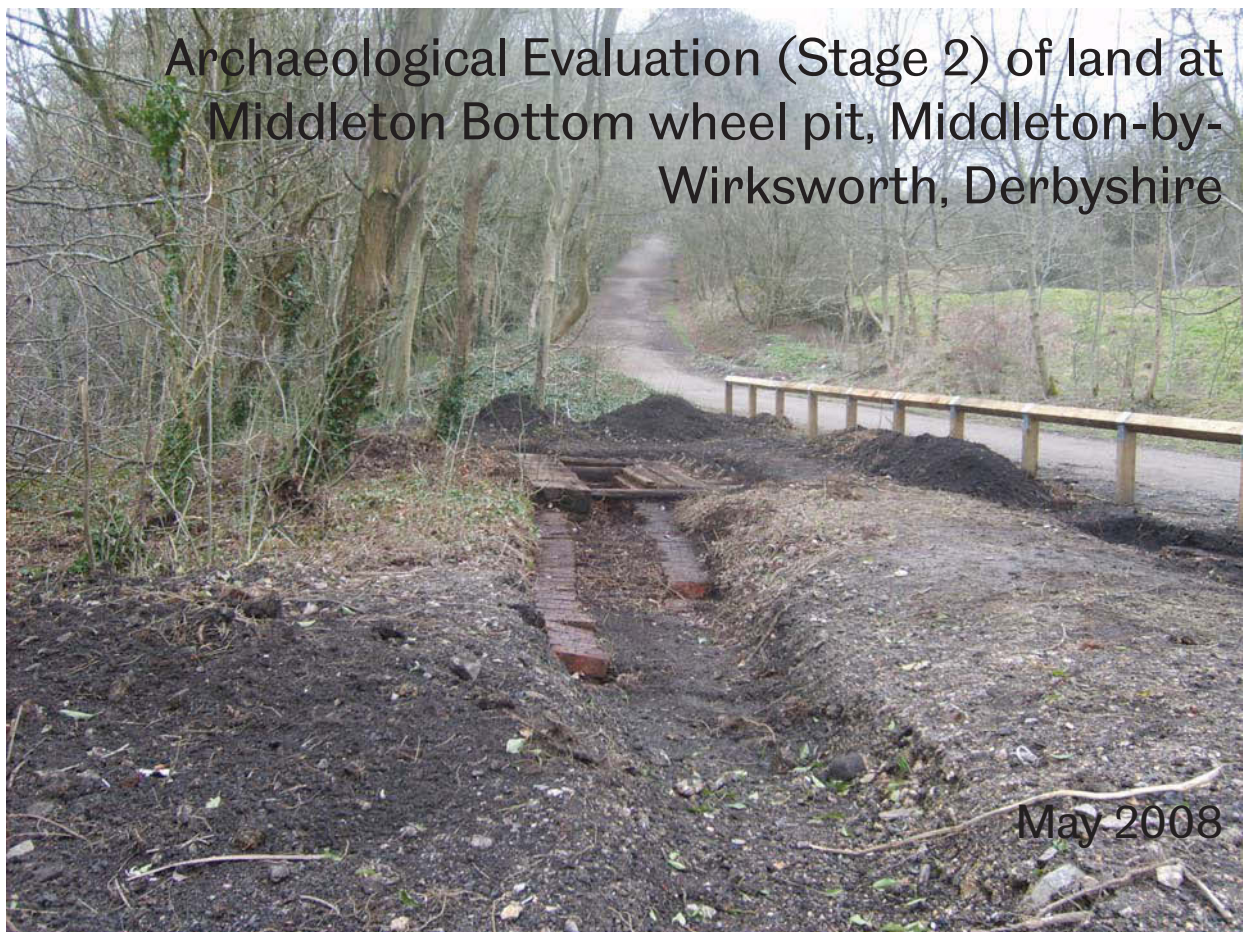




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Project Report 1152b.1(1)



By Steve Baker

Prepared for:
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Middleton Bottom wheel pit, Middleton-by-Wirksworth,
Derbyshire

National Grid Reference: SK 28311 55174

Trial trenching (stage 2)

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Fieldwork

Steve Baker

Reporting

Steve Baker

Illustrations

Chris Swales

Checked by:	Passed for submission to client:
Date:	Date:
Katherine Baker <i>ARCUS Archaeologist</i>	Anna Badcock <i>ARCUS Assistant Director</i>

