
THE FORMER BOATYARD,
955 SHEFFIELD ROAD, CHESTERFIELD.

REPORT ON A PROGRAMME OF
ARCHAEOLOGICAL MITIGATION EXCAVATION
OSA REPORT NO: OSA20EX02

July 2020

OSA

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Report Summary.

REPORT NO: OSA20EX02/OSA19EV35

SITE NAME: Former Boatyard, Chesterfield

COUNTY: Derbyshire

NATIONAL GRID REFERENCE: SK 37590 76047

PLANNING REF NO: CHE/16/00171/OUT

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1.0 Abstract.

A programme of archaeological evaluation and mitigation was undertaken by On-Site Archaeology Ltd at former Boatyard, 955 Sheffield Road, Sheepbridge, Chesterfield, Derbyshire in February and March 2020 on behalf of Vistry Partnerships.

The evaluation and subsequent mitigation excavation were commissioned to satisfy a condition attached to the planning permission for the development (Planning Reference No. CHE/16/00171/OUT). The investigation comprised the machine excavation of six evaluation trenches followed by a small open area of excavation around Trench 5. Two late 19th century Scotch kilns from Priestley's Brick Works were found within the mitigation area, both seen on Ordnance Survey maps of this period. Evidence for terraced housing located alongside Sheffield Road associated with the brickworks was also found within two of the evaluation trenches, these houses had been demolished during late 20th century.

2.0 Site Location and Geology.

The site is located approximately 5km to the north of the centre of Chesterfield, on the south side of the village of Unstone Green. The site is centred at approximately SK 37590 76047 (Figure 1).

The site lies to the east of the B5057, Sheffield Road, to the west of the Chesterfield to Dronfield railway line. The northern limit of the site is defined by a stream, a tributary of the River Drone, which it enters immediately to the northwest of the site.

The site was most recently used as a boatyard but is currently derelict (Plate 1). Several buildings are still present, dating from the later 19th to 20th centuries.

Geologically the site lies at the interface between Mudstone and Siltstone of the Pennine Lower Coal Measures Formation and carboniferous sandstone. Superficial deposits of alluvium, comprising gravel, sand, silt and clay may also be present, especially along the western fringes of the site (<http://mapapps.bgs.ac.uk>).

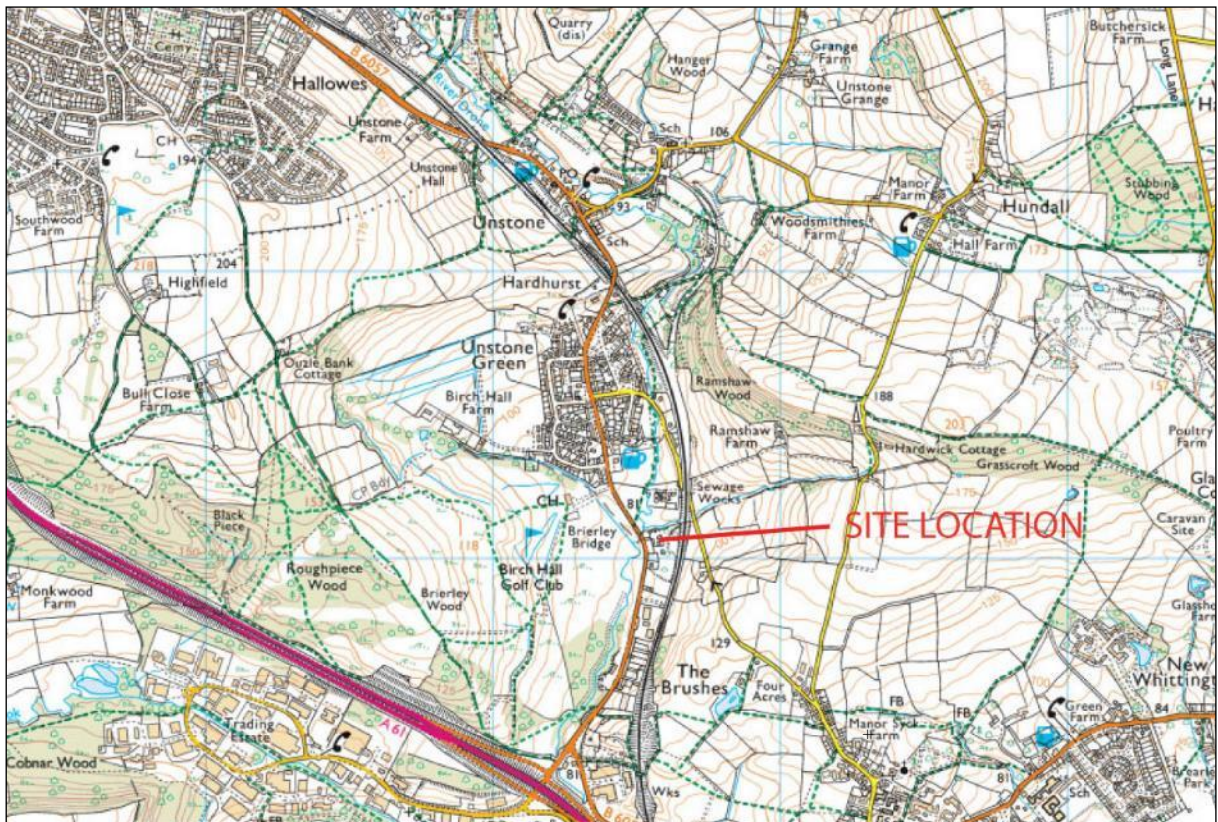


Figure 1. Site Location NGR SK 37590 76047

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3.0 Archaeological Background.

The site has been subject of a Desk-Based Assessment prepared by Archaeological Building Recording Services in July 2016, which predominantly draws upon information available in the Derbyshire Historic Environment Record. For full details of the evidence upon which the period summaries below are based, refer to the DBA (ABRS, 2016)

There is limited evidence for prehistoric activity in the vicinity of the site. Approximately 650m to the northeast of the site an archaeological investigation, carried out in the 1970s, comprising fieldwalking and excavation identified Mesolithic and Neolithic occupation evidence. Further fieldwalking and chance finds of flint artefacts and scatters suggest activity across a wider area. No Iron Age or Romano-British period archaeology is known within the vicinity of the site.

There is no evidence for early medieval settlement recorded within this area; although, the manor of Whittington is mentioned in the Domesday Survey of 1086 and is presumed to have Saxon origins.

The population and built environment developed in the late post-medieval period during the 18th and 19th centuries. As a result of the abundant coal measures and iron ore deposits, Iron and Steel foundries and brick, tile and pottery factories were established. The site itself has been identified as the location of Priestley's Brickworks. The following text is drawn directly from the DBA (ABRS, 2016, pp. 5-6).

"The first edition Ordnance Survey records a brick yard on the site in 1881 consisting of a single building, by the end of the 19th century there were a number of additional buildings, presumably kilns and by 1919 there were also two chimneys on the site. In 1973 the brickworks were described as having been derelict since 1915, at the same time there were said to be three Scotch kilns on the site, two of which were "in fair condition, and one mostly demolished". Documentary references held by the HER describes the brickworks:

There are three Scotch kilns at the disused works at Sheepbridge, near Chesterfield (SK 376761), formerly owned by Henry Priestley of Whittington. Two have 24 fireholes and one has 28, and the wicket at one end of each kiln is 8ft wide so that a cart could be loaded inside. Each kiln held 30,000 large facing bricks. The works manufactured pressed and handmade facing and common bricks and a wide range of special and ornamental shapes from a grey Coal Measures clay taken from a pit below the Derby-Sheffield railway line. The works was founded in the 1870s and closed down in 1915 but the site is still owned by one of Priestley's descendants."

Cartographic sources from the late 19th to early 20th century show the growth and increased complexity of the brickworks complex. The First Edition Ordnance Survey map of 1875 only showed a single building approximately in the centre of the site, together with a number of field boundaries, presumably being survivals of the earlier agricultural landuse. Although the brickworks closed in 1915 the 1919 edition of the Ordnance Survey is reproduced below to illustrate what is likely to be the majority of buildings present at the most extensive point of

the complex (Figure 2). Many of these structures had been present by 1898. In addition to the brickworks structures themselves, presumably including the kilns, located in the central area, the western part of site was occupied by a terrace of houses fronting onto Sheffield Road; Henry Priestley is believed to have occupied the largest end house. The eastern part of the site, adjacent to the railway line, shows clear evidence for the location of the clay extraction pit, as suggested in the documented description of the works. The 1966 edition of the Ordnance Survey indicates that the majority of the structures, including the houses, were still present at that date. However, since then the site has been cleared, with the exception of the central building, and a number of structures along the northern boundary. The DBA included a rapid building appraisal. This confirmed that three of the standing buildings as modern. The building in the central part of the site is not believed to be the same structure as that shown on the 1875 Ordnance Survey map, although it occupies a similar position. One of the buildings on the northern boundary is likely to have been constructed between 1875 and 1898, with subsequent 20th century alterations.

