Northamptonshire Archaeology

Archaeological watching brief during restoration at the Grotto, Stowe Landscape Gardens Buckinghamshire

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REGISTERED ORGANISATION IfA

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QUALITY CONTROL

	Print name	Signed	Date
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OASIS REPORT FORM

PROJECT DETAILS		
Project name	An archaeological Watching Brief during restoration work at the Grotto, Stowe, Buckinghamshire, November 2010	
Short description	An archaeological watching brief was conducted during the restoration of the Grotto at Stowe Landscape Gardens, Buckinghamshire. The work revealed evidence of the method of construction for the pebble mosaic floor and increased the understanding of the drain beneath that floor. Observation of service trenches for the new water and electricity supply revealed only levelling layers outside the structure.	
Project type	Watching brief	
Site status	Grade II* listed building within a Grade I Registered Park and Garden	
Previous work	Archaeological evaluation, photographic and drawn survey	
Current Land use	National Trust gardens	
Future work	Unknown	
Monument type/ period	Post-medieval Listed Building (Grade II*)	
Significant finds	None	
PROJECT LOCATION		
County	Buckinghamshire	
Site address	Stowe Landscape Gardens, Stowe, Buckingham, MK18 5EH	
OS Easting & Northing	SP 6764 3750	
Study area	Interior of the structure, external service trenches	
Height OD	*c* 114-119m aOD	
PROJECT CREATORS		
Organisation	Northamptonshire Archaeology	
Project brief originator	Gary Marshall, Regional Archaeologist	
Project Design originator	Verbal agreement to Brief, Joe Prentice	
Director/Supervisor	Joe Prentice	
Project Manager	Steve Parry, Northamptonshire Archaeology	
Sponsor or funding body	The National Trust	
PROJECT DATE		
Start date	November 2009	
End date	January 2010	
ARCHIVES	**Location (Accession no.)**	**Content (eg pottery, animal bone etc)**
Physical	NT event number ENA5530	
Paper		
Digital		

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AN ARCHAEOLOGICAL WATCHING BRIEF DURING RESTORATION WORK AT THE GROTTO, STOWE, BUCKINGHAMSHIRE

NOVEMBER 2010

Abstract
An archaeological watching brief was conducted during the restoration of the Grotto at Stowe Landscape Gardens, Buckinghamshire. The work revealed evidence of the method of construction for the pebble mosaic floor and increased the understanding of the drain beneath that floor. Observation of service trenches for the new water and electricity supply revealed only levelling layers outside the structure.

1 INTRODUCTION

An archaeological watching brief was undertaken prior the works to stabilise the pebble mosaic floor and install a new water supply and lighting within the Grotto at Stowe Landscape Gardens, Buckinghamshire (centred on NGR SP 67395 36990, Fig 1). The work was undertaken by Northamptonshire Archaeology on behalf of the National Trust and followed a written Brief for an archaeological watching brief outlined by Gary Marshall, Regional Archaeologist, Thames and Solent Region, National Trust event number ENA5530..

No specification was created in response, however, all conditions regarding the requirements in the Brief were adhered to, and complied with the procedural document MoRPHE issued by English Heritage (EH 2006) and the appropriate national standards and guidelines, as recommended by the Institute for Archaeologists (IfA 2008).

2 BACKGROUND

2.1 Location and topography

Stowe Landscape Gardens is a Grade I Registered Park surrounding Stowe House, former home of the Temple family, later the Dukes of Buckingham and Chandos. It is situated in north Buckinghamshire close to the Northamptonshire border approximately 3km north of the county town of Buckingham. The area of investigation is located within an area known as The Elysian Fields to the north-east of the mansion and which was created by William Kent *c*1740.

The underlying geology has been mapped by The British Geological Survey of Great Britain as comprising Glaciofluvial Deposits; sand and gravel (England and Wales, Sheet 219, Buckingham).

2.2 Historical background

The structure originated as a free-standing single cell building with side walls, overlooking the stream named the Alder River. In the 1760s it went through its first major phase of adaptation when the ground behind the building was banked-up, effectively giving it the appearance of a subterranean cave. A niche was added to the rear of the building to house the statue of Venus and a system of piped water was added to circulate around the statue and through the building. In the 1780s it went through a second major alteration when the interior and much of the exterior was covered in tufa. The statue of Venus disappeared as early as 1848 during the first Great Sale at Stowe and the hydrological scheme is no longer working; indeed it was

not certain until recently how in fact it had worked, but previous archaeological excavation at the rear of the structure revealed the presence of a lead pipe which apparently carried water into the building (Prentice 2004).

The grotto underwent a campaign of holding repairs and partial restoration in the 1970s before the National Trust took ownership of the gardens (in 1989). In 1997 the side passages were consolidated but the main chamber pebble mosaic floor has suffered damage from rabbit burrowing with large areas now missing and others in danger of collapse.