OASIS SUMMARY FORM

PROJECT DETAILS		
OASIS identifier	arcus2-41789	
Project title	Middleton Bottom wheel pit: trial trenching (stage 2)	
Short description of the project	ARCUS were commissioned by Derbyshire County Council to carry out a second stage of archaeological trial trenching at Middleton Bottom wheel pit, Middleton-by-Wirksworth, Derbyshire. Initial excavation works had been undertaken in 2007. Structures between the wheel pit and the base of the Middleton Incline were exposed, and proved to be the below-ground brick runnels conveying the cables between the pit and the incline. The southern runnel was observed to ramp upwards, and brought its cable above ground through a wooden sleeper structure perhaps associated with a tensioning wheel or pulley system. Excavations west of the sleeper structure confirmed that the cable runnels extended no further.	
Project dates	March 2008	
Previous/future work	Subsequent to a heritage audit of the Cromford and High Peak Railway carried out by ARCUS in 2003/4, and a previous phase of trial trenching during 2007: arcus2-36158	
Monument type and period	Wheel pit (railway incline); post-medieval (1870-1900)	
Significant finds (artefact type and period)	None	
PROJECT LOCATION		
County/Parish	Derbyshire/Middleton-by-Wirksworth	
Site address	N/A	
Site co-ordinates	SK 28311 55174	
Site area	c. 11 metres by 6 metres	
Height OD	224m	
PROJECT CREATORS		
Organisation	ARCUS	
Project brief originator	Derbyshire County Council	
Project design originator	ARCUS	
Director/supervisor	Steve Baker	
Project manager	Steve Baker	
Sponsor or funding body	Derbyshire County Council	
PROJECT ARCHIVES		
Archive Type	Location/Accession no.	Content (e.g. pottery, metalwork, etc)
Physical		
Paper	Buxton Museum DERSB:2007.91	Site records, photography, correspondence, report
Digital		
BIBLIOGRAPHY		
Title	Archaeological Evaluation (Stage 2) of land at Middleton Bottom wheel pit, Middleton-by-Wirksworth, Derbyshire	
Report no	1152b.1(1)	
Author	Steve Baker	
Date	May 2008	

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- 6 Gap in [304] where cable emerged from runnel
- 7 Steel reinforcing bar in [304], where cable emerged

NON-TECHNICAL SUMMARY

ARCUS were commissioned by Derbyshire County Council to carry out a second stage of archaeological trial trenching at Middleton Bottom wheel pit, Middleton-by-Wirksworth, Derbyshire. Initial excavation works had been undertaken in 2007. Structures between the wheel pit and the base of the Middleton Incline were exposed, and proved to be the below-ground brick runnels conveying the cables between the pit and the incline. The southern runnel was observed to ramp upwards, and brought its cable above ground through a wooden sleeper structure perhaps associated with a tensioning wheel or pulley system. Excavations west of the sleeper structure confirmed that the cable runnels extended no further.

1 INTRODUCTION

ARCUS were commissioned by Derbyshire County Council to carry out a second stage of archaeological investigation at Middleton Bottom Wheel Pit, Middleton-by-Wirksworth, Derbyshire (SK 28311 55174) (**Illustration 1**). The wheel pit is part of the High Peak Trail, on the former course of the Cromford and High Peak Railway, and archaeological excavation was required as part of works to preserve the existing structure and to enhance its understanding.

The need for remediation works to the wheel pit structures followed the conclusions of a heritage audit carried out by ARCUS in 2004 on behalf of English Heritage, on the route of the former Cromford and High Peak Railway. During remediation works in 2007 ARCUS carried out archaeological trial trenching adjacent to the wheel pit structure (Baker 2008). Following completion of the wheel pit refurbishment, an additional phase of work was requested, involving investigation of structures between the wheel pit and the base of Middleton Incline.

This document is a full report on the programme of investigation carried out by ARCUS during March 2008.

2 AIMS AND METHODOLOGY

2.1 Project aims and rationale

The general requirement for remediation works to the wheel pit structures arose from the conclusions of the heritage audit (Jessop 2004). The additional works carried out during March 2008 focused on surviving structures west of the wheel pit, relating to the cable transmission between the pit and the incline. The aims of the work were as follows:

- To expose any surviving structures relating to the operation of the incline. In particular, evidence for sidings and the brick runnels and other transmission structures relating to the incline cables;
- To interpret any structures thus exposed, within the chronology of the incline operation established during the first phase of work;
- To establish the sub-surface stratigraphy in the area west of the wheel pit.

