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GROUNDWORK BRIDGEND

TONDU IRONWORKS
BRIDGEND COUNTY BOROUGH

ARCHAEOLOGICAL EVALUATION ON GROUND TO SOUTH-EAST OF CALCINING KILNS

OXFORD ARCHAEOLOGICAL UNIT
SEPTEMBER 1998
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NMR DATA	
SITE NAME	TONDU IRONWORKS
TOWN	TONDU
PARISH	NEWCASTLE
BOROUGH	BRIDGEND C.B.
COUNTY	MID GLAMORGAN
NGR	SS 8915 8445
LISTED STATUS	S.A.M.
VISIT/SURVEY DATE	AUGUST 1998
OAU SITE CODE	TONDU 98

OXFORD ARCHAEOLOGICAL UNIT
SEPTEMBER 1998

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Summary

In August 1998 the Oxford Archaeological Unit (OAU) was commissioned by Groundwork Bridgend to carry out an archaeological evaluation at the site of the former Tondu Ironworks in bridgend. The evaluation was carried out between the surviving remains of the ironworks calcining kilns and an associated retaining wall. The work was carried out to the specifications defined in the Schedule Monument Consent. The evaluation recorded the presence of an intact surface which appeared to post-date iron production on the site (i.e. post-1895-6). Fragmentary remains were discovered of earlier structures and deposits more clearly related to iron-making on the site. These remains appeared to have suffered substantial damage when a gas or water main was laid in front of the kilns.

1 Introduction

1.1 The Oxford Archaeological Unit (OAU) was commissioned by Groundwork Bridgend to undertake an evaluation at the site of the former Tondu Ironworks, Bridgend. It is the intention of Groundwork Bridgend to consolidate, restore and improve the remains of the former Ironworks, a Scheduled Ancient Monument, for the use and enjoyment of the public.

1.2 The evaluation took place in August 1998 and was designed to investigate the foundations of the calcining kilns and any associated 'working surfaces'. The evaluation was required in preparation for an application for Scheduled Monument Consent for the consolidation of the kilns and the possible reconstruction a retaining wall in front of them which is potentially unstable.

2 Methodology

2.1 This first phase of work was the excavation of four test pits. This work was carried out by hand. The test pits were excavated in advance of geo-technical boreholes and were designed to establish the presence/absence of significant structures/surfaces or archaeological deposits. Any significant remains were to be investigated and fully recorded to allow a strategy to be evolved for the archaeological mitigation of the proposed rebuilding of the retaining wall, work which would potentially neccessitate the removal of substantial amounts of material behind the wall. One of the test pits (test pit 4) was expanded to investigate the depth of the kilns' foundations for engineering purposes i.e. to design a safe strategy for the reconstruction of the retaining wall without undermining the kilns. Eventually test pits 3 and 4 were connected by a long trench (trench 4) which was excavated to the depth of the last intact working surface.

2.2 Contexts were defined, plans and sections were drawn, and spoil heaps examined according to OAU procedure (Wilkinson, 1990). The test pits were of varying size (see results).

2.3 Trench 4 , connecting test pits 3 & 4, was designed to establish the presence/absence of any 'working surfaces' associated with the production of iron. This trench was 10 m in length and 0.6 m wide. The eastern end of the trench formed a T-shape spanning the area between the calcining kilns and the retaining wall. This trench was excavated by mechanical excavator under archaeological supervision.

3 Results

3.1 Test pit 1

3.1.1 Test pit 1 was located to the south-west of the calcining kilns. The pit cut through a geotextile and shingle road surface laid as part of the current programme of works. The pit was excavated to a depth of 1 m and measured c 1 m x 0.3 m.

3.1.2 The earliest deposit was a dark brown clay loam (104) with inclusions of slag, mortar and angular gravel. The deposit was excavated to a depth of 0.5 m but not bottomed. This was overlain by a compacted black shingle (103) 0.14 m thick, which formed an even surface across the excavated area. This surface was covered by a black clay loam (102), interpreted as topsoil. This was overlain by the geo-textile (101) and compacted shingle (100) of the present road surface. No working surfaces demonstrably associated with iron-making were found, probably a result of the laying of the gas/water main (407). It is of note that at a depth of some 3 metres below the present ground surface, the geotechnical engineers penetrated a cavity (probably a flue) some three metres high at this point.

