



**A.P.A.C. Ltd.**

Archaeological Perspectives Analysis Consultancy

ARCHAEOLOGICAL

WATCHING BRIEF

WB/AONB3/10



**Angiddy Ironworks, Tintern.**

**Wye Valley AONB**

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22/05/2011



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Cover photograph. The work in progress

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## 1 Non Technical Summary

*On the 4th June 2009, Dr. N. Phillips of A.P.A.C. Ltd was appointed to undertake; archaeological watching brief and site recording procedures during consolidation and conservation work at Angiddy Ironworks, Tintern, Monmouthshire.*

*The archaeological work was commissioned by Wye Valley AONB, with K Biggs as Project Officer.*

*This project forms a further phase of work at the site, in continuing the project, to reinstate the drainage system from the iron works floor; in order that conservation and consolidation of extant structures can be undertaken.*

*The project also covers the delivery of the conservation and consolidation measures themselves.*

*The work to uncover original drainage structures and their reinstatement was, as with prior attempts, partially successful. It is clear that the site now drains; furthermore, a greater understanding of the complexity of the drainage system has been initiated. However, the system is still neither fully understood nor fully cleared.*

*As to the conservation and consolidation measures, these have certainly halted the detrimental decay of the last three decades but the work has highlighted some questions that as yet need to be addressed; concerning earlier building phases that are evident at the site.*

## 2 Introduction

Angiddy Ironworks, SO5200, is situated south of the Angiddy stream, in the steep sided Angiddy valley west of Tintern, Monmouthshire, *fig 01*. If travelling north from Chepstow to Monmouth on the A466, the first left turn after Tintern Abbey is the lane to Llanishen, which after approximately 4 kilometres passes the furnace site.

In February 2005, Monmouthshire County Council; owners of The Angiddy Ironworks, commissioned a Conservation Plan Brief, for both the Clydach and Angiddy Ironworks. The purpose of the brief was to provide a management strategy to promote and preserve these nationally significant, heritage assets.

The strategy compiled considered the site of The Angiddy Ironworks as part of the wider tourism potential in this Area of Outstanding Natural Beauty, (AONB).

*The Conservation Plan was prepared in anticipation of a bid, 'Over looking the Wye', to the Heritage Lottery Fund by a partnership of interested organisations led by the Wye Valley AONB Joint Advisory Committee. This seeks the enhancement and preservation of the key landscape and archaeological features of the AONB, whilst improving the visitor experience through the better interpretation and upgraded facilities.*

(MCC 2005, 5)



The single consultative document was intended to provide:

- *clear guidelines for testing an evaluation of material changes to the site or its structures*
- *Preparing long-term conservation programs for the site and its components.*
- *Making day to day decisions with regard to maintenance and repair.*
- *Drawing up plans to enhance the potential contribution of the site in relation to the local community, the local economy and particularly the Wye Valley AONB.*

(MCC 2005, 6)

In order to pursue these aims, a list of general conservation principles were included in the plan, (MCC 2005, 29-36).

Unfortunately, none of the work proposed for the Angiddy Ironworks site; as laid out in (MCC 2005), was possible due to the presence of standing water over the lower floor. Indeed the presence of the standing water had caused problems as far back as the 1979-81 excavations, where 'full excavation' was impossible due to water levels, (Pickin 1982, 12 & Probert 1982, 26).

To address this problem, two previous attempts by AONB have been undertaken to reinstate drainage of the site, (Phillips, 2007) and (Phillips. 2009b). Both had some success and provided guidelines for this present project.

The outline specification for the present project noted; concerning drainage problems:

*Water ingress onto the site is constant and fast flowing. The aim is to understand the rate at which it is coming in and ensure that it can escape from the site via culverts and channels that are already there rather than stopping the flow, which is unlikely to be achievable and could have major implications on the historic fabric of the dam.*

(Biggs, 2009, 2)*a*

Comparing the 1982 and present day photographs to denote change, it further states that possible causes could be:

*The result of the sand and gravel used on the site in the 1980s washing into the wheel pit and blocking the culverts, although a collapse in the culvert is also likely to be a contributory factor.*

(*ibid*)

Understanding of structural problems noted:

*The standing remains were consolidated after the 1980's excavations using cement based mortar rather than lime mortar which is also causing deterioration in the structures. The structural remains will need to be re-pointed and repaired where cement mortar has failed and has become detached. However this can only be achieved when the issue of flooding has been resolved.*

(*ibid* .3)

The proposed specification therefore identified two stages of work:

*Stage 1 will clear the wheel pit and site, investigate the reason for the site flooding and the cause of the build up of silt and gravel on the casting house floor. This should facilitate drainage of the site through the historic culverts.*



*Stage 2 will involve the consolidation of structures once the site is drier and will also include access improvements to the site.*

*(ibid .3)*

Stage 1 work commenced in June of 2010 and concentrated on the wheel pit, the newly exposed culvert down stream of the outflow, and area K, fig 02.

Stage 2 began from the end of the month as the site became more accessible.

As the site of the ironworks is a Scheduled Ancient Monument, the specification further states that ‘where ground disturbance is necessary for the works this will take place under archaeological supervision’ (ibid, 3).

In accordance with this requirement, all of the clearance and de-silting work was overseen by K Biggs, project officer. The presence of Dr Phillips was only required during excavation of previously unexcavated ground, with the exception of test pit 2 and the bottom of the wheel pit.

Recording for this report was undertaken by Dr N Phillips during excavation work and took the form of measured photography, EDM survey and field notes.

## 2.1 **Location and scope of work**

The Angiddy Ironworks site is a Scheduled Monument, Cadw reference MM197. It is lozenge shaped measuring some 100m by 35m. Work undertaken during this project was concentrated both within the scheduled area, fig 03 and on land south of the Ironworks site, fig 04. The southern area is bounded by the garden of Furnace Cottages and made up waste ground; Cinder Bank, (Phillips. 2008. p20). Cinder Bank separates the culvert from the Angiddy River.

The culvert itself; recorded on Ordnance Survey maps as spring NGR 514.002, is shown to discharge some 200m east, into the Furnace pond NGR 515.002.

The general scope of the work is as stated:

- Observe and comment on the activities during investigations .....
- Record any significant features.
- Give consideration to the thoughts and views of the landowners.

(Biggs.4/7/2010)b

The specific undertaking for Dr Phillips was to:

Conduct a watching brief during excavation of any ground not previously disturbed during the 1979/81 excavations.

To record any significant changes or features occurring as a result of operations to de-silt the water courses or preparation and repair work to the standing structures. ‘Should any new features be visible or changes have occurred in the structural condition since the 1978 excavations, these will be photographed and recorded by Dr Neil Phillips. (Photographs from the excavation archive are available for comparison)’ (OLW (4) 2010-04-07).

Recording of work not involving the ‘excavation of any ground not previously disturbed during the 1979/81 excavations’, was undertaken during watching brief visits; with the exception of two final recording sessions at the end of the consolidation work.





The present work is a third phase of the project for A.P.A.C. Ltd.

To recap:

Phase 1:

In the summer of 2007, Dr N. Phillips A.P.A.C. Ltd, undertook a watching brief at the site of and adjacent to the Angiddy Ironworks, (Phillips. 2007a). That watching brief concerned itself with excavations south of the Devauden/Tintern road which were designed to locate and unblock the outfall of the drainage system, from the furnace site. This phase 1 work was partially successful in that the outfall was located but unsuccessful in that the outfall remained blocked. Furthermore, the blockage was to such an extent as to force the flow of the outfall to run above the original drainage culvert; the culvert itself having been buried in subsequent silting, Plate 01.

The results prompted the following responses from the appointed consultants, OPUS International:

*There is some evidence of a buried culvert running from the casting floor in an easterly direction ...*

*A Pit in the casting floor was assumed to be either on or connected to, the upstream head of the culvert. Attempts were made to rod and flush out the culvert. These operations were partially successful....*

*The site is at present in a reasonably stable condition, as the inflow and outflow are in a state of equilibrium. However, this will not last as the freed up voids will refill with silt in due course.*

*Recommendations:*

*Exploring further downstream end of buried culvert, to expose the headwall, if it exists, coupled with the excavation of the chamber in the casting floor, which appears to be at the upstream end. Ideally, we would then wish to introduce a pipe between the two, thereby providing an effective drainage system to the casting floor.*

(OPUS 29/11/07)

Phase 2:

In the winter of 2009, further work was commissioned on the blocked outfall identified in phase 1, (Phillips. 2009b). The project was originally suggested by local residents J & B Saunders who had succeeded in clearing some of the silt from the blocked culvert. Concerns with the drainage solutions being discussed for the ironworks site prompted Mr B Saunders to produce a proposal for further work, which the AONB funded (Saunders 2009). The ensuing work removed some half a metre depth of silt, from what had been previously been assumed to be a natural stream, to reveal a stone revetted culvert, Plate 02, running for some 80m from the outfall. The water level in the ironworks also reduced by some half a metre, partially draining the ironworks floor. Although, this proved to be a short term solution, Plate 03.

A further day's work; on this de-silting task, was undertaken on the 5<sup>th</sup> June 2010, during the current project. The work was privately funded and resulted in a further drop in the culvert water level, Plates 04 & 05. (Phillips. 2010).



Phase 3:

This present phase again addressed the problem of drainage but this time on four fronts:

- Two more attempts to remove the silt from the outfall length using a mechanical digger.
- Attempts to open the culvert within covered areas to remove silt by both hand digging and the use of pressure jetting.
- Removal of the silt from the wheel pit at the inflow.
- Sandbagging of the river bank.

As well as the drainage issue, the work also required that conservation and consolidation work was recorded so that comparison could be made with the older records of the 79-81 excavation.

## 2.2 Geology and topography

The site is located on the solid geology of the Upper Old Red Sandstone, Tintern Sandstone Group with a drift deposit of Alluvium (OS 1981).

The topography of the site location is a narrow steep sided wooded valley, centred on the Angiddy stream which generally falls in an easterly direction to the Wye at Tintern. The woodland, some of which is owned and managed by the Forestry Commission is a mixture of deciduous and coniferous trees. A broad fire break occurs south west of the site which opens up the aspect of the location.

The site is surrounded by SSSIs and LNRs but is itself not designated

## 2.3 Archaeological and historical background

The general archaeological and historical background to the area is fairly sparse, although it does show early prehistoric human activity within the general vicinity. In the Angiddy Valley however, the record of human activity tends to be dominated by the industrial period, although even this has links; albeit documentary, to the 16<sup>th</sup> century.

Regarding the Ironworks themselves, it is quite revealing to note that a field visit organised in 1947 by the Newcomen Society resulted in failure to find the site, (*Trans Newc Soc 25: 209*) cited in (Pickin 1. 1982). The site in question being the Abbey Furnace, SAM MM197; conversely, now the only site readily visible and presented as an archaeological resource.

The historical background to the site is well documented in Rees 1968, and Parr & Tucker 1976. Rees provides a very detailed account of the *Iron Works at Tintern* with good primary sourcing, whilst Paar and Tucker add flesh to the documentary bones. Monmouthshire County Council, Angiddy Ironworks Conservation Plan, 2005 reworked the information of the first two above whilst a report by J. van Laun Associates in 2005 added more in-depth information on industry within the valley. However, a more easily accessible, general background can be found in *The Water Powered Industries of the Lower Wye Valley*, Coates 1992.

Previous archaeological work undertaken at the site:

In the 1970s, some initial excavation and survey was undertaken by Paar and Tucker which concentrated on the wheel pit and leat, (Parr & Tucker 1975 V9 .2).



Large scale excavation conducted by John Pickin for Gwent County Council between 1979 and 1981(The Historical Metallurgy Societies Journal V16. 2. 1982).

A watching brief at the furnace site and adjacent property belonging to Furnace Cottages to investigate the drainage system for the Iron works. Contracted by AONB (Phillips, 2007a).

A test pit evaluation programme of the leat systems Contracted by TAP (Phillips, 2007b).

A desk based assessment of the Angiddy valley and environs concentrated 100ms each side of the Ironworks and leat systems from Beaufort to Furnace ponds. (Phillips, 2008).

A test pit evaluation programme of the leat systems Contracted by TAP (Phillips, 2009a).

A topographic survey and geophysical survey encompassing the area south of the site, (Phillips, 2009c).

A de-silting of the culvert south of the outfall. (Phillips, 2009b).

A second de-silting of the culvert south of the outfall. (Phillips, 2010).

### **3 Aims and Objectives**

#### **3.1 Watching Brief**

The aim of the watching brief was to preserve by record, within the resources available, any archaeological deposits uncovered during groundwork.

The watching brief would ensure that: in the event of archaeological resources of significance, being discovered requiring treatment beyond the remit of the watching brief; then steps would be implemented to ensure that their treatment would be undertaken within the standards recommended by the IFA.

The outcome of the watching brief will be presented in report form and two archives of the data will be digitised. The primary archive will remain with A.P.A.C. Ltd and a secondary archive will be kept at Monmouth Museum.

### **4 Watching Brief Methodology**

#### **4.1 Fieldwork**

The watching brief consisted of an archaeological fieldworker being present during groundwork at the site, whenever the ground being excavated impacted on undisturbed, pre-1979-81 horizons.

Most groundwork was undertaken using one of two, tracked mini diggers fitted with a range of toothless buckets. The toothed bucket was only used during culvert clearance; outside of the scheduled area.

Other ground work included high pressure jetting and some hand excavation.

#### Culvert, fig 04

Clearance work in the culvert was undertaken to reduce further the water level at the outflow, Plate 05, on the iron works floor, Plate 03, and the head of water backed up in the wheel pit, Plate 07. Earlier attempts to do this had been successful but limited due to the constrictions of working within the culvert itself.



The new groundwork along the outfall culvert was accomplished by reaching down from a prepared track along the south side of the culvert. The further de-silting was accomplished using a non toothed grading bucket and a longer reach mechanical digger.

Further work was undertaken from within the stream at the southern end, extending the gradient of flow.

The clearance silt from the stream bed was deposited on the southern bank.

More excavation was undertaken along the south of the cottage culvert outfall in order to expose the covered section, Plates 08 & 09. Once the covered section was exposed a set of cores were taken to access the inside of the culvert as an aid to de-silting,

De-silting work was undertaken using high pressure drain clearing equipment and hand tools, Plates 10 & 11.

#### The Iron works Area K figs 03, 05 & 06

Excavation of test pit 1, Area K, was undertaken to find the route of the culvert beneath the floor of the iron works, Plate 12. The top inset fig 06, shows the position of the test pit overlaid on a portion of the 1979-81 site drawing, (Pickin 1982). It was hoped that test pit 1 would allow access to the culvert in order to de-silt it with a pressure washer.

The test pit was excavated with a toothless bucket to the level of the archaeology. At this point, the features discovered were cleaned off with a shovel and then trowelled for recording, Plates 13 & 14.

After recording, the capstones were lifted from both exposed culverts. The dry western culvert, was excavated with a trowel, Plate 15 whilst the northern culvert, was excavated with hand tools and pressure washing, Plate 16.

Test pit 2; an attempt to locate a further length of culvert, was excavated by mechanical digger. Very near to the surface, the excavation impacted on known archaeology; possibly 183 or 185, fig 05, and as a consequence, work was halted. Dr N Phillips was not required to be present for this work and so the pit was not recorded or accurately located, Plates 17, 18 & 19.

#### The wheel pit

The wheel pit was excavated by mechanical digger and use of hand tools Plate 20 & 21. As the silt removed did not impact on the pre-1979-81 archaeological horizon, Dr N Phillips was again not required to undertake a watching brief on this work. The work was covered by K Biggs, project officer.

## 4.2 **Recording**

Recording in conditions where excavation is undertaken in confined spaces and mostly underwater is very difficult as visibility is often impossible and the excavation itself constantly changing.

Health and safety issues also dictate what can and what cannot be done.

Speed is of the essence in these conditions and as such, recording becomes mainly an accurate photographic record.

Recording therefore was undertaken using scaled photographs, all of which were given a unique number and listed in the archive of this report. The archive includes a digital list of all the photographs.



Wherever possible, and with due regard to health and safety issues; features uncovered were cleaned back to provide a reasonable surface for photographic recording.

Where necessary, features of interest were surveyed using a Topcon GPT 3007, reflectorless Total Station. The raw data was initially processed in CivilCad 6, imported to Autocad 2000 and converted to Illustrator format for final presentation.

All features uncovered were given a brief description in the site log. Any observation of interesting or anomalous data was also recorded for later interpretation.

#### 4.3 **Finds**

As mentioned above; excavation undertaken mostly underwater in confined spaces is very difficult. In the case of finds, their retrieval from buckets of mud and water from the spoil heap is fairly fruitless and of limited value as regards context.

In the case of the test pit 1 excavation, there were no finds.

### 5 **Watching Brief Results**

#### 5.1 **Soils and ground conditions**

Work on the site was conducted over a 10 month period, for the majority of the time in favourable conditions although there were periods of inclement weather. However, the biggest problem during this undertaking was the necessity of digging in the water. Obviously, this would have made observation difficult no matter what the prevailing weather conditions were but it serves as a good reminder of the complications of excavation underwater.

A further complication of this undertaking was the restricted access of most of the excavation. The open culvert itself which did not allow for the spoil to be removed very far from the stream bank, and the depth at which the digger had to delve, coupled with the height to which the digger had to reach to deposit on the bank, resulted in a fairly unstable spoil heap of wet silts and gravels. This unstable mass further complicated access to the stream for recording.

Discussion with ground staff and the visual impact of the work at the wheel pit also suggested that this work was quite difficult, and again not easy to record, Plate 22.

#### 5.2 **Description**

##### Culvert, open section

Prior to de-silting, the stream below the culvert appeared to be a <0.25m deep, naturally eroded, channel through the surrounding ground, (Phillips 2009b). With the exception of a single course of rough dry stone walling on the east bank; some 40m downstream from the culvert, there was no reason to suppose otherwise. However, as the silting was removed sections of dry stone revetment became apparent on both banks, in some places standing around 1m high.

