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Development at Blackchapel Road Niddrie, Edinburgh

Archaeological Excavation

Data Structure Report

No. 3173.1

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Commissioned by	Barratt East Scotland
Date issued	June 2014
Version	1
Planning Application No	13/01378/FUL
Grid Ref	NT 3092 7197
OASIS ref	cfaarcha1-184147

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**Development at Blackchapel Road
Niddrie, Edinburgh**

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1. INTRODUCTION

1.1 General

This report presents the results of an archaeological excavation undertaken by CFA Archaeology Ltd (CFA) in May and June 2014 in advance of a residential development at Blackchapel Road, Niddrie, Edinburgh (NGR: NT 3092 7197) (Fig. 1). The work was commissioned by Barratt East Scotland.

This programme of works represents mitigation measures carried out subsequent to an archaeological evaluation undertaken by CFA in May 2014 (Barton 2014). A WSI dated 04 February 2014 was produced for the initial phase of works, with the scope of the subsequent mitigation measures being agreed at an on-site meeting with John Lawson of the City of Edinburgh Council Archaeology Service (CECAS).

1.2 Background

A planning application (Ref. No. 13/01378/FUL) has been approved for a residential development on a brown-field site to the east of Blackchapel Road, within the Niddrie area of Edinburgh. The development will comprise of 67 houses and 24 flatted dwellings along with associated access roads, car parking and associated works.

The northern end of the proposed development area contained part of the site of the former Niddrie Fire Clay Works. Little information was obtained on these works but they would appear to have been for the manufacture of sanitary ware products such as sinks and toilets. The works was known locally as Steele's on account of it being operated by a company called Steele Bros and Sons. Early Ordnance Survey map editions suggest that the earliest features associated with these works dated to the late Victorian/early Edwardian period with it being absent from the 1895 Second Edition (surveyed 1893) (Fig. 3), but depicted on the edition of 1908 (surveyed 1906) (Fig. 4).

The edition of 1908 depicts a rectangular enclosure containing two circular buildings, probably kilns, with a large rectangular building to the south and two smaller buildings to the east. A curving railway siding is depicted entering the southern part of the area from the north-east, with a second siding at the northern end of the area entering from the west. The edition of 1914 (surveyed 1913) (Fig. 5) indicates a small level of expansion with additional buildings being depicted immediately to the east of the circular kilns and immediately to the west of the large rectangular building. By the time of the edition of 1934 (surveyed 1932) (Fig. 6), it had expanded considerably, extending for a considerable distance to the west outwith the development area. One of the circular kilns is no longer depicted and there is a considerable concentration of additional buildings within the development area.

Previous archaeological work carried out in relation to this development consisted of a trial trenching evaluation, which was undertaken by CFA in May 2014 (Barton 2014). The evaluation identified a number of features associated with the former Niddrie Fire Clay Works. These consisted of walls and floor surfaces, a chimney and flue system, and a brick platform associated with the railway siding.

1.3 Objectives

The objectives of the programme of works reported herein were:

- To excavate and record the remains of the Niddrie Fire Clay Works as agreed with CECAS.
- Produce an illustrated report presenting the results of the aforementioned works.

2. WORKING METHODS

2.1 General

CFA Archaeology Ltd follows the Institute for Archaeologists' Code of Conduct, Standards and Guidance.

2.2 Excavation

In agreement with CECAS, this excavation was targeted on the features at the northern end of the demolished works, which both map evidence and the results of the evaluation indicated was the main focus of industrial activity. This area incorporated the majority of the early building depicted on the 1908 map, with the exception of the full extent of the very large rectangular building, which the results of the evaluation suggested was of limited interest. To the south of the targeted area, the features consisted of concrete surfaces. These were considered to represent the original surfaces of the works and were not investigated further.

Modern overburden was removed by a tracked 360° mechanical excavator equipped with a variety of smooth-bladed ditching buckets. All groundbreaking work was carried out under constant archaeological supervision. Any further excavation required to fulfil the objectives of the brief were carried out by hand.

All excavation and on-site recording was carried out according to standard CFA procedures, principally by drawing, by photography and by completing standard CFA record forms.

The location of all archaeological features was recorded using industry standard electronic surveying equipment.

3. ARCHAEOLOGICAL RESULTS

3.1 General

Numbers in bold refer to contexts, a full list of which is contained in Appendix 2.

The deposits overlying these industrial remains consisted of made-ground and demolition debris associated with the demolition of the works.

3.2 Excavated Features

The features excavated (Figs 1 and 7-9) consisted of:

- a circular kiln (Kiln 1)
- two rectangular kilns (Kiln 2 and Kiln 3)
- part of the large rectangular building depicted on the 1908 OS map (Building 1)
- a partially uncovered structure along the eastern boundary of the site (Building 2)
- a later building overlying Kiln 1 (Building 3)
- a chimney base (Chimney Base 1)
- three phases of flue systems (Flue System 1-3)
- a railway siding (Railway Siding 1)
- a raised pentagonal concrete surface (Platform 1)
- a rectangular building at the eastern end of the railway siding (Building 4)
- two external areas (External Area 1 and 2).

Details of these features are contained within the following paragraphs.

Kiln 1

Kiln 1 (Fig. 10) was one of the features depicted on the 1908 Ordnance Survey map and represents one of the earliest elements of the fireclay works. It was circular in plan with an external diameter of 8.6m and an internal diameter of 5.3m. The wall (**003**) of this kiln was upstanding to a height of 0.3m externally and 0.45m internally, and was largely constructed from frogged bricks stamped MUIR ARMADALE. Internally, the kiln was lined with a single skin of unfrogged bricks stamped BOGHEAD. These were probably fire-bricks designed to withstand the high internal temperatures which would have been generated within the kiln. The upper courses of brick appeared to slope in slightly, possibly indicating that this may have been a beehive kiln with a domed roof.

The base (**004**) of this kiln consisted of a brick surface constructed from unfrogged bricks stamped BOGHEAD. These were of the same type as those lining the walls and are likely to have been of a highly heat resistant material. Rows of bricks were identified within the interior of the kiln sitting on top of the brick surface. These rows of bricks would probably have been used to support a floor surface at a level of perhaps 0.3m above the base of the kiln. This would have created a void beneath the floor to allow for the transfer of heat across the entire base of the kiln. A concrete

block sitting on the base of the kiln represents part of the foundation of a later building (Building 3) with a steel I-beam framework.

A square opening in the centre of the kiln base (**005**) dropped down vertically, giving access to an under-floor passage, which ran horizontally beneath the kiln in a north-west direction. The square opening measured 0.55m across internally, with its brick structure giving it an overall dimension of 1.05m across. Due to the quantity of demolition material within the void its overall depth was not recorded, but the depth to the base of the flue suggests that it would have been in the region of 1m.

The under-floor passage ran out through a small extension (**006**) on the north-western side of the kiln into a brick-built flue (**007**) (Fig. 11). The extension was constructed from frogged bricks stamped ETNA, measured 1.1m wide, and protruded out from the wall of the main kiln structure by a distance of c.0.7m. A metal damper housed within this extension would have controlled the draw through the flue system and would have allowed the internal temperature within the kiln to be regulated. The flue itself was constructed from unfrogged and unstamped bricks and measured c.0.9m in width externally. A length measuring 1.5m was uncovered, with it extending into the trench section to the north-west. Where part of the flue system had caved in there was some evidence of internal blocking, presumably carried out after it had fallen out of use. Slight traces of a brick structure were identified sitting on top of the flue but it had been extensively damaged meaning that its original form and function could not be determined. It is assumed that this flue would have run to an external chimney located outwith the development area. A small structure depicted on the extreme western edge of the works on the 1908 and 1914 Ordnance Survey maps may indicate the location of this chimney.

Building 1

Building 1 (Fig. 12) is also on the 1908 map edition and is depicted as a very large rectangular structure. An area of this building measuring 10.8m east-west by 8.2m north-south was excavated. It was constructed from unfrogged and unstamped bricks, with walls measuring 0.38m thick and upstanding to 0.55m (5 courses) in height. The walls (**008**) sat on concrete foundations, which were 0.1m thick and laid directly on the natural.

The interior of this building consisted of a concrete surface (**009**). The remains of lines of brick running east to west across this concrete surface indicate the position of sleeper walls (**010**), which would have been located to support a floor surface at a rather higher level. Upstanding segments of sleeper wall show that they were of honeycomb bond construction (Fig. 12) and that they were constructed from frogged NIDDRIE-stamped bricks. As the Niddrie brickworks did not open until c.1924, it is considered that these sleeper walls represent a more recent addition to the late 19th/early 20th century building. The date of the concrete surface is unclear, but it may be that it represents the original floor, with the floor level being subsequently raised at a later date. There were no clues as to the purpose of this building, but it may be that it was where the items of sanitary ware were being manufactured prior to firing in the adjacent kilns.