In response to this on-going damage the National Trust proposed to carry out a further phase of repair to the interior and exterior of the grotto which would include the consolidation and repair of the pebble floor, reintroduce the statue of Venus, recreate the hydrological system (using modern methods) and reinstating the tufa scheme but allowing the earlier decorative scheme to show through.

3 METHODOLOGY

The watching brief was carried out between November 2009 and January 2010 and was divided into two main parts, the recording of the interior prior to restoration and the excavation of trenching for new services externally.

The recording of the interior was carried out using drawn plan and elevations, written and photographic records to record those elements of decorative or hydrological details either surviving or visible, but without archaeological intervention. Its aim was to record those parts which would be obscured by the recent restoration.

The trenches necessary to carry electricity and water were excavated using a combination of hand-digging and machine excavation, the former technique used to the west of the grotto in an area of dense shrubbery and trees, the latter between the path leading to the entrance to the grotto and the edge of the Alder River. Each trench was cleaned to define the presence or otherwise of archaeology and then photographed. The trenches were individually planned onto a 1:500 survey provided by the National Trust.

The watching brief was carried out in accordance with *Standard and Guidance for an Archaeological Watching Brief* (IfA 2008). Northamptonshire Archaeology standard Health and Safety Guidelines were followed and a full Risk Assessment was produced prior to the commencement of the archaeological investigation.

4 THE WATCHING BRIEF

4.1 The Grotto

The grotto comprises vaulted entrance passages on the east and west sides, both leading into small ante rooms before opening into the main, vaulted central chamber which was the focus of this phase of work. The central chamber is roughly square with square returns in each corner giving the room a chunky cruciform plan with a curved recess at the north and an arched opening on the south side leading onto a semi-circular balcony (Fig 2). The walls are partially covered with tufa fixed to the stone and brick structure with iron nails and T-shaped clamps; this latest scheme overlies the earlier decorative scheme which appears to have comprised a mixture of mineral

pieces (including crystals) and pieces of mirrored glass. This would have created a shimmering interior enhanced by patterns from the exterior where sunlight was reflected from the surface of the Alder River below.

The floor of the central chamber of the grotto was originally covered entirely with a mosaic comprising natural pebbles of carefully selected size and shape and of two colours, white (with variations to almost brown) and black (Fig 2, Plate 1). The pattern of the mosaic was very simple and was basically a broad border of black pebbles around the perimeter of the room with the central part composed of white pebble. Whilst there were large areas missing, it does no appear that any further decorative areas had been present.

At the back (northern end) of the chamber is a round-topped semi-circular niche in which formerly stood the statue of Venus, and beneath this a marble basin. The niche was top-lit by a tubular light well. It is thought that originally water gently cascaded down over the statue before falling into the basin thus creating both sound and movement within the chamber; the water was conducted out of the basin beneath the floor of the room before falling from beneath the external balcony on the south side of the grotto into the head of the Alder River.

4.2 The pebble mosaic floor

The pebbles, mostly rounded but with a few more angular examples, were set in a layer of lime mortar and appear to have been laid in relatively small but regular areas since straight joins could be discerned within the white areas (Fig 2, Plate 2). This was thought to presumably reflect the working method of the mosaic makers and to indicate the areas which they could lay, perhaps in one day, or at least in one mix of lime mortar (a bit like fresco painters who would only lay an area of plaster on which they knew they could paint in one day). When the floor was being repaired, the craftsman who undertook the work used the following method of working; timber battens were laid around an area that was to be worked upon and then levelled. Lime mortar was laid within the battens and the pebbles roughly pressed into the surface. A detached batten was then run across the fixed, levelled, battens which had the effect of pushing down the pebbles fully into the mortar and at the same time producing a perfectly level surface. Once hardened, the battens were removed and the gaps they had left were infilled with mortar and pebbles creating lines identical to those observed in original sections of flooring (this commentary on the working methods of the repairing of the floor was observed by Mr G Marshall and conveyed to the author of this report). It therefore seems that this method was used originally and thus explains the straight lines which were visible within the floor surface.

Beneath the surface layer in which the pebbles were set there was, in some areas at least, another layer of coarser mortar which had its upper surface roughly scored, or keyed, on which the final layer was laid (the scoring comprised a roughly diamond pattern of varying size in different areas). This type of levelling using different grades of mortar (or plaster) is exactly the same way in which walls are plastered and where the final, or top coat, is laid over successive layers of coarser stuff. Beneath the lower, coarser mortar layer the sub-base appears to be a mixture of loose sands, gravels and soil which comprises the basic levelling within the structure. This sub-base was not excavated but only recorded in those areas where it had been exposed by rabbit burrowing.

