

FEEDER CANAL, SLOPES GARDEN, LYME PARK, CHESHIRE



Archaeological Watching Brief

Matrix Archaeology

March 2018

FEEDER CANAL,
SLOPES GARDEN,
LYME PARK,
CHESHIRE

Archaeological Watching Brief

Report No. 2018-08
(Project Code: MA665)

Client: The National Trust

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March 2018

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SUMMARY

Repair works undertaken on the Feeder Canal which linked the South Pond to the Rough Cascade allowed for close investigation and understanding of a mid C19 timber box culvert and other water-control features. Small finds recovered included weaponry from the late C19 and early C20.

1. INTRODUCTION

- 1.1 An archaeological watching brief was undertaken by Matrix Archaeology in the Slopes Garden, in Lyme Park, Cheshire, during May and October 2017. The work comprised the final stages of an ongoing project to repair the Feeder Canal. The initial archaeological investigation was undertaken in August 2015. The results of that investigation appear in a separate report: *The Swine Ground and Slopes Garden, Lyme Park, Cheshire, Archaeological Assessment and Evaluation, Matrix Archaeology 2016*.
- 1.2 The watching brief was commissioned by Jamie Lund, Archaeologist (North West) for the client, the National Trust. The main repair works were undertaken by Ebbsford Environmental Ltd.
- 1.3 The canal comprised a deep walled trough which extended between the South Pond, and the Rough Cascade. A masonry dam was located at the west end of the canal, and water had begun to leak from the vicinity of the dam, which necessitated the repair works.
- 1.4 **Acknowledgements**
The watching brief was undertaken by Peter Middleton and the report was compiled by Peter Middleton and Mark Fletcher. Site access was facilitated by Lyme Park staff.

2. METHODOLOGY

- 2.1 Excavation works within the Canal were generally by hydraulic excavator, with further hand cleaning of features of interest. Soil heaps were scanned by metal detector (Viking 6), and all finds were recorded photographically (see Plates and Appendix). Finds were subsequently deposited with the National Trust at Lyme Park.
- 2.2 The digital photos of the site include a 1m ranging rod for scale.
- 2.3 Site drawings were undertaken at 1:20 and 1:50 scale.

3. SITE LOCATION

- 3.1 The Slopes Garden is located in the heart of Lyme Park, almost immediately to the south-west of Lyme Hall, and 10km south-east of Stockport, in Macclesfield District, Cheshire. Lyme Park occupies the western edge of the Peak District Pennines, and the land rises within the south and west parts of the Park to over 350m OD. Much of the park is drained into the Norbury Brook, which extends northwards towards High Lane.
- 3.2 To the south of the Hall is the South Pond, this feature is dammed within what was historically a small valley, now partially infilled. The Slopes Garden is located on the south valley flank, and the Rough Cascade was designed to run down this valley flank. The Feeder Canal delivers a flow of water from the South Pond to the Cascade, and the dam lip of the Canal (i.e. the maximum water level) is located at 241.73m OD.

4. FURTHER RECORDING OF THE FEEDER CANAL

4.1 General

This report should be read in tandem with the earlier report which covers the initial stages of the archaeological investigation within the area: *The Swine Ground and Slopes Garden, Lyme Park, Cheshire, Archaeological Assessment and Evaluation*, Matrix Archaeology 2016.

4.2 The Timber Box Culvert

Work began at the western end of the Feeder Canal, with the removal of silt and whatever remained of a capping layer of puddled clay from above the timber box culvert. Much of the material was removed by machine, with further excavation and cleaning by hand. The lack of a pump at this time meant the flow of water had to be diverted around the north side of the structure. It re-entered the culvert via breaches in the timber side wall and roof, near to the east face of the stone dam. The hole in the roof had been recently 'repaired' with two previously recorded timbers associated with the north-south beam directly east of the culvert (see below).

A modern replacement plank for another broken roof element (near the inlet) had also been cut and fixed since 2015. These works were thought to have been undertaken by the gardening team at Lyme Park.