Building 2

Building 2 (Fig. 13) is depicted on the 1908 Ordnance Survey map edition as a square two-compartment structure with a small roofed annex at the north-east corner and an unroofed annex at the south-west corner. Due to the proximity of the steeply sloping bank along the eastern edge of the development area, this building was not fully exposed. The part that was exposed measured 9.4m NNE to SSW by >5m WNW to ESE, suggesting overall original dimensions of 9.4m by 9.4m. It was of brick construction and, like Building 1, the bricks were unfrogged and unstamped. The walls (**011**) were 0.6m thick (two brick lengths plus one brick width), survived up to a maximum height of 0.38m (four courses), were slightly stepped in from the base, and sat on made-ground c.0.2m above the level of the natural.

Internally, the building footprint was divided into four compartments by internal walls (**012**), one running NNE to SSW and the other running WNW to ESE. These walls measured c. 0.22m wide (one brick length or two brick widths). It is unclear if these walls represent internal divisions or if they were sleeper walls designed to support a floor surface at a higher level. As was the case with Building 1, there was no indication as to the purpose of this building, but its size may suggest something along the lines of site offices.

Railway Siding 1

This railway siding (Fig. 14) is first depicted on the 1908 map, constituting the southernmost of a series of railway sidings associated with the Niddrie Junction (west). The Niddrie junction is depicted on the earlier Second Edition Ordnance Survey map (1895) with an extensive complex of railway sidings already established, so it would appear that this siding was constructed exclusively to provide railway access for the fireclay works. Overall, the remains associated with this siding measured c.31m east to west by 4.4m north to south.

The southern edge of the railway siding was formed by a concrete platform (**013**) running almost the full length of the part of the fireclay works located within the development area. The surface of this platform was c. 1m higher than the base of the siding. At its eastern end, the northern edge of the siding was defined by a brick-built wall (**014**) which was constructed from unfrogged and unstamped bricks and stood to a height of 1.2m above the base of the siding. This wall ran east to west for a distance of c.11m before turning through 90° to the south and running across the width of the siding to abut the concrete platform (**013**) (Fig. 15). Railway tracks were identified in situ at the base of this siding, but with the return wall creating an enclosure, there would have been no direct access from this end of the siding back to the mainline. Consequently, it is considered most likely that there was a railway-based crane within this location, which was only required to move a very short distance, perhaps slinging cargo over the embankment to an adjacent siding located to the north. Wooden shuttering at the eastern end of this part of the siding gave access to Building 4, which first appears on the 1934 Ordnance Survey map edition.

The northern edge of the western part of the railway siding was defined by another brick wall (**015**), which abutted wall **014**. This wall measured 20m in length, was constructed from unfrogged bricks stamped BONNYBRIDGE BRAND, and was

upstanding to a height of c.1.1m above the base of the siding. At its western end, this wall also turned through 90° to abut the concrete platform (013) and form an enclosure. As with the eastern compartment, this would have meant that there was no direct railway access from the mainline, again suggesting that it is most likely to have been the location of a railway-based crane.

Kiln 2

A building in the location of Kiln 2 is first depicted on the Ordnance Survey map edition of 1914, where it is shown as a rectangular structure, but with its north-east corner dog-legged. The excavated building (Fig. 16) was rectangular in plan, measured 12m by 9.2m, and was upstanding to roughly floor level. The wall footings (016) were constructed from frogged bricks stamped NIDDRIE, which were obtained from the nearby Niddrie Brickworks. This would probably imply that the kiln had been at least partially rebuilt from that shown on the 1914 map as the Niddrie Brickworks was not established until c.1924. The bricks sat on top of a 0.08m thick concrete foundation, which overlay the natural, and the walls were generally upstanding to a height of three courses. Four brick structures (017) at the southern end of the building are considered most likely to have been the bases for the furnaces that fired the kiln (Fig. 16). These brick structures protruded out from the main walls by a distance of c.1.4m and measured 1.25-1.5m wide. They were upstanding to a height of 0.6m, their bases were constructed from concrete slabs, and the bricks were generally unfrogged and unstamped, but with a few frogged bricks stamped WHITEHILL.

Internally, this kiln appeared to be divided into two compartments by a brick walkway (018) running up the centre of the building. The walkway measured 0.75m wide and was constructed from unfrogged bricks stamped BONNYBRIDGE BRAND. Further brick surfaces were present at both the northern and southern ends of the building, constructed from bricks stamped DOURIE. On either side of walkway there were two areas identified as the kiln floors (019 and 020). These areas were rectangular in plan measuring c.8m by 4m. Numerous voids were identified beneath the floor level (Fig. 17), which would presumably have provided a system of heat transferral across the whole of the kiln floor. These voids were c.0.3m deep and were formed from a network of low walls constructed using unfrogged bricks stamped BONNYBRIDGE BRAND. The low walls acted as supports for the slabs used to construct the kiln floor. A number of these brick walls showed evidence of vitrification indicating the level of heat used to fire the sanitary ware. At the centre of each of the kiln floors, there was a square hole (021 and 022) (Fig. 17) dropping down vertically into a flue system. These holes measured 0.5m across and were divided in two by precast slabs.

Kiln 3

A building in the location of Kiln 3 is first depicted on the Ordnance Survey map edition of 1934, but this building appears to be much smaller than the excavated structure, only extending around half the length of Kiln 2. The excavated structure in contrast ran the full length of Kiln 2, measuring 12m north to south by 4.6m east to west (half the width of Kiln 2). It was upstanding to floor level and, like Kiln 2, was of brick construction sitting on a concrete foundation (023). The bricks used in its construction consisted of an external skin of frogged bricks stamped NIDDRIE and an internal skin of unfrogged bricks stamped BONNYBRIDGE BRAND. These

Bonnybridge bricks appear to have been designed to withstand high temperatures and were predominantly used on the interior of the kilns. Running around the external edge of the brick walls there were numerous concrete slots containing the remains of I-pillars indicating that the building had a steel framework.

Internally, this kiln was very similar in design to Kiln 2, but the much narrower width meant it consisted of only a single kiln floor instead of two. This kiln floor (**024**) was of the same 8m by 4m dimensions as those associated with Kiln 2 and had the same type of voids beneath the floor level to allow for the transferral of heat across the kiln floor. Again, these voids were 0.3m deep and constructed from BONNYBRIDGE BRAND stamped bricks supporting flooring slabs. A single hole (**025**) in the centre of the kiln floor dropped down vertically into a flue system and like Kiln 2, this hole measured 0.5m square and was divided in two by a large precast slab. At either end of the kiln floor at the northern and southern ends of the building, there were brick surfaces constructed from BONNYBRIDGE BRAND bricks.

Flue System

The draw for the kilns was provided by a series of brick-built flues attached to external chimneys. Three phases of flues (Fig. 19-20) were identified in relation to Kiln 2. The earliest phase consisted of a brick-built flue (**026**) running in a northern direction from the central vent-hole (**022**) in the eastern compartment before turning through 90° and heading in a westerly direction, terminating where it had been cut by a later flue (**028**). The exit into this flue had been bricked up after it fell out of use. A short length of flue (**027**) identified within the footprint of Building 3 is considered likely to be contemporary, and is thought to have run from the vent-hole (**021**) in the western compartment of Kiln 2 prior to being demolished and replaced with the phase 2 flue system. Both of these flues had internal measurements of 0.6m by 0.6m and external measurements of 1m by 1m. They had been constructed from a double skin of unfrogged bricks stamped BONNYBRIDGE 9R. The bricks forming the arched roof of the flues were slightly wedge shaped in profile. It is assumed that these flues would have run to the same chimney as that serving Kiln 1 on the western edge of the works.

The phase 2 flues (**028** and **029**) appear to have taken a rather more direct line away from the vent-holes (**021** and **022**) in the kiln bases, eliminating the need for the right angle turn present in flue (**026**). This would perhaps have provided a better draw and explain why the phase 1 flues were replaced. These flues utilized the same construction methods as the phase 1 flues and had the same 0.6m by 0.6m internal measurements. Both of the phase 2 flues were constructed with a double skin of unfrogged bricks stamped BONNYBRIDGE. However, within the footprint of Building 3, the flue running to the eastern kiln floor had been reinforced with a double skin of very light unfrogged and unstamped bricks and an outer skin of frogged bricks stamped either NIDDRIE or PRESTON GRANGE. These flues had been bricked up at the draw holes in the kiln floors after they had fallen out of use. It is assumed that the flues would have run to the same chimney as that serving the phase 1 flues, and represents a direct replacement for the earlier system.

The phase 3 flues (**030**, **031** and **032**) represent an entirely new system for providing the draw for the kilns, exiting into a more recent chimney stack to the east (Fig. 20).

