REPAIRS TO DAM RETAINING WALL, MOUSEHOLE FORGE, MALIN BRIDGE, SHEFFIELD

ARCHAEOLOGICAL OBSERVATION, INVESTIGATION AND RECORDING

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EXECUTIVE SUMMARY

In November 2014, Ed Dennison Archaeological Services Ltd (EDAS) were commissioned by the East Peak Innovation Partnership (EPIP) to undertake a programme of archaeological observation, investigation and recording (a watching brief) during repairs to a dam retaining wall at Mousehole Forge, Malin Bridge, Sheffield (NGR SK 32490 89082 centred). The site is a Scheduled Monument, and the archaeological recording was made a condition of a Scheduled Monument Consent (SMC) dated 6th August 2013.

Three areas of the dam wall along the southern boundary of the site were identified by English Heritage as requiring remedial conservation work, as well as one small area of the western boundary wall near the south-west corner of the site. A photographic record was maintained prior to, during and after the repair work, and some limited monitoring work was also carried while repairs were in progress. Apart from a few minor points relating to the construction of the dam wall and boundary wall, nothing of archaeological significance was noted during the watching brief.

1 INTRODUCTION

1.1 In November 2014, Ed Dennison Archaeological Services Ltd (EDAS) were commissioned by the East Peak Innovation Partnership (EPIP) to undertake a programme of archaeological observation, investigation and recording (a watching brief) during repairs to a dam retaining wall at Mousehole Forge, Malin Bridge, Sheffield (NGR SK 32490 89082 centred).

1.2 The site is a Scheduled Monument (National Heritage List for England entry 1004804), and the archaeological recording was made a condition of a Scheduled Monument Consent (SMC) dated 6th August 2013. This SMC also covered various tree and vegetation clearance works which had been undertaken at some time prior to EDAS's appointment, and so this report only covers the monitoring and recording undertaken during the stonework repairs.

2 SITE LOCATION AND SUMMARY DESCRIPTION

2.1 Mousehole Forge lies on the north-western bank of the River Rivelin, c.4.8km north-west of the centre of Sheffield, and c.0.32km to the south-west of Malin Bridge (see figure 1). The site complex is bounded by the River Rivelin and a pedestrian footpath to the north-east, east and south-east, another path to the north-west and the dam to a large mill pond to the south-west. A private house (formerly the forge manager's house) is located in the north-west corner of the site, while a range of former workshops lies along the north-east side (see figure 2).

2.2 Mousehole Forge is one of the first and longest running anvil factories in the country, and perhaps the world, with a period of continuous use from at least 1632 to 1933, and a high point of activity in the 1890s. The site contains the remains of two large drop/helve hammers, a puddling furnace, various steam hammers and hearths, a large stone dam, an extensive former water management system incorporating four waterwheel pits, and various other storage and workshop structures.

3 METHODOLOGY

3.1 The requirement for the watching brief was stipulated in the SMC dated 6th August 2013 (see Appendix 3). The SMC required that the consented works be undertaken under archaeological supervision (condition g), and that a report on the archaeological recording be produced and sent to English Heritage and the South Yorkshire Archaeology Service (condition gg).

3.2 In view of the short timeframe between commission and start of work, no EDAS methods statement or project design was able to be produced, although the scope and scale of the recording was confirmed with English Heritage prior to commencement. This established that the recording should comprise a pre- and post-intervention photographic record, and some limited monitoring in case any archaeological features were uncovered or disturbed during the course of the works. General advice relating to archaeological watching briefs and building recording projects produced by the Chartered Institute for Archaeologists (CIFA 2014a; 2004b) was followed, as well as that produced by English Heritage themselves (English Heritage 2006). A specification for the stonework repair was produced by English Heritage (see Appendix 2).

3.3 The pre-intervention photographs were taken on 20th November 2014, and the first monitoring/watching brief visit to record work in progress was made on 25th

November 2014. A further visit was made towards the end of the works on 11th December 2014, and a final post-intervention visit was undertaken on 14th February 2015, after the new mortar etc had had a short time to weather in. The conservation works took longer to complete than originally envisaged, due to the cold and snowy weather experienced during the site work.

3.4 The photographic record was achieved using a digital camera, following English Heritage guidelines (English Heritage 2006, 10-13). Subject to access, all photographs contain a graduated scale, and electronic flash was used where necessary. The photographic record (see Appendix 1) includes a register detailing the location and direction of each shot, and thumbnails of the photographs; selected larger prints accompany the main text of the report. A total of 87 photographs were taken in all. In view of the lack of archaeological deposits uncovered by the conservation works, no detailed records of the watching brief were produced (e.g. *pro forma* context sheets and detailed plans and sections), although sufficient notes were taken in the field to allow a description of the works to be produced.

3.5 In accordance with the conditions placed on the SMC, copies of the final report were provided to English Heritage and the South Yorkshire Archaeology Service; this also included copies of the digital photographs on a CD. Given the absence of any archaeological finds, no archive for the project was produced, although site notes, plans and photographs have been retained by EDAS (site code MFS 14).

4 OUTLINE ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

4.1 An archaeological assessment and building appraisal for the site complex has recently been completed by Wessex Archaeology (Dawson 2014). The following information has been taken exclusively from this report.

4.2 The earliest detailed record to what was to become Mousehole Forge dates to 1628, when Edward Barber of Wadsely leased various properties including the site, then recorded as a smelting house, to Thomas Revell of Stannington. A later indenture of 1631 between Edward and Francis Barber and Michael Burton of Holmesfield, for a lease of 21 years, also records “the two leadmylnes or smylting houses” as well as “all the waterways of dams, goits, wyres, shuttle ways, passages and appurtenances whatsoever to the said leadmyles or smylting houses”. In the following years, the smelting house became locally known as ‘Mousehole’, and by 1664, Edward Barber’s will indicates that Mousehole was a forge. Barber’s trustees sold the forge to George Bamforth II in 1672, and it passed to his son, George Bamforth III, in 1709. It was said to be producing 60 tons of wrought iron a year in 1717, converted from blast furnace pig iron.