5.0 Results.

Area A

Within this area two brick kilns were identified, as well as two external floor surfaces (Figure 4 and Plate 2). A number of layers were found above the kilns (Figure 7). The earliest of these layers was deposit (1025) which was seen between the two kilns over floor surface (1010) and consisted of dark greyish black sandy silt. It appeared to be the result of natural silting up between the two kilns. Over the kilns were two further layers of demolition material (1001) and (1024). It is unclear if these were two separate events or simply the way demolition was undertaken and infilled the space between and above the kilns. The final layer (1000) was the modern ground surface and levelling layer.

Kiln A (western kiln)

Kiln A had a width of 5.6m and a total length of 16.6m (Figure 5 and Plate 3). The preservation of this kiln was not as good as Kiln B, with two large and several smaller modern intrusions within the footprint of the kiln. A small section within the southern part of the kiln was better preserved with three brick floor levels being found in-situ to a height of 0.55m from the natural (Plate 5). The walls of this kiln (1011) were constructed from both frogged and unfrogged bricks. One of the single brick samples analysed from this context was a blown brick that appeared to have been handmade. From what could be seen of the walls they were constructed completely of bricks (no core) and there appeared to be no particular pattern to the bonding of the bricks within the inner parts of the walls. The mortar appeared to be of a sandy form.

There seemed to have been a rebuild and an extension to this kiln. In the southern part of the eastern wall a possible rebuild could be seen. When excavated the third and fourth course of the wall could be seen to sit over floor layer (1022) the third in a floor layer sequence (Figure 7). At the far northern end of the trench a 2.15m extension of the kiln could be seen (Plate 4). Two east to west walls ((1011) and (1018)) could be seen at the northern end of the trench. The original wall (1011) could be seen to be bonded into the side walls and formed the northern wall of the original built kiln. The extension wall (1018) abutted the original northern wall and was not bonded into it. The reason for such a small extension to the footprint of the kiln is unclear. A single brick sample from this context was found to be machine made and frogged.

Only 8 of the kiln flue vents were visible in the central part of the kiln where preservation of the walls was best. From what could be seen of the vents they were placed roughly evenly spaced along the outer walls. Fuel slag and ash were found within some of the vents (1013). Iron workings (1014) were only seen in one of the vents - for a description of the preserved iron workings within the flue vents see below.

In the better preserved central-southern part of the kiln a number of floor layers were observed (Plate 5). These floor layers were a series of mid orangey pinkish red gravel-like brick waste material deposits ((1021), (1022) and (1023)) and brick floor layers ((1015), (1016) and (1017)) (Figure 7 and Plate 6). Layer (1023) was definitely a bedding layer for brick floor (1017); however, it is unclear if layers (1021) and (1022) were bedding layers for the respective subsequent brick floors (1015) and (1016), accumulation layers on top of the

brick floors through activity in the kiln or a combination of both. It is assumed that floor (1015) was the latest floor, although this cannot be confirmed due to the level of preservation of the rest of the kiln. Three brick samples from context (1015) were found to be a mix of handmade and machine made. A further single brick sample taken from context (1017) was machine made, overfired and had battered edges.

A small section of flooring was also seen in the entrance of the kiln (1012). It was a section of differently aligned bricks from the rest of the walls and measured 1m by 2m. Due to the truncation of the walls it was unclear if this flooring represented the whole of the entrance or just the most used part. It may have been that these bricks had been replaced a number of times due to the high foot and cart traffic across this area. A single brick sample taken from this context was machine made, had wobbly arrises and was missing three corners indicating it had been heavily worn.

Kiln B (eastern kiln)

Kiln B had a width of 5.7m and a length of 14.4m (Figure 6 and Plates 7+8). It was generally better preserved than Kiln A and survived in places to a height of 0.75m above natural. The walls of this kiln (1002) were again constructed from both frogged and unfrogged bricks and were constructed in a very similar way to those in Kiln A. Four brick samples from this context were analysed and all were found to be machine made. One had frogging and another was a yellow firebrick with vitrified material attached that had been from the within a flue from this kiln.

The walls were preserved to height to show all the flue vents (one was truncated by a modern service trench) (Plate 9). As stated in the documentary evidence 24 kiln flue vents were found within this kiln – 12 on either side somewhat symmetrically. They were largely evenly spaced, although not precisely. Some metal workings were still in-situ within the vents (1005). It appeared as though there had been a metal base plate with a grate consisting of four metal plates laid longways and two metal bars either end of the vents (Plates 10+11). Again, fuel slag and ash were found within some of the vents (1004). At the level the vents were preserved some could be seen to run through the entire width of the wall and some not. This indicates that the vent outlets within the kiln were at different heights for better circulation of heat.

The entrance of this kiln was also located at the southern end. The size of the entrance of this kiln was much more obvious than in Kiln A due to the walls being preserved to a higher level (Plate 12). The entrance to the kiln measured 2.4m - the width stated as the size of the 'wicket' as 8ft (2.4m) in order for a cart to be used to offload and load the bricks.

The northern end of this kiln was constructed in a different manner to that seen in Kiln A (Plate 13). Five separate sections were identified. Two possible 'columns' appeared to be part of the original build; built in the same manner as the rest of the walls. If these were 'columns' there would have been three small entrance ways measuring 0.76-0.8m – enough for a person to enter the kiln sideways. The reason for these possible 'entrance ways' remains unclear. At some point these were blocked up with infills (1003) consisting of a skin of at

least two bricks thick and a rubble and brick-waste core (Figure 7 and Plate 14). A sample taken from one of these infills (1003) showed they were partly made of paver tiles.

A number of different floor surfaces were found within this kiln; however, these were likely to be contemporary rather than consecutive (unlike in Kiln A). Over the majority of the interior of the kiln (7.2m) was a three-layered floor. The base layer (1008) of fairly compact mid orangey pinkish red gravel-like brick waste material. This layer was overlain by a brick floor surface (1007) made largely from waster bricks laid on their side in rows (Plates 15+16). A single brick sample from floor (1007) was found to be machine made and blown. In the section of floor (1007) that was exposed during the excavation a few small areas were found not to contain any bricks – one of these was possibly an area of wheel rutting near the entrance of the kiln. Above the brick floor across most of the surface was another layer (1006) very similar to (1008) consisting of very compact mid orangey pinkish red gravel-like brick waste material. It remains unclear if this layer was deliberately laid down or accumulated through the kiln activity. In the northern part of the kiln interior was a further small section of brick floor (1009) that was constructed of better formed bricks laid flat in a much more orderly fashion (Plate 17). A single brick sample taken from this context was machine made with sharp arrises but had been blown. Bricks were laid up to floor (1007) appearing to respect that floor surface but 0.05m lower. The reason for this different floor surface remains unclear. To the north of floor (1009) up to the northern wall of the kiln was a 0.22m deep layer of deposit (1006) sitting on top of the natural. It remains unclear as to why this kiln appeared to have contemporary floor surfaces whereas Kiln A had subsequent floor surfaces – the top of the upper floor (1015) being 0.28m higher than floor (1007) in this kiln.

External

In between the two kilns was a narrow alleyway that would have been used to feed the flue vents of both kilns. A brick floor surface (1010) covered the majority of the area (Plate 18), although there were no bricks at the northwestern end of the southern end. At both ends it did appear as though there had not been a floor surface in these areas, although this was not clear. The bricks were offset in their bonding and tightly placed. The southern end of the flooring was uneven but this was probably due to more recent disturbance. A brick floor surface (1020) was also seen on the western side of Kiln A and appeared very similar to brick floor (1010) (Plate 3).

Evaluation Trenches

Trench 1

Trench 1 was located in the western area of the site. It was placed to target the southern end of the row of workers' cottages and outbuildings and was aligned east to west. A partially robbed out wall foundation and small section of another wall as well as two possible floor layers were found within this trench. The natural (113), a mid yellowish grey clay, was found at a maximum height of 81.68m AOD.

At the western end of the trench two brick walls foundations were found. Wall (107) was on a north-northeast to south-southeast alignment and measured 0.45m wide and 0.3m deep. The northern end of the foundation had been robbed out. A further short section of wall foundation (108), possibly a buttress, was located 0.9m to the southwest and parallel to wall

(107). The deposit between these two foundations (106) consisted of mid yellowish greyish brown clay that was 0.25m deep. The location of the wall foundations suggest they were part of one of the workers' cottages and deposit (106) was possibly a base layer for the flooring.

In the central part of the trench was a shallow cut [112] that measured over 5.5m long, 0.2m deep and extended beyond both the northern and southern L.O.E (limit of excavation). The function of this feature remains unclear; however, it was placed in the backyard of one of the workers' cottage. The feature had two fills; the lower fill (111) consisted of dark greyish reddish black ash with infrequent CBM fragments and had a depth of 0.05m. The upper fill (110) was a dark reddish black cinder and ash with infrequent CBM flecks and charcoal.