This chimney also served Kiln 3 and was probably contemporary with the later kiln representing a time when there was a considerable programme of expansion and upgrading within the works. In terms of construction, these flues were very similar to the earlier flues having the same 0.6m by 0.6m internal measurements. The flue (030) from the western kiln floor (019) in Kiln 1 was constructed from bricks stamped CALDER BRITISH MADE while the one (031) from the eastern kiln floor (020) was constructed from bricks stamped BONNYBRIDGE, and the one (032) from Kiln 3 was constructed from bricks stamped CALDER. All of these flues had a small brick built structure (033) located somewhere along their length where there was a small hatch giving access to the inside of the flue. These brick structures measured c.1m by 1.2m and were constructed from frogged bricks stamped NIDDRIE. The purpose of these structures is unknown, but they may have been inspection hatches, or they may have housed some kind of damping mechanism for controlling the draw through the flue.

Chimney Base 1

Chimney Base 1 (034) (Fig. 21) related to the final phase of flues in Kiln 2 and to the single phase flue in Kiln 3 (flues 030, 031 and 032). Internally it measured 1.8m by 1.8m while externally it measured 3.2m by 3.2m, stepping out to a maximum of 4.2m by 4.2m at the very base. It was upstanding to a maximum height of 1.5m from the concrete surface on which it was constructed and had a depth of 1.25m internally to floor level. Although largely constructed from frogged bricks stamped NIDDRIE, the interior had been lined with a single skin of unfrogged bricks stamped BONNYBRIDGE BRAND. This gave the walls an overall width of 0.7m.

Internally, the chimney base was divided by two lengths of diagonally placed wall (035) creating one compartment representing 50% of the floor area and two compartments each representing 25% of the floor area. Each of these three compartments related to a specific flue, with the larger compartment relating to the flue (030) exiting from the western kiln floor in Kiln 2. It is unclear as to why this compartment was double the size of the other two, but it may relate to the greater length of this flue, or indicate that a higher temperature was required in relation to this particular part of the kiln. These internal walls were constructed from unfrogged bricks stamped BONNYBRIDGE BRAND. Considerable evidence of vitrification was apparent throughout the interior of the chimney base indicating the high temperatures that it was subjected to.

Building 3

Building 3 (Fig. 7) had been built over the remains of Kiln 1 following its demolition. It measured c.16m north to south by 10m east to west and was constructed from frogged bricks stamped NIDDRIE. The brick walls sat on top of concrete foundations (036), which directly overlay natural. Concrete blocks containing the remains of cut-off I-pillars suggest that this building had a steel framework. The building had a concrete floor, which overlay the remains of Kiln 1 and parts of the flue system. A drainage system (037) for this building was present in the form of concrete-encased ceramic piping. Slight traces of surviving concrete and brickwork suggest that there may have been an annex to the west of this building.

Building 4

Building 4 (Fig. 22) is first depicted on the 1934 Ordnance Survey map at the eastern end of Railway Siding 1. The excavated remains measured c.7.5m north to south by 6m east to west. At its western end, the walls (**038**) of this building were upstanding to a height of c.2m above the base of the railway siding. These walls were constructed from frogged bricks stamped PRESTON GRANGE. An entranceway in this western wall gave access to the railway siding. This entranceway measured 2.7m wide by 1.4m high and was topped with an I-beam supporting several more courses of brick walling. The entranceway had been blocked with wooden shuttering.

The northern, southern and eastern walls (**039**) of this building were constructed on made ground at a level c.1.5m higher than the base of the western wall. Traces of concrete at the base of these walls suggest a floor level at about the same height as the metal beam spanning the top of the entranceway into the railway siding. The implication of this entranceway and raised floor is that the railway siding extended into the building, with the raised flooring perhaps serving as a loading platform.

Platform 1

Platform 1 (Fig. 23) was pentagonal in plan and consisted of a concrete surface (**040**) bordered by low brick walls (**041**). The brick walls were upstanding to a height of 0.32m (four courses) and were 0.23m wide (one brick length or two brick widths). The walls had been constructed from bricks which were unfrogged and unstamped. The bricks sat on top of concrete foundations which were c.0.1m thick and were laid on made ground at a height of c.0.2m above the natural. Breaks in the concrete surface indicate that the interior of the wall footings had been backfilled with rubble prior to the surface being laid. The age of this structure is uncertain; a line with a slight dogleg on the 1934 map indicates the line of the western side of this structure, but the brick used in its construction is the same as the earlier structures on the site.

External Area 1

External Area 1 (Fig. 24) was located between Kilns 2 and 3 and Railway Siding 1. It measured 17m east to west by 3m north to south and consisted of alternating areas of brick (**042**) and concrete surfacing (**043**). The brick surfaces were unfrogged and unstamped. Several metal fixings were present on the areas of concrete and there was a metal plate attached to a chain on one of the brick surfaces. These surfaces sat on top of 0.5m of made-ground.

External Area 2

External Area 2 (Fig. 25) was located between Building 3 and Kiln 2. It measured 14m north to south by 2.5m east to west. This area was partially brick surfaced (**044**) along its western edge with unfrogged bricks stamped BONNYBRIDGE BRAND. Towards the northern end of this surface there was a brick built inspection chamber containing some metal pipe-work. The chamber measured 0.7m north to south by 0.4m east to west and had a depth of >0.5m from the surface. A second brick surface (**045**) was located along the eastern edge of the area at a level c.0.3m below the aforementioned western one. Between these surfaces were larger concrete blocks

containing upright metal fixings. These metal fixings may have been for supports for some kind of walkway covering.

3.3 Finds

A limited number of finds (Appendix 4) were recovered from the kiln floors (019 and 020) of Kiln 2. These consisted of three kiln spurs (Fig.26), a piece of kiln furniture consisting of a lozenge-shaped pedestal support (Fig.27) and a barley-twist ornamental edging piece (Fig.28) which may have been produced in the works. The kiln spurs would have served the purpose of keeping small items within the kiln supported and separated, while the pedestal support is likely to have been for a large concave item such as a urinal. The implication of the barley-twist ornamental edging piece is perhaps that other items were being manufactured in addition to the documented sanitary ware.

4. DISCUSSION

The Ordnance Survey map of 1908 depicts the earliest phases of the Niddrie Fire Clay Works consisting of two probable circular kilns along with two railway sidings and a number of square/rectangular buildings. Excavation work carried out on one of the circular structures indicates that it was most likely to have been a beehive downdraft kiln. This kind of kiln works on the principle of hot air rising upwards into the structure from furnaces located around the circumference before being deflected downwards by the domed roof. The draw for the downdraft was provided by a hole in the floor dropping into a horizontal flue and then into a vertical external chimney. The level of heat within the kiln could then be controlled by regulating the draw using a steel damper located along the flue. A number of these features were identified during the course of the excavation including the vent hole in the floor, the horizontal flue, and the steel shutter damping system. Demolition had removed all trace of the location of the furnaces, and the vertical chimney is likely to have been located outwith the development area.

The later rectangular kilns identified on the site appear to have worked on a similar downdraft principle. Bases for fire grates were identified along with the flues and chimneys which would have created the downdraft. A sequence of three phases of flue was identified showing the development of the site, and perhaps indicate a drive towards greater efficiency and increased productivity. The age of these rectangular kilns is uncertain; a rectangular building is depicted on the 1914 Ordnance Survey map within the correct location, but the bricks utilised in the construction of the excavated kilns were from the local Niddrie Brickworks, which was not established until 1924. The implication of this is perhaps that the kilns underwent substantial episodes of reconstruction on the two occasions when the flue systems were updated.

The remaining structures excavated confirmed the ongoing development of the site as indicated on Ordnance Survey editions from 1908 to 1934. Early structures were predominantly constructed from bricks which were unfrogged and unstamped whereas the structures first depicted on the 1934 map were predominantly constructed from locally produced NIDDRIE-stamped bricks.

5. CONCLUSION

An archaeological excavation was carried out on the remains of the Niddrie Fire Clay Works. It is understood that these works produced items of sanitary ware such as toilets and sinks etc and were in operation from the early to mid 20th century. The excavation identified a number of key features associated with these industrial remains including kilns, a flue system, a chimney base, a railway siding, surfaced external areas and a number of buildings. An early kiln identified on the site was of the circular beehive type, with larger rectangular downdraft kilns being constructed as the works expanded. These rectangular kilns appear to have been continually developed and improved with three phases of flue system being evident. The results of the excavation are in keeping with the sequence of development and expansion as indicated on Ordnance Survey map editions from 1908 to 1934.

The project archive, comprising all CFA record sheets, maps and reports, will be deposited with the National Monuments Record of Scotland (NMRS) and copies of reports will be lodged with the City of Edinburgh Council Sites and Monuments Record.

A summary statement of this programme of works will be submitted for publication in *Discovery and Excavation in Scotland* and will also be reported on through *OASIS Scotland*.

