

EVENT PRN 49652



RABY'S FURNACE, FURNACE, LLANELLI (PRN 4491)

EXACAVATION AND RECORDING

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1. INTRODUCTION

1.1 Raby's Furnace, Llanelli is a scheduled ancient monument (CM219) situated at NGR SN 504015. The furnace complex was built within the upper part of the small, natural valley of the Afon Cinlle (Fig 1). Where the river passes through the furnace complex, it is carried in a stone built culvert which is believed to be original to the ironworks.

1.2 Problems with intermittent flooding of the Afon Cinlle were not completely solved by remedial works carried out *c.* 1990 as the culvert had partially collapsed slightly further to the south of those works.

1.3 The original date of construction of the ironworks remains unclear (Appendix 2, para 1.2). Ironworking probably began on the site in the 1750's and a well preserved blast furnace dating from 1793 or 1801 lies *c.* 15 m to the east of the excavated area (Fig 2). Whilst the presence of certain ancillary buildings and structures (e.g bellows house, waterwheel pits) can be inferred, there are no surviving plans of the working ironworks, so the layout of the complex also remains uncertain; there is however, a distinct possibility that ancillary structures may have extended out over the top of the stone culvert.

1.4 National Rivers Authority wish to carry out further flood prevention works. Following discussion between the NRA and Cadw, a scheme was drawn up which would cause minimal damage to the historic stone culvert and any associated or overlying archaeological structures or deposits.

2. THE SITE AND METHODOLOGY

2.1 The preferred scheme involved the excavation of an area *c.* 4 m by 4 m immediately to the north of the northern property boundary of Tudor Cottage (Fig 1) in order to create a connection between the existing, historic culvert and a new relief culvert running southwards.

2.2 The project brief (Appendix 2) called for the stratigraphic excavation of this 4 m by 4 m trench to reveal and record the upper surface of the roof of the historic culvert.

2.3 No specific depth for the culvert roof could be quoted, but it was felt that it would lie somewhere in the region of 1.4 m below the existing ground surface, in which case it would not be necessary to batter or step the trench. Given the small scale of the intended work and the practical problems involved in getting a mechanical excavator to the trench area, it was decided to excavate by hand. The trench was reduced in spits of *c.* 0.2 m, by pick and shovel, to a depth of 1.3-1.4 m below the modern ground surface. Selective, small scale excavation was undertaken in the centre of the trench around the edge of historic features to depths varying from 1.5-1.7 m in order to clarify the edges of walls.

2.4 At the time of the excavation, the area to the west of the blast furnace was densely overgrown, but the area for the trench had been trashed by NRA. The only significant structure in the vicinity was the blast furnace which lay *c.* 15 m to the east of the trench; all ancillary buildings associated with the furnace are either buried or slight. The vertical embankment for the B4309 lay *c.* 8 m to the west, with the road being *c.* 6m above the valley floor.

2.4 In accordance with the brief, context records were kept for all significant layers and features. Where appropriate, accurate plans were made of the latter at a scale of 1:20 (Figs 3 and 4) and a trench location plan was drawn at 1:100 (Fig 2). The more relevant features were photographed. The finds were kept, but as they largely consisted of sherds of pottery and pieces of bottle dating to the late 19th or early 20th century, they will be of little research value.

2.5 The fieldwork was undertaken between the 20th and 24th of May 1996. The site code was FU 96 and the site archive will be held at the National Monuments Record.

3. THE ARCHAEOLOGICAL FEATURES (Figs 3 and 4)

3.1 A wall (10) ran from the north west to the south east across the trench in the south west corner. It was 0.5 m wide and constructed of random stone (mainly locally quarried mudstone) bonded with a white lime mortar that had a slightly grey hue. Both wall faces had been finished flush, although the south side was less complete. The wall had been constructed over the top of the culvert, but was an integral part of the culvert. Wall (10) had been truncated in the recent past and the surviving stump (which stood to a maximum height of 0.7 m) had been partly broken and moved around by mechanical excavator during excavation works connected with a concrete inspection chamber (9) located *c.* 0.4 m to the south; the entrance to this chamber was evident at ground level *c.* 1 m further to the south west.