2.2 Methodology

The brief for the archaeological works was established verbally between ARCUS and the officers of Derbyshire County Council and English Heritage.

All excavation and recording work were carried out in accordance with current industry best practice (IFA 1999). To summarise:

A group of structures were exposed, cleaned and recorded, close to the modern ground surface. These included the brick walls of the runnels conveying the cables from the direction of the wheel pit, and a timber sleeper structure associated with the end of the southern runnel (**Illustration 2**) (**Plates 1 and 2**).

A sondage trench, measuring 5m by 0.6m, was hand-excavated adjacent to the western edge of the sleeper structure, to test the sub-surface deposits in this area.

2.3 Fieldwork programme

The project was managed for ARCUS by Steve Baker. Fieldwork was carried out by Steve Baker and Mike Hartwell during March 2008. Survey was carried out by Tom Sparrow.

2.4 Site location

The site is located at SK 28311 55174, immediately to the south of the High Peak Trail at Middleton-by-Wirksworth, Derbyshire. The wheel pit itself is a timber and brick structure set into the ground to a depth of approximately 1.5 metres, and the area for archaeological investigation west of the pit was covered by rough vegetation. The site geology is Carboniferous Limestone of the Matlock Group.

3 ARCHAEOLOGICAL BACKGROUND

During 2004, ARCUS carried out a heritage audit of the former Peak Forest Tramway and Cromford and High Peak Railway, on behalf of English Heritage (Jessop 2004). The wheel pit at Middleton Bottom was identified as feature 96 in this audit (Derbyshire County Council SMR No. 28308), and was considered to be in 'poor' condition.

The Cromford and High Peak Railway (CHPR) is located in central Derbyshire, within the White Peak. It begins at Cromford in the Derwent Valley, traverses the county for a distance of 33 miles on an approximate southeast-northwest alignment to Whaley Bridge in the northwest. After leaving Cromford the CHPR climbs onto the carboniferous limestone plateau of the White Peak, a largely agricultural landscape dotted with limestone quarries. In the northwest it leaves the limestone plateau and descends into the area of gritstone moorlands and steep valleys which fringe the north western edge of the White Peak.

Opening in 1830, it was one of the earliest railways in Britain and a major feat of 19th-century engineering. It crossed the White Peak of Derbyshire, rising at its highest point to over 1200ft, by means of a series of nine inclined planes with fixed steam engines to pull the trains. It was envisaged that a range of commodities would be transported including coal, grain, gritstone and limestone, although lime and limestone soon came to dominate the railway.

A number of quarries developed along the route of the railway and connecting links were built to them. The main of these was the London and North Western Railway (LNWR) opened in the 1890s, to serve the quarries developed around Hartington. Changes were made to the route for various reasons during the life of the line, for example, the route was changed to go through Buxton rather than over Shallcross because of the cost of operating the inclined planes.

The railway remained in use until the final closure of the line in 1963, when Derbyshire County Council and the Peak District National Park Authority took over much of the route to turn it into a long distance footpath, the High Peak Trail.

The wheel pit at Middleton Bottom was located at the base of the Middleton Incline, a rope-worked incline operated from the engine house at Middleton Top, which together with its ancillary structures forms a Scheduled Ancient Monument. The Middleton Bottom wheel pit was identified during the heritage audit as 'fragile and in active decay', and was included in a group of sites deemed to be in a poor state of

preservation where further archaeological survey was recommended (Jessop 2004, 55).

ARCUS subsequently carried out archaeological trial trenching as part of refurbishment of the wheel pit structure (Baker 2008). Trenches were hand-excavated around the eastern and western ends of the wheel pit structure. The build of the wheel pit structure appeared to be late 19th century in date, and the pit had been cut into the embankment deposits relating to construction of the Cromford and High Peak Railway. The build of the pit, and the associated material culture, suggests therefore that it was not contemporary with construction of the railway in the 1820s, and represents a later insertion or replacement of an original pit. The trench at the western end of the pit also encountered the brick-walled channels, or runnels, conveying the cables from the pit towards the base of the incline.