6. REFERENCES

Cartographic

Ordnance Survey map 25" to 1-mile (1895), *Edinburghshire, Sheet 004.10*

Ordnance Survey map 25" to 1-mile (1908), *Edinburghshire, Sheet 004.10*

Ordnance Survey map 25" to 1-mile (1914), *Edinburghshire, Sheet 004.10*

Ordnance Survey map 25" to 1-mile (1934), *Edinburghshire, Sheet 004.10*

APPENDIX 1: Photographic Register

Photo No.	Contexts/Description	Taken From
1-2	General site shots	SE
3-4	External Area 1	E
5-6	External Area 1	W
7-12	General site shots	S/SE/E
13	NE corner of site	E
14	NE corner of site showing flues 027 , 028 and 029	E
15	Eastern wall of Building 3 with flues in foreground	N
16	Flues 027 , 028 and 029	W
17-18	External Area 1, bricks 042	S
19	Bricks 042 and flue 026	S
20	External Area 1	W
21	Flue 026 cut by flue 028	W
22	External Area 1 showing bricks 042 and concrete 043	E
23-24	Kiln 3, kiln floor 024	N
25-27	Flue 026 beneath External Area 1	S
28	Flues 26 , 27 , 28 and 29 beneath I-beam associated with Building 3	E
29	Flues 26 , 27 , 28 and 29 beneath I-beam associated with Building 3	N
30	Flues 26 , 27 , 28 and 29 beneath I-beam associated with Building 3	S
31	Flue 028 beneath Kiln 2	N
32		
33	Chimney Base 1 with flue 032 in foreground	N
34	Chimney Base 1, NW corner	N
35-36	Interior of Chimney Base 1	E
37	Structure 033 on flue 032	W
38	Flue 031 and Chimney Base 1	W
39	Section through flue 030	W
40	Section through flue 030	W
41-42	Kiln 3, flue vent 025	N
43	Kiln 3, general shot	N
44	Kiln 3, kiln floor 025	N
45	Kiln 3, general shot	S
46	Kiln 3 showing slots for I-pillars	NW
47	Kiln 3 showing bases of I-pillars	NNE
48	Building 4, general shot	SE
49	Building 4, general shot	E
50	Railway Siding 1 showing position of railway tracks	W
51	Wooden shuttering at eastern end of Railway Siding 1	W
52-53	Railway Siding 1 with wall 014 abutting platform 013	E
54	Railway Siding 1 with wall 015 on left hand side	W
55	Railway Siding 1 with wall 014 in foreground	W
56	Railway Siding 1, wall 015 abutting wall 014	S
57	Railway Siding 1 showing drainage feature	N
58	Railway Siding 1, general shot	W
59	Kiln 2, flue vent 022	N
60	Kiln 2, flue vent 022	S
61	Kiln 2, flue vent 021	S
62	Kiln 2, flue vent 021	N
63	Kiln 2, kiln floor 020	W
64	Kiln 2, kiln floor 020	S
65	Kiln 2, general shot	S
66	Kiln 2, general shot	N
67	Kiln 2, northern wall footings	N
68-71	Kiln 2, furnace bases 017	S

Photo No.	Contexts/Description	Taken From
72	Brick surface at southern end of Kilns 2 and 3	S
73-74	Possible furnace bases along eastern side of Kiln 2	E
75	Furnace bases 017 and flue 030	W
76	External Area 2	S
77	Inspection chamber in External Area 2	E
78	External Area 2 with flue 028 in foreground	N
79-80	Kiln 1, general shot	S
81-82	Kiln 1, general shot	E
83	Kiln 1, general shot	W
84	Kiln 1, kiln floor 004	W
85-86	Kiln 1, flue vent 005	E
87	Kiln 1, flue 007 and extension 006	NW
88	Kiln 1, extension 006 showing damper plate	W
89	Flues 027 , 028 and 029	W
90-91	Kiln 1, flue 007 and extension 006	NW
92-93	Flue 028 and I-beam for Building 3	E
94	Flues 026 and 028 and I-beam for Building 3	N
95	External Area 1, metal fixings on concrete 043	Above
96	General shot of western end of site	NE
97	Building 1, general shot	E
98	Building 1 showing honeycomb bond sleeper walls 010	SE
99	Building 2, general shot	NW
100	Building 2, general shot	N
101	Platform 1, surface 040 and walls 041	W
102	Platform 1 bordering Railway Siding 1	W
103	Platform 1, general shot	E
104	Section through flue 031	E
105	Section through flue 031	W
106-176	General site shots from overhead mast	Various

APPENDIX 2: Context Register

No	Feature	Description
001	N/A	Natural
002	N/A	Demolition debris
003	Kiln 1	Walls of kiln
004	Kiln 1	Base of kiln
005	Kiln 1	Flue vent in kiln floor
006	Kiln 1	Extension housing metal shutter damper
007	Kiln 1	Brick built flue
008	Building 1	Brick walls on concrete foundations
009	Building 1	Concrete surface
010	Building 1	Later brick sleeper walls
011	Building 2	External brick walls
012	Building 2	Internal Brick walls
013	Railway Siding 1	Concrete platform
014	Railway Siding 1	Siding wall, north east part
015	Railway Siding 1	Siding wall, north-west part
016	Kiln 2	Wall footings on concrete foundations
017	Kiln 2	Brick furnace bases
018	Kiln 2	Brick walkway and surfaces
019	Kiln 2	Western kiln floor
020	Kiln 2	Eastern kiln floor
021	Kiln 2	Western flue vent

No	Feature	Description
022	Kiln 2	Eastern flue vent
023	Kiln 3	Wall footings on concrete foundations
024	Kiln 3	Kiln floor
025	Kiln 3	Flue vent
026	Flue system	Brick built flue (phase 1)
027	Flue system	Brick built flue (phase 1)
028	Flue system	Brick built flue (phase 2)
029	Flue system	Brick built flue (phase 2)
030	Flue system	Brick built flue (phase 3)
031	Flue system	Brick built flue (phase 3)
032	Flue system	Brick built flue (phase 3)
033	Flue system	Brick structures overlying phase 3 flues
034	Chimney base	Bricks forming chimney base
035	Chimney base	Internal divisions
036	Building 3	Brick walls on concrete foundations
037	Building 3	Drainage system
038	Building 4	Western wall
039	Building 4	Northern eastern and southern walls
040	Platform 1	Concrete surface
041	Platform 1	Low brick walls
042	External Area 1	Brick surface
043	External Area 1	Concrete surface
044	External Area 2	Brick surface
045	External Area 2	Brick surface
046	N/A	Made ground

APPENDIX 3: Field Drawings Register

No.	Sheet No.	Plot No.	Description	Scale
1A	1	N/A	Site plan	1:50
1B	2	N/A	Site plan	1:50
1C	3	N/A	Site plan	1:50
1D	4	N/A	Site plan	1:50
1E	5	N/A	Site plan	1:50
1F	6	N/A	Site plan	1:50
1G	7	N/A	Site plan	1:50

APPENDIX 4: Finds Register

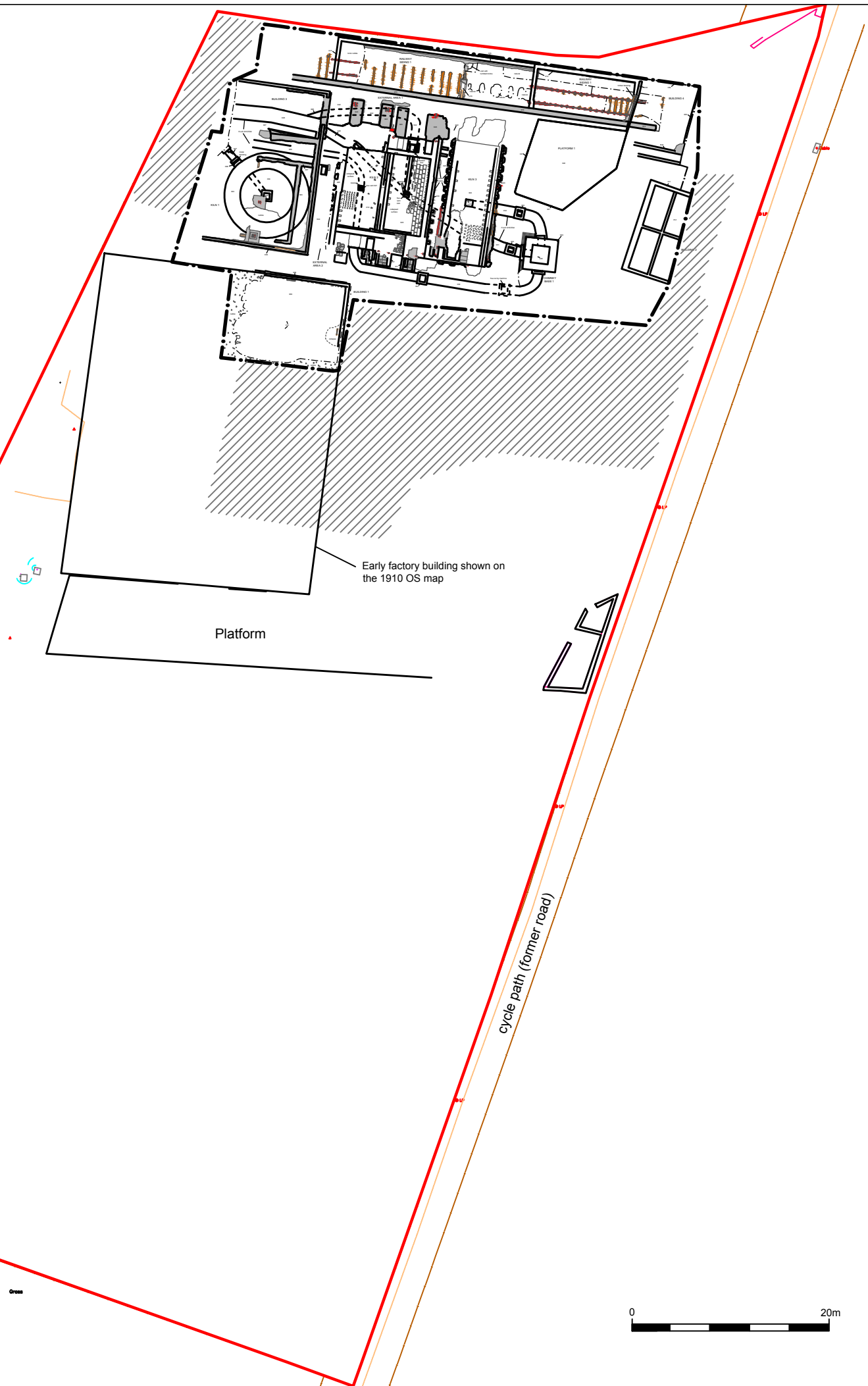
Dimensions LxBxW (mm)	Summary description
280 x 200 x 100	Barley twist ornamental garden edge stone with a light buff and grey glaze. Recovered from kiln floor 019
560 x 380mm x 80mm	Lozenge-shaped pedestal support for a concaved-shaped kiln product (Urinal). Two pear-shaped holes (150mm by 90mm) at its centre allowed it to be carried more easily. Recovered from kiln floor 019
50mm diameter 30mm diameter	Three small kiln spurs of fired clay. These were designed to support smaller manufactured products. Recovered from kiln floors 019/020