3.2 A small area of original roof belonging to the main north-south culvert (12) was found at a depth of 1.2 m below the modern ground surface; this extended for *c.* 0.4 m to the south of wall (10) at which point it was cut by the construction trench for a pre-formed concrete inspection chamber (9). The upper surface of the culvert roof was largely mortar identical to that found in wall (10) with some platy stones being evident; these latter were probably part of the roof capping.

3.3 The roof of culvert (12) had been removed to the north of wall (10), but the joint between the wall and the roof had been rendered and a narrow stub or ledge of mortar render projected out for 0.05-0.15 m (at which point it was snapped off) from the north face of wall (10). This ledge occurred at a depth of 1.4 m below the modern ground surface, i.e slightly lower than the culvert roof to the north of wall (10).

3.4 Part of the western wall of the main culvert (12) was found below the west end of the rendered joint. This appeared to be heading almost due north at an angle of *c.* 45 degrees to the projected line of the culvert; it is possible that the culvert narrowed as a funnel at this point as it passed under wall (10). No trace was found of

the eastern side wall of culvert (12), which would seem to have been removed by cut (5) infra at this level.

3.5 A second stone built culvert (11) entered the excavated trench from the east and joined the main culvert (12) in the south west corner of the trench at wall (10). This culvert would originate from somewhere to the north east of the trench (probably by the blast furnace) and would appear to have been entirely contemporary with culvert (12).

3.6 Culvert (11) was also formed from random platy mudstone bonded with the same type of mortar as wall (10) and culvert (12). The northern side wall and roof were examined, but the southern side probably lay just outside the southern trench edge, so the true width of the feature remains unknown; it was at least 1.6 m wide.

3.7 The upper surface of the roof of culvert (11) (which lay at around 1.3 m below the modern ground surface) was mounded up or 'domed' along its centre and was largely mortar with occasional small stones and randomly placed bricks (of 18th century type). The stonework illustrated (Fig 4) was only exposed because a bite had been removed from the upper part of northern side wall of the feature by a machine (cut 5) during recent repair works. This damage revealed that the walls were formed of substantial stones and that the culvert was of strong construction. There were indications that a protective layer of platy slabs *c.* 0.2-0.3 m in size had been laid over the roof before it was buried under a layer of glass slag waste (8) from the blast furnace.

3.8 There was a distinct projection or 'dog leg' on the northern side of culvert (11) and the uppermost stones at that point appeared to be large slabs, possibly a capping. As no further dismantling of the structure was attempted, the purpose of this widening remains unclear.

3.9 The original extent of the layer of glassy slag (8) remains unknown as this was also cut by the machine cut (5). To the south of that cut, in the south east corner of the trench, the slag was *c.* 0.5 m deep and the spaces between the glassy lumps were largely air voids. The material may have been selected for its drainage properties.

3.10 Most of the trench was occupied by a recent machine cut (5) dating from *c.* 1990 and over 95% of the material removed during the course of the excavation was backfill of this cut which would seem to have been part of a first phase of repair work. The cut entered the trench roughly two thirds of the way down the southern trench edge section and sloped down over the roof of culvert (11), taking a bite out of the upper northern side of the roof and then dropping away steeply; the entire northern half of the trench was occupied by the backfill of this (and later) cuts which extended below the bottom limit of the 1996 excavation; pieces of polythene and plastic were seen sticking out of the bottom surface of the excavation. The lowest fill of cut (5) was a dark brown loam (7) lying along the southern edge. A concrete lining (6) consisting of a thin skim of concrete *c.* 0.1 m deep and sloping down towards the north at *c.* 70 degrees overlay fill (7), above which lay several tons of dark brown loam (4) containing iron slag, pieces of 19th and 20th century pottery and glass as well as several pieces of very recent plastic food packaging.