The best preserved area of revetment uncovered was the roughly 20m section adjoining the southern end of the covered culvert, fig 04 (revetment section 1). Fig 07 shows a photo merged view of both banks along this section; with appropriate scale. The merged images consist of photograph sequences



DSC08832-DSC08842; North bank and DSC08844-DSC08858; South bank. Archive disc1. The construction is of roughly faced and squared blocks of local sandstone.

Further downstream, the remains of the revetting are less well extant, existing in isolated stretches none of which remain to original height, fig 04.

Revetment section nos:	Length of section	Width of culvert
1	20 metres	0.6m -0.8m both sides intact
2	4 metres	
3	1.7 metres	0.7m both sides intact
4	4 metres	
5	2.5 metres	
6	1.4 metres	
7	2.1 metres	
8	5 metres	1.4m both sides intact

Revetment 2 is unique to both sides as it was built as a curve, Plate 23. It runs for just under 4m and starts just below the small stream from the west. Unfortunately, there are no remains on the east bank to suggest a purpose for the curve or even the width of the culvert at this point.

Revetment 5 is also unique in that it contains a section of mortared wall, Plate 24. The mortared wall is to the right of the ranging rod. To the left of the ranging rod are the remains of the underlying dry stone revetment.

Fig 04 also shows a selection of cross sections through the culvert.

With the exception of some stone slab fragments between revetment sections 1 & 2, the debris removed from the stream were mainly red sandy silts with rounded gravels and some blue and green furnace slag. One area of compacted sand stone was found close to the junction with the side stream mentioned above. This material corresponds to the natural bedding planes noted in sections of the leats above the furnace site and below the Furnace Pond in evaluation trenching (Phillips 2009a).

No finds were recovered during the de-silting operation but in such conditions finds recovery is very unlikely.

The covered section of culvert will be described in two easily discernable building techniques, each possibly indicative of phasing; certainly indicative of design.

#### Culvert, covered section

The exposed portion of the covered culvert, starts from the outfall at the cottage, figs 02 & 04 and continues south east, for just over 16m, to the open culvert.

Adjacent to the existing cottage wall, the top of the culvert is some 2.2m beneath ground level, Plate 25. The internal depth of channel at this point reaches a further 0.9m and encloses a width of 0.5m.

At the southern end of the covered culvert, the ground level itself reduces by about 1.5 m with the top of the culvert at just less than 1m below that, Plate 26. The culvert here is just less than 1m wide and has been measured to 1m deep, but the bottom has not been confirmed.



Construction of the culvert is in two distinct parts with the upper section covered by sandstone capstones, Plate 27, and the lower, southern section covered with a mortared shallow arching of rough squared sandstone blocks, Plate 28.

Plate 5 also shows the level of the silting within the culvert before work commenced. It should also be noted that the silt contains none of the gravel, anticipated in the design specification, *above*.

At the point where the difference in construction occurs; a course of masonry has been butted up to the existing walls, narrowing the gap. This can be clearly seen in Plate 28, which shows the start of the capstone roof; centre picture, with the wall addition to the left. Plate 29 shows a closer view of the capstone and wall abutment, whilst Plate 30, taken from the same position, shows the next wall addition, this time from the right.

The construction feature is also evident at the exposed excavated sections, where capstones have been lifted. Plate 31, shows a view of a section of exposed culvert with an entire butted section of wall, seen as a bulge along the right hand side. The bulge can be seen starting from below the first akrow prop and ending just in front of the outflow beside the cottage wall.

Plate 32, shows a vertical view into the culvert during pressure washing. At the top left hand corner of the culvert can be seen a curved stone bulging out from the edge. The bulge shown is the one noted in Plate 31, 'starting below the first akrow prop'. The stone presumably forms a platform for the capstone.

Inspection of the curved stone revealed it to be worked and formed into a quadrant of a circle. It is likely to have been re-used from some other purpose when the original culvert wall was adapted to take the capstone construction. Interestingly; one of the capstones from this area carries a masons mark, Plate 33

The other side of the culvert bulge referred to in Plate 31, can be seen in Plate 34. The view shows the bulge 'just in front of the outflow beside the cottage wall'. In this instance, the butt joint has been constructed with size graded stone to form a curve and thereby reduce any impediment to the flow of water which would cause turbulence leading to erosion of the structure. Further evidence that this is an addition to, rather than an original construction.

Another reduction in culvert width can be seen at the outflow by the cottage, Plate 31. A whole section of culvert wall can be seen to butt up to the cottage wall. The outfall itself is the small square hole, bottom centre of the wall; effectively narrowing the culvert to around half width. The adjacent cottage wall was found during earlier excavation to be rendered at this level, therefore presumably, originally above ground (Phillips 2007).

Internally the west abutment appears to run the full length of the cottage; along what would be its eastern wall, Plate 35. The plate shows the view north along the culvert; the cottage would be to the left. At around some 6/7m along the culvert the abutment changes to the west wall Plate 36, visible just above the end of the silt bank.

Beyond the reach of the cameras flash, Plate 36, the capstones can be seen to reduce in height and the culvert would appear to turn to the left. The position of the turn would be under the road but this could not be verified.

One final point of note can be seen in Plate 29. At the extreme left of the photograph can be seen a vertical edge of three faced stone blocks. The edge does not appear to be respected in the roof construction but does mark a position on the surface where there is a boundary bank and slope. The boundary is recorded on the 1881 Ordnance Survey map as a walled area belonging to the cottage Fig 08. The inset shows part of a topographic survey of the area in 2009. The surface bank, relating to the 1881 boundary wall is shown in grey with top and bottom of the bank marked in dotted lines, (Phillips 2009c).



### Test pit 1

The reason for excavating test pit 1 was to gain access to the culvert in between the outfall and the inflow in order to open, a mid point opportunity, to access and clear any blockages. The position for test pit 1 was chosen because of previous work in 2007, which had opened drainage holes to the south west (Phillips 2007b) and unfortunately; over the intervening years, these holes had been further eroded by water draining from the site. The problem was made more acute when one of the holes was purposefully widened for some undocumented reason.

There was concern that since the passage of water through the underlying fabric of the ground had been introduced, and then increased, there was likely to be an increase of damage on any underlying archaeological resources, as well as the detrimental effect on the stability of the ground.

Therefore, invasive investigation at this point could address a series of problems and provide their solutions.

Furthermore, a flow of water through a culvert could be seen adjacent to the point chosen; within drain chamber, 204, figs 03, 05 & 06, Plate 37.

The excavation was set out at 3m x 3m to the SW of drain 204. The mechanical digger first removed the overlying vegetation and around 0.25m of soil and gravel; associated with the restoration work of 1979/82.

Beneath this was a 0.2m layer of orange brown, coarse sandy silt with some dark red and dark grey staining, Plate 13.

Along most of the west side of the trench, was the rough stone work of the raised drain, 204. The top 0.2m of the drain structure was cemented and fairly vertical in section but beneath this the structure became mortared and extended outwards into the trench, Plates 13 & 38.

Along the eastern edge of the test pit, the mechanical digger uncovered another wall, 196. This wall was less than 0.2m below the surface was constructed of small squared slabs. As the photograph shows, Plate 39, the wall had been constructed with a small vertical recess. The recess measures 0.08m x 0.35m and was measured to a depth of 0.9m at which point it passed below the limit of excavation, fig 06, Plate 15 & 39.

The recess also feeds into a covered culvert which runs at a slope of 1:17, from under wall 196 to drain 204, where it empties, from above, into the wet culvert, fig 06, Plates 37 & 38.

The culvert was covered with flat slabs of sandstone, mortared into place over a stone lined channel, fig 06, Plates 38 & 39. Excavation of the channel, Plate 40 & 41, revealed a fill of fine grained silt with some red and grey staining to a depth of 0.02m. A small test pit within the channel revealed a further 0.19m of black, compacted, ferrous, silt before a surface of coarse compacted silt was reached, Plate 42. At this point, the excavation stopped to remain within the remit of the watching brief.

As the test pit had not found the culvert and as the northern edge of the excavation had encountered no structures, it was decided to extend the test pit to the north in order to continue the search for the main culvert, fig 06, Plates 14, 43 & 44.

With the exception of the included north edge of drain 204, Plate 43, the fill removed from the excavation of the test pit extension was remarkably sterile of finds. The ground itself was very unstable and which made it impossible to make any in-depth recordings. Plate 45, shows the nature of the fill; some 1m in depth with a red and black band at the top; associated with the 1979/81 conservation measures. Beneath is a saturated matrix of stone and red silty sand.





Once a central area within the test pit extension was made safe from collapse from the saturated trench edges, a section of the culvert was cleaned off and recorded, Plate 44.

The three capstones uncovered were mortared in place. The central capstone was lifted to reveal the dry stone lined culvert beneath, Plate 14. On inspection, there was a slow flow of water through the culvert, the level of which was about 0.2m from the roof, Plate 46. After some clearing and pressure jetting, it was possible to reduce the level of the water to about 0.5m from the roof. Plate 47 shows the maximum drop in level achieved; the orange staining revealing where the original silt level had been. At the time of recovering the culvert, the depth of the culvert was thought to be around 1m.

A final attempt at pressure washing the remaining silt through the culvert was made by jetting from the wheel pit hutch. On this attempt, the jet head was successful in advancing beyond the drain 204 and its passing could be clearly heard from the drain chamber. Unfortunately, it completely bypassed the culvert opening located in test pit 1.

### Test pit 2

The reason for the excavation of test pit 2 was to gain another access point within the culvert, between test pit 1 and the wheel pit. The reason for this further excavation was to investigate the reason why the pressure jet; inserted from the wheel pit, had bypassed the drain, 204, without passing along the exposed culvert in test pit 1.

Interestingly, height readings taken at various points along the culvert gave the following levels:

the wheel pit hutch	50.168
drain 204 (IC)	50.589
the cottage outfall	50.476
lower culvert outfall	50.463

The discrepancy in the flow gradient; shows the inflow at the wheel pit to be 0.295m lower than the outfall. Of course, it is not possible to confirm that the bottom of the culvert had been reached through the silt but it does tend to throw some doubt on the presumed course of the culvert.

Positioning for the pit was based on the calculated intersection of a projected extension of the culvert from test pit 1 to a projected extension of the culvert from the hutch in the wheel pit. This is shown on the left plan in fig 09. The extensions were planned by extending the line of the known east wall of the exposed culvert in test pit 1, and an extension of the known west wall of the culvert from the wheel pit hutch.

The western extent of the test pit was proposed to run from the set of stones shown in Plate 48, which would place most of the excavation along the raised bank and away from the known archaeological resources of 183, 185 and possibly 184, fig 05.

The probable position of test pit 2, assessed from photographs, Plates 48, 17, 18 & 19, is shown in the second plan, Fig 09.

From discussions with K Biggs, it seems that the shallow test pit impacted on archaeological resources just under the topsoil and so the excavation was halted and the trench backfilled. Plate 19 does show three distinct areas of masonry.

In superimposing the 1979/81 site drawing over the modern survey, left plan fig 09, it is possible to explain the masonry uncovered, as part of the recorded features 183 and 184 or 185, fig 05. The assumption cannot be verified as the exact position of the test pit was not recorded and the drawn site plan (Pickin 1982) does not accurately match the modern survey.



The position of the trench shown differs from the proposed position by around 1m to the south west. If the interpretation is correct then the test pit just missed the east edge of the culvert.

## 6 Recording work methodology of the standing remains

### 6.1 Recording

The recording work on the consolidation and conservation of the standing structures was required to be undertaken 'should any new features be visible or changes have occurred in the structural condition since the 1978 excavations...' (OLW 2010-04-07). Unfortunately; with the exception of a final specific recording visit in May of 2011, such recording was required to be made during site attendance for watching brief duties.

Within these restrictions, each opportunity was taken to preserve by photographic record the various changes that the standing remains underwent during consolidation and conservation work.

As stated in the archaeological brief, (*ibid*), it is hoped that comparison with photographs from the original excavation would be used to record any changes.

The recording method was undertaken using scaled photographs, all of which were given a unique number and listed in the archive of this report.

Primary archives including original and annotated copies of the entire photographic range will be deposited with various bodies, (*see below*).

Wherever possible, and with due regard to health and safety issues; features uncovered were cleaned back to provide a reasonable surface for photographic recording.

Where necessary, features of interest were surveyed using a Topcon GPT 3007 reflectorless Total Station. The raw data collected was initially processed in CivilCad 6, imported to Autocad 2000 and converted to Illustrator format for final presentation.

All features uncovered were given a brief description in the site log. Any observation of interesting or anomalous data was also recorded for later interpretation.

Where necessary; to illustrate changes in the structure, scaled photographs were processed to remove perspective and lens distortion and drawn as digitised line drawings.

This enabled comparison to be made between original records from the 1979-81 work and the present undertaking.

## 7 Recording results of work to the standing structures.

### Wheel pit.

Work on the wheel pit began by removing the railings and building a ramp on the south east side, Plate 22. This allowed access for a small tracked mechanical digger to straddle the wheel pit using two road plates, Plates 22& 49.



From this elevated position, it was possible to reach into the wheel pit and remove the silt that had collected since the 1979-81 work. No finds or new features were reported during this work but then the remit was to remove only the silt and to stop above the previously unexcavated levels. As no archaeological resources were impacted upon, the requirement to record was not actioned and so the record of some areas is a little sparse.

Further work on the wheel pit was accomplished with pressure washing equipment. Water ingress was addressed with sandbags placed along the adjacent river bed and constant pumping.

Comparison of Plates 50 & 51 from the 1979/81 excavation; with Plates 20 & 21 taken during clearance work, show that there had been remarkably little change to the structures. One possible exception being the squared off channel in the north wall, through which the water enters, fig 10, Plate 52.

A general view of the wheel pit after the consolidation and conservation work had finished shows a very much more coherent structure with a noticeably lower water level, Plate 53. The top of the wheel pit has been squared off and an inset row has been added to the west edge, clearly identifying the new repair work.

A feature of a narrow ledge; mid height, on the south west side of the wheel pit is also more apparent, now that it has been cleaned and repaired, Plates 50, 51, 53 & 54.

On the south east edge of the wheel pit a construction feature not mentioned in the Pickin report is now clearly recognisable, Plate 5408813. The construction phase shown is a butt jointed wall which stands on three courses of rough masonry blocks which form a slope into the wall. It is possible that this was a former access way into the wheel pit.

At the north west corner of the wheel pit it was possible to confirm that there had been no change to the outflow hutch. Plate 55, shows its condition during the original excavation and Plate 56, shows it during de-silting with the pressure jet. One of the wooden beams recorded on fig 10 can be seen *insitu* top left, Plate 56. A probable return jam for the post can be seen top right of the photograph. At the bottom, the pressure jet hose can be seen running under the capstone to the culvert.

Plate 57,, shows a view along the hutch culvert under the capstone shown in Plate 56. The silt at this point is around 1m deep. The capstone roof to the culvert can be seen to be in a poor state of repair which can only be expected to get worse, if not attended to.

One casualty of the consolidation work has been the loss of some of the scouring detail caused by the water wheel to the wall of the wheel pit. Fig 10 shows the amount that was recorded during the 1979/81 excavations; bourn out in Plate 58 SC043. After consolidation work, some of the detail has been lost as can be seen by comparing Plates 58 and 59.

#### Upper Wheel pit housing

The upper surrounds of the wheel pit before the present work began was in a very bad state of repair, as has been shown in Plates 07, 22 & 49. Once clear of vegetation a comparison can be made between the excavation photographs of 1979/81, Plate 60 and 61. Such a comparison identifies areas where restructuring had been undertaken; particularly along the wheel pit edges and the construction of the barrelled buttress Plate 62.

Plate 63, shows the final consolidation work and again clearly identifies changes that have taken place to the structure. Worth noting, is the re-interpretation of the some of the features to create more rounded and flatter structures. The sequencing shown in fig 11 illustrates this quite clearly.



The original drawing 1, shows a schematic sketch of the north corner of the wheel pit. Identifiable are the wall base 111 with its position in relation to the later back wall 210 and the angular edge of 112.

The photographic recording undertaken in September 2010 Plate 61 from which fig 11, 2, was drawn; shows feature 111 has not changed much but 112 is less well defined. One in the sequence of vertical photographs taken to record this area during clearing; shows the area of 112 as a jumble of mortared and loose stone Plate 64.

At the end of consolidation work fig 11, 3, the area 112 has been established and constructed as a raised rectangular platform abutting wall 111. Although it is likely that the raised structure is the remains of the final support for the raised launder; the path of the launder, which is shown in fig 02, would suggest caution. In particular, the angle between 119 and 112 which would be indicative of a sharp turn in any supported launder. In addition, the large stone jutting out from the south corner of the raised base throws some doubt as to the full extent of the original structure at this point Plate 63.

In the case of base walls 111 & 110, the photographic record shows that these have remained undisturbed throughout the present work, figs 02, 05, 09 & 11. They have also retained their mystery. Described by Pickin as:

*Two walls (110,111) were also examined that ran N-S and E-W respectively beneath the N.W. outer wall of the later pit, and which had been used by it as a secondary foundation layer; they were not excavated to their full extent and no functional interpretation could be made although it was apparent that their orientation was completely out of alignment with that of the later pit*

(Pickin 1982, 31& fig 08)

At the end of the current work, no addition to the interpretation can be made but it is fortunate that the consolidation processes have not impacted adversely on the structures but rather have preserved them for future investigation.

The record however can be updated with the additional information:

Base wall 111 is exposed for a distance of 3.7m, running from walls 210 & 115, fig 05, after which it continues a further 1.4m under 209, where it creates the undercut which prompted the 1979/81 construction of the supporting barrel buttress, Plates 65 & 66. Base wall 111 forms an 8 degree angle at its intersection with later wall 209. At the north end, it has a 0.55m width measured perpendicularly from 209 whereas at the south end, it undercuts by 0.12. It should be noted that the extent of the undercut has been obscured by the 1979/81 barrel buttress, Plates 62, 67 & 68.