This feature was then truncated in the eastern part of the trench by the cut for a modern septic tank [104]. At the very far eastern end of the trench was a deposit of modern backfilling (105). Above all of these deposits and features was a demolition layer (101) 0.6m deep and a final layer (100) of topsoil and tarmac representing the modern ground surface.

Trench 2

Trench 2 was located in the southern part of the site, southeast of Trench 1. Part of the trench had to be excavated to the side of the original proposed location due to the presence of a modern gas pipe. No archaeology was found within this trench. Natural (202) was exposed at a maximum height of 83.28m AOD (0.7m below ground level) and consisted of mid grey clay. The rest of the trench as filled with modern demolition rubble (201) and a gas pipe service trench. The final layer was the modern surface of tarmac (200).

Trench 3

This trench was located in the central part of the site to the north of Trench 2. It was also aligned east to west and was placed to investigate a possible historic building in this location. The excavation and recording of this trench were hampered by flooding. A small area of possible floor surface was the only archaeological deposit found within this trench. The geological natural (311) consisted of mid yellowish grey clay and was found at a maximum height of 83.16m AOD.

The small area of possible floor surface (309) was located in the central part of the trench and measured 1.1m wide and extending beyond the northern and southern L.O.E's. It was constructed of randomly laid bricks and had a bedding layer (310) of mid yellowish brown clay. Above the floor surface was a deposit (308) of light yellowish white crushed limestone layer, possibly a further floor surface. These floor layers were truncated on their eastern side by modern intrusion [304] which was filled with breeze blocks and plastic.

The final layers consisted of a layer of degraded tarmac (302), a demolition layer (301) and the tarmac modern ground surface (300).

Trench 4

Trench 4 was located just to the northeast of Trench 3 and was aligned north to south. The excavation and recording of this trench were hampered by flooding. A floor, two walls and a

pit were found within this trench. Also, a number of modern intrusions and a manhole with associated drain were seen. Geological natural (419) was a mid yellowish grey clay and shale bedrock and was found at a maximum height of 83.45m AOD.

Within the southern part of the trench was a section of preserved flooring and wall foundations. The two wall foundations ((411) and (414)) were situated parallel to each other with a small 0.3m wide gap between. It was unclear if these were internal or external walls. Both were constructed of bricks. The gap between the two was filled with deposit (412), a mid yellowish grey clayey silt with moderate inclusion of natural shale bedrock. This layer was between 0.03m and 0.12m deep and overlay pit [416]. This pit was only seen in the western end of the gap between walls (411) and (414) and could only partially be excavated. It measured over 0.38m by over 0.4m with a depth over 0.38m. The only visible fill (415) consisted of mid yellowish grey clayey silt with moderate natural shale inclusions. Fragments of CBM (not retrieved), a fragment of tile and a fragment of glazed CBM were found within the fill. This fill appeared to be the result of deliberate backfilling.

A floor surface was also found within this part of the trench. This flooring consisted of strips of both brick (417) and wood (418) extending southward from wall (414). The reason for this construction of flooring is unclear. The eastern part of the floor was truncated by modern instruction [406].

The northern part of the trench was taken up by a manhole (408) with an associated drain [410] and a further modern intrusion [404]. The final layer within the trench were two deposits of demolition material ((401) and (402)) and the upper layer (400), the modern ground surface.

Trench 5

Superseded by Area A.

Trench 6

Trench 6 was located in the northwestern part of the site and was located to investigate the northernmost of the terrace houses – the largest and the one believed to have belonged to Henry Priestley. The rear room of the house was seen within the trench, as well as a rear wall or wall of an outhouse. The geological natural (614) in this trench consisted of mid brown clay with pebbles and was found at a height of 80.74m AOD.

Four wall foundations were identified at the far western end of the trench. The full widths of both north-south wall foundations ((605) and (606)) were seen; however, the east-west wall foundations ((607) and (608)) were only partially visible within the trench. The deposit within the wall foundations (609), a dark grey silty clay, was probably an infill deposit below a floor layer that had been removed. A modern intrusion [603] had truncated a small part of this room in the northwestern corner.

At the far eastern end of the trench was a further wall foundation (610) that probably represented the western wall of an outhouse (seen on the historic maps). A deposit (612) to the east of wall (610) consisted of mid brownish grey silty clay and also probably represented a base layer for a floor layer above. A deposit (611) to the west of wall (610) was similar again – a mid brownish grey silty clay and may have been below a yard surface. A manhole

(604) was also seen in the centre part of the trench. It is unclear if this was associated with the terrace houses or was part of some later drainage.

Again, there was a layer of demolition material (601) overlain by the modern ground surface layer (600).

6.0 Conclusion and Recommendations.

The various stages of archaeological investigations on this site have supplemented the existing cartographic and documentary evidence for the late 19th century brickworks. Priestley's Brick Works was producing bricks from the late 19th century through to 1919 when it was forced to stop due to the post-war economics. Despite recent disturbance two of the three brick kilns known to have existed on this site partially survived below the modern ground surface. The truncated remains of the foundations of some of the terraced houses along Sheffield Road were identified during the evaluation trenching but due to the absence of contemporary floor surfaces these buildings were not investigated further. A phase of building recording of the standing buildings also indicated that two were present during the life of the brickworks, although having been altered somewhat in the last century.

The two brick Scotch kilns, found within Area A (Figure 3), were partially preserved largely as a result of the natural slope that exists on site. Although these kilns were built partially side by side and clearly at one time functioned together it appears likely they were built at different times. Despite the archaeological and cartographic investigations, it remains unclear which was built first. In construction there were a number of similarities as well as differences between the two kilns. Both were roughly the same width and, without the extension of Kiln A, both were a similar length. The reason for the small extension of Kiln A remains unclear. From documentary sources we know Kiln A had 28 flues and Kiln B 24 flues – the latter confirmed archaeologically. Kiln A appeared to have a sequence of floor layers whereas the floors within Kiln B were contemporary with one another. Furthermore, the possible small 'entrances' at the northern end of Kiln B were only seen in this kiln. Again, the reason for the presence of these 'entrances' remains unclear as does the later infilling of the gaps. Documentary evidence states that 30,000 bricks could be fired in each kiln per firing and at Priestley's the bricks were dried within the kilns using a low initial heat.

Recording of the standing buildings still present on site indicated that a couple of the buildings (Building D east and west) located north of Kilns A and B and alongside the brook were used in the production of the bricks utilising the water for the processing of the clay and also possibly for power. Although the building to the south of the kilns (Building A) is on the footprint of one of the original brick works building, seemingly the earliest of all the buildings according to evidence from the OS maps, it has been rebuilt since the time of the brick works.

Evaluation trenching was carried out across the rest of the site and found large areas had been truncated.

The preservation of the Scotch kilns on this site, as well as the cartographic and documentary evidence has given a valuable opportunity to investigate a late 19th century brickworks. Only a few of these kilns have been archaeologically recorded within this region.



Figure 3. 1919 OS Map with location of archaeologically recorded kilns.

7.0 Bibliography.

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8.0 Appendix 1 ~ Context Register.