3.11 There was some evidence of a second phase machine cut (2) running parallel with the northern trench edge and c. 0.7 m to the south of it. This was cut through backfill (4) and was in turn filled with machine backfill (3) consisting of dark brown loam and mid brown loamy clay. Above this, the entire area of the trench was mounded up with modern dark loamy topsoil (1) developed on recent landfill.

4. CONCLUSIONS

4.1 The deposits and structures investigated fall into two distinct (and probably short-lived) phases:-

A) Contexts associated with the construction of the historic culvert complex:-

- culverts (11) and (12)
- wall (10)
- the dump of furnace waste slag (8)

B) Contexts associated with repair works carried out c. 1990:-

- cut (5); fills (4), (6) and (7)
- cut (2); fill (3)
- inspection chamber (9)
- soil (1)

4.2 Virtually all of the material removed during the course of the excavation was machine backfill from works already undertaken on this part of the culvert in connection with the placement and construction of a concrete inspection chamber located to the immediate south west of the trench; part of this chamber protruded slightly into the trench at the south west corner. The roof of the historic culvert to the north of wall (10) was presumably removed at that time. The machine cut for that operation was deeper than the excavation described here (pieces of plastic were seen in the backfill slightly below the level of the excavated trench) and it seems likely that this part of the culvert contains a concrete pipe.

4.3 The excavation revealed a previously unknown side culvert joining the main culvert from the north east. This feature would appear to be entirely contemporary with the main culvert. A stone wall crossed over the area where the two drains met. This wall had been truncated at some time in the past, but probably originally stood above ground level. It is possible that this feature was part of an earlier inspection chamber, but a fragment of culvert roof survived to the south of this wall adjacent to and cut by inspection chamber (9).

5. ACKNOWLEDGEMENTS

The fieldwork was supervised by Kevin Blockley who was assisted by Nick Tavener and Phil Evans. The text for this report was prepared by Nick Tavener and Kevin Blockley prepared the illustrations.

APPENDIX 1

SUMMARY OF CONTEXTS

- 1 Modern topsoil developed on recent landfill.
- 2 Machine dug trench cut - second phase of work *c.* 1990 in north part of trench.
- 3 Fill - machine backfill of cut (2).
- 4 Machine fill or landfill within cut (5) and to south of cut (2).
- 5 Machine dug trench cut - 1st phase of work *c.* 1990 occupying most of trench except for area affected by cut (2).
- 6 Concrete lining - thin skim of concrete placed *c.* 1990 along edges of cut (5).
- 7 Layer below (6) - probably the bottom fill of cut (5).
- 8 Layer of glassy slag (with air voids between the pieces) in south east corner of trench - rakeout deposits or waste from the blast furnace spread out over culvert (11), probably deliberately to give good drainage.
- 9 Large, circular, concrete inspection chamber - placed *c.* 1990.
- 10 Wall - constructed on top of culvert (12) and bisecting it at a right angle (running NW to SE) and bonded into culvert (12), i.e an original feature.
- 11 Stone built culvert - a second drain joining the main culvert in the south west corner of the excavated trench. This would originate from somewhere to the north east of the trench (probably by the blast furnace) and would appear to be entirely contemporary with culvert (12).
- 12 Stone built culvert - the main north-south drain.