3.2 Test pit 2

3.2.1 Test pit 2 measured 0.8 m x 0.3 m and was excavated to a depth of 0.72 m. It was located 0.5 m in front (south-east) of the westernmost kiln

3.2.2 The earliest deposit was a friable grey brown clay loam (203) with slag, gravel and mortar inclusions. Deposit 203 was excavated to a depth of 0.4 m but not bottomed. It was overlain by a 0.12 m thick sandy silt layer with a compacted surface (202). This layer which contained some inclusions of gravel, coke and iron oxide residue was the only clearly defined surface encountered during the excavation of this test pit. Set into the top of deposit 202 was an east-west aligned row of yellow stock bricks. The yellow stocks were only seen in section but appeared to be consistent with those identified in trench 4. Deposit 202 was overlain by a clay loam (201) topsoil. This topsoil was directly overlain by the modern road surface (200). Once again, no working surfaces demonstrably associated with iron-making were found.

3.3 Trench 4 (including test pits 3 and 4)

3.3.1 Trench 4 was 10 m in length and 0.6 m wide. The eastern end of the trench formed a T-shape spanning the area between the calcining kilns and the retaining wall. The trench was excavated to the depth of oth earliest working surface located by test pits 3 and 4. It was hoped that by exposing a sufficiently large area of this surface, any significant ruts or sleeper depressions not visible in section would become apparent.

3.3.2 The principal purpose of test pit 4 was to investigate the nature and depth of the foundation of the calcining kilns. The test pit revealed that the kilns rested on a foundation of sandstone rubble (416). The sandstone was typically irregular and unfinished. The rubble was well bonded with a strong whitish mortar and it extended to at least 1.2 m from present ground surface. The excavation was terminated at this depth due to health and safety considerations. Probing by the engineer suggested that the foundations continued at least 0.5 m further, i.e. to at least 1.7 m from current ground level at this point. The rubble foundation was overlain by a large sandstone spreadstone (415). This was 0.13 m thick and extended 0.32 m from the face of the kiln wall. Above the spreadstone was a single offset course of well-dressed sandstone (414), with exceptionally well-preserved tooled face and drafted margins, matching the few remaining un-eroded quoins of the kils themselves. This course was offset by some 0.06 m from the wall and it was 0.2 m thick.

3.3.3 Overlying the spreadstone and butting the offset was a layer of sandstone slabs (404). The layer was burnt and had evidence of heat cracking. A 0.03 m thick deposit of sandy clay (402) with a 20% inclusion of mortar and fired clay covered the sandstone. A layer of gravel and powdered iron oxide (401) overlay deposit 402. This deposit was up to 0.4 m thick. Contained within this deposit was a disused narrow gas pipe (403) with an open upturned end. It appeared that this would have originally connected to a vertical pipe feeding a gaslight on the corner of the kiln. The mortices cut into the stonework for the supporting bracket were still clearly visible.

3.3.4 Truncating deposits 401- 404 was a linear service trench (406). The northern edge of the cut sloped down at 70^0 for 0.6 m and then vertically for a further 0.4 m. The southern edge and the base of the cut were not identified within the excavation. A thick iron pipe (407) of some 0.17 m diameter was recorded within the cut, 1.2 m from ground present surface. The exterior of the pipe was in a good state of preservation and it was unclear whether it carried gas or water. The cut for this pipe was filled by a grey brown sandy silt (408) with a 20% inclusion of sandstone and brick. This deposit was some 0.7 m thick and it was overlain by a 0.09 m thick layer of black gravel (409) containing coal waste and patches of mortar and sandy silt. The top of the cut was sealed by a 0.08 m thick compacted layer of brown sandy silt with a compacted upper surface (405). It was this surface that was exposed along the length of trench 4. The layer sloped upwards from east to west, rising by 0.3 m over the length of the trench. Set into this surface were two rows of yellow stock bricks laid flat (dimensions 230 mm

x 105 mm x 60 mm), their upper faces level with the compacted surface. The bricks appeared to follow the alignment of the iron pipe (407) and may represent a capping or a method of permanently defining its alignment on the (then) surface of the ground.