The timber culvert was subsequently sawn through at the east dam face, and lifted from the Canal in sections with the aid of the machine. It was crudely reassembled on the bank for further analysis and recording. The sides, roof and base of the structure were formed from 50mm thick hardwood planks with a tight, wavy grain (probably Elm). Slightly irregular, but generally parallel saw marks, at 90 degrees to the longer axes, suggested conversion with a mechanically-driven pit saw of C19 date. The base timbers were nailed up, and the roof timbers nailed down, respectively, into the side timbers, and the enclosed section measured 0.51m by 0.26m. The nails were a maximum 160mm long and appeared to be early 'cut nails' of the early to mid C19. The butt joints had been carefully sealed with strips of felt-like material which had been soaked in a white liquid, possibly tallow or wax.

The intake was formed from heavier timbers fixed to the side walls with large, square-headed screws or coach bolts. These fixings, with hand forged heads, possibly dated to the second quarter of the C19. The large timbers supported an upper frame or flange plate, to seat the wooden plug. Circular saw marks were noted on the flange plate elements and chiselled or gouged recesses on the underside allowed for countersinking of the screw heads (Plate 15).

4.3 The Wooden Plug

The shaped wooden plug was described in the 2016 report. The remains of an iron loop or staple was also noted on the upper surface. It sat directly to one side of the central lifting loop and was possibly an attachment point for a chain. A section of hand-forged chain was recovered from the silt (Plate 52 and Appendix). A new rubber seating had been fitted to the plug after 2015.

4.4 The North-South Beam

The timber beam lying directly to the east of the box culvert was also thoroughly excavated and examined. The previous identification of a submerged barrier or fence were confirmed (Plate 18) and the suggestion of water being guided directly into the culvert's intake proved correct.

The flow had also been forced through a screen of vertical dowels set at 45 degrees to the beam. Mortice holes for ten, 35mm square dowels survived in the horizontal member. This trap was probably preventing debris from entering and potentially blocking the timber culvert during any periodic flushing of the canal channel. Four other rectangular mortice holes in the lower beam probably held posts to fix the edges of the side barriers.

4.5 The Stone Dam

The stone dam and the side walls of the canal adjacent to the dam, were thought to have been constructed with reused masonry blocks (Matrix Archaeology, 2016). The use of rusticated and channel jointed ashlar for the dam's permanently submerged east face, for example, made little sense, unless the stones had been recycled. This idea was virtually confirmed by further excavation and discovery of a similar, highly finished stone to the north of the box culvert. It was forming part of a stepped footing, which was clearly not its original function. The 370mm thick block projected 80mm from the face of the dam, with a similar foundation recorded to the south of the wooden channel.

The ashlar blocks also defined the sides and top of the opening for the culvert. The aperture was only slightly larger than the timber box structure and the narrow gap was sealed with puddle clay. This contrasted with findings from the centre of the dam, where the culvert was packed above with smaller stones and pieces of wood (Matrix Archaeology, 2016). The original builders had clearly regarded the construction of a long, precise and slightly inclined tunnel to house the conduit, as both unnecessary and difficult to achieve. They instead relied on a tight junction and clay seal at the east face of the dam, to hold back the water within the Feeder Canal.

A small sondage, and further probing with a road pin, failed to find either a solid floor to the opening or any continuation of the stepped footing. This was confirmed on 30 October 2017 by further excavation works, after the flow of water had been stemmed (Plates 21 and 22).

4.6 The Clay Base

The puddled clay base of the canal was on a gentle and steady, east - west slope and was slightly dished towards the centre. Excavations at the west end of the channel showed the firm, yellow-grey clay contained lenses of small rounded pebbles and generally small Pennine stone fragments. Some larger Pennine stone blocks measuring up to 370 by 400 by 200mm, were noted further to the east. The roughly worked stones were embedded into the top of the clay and were probably displaced coping stones from the side walls.

A few associated finds appeared to date the clay to the early to mid C19, although the method of excavation and possible disturbance to the deposit meant this was not definitive.

The clay had completely surrounded the timber culvert and was clearly abutting the side walls of the canal by as much as 0.5m. There was also some limited evidence (by probing) for the side walls being built directly off the puddled clay. It certainly extended below the stepped footing of the dam, to provide a watertight seal to the base of the structure.