Aligned north-south down the centre of the room was a simple brick drain which channelled the water from the marble basin on the north side. The channel lay beneath the bottommost layer of coarsely scored mortar sub-base and was entirely

concealed by that and the overlying final mortar and pebble surface; its presence was only revealed when the pebble surface was disturbed by the burrowing of the rabbits (see Fig 2). The drain comprised a base of bricks with sides comprising a single course of brick laid on edge, end to end and capped by a further layer of brick, all bonded in lime mortar. Since it served the marble basin situated within the niche, this drain must relate to the programme of hydrology added during the 1760s. As the pebble floor overlies this drain and also appears to respect the edge of the marble basin, the floor itself most likely also relates to this phase of works.

4.3 The marble basin

At the north side of the chamber only parts of the oval grey/white veined marble base of the basin remained *in situ* (Fig 2, Plate 3). The marble base comprised a number of slabs which had been subsequently broken, and is now incomplete. The slabs of marble were approximately 35mm thick. It is possible that this marble was re-used, since when parts of the slabs which had been moved outside of the basin were re-fitted, it was seen that on one piece at least were remains of tooled-off raised rib, perhaps originally moulded (Plate 4). None of the sides of the basin remained but its original depth could be tentatively determined by the presence of slabs of finely grained stone along the southern edge with three holes in which are thought to represent the drainage holes for the overflow (Fig 5). These stones also appear to have been re-used having a simple cavetto moulding along their inner edge, although this might have been a deliberate part of the design.

Below the pieces of stone on the southern edge of the basin and flush with the marble slab of the base is the end of a lead pipe, splayed where it presumably sat flush with the internal face of the side of the basin (Plate 5). It is assumed that this acted as a drain for when the basin needed to be drained, since if it was open all of the time the basin could not have held water. It presumably connects with the brick drain beneath the pebble floor. The height of the floor above the base of the basin suggests that when complete (though not including any raised lip which may have been in place) the basin was *c*0.3m deep. It is not known how the edges of the basin were finished, nor can it be determined whether its upper edge was flush with the pebble floor or stood proud of it, though perhaps the latter is the most likely. All of the above mentioned pieces of stone and marble are set within a blue/grey clay which acted as a waterproof lining.

As commented on above, the marble basin and niche are thought to have been added during the 1760s along with the pipework associated with it.

4.4 Lead pipe beneath the pebble floor

In two of the rabbit burrows at the north-east corner of the room a lead pipe (diameter 35mm, 1 3/8 inches) was exposed (Fig 2). It rose vertically close to the east side of the basin and was laid 0.26m below the finished level of the floor. Aligned roughly north-south for approximately 2.5m it turned eastwards and presumably is located beneath the floor of the eastern ante chamber before extending eastwards through the eastern entrance passage; its eastern limit is unknown, but may connect with a piece seen previously (Wainwright 1991). It is unclear whether this pipe channelled water into, or out of, the chamber.

4.5 The rear niche

The curved niche at the rear (north side) of the chamber comprises two parts; the large, almost semi-circular round topped niche in which the lower marble basin was positioned and which fills most of the rear wall, and a second, smaller niche set within in the larger niche at a higher level (Plate 6). The latter is thought to have contained the statue of Venus. Both the large and small niches are formed of a combination of brick and stone (though most of the arris's to each niche are formed of brick) and both retain fragments of surface mortar render. Almost no surface decoration remains, though a very few pieces of tufa pegged into the walls remain at the outer edges close to the ceiling and floor. There are some isolated areas of the first phase of decorative scheme, most clearly seen at the top right of the smaller arch soffit where it appears that crushed glass, and possibly also quartz, has been set into the surface of the mortar render (Plate 7). The glass and quartz appears to be a variety of colours; muddy brown/green, turquoise green, orange, brown and pink. Though now dull, originally this surface must have sparkled quite brilliantly.

In the eastern side of the larger niche an angled line of bricks, set on edge flush with the wall face indicate the position of a channel set into the wall (Fig 3, Plate 8). It is thought that this might have either conducted water freely through it (perhaps acting as an overflow?), or perhaps more likely, was the channel in which the lead pipe seen in the floor at the south-eastern end was set. The channel leads from the lower right-hand side of the upper niche to the lower right-hand side of the larger niche (Fig 3).

In the rear wall of the larger niche, beneath the upper niche is a hole in the brick- and stonework (Fig 3, Plate 9). This has previously been reported upon (Prentice 2004) and since the opening was not opened further, nor additional information gleaned, nothing further can be added. In summary, it appears that an arched culvert is positioned behind the rear wall at this level and appears to carry water. It may, therefore, simply be a drain which carries water from and to unknown sources/destinations, or it might have a bearing on the water supply to the lower basin. The latter appears to be unlikely since the present opening though which the limited investigation has been carried out, appears not to be original. If this is the case there does not appear to be any way in which the water it carried could be utilised. Thus, its function remains a mystery, and unless, or until more of it is exposed no more can be said.