3.3.5 Layer 405 was overlain a probable make-up layer of black silty sand (413) with a 50% inclusion of gravel/shingle. A 0.04 m thick layer of compacted gravel and mortar (412) overlay deposit 413. This layer formed another level surface, which appeared to have represented a resurfacing of the footpath. This was overlain by another apparent make-up layer 411, which appeared to be identical to deposit 413. This appeared to be a make-up layer for a further buried compacted footpath surface 410. Over all the excavated area, this surface had become buried by a clay loam topsoil (400).

3.3.6 A small side trench was excavated off trench 4, extending towards the central arch of the calcining kilns. A buried structure (417) was located. This structure was composed of very hard reddish brown mortar/cement with some iron ore inclusions. The upper face of 417 bore imprints which appeared to show that slabs of stone or more probably iron, forming a floor surface, had been pressed into the deposit when it was laid. The surviving part of this structure had been truncated by cut 406.

4 Conclusions

4.1 Deposits 410-413 appeared to be successive resurfacings of the public footpath. The earliest intact surface was identified within test pits 1 and 2 and trench 4 (103, 202, 405). From its un-metalled character, the lack of any imprints from sleepers or wheels, and from the complete lack of residues of iron ore or coke, it is inferred that this surface post-dates the production of iron on the site. The presence of the iron pipe (407) may suggest a date of c 1918-19, when gas and water pipes would have been laid for the adjacent by-product coking plant then under construction. The strip of yellow stock bricks which were laid into this surface appeared to be little worn and did not appear to represent serious cobbling of the surface. It appears likely that they were used to delineate the presence of an underground gas or water main although it is of note that identical yellow bricks were used to resurface the continuation of the footpath north-east of the kilns.

4.2 The southern edge of the pipe trench was not identified during the course of the evaluation. Surface 405 was followed to the limit of excavation where the hedge above the retaining precluded further investigation. Whilst not conclusive, this would suggest a substantial truncation of any pre-20th century surfaces. If the truncation is consistent right along the front of the calcining kilns, surfaces contemporary with the production of iron (pre- 1896) will only survive within c 0.6 m of the kiln archways. There is a likelihood that similar early deposits survive beneath the hedge at the top of the

retaining wall although it is probable that these will have been damaged by the movement which has taken place in the wall itself.

D.Wood/R.Kinchin-Smith
Oxford Archaeological Unit
September 1998

Appendix A

Table of Contexts

Context	Type	Comments	Finds
100	Layer	Current road surface	No
101	Layer	Geo-textile	No
102	Layer	Topsoil	No
103	Layer	Surface	No
104	Layer	Made ground	No
200	Layer	Current road surface	No
201	Layer	Topsoil / pathway make-up	No
202	Layer	Surface	No
203	Layer	Made ground	No
400	Layer	Topsoil	No
401	Layer	Iron Oxide residue	Yes
402	Layer	Mortar surface	No
403	Service	Gas pipe	No
404	Layer	Heat cracked stone	No
405	Layer	Surface	No
406	Cut	Pipe trench	No
407	Service	Water/gas pipe	No
408	Fill	Fill of 406	Yes
409	Fill	Fill of 406	No
410	Layer	Current footpath	No
411	Layer	Make-up	No
412	Layer	Gravel surface	No
413	Layer	Make-up	No
414	Structure	Offset	No
415	Structure	Spread stone	No
416	Structure	Foundation	No
417	Structure	Structure in front of kiln	No

Appendix A

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402	Layer	Mortar surface	No
403	Service	Gas pipe	No
404	Layer	Heat cracked stone	No
405	Layer	Surface	No
406	Cut	Pipe trench	No
407	Service	Water/gas pipe	No
408	Fill	Fill of 406	Yes
409	Fill	Fill of 406	No
410	Layer	Current footpath	No
411	Layer	Make-up	No
412	Layer	Gravel surface	No
413	Layer	Make-up	No
414	Structure	Offset	No
415	Structure	Spread stone	No
416	Structure	Foundation	No
417	Structure	Structure in front of kiln	No