Some further probing of the clay indicated a change to a firmer stony layer which may have represented natural subsoil or possibly decayed bedrock. This boundary was marked on the section drawings.

4.7 The Side Walls

The general overview of the side walls was as previously described (Matrix Archaeology 2016). However, the complete removal of silt provided an uninterrupted view of these structures with some new features of interest exposed.

The walls were approximately 23.4m long and between 2.2m to 2.4m in height from the top of the canal's clay base. Probing with a road pin may have detected the bottom of the walls, lying 0.2m to 0.5m below the puddled clay surface.

A north-south iron I-beam had been inserted into the walls near the east end of the canal. It was of unknown function. Immediately to the west of the I-beam (north wall) was an inserted cast iron pipe with a pierced cowl to prevent the intake of debris. The large bore pipe was approximately 300mm in diameter, and would have fed the pump in the nearby pump house. The upper sections of both walls were modern rebuilds, measuring up to 0.37m in height.

4.8 The Drop Board Sluice

The drop board sluice at the extreme east end of the canal was as previously described (Matrix Archaeology, 2016).

The de-silting process had uncovered the complete structure down to the clay base of the channel. As expected, the bottom of the grooved posts and side planking, were surrounded and sealed by the puddled clay. A 0.35m by 1.29m plank, found propped against the side wall, had clearly been located between the posts, and was evidently the lowest drop board. The 40mm thick oak or elm timber was heavily worn (Plate 33).

4.9 The Silt

The remaining organic, black-brown silt was removed from the canal with aid of the hydraulic excavator. The very soft and wet deposit was a maximum 1m thick and contained Pennine stone fragments (up to 300mm by 200mm), some brick pieces and rounded pebbles.

A metal detector was used on the excavated silt which had been spread on adjacent land. The base of the canal was also detected for metal finds. The details of artefacts recovered are contained in the finds record. More generally, the dominance of C20 objects, suggested the canal was last fully de-silted around the beginning of the 20th century.

The broken crockery and some household items show that the canal became a place to dump rubbish in the early C20. Certainly, the gamekeeper of the time was probably throwing used shotgun cartridges into the water at this date.

The gamekeeper possibly discovered the WW1 rifle grenade in the park and brought it back for disposal in the canal. This probable practise round may have been discarded after becoming damaged. The 'Disley Volunteers' were known to have practised manoeuvres and rifle drill on the hills to the west of Lyme Cage at the beginning of the war.

The mid C19 Colt Pocket Revolver possibly related to the WW1 training activity, but was somewhat obsolete by this date. The gun was more likely associated with Lyme House and either accidentally dropped from the bridge or deliberately thrown away.

The coinage recovered, was again mostly C20 in date and probably represented tokens of good luck. Other finds (glasses, penknife, brooch, thimble etc) were probable accidental losses.

5. INTERPRETATION

The 2017 watching brief and earlier investigation work provided a much improved understanding as to the development and functioning of the Feeder Canal and associated structures.

The timber box culvert, for example, was fairly accurately dated to the mid C19, with a similar date attributed to the surrounding puddle clay. The same clay, extending below the dam, meant this structure was also likely to have been built (or re-built) in the mid C19. Indeed, it was possible that the culvert was set in place on the puddle clay, prior to the construction of the dam.

The age of the side walls was less certain, but the presence of clay below the footings implied they were potentially contemporary mid C19 features. Further excavation would be required to prove this theory.

The overall conclusion was that the feeder canal, dam, drop board sluice and the box culvert were likely to have been constructed in the mid C19. They may have been direct replacements for a water course which was already over 100 years old at this point in time. The putative rebuild was perhaps contemporary with the remodelling of the South Pond which occurred in c.1840. The alterations to the pond (and possibly the canal, etc) were evident when comparing Pollitt's plan of 1824 and the later, c.1850 Tithe map.

6. RECOMMENDATIONS

Any further works related to the Rough Cascade, feeder channel, and culvert should be accompanied by an archaeological watching brief, given the potential for further understanding of these features.

APPENDIX 1 – FINDS REPORT (SEE PLATES)

Plate 34. Early to mid C19 early-cut nails, square-headed screw and jointing material (felt strip?) from the timber box culvert.