APPENDIX 5: Discovery & Excavation in Scotland Entry

LOCAL AUTHORITY:	City of Edinburgh
PROJECT TITLE/SITE NAME:	Blackchapel Road, Edinburgh
PROJECT CODE:	BRED
PARISH:	Edinburgh (City of)
NAME OF CONTRIBUTOR:	Magnus Kirby
NAME OF ORGANISATION:	CFA Archaeology Ltd
TYPE(S) OF PROJECT:	Archaeological Excavation
NMRS NO(S):	N/A
SITE/MONUMENT TYPE(S):	Niddrie Fire Clay Works
SIGNIFICANT FINDS:	Kilns, flue system, chimney base, building (20 th century)
NGR (2 letters, 10 figures)	NT 30920 71970
START DATE (this season)	May 2014
END DATE (this season)	June 2014
PREVIOUS WORK (incl. <i>DES</i> ref.)	N/A
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	An archaeological excavation was carried out on the remains of the Niddrie Fire Clay Works. It is understood that these works produced items of sanitary ware such as toilets and sinks etc and were in operation from the early to mid 20 th century. The excavation identified a number of key features associated with these industrial remains including kilns, a flue system, a chimney base, a railway siding, surfaced external areas and a number of buildings. An early kiln identified on the site was of the circular beehive type, with larger rectangular downdraft kilns being constructed as the works expanded. These rectangular kilns appear to have been continually developed and improved with three phases of flue system being evident. The results of the excavation were in keeping with a sequence of development and expansion as indicated on Ordnance Survey map editions from 1908 to 1934.
PROPOSED FUTURE WORK:	N/A
CAPTION(S) FOR ILLUSTRS:	N/A
SPONSOR OR FUNDING BODY:	Barratt East Scotland
ADDRESS OF MAIN CONTRIBUTOR:	The Old Engine House, Eskmills Park, Musselburgh, EH21 7PQ
EMAIL ADDRESS:	cfa@cfa-archaeology.co.uk
ARCHIVE LOCATION (intended/deposited)	Royal Commission on the Ancient and Historical Monuments of Scotland City of Edinburgh Council Sites & Monuments Record



SITE



Early factory building shown on the 1910 OS map

Platform

cycle path (former road)



- Key:
- Area of original evaluation
 - Concrete on ground
 - Limit of Excavation

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Fig. No: 1	Revision: A
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Title:
Location Plan

Project:
**Development at Blackchapel Road, Edinburgh
Archaeological Excavation**

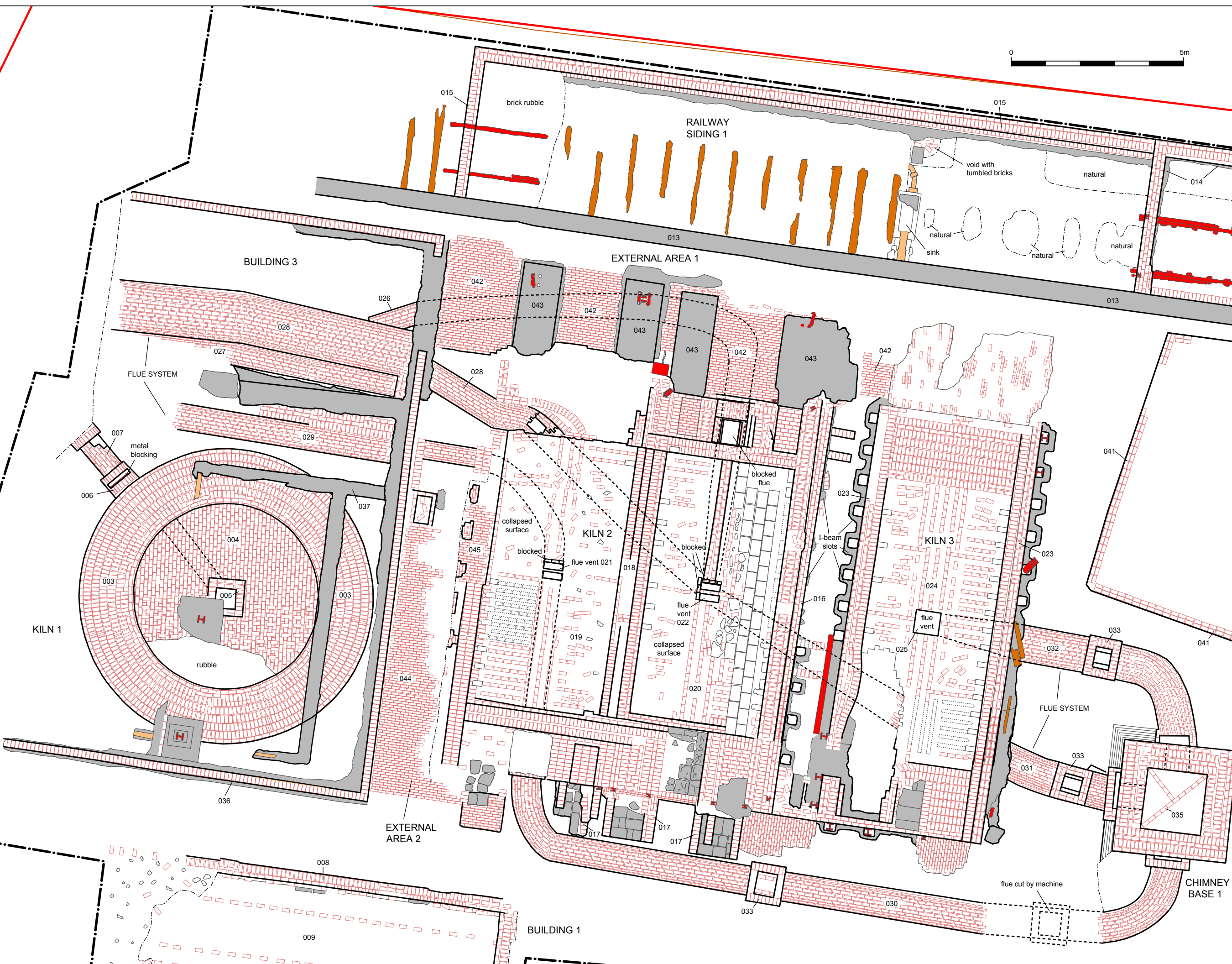
Client:
Barratt East Scotland

Scale at A3:
1:500





- Key:
- Brickwork
 - Concrete
 - Ceramic pipe
 - Wood
 - Steel
 - Positions of features removed
 - Route of underground flue
 - Site Boundary
 - Limit of Excavation



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Fig. No: **2a** Revision: **A**