Base wall 110 at the south west corner of the upper wheel pit fig 05 Plate 69, runs for some 2 m intersecting and undercutting 118 at a 7 degree angle. It is some 0.23m wide at the southern extremity and undercuts by 0.18 at the barrel buttress. A view of its intersection with 106/7 the south wall suggests, that the latter is an addition with 110 pre-dating it Plate 70. Of course, the base of 106/7 would also tend to suggest that the entire wall was later than the wheel pit.

Another interesting feature which came to light during clearing work, was the north west wall above the wheel pit; originally described as 'an evenly coursed sandstone retaining wall in three structural sections (118), (209) (210)... (Pickin 1982. 35 & fig 08).

Figure 12, gives a series of drawings of the 3 section wall with original annotation.

The first drawing is that of John Pickin. It is not clear if the diagram represents the entire remains of the wall at that time or whether it was made to highlight the two vertical butt joints.



Drawings 2 and 3 represent stages in the present work. 2 at a point in September during 'raking out' and clearance, and 3 the final form of the consolidation work. All three drawings share the same scale and are aligned aa, bb; to aid interpretation.

The general lack of difference between the drawings; notwithstanding the caveat of the extent of the original drawing mentioned above, is encouraging as regards impact of not only the present work but also the intervening years of erosion. There are some minor differences in some of the stonework but this relates to patches of cement render obscuring edges prior to raking out.

The surprising outcome however, is the lack of description and interpretation given to the wall. It is known that work on this was done during a period when Pickin was absent (Pickin *pers comm.* 2010).

Plate 71 shows a long view of the site at some time in the summer of 1979. The person is standing on the east side of the wheel pit and behind her is the 3 section wall (118), (209), (210), referred to above. Work had also started on the building of the barrel buttress also referred to above, and base wall 111 can be seen at shoulder height running from the right of the wheel pit enclosure to the gap in the wall 118/209.

Close up photographs of the gap in 118/209, Plates 72 & 73 show that excavation had taken place revealing within; a set of steps. The former gap had therefore been an access point to and from the wheel pit, and the description of a three section wall a little misleading. Plate 74 shows the gap at some point prior to excavation in 1979, an interesting difference with that of plate 67 taken when the wall was first cleared in September 2010.

Furthermore, beyond the wall, and possibly obscuring the steps, are the remains of laundry support 119 and in the distance 118, figs 02 & 05, Plates 72, 73 & 75. The position of the laundry supports, and the photographic evidence would tend to suggest that the laundry had been built at a time when this entrance was no longer in use. Pickin records that the area west of the wheel pit was made up ground at the time when the culvert was realigned to the new laundry (Pickin 1982. 21, 22).

Another feature which escaped detailed interpretation is that of 115 fig 05 '...a set of steps butt-jointed to (210) and connecting with (114) by a cross wall (153), (ibid., 35). Unfortunately, there are few photographic records of this feature with which to compare changes. Probably the best would be Plates 76 and 77 which are not very detailed. The feature is still discernable now, if you know where to look.

The final feature of interest within the wheel pit enclosure was a previously unrecorded plank of wood set into the upper floor of the wheel pit edge 113. Unfortunately, although its occurrence was noted to the project officer, no action was required to further investigate or record it before it was covered over.

It was fortunate that interest was expressed by a local resident Mrs Saunders, who kindly photographed this potentially important archaeological resource.

The following sequence shows the work to remove the overburden prior to the discovery of the plank Plate 78. Plate 79 shows the position of the plank in relation to known surroundings; for any future investigation. Plate 80 establishes the size of the plank against a 2 inch WHS trowel. Plate 81 shows some of the grain detail including the impression left in the mortar underneath.

#### Enclosure 155,157,158.

In the Pickin report, the three sided enclosure 155,157,158, is briefly mentioned in an association with Building E. Along with its inclusion on fig 08 page 27 its is given nothing more than internal measurements and alignment, (ibid. 32& 40). Only one photograph was available of the work done in this area during the 1979/81 excavation, and that is centred more on the blowing house, E, in front of the enclosure, Plate 76, than the enclosure itself. The presence of the akrow props within the enclosure, Plate



76, would indicate that the structure must have been deemed unstable which would account for its having been backfilled.

Present work on the enclosure involved the removal of the backfill and re-pointing of the walls. From the limited evidence for comparison, there would appear to have been no change to the structure of this enclosure, Plate 82.

#### 224

The feature 224 was described as a drain of neatly pitched stone with a small retaining wall (225) on the slope side...with a slope of 12 degrees SE , ... Having no functional connection with any other structure it probably acted as a drainage gutter for rainwater from buildings H and J, (ibid. 42).

There are no early views of the drain for comparison but Plate 83, reveals its condition at the beginning of clearance work in July. The stone slabs had been cemented over the cobbled area obscuring it from view. Plate 84 shows a later view, once consolidation had been completed.

At the southern end of 224, some clearance to accommodate pointing work was undertaken and uncovered an area of cobbled surface. This has been left open to view Plate 85.

#### Furnace

Consolidation and conservation work on the furnace was another instance where lack of disturbance to undiscovered archaeological features was felt to be unlikely. Therefore recording of change was only undertaken at opportune times.

For comparison, a good photograph of the furnace during the 1979/81 excavation can be seen in Plate 86. The photograph shows west wall 148 with part of the hearth area at the bottom. The excavation report records:

*The lining was made up of neatly dressed blocks of sandstone with an average size of 0.6m by 0.3m, and irregular patches of brickwork were observed amongst the masonry which possibly represented small scale repair work. Both the stone and brickwork were vitrified and some portions of the lining were completely obscured by a coating of green blue glassy slag some 0.1m thick. The lining was set against a compacted layer of coarse yellow sand (215) which showed signs of having been subjected to heat which formed a buffer layer between the lining and the inner fill (213) of the main furnace square...*

(ibid. 33 & 34).

Two annotated diagrams of the furnace figs 09 & 10 (ibid. 29 & 30), have been reproduced in Fig 13.

Photographs taken at the end of clearance work illustrate some changes, although, it is not clear if these are a result of consolidation work or weathering. Plate 87 is taken in almost the same direction as Plate 86. Comparison shows that the blue/green glassy slag is no longer present neither is the burning to wall 148. There also seems to be a more defined line of repair brick, which did not exist on the earlier photograph.

#### Buildings F & G.

Another instance where consolidation and conservation work was deemed unlikely to impact upon any previously undiscovered archaeological resources. Again, recording was under taken during opportune visits. Unfortunately, in this instance there were no earlier photographs for comparison.



Plate 88 can therefore only serve to record the final condition of the building after consolidation and conservation had taken place.

On the left of the photograph, the upper ranging rod stands on the right side of a square recess, interpreted as a former window and predating the ground build-up connected with the construction of the later launder.

To the centre of the photograph is a fireplace and chimney. At the top of the chimney is a flu opening which leads down to the top corner of the window mentioned earlier.

There is no sign of the thick coating of lime plaster mentioned in the 1979/81 report, (ibid. 38).

#### Terminal pond.

The final part of the work addressed the southern section of the terminal pond; in particular, features: 42, 43, and 44, which had been interpreted as a sluice system (ibid. 22). Again, not considered to be likely to impact on previously undisturbed archaeology, its recording was quite minimal. With only one photograph from the 1979/81 excavation, Plate 89, and no photographs prior to consolidation and conservation work, there is little opportunity to estimate any change. Plate 90 gives some idea of the work to this area at the end of the consolidation and conservation work.

## 8 Discussion and Interpretation

### 8.1 Reliability of field investigations

The watching brief was conducted in difficult conditions, usually involving mud and water, in very restricted excavations. This will have had negative consequences on the accuracy of the recording. In addition, working under shallow water did not make observation very easy, with archaeological resources being identified on the spoil heap rather than *in situ* or by the sound of their discovery on contact with the bucket of the digger. That said; investigation of the spoil deposits and excavated sections, where possible, revealed that the lack of finds was representative of the archaeology and not the watching brief process.

With the standing structures, the nature of the limited field work requirement meant that the success or failure of recording changes only became evident during the post-processing. It was not possible to record changes before, during an after with any controlled intent or pre-planning. The outcome was that a spontaneous blanket covering of photography had to be employed which has obviously had consequences in the report and archive creation.

That said, with certain misgivings concerning: enclosure 155,157,158, furnace, buildings F & G and the terminal pond, the recording work has managed to provide a qualitative record of change to the site.

### 8.2 Interpretation

Resulting from the work undertaken on the culvert to the south of the road there is no doubt that this is a major part of the drainage system from the furnace site. Work within the furnace site at test pit 1 does however; establish that it is not the only drainage system.

It also remains to be seen if the flooding problem has been solved; bearing in mind that it has been a very dry year so far, and the sandbags have not been removed from the river yet.

In addition, although a vast amount of silting was removed from the drainage system there is arguably much more left, and this itself, will collect more. Conversely, the increased water flow through the culvert



will affect the silt deposits, dispersing, moving etc. Such an increase in flow could create problems in areas of culvert where the capstones are cracked and already sagging.

In the case of the structural work across the site, there is every reason to believe that the work has stopped the decay resulting from the incorrect consolidation undertaken during the earlier 1979/81 work.

Arguably, the inevitable re-construction has produced some slight changes but as they have been recorded, they should not adversely affect any future interpretation work.

### ***Finds***

The only find retained is a partial leather shoe which was removed from the spoil taken out of the lower culvert. At the time of writing the report, the find had been given to the project manager who had it in storage awaiting conservation work.

## **8.3 Overall interpretation**

The work would appear at this point to have been a success in that the decay of the Scheduled Ancient Monument has been stopped and its presentation made more conducive for public display.

Whether the work will have lasting benefit remains to be seen, as the problem with water ingress has not yet been solved but merely postponed.

Work on the drainage system and the comparison work conducted during the report have added considerably to our knowledge of the site. Knowledge which will be retained in a comprehensive archive for future work and interpretation.

## **9 Acknowledgements**

I am indebted to Mr and Mrs Saunders for access to their land and their wealth of knowledge about the site. My appreciation to AONB for allowing me the opportunity to take part in the work. Thanks to Ascend, Darren, Tom, Howard and Jeff, for going that extra and very wet mile and Richard for his can do spirit with the digger. Lastly thanks to Kate for shouldering the burden of project management.





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**ARCHIVE COVER SHEET*****ANGIDY IRONWORKS, TINTERN***

Site Name:	Angidy Ironworks
Site Code:	WB/AONB3/10
PRN:	-
NPRN :	-
SAM:	-
Other Ref No:	A.P.A.C. Ltd Report No. 107
NGR:	SO 51415 00236
Site Type:	Industrial
Project Type:	Watching Brief and recording
Project Officer:	Neil Phillips
Project Dates:	June 2010
Categories Present:	N/A
Location of Original Archive:	A.P.A.C. Ltd
Location of duplicate Archives:	Monmouth Museum
Number of Finds Boxes:	N/A
Location of Finds:	N/A
Museum Reference:	N/A
Copyright:	A.P.A.C. Ltd
Restrictions to access:	None

Digital Photographic Record

Photo No	Date	Time	Camera	JPG	Size	MB	Area	View	Description	Drawing
DSC05908	21/12/2009	11.09	DSC-F828	√	2592x1944	2.4	S road	NW	View of culvert resurgence prior to de-silting (WB/AONB2/09)	
DSC05935	21/12/2009	13.04	DSC-F828	√	2592x1944	2.2	S road	NW	View of culvert resurgence after de-silting (WB/AONB2/09)	
DSC07594	04/06/2010	8.09	DSC-F828	√	2592x1944	2.6	S road	NW	Culvert beside cottage showing level of water (WB/JB/10).	
DSC07595	05/06/2010	9.12	DSC-F828	√	2592x1944	2.3	S road	SE	Culvert beside cottage showing level of water (WB/JB/10).	
DSC07596	05/06/2010	9.12	DSC-F828	√	2592x1944	2.3	S road	SW	Silt dump at the wheel pit	
DSC07597	05/06/2010	9.13	DSC-F828	√	2592x1944	2.4	S road	SW	Silt dump at the wheel pit	
DSC07598	05/06/2010	9.13	DSC-F828	√	2592x1944	2.4	S road	SE	Silt dump at the wheel pit	
DSC07605	05/06/2010	13.03	DSC-F828	√	2592x1944	1.2	S road	N	Road bridge	
DSC07607	05/06/2010	13.06	DSC-F828	√	2592x1944	2.4	S road	SW	Rodding out the culvert after further de-silting (WB/JB/10).	
DSC07608	05/06/2010	13.09	DSC-F828	√	2592x1944	2.2	S road	NW	Lower covered culvert. Arched roof	
DSC07609	05/06/2010	13.1	DSC-F828	√	2592x1944	2.2	S road	NW	Lower covered culvert. Arched roof 2	
DSC07610	05/06/2010	13.1	DSC-F828	√	2592x1944	2.3	S road	NW	Lower covered culvert. Arched roof 3	
DSC07611	05/06/2010	13.1	DSC-F828	√	2592x1944	2.3	S road	NW	Lower covered culvert. Arched roof 4	
DSC07612	05/06/2010	15.19	DSC-F828	√	2592x1944	2.1	S road	NW	Culvert beside cottage showing level of silt (WB/JB/10). 1	
DSC07613	05/06/2010	15.19	DSC-F828	√	2592x1944	2.1	S road	NW	Culvert beside cottage showing level of silt (WB/JB/10). 2	
DSC06541	19/03/2010	13.15	DSC-F828	√	1944x2592	2.2	Wheelpit	SW	Wheelpit waterlevel, mid March 2010	
DSC06542	19/03/2010	13.15	DSC-F828	√	1944x2592	2.2	Wheelpit	NE	Wheelpit waterlevel, mid March 2010. Inflow submerged	
DSC06543	19/03/2010	13.16	DSC-F828	√	2592x1944	2.2	Ironworks	SE	Overview of site showing water logging	
OJ001	02/06/2010	17.14	Olympus	√	1280x960	0.2	Ironworks	N	Overview at start of project (casting Floor)	
OJ002	02/06/2010	17.14	Olympus	√	1280x960	0.2	Ironworks	SE	Overview at start of project (casting Floor). Sanbagged wheelpit edge	
OJ003	02/06/2010	17.13	Olympus	√	960x1280	0.2	Wheelpit	NE	Water level in wheelpit at beginning of project	
OJ004	02/06/2010	17.23	Olympus	√	960x1280	0.2	Ironworks	NW	Overview at start of project (casting Floor). Sanbagged drain in foreground	
OJ005	02/06/2010	17.24	Olympus	√	1280x960	0.2	Ironworks	SW	Silt from wheelpit dumped in front of the furnace.	
OJ006	02/06/2010	17.35	Olympus	√	1280x960	0.2	Ironworks	SW	Water level at cottage outfall resulting from previous work WB/AONB2/09	
DSC07751	21/06/2010	9.17	DSC-F828	√	2592x1944	2.4	S road	N	Culvert beside cottage, water levels reduced.	
DSC07752	21/06/2010	9.44	DSC-F828	√	2592x1944	2.3	S road	SE	Preparing the ground for excavation of the covered culvert	
DSC07753	21/06/2010	11.31	DSC-F828	√	2592x1944	2.3	S road	SE	Pumping out the water from on top of the covered culvert	
DSC07754	21/06/2010	16.29	DSC-F828	√	2592x1944	2.3	S road	V	View into the culvert, capstones removed	
DSC07755	21/06/2010	16.3	DSC-F828	√	2592x1944	2.3	S road	NW	Culvert beside cottage, water levels reduced.	
DSC07756	22/06/2010	9.22	DSC-F828	√	2592x1944	2.3	S road	V	Cored capstone from covered culvert	
DSC07757	22/06/2010	10.06	DSC-F828	√	2592x1944	2.3	S road	V	Another cored capstone from covered culvert	
DSC07758	22/06/2010	10.07	DSC-F828	√	2592x1944	2.4	S road	V	Another cored capstone from covered culvert, edge view	
DSC07759	22/06/2010	12.18	DSC-F828	√	2592x1944	2.2	S road	NW	Inside of culvert showing core position through capstone roof	
DSC07760	22/06/2010	12.18	DSC-F828	√	2592x1944	2.2	S road	NW	Inside of culvert showing core position through capstone roof view 2	
DSC07761	22/06/2010	12.18	DSC-F828	√	2592x1944	2.1	S road	NW	Inside of culvert showing core position through capstone roof view 3	