4.3 By 1734 the manor of Wadsley had passed to the Burton family, and John Cockshutt, ironmaster at the Wortley forge, was the tenant in 1741 and 1757. During this time there was also a cutler’s forge occupied by Joseph Trickett, although its location within the site is unknown. William Armitage became Cockshutt’s manager after 1762, and he was the occupier and later partner in the works by 1794 as well as in 1832. The first cartographic source dates to 1777, when the dam, sluices, two workshop buildings, tail goits and a house are depicted. Late 18th and early 19th century improvements were then made, including a second opening from the dam, and by 1828 four wheels were being powered. Two of the wheels were recorded as being breast-shot, which powered the helve hammers. A dispute over water levels shows that, after flood damage in 1839, Mousehole weir was rebuilt and raised (and partially lowered again) in 1842-

44. In the mid 19th century, additional air for the furnaces was piped from the nearby Grogram Wheel, which had been bought by Armitage together with Mousehole on 1842. Other plans of 1838, the 1840s and 1842 record the development of the site.

4.4 After George Armitage's death in 1875, Mousehole was sold to William Cooper who with Brookes made anvils until 1927. It was also during this time that the site reached its fullest extent, as revealed by contemporary views and historic maps. Brookes and Cooper were succeeded by Owen, Thomas and Company, who continued to make anvils at the site until 1933. After this, any leases concerning Mousehole only relate to outbuildings, suggesting that production had stopped. The complex is labelled as being 'disused' on the Ordnance Survey map of 1935, and by 1940, when H G Baker photographed the site, the roof of the main forge had gone, whilst the walls were demolished during World War II, which left only the former Manager's House and workshop/storage range standing. The complex was owned by Sheffield City Council until 1983, when it was bought by Mr and Mrs Hadfield who restored the house and storage range, and were instrumental in preserving the rest of the site.

4.5 The 2014 assessment work noted that four historic phases of development and construction could be identified within the site, namely Phase 1 (by 1777), Phase 2 (between 1777 and 1796), Phase 3 (between 1796 and 1842) and Phase 4 (between 1842 and 1892) (see figure 3).

5 RESULTS FROM THE MONITORING WORK

5.1 Three areas of the dam wall along the southern boundary of the site were identified by English Heritage as requiring remedial conservation work, as well as one small area of the western boundary wall near the south-west corner of the site (see Appendix 2); figure 3 shows the locations of the four areas involved. The photographic record appears as Appendix 1; photographs are referenced in the following text in italics and square brackets, the numbers before the stroke representing the film number and the number after indicating the frame e.g. [*1/32*].

Area 1

5.2 Area 1 lay towards the north-west end of the dam wall, behind the remains of the west hammer (see figure 3), where there was a significant fracture in the mortar joints and some outward displacement/bulging, most likely as a result of root damage from mature trees growing on top of the wall; the fracture occurred at the junction of coursed rubble to the left (west) and larger ashlar masonry to the east in the 2.80m high wall [*1/373-1/378*]. The 2014 archaeological appraisal considered that the ashlar stonework represented the original dam wall construction, while the smaller coursed stonework was probably a rebuild (Dawson 2014, 13). As previously noted, the trees on top of the dam had been cut down in an earlier operation. The pointing was to be raked out along this section of wall, as well as either side of the large fracture, and 6mm HeliFix HeliBars were to be inserted and grouted into the horizontal bedding joints. The remainder of this section of wall was then required to be repointed.

5.3 Plates 1 to 3 depict the section of dam wall prior to the start of work, while plates 4 and 5 show work in progress with some of the overhanging vegetation cut back and the defective mortar in the joints between the coursed rubble having been raked out [*2/411-2/412*]. Some of the ashlar on the left side of the vertical fracture was covered with a tar-like substance, but this was not required to be removed as

part of the repair work. A total of ten 1.00m long HeliBars were inserted across the fracture along various bedding joints [*2/413-2/415*] which were then grouted/mortared in (see plate 6). The repointing work covered an area measuring c.5.0m wide, extending to and including a buttress at the west end of this section of dam wall (see plate 7) [*3/506-3/509*]. In accordance with the English Heritage specification, the new mortar was flush with the surrounding wall face, was tamped and brushed to create an appropriate finish, and protected from frost once in place [*3/513*]. Plate 8 depicts the repointing two months after completion [*4/681-4/685, 4/688-4/689*]. Nothing of archaeological importance was disturbed during the repair/consolidation work.

Area 2

5.4 Area 2 lies further to the south-east, at the corner of part of a Phase 4 building formerly containing anvil hearths (see figure 3). The conservation work was required to the collapsed corner of the dam wall built of well coursed rubble; the corner also contained one or two quoins, presumably to aid stability. The courses that remained in situ had been displaced by the rotational forces of the uncontained embankment above and behind the dam wall. The slipped spoil was to be removed, the loose stones taken off, cleaned and re-bedded, and the wall rebuilt to a similar height to that of the adjacent wall sections. The various wall sections were to be tied together with masonry or stainless steel wall ties as appropriate, and a number of 6mm HeliFix HeliBars were to be inserted through the newly-built masonry to the top of the wall. The area was then to be repointed and soil reinstated to the rear of the newly-built wall. The 2014 archaeological appraisal implied that this part of the dam wall, of coursed stonework, was probably a rebuild of the original (Dawson 2014, 13).

5.5 Prior to repair, the adjacent sections of the dam wall measured 2.60m high while the right-angled corner was only 0.85m high (five courses); the right-angled section projected 2.10m out (north) from the main dam wall, and then returned to the west for 1.0m before curving round to the north-west (see plate 9) [*1/379-1/380, 1/382-1/383, 1/389*]. The right-angled wall was well constructed with some stones acting as quoins at the corner, presumably for stability (see plate 10) [*1/381*]. As required by the English Heritage specification, the overhanging vegetation and soil behind the wall was cut back by c.0.5m to allow the right-angled stonework to be rebuilt [*2/416-2/424*]. This did not reveal any evidence for stratigraphy in the dam structure, but the infill was formed from a loose dark brown/black silty clay with mortar flecks, and contained some loose rubble including fragments of broken brick. The covering vegetation was predominantly ivy with brambles, and there was considerable root penetration (see plate 11). The removal of the soil revealed that the face of the right-angled wall was 0.65m-0.70m wide, with a rubble core behind, and also suggested that the east side of the wall butted up to the face of the main east-west aligned dam wall, although considerably more excavation would have been required to confirm this [*2/427-2/428*]. The loose mortar in the wall faces requiring repointing was then raked out, in accordance with the English Heritage specification. Loose stones from the wall top and infill were collected for later rebuilding [*2/425-2/426*], although additional stone needed to be sourced from a heap at the east end of the dam wall.