APPENDIX 2

CADW:WELSH HISTORIC MONUMENTS

BRIEF FOR MINOR RECORDING AND EXCAVATION WORKS AT RABY'S FURNACE, LLANELLI

1.0 Introduction

- 1.1. Raby's Furnace, Llanelli is a scheduled ancient monument (CM219) situated at NGR SN 504015. The NRA and Cadw have been discussing how to solve the problem of periodic flooding in the valley of the Afon Cinlle which passes through the site and they have come forward with a scheme causing minimal archaeological damage. This brief is to commission small-scale archaeological excavation and recording in advance of these flood prevention works.
- 1.2. Raby's Furnace is a well-preserved blast furnace dating from 1793 or 1801. Ironworking probably began on the site in the 1750's. Remains of the ancilliary buildings associated with the blast furnace are slight or buried. However a casting house will have extended out from the front of the furnace. There will have been a bellows house to one side with its associated leats, waterwheel pits and overflows. The Carmarthenshire Railway, a tramroad built in 1803 entered the site and the location of the second blast furnace is not clear. Unfortunately no plan of the site, when in operation, survives, so the layout cannot be accurately predicted.
- 1.3. The Afon Cinlle is carried from the dam/bridge at the north end through the site in a stone lined culvert which is probably original to the ironworks. The ironworks buildings are likely to have extended across the line of this culvert. Piecemeal repairs to this culvert, the creation of a spillway and two open grilles have not completely solved the problem of periodic flooding caused by partial collapse of the culvert lower down its course.

2.0. SCHEDULE OF WORKS

- 2.1. The preferred scheme agreed by the NRA and Cadw involves the excavation of an area $\approx 4\text{m} \times 4\text{m}$ to create a connection between a relief culvert running south and the historic culvert running through the ancient monument. A grille to catch floodwater will be built at this point in an earthwork bund to trap any floodwater running through the site. The location of the works is at point B on the attached location plan and the engineering details are also attached.
- 2.2. A shallow earthwork bund has already been created at this point and so there may already have been some ground disturbance. Tree roots will have penetrated the upper layers.

2.3. The following operations will be undertaken:-

- 1) Meet with representatives of NRA/Cadw to peg out the site
- 2) Clear working area of vegetation (The NRA will trash the site before work commences)
- 3) Undertake stratigraphic excavation of an area c 4m x 4m to reveal the upper surface of the masonry above the historic culvert
- 4) Produce appropriate context records, plans, sections and black and white photographs
- 5) Produce a location plan at scale 1:100 showing the position of the excavation in relation to the site boundaries and the blast furnace
- 6) Produce six copies of the report on this excavation, two to be passed to the NRA, one to Cadw, one to the regional SMR held by the Dyfed Archaeological Trust, and one with the ordered site archive to the National Monuments Record. The final copy will be passed to the site owner (name and address to be supplied)
- 7) Only in exceptional circumstances will a full finds analysis be undertaken. Finds should be listed and where possible be identified by the excavators. Should specialist identification be required this will be negotiated separately to this brief.
- 8) Access to the site will be on foot from the NE corner of the site (see location plan) making work entirely by hand. The site may have to be temporarily backfilled for safety reasons and this cost will be included in any tender.

3.0. HEALTH AND SAFETY

- 3.1. During the excavation, the archaeological organisation will be responsible for the health and safety of its employees and may be expected to produce evidence of conformity to the Health and Safety at Work Acts. Reference to: Andrews W.H., Allen J.L. and St. John Holt A. 1991, Health and Safety in Field Archaeology. SCAUM is recommended.

4.0. TIMETABLE AND FINANCIAL ARRANGEMENTS

- 4.1. A fixed price tender for undertaking the works described in this brief will be sent to Mr R Turner by Wednesday 10 April 1996.
- 4.2. The fieldwork will be completed by the end of May 1996 and the reports submitted by the end of June 1996 (unless specialist finds identification is agreed).

4.3. The archaeological organisation will be responsible for arranging an initial meeting with Mr E Petty, NRA, Bridgend (tel:01656 662748) and Mr R Turner, Cadw (tel: 01222 500230) to peg out the site and discuss the programme of works.