4 RESULTS

4.1 Cable runnels

Brick-lined runnels, formerly conveying the cables below ground level from the wheel pit to the base of the incline, were encountered in the 2007 excavation running west from the edge of the pit. The northern cable was originally conveyed beneath the tracks, now the High Peak Trail, to run up the northern side of the incline. Historic photographs show the cables running along the ground surface, between the rails, so at some point they were clearly conveyed out of the underground runnels, perhaps by a pulley system.

West of the wheel pit, the upper courses of the brick walls lining the cable runnels were encountered within a few centimetres of the current ground surface. The runnel walls were two skins thick, and construction was largely in the same brick as the wheel pit itself, a machine made pinkish-red 3" brick, with 8 rough circular holes, 9mm diameter, through the face. A pale yellow-brown sandy mortar was used. The similarity in build suggests that the runnels are contemporary with the main build of the pit, dating from the late 19th century.

The northern runnel (contexts [309], [310], [311]) was traced over a length of 4.84m east-west (**Plate 3**). To the west, the structures continued beneath the fencing adjacent to the High Peak Trail. To the east, the runnel walls became progressively truncated but did appear to continue at a lower level towards the wheel pit. A wooden beam resting on the lip of the northern runnel wall was traced right through to the edge of the pit. The internal width of this runnel was typically 0.46m. The southern wall [310] was offset to the south part way along its length, continuing as concrete-capped wall [311] and giving a new internal width of 0.70m. The reason for this offset is unknown, although the wider channel may have accommodated a wheel or pulley mechanism at this point. The runnel was not excavated beyond the top courses of its walls. At this point the channel was filled with a humic topsoil material (300), although it is likely that at a lower level the usual decommissioning infill of limestone ballast is present.

The southern runnel (contexts [307], [308]) was traced over a length of 5.90m (**Plate 4**). Both of the runnel walls continued beneath the wooden sleeper structure [304] to the west, the northern wall [308] ending after an additional 1.90m. To the east, the walls became progressively truncated, but appeared to continue at a lower

(unexcavated) level towards the wheel pit. The internal width of the runnel was typically 0.54m, narrowing progressively eastward to as little as 0.44m. This narrowing was probably due to a partial inward slump of the walls. The runnel was filled with a limestone ballast (302) in a loose humic matrix. This material was also used to fill gaps in the wooden sleeper structure, and a similar material was found to fill both runnels in the 2007 excavations. (302) appears therefore to be a decommissioning infill of the cable runnels and associated structures, and probably dates between the 1960s and 1980s. At the western end of the runnel, against the sleeper structure, (302) was removed down to the base of the runnel, which was formed of a compact soil and clinker material (301) at a depth of only 0.28m, corresponding to three courses of the brick side wall [308]. Compared with the considerable depth of the runnels adjacent to the wheel pit, this suggests strongly that the bases were ramped up progressively westwards, bringing the cables towards the surface.

4.2 Wooden sleeper structure [304]

The walls of the southern runnel [307]/[308] ended beneath wooden sleeper structure [304], apparently conveying the cable up to the surface through a long rectangular slot (**Plate 5**). [304] therefore marks the location where the southern cable emerged from its runnel onto the surface of the incline.

[304], measuring a total of 5.13m east-west and 1.95m north-south, was composed of two parallel railway sleepers (each 5.13m x 0.64m x 0.17m thick), laid 1.08m apart. Five metal rail 'chairs' were attached to the northern sleeper, and the rivet holes for chairs were visible on the southern sleeper, suggesting that the rails were conveyed over the top of [304]. The space between the sleepers was filled by smaller transverse and longitudinal timbers, creating two rectangular gaps against the southern sleeper. The eastern gap measured 2.14m east-west by 0.41m north-south, while the western gap measured 1.08m east-west by 0.81m north-south. The cable runnel apparently conveyed the cable into the western gap, beneath a timber strut and reinforcing metal bar (**Plate 6**). A notch worn in the underside of the metal bar confirms that the cable did indeed run in this location (**Plate 7**). Timbers running the length of the gap were set down at a lower level, suggesting perhaps that a tensioning wheel or pulley, bringing the cable to the surface, was free to slide here. The function of the eastern gap, if any, was unclear.

A stray timber [305], running diagonally from the northern edge of [304], appeared to have no structural purpose, and was considered likely to be a rejected or sub-standard timber incorporated into the track ballast.

4.3 Stratigraphy

A sondage, measuring 5.00m north-south by 0.60m east-west, was excavated immediately to the west of the wooden sleeper structure [304], to test for any further below ground structures, and to assess the general stratigraphy in this area (**Illustration 3**). No structures were identified, confirming that the cables had indeed emerged from the below-ground runnels by this point. No archaeological evidence was encountered for the sidings shown on historic photographs.