The smaller niche retains a single piece of lead pipe projecting slightly from the rear, curved wall, towards the top (Plate 10). It is thought that this connects with the lead pipe exposed previously when a trench was opened at the rear of the grotto. If this is the case it seems that this would have carried the water into the grotto from a source as yet un-confirmed, and on to the top of the statue of Venus. The water would then have fallen over the figure and, it is thought, into a smaller basin (now lost) situated at the base of the upper niche. From there the water either cascaded over the front edge into the lower oval basin, or was piped, perhaps through the lead pipe set into the eastern wall via the sloping brick channel, into the lower basin, or out via the pipe found beneath the pebble floor.

4.6 The floor of the balcony

The floor of the balcony, both beneath the southern arch and externally, has been re-laid. It is thought this was carried out when the grotto was repaired during the 1970s. The balcony floor is separated from the interior of the grotto chamber by a sill, or kerb, of fine grained stone blocks (Plate 11). It is not clear if this sill is an original feature, though it is thought that it probably is as the stones which form it are deeply set (their

bases were not seen) and there appears to be no clear cut for their insertion which would be seen if they were added recently. The pebbles on the balcony floor are well laid, though of a larger size than within the grotto, and they do not appear to have been sorted by colour.

4.7 Service trenches

Two separate lengths of trench were excavated (Fig 4). That to the west of the grotto (Trench 1) was connected into an electricity supply whilst the section to the south (Trench 2) was to supply water from the Alder River.

Trench 1 was hand dug for some of its length due to its location within shrubs and trees around the electricity junction box located there. The trench was *c*0.5m deep and revealed only topsoil and the upper layer of what was probably not natural clay. The area around the grotto has been heavily landscaped and it seems unlikely that any of the soils revealed were natural. Also, given the restricted nature of the trenches and the heavy root contamination it was not easy to clean the sections or photograph them. The trench was watched only as far as the gravel path beneath which the remainder of the trench was to be positioned.

Trench 2 was located to the east side of the gravel path and dog-legged towards the edge of the Alder River to the east. The unconventional route was dictated by the presence of a large yew tree whose roots were to be avoided where possible. This section of trench was excavated by mini-digger, though the very lower end close to the waters edge was hand dug due to the fact that the machine could not get a grip on the steep slope and started slipping into the water. Beneath a distinct introduced topsoil layer of clay loam there were mixed underlying layers of either fairly clean sands and gravels or almost clean orange/brown clay (Plate 12). A small dump of late nineteenth-/early twentieth-century bottles was revealed. They were of a variety of shapes, colours and materials (white and coloured glass and stoneware) and appeared to be medicine bottles. Only one was named, this had the raised moulded label of 'SLOAN'S LINIMENT' on the side. This was, according to Wikipedia, a liniment primarily used for horses to relieve stiff and aching muscles. It was first sold in the 1870s in America, though appears to have become a world-wide business by the early years of the twentieth century.

5 FINDS

Within the grotto few finds were recovered from any of the cleaning of the floor, and most of these comprised iron fixings for the tufa of the wall and roof covering along with large quantities of loose pebbles, both black and white. These were left on site for possible re-use. A single piece of salt glazed Nottingham stoneware (date range 1700-1800) was recovered from the sand and gravel levelling layer beneath the mortar layers of the pebble floor within the central grotto chamber.

6 CONCLUSIONS

The Stowe Grotto, though fairly well documented visually from its creation into the early years of the nineteenth-century, appears to have been less well recorded after that date. What is not clear is when it stopped being supplied with water, though this probably occurred at the time the statue of Venus was sold in 1848. If this is the case it has been effectively non-functional for more than half of its life.

While the development of the remaining building is fairly well understood from a structural point of view, the finer points of the hydrological system are little understood,

and apart from the fact that it is almost certain that the water entered the structure from the rear (north) side, and exited via the brick drain beneath the floor before falling into the Alder River, very little can be said with absolute certainty. Disparate sections of pipework, channels in the walls and drains are virtually impossible to reconstruct into a convincing system, especially as it is unclear whether they are all contemporary, or some replace earlier versions.

The end of a lead pipe visible towards the top of the upper niche suggests the most likely entry route of the water into the building from where it then flowed over the former statue before falling either into an upper basin (now missing) at the base of the same niche, and then either over the front of the same basin or via pipework into the lower basin. It could, of course, have done both, either at the same time or at different times or potentially neither. With no upper basin and remaining *in situ* pipework at this level, it is speculative to suggest further in any detail.

The lower basin appears to be more easily understood if taken in isolation. However the water entered it, it seems that it exited via the three holes in the re-used stone on the south edge which connect with the brick drain beneath the pebble floor. This in turn exits from a hole beneath the balcony before entering the Alder River (this theory has been confirmed by pouring water down the holes on the edge of the basin). Not only would this have served the simple function of draining water from the basin but it would also have created both the sound and sight of moving water to add variety to this secluded upper end of the River.

