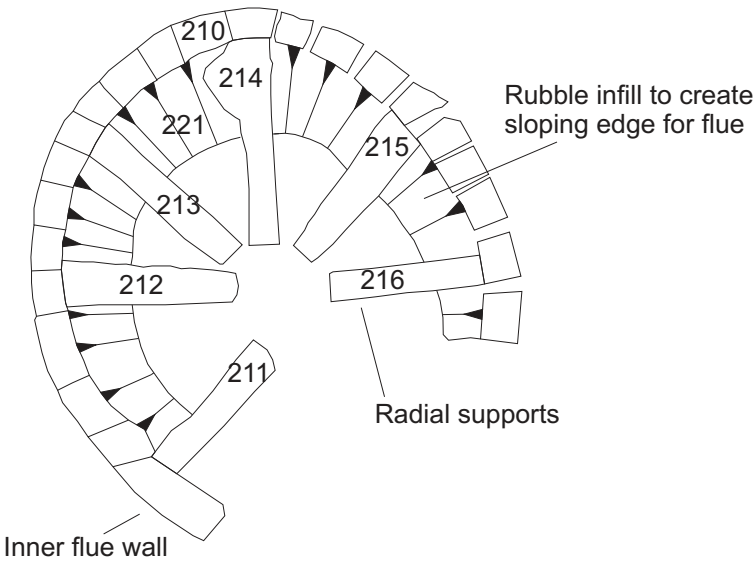


Figure 5: Elevations and flue plan

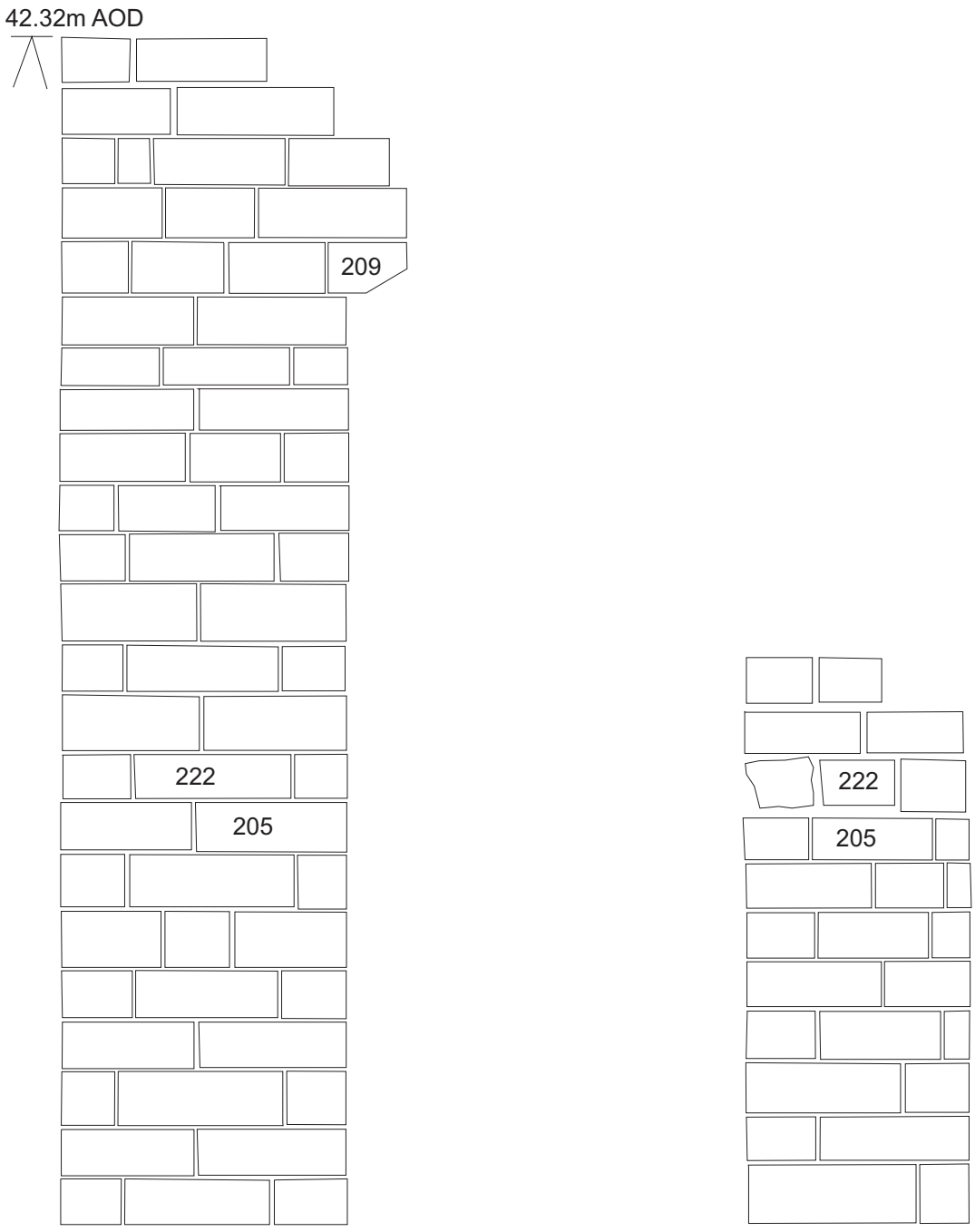


