

**GLAMORGAN-GWENT ARCHAEOLOGICAL TRUST**

**PRELIMINARY EXCAVATIONS AT THE  
BEDFORD IRONWORKS  
CEFN CRIBWR**

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## Contents

Acknowledgements	3
1. Introduction	4
1.1. Historical Background	4
2. Methodology	5
3. Results of Excavations	6
3.1 Casting House	6
3.2 Tree-planting Trench	7
3.3 Calcining Kilns	8
4 Conclusions	9

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The report was compiled by P F Wilkinson with the assistance of other members of the staff of the Trust.

## 1. Introduction

The Glamorgan-Gwent Archaeological Trust was commissioned by Ogwr Borough Council to carry out preliminary excavations at the Bedford Ironworks, Cefn Cribwr. The work was undertaken as part of the first stage of preservation works on the site.

### 1.1 Historical Background

The ironworks, which were built by John Bedford in the 1780s, appear to have operated, probably intermittently, until the 1830s. The surviving remains include a blast furnace with walls which would have supported a charging ramp to the south of it. Lying to the north of the furnace are the remains of a casting house, and to the east, a blowing engine house. A short distance to the south of the site of the charging house are the remains of what were probably calcining kilns.

Recent research by Mr Philip Riden and others has shown that parts, if not all, of the ironworks were rebuilt at intervals during their history. Mr Riden's preliminary assessment of the available cartographic evidence suggested that one phase of this rebuilding may have involved a major change in the layout and alignment of the works. He argued that the map evidence strongly suggests that when 'new' furnaces were erected on the site in 1811 and 1824 they were in the same position as the one built about 1786-90 by John Bedford.

Documentary evidence suggests that the works' blowing engine was water-powered at least as late as 1798. Mr Riden, in the light of this, has interpreted the map evidence as indicating the likelihood that the waterwheel was located in a wheel-pit immediately west of the present remains of the charging house. It would then be likely that the blowing engine house would then have been located to the south of the furnace, below the charging ramp. If this were the case, and if the wheel were driving bellows, the original casting house might be expected to lie at right angles to the line of the blowing house, probably to the east of the furnace. This arrangement would seem to explain the apparent east-west alignment of the works on early maps. If, however, the furnace was blown by blowing cylinders rather than by bellows, or if the waterwheel was located elsewhere, the arrangement of the various elements of the works may have been somewhat different. If the latter were the case it is possible that the casting house, the remains of which survive today, is the original one built by Bedford. If the former hypothesis is correct, the alignment would probably have been changed to the present north-south line when the waterwheel was replaced by a steam engine.

## 2. Methodology

The purpose of the excavations was to expose the lower parts of some of the walls of the casting house to allow them to be re-pointed by the masons who were consolidating the masonry. Any features of archaeological interest which came to light in the process were recorded. The Trust also undertook the excavation of a trench for tree planting which ran parallel to, and along the length of, the outside of the southern boundary fence of the site. In addition, the overburden of soil and vegetation was removed from the calcining kilns.

The work on the wall trenches and the calcining kilns was carried out by hand while the bedding trench was dug with a small mechanical excavator under archaeological supervision. Archaeological features exposed in the course of this were then cleaned by hand and recorded.

### 3. Results of Excavations

#### 3.1 Casting House

The excavations in the casting house had two principal aims. Firstly, to provide trenches along the faces of selected walls to allow consolidation by the masons to take place. Secondly, one square metre was excavated to the level of the original floor of the building to allow its nature and condition to be assessed.

The Trust had been requested to excavate trenches 1 metre wide and to a depth of 0.3 metres along most of the length of the inner faces of the walls, (Figure 1). The uneven nature of the ground surface adjacent to the walls, however, made the maintenance of a consistent depth of 0.3 metres both impractical and inconvenient for the stone masons. The trenches were, therefore, excavated to an average depth of 0.3 metres but the actual depth varied along their length. The total length of trench excavated was 25 metres.

Throughout the trenches the material through which they were dug consisted of stone rubble with mixed humic soil, containing substantial quantities of mortar, in its interstices. The material also contained numerous tree and other roots.