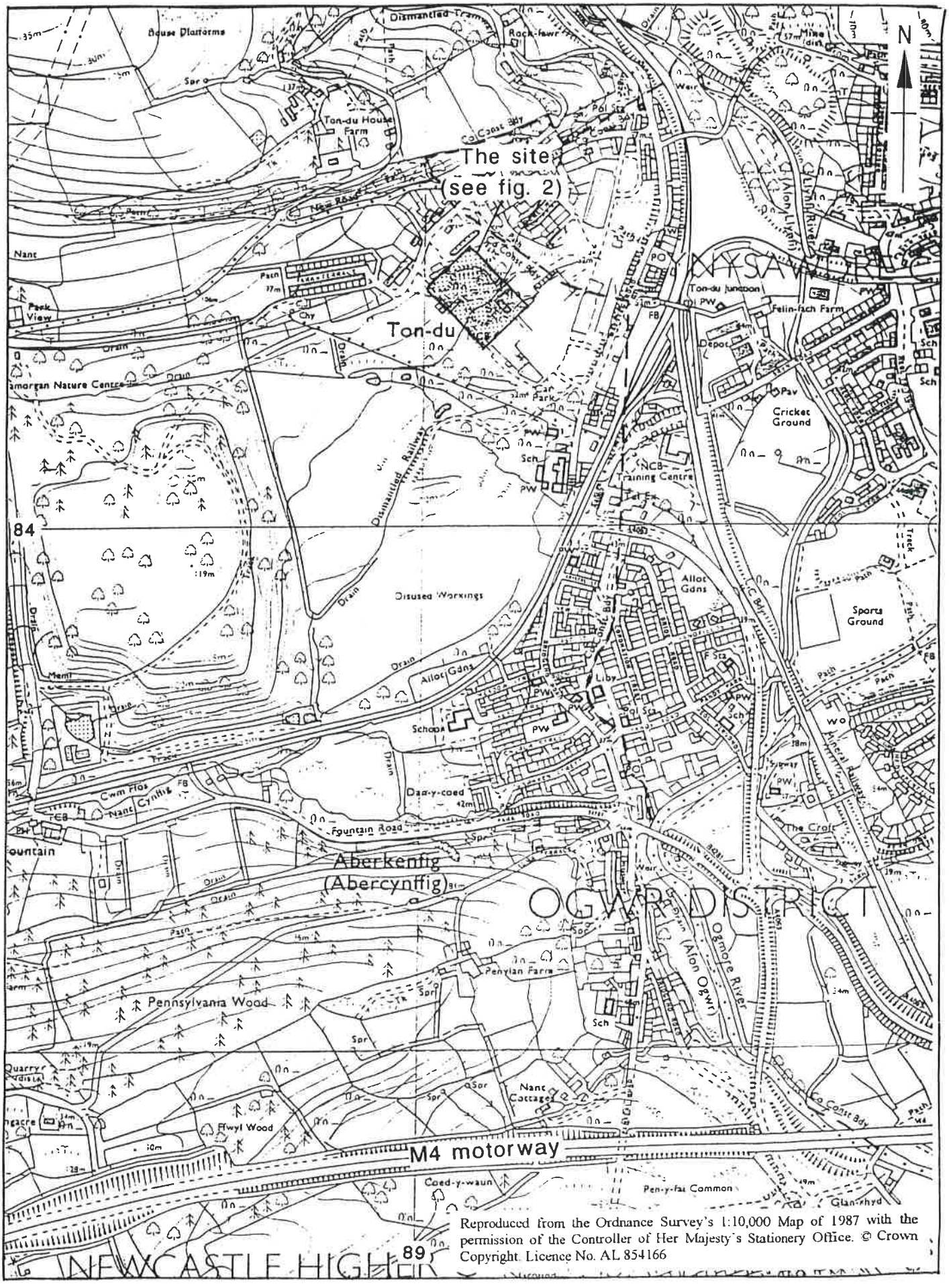

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Figure 1: Site location plan