5.6 The right-angled wall was rebuilt using the sourced stone to match the height and coursing of the main dam wall, with a number of larger stones acting as quoins or capping (see plates 12 and 13). Ten 1.00m long HeliBars were also inserted along various horizontal bedding joints to tie the new build into the existing, and these were grouted/mortared in. The soil was then reinstated behind the new build,

using additional soil from the base of the wall as necessary. The subsequent repointing work covered all of the right-angled wall, and extended to all of the curving section to the west, although existing sound mortar was retained (see plate 14) [*3/499-3/501, 3/504-3/505*]. Again, in accordance with the English Heritage specification, the new mortar was finished flush with the surrounding wall face, was tamped and brushed, and protected from frost once in place [*3/514-3/515*]. Plates 15 and 16 depict the repointing two months after completion [*4/672-4/673, 4/675, 4/677-4/680, 4/690*]. Apart from the features noted above, nothing of archaeological importance was disturbed during the repair/consolidation work.

Area 3

5.7 This area lies immediately to the east of Area 2, and represents a small coursed rubble section of the dam wall containing various voids and stepped cracking. All the debris and loose masonry was to be removed and the joints raked out, and any missing stones were to be reinstated and re-bedded using stone salvaged from the vicinity. Some 6mm HeliFix HeliBars were to be inserted where appropriate and the area repointed.

5.8 This section of coursed rubble wall contains an opening half way up its 2.60m height, the base of which is partially filled with brick above and below a piece of horizontal ironwork; there are straight joints in the wall below the ironwork [*1/384-1/388*], suggesting an opening 0.75m wide. The brickwork appears to be blocking this opening, with the stone above having fallen out to create a void - the void measured 0.60m wide by 0.42m high (see plate 18). The function of this opening is unclear, although it presumably relates to a small structure visible as a brick-defined platform to the front of the wall (see plates 16, 17 and 19) [*4/673*]; this platform was not specifically identified in the previous survey of the site, although it does lie within a general area labelled as 'anvil hearths' (see figure 3).

5.9 The loose mortar in the wall face surrounding the opening was raked out, in accordance with the English Heritage specification, the hole was infilled with end-on bricks and small stones, and the whole area repointed. It is not known whether any HeliBars were used. The whole of the wall face around the opening was repointed, as far as the right-angled wall to the west (see plate 20) [*3/502-3/503*]. The new mortar was flush with the surrounding wall face, was tamped and brushed to create an appropriate finish (see plate 21) [*4/676*], and protected from frost once in place. Plate 22 depicts the repointing two months after completion [*4/672, 4/674*]. Nothing of archaeological importance was disturbed or uncovered during the repair/consolidation work, although in retrospect perhaps the void above the brick-blocked opening should perhaps have been filled with coursed rubble rather than brick, and the right-hand vertical joint below the horizontal ironwork left unmortared to maintain the visual impression of the blocked opening.

Area 4

5.10 This area formed part of the western boundary wall of the site, towards the south-west corner, where a small section of the wall had been pushed in from the west (outside the site) by vandals. This wall also forms a retaining wall, with the internal ground level within the site being significantly lower than that on the outside. The outer skin of the wall is constructed from thin coursed stones, with the rubble core and inner skin being more random; the wall is capped with larger end-on stones. Internally, the lower part of the wall forming the revetment is more substantial, with evidence for a levelling course and larger stones tieing the courses together. The wall may originally have been of drystone construction, or to have had minimal

bedding mortar, but there have been several historic phases of consolidation and pointing, at least internally.

5.11 All the debris and loose masonry was to be removed from the area of collapse, the joints raked out, and any missing stones reinstated and re-bedded using stone salvaged from the vicinity. The collapsed section was also to be rebuilt to match the existing coursing on either side, tied into the adjacent standing masonry and repointed as appropriate.

5.12 Since the production of the repair specification (see Appendix 2), more damage had occurred, so that the collapsed section of wall now measured 1.80m wide and 1.40m high internally (see plate 23) [*1/363-1/365, 1/371*]; the collapse also allowed the construction of the wall to be seen, with two skins separated by a rubble-filled core (see plate 24) [*1/366-1/367*]. As noted above, there are several areas of different build and mortar along this inside section of wall, suggesting several phases of repair or rebuild [*1/369-1/370*]. Suitable stone for the repair work was sourced from the collapse inside the wall (see plate 23) and an adjacent spoil heap, from the area which was previously determined to be a Phase 4 storage building (see figure 3) [*1/368, 1/372*].

5.13 Rebuilding and repointing was carried out in accordance with the English Heritage specification. Care was taken to ensure that the existing larger stones and coursing on the inside face of the wall, and the much more thinly bedded thinner stones on the outside, were matched. The new stonework was bedded in with new lime mortar, finished so as to be flush with the surrounding wall face, and it was tamped and brushed to create an appropriate finish (see plates 25 and 26) [*3/495-3/498, 3/510-3/512*], and protected from frost once in place. The repaired and repointed area measured 2.20m wide by 1.60m high internally, and 1.70m wide by 1.40m high externally. Plates 27 and 28 depict the repointing two months after completion [*4/686-4/687, 4/691-4/692*]. Apart from the minor structural information relating to the construction of the wall noted above, nothing of archaeological importance was disturbed during the repair/consolidation work.