The excavations showed that the casting house originally had wide openings on its eastern and western sides close to the northern end. That in the eastern wall was 2.6 metres wide, its northern end being 0.9 metres from the north-east inside corner of the building. In this opening, fragments of shallow arching, made of bricks similar to those used on the bull's-eye windows in the northern wall, were found. It is most likely that this brick arching originally formed the top of the opening.

The opening in the western wall was 0.9 metres from the north-west inside corner of the building, and was 2.56 metres wide. This opening had clearly had a slightly more complex history than that in the eastern wall. It was found to have been partially blocked with masonry to form a narrower opening at its northern end, some 1.02 metres wide. In the base of this opening two brick steps had been built, (Plate 3). This would suggest that at the time the steps were built, the ground level outside the building was higher than the floor level inside. This narrower opening had then, in turn, been blocked with stone rubble, apparently deliberately.

In the north-east corner of the casting house an area of 1 square metre was excavated down to the base of the rubble and soil which filled the building. At a depth of 1.1 metres below present ground level, the surface of a layer of fine, pale yellow sand was found. This may be interpreted as the casting sand which would have covered much of the floor of the building. In the corner of the building the sand was cut by a roughly circular feature averaging 0.3 metres in diameter. It was filled with

dark brown sandy soil which contained small fragments of slag. This feature was not excavated, as this would best be done as part of an excavation of the casting house as a whole.

In order to allow the sides of the opening to be consolidated, the excavation extended a little way outside the opening in the eastern wall. This revealed the end of a wall abutting the eastern wall of the casting house between the opening and the building's north-eastern corner, (Figure 2, and Plates 1 and 2). Its inner face was some 0.2 metre to the north of the opening. It was 0.8 metre thick and 0.7 metre of its height was uncovered. It was constructed mostly of brick but had a stone face on its northern side. The wall contained the base of an alcove in its southern side which measured 360mm wide by 430mm deep. The southern face of the wall was pierced by a small opening measuring 250mm wide and more than 250mm high, at the base of the part of the wall which was uncovered. The base of the wall was not found.

The presence of this wall suggests that an additional building had been added to the eastern side of the casting house. The thickness of the wall suggests that this may have been quite a substantial building, perhaps being that which appears to be represented on the tithe map of 1842.

### 3.2 Tree-Planting Trench

A trench was excavated in the picnic site to the south of the ironworks to allow for the planting of trees and shrubs in front of the site fence. It was 1 metre wide, averaged 0.8 metres in depth, and was between 0.5 and 1 metre from the fence. The total length of trench was approximately 80 metres, with a gap in front of the gate to the site. Some of the trench was excavated by hand but the majority of it was excavated by a small mechanical digger.

Throughout most of the length of the trench the material through which it cut consisted of clay and fragments of shale mixed with coal ash and slag. To the south and south-west of the calcining kilns there were large quantities of coal, coal dust, ash, and cinder. To the south of the calcining kilns a brick-lined gully was found, (Plate 4). It was cut into the underlying clay and its sides were lined with three courses of bricks forming a gully 0.22 metre wide and 0.2 metre deep. It was capped with brick slabs. The gully was filled with loose humic soil and its base was unlined. It is most likely that this gully was intended to carry water, perhaps as a drain.

To the west of the gully, a brick-paved surface was found. It was composed of bricks set on edge to provide a firm surface. This could be traced for a length of some 3.6 metres east-west. It overlay clay mixed with slag and cinders and it was overlain by coal dust. The presence of slag beneath the bricks indicates

that this surface is unlikely to date from the original construction of the ironworks.

### 3.3 The Calcining Kilns

The vegetation, and up to half a metre of soil, was removed from the calcining kilns. This work enabled the earlier interpretation of the structure as consisting of two kilns and a central passageway to be confirmed. Both the kilns and the passageway were brick-lined. The outside of the structure was faced in stone and the space between the stone facing and the brick lining of the kilns and passageway was filled with loose stone rubble. In the case of the western kiln, this fill survived sufficiently well to show that the lining had been ventilated by means of purpose-made bricks which formed air channels. Similar air channels were observed in the lining of the blast-furnace. Their function was, presumably, to cool the kiln's lining.



#### 4. Conclusions

The very limited nature of the excavation means that only tentative conclusions may be drawn from the results.

In the casting house, it was established that there were wide openings in the side walls close to the northern end. That on the western side was subsequently partially blocked to form a narrower doorway. This was itself later blocked.