Figure 6: Elevation 3, north facing, kiln 2, 1:10

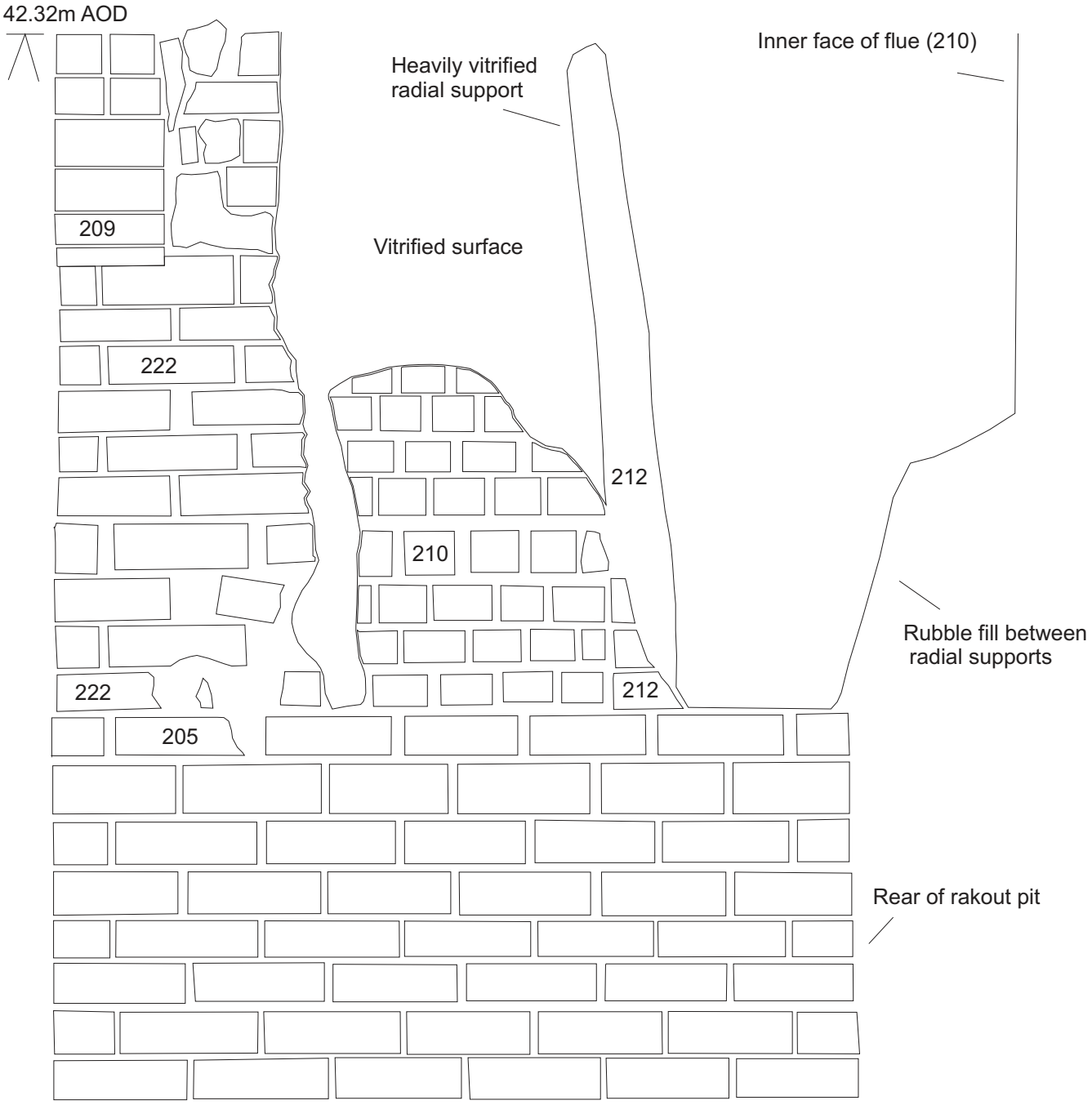