A compact yellow-brown material (303), composed of a sandy grit with limestone rubble, formed the base of the sondage. This was interpreted as a made ground material used to create the railway embankment, presumably during the initial

construction of the Cromford and High Peak Railway during the 1820s. The surface of (303) was encountered typically 0.43m below the modern ground surface, rising to only 0.12m at the northern end of the sondage, towards the tracks.

Above (303) was a compact infill material (301), typically 0.24m thick and comprising a mixture of humic topsoil with clinker. This material was also present at the excavated bases of the southern cable runnel and the gaps within the sleeper structure [304], and appears to represent a levelling deposit associated with construction of the runnels and the sleeper structure (and the wheel pit itself) during the late 19th century.

At the modern ground surface was a topsoil layer (300), 0.12m thick, and composed of a dark humic silt with a well-developed ivy root mat.

5 DISCUSSION

The features excavated during the additional phase of works clearly represent the cable runnels associated with the late 19th-century wheel pit. Wooden sleeper structure [304] marks the western end of the southern runnel, forming the location where this cable emerged onto the surface between the tracks, perhaps by means of a mounted tensioning wheel or pulley. The northern runnel was presumably conveyed beneath the tracks in some sort of culvert, to emerge on the other side of the incline.

As discussed in the previous report (Baker 2007), it is interesting that neither the wheel pit nor the cable runnels relate to the original 1820s build of the railway, representing rather an addition during the later decades of the 19th century. Little is currently known about the original operation of the incline, or whether any features relating to this earliest phase survive.

6 ARCHIVE

The site archive will be deposited with Buxton Museum and Art Gallery under accession number DERSB: 2007.91.

7 COPYRIGHT

ARCUS give permission for the deposited material to be used by the Museum, in perpetuity, although ARCUS retains the right to be identified as the author of all project documentation and reports as specified in the *Copyright, Designs and Patents Act 1988* (chapter IV, section 79). The permission will allow the Museum to reproduce material, including for use by third parties, with the copyright owner suitably acknowledged.