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DSC07762	22/06/2010	12.18	DSC-F828	√	2592x1944	2	S road	NW	Inside of culvert showing core position through capstone roof view 4
DSC07764	22/06/2010	12.2	DSC-F828	√	2592x1944	2.3	S road	SE	Excavating inside the culvert
DSC07765	28/06/2010	9.34	DSC-F828	√	2592x1944	2.2	K	E	Sump, beginning of work. Listed 204, (Pickin 1982)
DSC07766	28/06/2010	9.34	DSC-F828	√	2592x1944	2.3	K	NW	Overview of sump, beginning of work. Listed 204, (Pickin 1982)
DSC07767	28/06/2010	11.21	DSC-F828	√	2592x1944	2.3	S road	SE	Clearing the spoil from the 2007 work (WB04/AONB1/07)
DSC07768	28/06/2010	15.23	DSC-F828	√	2592x1944	2.2	S road	E	Excavating the culvert abutting the cottage wall
DSC07769	28/06/2010	15.23	DSC-F828	√	2592x1944	2.3	S road	E	Lifting of capstone from culvert close to the cottage wall
DSC07770	28/06/2010	15.24	DSC-F828	√	1944x2592	2	S road	N	Waiting for the culvert to run clear to view the submerged excavation area
DSC07771	29/06/2010	12.3	DSC-F828	√	2592x1944	2.3	K	SE	Excavated area K between 204 & 198 (Pickin 1982). Culvert & drain
DSC07772	29/06/2010	12.31	DSC-F828	√	1944x2592	2.3	K	NE	Excavated area K between 204 & 198 (Pickin 1982). Culvert & drain
DSC07773	29/06/2010	12.31	DSC-F828	√	1944x2592	2.1	K	V	Vertical shot of excavation at area K
DSC07774	29/06/2010	12.31	DSC-F828	√	2592x1944	2.1	K	V	Excavated area K. vertical view down 204, (Pickin 1982)
DSC07775	29/06/2010	14.56	DSC-F828	√	2592x1944	2.2	K	NE	NE section of excavated area K. Build of 204 to the right edge of photograph
DSC07776	29/06/2010	14.56	DSC-F828	√	2592x1944	2.2	K	SE	SE section of excavated area K. Build of 204 centre of photograph
DSC07777	29/06/2010	15.58	DSC-F828	√	2592x1944	2.3	K	NW	NW section of excavated area K. Made up ground
DSC07778	29/06/2010	15.58	DSC-F828	√	2592x1944	2.3	K	NW	Overview of north west area of excavation in K. 204 in foreground right
DSC07779	30/06/2010	10.1	DSC-F828	√	2592x1944	2.2	K	NW	Excavation in K. Main covered culvert
DSC07780	30/06/2010	11.09	DSC-F828	√	2592x1944	2.2	K	V	Upper covered culvert. Capstone removed showing lining and fill
DSC07781	30/06/2010	12.2	DSC-F828	√	2592x1944	2.3	K	SW	Upper culvert at join under 198.
DSC07782	30/06/2010	14.33	DSC-F828	√	2592x1944	2.3	K	V	Upper culvert at join under 198 after clearing of silt
DSC07783	30/06/2010	14.33	DSC-F828	√	2592x1944	2.2	K	V	Upper culvert at join under 198. Test pit through bottom of culvert
DSC07784	30/06/2010	14.34	DSC-F828	√	2592x1944	2.3	K	NE	Main Culvert, excavation in K with capstone lifted
DSC07785	30/06/2010	14.35	DSC-F828	√	2592x1944	2.3	K	NW	Overview of excavation in K showing both culverts
DSC07786	08/07/2010	10.16	DSC-F828	√	2592x1944	2.2	K	NW	Main Culvert, excavation in K. View towards wheelpit. Silt on left
DSC07788	08/07/2010	10.19	DSC-F828	√	1944x2592	2.2	S road	NW	View along culvert at cottage, with partial removal of capstones
DSC07791	08/07/2010	13.42	DSC-F828	√	2592x1944	2.1	S road	NW	View up culvert at from test pit 1
DSC07841	22/07/2010	9.33	DSC-F828	√	1944x2592	2.3	S road	NW	Later view along culvert at cottage, prior to jetting
DSC07842	22/07/2010	9.54	DSC-F828	√	2592x1944	2.2	S road	V	Jetting operation in Cottage outfall, culvert
DSC07844	22/07/2010	10.33	DSC-F828	√	2592x1944	2.2	S road	NW	Cottage outflow at south end of covered culvert. Internal details
DSC07845	22/07/2010	10.33	DSC-F828	√	2592x1944	2.1	S road	NW	2nd view: Cottage outflow at south end of covered culvert. Internal details
DSC07848	22/07/2010	10.56	DSC-F828	√	2592x1944	2.1	S road	SE	View down culvert below cottage, from open capstone area
DSC07849	22/07/2010	10.56	DSC-F828	√	2592x1944	2.2	S road	NW	Close up of butt joint to south west wall of culvert, beyond the mortared arch
DSC07851	22/07/2010	11.52	DSC-F828	√	2592x1944	2.3	S road	V	Further jetting attempt in Cottage outfall, culvert
DSC07852	22/07/2010	11.53	DSC-F828	√	1944x2592	2.3	S road	V	Further jetting attempt in Cottage outfall, culvert
DSC07853	22/07/2010	11.53	DSC-F828	√	1944x2592	2.2	S road	V	Further jetting attempt in Cottage outfall, culvert
DSC07854	22/07/2010	11.53	DSC-F828	√	1944x2592	2.1	S road	V	Further jetting attempt in Cottage outfall, culvert

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DSC07855	22/07/2010	12.04	DSC-F828	√	2592x1944	2.2	S road	NW	Cottage outfall, internal view of culvert. Detail	
DSC07858	22/07/2010	13.39	DSC-F828	√	2592x1944	2.3	Furnace	W	Dry arch under south east side of furnace	
DSC07859	22/07/2010	13.4	DSC-F828	√	1944x2592	2.2	Furnace	W	Dry arch under south east side of furnace and upper blocked tunnel	
DSC07860	22/07/2010	13.41	DSC-F828	√	1944x2592	2.2	Furnace	W	Rear of upper blocked tunnel to rear of furnace	
DSC07861	22/07/2010	13.41	DSC-F828	√	1944x2592	2.2	Furnace	W	Upper blocked tunnel to rear of furnace	
DSC07862	22/07/2010	13.42	DSC-F828	√	2592x1944	2.4	H	SW	Cleared area no's: 225, 224, 137. (Pickin1982)	
DSC07863	22/07/2010	13.44	DSC-F828	√	1944x2592	2.2	H	NW	Cleared area no's: 225, 224, 137. (Pickin 1982) Detail	
DSC07864	22/07/2010	123.45	DSC-F828	√	1944x2592	2.3	H	V	Cleared area no's: 225, 224, 137.(Pickin 1982) Detail	
DSC07866	22/07/2010	13.46	DSC-F828	√	1944x2592	2.2	H	E	Cleared area no's: 225, 224, 137. (Pickin 1982)Viewed along downward slope	
DSC07867	22/07/2010	13.46	DSC-F828	√	2592x1944	2.4	H	V	Cleared area no's: 202,205 (Pickin 1982).	
DSC07868	22/07/2010	13.47	DSC-F828	√	1944x2592	2.3	H	NW	Overview along rear of furnace site	
DSC07869	22/07/2010	13.5	DSC-F828	√	2592x1944	2.4	F	NW	Chimney breast in area F. Flue shown	
DSC07870	23/07/2010	11.52	DSC-F828	√	2592x1944	2.4	S road	V	Rounded butt joint in culvert to take capstones. Cottage outfall	
DSC07871	23/07/2010	11.54	DSC-F828	√	2592x1944	2.1	S road	NW	Slightly reduced water level in cottage outfall, internal view of culvert.	
DSC07872	23/07/2010	11.54	DSC-F828	√	2592x1944	2.3	S road	NW	Silt remains at about 4m into the cottage outfall culvert	
DSC07873	23/07/2010	11.55	DSC-F828	√	2592x1944	2.2	S road	NW	Beyond silt remains at the cottage outfall culvert.	
DSC08019	09/08/2010	13.42	DSC-F828	√	1944x2592	2.2	H	NW	Overview along rear of furnace site after clearing	
DSC08020	09/08/2010	15.09	DSC-F828	√	2592x1944	2.3	S road	SW	South bank of cottage outfall culvert. Remains of stone revetment	
DSC08021	09/08/2010	15.1	DSC-F828	√	2592x1944	2.5	S road	SW	South bank of cottage outfall. Remains of stone revetment & mortared wall	
DSC08038	11/08/2010	10.43	DSC-F828	√	2592x1944	2.4	K	NW	Test pit 1 culvert after de silting. View along culvert, towards wheelpit.	
DSC08042	11/08/2010	11.09	DSC-F828	√	2592x1944	2.2	Wheelpit	E	Lintel above output hutch in eastern wall of wheelpit.	
DSC08043	11/08/2010	11.1	DSC-F828	√	1944x2592	2.2	Wheelpit	NE	Stream side of wheelpit showing water ingress, river sandbagged	
DSC08044	11/08/2010	11.11	DSC-F828	√	1944x2592	2.2	Wheelpit	NE	Drained wheelpit showing hutch under rear furnace wall	
DSC08045	11/08/2010	11.52	DSC-F828	√	2592x1944	2.4	Ironworks	SE	Desilting through sump: 204 (Pickin1982)	
DSC08046	11/08/2010	11.53	DSC-F828	√	2592x1944	2.3	Ironworks	SE	Desilting through sump: 204 (Pickin1982)	
DSC08048	11/08/2010	12.32	DSC-F828	√	1944x2592	2.1	Wheelpit	V	Draining the wheelpit	
DSC08049	11/08/2010	12.35	DSC-F828	√	2592x1944	2.1	Wheelpit	SE	Eastern hutch in drained wheelpit	
DSC08050	11/08/2010	12.35	DSC-F828	√	2592x1944	2.2	Wheelpit	SE	Eastern hutch in drained wheelpit showing wooden lintel and socket.	
DSC08051	11/08/2010	12.35	DSC-F828	√	2592x1944	2.2	Wheelpit	SE	Eastern culvert from the wheelpit hutch. Silt level	
DSC08052	11/08/2010	12.35	DSC-F828	√	2592x1944	2.2	Wheelpit	SE	Eastern culvert from the wheelpit hutch. Silt level and broken capstones	
DSC08054	11/08/2010	12.39	DSC-F828	√	2592x1944	2.3	Wheelpit	NE	River side wall of wheelpit and eastern hutch position	
DSC08055	11/08/2010	12.39	DSC-F828	√	2592x1944	2.3	Wheelpit	NE	Denizen of the deep. The Angiddy Hydra? Gate keeper of the culvert	
DSC08056	11/08/2010	12.43	DSC-F828	√	2592x1944	2.3	Wheelpit	SE	Eastern wheelpit hutch. Wooden sill insitu	
DSC08183	17/09/2010	10.41	DSC-F828	√	2592x1944	2.3	Wheelpit	SW	Rear Wheelpit. Measured photographic recording	
DSC08184	17/09/2010	10.42	DSC-F828	√	2592x1944	2.3	Wheelpit	W	Rear Wheelpit. Measured photographic recording	
DSC08185	17/09/2010	10.47	DSC-F828	√	2592x1944	2.3	Wheelpit	SW	S1 Rear Wheelpit & buttress. Measured photographic recording	

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DSC08186	17/09/2010	12.03	DSC-F828	√	2592x1944	2.3	Wheelpit	NW	S2 Wheelpit & buttress. Measured photographic recording.	
DSC08187	17/09/2010	12.05	DSC-F828	√	2592x1944	2.3	Wheelpit	NW	S3 Wheelpit Upper northern wall. Measured photographic recording.	
DSC08188	17/09/2010	12.1	DSC-F828	√	2592x1944	2.3	Wheelpit	NW	S4 Wheelpit Upper northern wall. Measured photographic recording.	
DSC08189	17/09/2010	12.12	DSC-F828	√	2592x1944	2.4	Wheelpit	NE	Wheelpit. Upper E wall. Measured photographic recording.	
DSC08190	17/09/2010	12.19	DSC-F828	√	1944x2592	2.2	Wheelpit	NE	Wheelpit.Measured photographic recording.	
DSC08191	17/09/2010	12.2	DSC-F828	√	2592x1944	2.4	Wheelpit	V	S1 Wheelpit.Measured photographic recording.	
DSC08192	17/09/2010	12.21	DSC-F828	√	2592x1944	2.3	Wheelpit	V	S2 Wheelpit.Measured photographic recording.	
DSC08193	17/09/2010	12.21	DSC-F828	√	2592x1944	2.3	Wheelpit	V	S3 Wheelpit.Measured photographic recording.	
DSC08194	17/09/2010	12.24	DSC-F828	√	1944x2592	2.3	Wheelpit	NE	S1 Wheelpit overview.Measured photographic recording.	
DSC08195	17/09/2010	12.24	DSC-F828	√	1944x2592	2.2	Wheelpit	NE	S2 Wheelpit overview.Measured photographic recording.	
DSC08196	17/09/2010	12.25	DSC-F828	√	2592x1944	2.3	Wheelpit	NW	Wheelpit, upper wall. Photogrammetry sequence 1 Of 6	
DSC08197	17/09/2010	12.25	DSC-F828	√	2592x1944	2.4	Wheelpit	NW	Wheelpit, upper wall. Photogrammetry sequence 2 Of 6	
DSC08198	17/09/2010	12.25	DSC-F828	√	2592x1944	2.3	Wheelpit	NW	Wheelpit, upper wall. Photogrammetry sequence 3 Of 6	
DSC08199	17/09/2010	12.26	DSC-F828	√	2592x1944	2.3	Wheelpit	NW	Wheelpit, upper wall. Photogrammetry sequence 4 Of 6	
DSC08200	17/09/2010	12.26	DSC-F828	√	2592x1944	2.4	Wheelpit	NW	Wheelpit, upper wall. Photogrammetry sequence 5 Of 6	
DSC08201	17/09/2010	12.26	DSC-F828	√	2592x1944	2.4	Wheelpit	NW	Wheelpit, upper wall. Photogrammetry sequence 6 Of 6	
DSC08202	17/09/2010	12.27	DSC-F828	√	1944x2592	2.2	Wheelpit	SW	Wheelpit. Overview, measured photographic recording	
DSC08203	17/09/2010	12.27	DSC-F828	√	1944x2592	2.2	Wheelpit	NE	Wheelpit. Overview, measured photographic recording	
DSC08204	17/09/2010	12.28	DSC-F828	√	2592x1944	2.4	Wheelpit	NE	Wheelpit. Upperwal detail sequence 1 of 8	
DSC08205	17/09/2010	12.29	DSC-F828	√	2592x1944	2.4	Wheelpit	NE	Wheelpit. Upperwal detail sequence 2 of 8	
DSC08206	17/09/2010	12.29	DSC-F828	√	2592x1944	2.3	Wheelpit	NE	Wheelpit. Upperwal detail sequence 3 of 8	
DSC08207	17/09/2010	12.29	DSC-F828	√	2592x1944	2.3	Wheelpit	NE	Wheelpit. Upperwal detail sequence 4 of 8	
DSC08208	17/09/2010	12.29	DSC-F828	√	2592x1944	2.3	Wheelpit	NE	Wheelpit. Upperwal detail sequence 5 of 8	
DSC08209	17/09/2010	12.29	DSC-F828	√	2592x1944	2.3	Wheelpit	NE	Wheelpit. Upperwal detail sequence 6 of 8	
DSC08210	17/09/2010	12.3	DSC-F828	√	2592x1944	2.3	Wheelpit	NE	Wheelpit. Upperwal detail sequence 7 of 8	
DSC08211	17/09/2010	12.3	DSC-F828	√	2592x1944	2.4	Wheelpit	NE	Wheelpit. Upperwal detail sequence 8 of 8	
PA00001	28/09/2010	17.04	Olympus	√	1280x960	0.2	Wheelpit	W	Wheelpit. Upperwall, clearing	
P9280004	28/09/2010	16.48	Olympus	√	1280x960	0.2	Ironworks	NE	Overview across SE extent of Area K. Culvert excavation backfilled	
P9280005	28/09/2010	16.48	Olympus	√	1280x960	0.2	Ironworks	N	Overview across extent of Area K. Culvert excavation backfilled. Test trench	
P9280006	28/09/2010	16.48	Olympus	√	1280x960	0.2	Ironworks	NE	Overview across extent of Area K. Culvert excavation backfilled.	
P9280009	28/09/2010	16.5	Olympus	√	1280x960	0.2	Ironworks	NE	Area K. Test trench and advised position for test trench. Stone pile	
P9280010	28/09/2010	16.53	Olympus	√	960x1280	0.2	area K	NE	Test trench to find culvert line	
P9280011	28/09/2010	16.55	Olympus	√	960x1280	0.2	area K	NE	Test trench to find culvert line. Close up	
P9280012	28/09/2010	16.55	Olympus	√	960x1280	0.2	area K	NE	Test trench and advised position	
P9280013	28/09/2010	16.56	Olympus	√	960x1280	0.2	area K	SW	Test trench Wall remains, probably recorded as 183 (Pickin 1982, fig 8).	
P9280014	28/09/2010	16.57	Olympus	√	960x1280	0.2	area K	V	Test trench Wall remains, probably recorded as 183 (Pickin 1982, fig 8).	