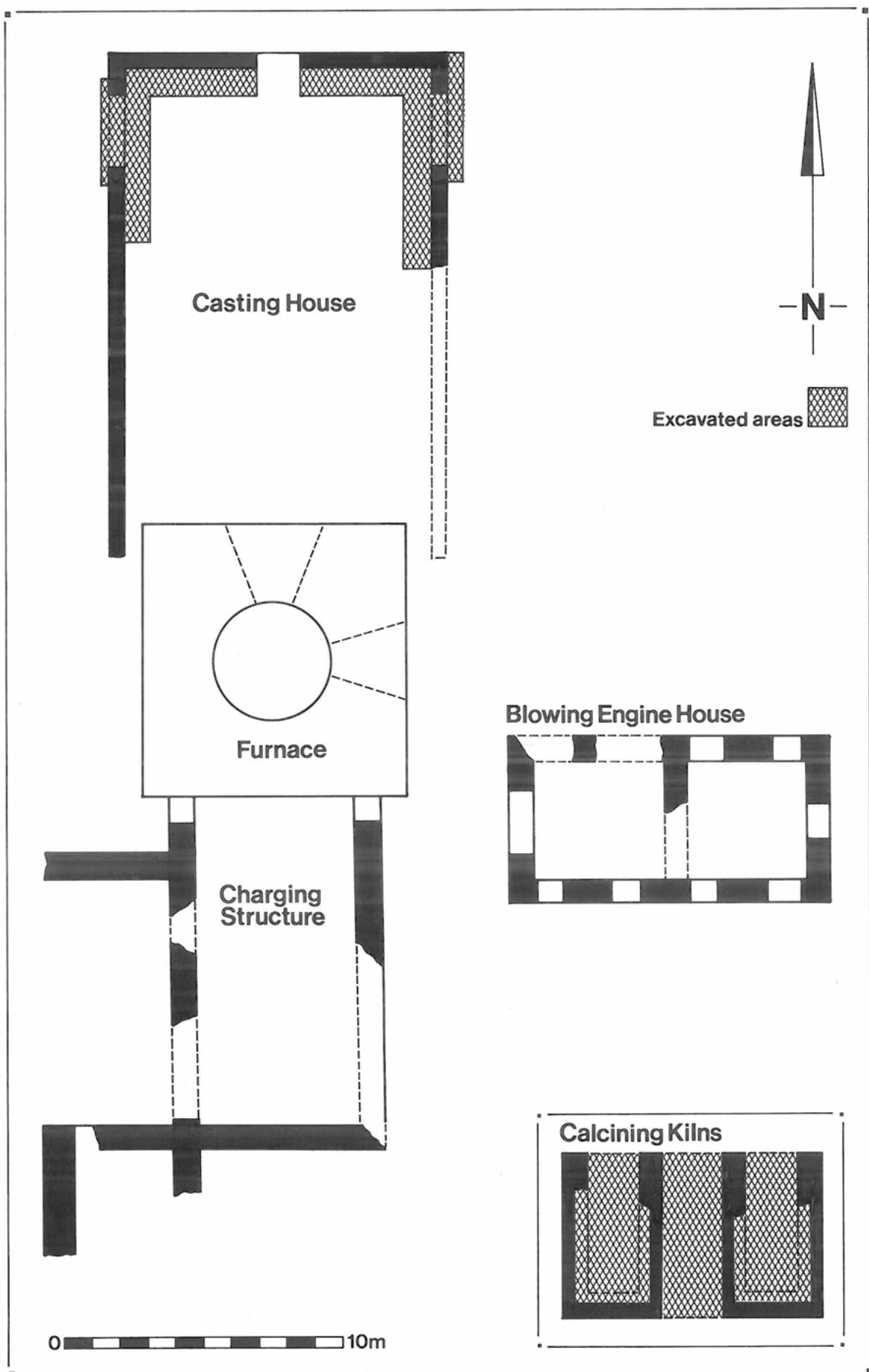
Some of the casting sand still survives on the floor of the casting house. This would seem to indicate that the floor, and any features associated with it, are likely to survive in a good state of preservation. The fact that a small feature was found to cut the sand suggests that other features in the sand, possibly associated with casting, might also survive.