6 BIBLIOGRAPHY

CIFA (Chartered Institute of Archaeologists) 2014a *Standard and Guidance: Archaeological Watching Brief*

CIFA (Chartered Institute of Archaeologists) 2014b *Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures*

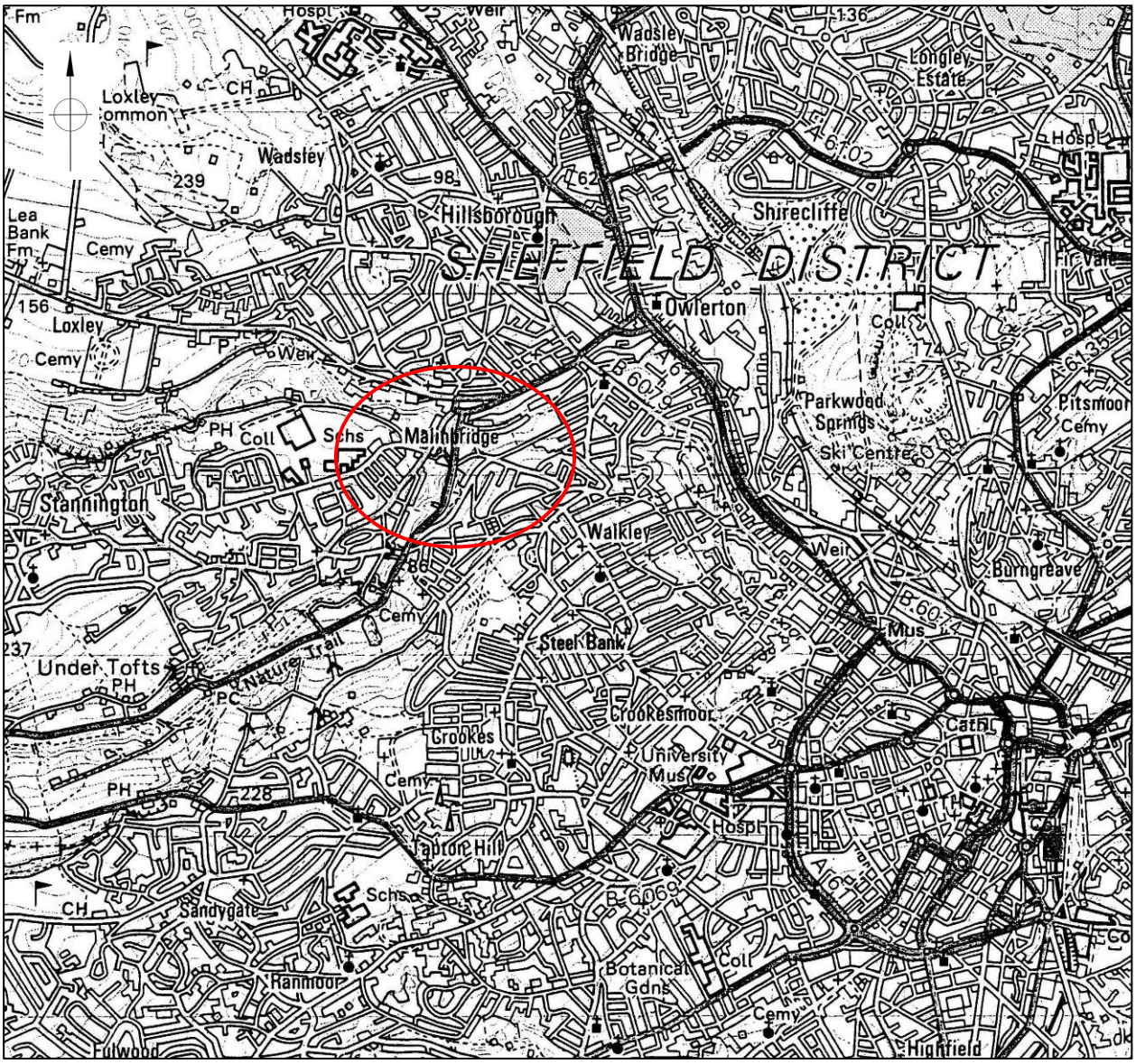
Dawson, L 2014 *Mousehole Forge, Sheffield, South Yorkshire: Archaeological Assessment and Building Appraisal* (unpublished Wessex Archaeology report 101750.01 for East Peak Innovation Partnership)

English Heritage 2006 *Understanding Historic Buildings: A Guide to Good Recording Practice*