Plate 35. Early to mid C19 finds associated with puddle clay at base of canal. Early-cut nail, horticultural window glass, moulded bottle glass and Pearlware rim sherd from a tea cup (Transfer-Printed Willow Pattern). Several fragments of plant pot including a sherd embossed Sankeys Ltd Bulwell (established 1855). Lead disc of indeterminate age. Possibly an impacted bullet or ball.

Plate 36. This and all subsequent artefacts were recovered from the silt. Model 1849 Colt Pocket Percussion Revolver found near the centre of canal. Appeared to be an original ‘cap and ball shooter’ although slightly later reproductions were made in Belgium for example. Shot lead ball or conical bullet .32 caliber (8.1mm). Discovered by Lawrence Pickup of Ebsford Environmental.

Plate 37. Detail showing brass frame and bone or ivory grip (discoloured). Note nipple in cylinder for cap.

Plate 38. An example in good condition with ‘factory ivory grips’.

Plate 39. WW1 Rifle Grenade No. 20 Mk II first produced in 1917 by Marten Hale Cotton Powders Ltd. The ‘Hale’ was fired by a blank cartridge from the end of the rifle barrel with the gunstock resting on the ground. The missing detonator cap and detonator meant this may have been a practice round. The explosive charge (Ammonal) had also been removed or dissolved away over time. The grenade may have been discarded after the rod became bent.

Plate 40. Detail of Rifle Grenade.

Plate 41. Cross section drawing of similar grenade.

Plate 42. Coins reverse side. Single, bronze Victoria ‘Bun’ Penny to left. Heavily worn, 1860 to 1894. Pre decimal C19 bronze pennies and half pennies in three centre columns. Modern coinage to right. Note lack of tarnish on some coins due to anaerobic conditions in silt.

Plate 43. Coins obverse side.

Plate 44. Two cast lead musket balls measuring 14.5mm diameter and weighing 18 grams. Probably unfired with clearly defined sprues and casting seams. Size suggests possible use in carbine, pistol or flintlock hunting rifle within the period 1600 to 1850. Virtually identical to ball found recently in nearby excavation (Trench B, Archaeological Investigations, Matrix Archaeology, 2016). Lead ‘disc’ possibly part of an impacted ball. A 6.5mm calibre,

rimmed cartridge case stamped IV 1896 K&C (Keller & Co, Hirtenburg, Austria) - possibly a sporting round. Early C20 brass shotgun cartridge heads. One 28 gauge by ELEY, two 12 gauge by ELEY and five 12 gauge by KYNOCH. Full brass shotgun cartridges of the same date. One by ELEY and four stamped T. HEPPLESTONE KYNOCHS PATENT GROUSE EJECTOR MANCHESTER. Thomas Hepplestone of Shudehill was 'a fishing tackle maker, dealer and gun maker' who ceased trading in 1910. One 12 gauge head stamped ELEY KYNOCH with ICI logo was mid C20 (post 1926) in date. Possibly WW2 issue to Home Guard.

Plate 45. Detail of cartridge head stamps.

Plate 46. Various artefacts including a brass door knob and spindle, early C20 suitcase lock by LEGGE (est. 1881) and a 1901 thimble by James Fenton of Birmingham. The holed thimble was possibly worn as a necklace. A mid C20 SCOTIA STAINLESS spoon by John McClory of Sheffield and a 1950's Miniature Celluloid Bottle Pocket Knife and Corkscrew by Richards of Sheffield were also recovered.

Plate 47. Remains of early C20 'Big Ben' peg leg alarm clock, possibly by Westlock.

Plate 48. Sample of C19 to early C20 potsherds (tablewares). Whitewares, Bone China, Porcelain, Transfer-Printed Ware and Pearlware. Base of a large, C19 Salt Glazed jug with hunting scene. Possible sherd of early C18 Dark Glazed Ware.

Plate 49. Mid C20 (post 1933) tea cup by SAMPSON BRIDGWOOD of Longton, an unidentified large jug of similar date and a small intact plant pot.