8.1 Context Register

Context	Description	Thickness	Extent
<i>Area A</i>			
1000	Stone and tarmac. Overburden/levelling layer.	0.2m	Trench
1001	Demolition material. Layer.	0.2-0.8m	Trench
1002	Bricks and mortar. Walls of Eastern Kiln.	0.1-0.55m+	1.1m x 14.4m
1003	Bricks, mortar and rubble infill. Three sections of infill walls (northern wall of Eastern Kiln).	0.55m+	0.76-0.8m x 1.1m
1004	Rubble, fuel slag and ash. Flue fill in Eastern Kiln.	0.1-0.3m	0.2-0.3m x 0.6-1.1m
1005	Iron workings of flues in Eastern Kiln.	0.1m	Various
1006	Mid orangey pinkish red brick waste and gravel. Floor surface in northern part of Eastern Kiln.	0.05-0.24m	3.6m x 14.4m
1007	Bricks. Floor surface in Eastern Kiln.	0.15m	3.6m x 9.4m
1008	Mid orangey pinkish red brick waste and gravel. Bedding for floor in Eastern Kiln.	0.02-0.1m	3.6m x 9.4m
1009	Bricks. Brick floor surface near northern end of Eastern Kiln.	-	3.2m x 1.16m
1010	Bricks. Floor surface in 'alley' between Kilns.	-	1.1-2m x 11.3m
1011	Bricks and mortar. Walls of Western Kiln.	0.1-0.45m+	1.1m x 14.4m
1012	Bricks. Floor surface in entrance of Western Kiln.	0.1m	1.1m x 2m
1013	Rubble, fuel slag and ash. Flue fill in Western Kiln.	0.18-0.2m	0.7-0.9m
1014	Iron workings of flues in Western Kiln.	0.1m	Various
1015	Bricks. Floor surface – Upper floor of Western Kiln.	0.8-0.1m	3.4m x 2.8m
1016	Bricks. Floor surface – Middle floor of Western Kiln	0.11m	1m+ x 1.5m+
1017	Bricks. Floor surface – Lower floor of Western Kiln	0.1m	1m+ x 1.5m+
1018	Bricks and mortar. Northern part of walls of Western Kiln (extension).	0.1m+	1.15m x 2m
1019	Mid orangey pinkish red brick waste and gravel. Floor surface of Western Kiln (extension).	0.05m	1.1m x 3.1m
1020	Bricks. Floor surface external western side of Western Kiln.	-	0.96m+ x 9.8m
1021	Mid orangey pinkish red brick waste and gravel. Bedding of floor surface (1015).	0.1m	1m+ x 1.5m+
1022	Mid orangey pinkish red brick waste and gravel. Bedding of floor surface (1016).	0.03-0.14m	3.5m x 3.7m+
1023	Mid orangey pinkish red brick waste and gravel. Bedding of floor surface (1017).	0.05-0.09m	1m+ x 1.5m+
1024	Mid reddish brown sandy silt and demolition material. Layer.	0.22m	Patches
1025	Dark greyish black sandy silt. Layer.	0.22m	2m x 16m
1026	Mid yellowish grey shale bedrock and mid yellowish grey clay. Natural.	-	Trench
<i>Trench 1</i>			
100	Topsoil and tarmac. Modern overburden/surface.	0.1m	Trench
101	Demolition material. Layer.	0.6m	Trench
102	Hardcore. Fill of [104].	-	2m x 3m
103	Bricks. Walls of tank.	-	2m x 3m
104	Cut of former septic tank.	-	2m x 3m
105	Dark grey clayey silt. Modern backfill.	-	1.6m+ x 2m+
106	Mid yellowish greyish brown clay. Levelling layer.	0.25m	1.5m+ x 1.6m+
107	Brick. Foundation.	0.3m	0.45m x 1m+
108	Brick. Foundation.	0.25m	0.3m x 0.6m
109	Cut of foundations (107) and (108).	0.3m+	0.3-0.45m x 1m+
110	Dark reddish black cinder, ash, CBM etc. Fill of [112].	0.15m	1.6m+ x 5m+
111	Dark greyish reddish black ash and brick fragments. Fill of [112].	0.05m	0.75m+ x 0.75m+
112	Cut of yard depression.	0.2m	1.6m+ x 5m+
113	Mid yellowish grey clay. Natural.	-	Trench
<i>Trench 2</i>			

200	Tarmac. Modern surface.	0.1m	Trench
201	Demolition rubble. Layer.	0.7m	Trench
202	Mid grey clay. Natural.	-	Trench
<i>Trench 3</i>			
300	Tarmac and hardcore. Modern surface.	0.1m	Trench
301	Mid brown sandy silt and demolition material. Layer.	0.3m	Trench
302	Degraded tarmac. Layer.	0.16m	2.7m x 1.8m+
303	Modern material. Fill of [304].	-	1.95m x 1.8m+
304	Cut of modern feature.	-	1.95m x 1.8m+
305	Rubble and CBM. Fill of [306].	-	0.35m x 1.8m+
306	Cut of soakaway/drain.	0.2m	0.35m x 1.8m+
307	Mid yellowish grey clay. Redeposited natural layer.	0.16m	1.8m x 2.3m
308	Light yellowish white crushed limestone. Layer.	0.1m	1.1m x 1.8m
309	Brick. Floor surface.	0.1m	1.1m x 1.8m
310	Mid yellowish brown clay. Bedding layer.	0.12m	1.8m
<i>Trench 4</i>			
400	Light creamy grey stone and rubble. Modern surface and backfill.	0.3-0.35m	Trench
401	Light to mid grey clayey silt. Makeup layer.	0.2-0.3m	Trench
402	Mid grey clayey silt. Makeup layer.	0.1-0.2m	Trench
403	Mixed mid orangey yellow clay and mid grey clayey silt. Fill of [404].	-	1m+ x 4m
404	Cut of modern intrusion.	-	1m+ x 4m
405	Mid to dark brownish grey clayey silt and rubble. Fill of [406].	-	0.65m+ 4m+
406	Cut of modern intrusion.	-	0.65m+ x 4m+
407	Dark brownish grey clayey loamy silt. Backfill of manhole.	-	0.85m x 0.95m
408	Bricks. Structure of manhole.	0.25m+	1.7m x Tr.
409	Dark brownish grey clayey silt. Fill of drain cut.	-	1.6m+ x 8m+
410	Cut of drain cut.	-	1.6m+ x 8m+
411	Brick. Wall.	0.38m+	0.35m x 1.6m+
412	Mid yellowish grey clayey silt. Deposit.	0.03-0.12m	0.3m x 1.6m+
413	Dark grey gritty sand. Floor layer.	0.03m	0.4m+ x 1.6m+
414	Brick. Wall.	0.38m+	0.5m x 1.6m+
415	Mid yellowish grey clayey silt. Fill of [416].	0.38m+	0.3m+ x 0.4m+
416	Cut of ?pit.	0.38m+	0.3m+ x 0.4m+
417	Brick. Floor surface.	-	0.35-0.75m x 1.25-1.4m+
418	Wood. Floor surface.	-	0.3-0.45m x 1.2-1.4m+
419	Mid yellowish grey clay and shale bedrock. Natural.	-	Trench
<i>Trench 6</i>			
600	Tarmac and hardcore. Modern ground surface.	0.12m	Trench
601	Demolition material. Layer.	0.55m	Trench
602	Dark greyish black clayey silt. Fill of [603].	-	1.8m x 2.7m+
603	Cut of later intrusion.	-	1.8m x 2.7m+
604	Brick. Manhole structure.	-	1.1m x 1.6m
605	Brick. Wall foundation.	-	0.35m x 2m+
606	Brick. Wall foundation.	0.35m	0.35m x 2m+
607	Brick. Wall foundation.	-	0.2m+ x 3.5m+
608	Brick. Wall foundation.	-	0.1m+ x 0.75m+
609	Dark grey silty clay. Layer.	-	2.5m x 3.5m
610	Brick and sandstone. Wall foundation.	-	0.5m x 2m+
611	Mid yellowish brownish grey silty clay. Levelling layer.	0.1m	2m+ x 7.5m
612	Mid brownish grey silty clay. Levelling layer.	-	2m+ x 2m+

613	Mid greyish brown clayey silt. Layer.	0.25m	0.4m+ x 0.4m+
614	Mid brown clay with pebbles. Natural.	-	0.4m+ x 0.4m+

9.0 Appendix 2 ~ Archive Index

9.1 Drawing Register – OSA19EV35.

Drawing No	Description	Scale	Date	Initials
1	Plan of Trench 1.	1:50	17/02/20	BMcC
2	North facing section of foundations (107) and (108).	1:20	17/02/20	BMcC
3	Northeast facing section of [112].	1:10	17/02/20	BMcC
4	Southeast facing section of [112].	1:20	17/02/20	BMcC
5	Plan of Trench 2.	1:50	17/02/20	BMcC
6	North facing sample section of Trench 2.	1:20	17/02/20	BMcC
7	Plan of Trench 6.	1:50	18/02/20	BMcC
8	North facing section of (606) and (608).	1:10	18/02/20	BMcC
9	Plan of Trench 4.	1:50	19/02/20	KL
10	East facing section of walls (411) and (414) and pit [416].	1:10	19/02/20	KL
11	Plan of Trench 5.	1:50	19/02/20	BMcC
12	North facing section of Trench 5.	1:20	19/02/20	BMcC
13	Plan of Trench 3.	1:50	18/02/20	BMcC
14	South facing section of Trench 3.	1:20	18/02/20	BMcC

9.2 Drawing Register – OSA20EX02.

Drawing No	Description	Scale	Date	Initials
1	Plan (Grid Square 45/45)	1:20	26/03/20	GB
2	Plan (Grid Square 45/20)	1:20	26/03/20	GB
3	Plan (Grid Square 45/25)	1:20	26/03/20	GB
4	Plan (Grid Square 45/30)	1:20	26/03/20	GB
5	Plan (Grid Square 50/20)	1:20	26/03/20	JS
6	Plan (Grid Square 50/25)	1:20	26/03/20	JS
7	Plan (Grid Square 50/30)	1:20	26/03/20	JS
8	South elevation of north wall (Eastern Kiln) showing infill (1003)	1:10	27/03/20	KL
9	South facing section of floor surfaces of Western Kiln	1:10	27/03/20	KL

10.0 Appendix 3 ~ Assessment of Ceramic Building Material

By S Garside-Neville

Introduction

A total of 17 fragments, complete bricks and tile weighing 53.125 kg were submitted for report .

Methodology

Each of the 16 bricks and one tile were examined for method of manufacture, measured, weighed, and the fabric identified with an x10 hand lens. This information was recorded on a pro forma, and the details transferred to an Excel chart which forms the basis of Table 2 (p.48). During recording, a retention selection was put in place, so that bricks with particular features, such as signs of method of manufacture, and a small selection of typical bricks were kept.

There are eight fabric samples, and basic descriptions can be found on Table 3.