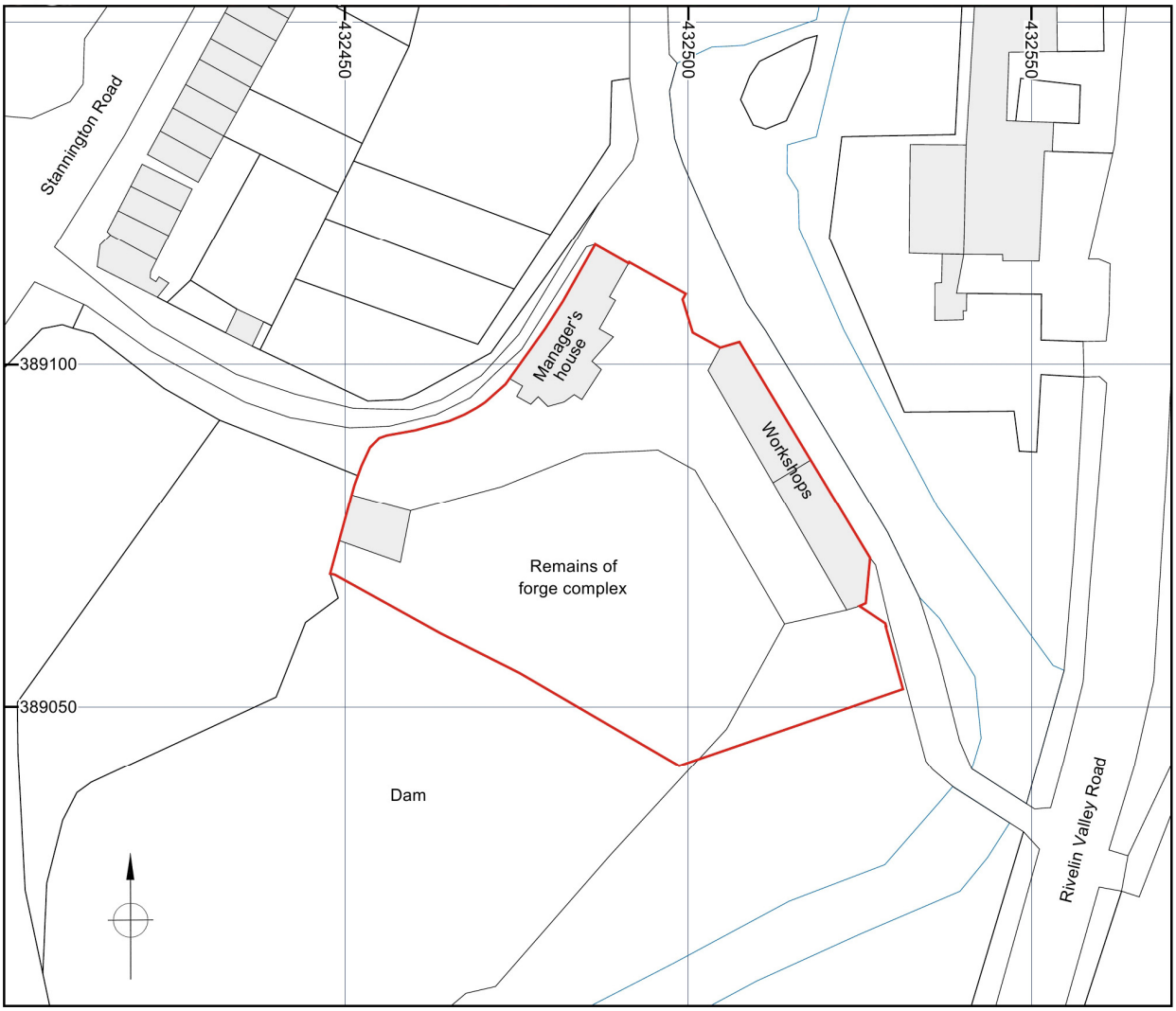
7 ACKNOWLEDGEMENTS

7.1 The archaeological watching brief was commissioned and funded by the East Peak Innovation Partnership, and EDAS would like to thank Stephen Gould (Manager) and latterly Tracy Charlesworth of EPIP for their help and co-operation during the project. Thanks are also due to Nicky Brown (English Heritage), Mrs Julia Hatfield (owner) and Richard Lowe (Walcot Joinery and Building Services Ltd - site

contractors). The site recording and reporting was undertaken by Ed Dennison of EDAS, and the responsibility for any errors or inconsistencies remains with him.



PROJECT: REPAIRS AT MOUSEHOLE FORGE	
TITLE: GENERAL LOCATION	
SCALE: NTS	DATE: FEB 2015
EDAS	FIGURE: 1



Reproduced from Dawson, L 2014 *Mousehole Forge, Sheffield, South Yorkshire: Archaeological Assessment and Building Appraisal*, figure 1.

PROJECT: REPAIRS AT MOUSEHOLE FORGE	
TITLE: DETAILED LOCATION	
SCALE: NTS	DATE: FEB 2015
EDAS	FIGURE: 2

PROJECT	
REPAIRS AT MOUSEHOLE FORGE	
TITLE	
DETAILED SITE PLAN	
SCALE: NTS	DATE: FEB 2015
EDAS	FIGURE: 3

Base plan reproduced from Dawson, L 2014 *Mousehole Forge, Sheffield, South Yorkshire: Archaeological Assessment and Building Appraisal*, figure 4.

Areas of stonework repair shown in blue.

Plate 1: Area 1 dam wall prior to repair, looking S (photo 1/373).

Plate 2: Area 1 dam wall prior to repair, showing vertical fracture, looking S (photo 1/377).

Plate 3: Area 1 dam wall prior to repair, showing displacement at fracture, looking W (photo 1/375).

Plate 4: Area 1 dam wall, work in progress, looking SE (photo 2/412).

Plate 7: Area 1 dam wall immediately after repointing, looking SE (photo 3/508).

Plate 8: Area 1 dam wall two months after completion, looking SE (photo 4/685).

Plate 5: Area 1 dam wall, detail of vertical fracture, looking S (photo 2/413).

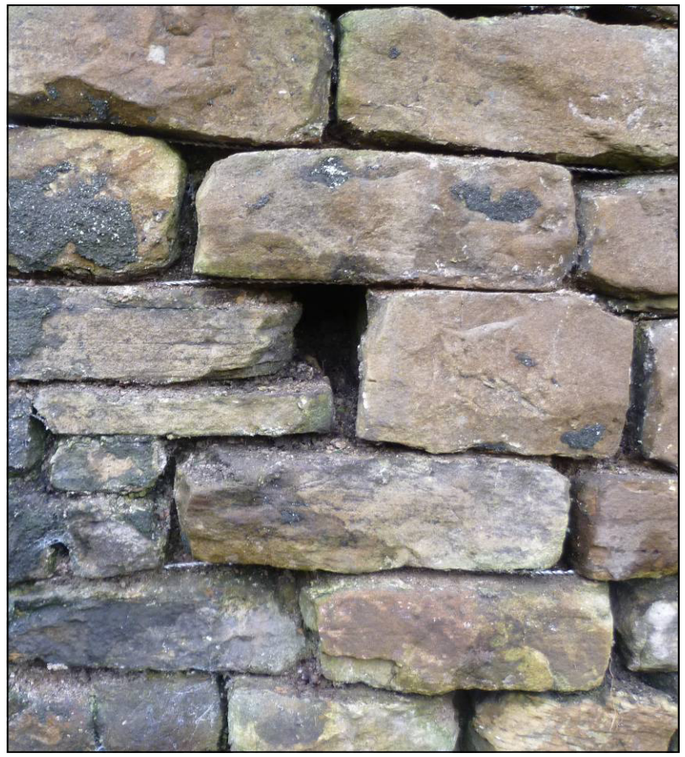


Plate 6: Area 1 dam wall, detail of embedded tie bars, looking S (photo 2/414).

PLATES 1 TO 8: AREA 1

Plate 9: Area 2 dam wall prior to repair, looking SW (photo 1/379).

Plate 10: Area 2 dam wall during clearance, looking SW (photo 2/416).

Plate 11: Area 2 dam wall with clearance complete, looking W (photo 2/422).

Plate 12: Area 2 dam wall immediately after repointing, looking SW (photo 3/499).

Plate 13: Area 2 dam wall immediately after repointing, looking W (photo 3/504).

Plate 14: Area 2 dam wall immediately after repointing, looking S (photo 3/505).

Plate 15: Area 2 dam wall, two months after completion, looking S (photo 4/680).

Plate 16: Area 2 dam wall, two months after completion, looking SW (photo 4/673).

PLATES 9 TO 16: AREA 2

Plate 17: Area 3 dam wall prior to repair, looking S (photo 1/386).