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P9280016	28/09/2010	16.58	Olympus	√	960x1280	0.2	area K	SW	Test trench overview in order to establish position.	
P9280018	28/09/2010	16.59	Olympus	√	1280x960	0.2	area K	S	Trench position overview towards south	
PA00002	01/10/2010	16.19	Olympus	√	1280x960	0.2	Wheelpit	SE	Clearing the upper wheelpit	
PA00003	01/10/2010	16.24	Olympus	√	1280x960	0.2	Wheelpit	SW	Overview of wheelpit clearance. Pumps off	
PA00004	02/10/2010	16.24	Olympus	√	1280x960	0.2	Wheelpit	W	Overview of wheelpit clearance. Position of plank recorded on film	
PA020009	02/10/2010	16.29	Olympus	√	1280x960	0.2	Wheelpit	V	Wooden plank 1	
PA020010	02/10/2010	16.29	Olympus	√	960x1280	0.2	Wheelpit	SW	Wooden plank 2 in setting	
PA020011	02/10/2010	16.32	Olympus	√	1280x960	0.2	Wheelpit	V	Wooden plank 3 with impromptu scale, 2 inch trowel	
PA020012	02/10/2010	16.34	Olympus	√	1280x960	0.2	Wheelpit	NW	Wooden plank 4 Position above wheelpit	
PA020013	02/10/2010	16.34	Olympus	√	1280x960	0.2	Wheelpit	NW	Wooden plank 5 Position above wheelpit. Close up	
PA020014	02/10/2010	16.35	Olympus	√	1280x960	0.2	Wheelpit	N	Wooden plank 6 Position above wheelpit. Overview	
PA020015	02/10/2010	16.37	Olympus	√	1280x960	0.2	Wheelpit	W	Wooden plank 7 Position above wheelpit. Overview	
PA030001	03/10/2010	17.3	Olympus	√	1280x960	0.2	Wheelpit	V	Wooden plank 1 Second day of exposure after clearing	
PA030002	03/10/2010	17.3	Olympus	√	1280x960	0.2	Wheelpit	V	Wooden plank 2 Second day of exposure after clearing. Close-up	
PA030003	03/10/2010	17.31	Olympus	√	1280x960	0.2	Wheelpit	V	Wooden plank 3 Second day of exposure after clearing. Close-up	
PA030004	03/10/2010	17.31	Olympus	√	1280x960	0.2	Wheelpit	V	Wooden plank 3 Second day of exposure after clearing. Close-up	
DSC08292	03/10/2010	16.39	DSC-F828	√	1944x2592	2.4	K	NE	Trial trench to find culvert	
DSC08293	03/10/2010	16.39	DSC-F828	√	2592x1944	2.2	Wheelpit	NW	Wood floor plank, in situ SE of 111 (Pickin1982)	
DSC08294	03/10/2010	16.4	DSC-F828	√	2592x1944	2.2	Wheelpit	NW	Overview location of wood floor plank, in situ SE of 111 (Pickin1982)	
PA030005	04/10/2010	17.26	Olympus	√	1280x960	0.2	Wheelpit	SW	Repointing of wheelpit. Plank covered but not recorded	
PA030006	04/10/2010	17.27	Olympus	√	1280x960	0.2	Wheelpit	SW	Repointing of wheelpit. Plank covered but not recorded, nor protected	
PA030007	06/10/2010	17.18	Olympus	√	960x1280	0.2	Wheelpit	SW	Overview of wheelpit repointing. Plank concealed	
PA030008	08/10/2010	15.26	Olympus	√	1280x960	0.2	Wheelpit	SW	Overview of wheelpit mortar protection	
PA030009	11/10/2010	17.05	Olympus	√	1280x960	0.2	Wheelpit	NW	Wheelpit. Plank completely covered over	
DSC08797	08/11/2010	10.23	DSC-F828	√	2592x1944	2.2	S road	V	Mason mark on one of the culvert capstones, south east of cottage outfall	
DSC08799	08/11/2010	10.33	DSC-F828	√	1944x2592	2.4	S road	N	Culvert prior to back fill.	
DSC08800	08/11/2010	11.3	DSC-F828	√	2592x1944	2.4	Area F	NW	Rear of area F showing various feature phases	
DSC08801	08/11/2010	11.3	DSC-F828	√	1944x2592	2.3	Wheelpit	NE	Overview of wheelpit after consolidation	
DSC08802	08/11/2010	11.59	DSC-F828	√	2592x1944	2.4	K	NE	160/161 (Pickin 1982) Exposed structure prior to infill	
DSC08803	08/11/2010	12.02	DSC-F828	√	2592x1944	2.3	Blow house	NE	Blowing house after consolidation	
DSC08804	08/11/2010	12.02	DSC-F828	√	2592x1944	2.4	Blow house	NE	Blowing house after consolidation	
DSC08805	08/11/2010	12.05	DSC-F828	√	2592x1944	2.2	Furnace	W	Furnace after clearing	
DSC08806	08/11/2010	12.05	DSC-F828	√	1944x2592	2.3	Furnace	Sw	Close up of furnace shaft after clearing	
DSC08807	08/11/2010	12.06	DSC-F828	√	1944x2592	2.3	Furnace	Sw	2nd Close up of furnace shaft after clearing	
DSC08808	08/11/2010	12.07	DSC-F828	√	2592x1944	2.3	Furnace	NW	Phasing detail, Furnace to wheelpit upper wall, joints	
DSC08813	08/11/2010	12.13	DSC-F828	√	2592x1944	2.4	Wheelpit	SE	Phasing detail, wheelpit after repointing	

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DSC08814	08/11/2010	12.16	DSC-F828	√	2592x1944	2.3	J	V	Step 202 (Pickin 1982)	
DSC08816	08/11/2010	12.19	DSC-F828	√	1944x2592	2.2	H	NW	View along 224/225 (Pickin 1982) after re pointing	
DSC08817	08/11/2010	15.29	DSC-F828	√	2592x1944	2.3	S road	V	Stone bowl Plan view	
DSC08018	08/11/2010	15.3	DSC-F828	√	2592x1944	2.2	S road	V	Stone bowl Section view	
DSC08819	10/11/2010	9.49	DSC-F828	√	2592x1944	2	S road	NW	Back filling by cottage	
DSC08820	10/11/2010	9.5	DSC-F828	√	2592x1944	2.3	S road	SE	Back filling by cottage	
DSC08827	10/11/2010	16.53	DSC-F828	√	2592x1944	2.4	S road	SE	Back filling by cottage	
DSC08828	10/11/2010	16.53	DSC-F828	√	1944x2592	2.3	S road	SE	Back filling by cottage	
DSC08829	11/11/2010	11.04	DSC-F828	√	2592x1944	2.4	Ironworks	W	1st Overview of ironworks. Ground levelling	
DSC08830	11/11/2010	11.04	DSC-F828	√	2592x1944	2.5	Ironworks	W	2nd overview of ironworks. Ground levelling	
DSC08831	11/11/2010	11.04	DSC-F828	√	2592x1944	2.4	Ironworks	NW	3rd overview of ironworks. Ground levelling	
DSC08832	11/11/2010	11.34	DSC-F828	√	2592x1944	2.3	S road	NE	North bank of culvert photomerge sequence of 11. 1	
DSC08833	11/11/2010	11.35	DSC-F828	√	2592x1944	2.4	S road	NE	North bank of culvert photomerge sequence of 11. 2	
DSC08834	11/11/2010	11.35	DSC-F828	√	2592x1944	2.4	S road	NE	North bank of culvert photomerge sequence of 11. 3	
DSC08833	11/11/2010	11.35	DSC-F828	√	2592x1944	2.4	S road	NE	North bank of culvert photomerge sequence of 11. 4	
DSC08836	11/11/2010	11.35	DSC-F828	√	2592x1944	2.4	S road	NE	North bank of culvert photomerge sequence of 11. 5	
DSC08837	11/11/2010	11.35	DSC-F828	√	2592x1944	2.4	S road	NE	North bank of culvert photomerge sequence of 11. 6	
DSC08838	11/11/2010	11.35	DSC-F828	√	2592x1944	2.4	S road	NE	North bank of culvert photomerge sequence of 11. 7	
DSC08839	11/11/2010	11.36	DSC-F828	√	2592x1944	2.3	S road	NE	North bank of culvert photomerge sequence of 11. 8	
DSC08840	11/11/2010	11.36	DSC-F828	√	2592x1944	2.3	S road	NE	North bank of culvert photomerge sequence of 11. 9	
DSC08841	11/11/2010	11.36	DSC-F828	√	2592x1944	2.3	S road	NE	North bank of culvert photomerge sequence of 11. 10	
DSC08842	11/11/2010	11.36	DSC-F828	√	2592x1944	2.4	S road	NE	North bank of culvert photomerge sequence of 11. 11	
DSC08844	11/11/2010	11.37	DSC-F828	√	2592x1944	2.3	S road	SW	South bank of culvert photomerge sequence of 15. 1	
DSC08845	11/11/2010	11.37	DSC-F828	√	2592x1944	2.3	S road	SW	South bank of culvert photomerge sequence of 15. 2	
DSC08846	11/11/2010	11.37	DSC-F828	√	2592x1944	2.4	S road	SW	South bank of culvert photomerge sequence of 15. 3	
DSC08847	11/11/2010	11.38	DSC-F828	√	2592x1944	2.3	S road	SW	South bank of culvert photomerge sequence of 15. 4	
DSC08848	11/11/2010	11.38	DSC-F828	√	2592x1944	2.2	S road	SW	South bank of culvert photomerge sequence of 15. 5	
DSC08849	11/11/2010	11.38	DSC-F828	√	2592x1944	2.2	S road	SW	South bank of culvert photomerge sequence of 15. 6	
DSC08850	11/11/2010	11.38	DSC-F828	√	2592x1944	2.2	S road	SW	South bank of culvert photomerge sequence of 15. 7	
DSC08851	11/11/2010	11.38	DSC-F828	√	2592x1944	2.2	S road	SW	South bank of culvert photomerge sequence of 15. 8	
DSC08852	11/11/2010	11.39	DSC-F828	√	2592x1944	2.4	S road	SW	South bank of culvert photomerge sequence of 15. 9	
DSC08853	11/11/2010	11.39	DSC-F828	√	2592x1944	2.3	S road	SW	South bank of culvert photomerge sequence of 15. 10	
DSC08854	11/11/2010	11.39	DSC-F828	√	2592x1944	2.3	S road	SW	South bank of culvert photomerge sequence of 15. 11	
DSC08855	11/11/2010	11.39	DSC-F828	√	2592x1944	2.3	S road	SW	South bank of culvert photomerge sequence of 15. 12	
DSC08856	11/11/2010	11.39	DSC-F828	√	2592x1944	2.3	S road	SW	South bank of culvert photomerge sequence of 15. 13	
DSC08857	11/11/2010	11.39	DSC-F828	√	2592x1944	2.3	S road	SW	South bank of culvert photomerge sequence of 15. 14	



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DSC08858	11/11/2010	11.39	DSC-F828	√	2592x1944	2.3	S road	SW	South bank of culvert photomerge sequence of 15.15
DSC08859	11/11/2010	11.39	DSC-F828	√	2592x1944	2.3	S road	S	South bank of culvert at junction with stream.
DSC08860	11/11/2010	11.39	DSC-F828	√	2592x1944	2.3	S road	NW	Temporary mat of Hessian sacking to preserve bank from erosion
DSC08861	11/11/2010	11.58	DSC-F828	√	2592x1944	2	S road	V	Leather shoe from spoil bank south of the culvert. Top. 1 of 3
DSC08862	11/11/2010	11.59	DSC-F828	√	2592x1944	2.2	S road	V	Leather shoe from spoil bank south of the culvert. Side. 2 of 3
DSC08863	11/11/2010	11.59	DSC-F828	√	2592x1944	2.2	S road	V	Leather shoe from spoil bank south of the culvert. Bottom. 3 of 3
DSC00221	17/01/2011	11.42	DSC-F828	√	2592x1944	2.4	T Pond	SW	Terminal pond, sluice system? During re pointing
DSC00222	17/01/2011	11.42	DSC-F828	√	2592x1944	2.4	T Pond	NW	Terminal pond, sluice system? During re pointing
DSC00499	19/03/2011	15.28	DSC-F828	RAW	3264x2448	17	S road	SW	Culvert drystone wall with section of mortared wall above and at angle
DSC00500	19/03/2011	15.29	DSC-F828	RAW	3264x2448	17	S road	SE	Positional overview for DSC00499
DSC00501	19/03/2011	15.31	DSC-F828	RAW	3264x2448	17	S road	SE	More walling of culvert south bank and south of stream join
DSC00502	19/03/2011	15.31	DSC-F828	RAW	3264x2448	17	S road	S	Curved walling of culvert, south bank and just south of stream join
DSC00503	19/03/2011	15.32	DSC-F828	RAW	3264x2448	17	S road	N	Small section of culvert wall, south side above stream join
DSC00504	19/03/2011	15.33	DSC-F828	RAW	3264x2448	17	S road	N	Start of intact section of walling along south bank of culvert
DSC00505	19/03/2011	15.34	DSC-F828	RAW	3264x2448	17	S road	N	Final intact sections of culvert; both banks.
DSC05908	21/12/2009	11.09	DSC-F828	√	2592x1944	2.4	S road	NW	View of culvert resurgence prior to de-silting
DSC00572	06/05/2011	12.18	DSC-F828	RAW	3264x2448	17	Wheel pit	NW	Final elevation record, Upper wheel pit 1
DSC00573	06/05/2011	12.23	DSC-F828	RAW	3264x2448	17	Wheel pit	NW	Final elevation record, Upper wheel pit 2
DSC00574	06/05/2011	12.24	DSC-F828	RAW	2448x3264	17	Wheel pit	NW	Final elevation record, Upper wheel pit 3
DSC00575	06/05/2011	12.26	DSC-F828	RAW	3264x2448	17	Wheel pit	NW	Final elevation record, Upper wheel pit 4
DSC00576	06/05/2011	12.27	DSC-F828	RAW	3264x2448	17	Wheel pit	NW	Final elevation record, Upper wheel pit 5
DSC00577	06/05/2011	12.3	DSC-F828	RAW	2448x3264	17	Wheel pit	NW	Final elevation record, Upper wheel pit 6
DSC00578	06/05/2011	12.35	DSC-F828	RAW	2448x3264	17	Wheel pit	NW	Final elevation record, Upper wheel pit 7
DSC00579	06/05/2011	12.44	DSC-F828	RAW	2448x3264	17	Wheel pit	NW	Final elevation record, Upper wheel pit 8
DSC00580	06/05/2011	12.44	DSC-F828	RAW	2448x3264	17	Wheel pit	NW	Final elevation record, Upper wheel pit 9
DSC00581	06/05/2011	12.46	DSC-F828	RAW	2448x3264	17	Wheel pit	NW	Final elevation record, Upper wheel pit 10
DSC00582	06/05/2011	12.52	DSC-F828	RAW	3264x2448	17	Wheel pit	NW	Final elevation record, Upper wheel pit 11
DSC00583	06/05/2011	12.54	DSC-F828	RAW	3264x2448	17	Wheel pit	NW	Final elevation record, Upper wheel pit 12
DSC00584	06/05/2011	12.55	DSC-F828	RAW	3264x2448	17	Wheel pit	NW	Final elevation record, Upper wheel pit 13
DSC00585	06/05/2011	12.56	DSC-F828	RAW	3264x2448	17	Wheel pit	NW	Final elevation record, Upper wheel pit 14
DSC00586	06/05/2011	13.01	DSC-F828	RAW	3264x2448	17	Wheel pit	V	Final plan view, upper wheelpit 1
DSC00587	06/05/2011	13.03	DSC-F828	RAW	3264x2448	17	Wheel pit	V	Final plan view, upper wheelpit 2
DSC00588	06/05/2011	13.09	DSC-F828	RAW	3264x2448	17	Wheel pit	V	Final plan view, upper wheelpit 3
DSC00589	06/05/2011	13.1	DSC-F828	RAW	3264x2448	17	Wheel pit	V	Final plan view, upper wheelpit 4
DSC00590	06/05/2011	13.1	DSC-F828	RAW	3264x2448	17	Wheel pit	V	Final plan view, upper wheelpit 5
DSC00591	06/05/2011	13.1	DSC-F828	RAW	3264x2448	17	Wheel pit	V	Final Wheel pit

Digital Photographic Record

DSC00592	06/05/2011	13.11	DSC-F828	RAW	2448x3264	17	Wheel pit	SW	Final Wheel pit Recessed ledge	
DSC00593	06/05/2011	13.2	DSC-F828	RAW	3264x2448	17	Area H	V	Final. Restored 224. 1	
DSC00594	06/05/2011	13.2	DSC-F828	RAW	2448x3264	17	Area H	S	Final. Restored 224. 2	
DSC00595	06/05/2011	13.21	DSC-F828	RAW	2448x3264	17	Area H	S	Final. Restored 224. 3	
DSC00596	06/05/2011	13.23	DSC-F828	RAW	2448x3264	17	Area H	S	Final. Restored 224. 4	
DSC00597	06/05/2011	13.23	DSC-F828	RAW	3264x2448	17	Area H	V	Final. Restored 224.5	
DSC00598	06/05/2011	14.54	DSC-F828	RAW	2448x3264	17	Leat	NW	Final. Terminal pond, sluice system 1	
DSC00599	06/05/2011	14.55	DSC-F828	RAW	2448x3264	17	Leat	SW	Final. Terminal pond, sluice system 2	
DSC00600	06/05/2011	14.56	DSC-F828	RAW	2448x3264	17	Leat	SW	Final. Terminal pond, sluice system 3	
DSC00601	06/05/2011	14.56	DSC-F828	RAW	3264x2448	17	Leat	V	Final. Terminal pond, sluice system 4	
DSC00602	06/05/2011	14.57	DSC-F828	RAW	3264x2448	17	Leat	V	Final. Terminal pond, sluice system 5	
DSC00603	06/05/2011	15.13	DSC-F828	RAW	3264x2448	17	Wheelpit	NW	Wheel pit water wheel rub marks	
DSC00604	06/05/2011	15.14	DSC-F828	RAW	3264x2448	17	Furnace	NE	Remains of initials	

79/81 Excavation Records

Scan No	Camera	Scanner	JPG	MB	Date	Area	View	Description	Drawing
SC001	CanonIXUS70		√	1.6	19/09/2010	Ironworks	W	Reconstruction sketch c1760	
SC002	CanonIXUS70		√	1.6	19/09/2010	Ironworks	W	Reconstruction sketch c1650	
SC003		Plustek 7500i	√	9.1	18/08/2009	Ironworks	NW	Overview of site in 1984 after original consolidation work	
SC004		Plustek 7500i	√	0.6	18/08/2009	Ironworks	Plan	Angiddy Upper Wireworks survey 29 Jan 1980	
SC006	CanonIXUS70		√	2	19/09/2010	Area K	Plan	Area K plan.	
SC007		Plustek 7500i	√	8.3	18/08/2009	Area E	NE	Blowing house after excavation 1979.	
SC008		Plustek 7500i	√	11	18/08/2009	Wheelpit	NW	Blowing house summer 1979.	
SC009	CanonIXUS70		√	1.7	19/09/2010	Area B	Plan	Buiding B cobbled area plan.	
SC010	CanonIXUS70		√	2	19/09/2010	Area C	Plan	Buiding C area plan.	
SC011		HPScanjetdo2c	√	0.7	11/04/2011	Areas Y&E	NE	Buildings Y & E from Furnace top.	
SC012		HPScanjetdo2c	√	0.7	11/04/2011	Areas Y&E	SE	Cast capping plates to drain 162 Building K.	
SC013		Unknown	√	0.8	30/06/2010	Areas Y&E	NE	Counter balance pit October 1979.	
SC014		Unknown	√	0.9	30/06/2010	Wheelpit	NW	Emptying wheelpit May 1979.	
SC015		Plustek 7500i	√	17	18/08/2009	Areas X&Y	W	Excavating furnace Aug 1979.	
SC016		Plustek 7500i	√	13	18/08/2009	Areas X&Y	NW	Excavating furnace Aug 1979.	
SC017		Plustek 7500i	√	14	18/08/2009	Areas A&C	SW	Excavating ore house 1980.	
SC018		Plustek 7500i	√	17	18/08/2009	Wheelpit	SW	Excavating wheelpit may 1979	
SC019		Plustek 7500i	√	8	18/08/2009	Wheelpit	SW	Excavating wheelpit may 1979	
SC020		Plustek 7500i	√	11	18/08/2009	Area B	S	Excavation charging house 1980.	
SC021	CanonIXUS70		√	1.5	19/09/2010	Furnace	V	Excavation furnace hearth.	
SC022		Plustek 7500i	√	6	18/08/2009	Wheelpit	?	Excavting wheelpit May 1979	
SC023	CanonIXUS70		√	1.7	19/09/2010	Ironworks	Plan	Extent of excavation August 1979	
SC024		Plustek 7500i	√	3.3	18/08/2009	Ironworks	W	Furnace before excavation April 1979	
SC025		Plustek 7500i	√	13	18/08/2009	Furnace	NW	Furnace during excavation July 1979	
SC026	CanonIXUS70		√	1.7	19/09/2010	Furnace	V	Excavation furnace hearth.	
SC027	CanonIXUS70		√	1.5	19/09/2010	Furnace	NW	Furnace profile.	
SC028	CanonIXUS70		√	1.5	19/09/2010	Furnace	ELV	Furnace profile.	
SC029	CanonIXUS70		√	1.9	19/09/2010	Furnace	NE	graffiti on furnace arch wall.	
SC030		Plustek 7500i	√	8	18/08/2009	Leat	NW	Leat excavation 1979.	
SC031	CanonIXUS70		√	1.6	19/09/2010	Furnace	NW	Leat excavation 1979.	
SC032	CanonIXUS70		√	1.6	19/09/2010	Ironworks	Plan	Leat pases 1979.	
SC033	CanonIXUS70		√	1.8	19/09/2010	Furnace	NA	Leattake off 1979.	
SC035	CanonIXUS70		√	2.6	19/09/2010	Ironworks	W	Reconstruction sketch Phase 2	
SC036	CanonIXUS70		√	1.7	19/09/2010	Ironworks	Plan	Pre excavation profiles.	
SC037		Plustek 7500i	√	8.2	18/08/2009	Areas Y&E	SE	Pumping wheelpit summer 1979.	