THE BRICKS

There are two types of brick in the sample. Three bricks have frogs and the rest do not. All of the bricks examined seem to be machine made, though three show signs of skintling marks (contexts 1003, 1011 & 1015). These bricks have no frogs, and may have been made at least partly by hand as 1003 has narrow indented borders, which happens when the mould is tapped on the brick to level any pulled up clay. Skintling is normally a handmade brick feature, where the wet clay brick was just dry enough to be moved and the bricks would be skintled (piled up) in such a way as to allow the air to circulate. The skintling is horizontal on these bricks which seems to be a feature that dies out during the 19th century (James & Rose, 2004, 7). In addition, rather than stacking, it is reported that the bricks on this site were dried in the kiln itself (Hammond 1977, 176).

The rest of the unfroged bricks have sharp arrises (edges) which would point to machine manufacture. They could have been pressed in a machine which was operated by the brickmakers. Frequently the bricks are battered, and some show signs of re-use, such as mortar on a broken edge, or a couple of types of mortar. Several are also blown - overfired to the point that the bricks shrink and become misshapened. These could easily be products of the kiln, which could not be easily sold on, but could be reused within the brickworks. There are three bricks that have frogs on both sides (contexts 1002, 1011 & 1018) and are definitely the products of machine manufacture. These bricks do not have stamps, but known examples from elsewhere show just the initials of Henry Priestley (Sallery, 2020). There are also Priestley coping bricks, with the full surname (Fretwell, 2016). The format of the frogs are different to the stamped examples. One type of froged brick (context 1002) has a shallow rectangular frog, with one set of two screws, and sometimes two raised dots or lumps on the outer edge of the frog. There is also a shallow frog on the other side with a set of two screws. There is also a sub-rectangular frog (context 1011) with 2 outer screws on one face, and two outer screws and two inner lumps on the other. Hammond (1977, 176) states that the yard

aimed for facing bricks to be 9in x 4½ x 3 inches (230x112x78mm) after firing. One brick from context 1002, has these measurements; it is frogged both sides, and machine made. There was part of one yellow firebrick (context 1002, 2nd flue) which was not part of the products of this brickworks. The brick was found in a flue, and would need resilience to very high temperatures. This brick has vitrified material fused to its surface.

Paver

A fragment of paver was retrieved from context 1003, infill in Kiln B. The only complete measurement is the thickness of the tile, 25mm - just over 1 inch in imperial measurements. Pavers or floor tiles are not listed as products of Priestley's brickyards, though they did make special items (Hammond 1977, 176).

BRICK AND TILE FABRICS

There are eight fabrics, some of which are probably from the same source, but are different in the distribution and size of the inclusions. Fabrics 1, 2 and 4 include overfired and blown bricks, possibly wasters made at the brickworks.

THE KILNS

Much of the documentary information about the kilns is taken from Hammond's 1977 article which surveyed some of the then still standing kilns in England. However, there are also several websites with useful information, including interviews with people who were related to those making bricks.

There were three intermittent updraught open-topped Scotch kilns on the site. Initially, there was just one, as shown on the OS Map of 1883. By the time Hammond saw the site, this kiln (called Kiln 1 by Hammond) was in a ruinous state but he was able to draw it. Details about its measurements can be seen in Table 1. All three kilns have over twenty fireholes, which is more than the other Scotch kilns investigated by Hammond, and also other literature found eg. Oakham (Leics) 14 fireholes (McWhirr & Smith, 1994), and Farlesthorpe (Lincs) 16 fireholes (Redmore, 2008, 23). However, Slingsby (Yorks) has 24 fireholes (Brook, 1997, 4).

Table 1

Kiln Number (Hammond & OSA)	Internal Measurements (metric) (Hammond only)	Fireholes
Kiln 1 (Hammond only)	12.9x5.66x3.35m	24
Kiln 2 (OSA kiln A, west)	14.02x3.45x3.66m	28
Kiln 3 (OSA kiln B, east)	12.24x3.58x3.60m	24

At the Chesterfield kilns brickmaking took place all year around. The grey Coal Measures clay were dug out by hand. The clay was then screened, and a small amount of water added.

The brickworks had a machine that could press 650 bricks an hour. This machine could have been steam driven or possibly was operated by man moving a lever, or perhaps a harnessed horse pulling the lever round (Watt, 1990, 96). At some point steam powered machinery was installed, which led to a chimney being built on the site, with the initials H P painted on it (Fretwell, 2016). When pressed the bricks were then transported to the kilns and loaded up inside. Rather than allowing the bricks to dry naturally, the kiln was lit to a slow burn, which took up to five days.

When the workmen were satisfied the bricks were dried out, the kiln was covered over the top with soil and clay. Then the proper burning began, with each of the fireholes being fully stoked with Langwith Colliery slack (ie. brittle) coal. Each Firehole had an iron grate (contexts 1005 and 1014, plates 10 and 11 in the excavation report), level with the kiln floor. Firing temperatures were not recorded but the workers had methods of judging the shrinkage. Once again, this lasted for around five days, with the brickmakers probably working in the lean-tos or sheds that would have run down either side of the kilns. In the case of kilns A and B, there was a brick surface running in between (context 1010) which the stokers would have walked to shovel the coal in for both kilns. The kilns each held around c. 30,000 facing bricks per firing.

When the bricks were fully burned, the fireholes were sealed with clay and brick, then left to cool. Unloading of the fired bricks could start when the kiln was finally cold, and the bricks were then sorted. Some would be overfired or underfired, and these would be put aside to be utilised in the brickworks. If they were dark red and well formed, they were deemed to be the best and suitable for sale.

Priestley's manufactured pressed and handmade facing and common bricks, as well as special shapes. They also made pantiles, for which they had a machine (Fretwell, 2016).

DISCUSSION

The probable wasters suggest that these bricks were made at the brickworks. Different brick characteristics - ?handmade (indented borders and skintling) and machine made (pressed and frogged bricks) indicate changes in manufacturing methods during the forty or so years of production.

However, there is no reason to assume that all of the bricks from the kilns were all made at the site, and it is possible that these bricks were bought in from elsewhere. Particularly when the first kiln was being built, the owners would need to buy in bricks. Due to the corona virus lockdown, I was unable to consult the document alluded to by Fretwell (2016) as being in the Chesterfield Library. It is an interview with Fred Johnson, nephew of Henry Priestley, and contains information about how the business was run, including processes and machinery.

As there is so much information about the site (archaeology, documentary, building recording and local/oral history), it is recommended that publication should be considered, in the form of a booklet, as per the Greater Manchester's Past Revealed series (available in print and as a PDF). This format is perfect for a popular audience, as well as providing a lasting record of the brickworks.

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Table 3 Fabric descriptions, using x10 hand lens

Fabric Number	Description
F1	Brick, dark red; coarse; occasional flint; frequent calcite voids; occasional silty bands; occasional grog; medium amount limestone voids
F2	Brick, red; medium; occasional silty bands; occasional calcite voids; occasional grog; occasional small pebbles
F3	Brick; orange; fine; frequent calcite voids; frequent small clay pellets; occasional grog;
F4	Brick; red; medium; medium calcite voids; occasional small pebbles; occasional silty bands; occasional flint

F5	Brick; orange; medium; occasional grog; frequent calcite voids; medium calcite; occasional silty bands
F6	Paver; red; fine; occasional small pebbles; frequent calcite voids; occasional calcite; occasional grog
F7	Firebrick; yellow; machine made; frequent pebbles up to 1mm; occasional grog; frequent limestone voids; occasional black iron ore; frequent flint
F8	Brick; dark orange; frequent clay pellets up to 10mm; occasional limestone voids

11.0 Appendix 4 ~ Plates.



Plate 1. General site shot, looking southeast.



Plate 2. Kilns A and B, looking northeast.



Plate 3. Kiln A, looking northwest.



Plate 4. Kiln B showing extension (1018), looking southeast.



Plate 5. Kiln A central part showing floor (1015), looking southeast.



Plate 6. South facing section of floors (1015), (1016) and (1017) of Kiln A.



Plate 7. Kiln B, looking north.



Plate 8. Kiln B, looking southeast.



Plate 9. Western wall (1002) of Kiln B showing flue vents (1004), looking north.



Plate 10. Flue vent within eastern wall of Kiln B showing iron workings (1005), looking west.



Plate 11. Flue vent in western wall of Kiln B showing iron base plate, looking east.



Plate 12. East facing elevation of western part of southern wall of Kiln B (entranceway).



Plate 13. South facing elevation of northern wall of Kiln B showing wall infills (1003).



Plate 14. South facing elevation of northern wall of Kiln B within sondage showing infills (1003).



Plate 15. Floors (1006), (1007) and (1008) in southern part of Kiln B, looking north.



Plate 16. South facing section of floors (1006), (1007) and (1008).



Plate 17. Floors (1006), (1007), (1008) and (1009) in northern part of Kiln B, looking west.



Plate 18. Northern part of external floor surface (1010) between Kilns A and B, looking east.



Plate 19. Trench 1, looking west.