The discovery of a wall abutting the outside of the eastern side of the casting house indicates that the remains of this structure, which would appear to be the building shown on the 1842 tithe map, and possibly other structures, still survive below the present ground surface. There is, therefore, a good chance that much additional information on the ground plan of the ironworks could be recovered by further excavation.

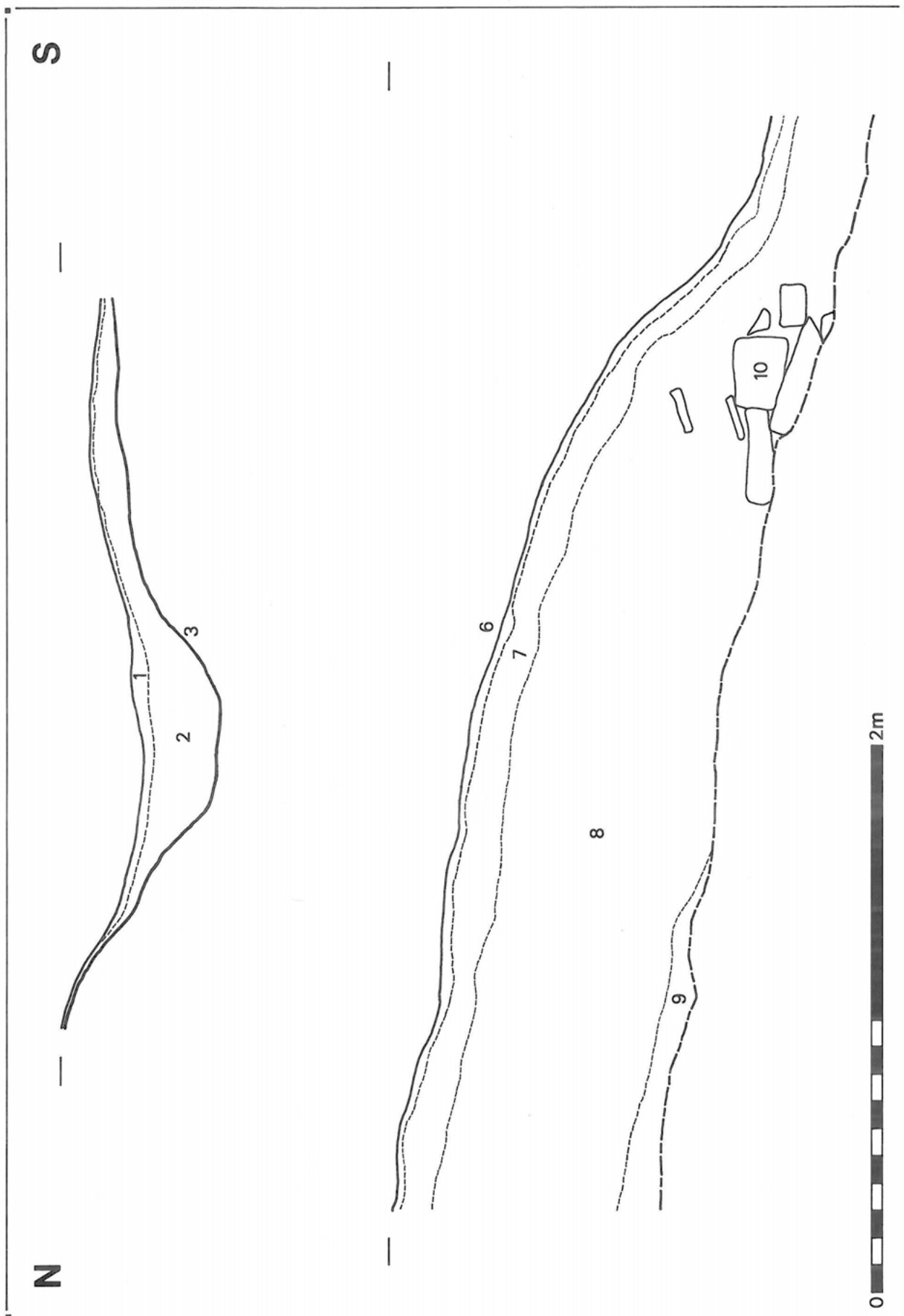
The discovery of the brick-lined water channel and the brick-paved surface during the excavation of the tree-bedding trench indicates that other surface and below-ground features are likely to survive in this area. It is across this area that most of the materials used in the iron-making process would have been carried. It is clearly important, therefore, that there should be wider excavation of this area.