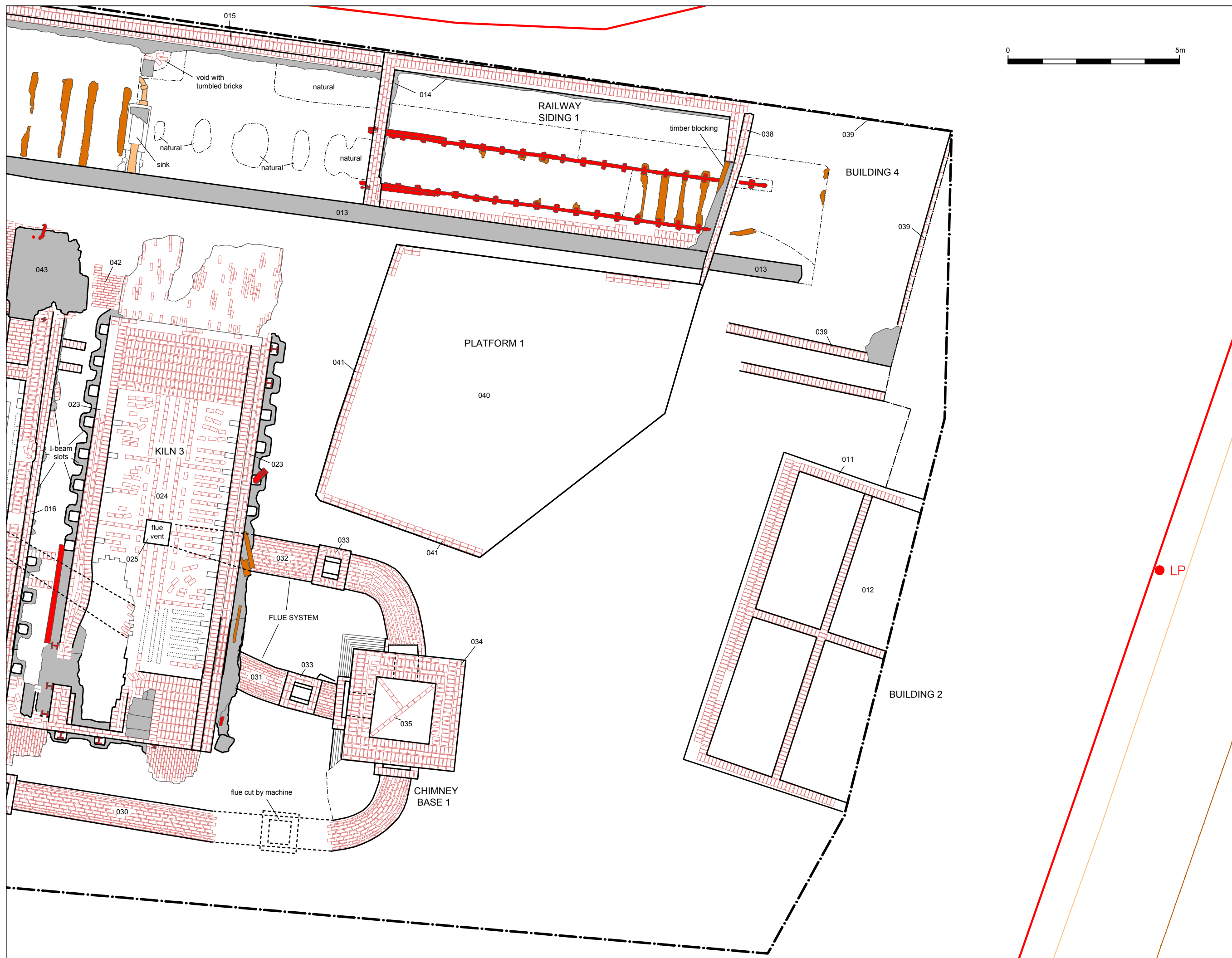
Title: **Site Plan, central area**



Project: **Development at Blackchapel Road, Edinburgh Archaeological Excavation**

Client: **Barratt East Scotland**

Scale at A3: **1:100**



- Key:
- Brickwork
 - Concrete
 - Ceramic pipe
 - Wood
 - Steel
 - Positions of features removed
 - Route of underground flue
 - Site Boundary
 - Limit of Excavation

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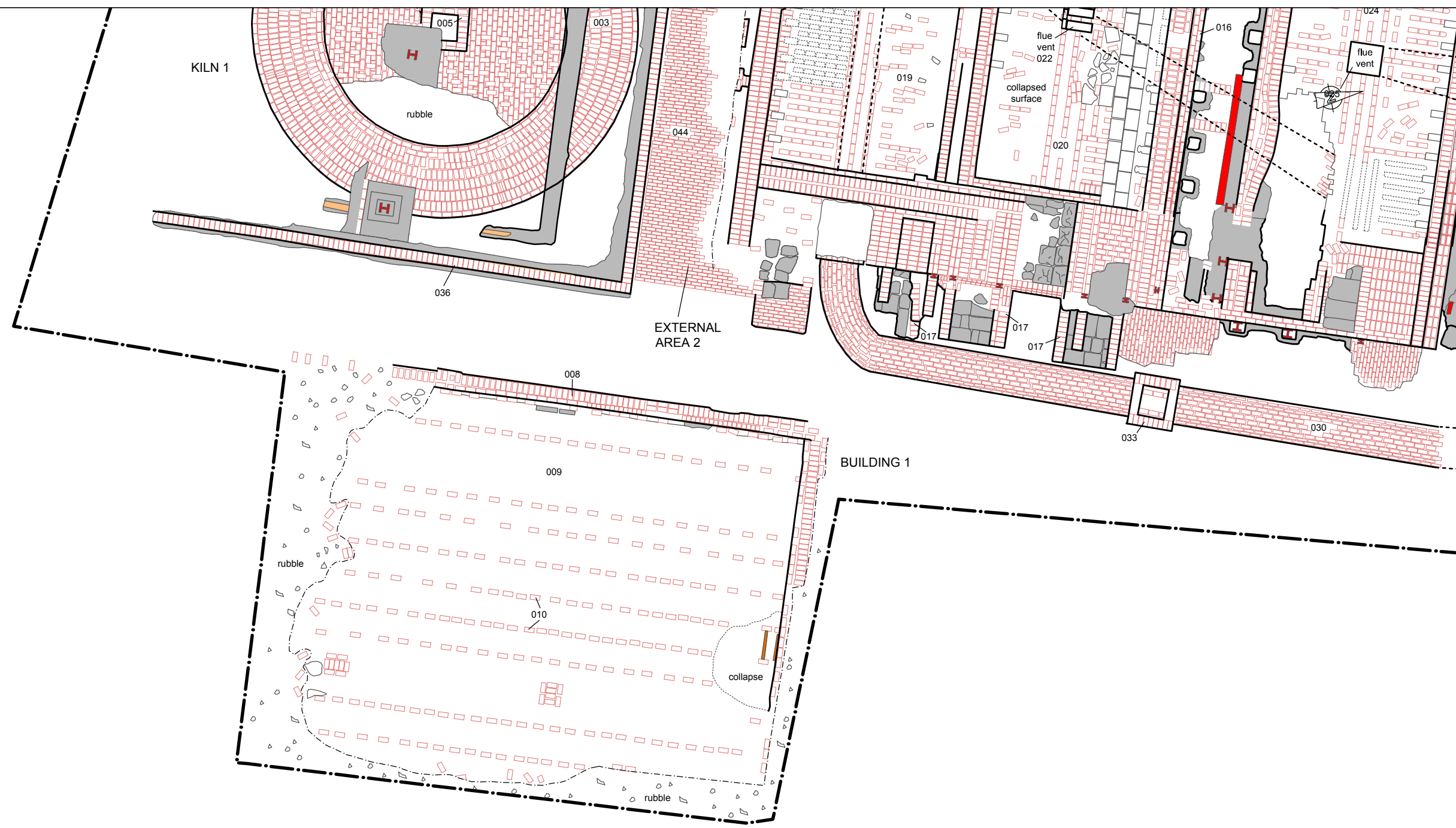
Fig. No: 2b Revision: A

Title: Site Plan, E area

Project: Development at Blackchapel Road, Edinburgh Archaeological Excavation

Client: Barratt East Scotland

Scale at A3: 1:100




- Key:
- Brickwork
 - Concrete
 - Ceramic pipe
 - Wood
 - Steel
 - Positions of features removed
 - Route of underground flue
 - Site Boundary
 - Limit of Excavation

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Fig. No: **2c** Revision: **A**