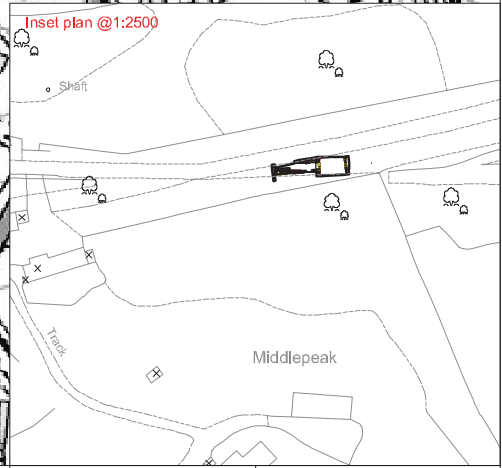
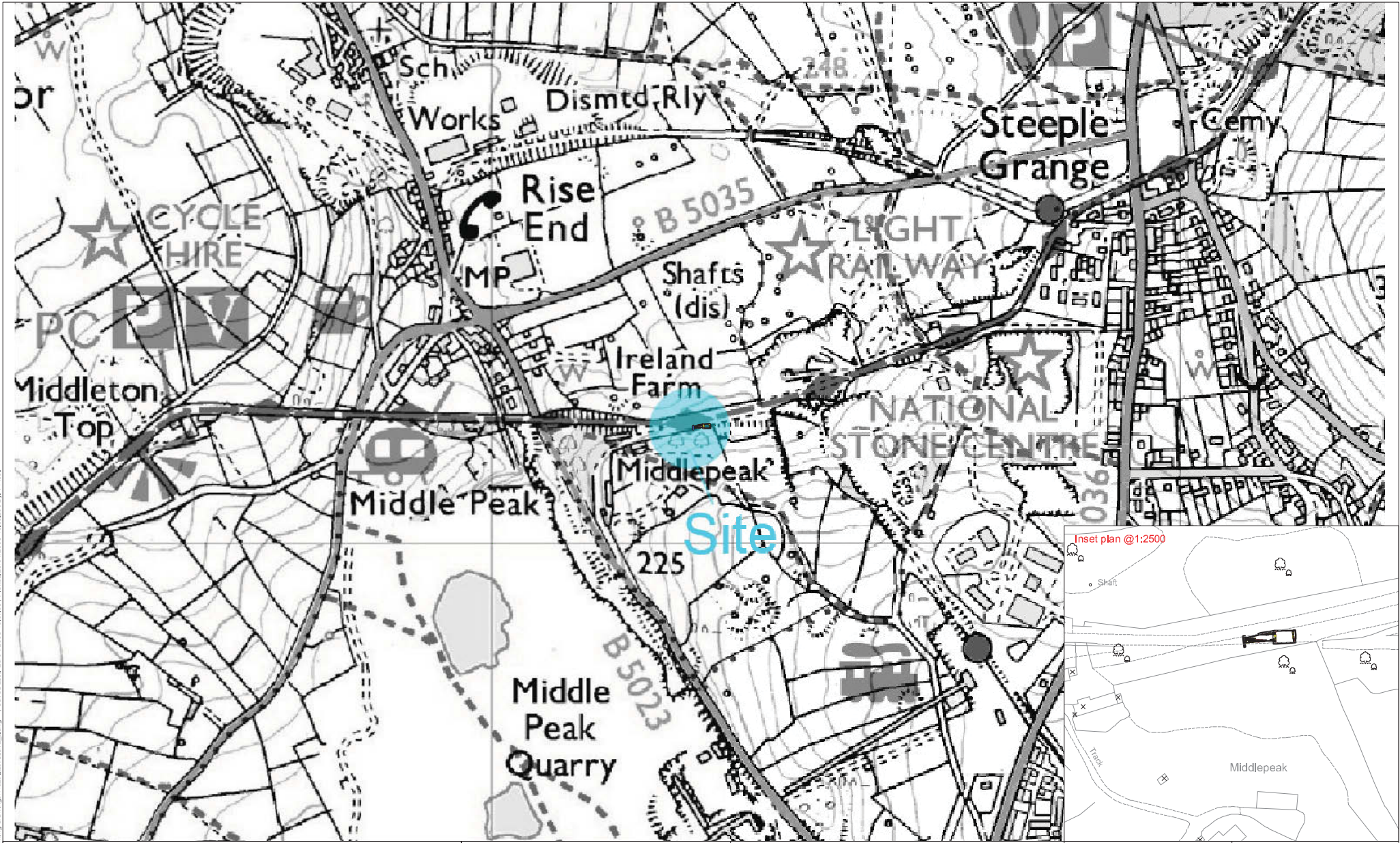
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9 ILLUSTRATIONS



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Project:

Middleton Bottom additional trench

Title

Site location

Scale

1:7500

Date

April 2008

NGR

SK 28311 55174

Drawn

Chris Swales

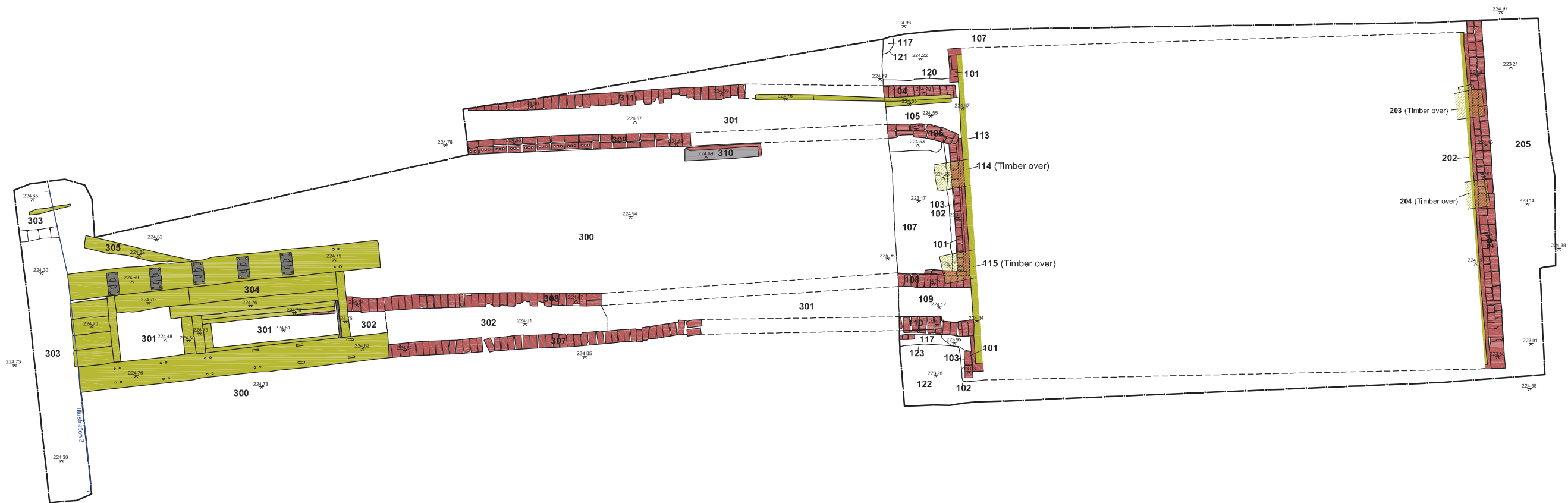
Project No.