Two sections of the hydrological system that at present are not understood (at least, by the author of this report) are the section of lead pipe located beneath the pebble floor and extending into the eastern passage and the brick culvert behind the wall at the rear of the lower basin.

The lead pipe has been only partially seen, and the end near the base of the rear niche is clearly cut off so its original extent is uncertain. Also unclear is whether it introduced water into the grotto or drained water from it, a fundamental issue. Unless the eastern end is complete and can be confirmed as leading *from* a supply or *into* a drain, this question cannot be answered. That it is part of the original scheme seems more likely since there is no clear evidence to indicate that the floor has been repaired above it which would imply that it had been inserted at a later date.

The arched brick culvert behind the lower basin is equally problematic. It has been suggested that this could have acted as a sound box, amplifying the sound of water falling from the upper into the lower basin. While initially this sounds plausible, sound boxes need either a reasonable sized opening and corresponding echo-chamber for the sound to enter and reverberate in, or a membrane over the opening of an echo-chamber through which the sound can travel before reverberating. What is known of the arched feature suggests that this could not have been the case as it appears that the present hole leading into it is not original, and does not appear large enough to allow sound in before returning out of it, amplified. It also begs the question, why, in an underground stone and brick vaulted room would you need an additional echo chamber? The entire room to this day amplifies sound, and certainly would have done so when first completed with its crushed glass covered walls, marble statue and basins and pebble-stone floor, all of which are hard, sound reflecting, materials. Also, if it was an echo chamber it seems unlikely that it would, coincidentally, later act as a culvert, carrying water from and to unknown destinations. It certainly has water flowing through it at certain times as this has been observed, and it is the opinion of the author of this report that it is simply a drain constructed when the earth was piled-up behind the building to prevent a structurally dangerous build-up of water behind the main chamber.

This would explain its apparent sporadic flow, and the fact that the present hole is probably simply knocked through or the result of accidental damage, since to have a hole at the front would allow water to potentially flood the main grotto chamber.

Fragmentary remains of hydrological systems are notoriously difficult to understand, the author has previously excavated another of Kent's water features (the Cascade at Chiswick) where a similarly incomplete structure proved equally difficult to understand, even after consultation with an expert on early hydrology from the Science Museum, London (Dix and Parry 1997).

The construction of the pebble floor is, by contrast, easier to understand being simply a mortar base laid over levelling layers with a pebble surface. The decorative schemes on the walls and vaulting remain in sufficient detail to catalogue, the first phase apparently being a surface of crushed glass, and possibly also quartz, which would in combination with mirror glass have produced a glittering reflective surface. This was later covered by a more rustic surface of tufa blocks to produce a more natural cave-like space.