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SC038		Unknown	√	0.9	22/04/2011	Furnace	NW	Repointing furnace Sept 1979.	
SC039	CanonIXUS70		√	0.5	19/09/2010	Wheelpit	Plan	secondary wall 209 before removal.	
SC040	CanonIXUS70		√	0.5	19/09/2010	Ironworks	Plan	Site before excavation.	
SC041	CanonIXUS70		√	2	19/09/2010	Ironworks	Plan	Site before excavation showing Janet's cottage	
SC042	CanonIXUS70		√	1.9	19/09/2010	Areas F&G	Plan	Buildings Fand G.	
SC043	CanonIXUS70		√	2	19/09/2010	Wheelpit	NW	Wheel grooves 1.	
SC044	CanonIXUS70		√	1.3	19/09/2010	Wheelpit	ELV	Wheel pit E section.	
SC045	CanonIXUS70		√	1.8	19/09/2010	Wheelpit	Plan	Wheel pit features.	
SC046	CanonIXUS70		√	1.9	19/09/2010	Wheelpit	NW	Wheel scours b.	
SC048		Unknown	√	0.8	30/06/2010	Wheelpit	NE	Wheelpit after excavation summer 1979.	
SC049		Plustek 7500i	√	11	18/08/2009	Wheelpit	NE	Wheelpit after removal of topsoil April 1979	
SC050		Unknown	√	0.8	30/06/2010	Wheelpit	NE	Wheelpit b May 1979.	
SC053		Unknown	√	3.3	30/06/2010	Wheelpit	SE	Wheelpit hutch 207 internal view during excav summer 1979	
SC055		Unknown	√	0.8	30/06/2010	Wheelpit	NE	Wheelpit a May 1979.	
SC056	CanonIXUS70		√	1.3	19/09/2010	Wheelpit	ELV	Wheelpit sections.	
SC057		Unknown	√	3.3	30/06/2010	Wheelpit	NE	Wheelpit view NE summer 1979.	
SC058		Unknown	√	3.7	30/06/2010	Wheelpit	SW	Wheelpit view SW showing drain 129.	
SC059		HPScanjetdo2c	√	0.6	10/09/2010	Wheelpit	NW	Wheelpit, long wall0001.	
SC060		HPScanjetdo2c	√	0.8	11/04/2011	Wheelpit	NW	Wheelpit, long wall0002.	
SC061		HPScanjetdo2c	√	1	11/04/2011	Wheelpit	N	Wheelpit, long wall0003.	
SC062JS		HPScanjetdo2c	√	0.8	11/04/2011	Wheelpit	NW	Wheelpit, long wall0004.	
SC063JS		HPScanjetdo2c	√	0.5	11/04/2011	Wheelpit	N	Wheelpit, long wall0005.	
SC064JS		HPScanjetdo2c	√	0.9	11/04/2011	Wheelpit	NW	Wheelpit, long wall0006.	
SC065JS		HPScanjetdo2c	√	0.9	11/04/2011	Wheelpit	NW	Wheelpit, long wall0007.	

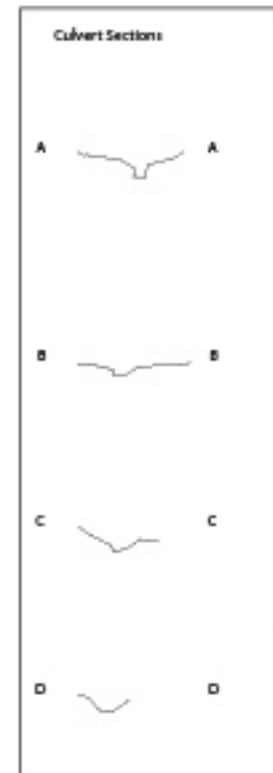
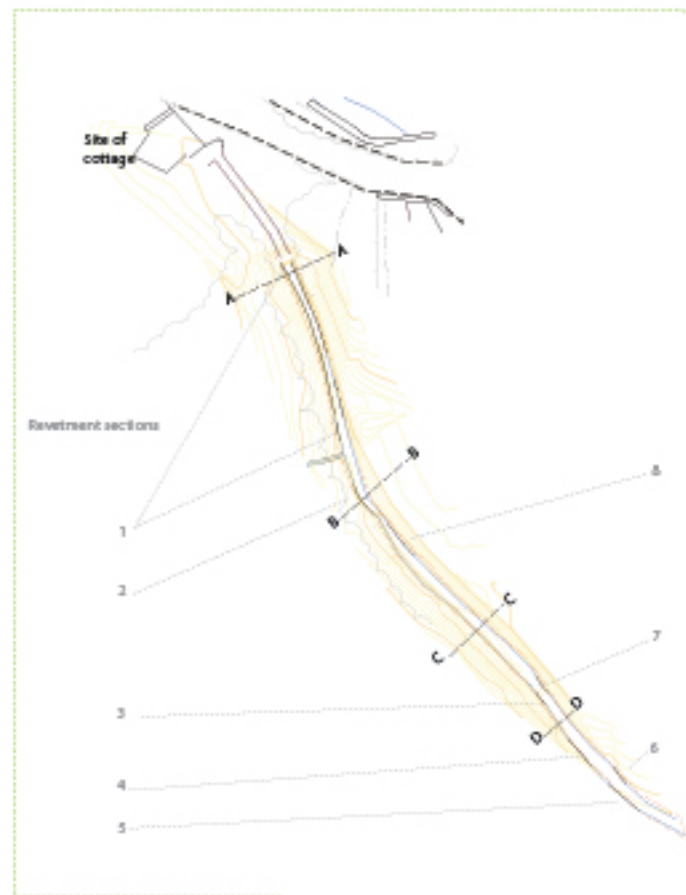




Fig 02: Site plan



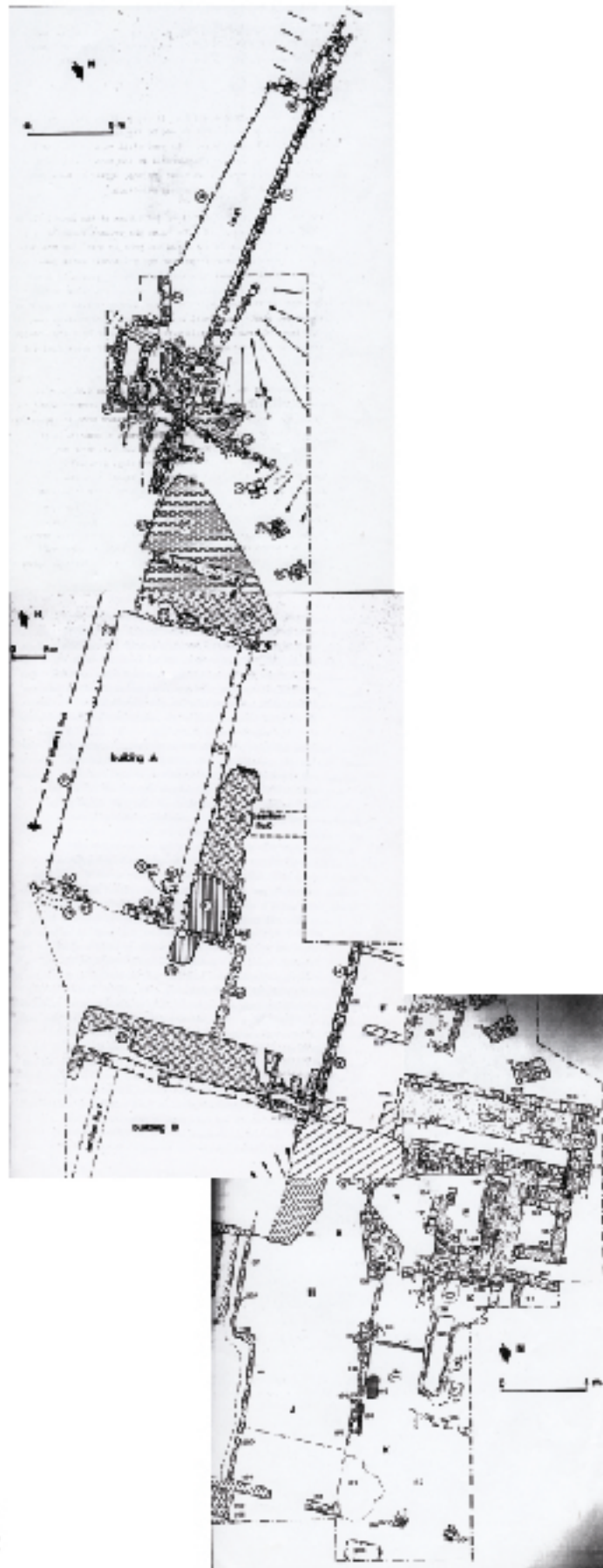
Figure 03: Site plan, Ironworks



<p>North set at magnetic</p>
<p><b>Key</b></p> <ul style="list-style-type: none"> <li> Masonry</li> <li> River</li> <li> Hedges</li> <li> Road</li> <li> Top of bank</li> <li> New excavation areas</li> <li> 1m contour</li> <li> 0.2m contour</li> </ul>
<p><b>Notes:</b></p> <p>The survey was adapted from (Phillips, Ig 05, 2C, 187, 08).</p>
<p><b>Location:</b> Angiddy Ironworks Tintern</p>
<p><b>Type:</b> Site Plan 3</p>
<p><b>Stage:</b> Watching Brief</p>
<p><b>Period:</b> 2010/2011</p>
<p><b>Produced for:</b> AONB</p>
<p><b>Scale at A4:</b> Bar</p>
<p><b>Survey:</b> Dr. N. Phillips</p>
<p><b>Processing:</b> Dr. N. Phillips 27/04/2011</p>
<p> <b>A.P.A.C. Ltd</b> 24 Station Road, Abergavenny, Monmouthshire NP23 7BA apc@philip@tinternet.co.uk</p>

Figure 04: Site plan, Culvert





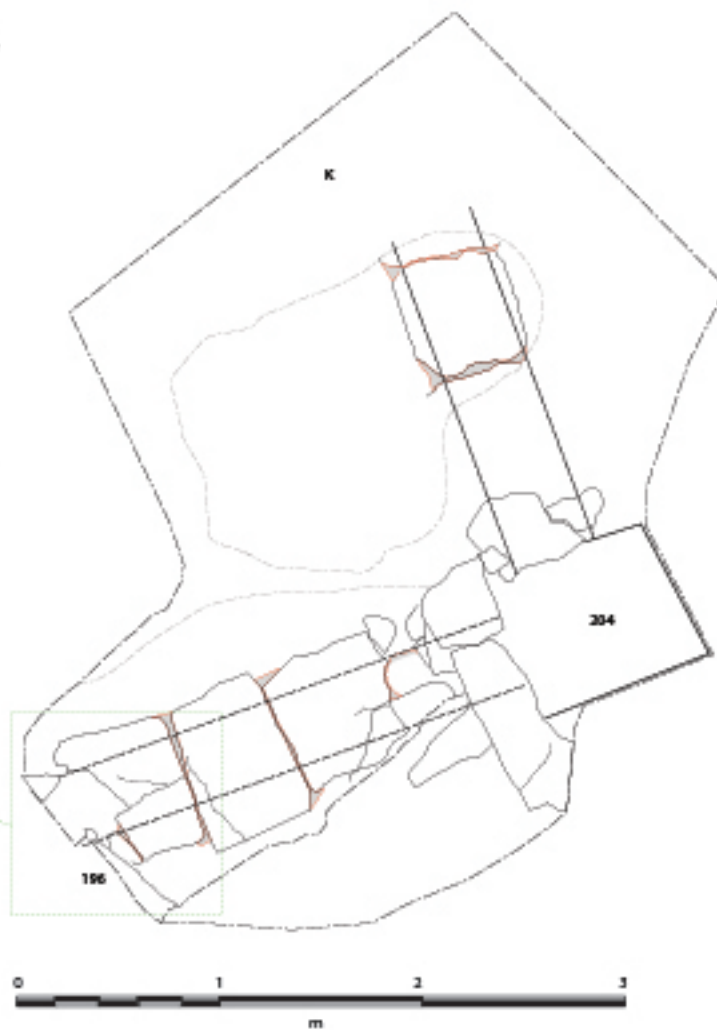
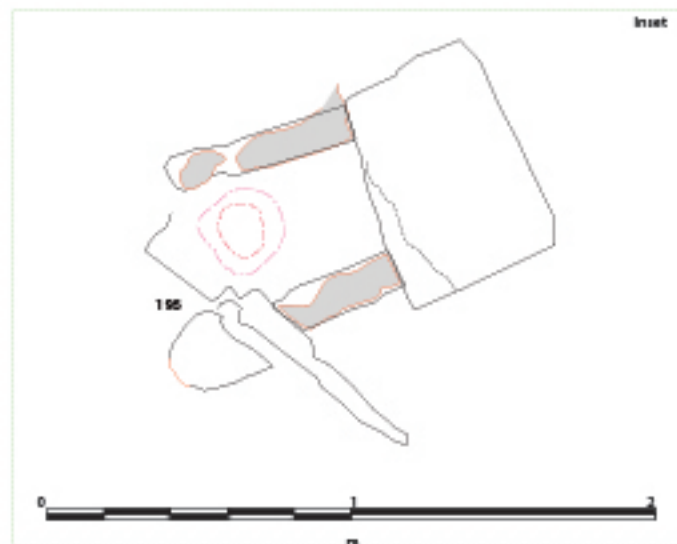
Figs: 4,5&8  
Pickin 1982

Fig 05: Pickin site diagram 1982



- Key**
- Top of trench
  - Bottom of trench
  - Mortar
  - Line of culvert
  - Stone
  - Cracks