Plate 18: Area 3 dam wall prior to repair, looking S (photo 1/387).

Plate 19: Area 3 dam wall immediately after repointing, looking SW (photo 3/502).

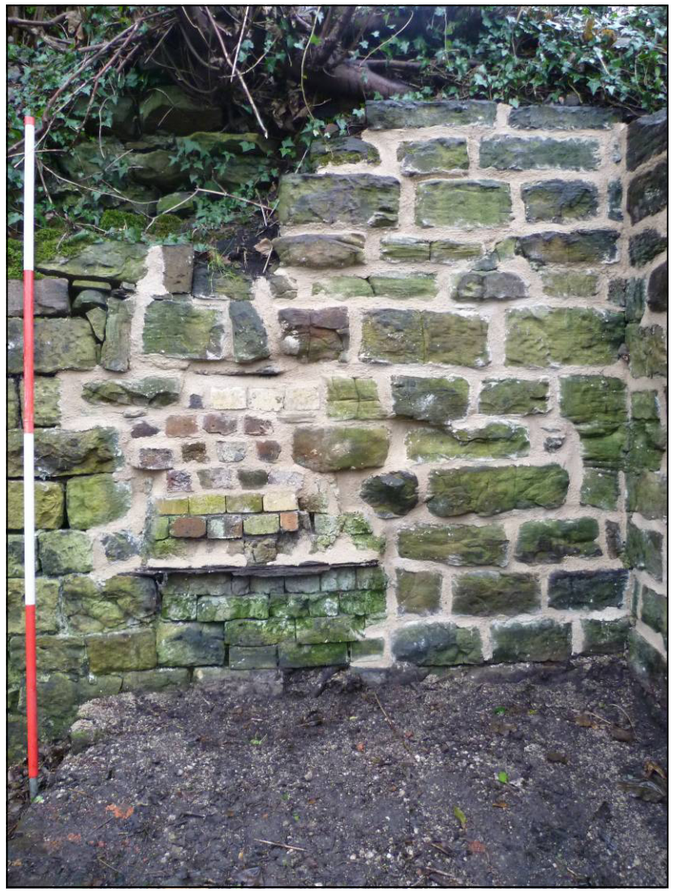


Plate 20: Area 3 dam wall immediately after repointing, looking S (photo 3/503).

Plate 21: Area 3 dam wall, detail of repointing, looking S (photo 4/676).

Plate 22: Area 3 dam wall, two months after completion, looking S (photo 4/674).

PLATES 17 TO 22: AREA 3

Plate 23: Area 4 boundary wall (internal) prior to repair, looking W (photo 1/363).

Plate 24: Area 4 boundary wall prior to repair, showing double skin and core, looking NW (photo 1/367).

Plate 25: Area 4 boundary wall (internal) immediately after repointing, looking W (photo 3/496).

Plate 26: Area 4 boundary wall (external) immediately after repointing, looking E (photo 3/511).

Plate 27: Area 4 boundary wall (internal), two months after completion, looking W (photo 4/686).

Plate 28: Area 4 boundary wall (external), two months after completion, looking E (photo 4/692).

PLATES 23 TO 28: AREA 4

APPENDIX 1

REPAIRS TO DAM RETAINING WALL, MOUSEHOLE FORGE, MALIN BRIDGE, SHEFFIELD: PHOTOGRAPHIC CATALOGUE

Film 1: Colour digital photographs taken 20th November 2014 (pre-intervention)
Film 2: Colour digital photographs taken 25th November 2014 (during works)
Film 3: Colour digital photographs taken 11th December 2014 (during final works)
Film 4: Colour digital photographs taken 14th February 2015 (post-intervention)

Film	*Frame*	*Subject*	*Scale*
1	363	Area 4 boundary wall (internal) prior to repair, looking W	2m
1	364	Area 4 boundary wall (internal) prior to repair, looking W	2m
1	365	Area 4 boundary wall (internal) prior to repair, looking W	2m
1	366	Area 4 boundary wall prior to repair, showing double skin and core, looking SW	-
1	367	Area 4 boundary wall prior to repair, showing double skin and core, looking NW	-
1	368	Area 4 boundary wall (internal) prior to repair, with rubble to front, looking W	2m
1	369	Area 4 boundary wall (internal) prior to repair, showing changes in structure, looking NW	2m
1	370	Area 4 boundary wall (internal) prior to repair, showing changes in structure, looking NW	2m
1	371	Area 4 boundary wall (internal) prior to repair, with rubble in foreground, looking W	2m
1	372	Collapsed rubble adjacent to Area 4 boundary wall (internal), looking S	2m
1	373	Area 1 dam wall prior to repair, looking S	2m
1	374	Area 1 dam wall prior to repair, looking S	2m
1	375	Area 1 dam wall prior to repair, showing displacement at fracture, looking W	1m
1	376	Area 1 dam wall prior to repair, showing displacement at fracture, looking E	1m
1	377	Area 1 dam wall prior to repair, showing vertical fracture, looking S	1m
1	378	Area 1 dam wall prior to repair, showing vertical fracture, looking S	1m
1	379	Area 2 dam wall prior to repair, looking SW	2m
1	380	Area 2 dam wall prior to repair, looking SW	2m
1	381	Area 2 dam wall prior to repair, looking W	2m
1	382	Area 2 dam wall prior to repair, looking W	2m
1	383	Area 2 dam wall prior to repair, looking W	2m
1	384	Area 3 dam wall prior to repair, looking S	2m
1	385	Area 3 dam wall prior to repair, looking S	2m
1	386	Area 3 dam wall prior to repair, looking S	2m
1	387	Area 3 dam wall prior to repair, looking S	2m
1	388	Area 3 dam wall prior to repair, looking S	2m
1	389	Area 2 dam wall prior to repair, looking SW	-
2	411	Area 1 dam wall, work in progress, looking SW	2m
2	412	Area 1 dam wall, work in progress, looking SE	2m
2	413	Area 1 dam wall, detail of vertical fracture, looking S	2m
2	414	Area 1 dam wall, detail of embedded tie bars, looking S	-
2	415	Area 1 dam wall, detail of embedded tie bars, looking S	-
2	416	Area 2 dam wall during clearance, looking SW	2m
2	417	Area 2 dam wall during clearance, looking S	2m
2	418	Area 2 dam wall during clearance, looking S	2m
2	419	Area 2 dam wall during clearance, looking S	2m
2	420	Area 2 dam wall with clearance complete, looking SW	2m
2	421	Area 2 dam wall with clearance complete, looking S	2m
2	422	Area 2 dam wall with clearance complete, looking W	2m
2	423	Area 2 dam wall with clearance complete, looking W	2m
2	424	Area 2 dam wall with clearance complete, looking SW	2m
2	425	Area 2 dam wall, stones ready for re-use, looking S	1m
2	426	Area 2 dam wall, stones ready for re-use, looking S	1m
2	427	Area 2 dam wall, junction of walls, looking SW	1m
2	428	Area 2 dam wall, junction of walls, looking SW	1m
3	495	Area 4 boundary wall (internal) immediately after repointing, looking W	2m
3	496	Area 4 boundary wall (internal) immediately after repointing, looking W	2m