Clearance of the overburden on the calcining kilns revealed new details of their construction, including evidence of the way in which the linings of the kilns were cooled.

In general, the excavations reported here provide an insight into the potential of the site to provide much greater detail of its use and development through more widespread excavation.



**Figure 1:** Location of excavated areas in Bedford Ironworks



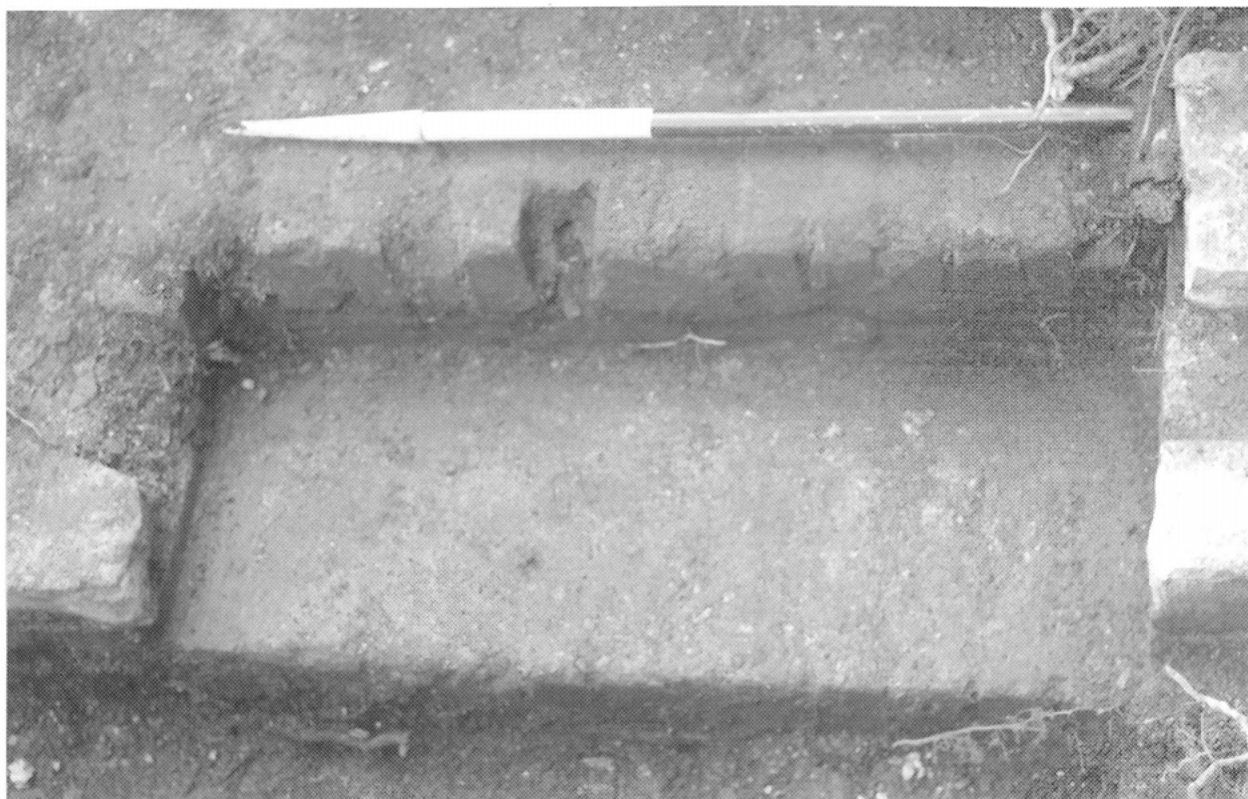
**Figure 2:** West-facing sections of Trial Trenches 1 and 2



**Plate 1:** Wall abutting east wall of casting house, from the south

**Plate 2:** Detail of wall abutting east wall of casting house





**Plate 3:** Detail of brick steps in opening in west wall of casting house

**Plate 4:** Brick-lined gully to south of calcining kilns, (Scale: 0.25m)