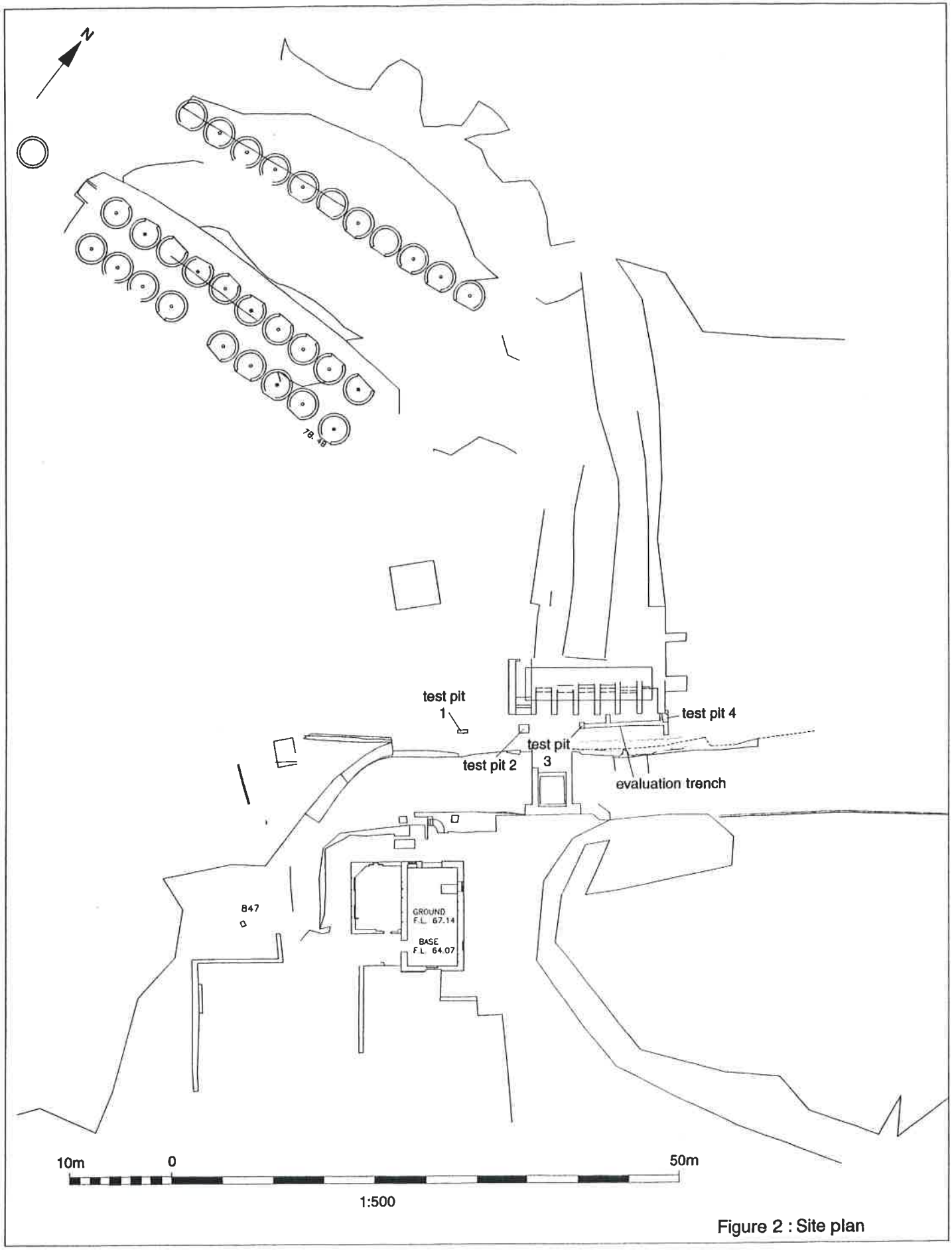

Figure 2 : Site plan

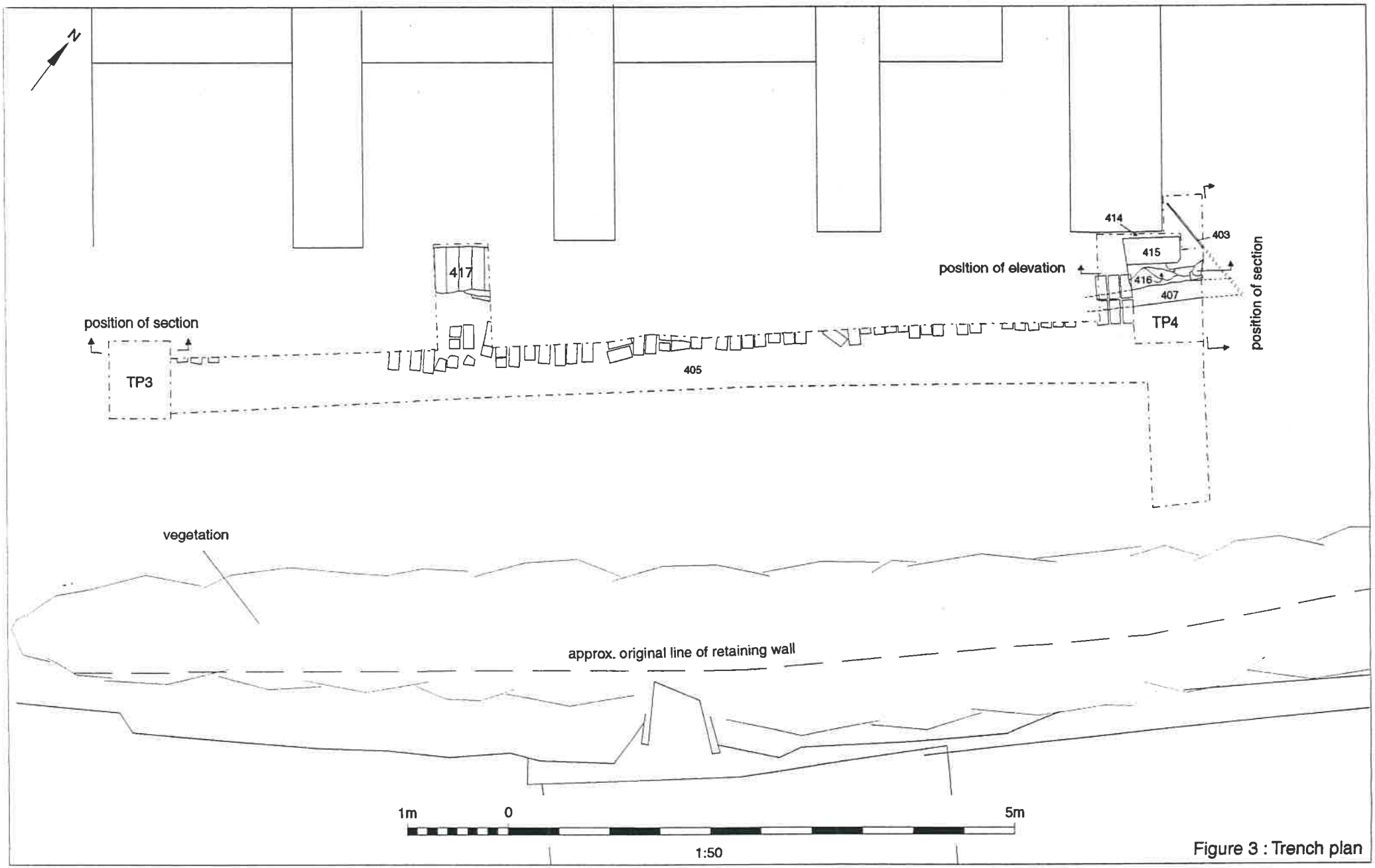

Figure 3 : Trench plan

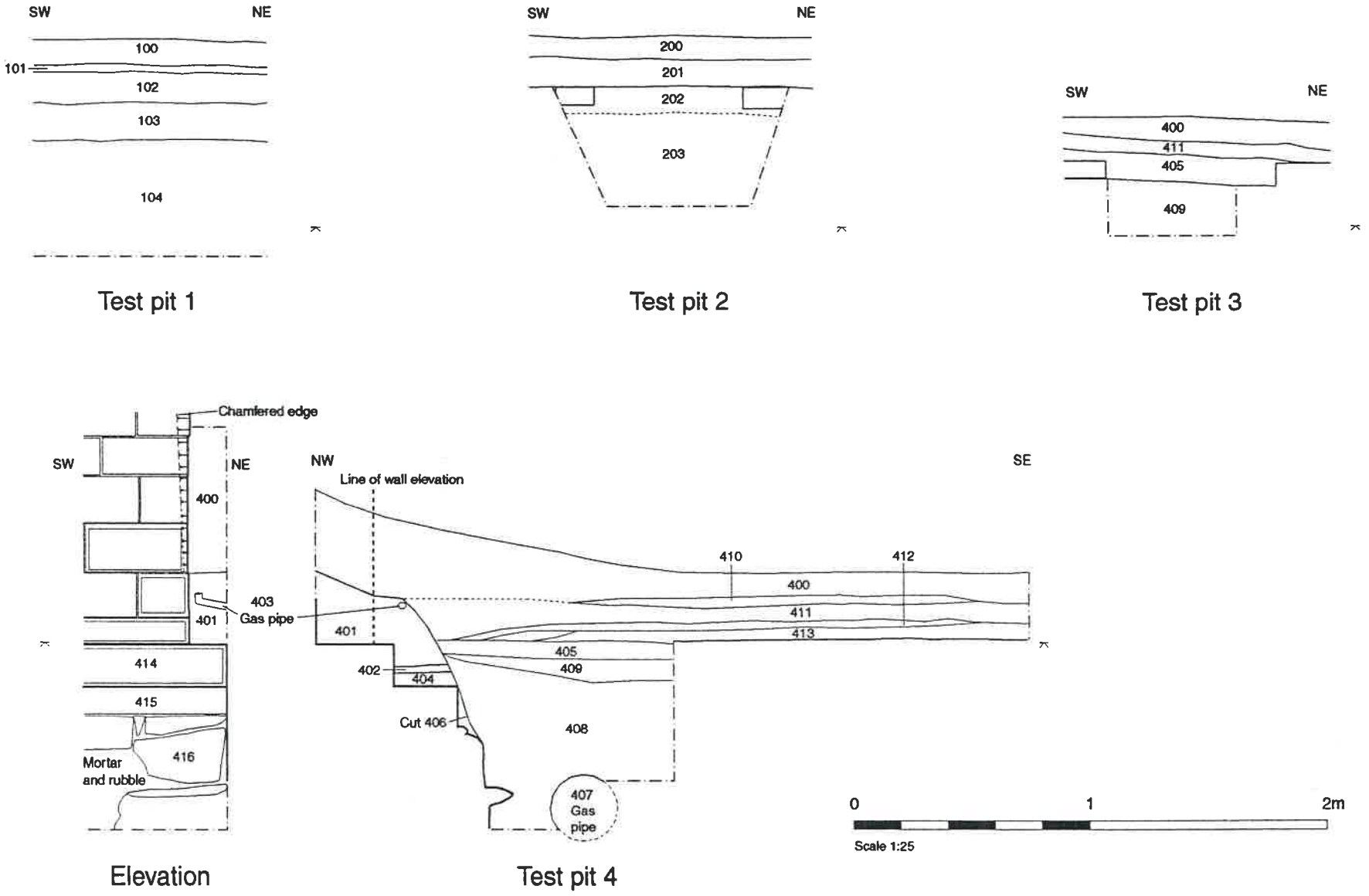
SW
NE
100
101
102
103
104
Test pit 1
SW
NE
200
201
202
203
Test pit 2
SW
NE
400
411
405
409
Test pit 3
Chamfered edge
SW
NE
400
403
Gas pipe
401
414
415
Mortar and rubble
416
Elevation
NW
SE
Line of wall elevation
410
412
400
411
413
401
405
409
402
404
Cut 406
408
407
Gas pipe
Test pit 4
0
1
2m
Scale 1:25

Figure 4

Plate 1: General view of trench 4 from the North-east, showing surface 405 with inset bricks apparently following the line of pipe 407.

Plate 2: Truncated and broken layer of sandstone with possible evidence of heat-cracking (402). This layer appeared to have been cut by feature 406.

Plate 3: Calcining kiln foundation showing large spreadstone 415 overlying mortared rubble-stone foundation 416. Note pipe 407 in the bottom of the trench, surface 405 with inset bricks on the left and red deposit 401 with small gas pipe 403 to the upper right.

Plate 4: Test pit 4. Note calcining kiln foundation and red deposit 401 with small gas pipe 403 to the left. This deposit appeared to have been cut by feature 406.

Plate 5: Feature 417 revealed by the small side trench off trench 4.