3	497	Area 4 boundary wall (internal) immediately after repointing, looking SW	-
3	498	Area 4 boundary wall (internal) immediately after repointing, looking SW	-
3	499	Area 2 dam wall immediately after repointing, looking SW	2m
3	500	Area 2 dam wall immediately after repointing, looking S	2m
3	501	Areas 2 & 3 dam wall immediately after repointing, looking W	2m
3	502	Area 3 dam wall immediately after repointing, looking SW	2m
3	503	Area 3 dam wall immediately after repointing, looking S	2m
3	504	Area 2 dam wall immediately after repointing, looking W	2m
3	505	Area 2 dam wall immediately after repointing, looking SE	2m
3	506	Area 1 dam wall immediately after repointing, looking S	2m
3	507	Area 1 dam wall immediately after repointing, looking SE	2m
3	508	Area 1 dam wall immediately after repointing, looking SE	2m
3	509	Area 1 dam wall immediately after repointing, looking SW	2m
3	510	Area 4 boundary wall (external) immediately after repointing, looking E	-
3	511	Area 4 boundary wall (external) immediately after repointing, looking E	2m
3	512	Area 4 boundary wall (external) immediately after repointing, looking NE	2m
3	513	Area 1 dam wall, protected from frost, looking SW	-
3	514	Area 2 dam wall, protected from frost, looking SE	-
3	515	Area 2 dam wall, protected from frost, looking S	-
4	672	Area 2 dam wall, two months after completion, looking SW	2m
4	673	Area 2 dam wall, two months after completion, looking SW	2m
4	674	Area 3 dam wall, two months after completion, looking S	2m
4	675	Area 2 dam wall, two months after completion, looking W	2m
4	676	Area 3 dam wall, detail of repointing, two months after completion, looking S	2m
4	677	Area 2 dam wall, two months after completion, looking S	2m
4	678	Area 2 dam wall, two months after completion, looking SE	2m
4	679	Area 2 dam wall, two months after completion, looking S	2m
4	680	Area 2 dam wall, two months after completion, looking SE	2m
4	681	Area 1 dam wall, two months after completion, looking S	2m
4	682	Area 1 dam wall, two months after completion, looking S	2m
4	683	Area 1 dam wall, two months after completion, looking S	2m
4	684	Area 1 dam wall, two months after completion, looking SE	2m
4	685	Area 1 dam wall, two months after completion, looking SE	2m
4	686	Area 4 boundary wall (internal), two months after completion, looking W	2m
4	687	Area 4 boundary wall (internal), two months after completion, looking W	2m
4	688	Area 1 dam wall, two months after completion, looking S	-
4	689	Area 1 dam wall, two months after completion, looking S	-
4	690	Area 2 dam wall, two months after completion, looking S	-
4	691	Area 4 boundary wall (external), two months after completion, looking E	1m
4	692	Area 4 boundary wall (external), two months after completion, looking E	1m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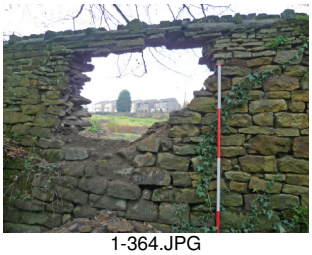
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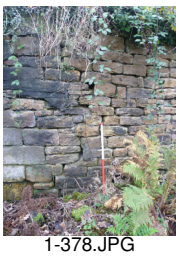
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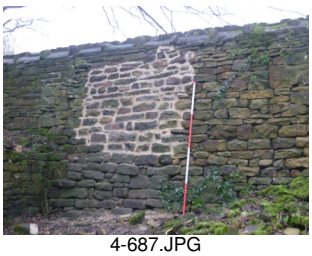
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APPENDIX 2

MOUSEHOLE FORGE
MALIN BRIDGE
SHEFFIELD

WORKS TO DAM RETAINING WALL

Scheduled Monument No 1004804

Prepared on behalf of East Peak Innovation Partnership

May 2013

Mousehole Forge, Malin Bridge, Sheffield, is a scheduled monument in private ownership. Its condition is listed on the English Heritage, Heritage at Risk Register 2012 as being 'generally unsatisfactory with major localised problems'. This is due primarily to damage caused by mature trees and shrubs growing along the top of the dam retaining wall and to the progressive decay of the existing timber hammers which are currently exposed to the elements. Works to return the site to a condition such that it can be removed from the Register are proposed. These works are to be commissioned by the East Peak Innovation Partnership (EPIP) Industrial Heritage Support Programme, which is co-funded by LEADER and English Heritage.

The works will focus mainly on the removal of trees and the protection of the timber hammers, **this work is specified elsewhere**. Once these critical actions have been carried out it is proposed that re-pointing and, where necessary, repair works should be carried out to the dam retaining wall at the south west of the site. Repairs are to be focused on three areas of the retaining wall that have been damaged by the tree and vegetation growth and one area of the boundary wall, these areas are shown in the photographs below.