Plate 20. Northwest facing section of deposit (106) between wall foundations (107) and (108).



Plate 21. Trench 2, looking east.



Plate 22. Trench 3, looking east.



Plate 23. Floor surface (309) in Trench 3, looking northeast.



Plate 24. Trench 4, looking south.



Plate 25. East facing section of pit [416] showing walls (411) and (414).



Plate 26. Floors surfaces (417) and (418), looking north.



Plate 27. Trench 5 (superseded by Area A), looking west.



Plate 28. Trench 6, looking west.



Plate 29. Foundation of walls ((605), (606), (607) and (608)) of room of building within Trench 6, looking west.

12.0 Appendix 5 ~ Figures.

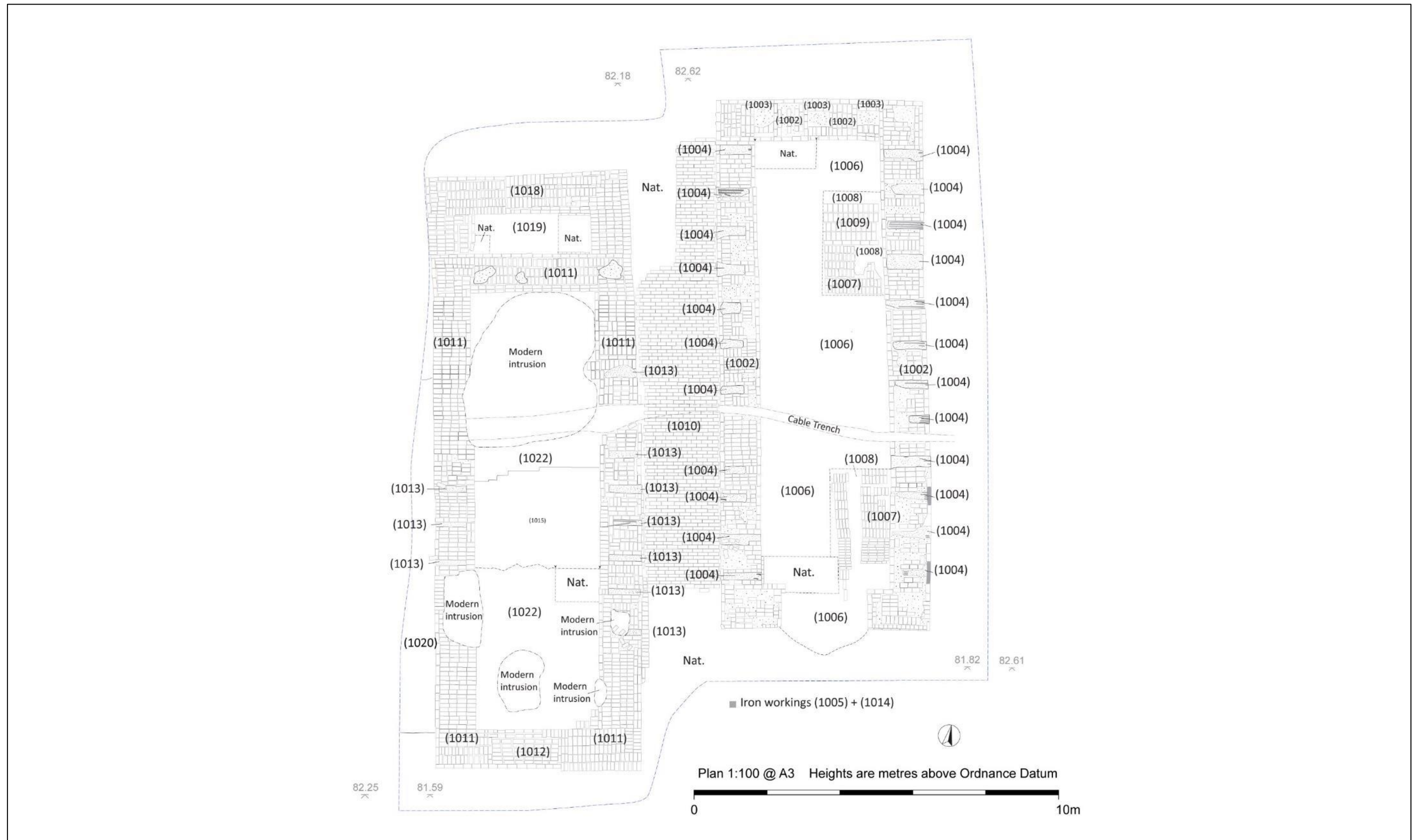


Figure 4. Plan of Area A showing Kilns A and B.

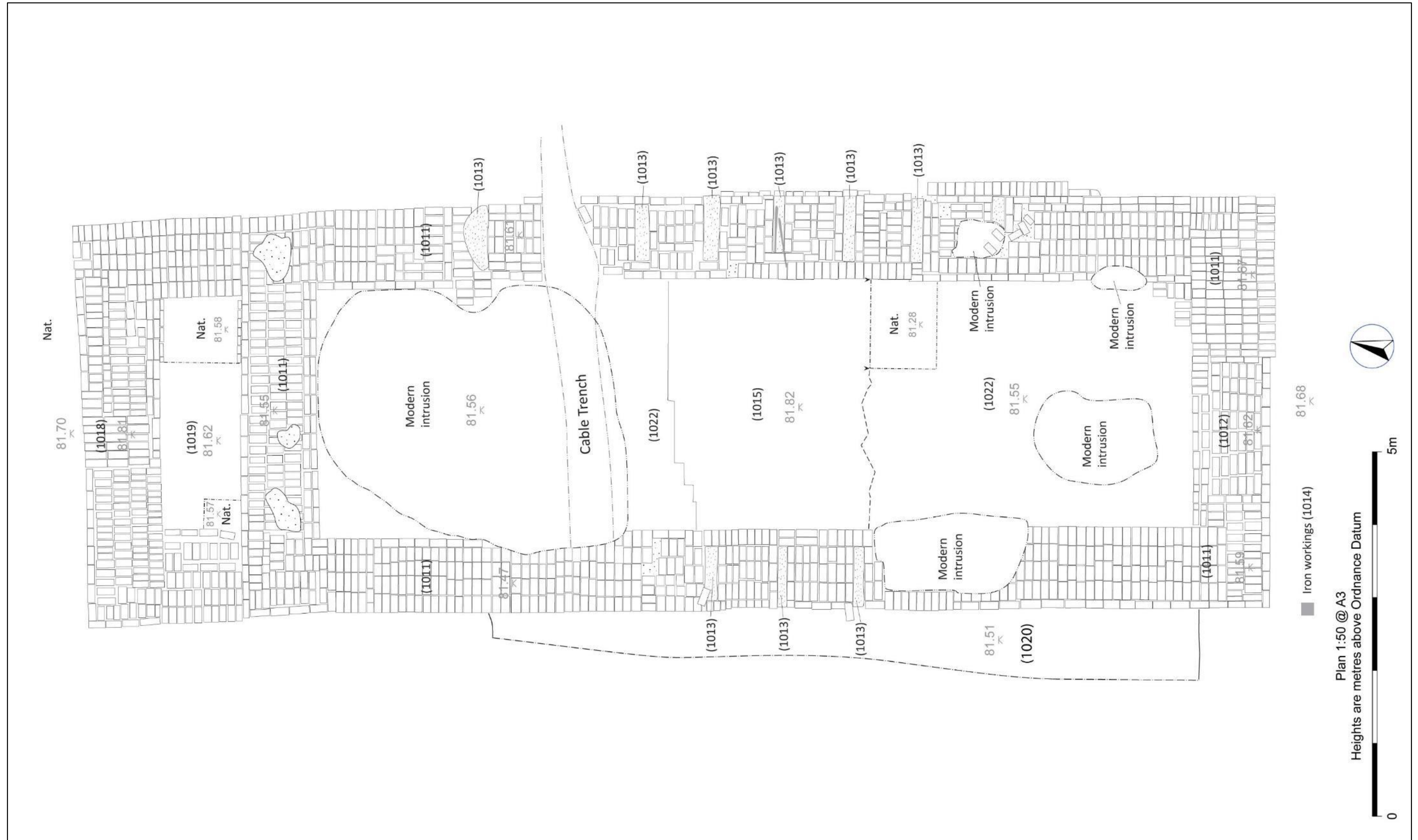


Figure 5. Plan of Kiln A.