- Test pit top
- Test pit bottom



Not & Letters in red after Pickin 1982

Fig 06 :Test trench area K

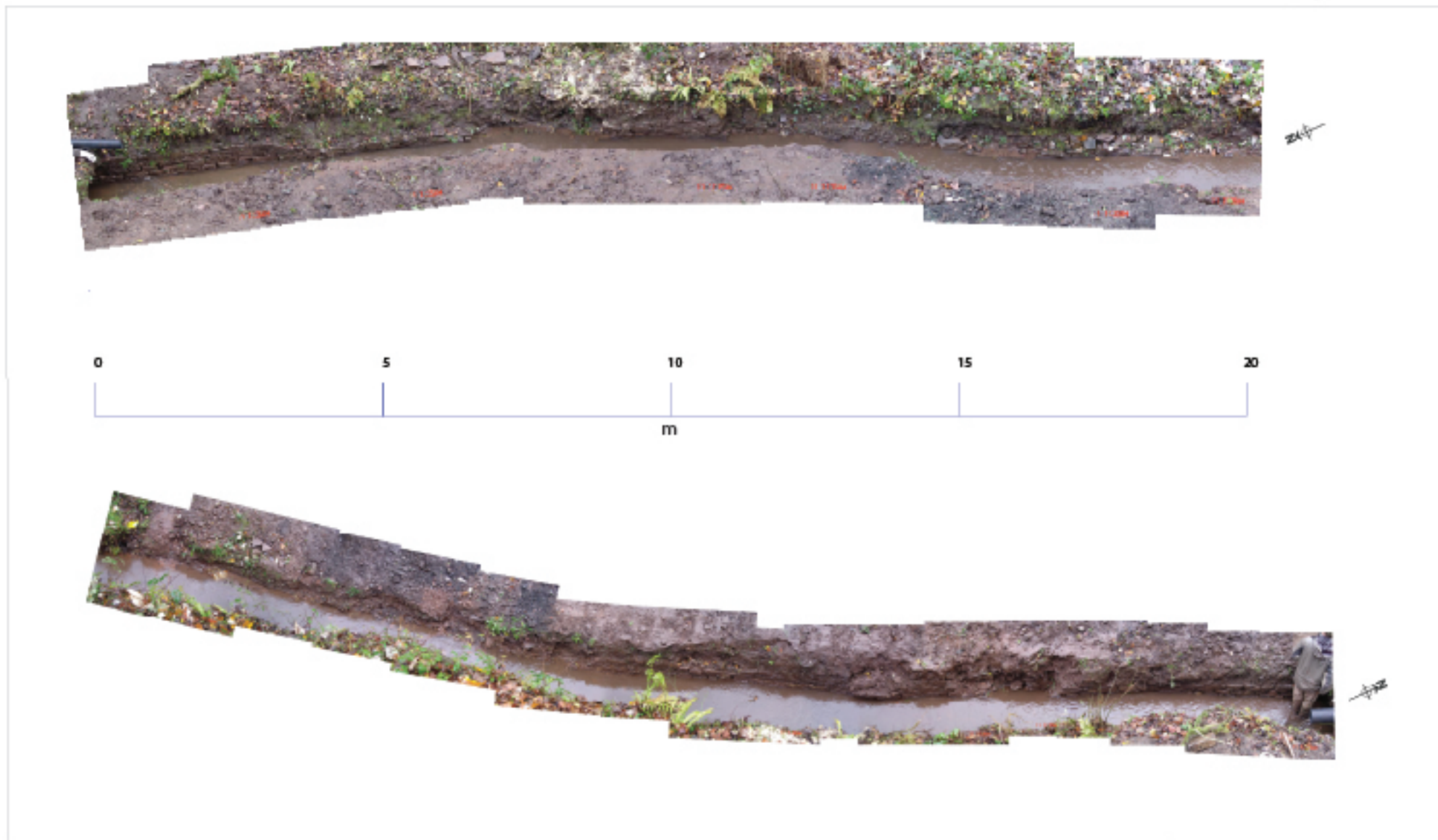
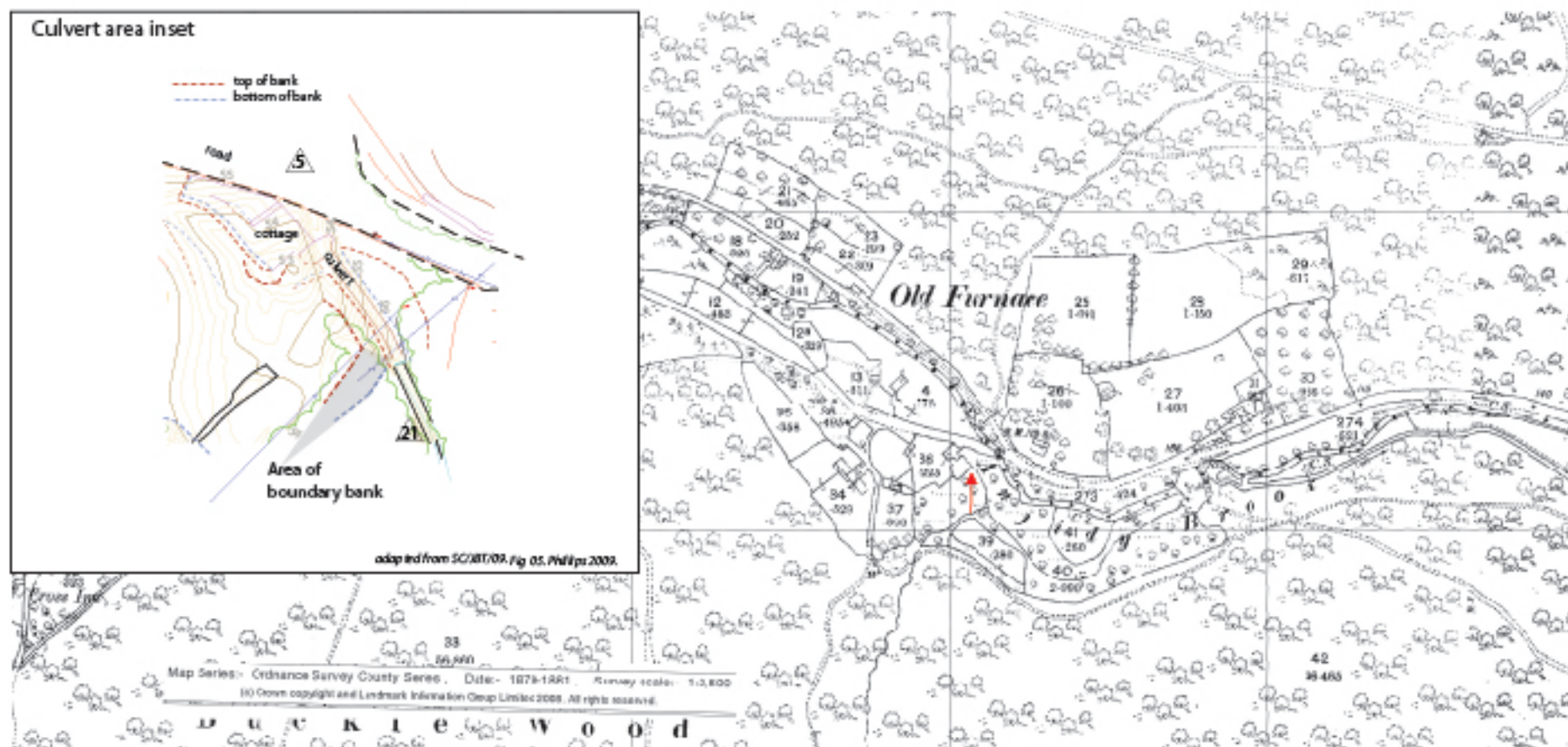


Fig 07: Culvert banks. Photomerged, scaled image



OS Licence:100046577

Figure 08 1879-1881 OS 1:2,500



Figure 09: Proposed and probable positions for test pit 2

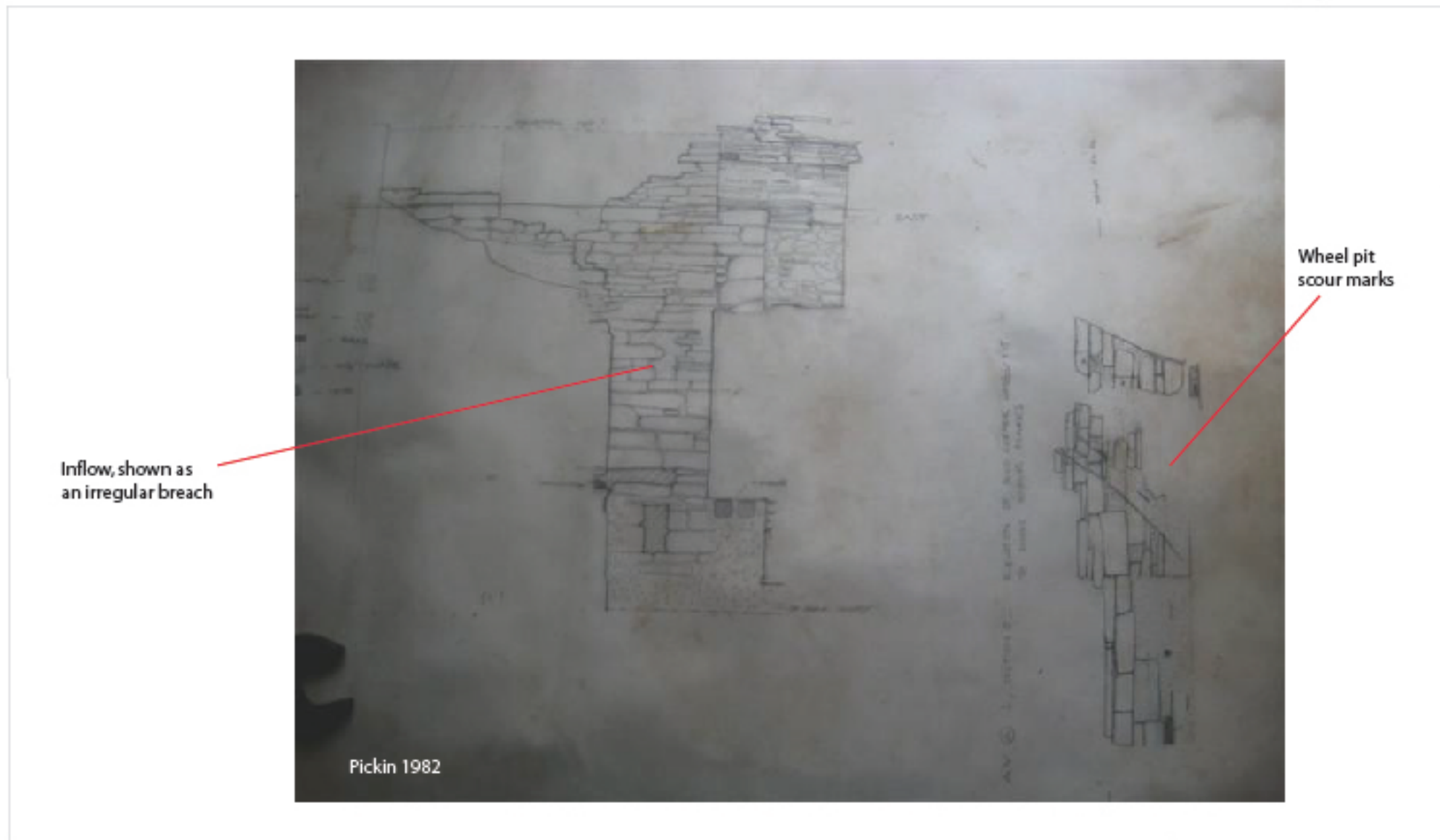
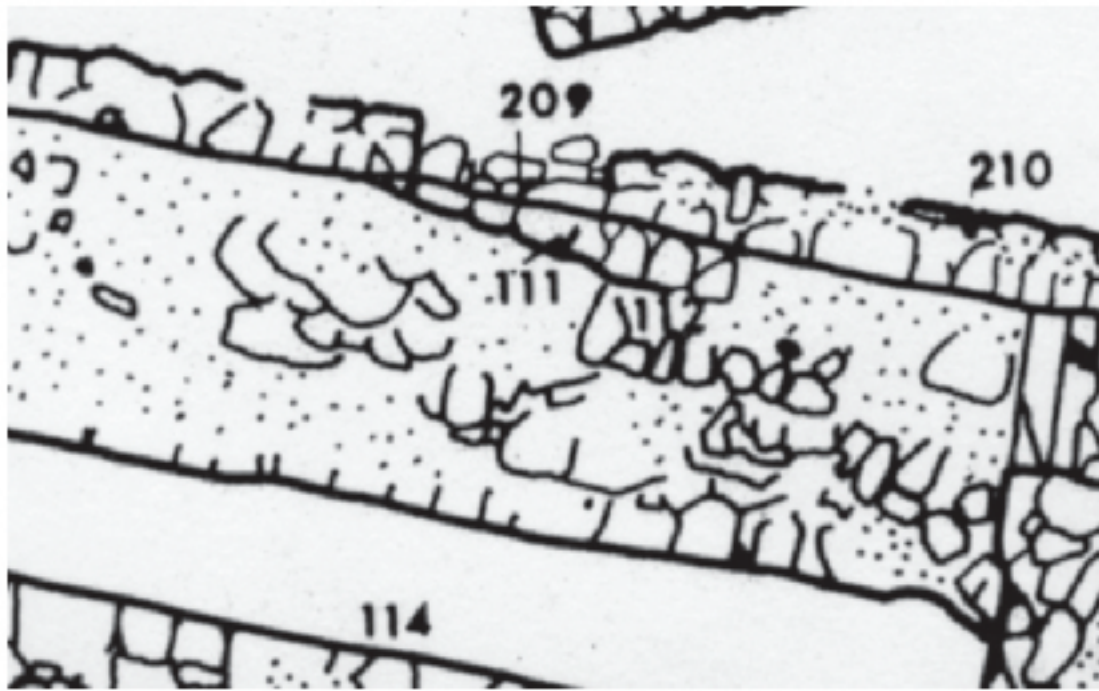


Fig 10: East wall of wheel pit 1979/81.

1 Pickin 1979/82









2 September 2010



3 May 2011



-  Wall 111
-  Original structure of 112, prior to consolidation
-  Structure of 122, post consolidation
-  Structure of 100, post consolidation
-  Surrounding walls 210 & 115/153
-  Vertical edges denoting level change

Numbers & Letters in red after Pickin 1982

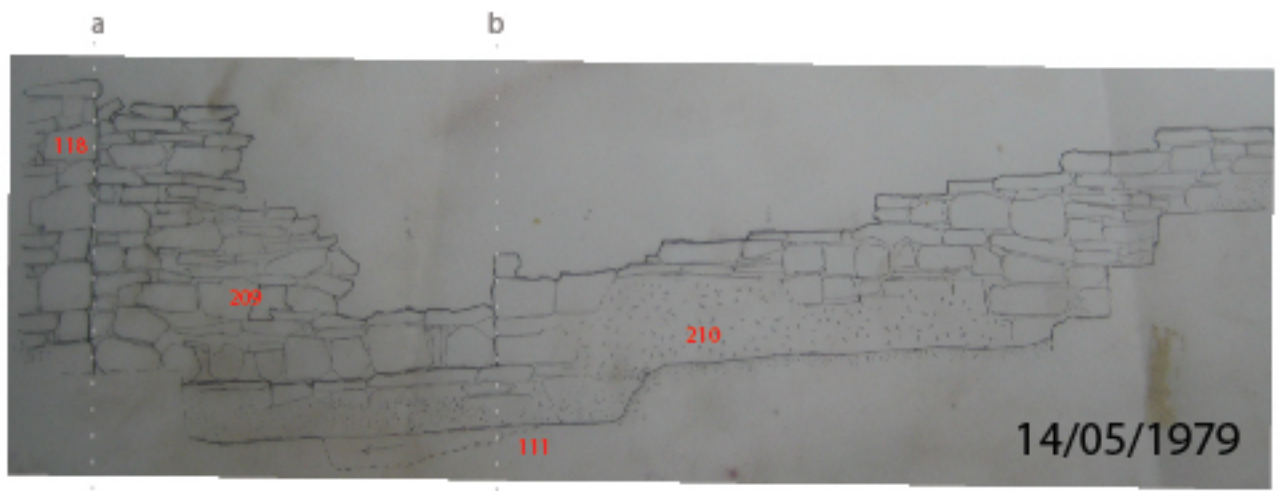


Fig 11: West top of Wheel pit. 1979/82, pre consolidation 2010 & final consolidation 2011



1

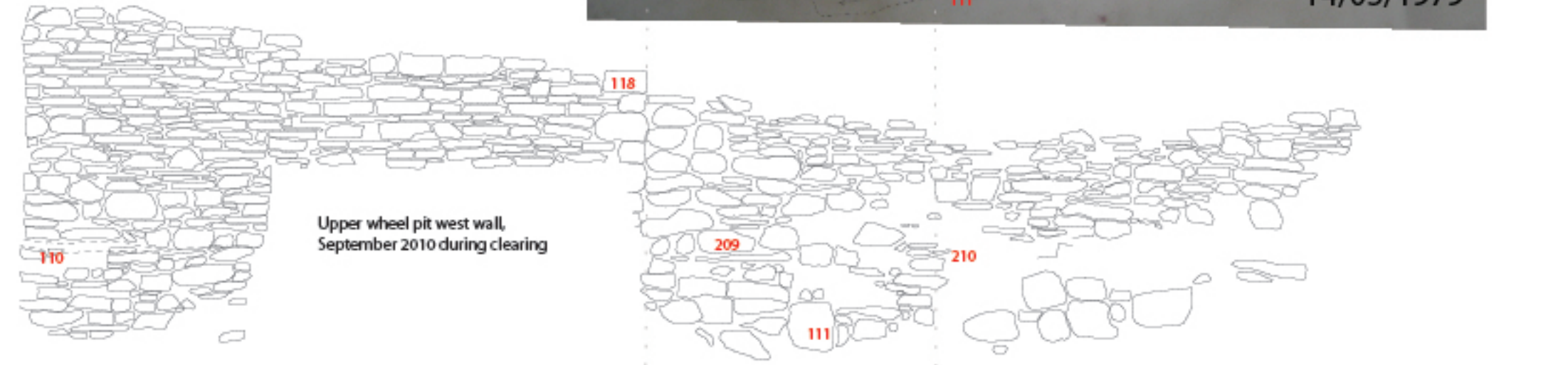
Site drawing Upper wheel pit west wall 1979/81



Numbers & Letters in red after Pickin 1982

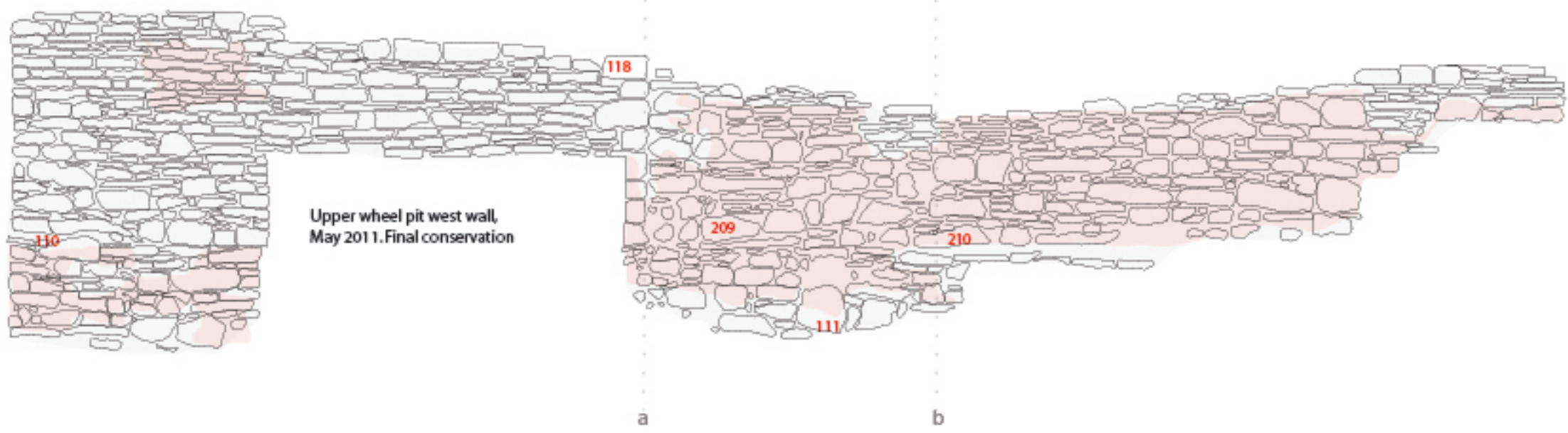
2

Upper wheel pit west wall, September 2010 during clearing



3

Upper wheel pit west wall, May 2011. Final conservation



- Re-pointed mortar
- Cleared or cemented areas

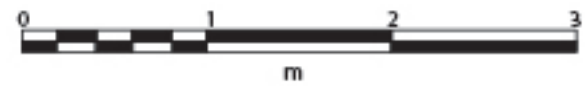


Fig 12: Upper west wall of Wheel pit: 1979/82, pre consolidation 2010 & final state 2011



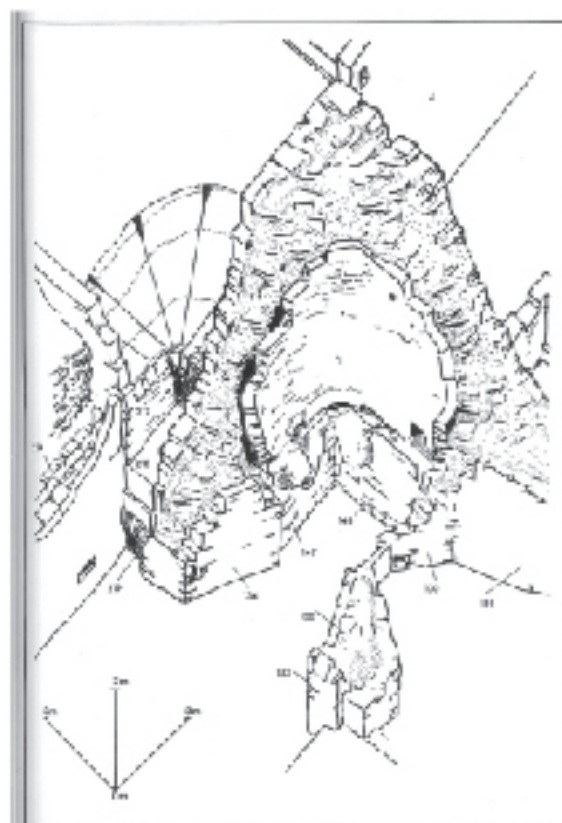


Fig. 9. The East Furnace.