5.0. DRAWINGS ATTACHED

5.1. Location plan

5.2. Engineering details of new works at point B

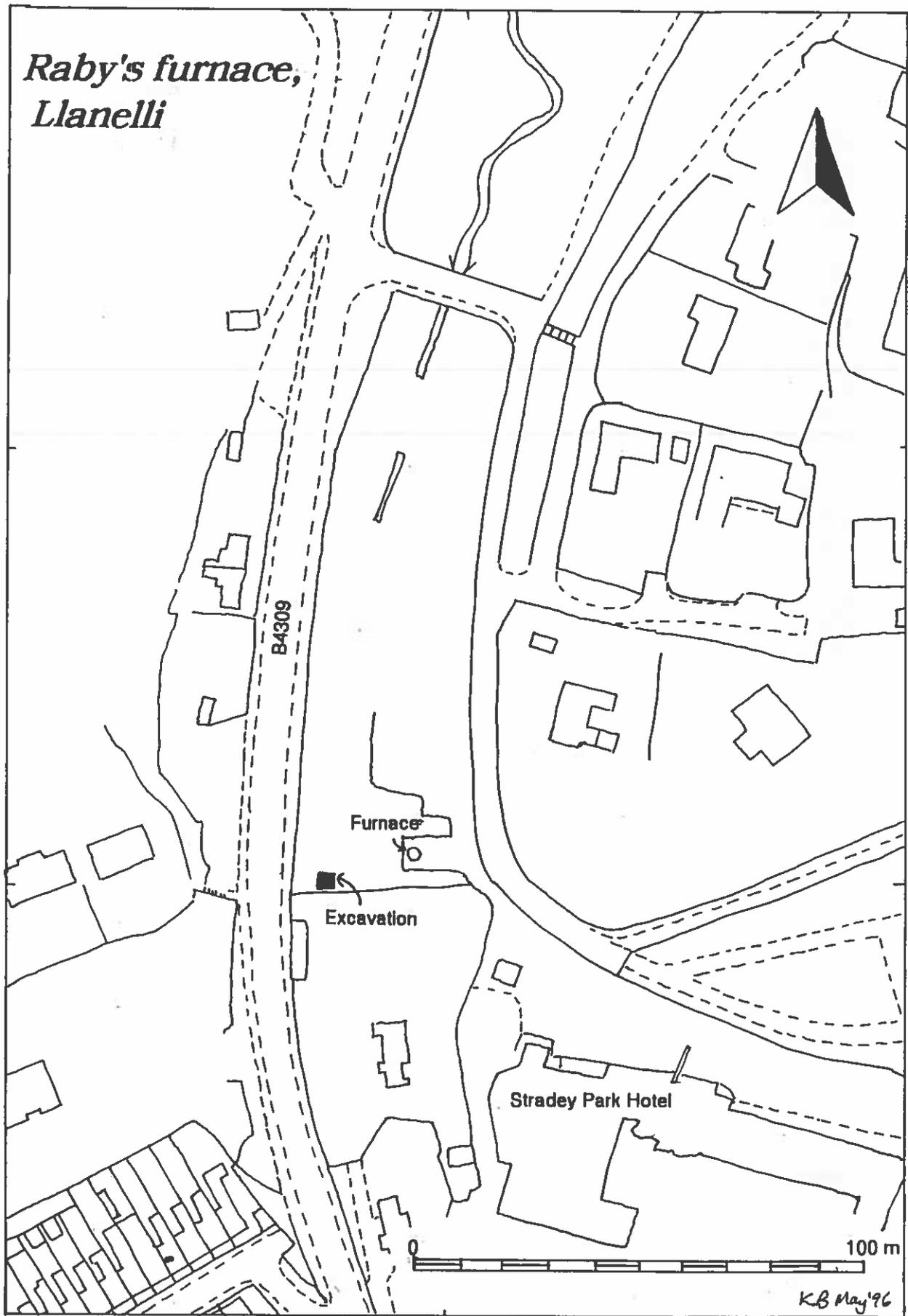


Fig 1 Location plan showing the excavation and furnace.