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Website

en.wikipedia.org/wiki/Earl_Sloan

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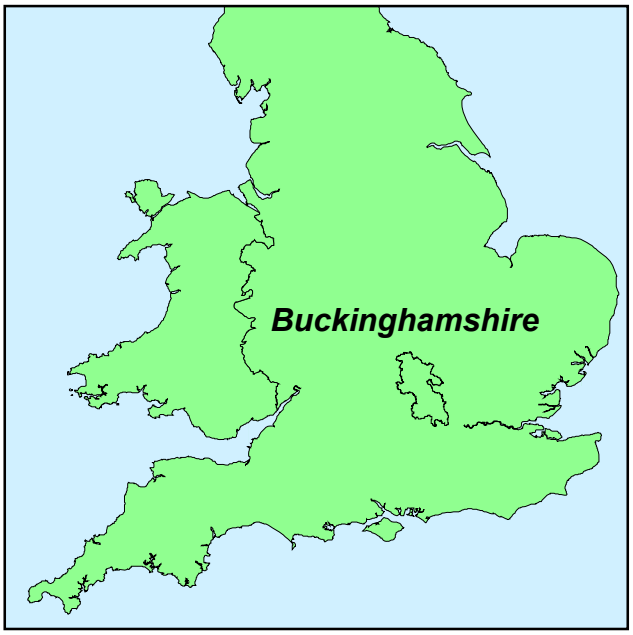
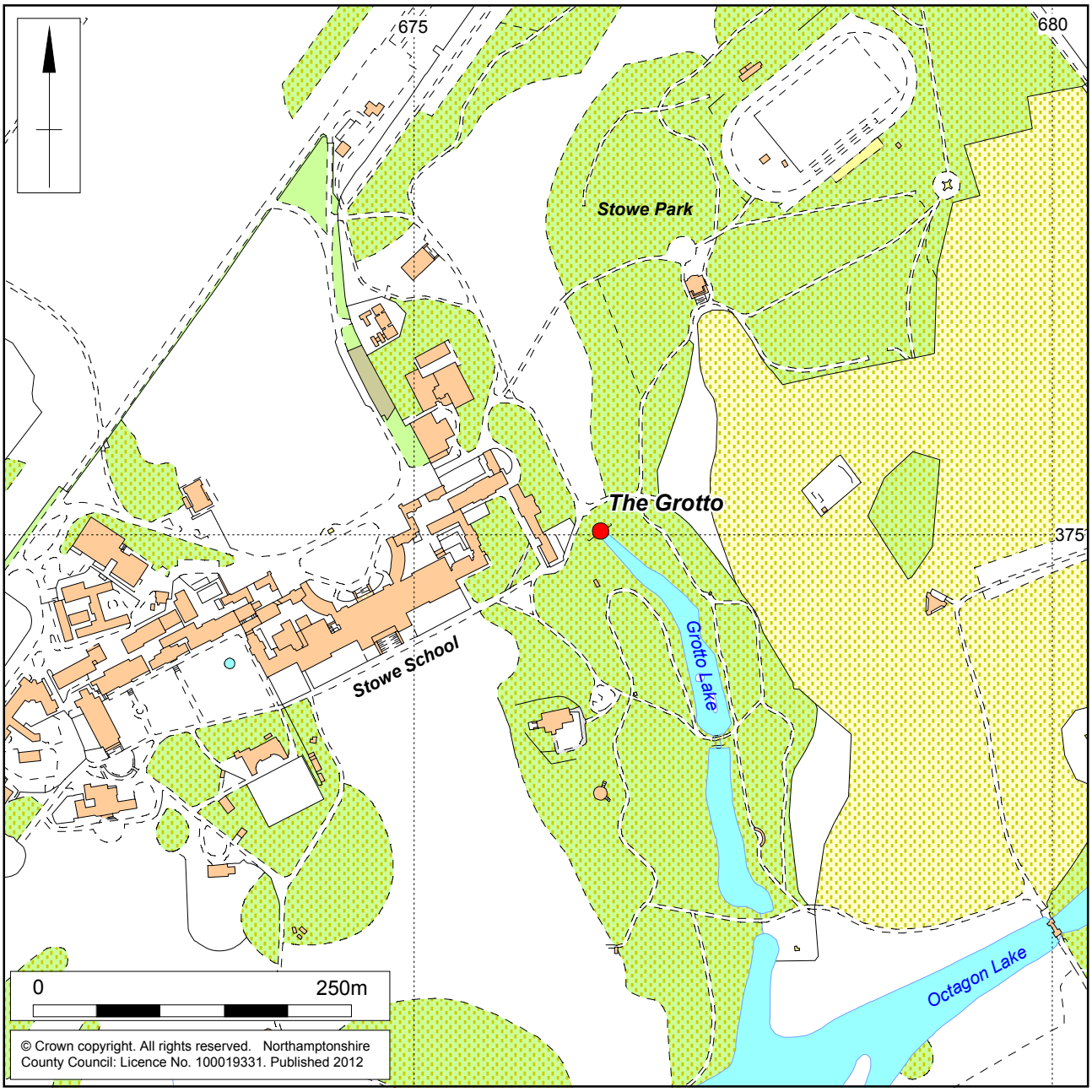
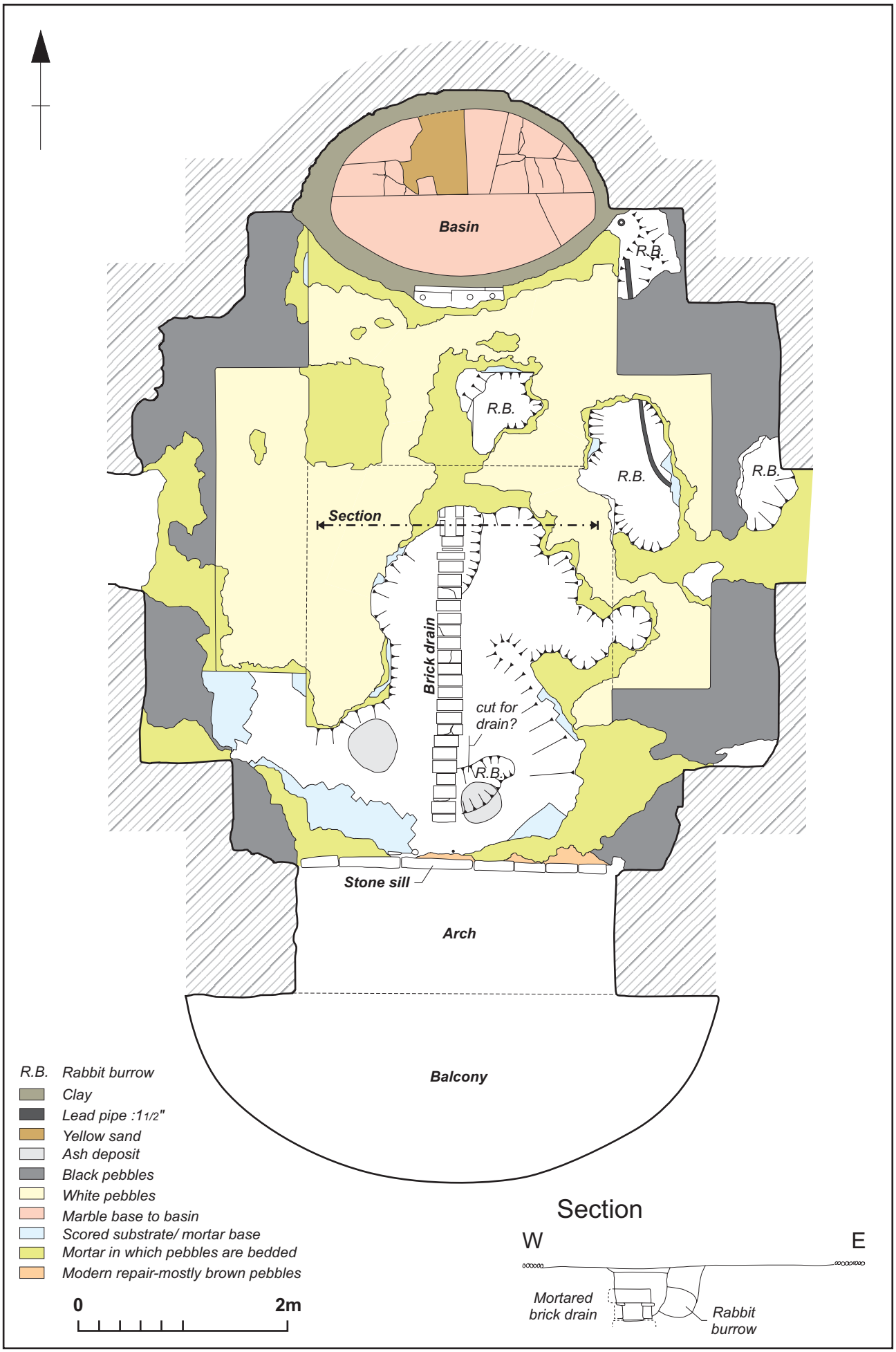