Figure 7: Elevation 4, Kiln 2
east facing, 1:10

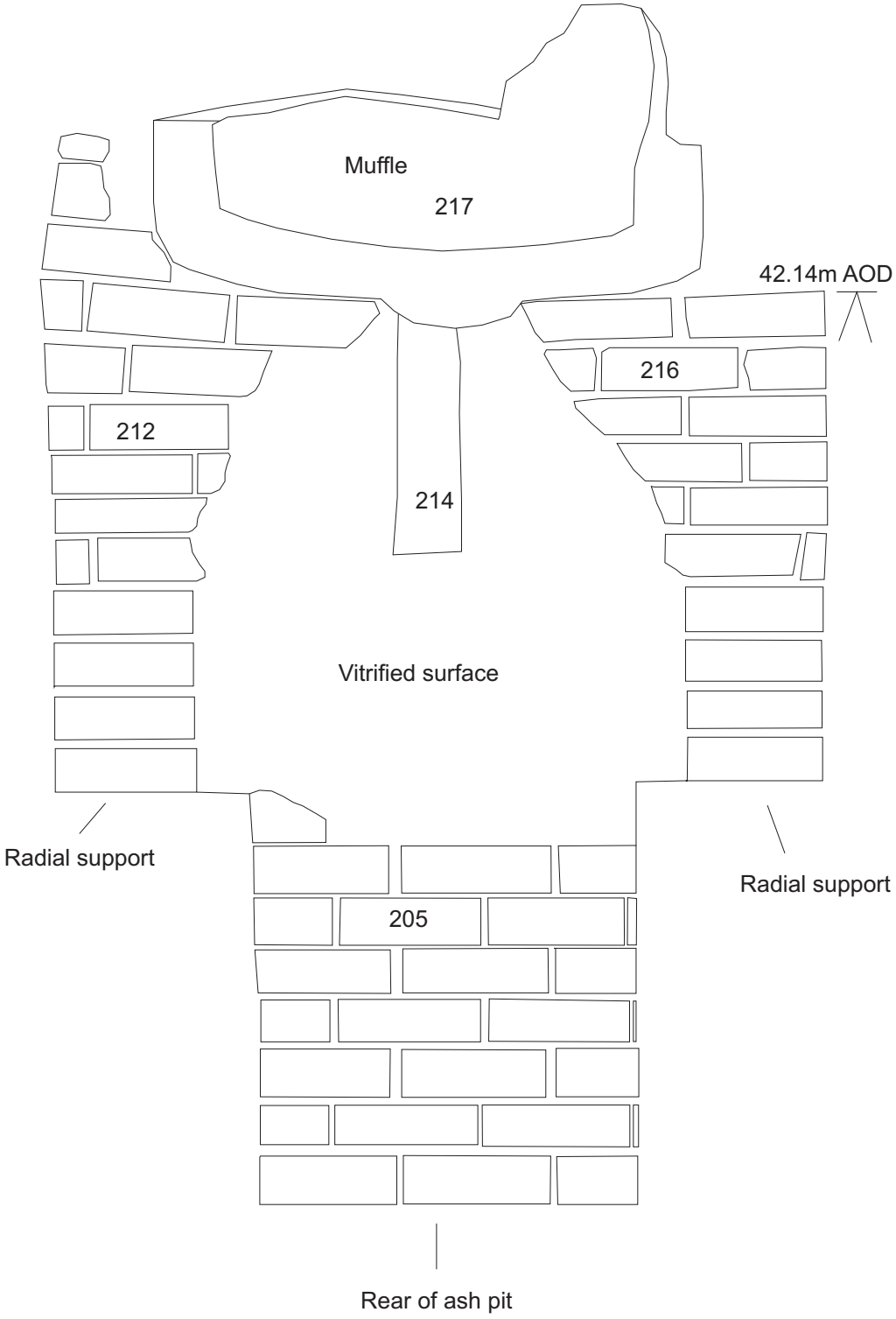


Figure 8: Elevation 5, 1:10