Raby's furnace, Llanelli

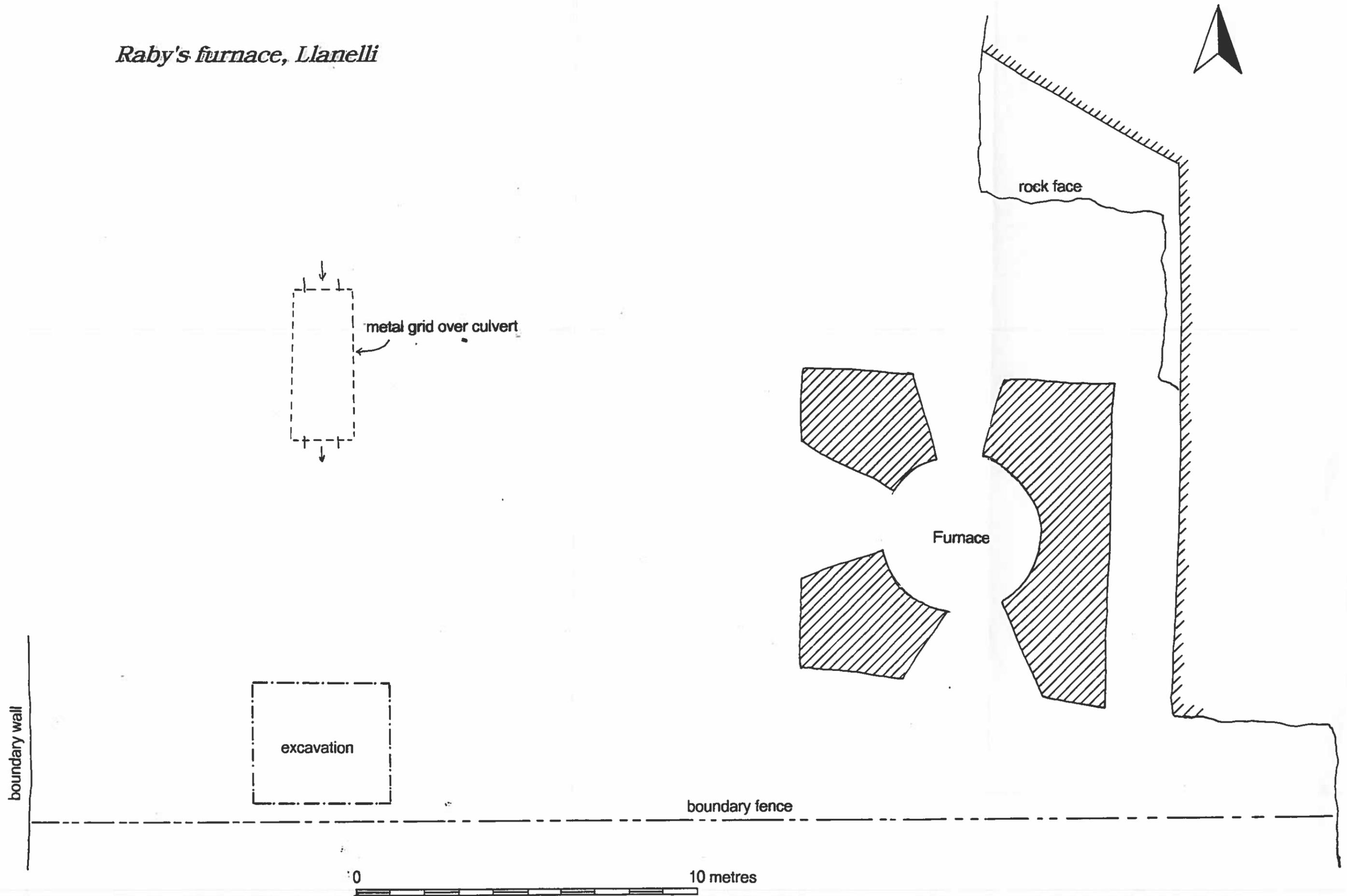


Fig 2 Location of the excavation, showing boundary walls, furnace and

KB May '96.