Plate 50. Mid C19, 3-piece moulded, wine bottle (clear glass) to centre with W & A Gilbey (est. 1857) embossed on base. Two moulded bottle bases (green and brown glass) of the same period. Probable wine bottles, one with '33' embossed on base with separate mould piece. Three mid C20 mineral water bottles made by AEROWATA LTD MANCHESTER & LIVERPOOL (Wirral based manufacturer until the 1960s) and mid C20, 6oz. Pepsi Cola bottle.

Plate 51. Collection of 1960s to 70s drinks bottles including Pepsi Cola, Coca Cola and 'Zing' (a bright green soda from the late 60s). Probably sold from the nearby Pump House at this time. Milk bottle and neck of stoppered bottle of the same date.

Plate 52. Various ironwork including a piece of cast iron guttering and cast iron stop valve with probable Pump House associations. A length of handmade, wrought iron chain which may have been used to raise or slew the plug of the box culvert during draining of the canal.

Plate 53. Further ironwork elements were a 1.33m long strap and a 2.57m length of 30mm diameter iron bar. The broken end of this bar was 0.93m long with a hand forged, spear shaped tip which may have been driven into the ground. Two discarded cast iron pipes were

115mm (4.5'') in diameter with 7mm thick walls. One complete section was 1.96m in length and a broken section with ribbed jointing sleeve was 1.62m long.

APPENDIX 2 – ARCHIVE DEPOSITION

- (1) The small finds have been deposited at the property (Lyme Hall).
- (2) The rifle grenade (Plate 39) was removed by Cheshire Police, and may have been destroyed by them.
- (3) The paper archive (drawn plans, sections, and context sheets) remain with Matrix Archaeology Ltd.
- (4) The digital archive (Word, AutoCAD, and JPEG files) have been deposited with the National Trust.
- (5) A copy of the digital archive remains with Matrix Archaeology Ltd.
- (6) A PDF of the report will be submitted to the OASIS archive.

SOURCES

Abbreviations

CRO – Cheshire Record Office

GMCRO – Greater Manchester County Records Office (Manchester Archives)

Bibliography

Matrix Archaeology Ltd 2016 *The Swine Ground and Slopes Garden, Lyme Park, Cheshire: Archaeological Assessment and Evaluation*, Client Report No. 2016-12

Maps and Plans

Plan of Lyme Park in the County of Chester belonging to Thomas Legh Esqr. M.P., by Thomas Pollitt surveyor 1824 (GMCRO E17/210/167).

Plan of the Township of Lyme-Handley with Lyme in the Parish of Prestbury and County Palatine of Chester, c 1850 (CRO EDT 252/2).