Scale 1:5000

Site Location Fig 1

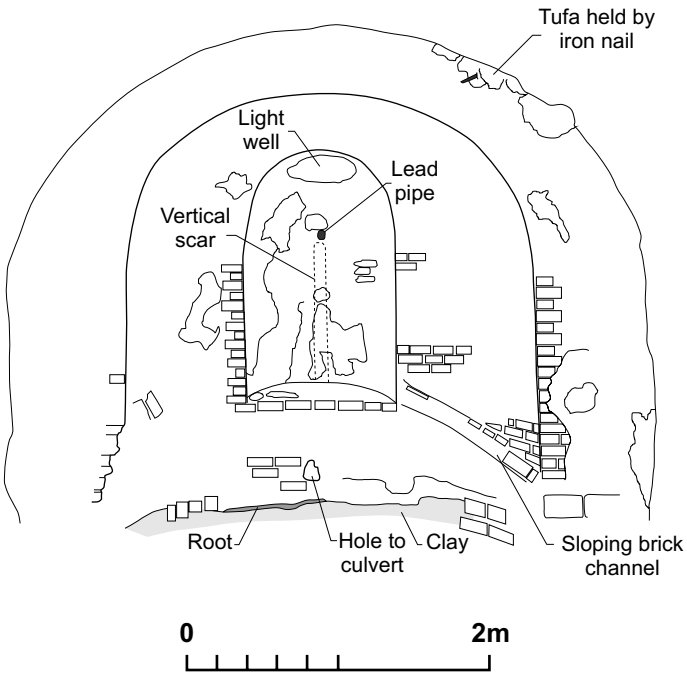


Scale 1:50, Section 1:25 (A4)

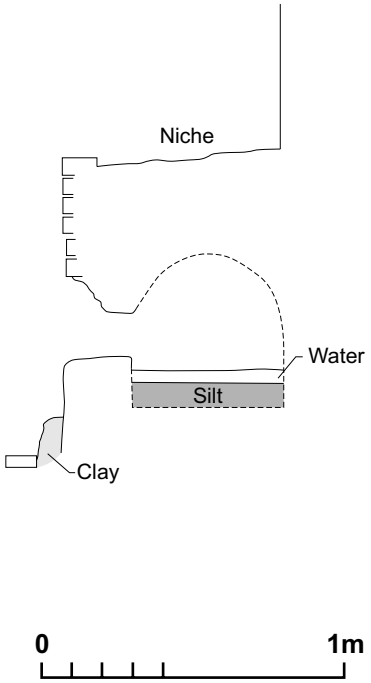
Plan of the Grotto floor, showing pebble floor, repairs and damage