1152b

Illustration No.

1

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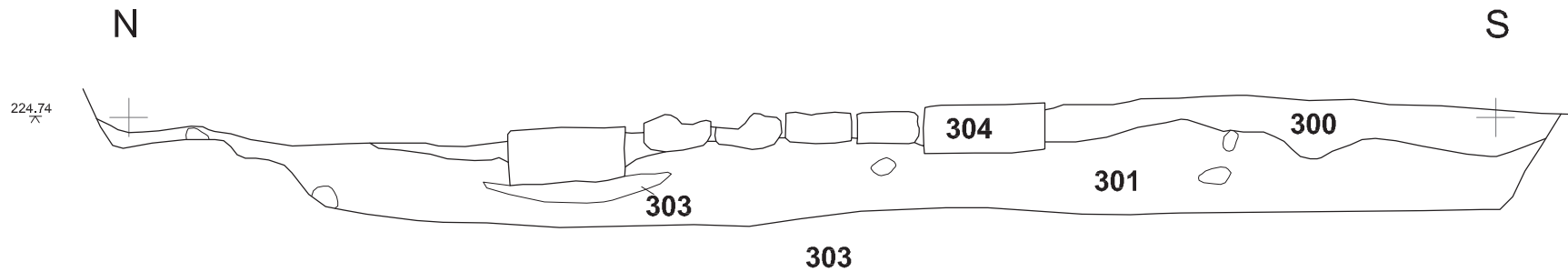
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	Iron
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	Concrete
	Wood



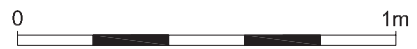
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Project:	Middleton Bottom additional trench
Title	Trench plan

Scale	1:75	Date	April 2008
NGR	SK 28311 55174	Drawn	Chris Swales
Project No.	1152b	Illustration No.	2



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Project:	Middleton Bottom additional trench
Title	West-facing section of sondage trench

Scale	1:25	Date	April 2008
NGR	SK 28311 55174	Drawn	Chris Swales
Project No.	1152b	Illustration No.	3

10 PLATES



Plate 1: General view of southern cable runnel and timber structure [304], showing base of incline in background. Looking west.



Plate 2: General view of timber structure [304], with both cable runnels behind, leading to the wheel pit. Looking east



Plate 3: Northern cable runnel [309]/[310]/[311], looking east towards the wheel pit.



Plate 4: Southern cable runnel [307]/[308], looking east towards the wheel pit. Note timber structure [304] in foreground with steel reinforcing strut where cable emerged from runnel.



Plate 5: Timber sleeper structure [304], with southern cable runnel in background. Looking east.



Plate 6: Gap in [304] where cable emerged from runnel; note brick runnel wall [308] running beneath timber. Looking north-east.



Plate 7: Steel reinforcing bar in [304], where cable emerged. Note semi-circular notch worked by steel cable.

APPENDIX 1: LIST OF CONTEXTS

Context	Type	Description
300	Deposit	Topsoil: humus and root mat
301	Deposit	Levelling layer (late 19 th C); humus and clinker
302	Deposit	Compact embankment material (early 19 th C)
303	Deposit	Limestone ballast infill (late 20 th C)
304	Structure	Wooden sleeper structure
305	Structure	Stray timber beam
306	Deposit	Cemented material at northern edge of [304]
307	Structure	South wall of southern cable runnel
308	Structure	North wall of southern cable runnel
309	Structure	South wall of northern cable runnel
310	Structure	Offset south wall of northern cable runnel
311	Structure	North wall of northern cable runnel