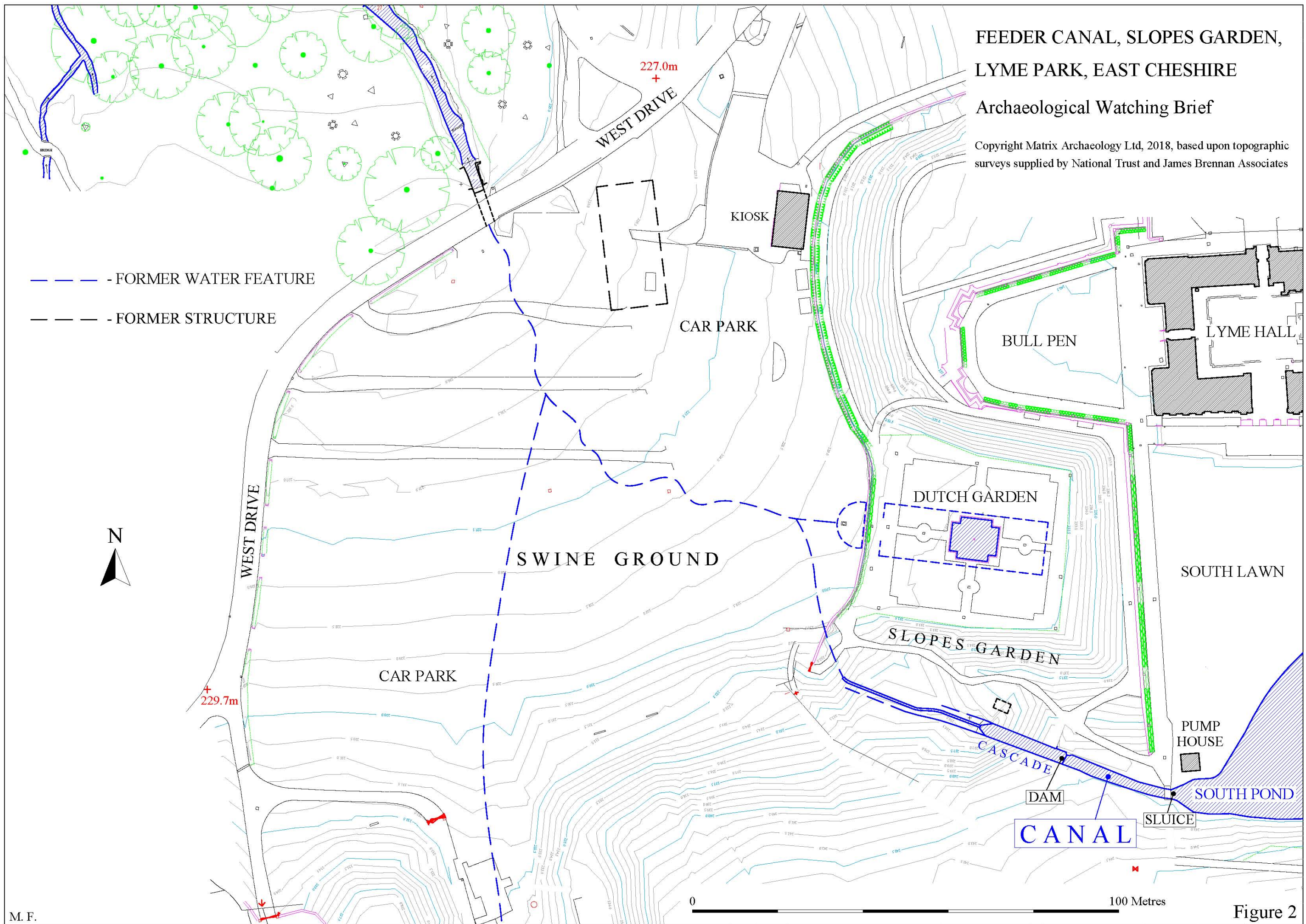


Figure 1. Site Location Map, based upon O.S. 1:25,000 series map. Crown Copyright, O.S. Licence No. AL100032621.