Fig 2

North elevation of niche



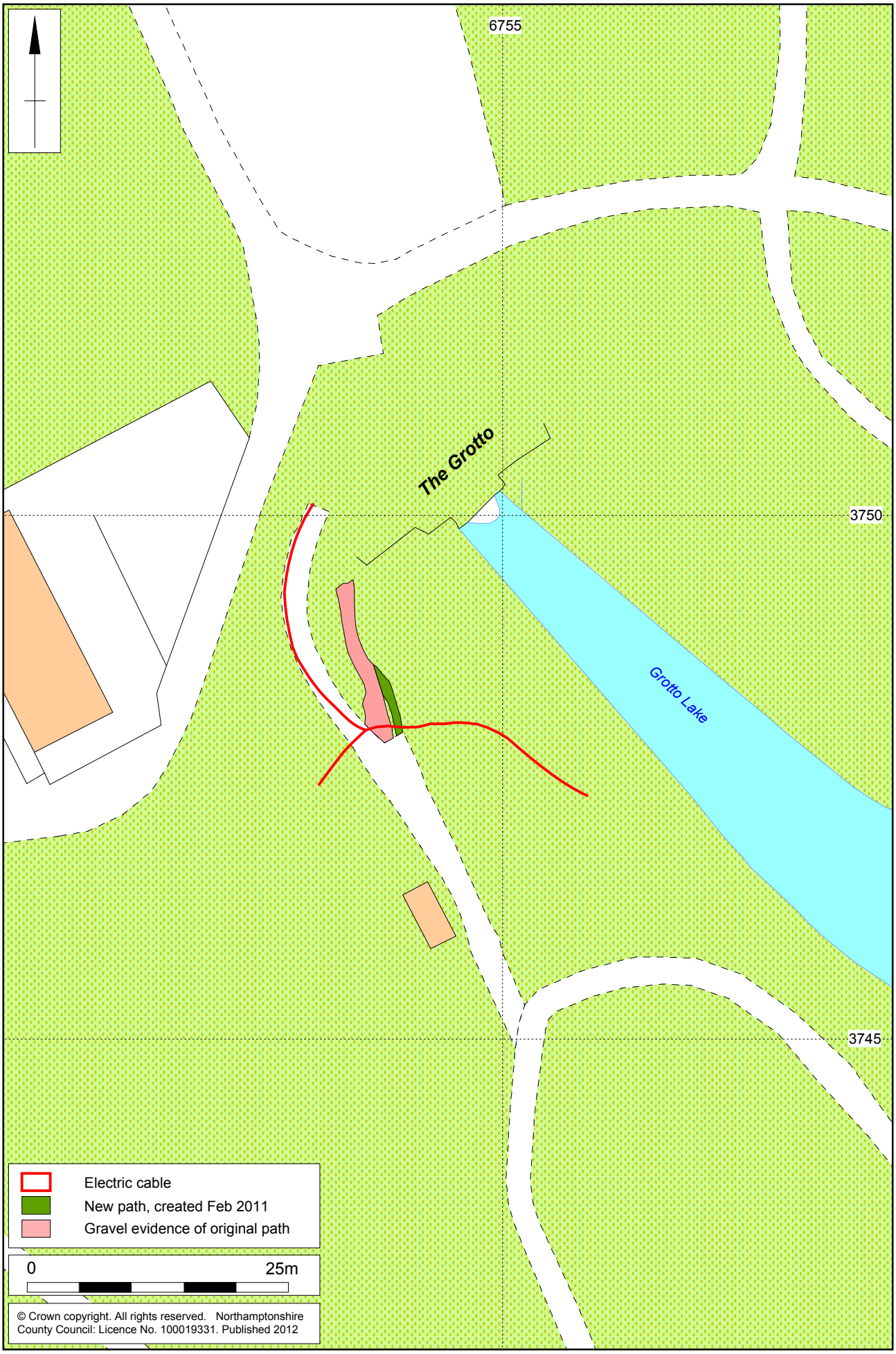
Section through niche and culvert



Scales, elevation 1:50, section 1:25 (A4)

Elevation of the niches at the rear (north side) of the grotto

Fig 3



Scale 1:500 (A4)

Location of the service trenches outside the Grotto Fig 4

The pebbles showing white and black colouring Plate 1

White pebble flooring showing area of loss with straight edges indicating method of laying Plate 2

The marble basin Plate 3

The back of a marble slab fragment showing evidence of former moulding since tooled off Plate 4

Re-used stone blocks with overflow holes on the south side of the marble rim basin rim and lead pipe flush with the base of the marble basin, looking south Plate 5

The large and small niches at the rear (north side) of the grotto Plate 6

Fragments of surface decoration within the upper niche Plate 7

Brick channel in the east side of the large niche, looking east Plate 8

Hole beneath the upper niche leading into the brick culvert Plate 9

Lead pipe at the top of the upper niche Plate 10

Stone kerb between the balcony and interior flooring, looking north Plate 11

Service trench leading to the Alder River, looking south-east Plate 12