Title:
Site Plan, S area

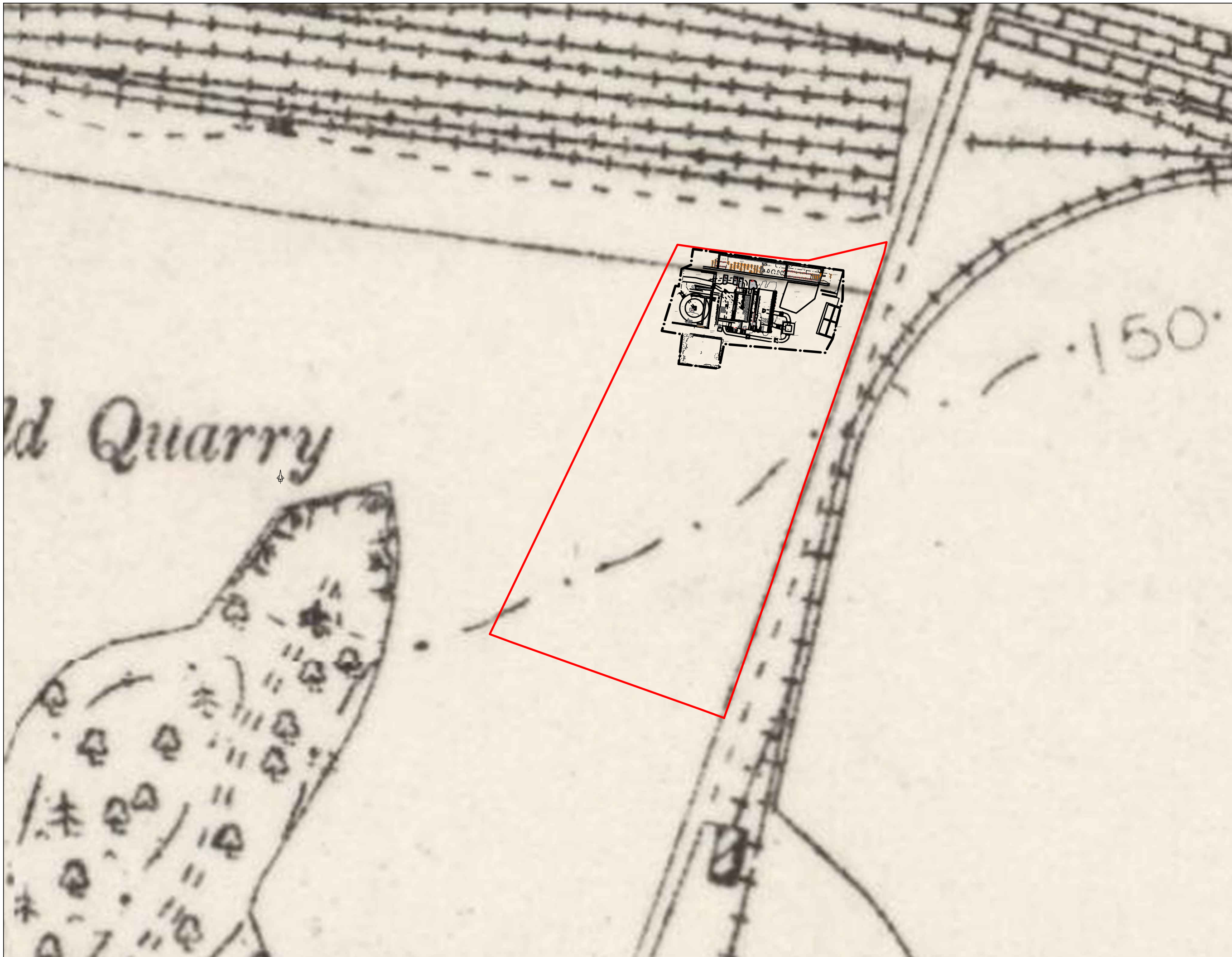


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Client:
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Scale at A3:
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Fig. No:	3	Revision:	A
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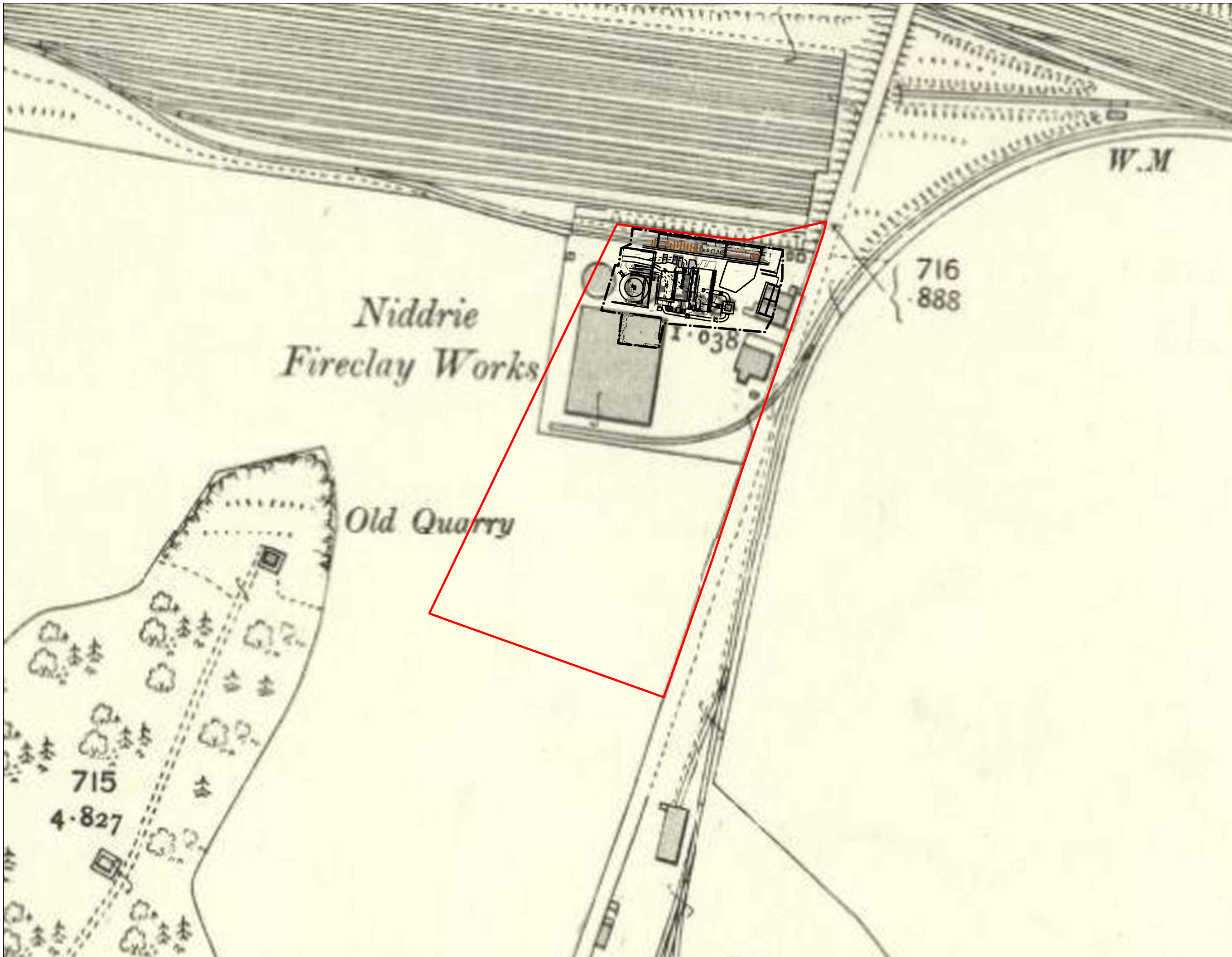
Title:
Ordnance Survey Map (1895)

Project:
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Client:
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Scale at A3:
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Fig. No:	4	Revision:	A
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Title:
Ordnance Survey Map (1908)