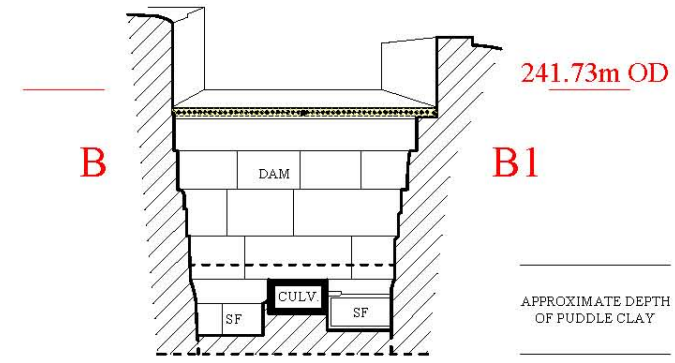
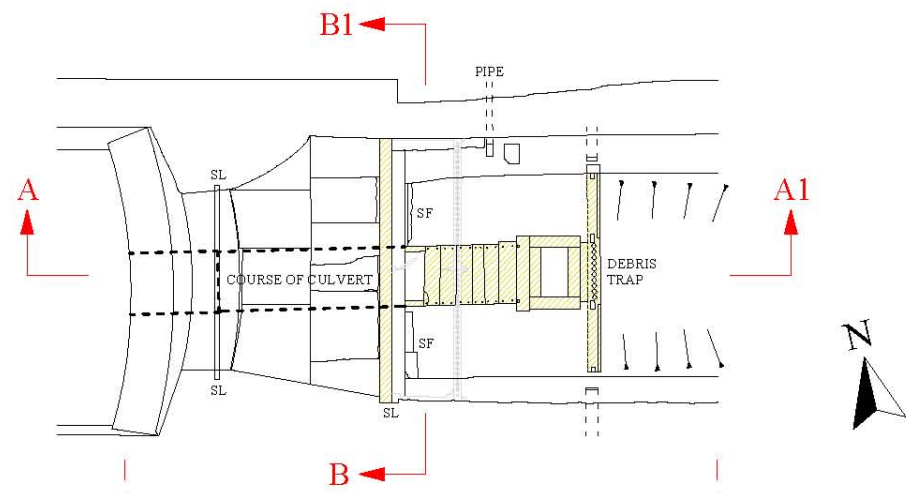
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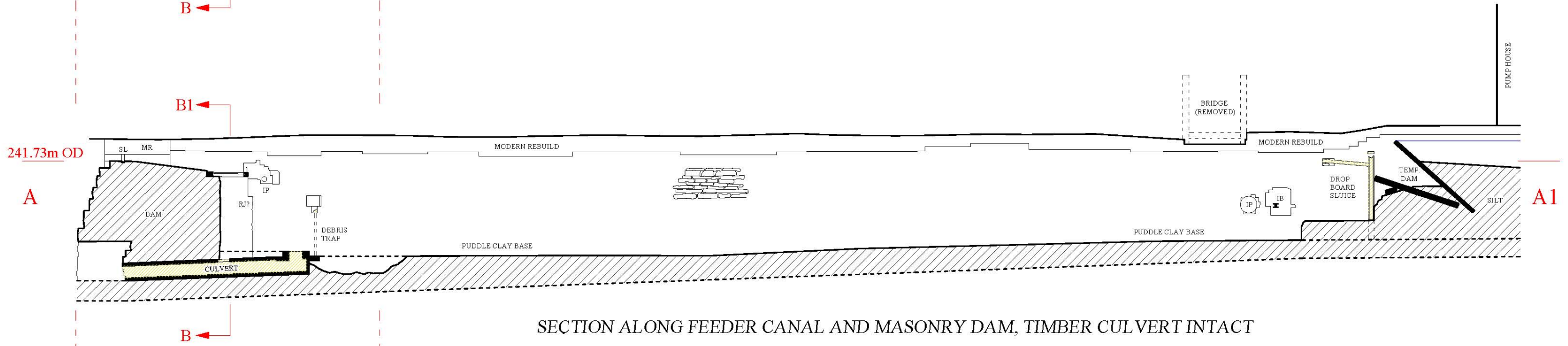
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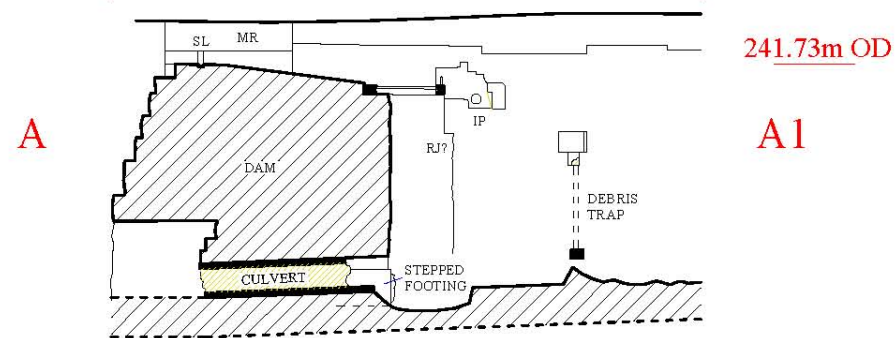
DAM AND CULVERT - PLAN



SECTION ON UPSTREAM DAM FACE



SECTION ALONG FEEDER CANAL AND MASONRY DAM, TIMBER CULVERT INTACT



TIMBER CULVERT PARTIALLY REMOVED

- TIMBER VIEWED IN ELEVATION
- TIMBER VIEWED IN SECTION





Plate 1. Silt removal at west end of canal, viewed from east.



Plate 2. Silt removal completed, viewed from east.



Plate 3. Timber culvert exposed and cleaned up, viewed from east.



Plate 4. Timber culvert exposed, note surrounding puddled clay, viewed from north.



Plate 5. Timber culvert viewed from east.



Plate 6. Culvert intake at east end, with flange plate removed (Plate 13), viewed from west.