Raby's furnace, Llanelli

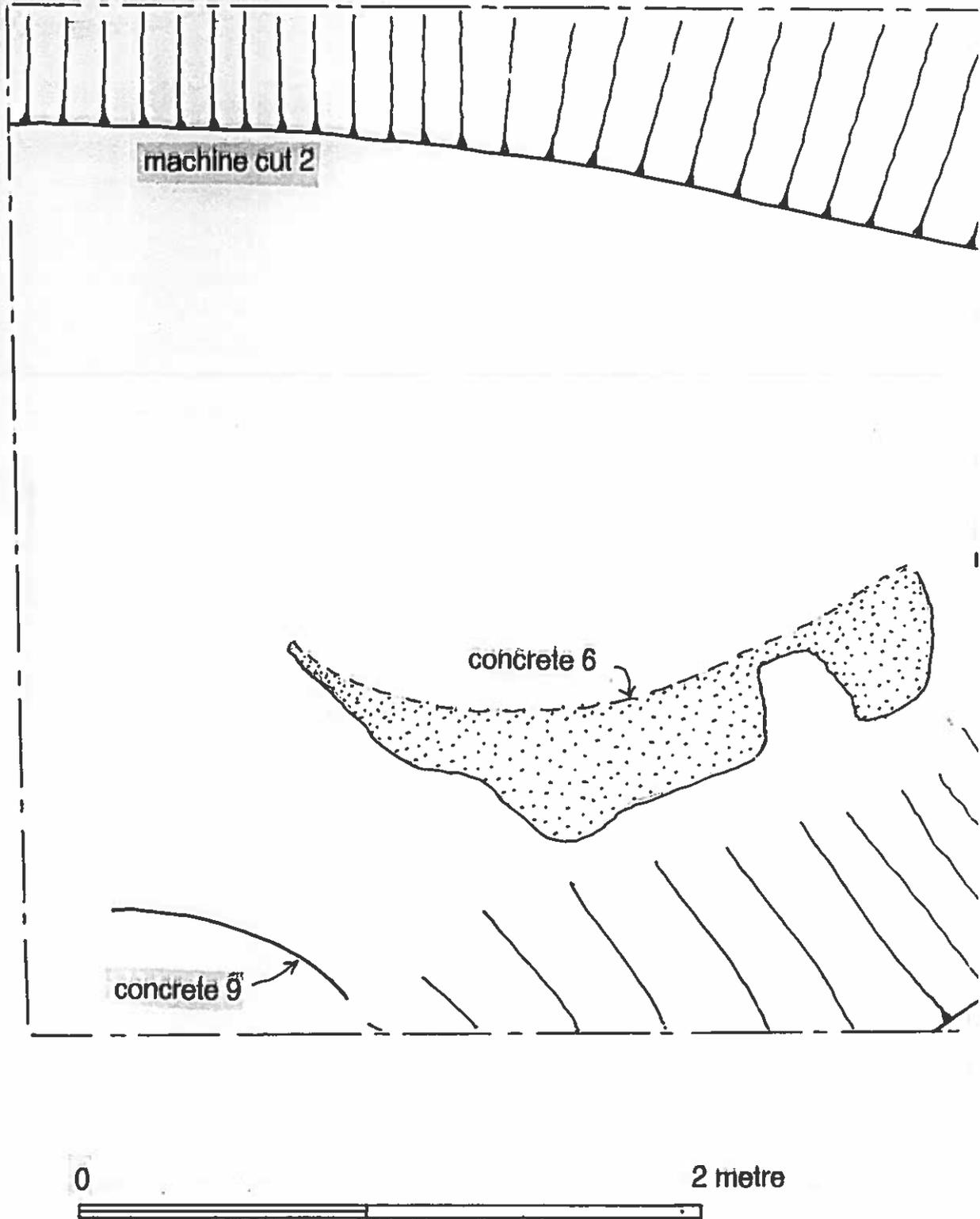


Fig 3 Detail of recent machine-cut trenches and concrete. Scale 1:20.