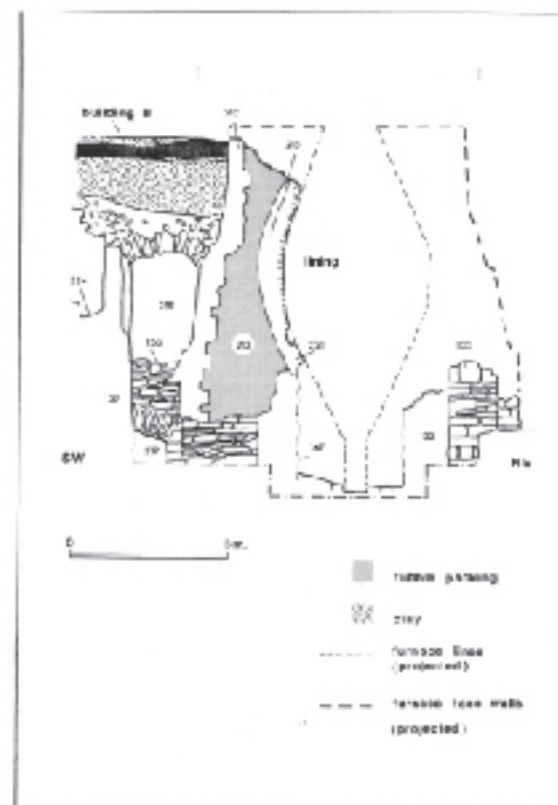


Fig. 10. Profile of Furnace.

Fig 13: Furnace diagrams from Pickin 1982

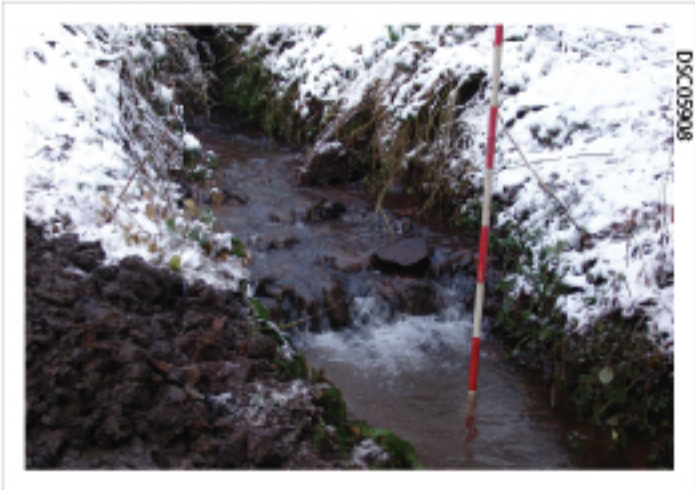


Plate 01: View of culvert resurgence prior to de-silting (WB/ACNB2/09)



Plate 02: View of culvert resurgence after 1m de-silting (WB/ACNB2/09)



Plate 03: Overview of site showing water logging



Plate 04: Rodding out the culvert after further de-silting (WB/JB/10).



Plate 05: Culvert beside cottage showing level of silt (WB/JB/10).



Plate 06: Culvert beside cottage showing level of water (WB/JB/10).



Plate 07: Wheelpit waterlevel, mid March 2010.  
Inflow submerged



Plate 08: Culvert beside cottage, water levels reduced.



Plate 09: Lifting of capstone from culvert close to the cottage wall



Plate 10: Further jetting attempt in Cottage outfall, culvert



Plate 11: View along culvert at cottage, with partial removal of capstones



Plate 12: Overview of excavation in K showing both culverts



Plate 13: Excavated area K between 204 & 198 (Pickin 1982). Culvert & drain.





Plate 14: Main Culvert, excavation in K with capstone lifted



Plate 15: Upper culvert at join under 198 after clearing of silt



Plate 16: Desilting through sump: 204 (Pickin1982)



Plate 17: Trench position overview towards south



P9280016

Plate 18: Test trench overview in order to establish position.



P9280011

Plate 19: Test trench to find culvert line. Close up



D5C08944

Plate 20: Drained wheelpit showing hutch under rear furnace wall



D5C08948

Plate 21: Draining the wheelpit





Plate 22: Silt dump from wheel pit



Plate 23: Curved walling of culvert, south bank and just south of stream join



Plate 24: Culvert drystone wall with section of mortared wall above and at angle



Plate 25: Culvert beside cottage, water levels reduced.







Plate 26: Culvert prior to back fill.



Plate 27: Main Culvert, excavation in K. View towards wheelpit. Silt on left



Plate 28: Cottage outflow at south end of covered culvert. Internal details





Plate 29: Close up of butt joint to south west wall of culvert, beyond the mortared arch



Plate 30: View down culvert below cottage, from open capstone area



Plate 31: Later view along culvert at cottage, prior to jetting





Plate 32: Jetting operation in Cottage outfall, culvert



Plate 33: Mason mark on one of the culvert capstones, south east of cottage outfall



Plate 34: Upstream butt joint to culvert below outflow. Curved construction to reduce turbulent water flow and erosion.



Plate 35: Cottage outfall, internal view of culvert. Detail  A.P.A.C. Ltd WB/AONB3/10



Plate 36: Beyond silt remains at the cottage outfall culvert.



Plate 37: Excavated area K, vertical view down 204, (Pickin 1982)



Plate 38: Excavated area K between 204 & 198 (Pickin 1982). Culvert & drain



Plate 39: Vertical shot of excavation at area K



Plate 40: Upper covered culvert. Capstone removed showing lining and fill



Plate 41: Upper culvert at join under 196.





Plate 42: Upper culvert at join under 198. Test pit through bottom of culvert



Plate 43: Overview of north west area of excavation in K. 204 in foreground right



Plate 44: Excavation in K. Main covered culvert

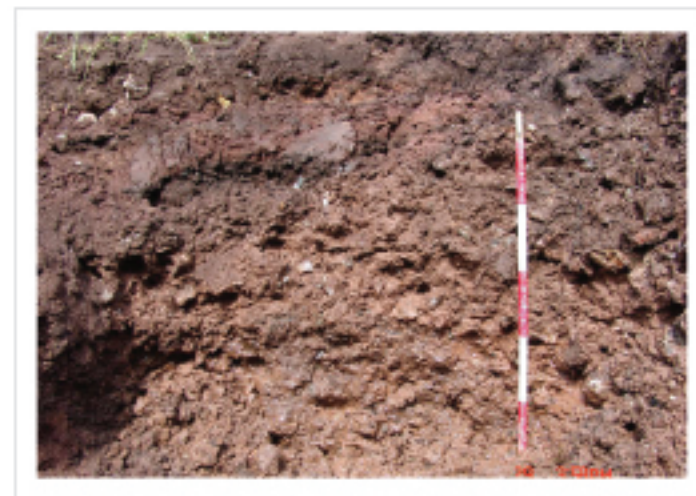


Plate 45: NW section of excavated area K. Made up ground





Plate 46: View along culvert from test pit 1



Plate 47: Test pit 1 culvert after de silting. View along culvert, towards wheelpit.



Plate 48: Area K. Test trench and advised position for test trench. Stone pile.



Plate 49: Silt dump at the wheel pit



Plate 50: Wheelpit view SW showing drain 129.

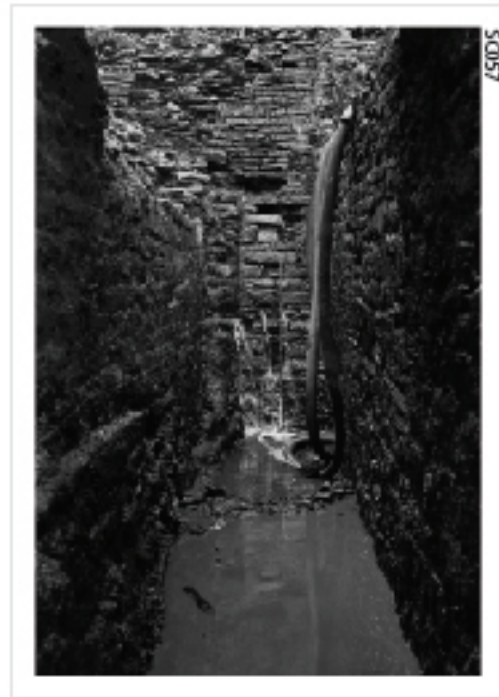


Plate 51: Wheelpit view NE summer 1979.



Plate 52: Stream side of wheelpit showing water ingress, river sandbagged



Plate 53: Final Wheel pit Recessed edge







Plate 54: Phasing detail, wheelpit after repointing



Plate 55: Wheelpit hutch 207 internal view during excavation summer 1979



Plate 56: Eastern hutch in drained wheelpit showing wooden lintel and socket.



Plate 57: Eastern culvert from the wheelpit hutch. Silt level and broken capstones





SC043

Plate 58: Wheel grooves 1.



DS00603

Plate 59: Wheel pit water wheel rub marks



SC048


Plate 60: Wheelpit after excavation summer 1979.  A.P.A.C. Ltd WB/AONB3/10



Plate 61: Wheelpit. Measured photographic recording.



Plate 63: Overview of wheelpit after consolidation



Plate 62: Final elevation record, Upper wheel pit 5



Plate 64: S1 Wheelpit.Measured photographic recording.



Plate 65: Wheelpit, long wall0001.



Plate 66: Wheelpit, long wall0002.



Plate 67: Wheelpit, upper wall. Photogrammetry sequence 2 of 6



Plate 68: Wheelpit. Overview, measured photographic recording

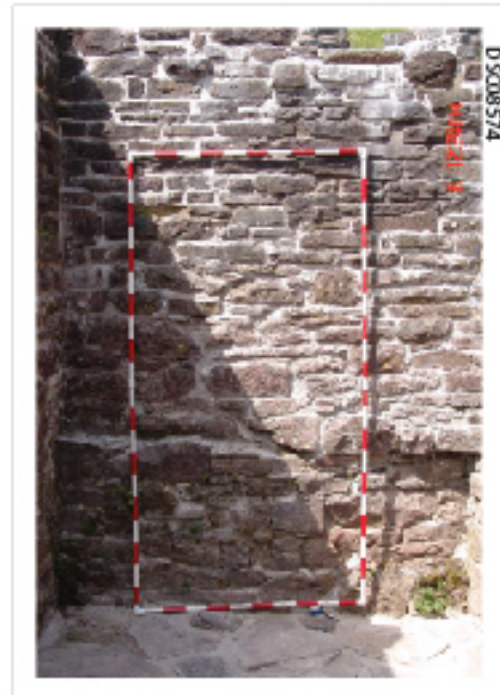


Plate 69: Final elevation record, Upper wheel pit 3



Plate 70: Rear Wheelpit. Measured photographic recording



Plate 71: Blowing house summer 1979.



Plate 72: Wheelpit, long wall0005.



Plate 73: Wheelpit, long wall0006.



Plate 74: Wheelpit, long wall0003.



Plate 75: Wheelpit, long wall 0007.



Plate 76: Buildings Y & E from Furnace top.

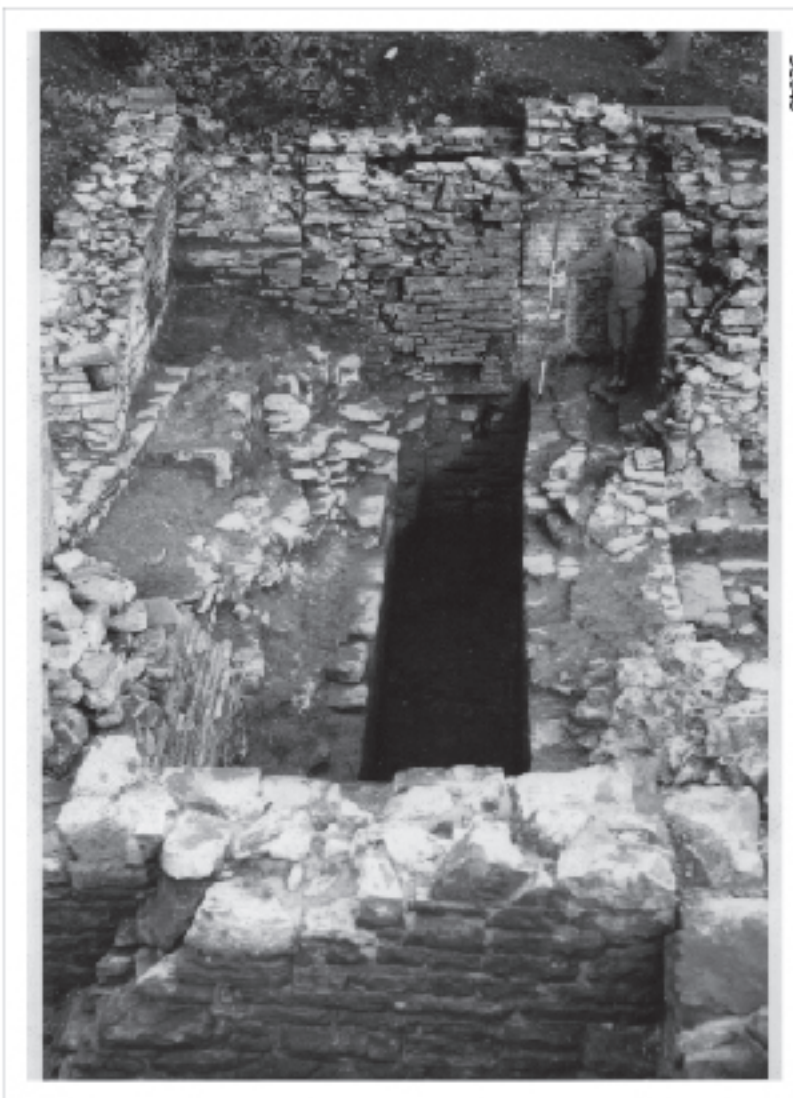


Plate 77: Wheelpit after excavation summer 1979.  A.P.A.C. Ltd WB/AONB3/10



Plate 78: Wheelpit. Upperwall, clearing



Plate 79: Wooden plank 6 Position above wheelpit. Overview



Plate 80: Wooden plank 3 with impromptu scale, 2 inch trowel



Plate 81: Overview of wheelpit clearance. Position of plank recorded on film







Plate 82: Enclosure behind blowing house after consolidation



Plate 83: Cleared area no's: 225, 224, 137.  
(Pickin 1982) Detail

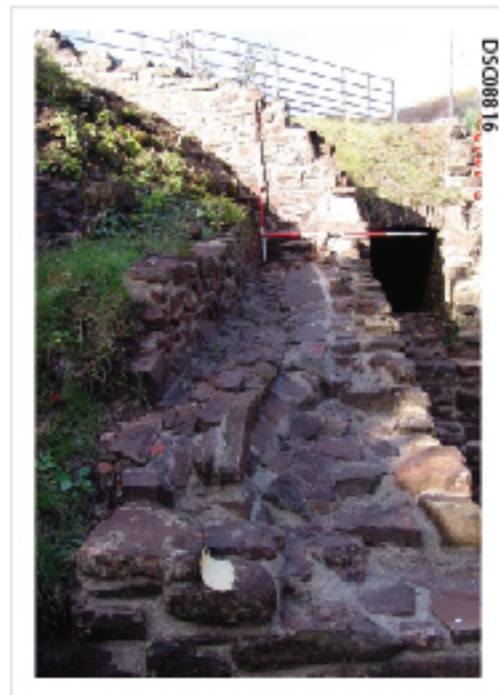


Plate 84: View along  A.P.A.C. Ltd WB/AONB3/10  
224/225 (Pickin  
1982) after re pointing



Plate 85: Step 202 (Pickin 1982)



Plate 86: Furnace during excavation July 1979



Plate 87: 2nd Close up of furnace shaft after clearing