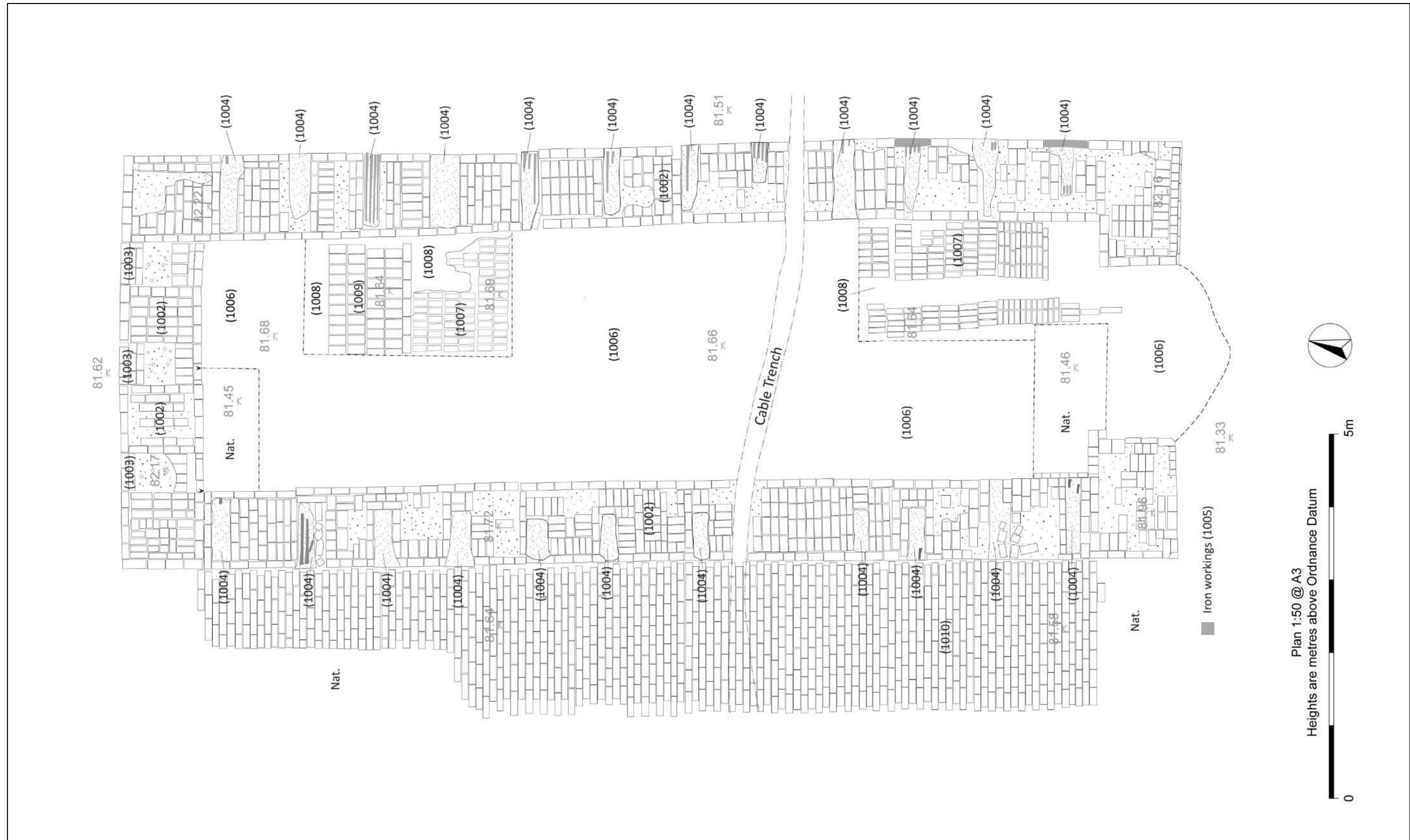


Figure 6. Plan of Kiln B.

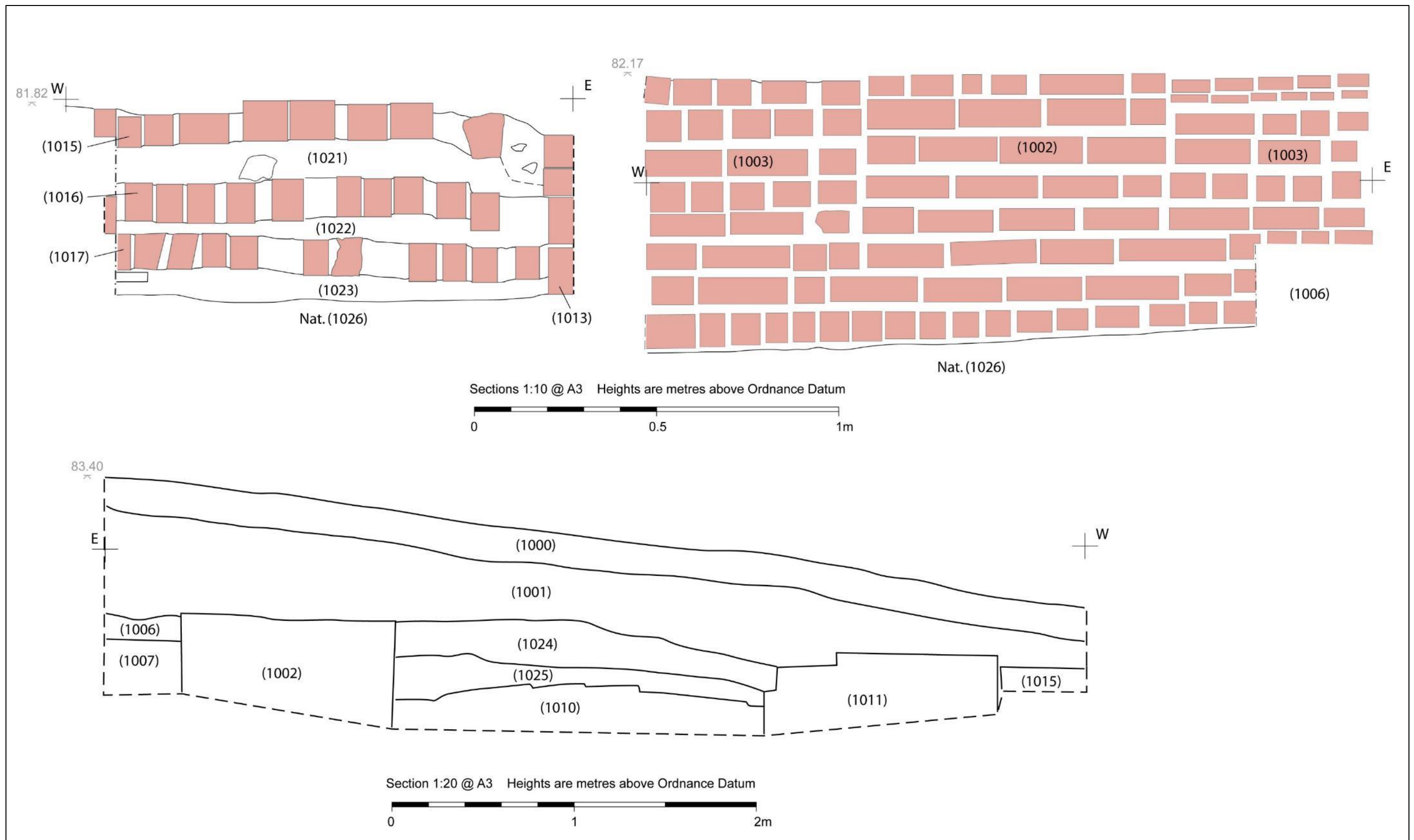


Figure 7. Area A sections.