Raby's furnace, Llanelli

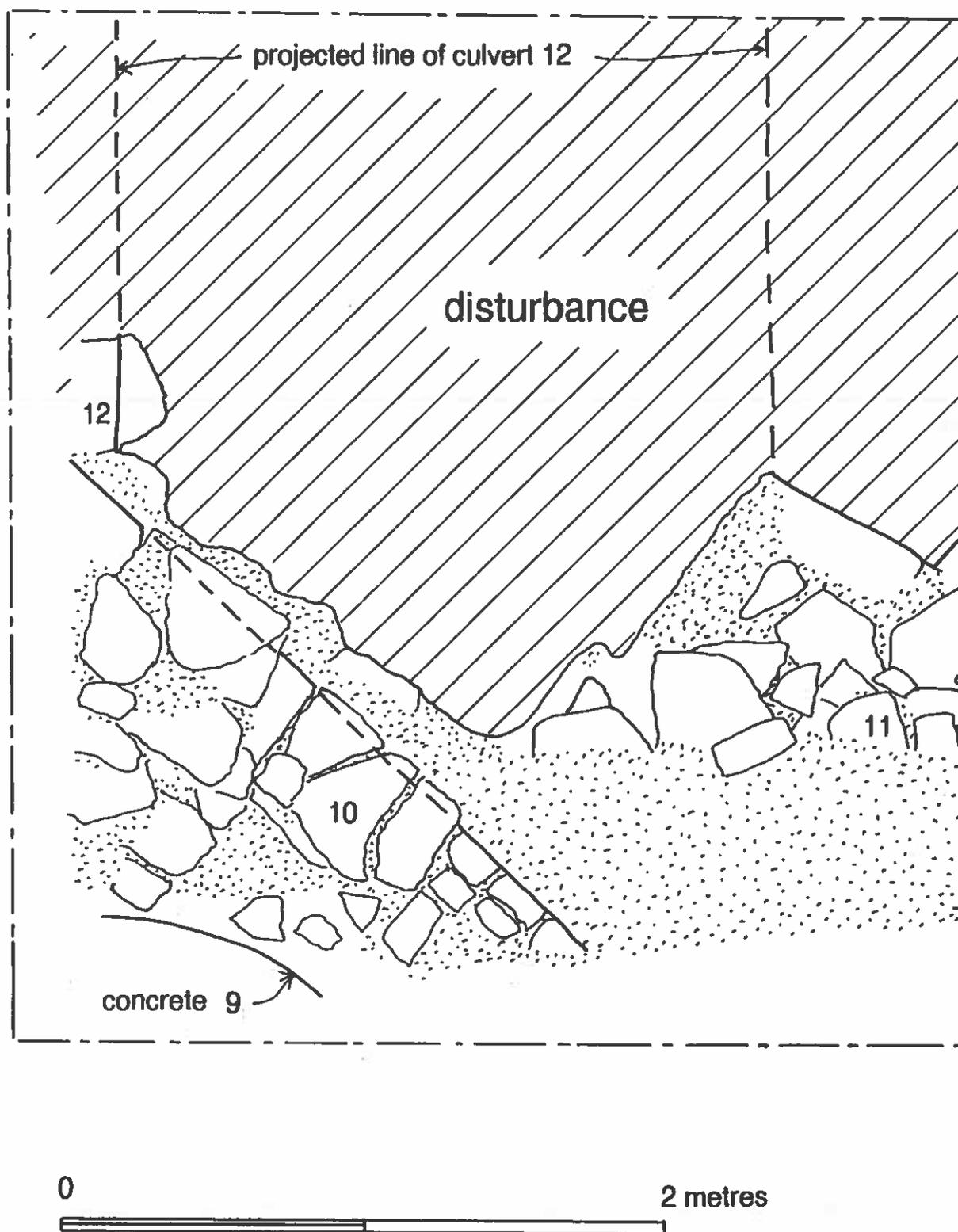


Fig 4 Detail showing surviving remains of 18th/19th century culverts. Sca