north facing kiln 2

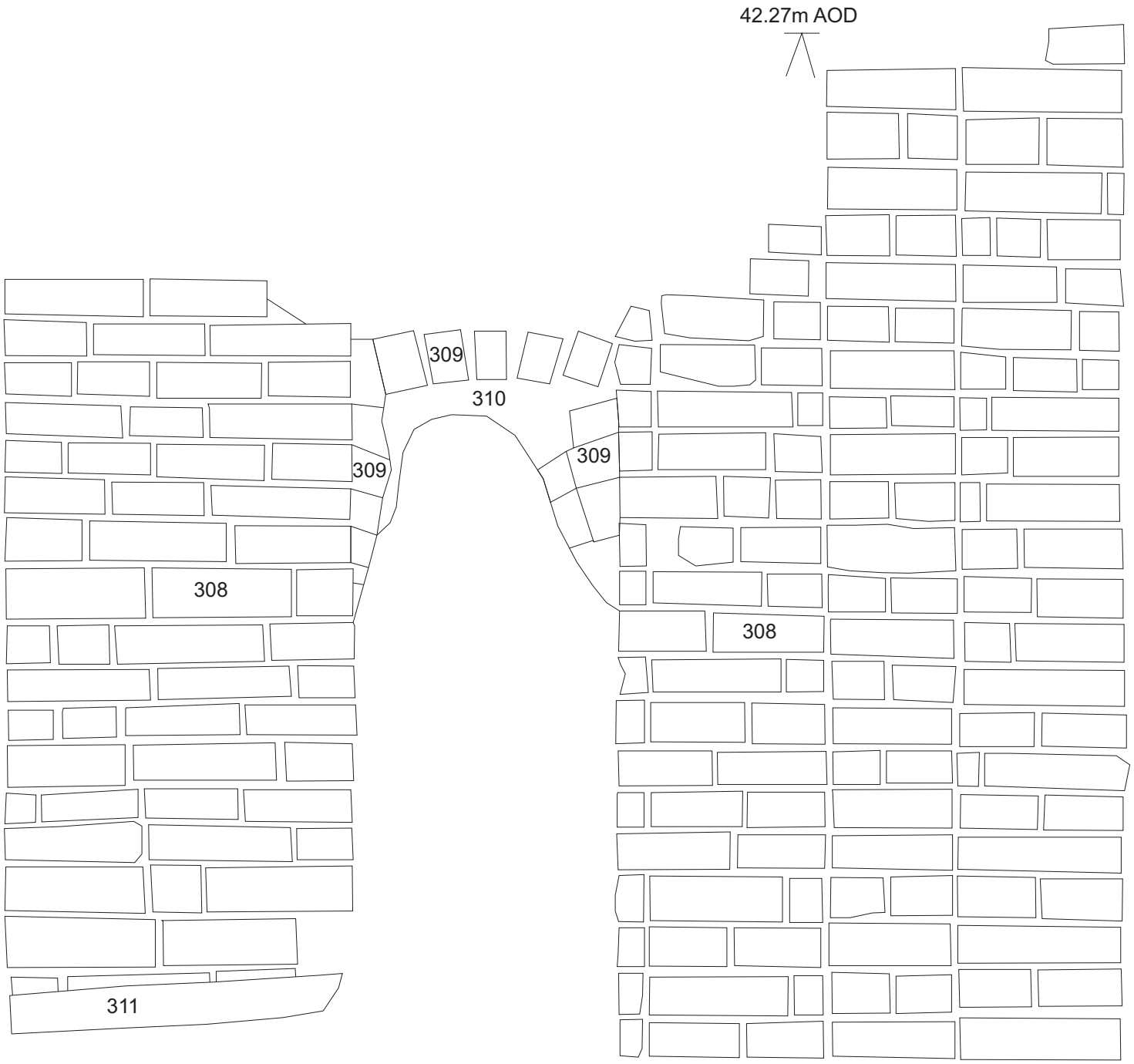


Figure 9: Elevation 6, 1:10