Plate 7. Culvert and aperture in dam base, note missing roof planks, viewed from east.



Plate 8. Sondage in puddled clay showing stepped footing of dam, viewed from east.



Plate 9. Removal of timber culvert, viewed from east.



Plate 10. Reassembled ex-situ culvert, note worn base timbers.



Plate 11. Reassembled ex situ culvert.



Plate 12. Intake timber plug with rubber seal.



Plate 13. Intake timber flange plate.



Plate 14. Timber flange plate removed.



Plate 15. Underside of timber flange plate, note gouged recesses for screw heads.



Plate 16. Jointing material between culvert timbers. Possibly a felt strip.



Plate 17. Base rail cleaned up, note holes for former central debris trap, viewed from east.



Plate 18. Base rail and partly reassembled barrier/fence. Note decayed top rail within recess, near top of photo, viewed from north-east.



Plate 19. Dam wall and culvert aperture, viewed from east.



Plate 20. Culvert aperture beneath dam, with remains of timber culvert, viewed from east.



Plate 21. Further excavation within aperture, 30 Oct. 2017, viewed from south-east.



Plate 22. Completed excavation with same clay extending below base of culvert and dam footing, viewed from east.



Plate 23. South side wall of canal nearest dam, viewed from north.



Plate 24. North side wall of canal nearest to the dam, viewed from south.



Plate 25. Silt removal from centre of canal, viewed from west.



Plate 26. Canal cleared of silt, note puddle clay base, viewed from east.



Plate 27. Canal cleared of silt, viewed from west.



Plate 28. Silt removal at east end of canal, note site of removed bridge, viewed from west.



Plate 29. North side wall of canal at east end, viewed from south.



Plate 30. South side wall of canal at east end, viewed from north.



Plate 31. New drop board sluice and bridge, at east end of canal, 30 Oct. 2017, from west.



Plate 32. Detail showing north side wall, extending 0.22m below top of puddled clay, viewed from south.



Plate 33. Worn drop board removed from original structure, visible in background, viewed from west.



Plate 34. Finds - see Appendix.



Plate 35. Finds - see Appendix.



Plate 36. Ditto.



Plate 37. Ditto.



Plate 38.



Plate 39.



Plate 40.

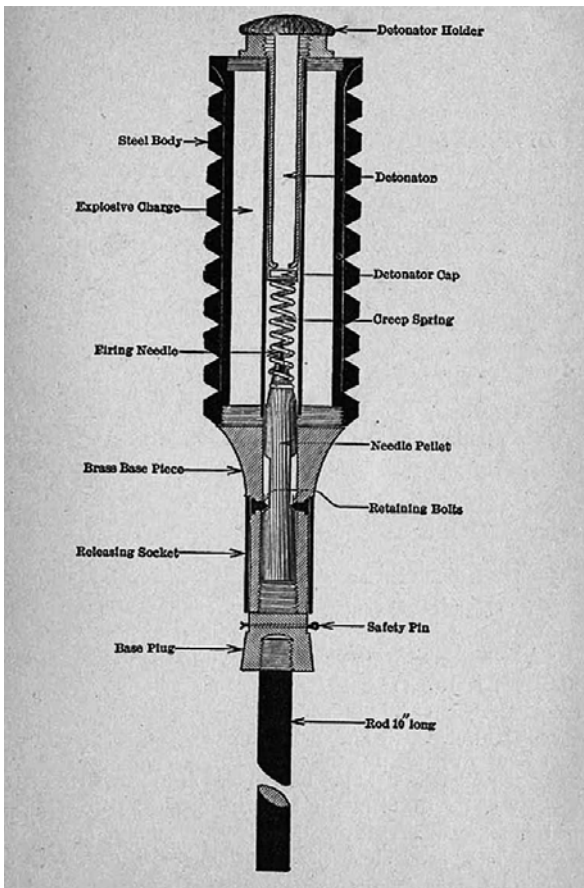


Plate 41.



Plate 42.



Plate 43.



Plate 44.



Plate 45.



Plate 46.



Plate 47.



Plate 48.



Plate 49.



Plate 50.



Plate 51.



Plate 52.



Plate 53.