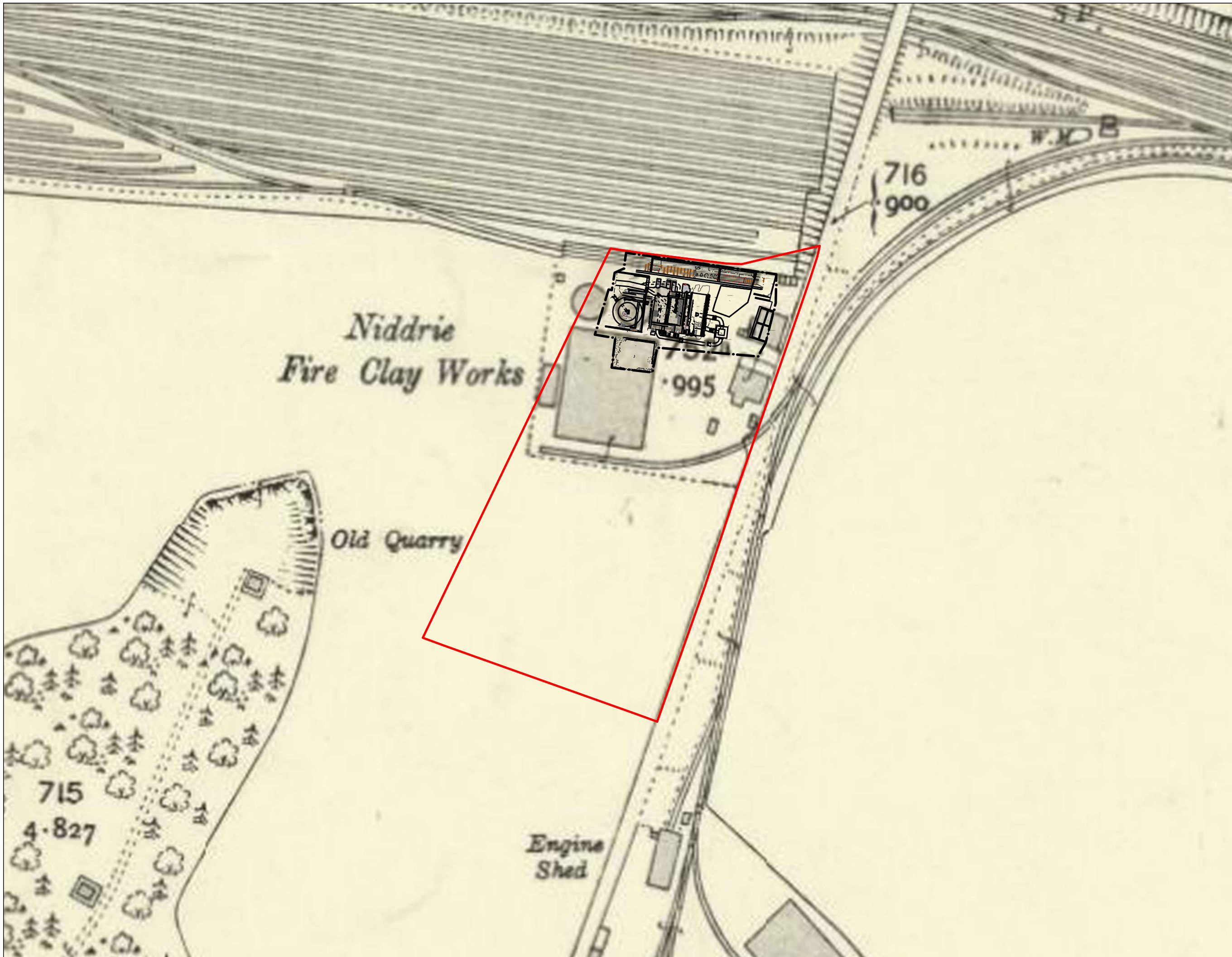
Project:
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Client:
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Scale at A3:
1:1000

Drawn by:	Checked:	Report No:
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Fig. No:	5	Revision:	A
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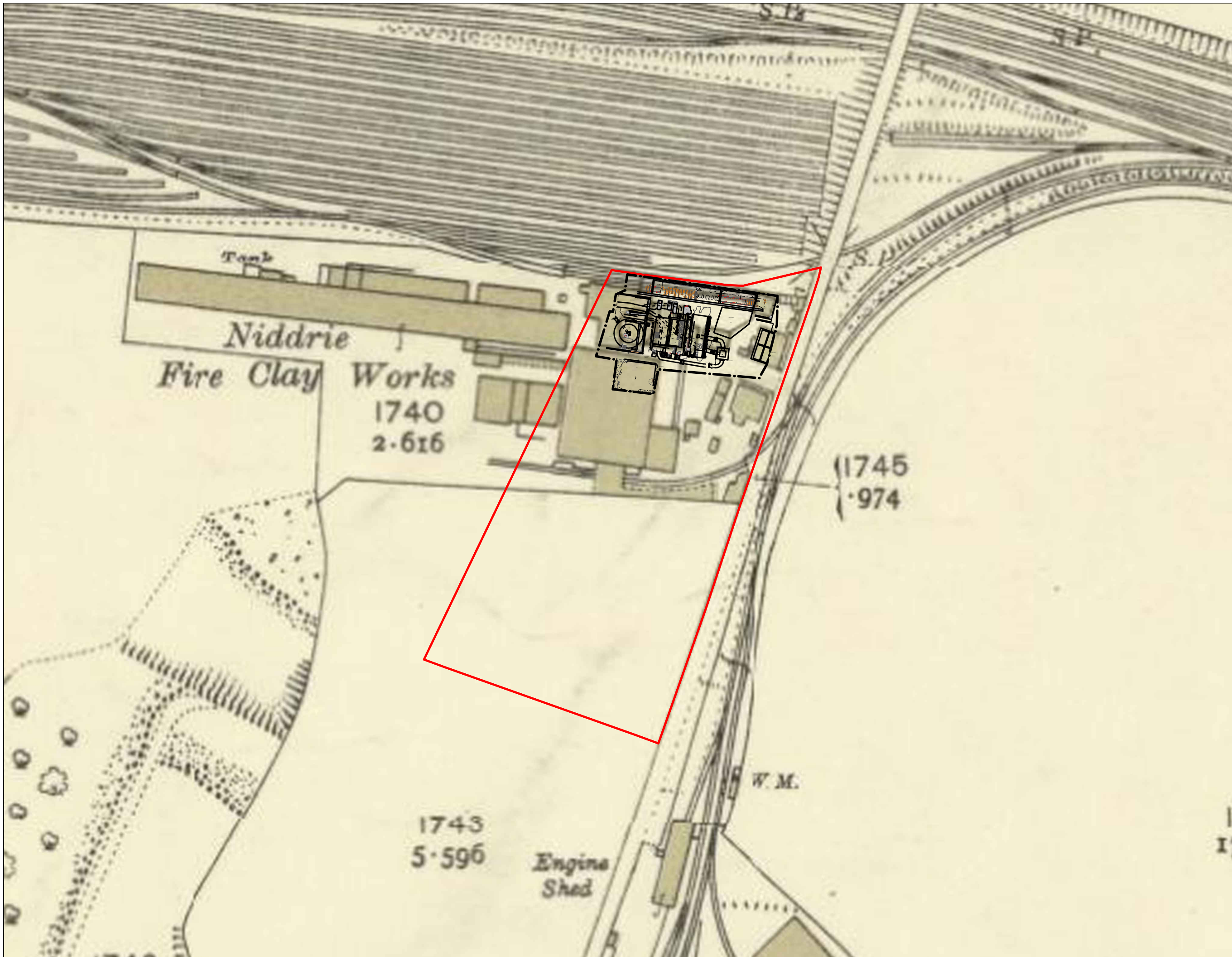
Title:
 Ordnance Survey Map (1914)

Project:
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 Road, Edinburgh
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Client:
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Scale at A3:
 1:1000





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Fig. No: 6 Revision: A

Title:
 Ordnance Survey Map (1934)

Project:
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Client:
 Barratt East Scotland

Scale at A3:
 1:1000







Fig. 7 - Overhead shot of western end of site



Fig. 8 - Overhead shot of central part of site

Fig. No: 7-8		Revision: A	Project: Development at Blackchapel Road, Edinburgh Archaeological Excavation		
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Fig. 9 - Overhead shot of eastern part of site



Fig. 10 - Kiln 1 from south

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Fig. 11 - Kiln 1 showing flue 007



Fig. 12 - Building 1 from the east





Fig. No: 11-12		Revision: A	Project: Development at Blackchapel Road, Edinburgh Archaeological Excavation		
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Fig. 13 - Building 2 from the north-west



Fig. 14 - Railway Siding 1 from east

Fig. No: 13-14		Revision: A	Project: Development at Blackchapel Road, Edinburgh Archaeological Excavation		
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Fig. 15 - Railway Siding 1 showing wall 014



Fig. 16 - Kiln 2 from south

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Fig. 17 - Voids beneath kiln floor



Fig. 18 - Flue vent in kiln floor

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Fig. 19 - Phase 1 and 2 flue system



Fig. 20 - Phase 3 flue system

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Fig. 21 - Chimney Base 1 from west



Fig. 22 - Building 4 from south-east

Fig. No: 21-22		Revision: A	Project: Development at Blackchapel Road, Edinburgh Archaeological Excavation			CFA ARCHAEOLOGY LTD The Old Engine House Eskmills Park, Musselburgh East Lothian, Eh21 7PQ
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Fig. 23 - Platform 1 from east



Fig. 24 - External Area 1 from west





Fig. No: 23-24		Revision: A	Project: Development at Blackchapel Road, Edinburgh Archaeological Excavation			CFA ARCHAEOLOGY LTD The Old Engine House Eskmills Park, Musselburgh East Lothian, Eh21 7PQ T: 0131 273 4380 F: 0131 273 4381 e: info@cfa-archaeology.co.uk w: www.cfa-archaeology.co.uk
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Fig. 25 - External Area 2 from south



Fig. 26 - Kiln spurs from Kiln 2

Fig. No: 25-26		Revision: A	Project: Development at Blackchapel Road, Edinburgh Archaeological Excavation			CFA ARCHAEOLOGY LTD The Old Engine House Eskmills Park, Musselburgh East Lothian, Eh21 7PQ T: 0131 273 4380 F: 0131 273 4381 e: info@cfa-archaeology.co.uk w: www.cfa-archaeology.co.uk
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Fig. 27 - Moulded fireclay support from Kiln 2



Fig. 28 - Barley-twist ornamental edging from Kiln 2

Fig. No: 27-28		Revision: A	Project: Development at Blackchapel Road, Edinburgh Archaeological Excavation		
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