west facing kiln 3

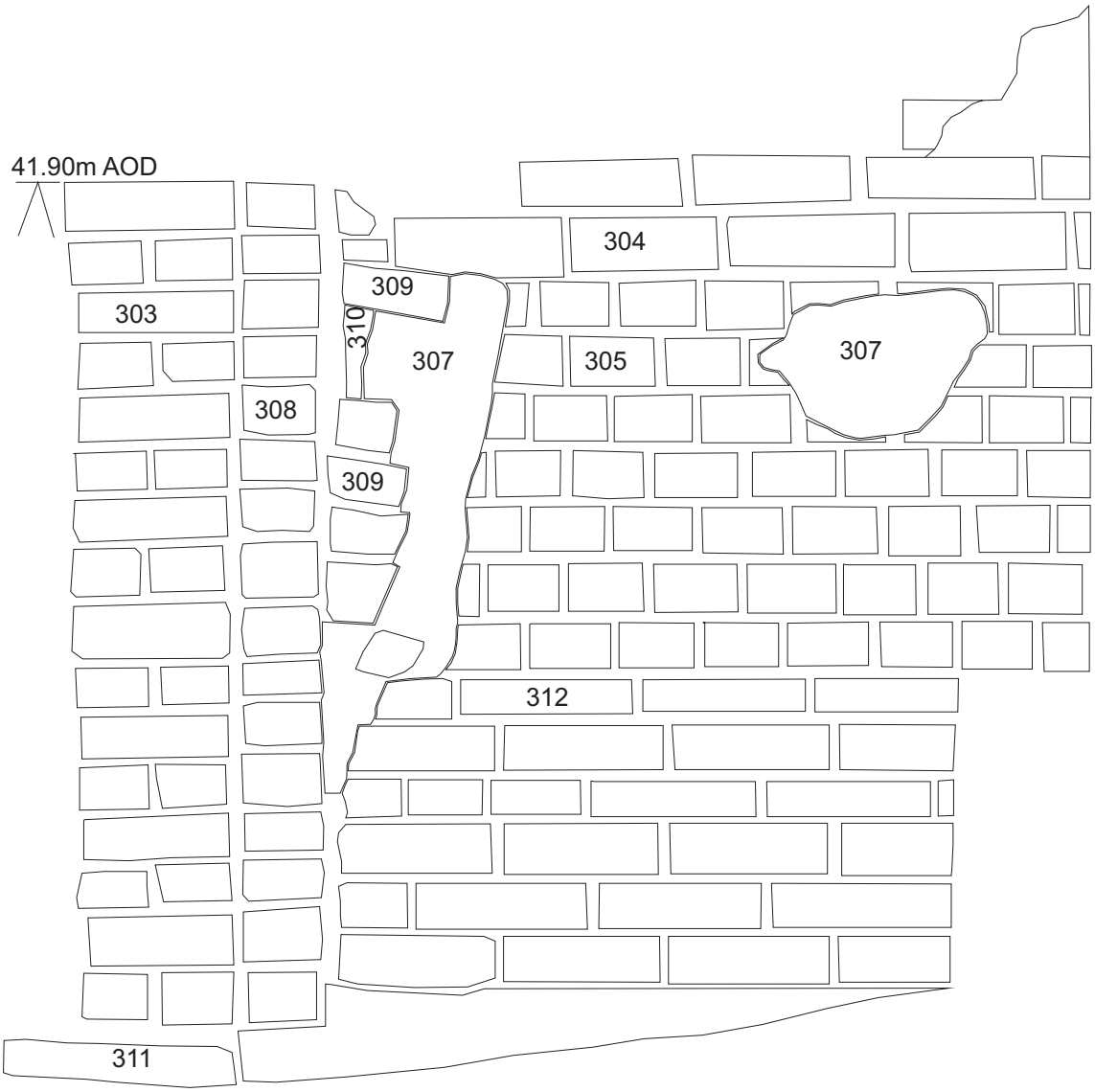


Figure 10: Elevation 7, 1:10
south facing kiln 3