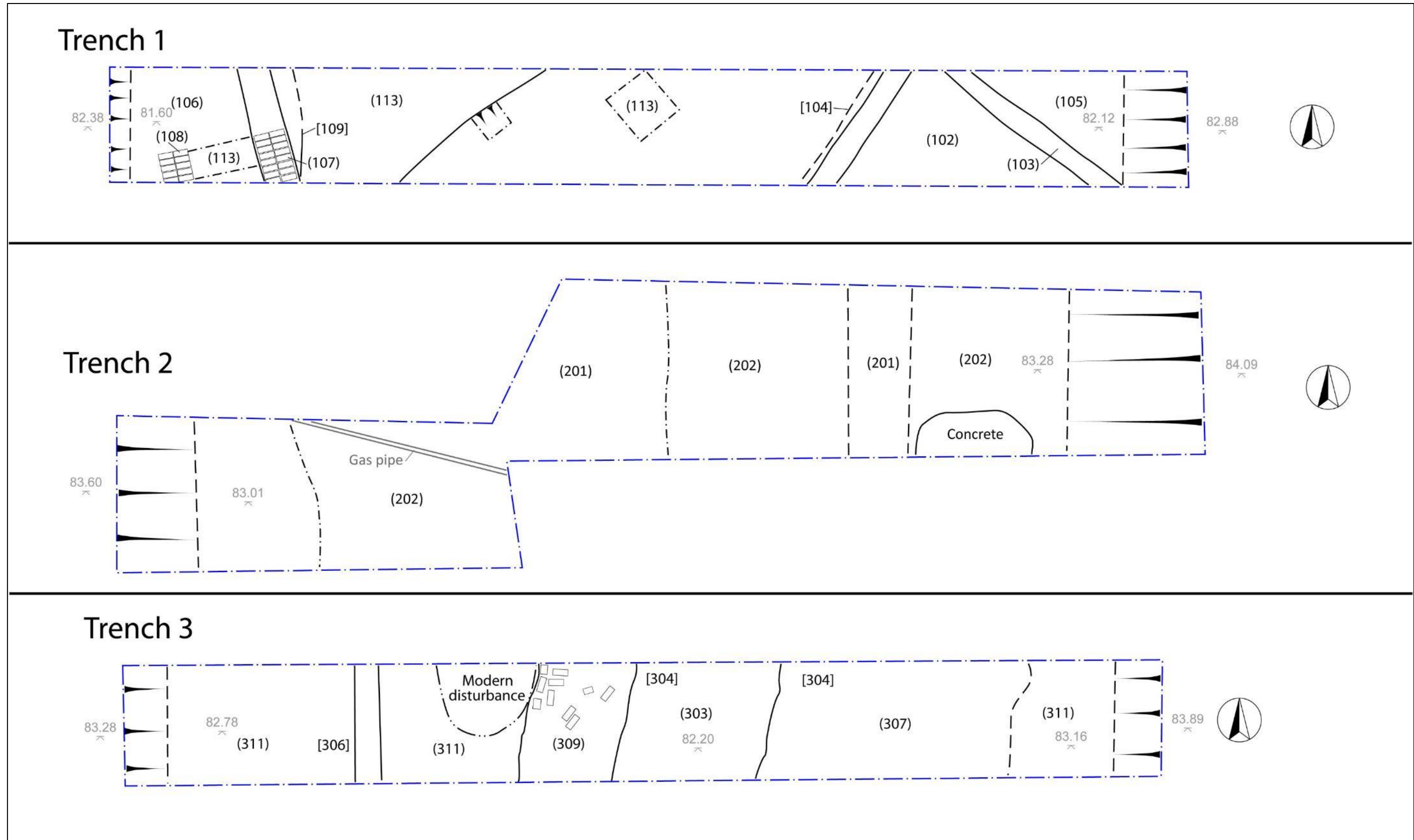


Figure 8. Plans of Evaluation Trenches 1-3

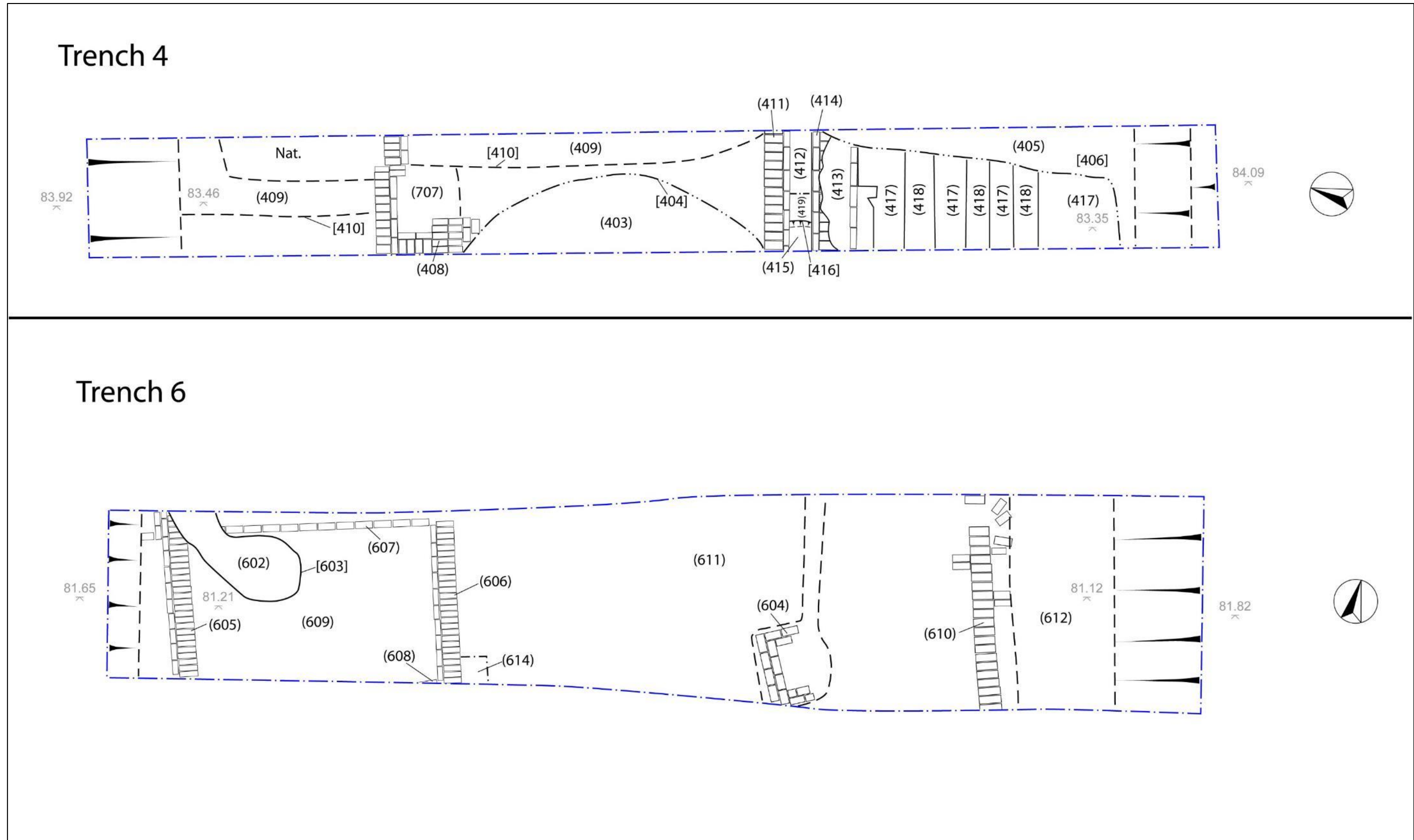


Figure 9. Plans of Evaluation Trenches 4 + 6.

Table 2 – Brick, tile and other items*Key*

Br = Breadth; Len = Length; Th = Thickness; Man = method of manufacture, ie. M=machine manufactured, & H=handmade

Spot date = possible date range (Eg. 1 18-19th = Late 18th to 19th century)

Context	Form	Fab	Wgt	Len	Br	Th	Man	Comments	Spot date	Kept
1002	Brick	F1	3625	217	105	78	M	Battered, sharp arrises; moderate white mortar on all surfaces; sandy clay overall surfaces bar one header & stretcher; whitewash on header	m19th-e20th	
1002	Brick	F1	4050	230	113	77	M	Rectangular shallow frog, 1 screw impression at either end; sparse mortar white mortar; 1 raised dot to either end of frog; shallow frog on other side & 1 screw at each end; burnt stretcher	m19th-e20th	Y
1002	Brick	F1	3380	215	105	77	M	Sharp arrises; battered; one corner reduced diagonally, moulded or trimmed (eg. see plate 12 in excavation report); reduced core	m19th-e20th	Y
1002	Brick	F7	590	-	102	64	M	Half bat; fire brick; highly heated stretcher with vitrified material attached; brown mortar under sandy clay	m19th-e20th	
1003	Brick	F5	2900	220	105	71	H?	Horizontal skintling on stretcher; sparse white mortar & grey gritty mortar; indented borders on top face	118th-19th	
1003	Paver	F6	410	-	-	25	M	Fragment; mortar on broken edge & base; burnt edge	m19th-e20th	
1007	Brick	F1	3670	230	99	83	M	Blown; wobbly arrises; sandy clay all surfaces & white mortar underneath; measurements are skewed	m19th-e20th	
1007	Brick	F1	3875	225	105	78	M	Sandy clay all surfaces; overfired/blown	m19th-e20th	
1009	Brick	F4	3400	236	109	73	M	Overfired & blown at one end; sparse mortar; sandy clay over sharp arrises	m19th-e20th	
1011	Brick	F3	3930	228	109	79	M	Sub-rectangular concave frogs both sides; moderate mortar in 1 frog; one face has 2 outer screws; frog on other side shallower, 2 inner dots as well as 2 outer screws; brown mortar on stretcher	m19th-e20th	Y
1011	Brick	F2	3910	242	104	81	H?	Vitrified header; blown; moderate cream mortar on base; horizontal skintling on the stretcher	m19th-e20th	
1012	Brick	F2	3000	222	103	75	M	Sandy clay covering; worn; overfired; 3 corners missing; wobbly arrises	m19th-e20th	
1015	Brick	F1	3710	226	111	73	M	Covered in sandy clay; sharp arrises	m19th-e20th	
1015	Brick	F1	3940	223	106	78	H?	Sharp arrises; horizontal skintling; slightly overfired	118th-19th	
1015	Brick	F1	1770	-	111	74	M	Half bat; sandy clay all over; sharp arrises; sparse white mortar under sandy clay deposit	m19th-e20th	
1017	Brick	F1	3190	216	102	71	M	Overfired; covered in sandy clay; battered arrises	m19th-e20th	
1018	Brick	F8	3775	226	112	78	M	Shallow rectangular frog, 2 screws within, & 2 dots further out; same frog on other side, 2 screws within, battered no mortar	m19th-e20th	