AREA 1 – junction of coursed rubble and ashlar where outward displacement of the rubble masonry has occurred. This area is to be re-pointed and strengthened with bed joint reinforcement where displacement has occurred

AREA 2 – coursed rubble wall section with collapsed corner.
This corner is to be rebuilt to the height of adjacent wall sections,
strengthened using helibars and re-pointed

AREA 3 – coursed rubble section with voids and fractures,
This section is to be re-pointed, cracks are to be
repaired and missing stones are to be reinstated

Public side

Garden side

AREA 4 - section of perimeter wall which has been pushed in.
This section is to be repaired using displaced stones
which are believed to be stored on site

1.0 GENERAL ITEMS

1.1	Provide welfare facilities in accordance with all current regulations and remove the same from site on completion, make good any damage to landscaping/hardstandings caused by welfare facilities.	
1.2	Provide all temporary works required to carry out the works described and remove the same from site on completion, make good any damage caused by temporary works.	
1.3	Provide all necessary tools, labour, supervision and the like to carry out the works described.	

2.0 RE-POINTING GENERALLY

2.1	Allow for application(s) of suitable proprietary herbicide to ivy and other invasive vegetation growing atop the stone retaining wall to the south-west of the site. Leave for recommended period of time to ensure that vegetation dies back sufficiently to enable its removal without damaging the stonework.	
2.2	When vegetation has died back, remove all vestiges to expose the wall top to the full length of the stone retaining wall.	
2.3	Carefully brush off soil and debris to expose the top course of masonry.	
2.4	Take off, clean and re-bed any loose rubble masonry. Mortar to be 1 part NHL 3.5 to 2.5 parts well graded sand (3mm down to 0.075mm). Note: vestiges of existing mortar do remain in sheltered areas of the site and new mortar should match this as closely as possible in terms of colour, texture, etc. Allow for providing up to 3No pointing samples for approval.	
2.5	Allow for reinstating and re-bedding any localised missing stones, it is likely that salvaged stone that has been retained on site will be available in sufficient quantities.	

2.6	Re-point areas of the rubble retaining wall exhibiting open and defective joints. Sound areas of existing mortar are to be retained in situ and areas of ashlar are to be excluded unless joints are very open and vulnerable to water ingress. Carefully rake out decayed and defective joints by hand back to a sound substrate or to a minimum depth of twice the width of the joint. Flush out all joints with clean water to remove dust, debris and loose material and moisten prior to re-pointing. Wide/deep joints should be filled with suitable pinning stones and/or pointed in layers not exceeding 20mm with each layer being allowed to firm up before further mortar is added. Finished pointing is to be flush with surrounding masonry and tamped with a stiff bristle brush as it starts to firm up.	
2.7	Allow for leaving sufficient open joints at regular intervals along the length of the wall to act as weep holes in order to prevent a potentially damaging build up of water behind the retaining structure.	
2.8	Allow for tending the new mortar to prevent it from drying out too quickly and protect it from frost, wind, rain and direct sunlight until it has cured sufficiently.	
2.9	On completion provide and plant suitable non-invasive soft capping species to protect the exposed wall tops; turf, sedum or the like.	

In addition to general re-pointing carry out the following repairs to specific areas of the wall:

3.0 AREA 1

The masonry of Area 1 exhibits stepped cracking through its mortar joints and outward displacement, most likely as a result of tree root damage from the mature trees growing atop the retaining wall in close proximity to the structure. The trees are to be felled and poisoned to prevent regeneration (specified elsewhere). The wall is not felt to be structurally compromised to such a degree that rebuilding is required and the felling of the trees will remove some of the outward pressure on the structure, however, the wall is bowing outwards and it would be prudent to tie across the fracture to reduce the likelihood of further displacement. Prior to re-pointing the area of retaining wall identified as Area 1:

3.1	Rake out slots to a depth of approximately 40mm at regular intervals in the horizontal mortar joints in the area of displacement. Exact locations will be determined by the coursing but generally at 450mm vertical centres and extending a minimum of 500mm to either side of the fracture.	
3.2	Remove all dust and mortar from the slots and thoroughly flush with clean water.	
3.3	Provide and install 6mm HeliFix HeliBars into the slots in full accordance with manufacturer's recommendations (appended).	
3.4	Allow grout to set and re-point as Section 2.0.	

4.0 AREA 2

The masonry in Area 2 has collapsed at the external corner and the masonry courses that remain in situ have been displaced by the rotational forces of the uncontained embankment. It is proposed to rebuild the collapsed wall section and strengthen this vulnerable corner in order to reduce the likelihood of future collapse. Prior to re-pointing the area of retaining wall identified as Area 2:

4.1	Carefully remove any slipped soil to expose the top of the masonry retaining wall.	
4.2	Take off, clean and re-bed loose stones.	
4.3	Using salvaged stone that has been retained on site rebuild the collapsed sections of wall to the height of the adjacent wall sections. Ensure that the wall sections are tied together using masonry or, if a sufficient bond cannot be achieved, using suitable stainless steel wall ties.	
4.4	Rake out slots to a depth of approximately 40mm in the existing low level masonry. These are to be at regular intervals in the horizontal mortar joints in the areas of stepped fractures (i.e. to either side of the external corner). Exact locations will be determined by the coursing but generally at approximately 450mm vertical centres and extending a minimum of 500mm to either side of the fractures. Note: where this would extend beyond the end of the wall the slot is to be formed so that it continues a minimum of 100mm around the corner.	
4.5	Remove all dust and mortar from the slots and thoroughly flush with clean water.	
4.6	Provide and install 6mm HeliFix HeliBars into the slots in the existing masonry and continue to install HeliBars at approximately 450mm intervals up through the newly re-built masonry to the top of the wall, all in full accordance with manufacturer's recommendations (appended) and bending the HeliBars around the corner of the wall as required.	
4.7	Allow grout to set and re-point as Section 2.0.	
4.8	Provide and install soil to the rear of the newly rebuilt wall section to adjacent levels.	

5.0 AREA 3

There is a significant void in the masonry in this area and stepped cracking has occurred through the mortar joints. It is proposed to introduce bed joint reinforcement to the fractured area and to reinstate missing masonry. Prior to re-pointing the area of retaining wall identified as Area 3:

5.1	Remove all foliage and vegetation which is currently obscuring the wall.	
5.2	Remove all debris and loose materials from the voided area of masonry. Reinstate and re-bed missing stones, it is likely that salvaged stone that has been retained on site will be available in sufficient quantities.	
5.3	Rake out slots to a depth of approximately 40mm at regular intervals in the horizontal mortar joints where stepped cracking has occurred. Exact locations will be determined by the coursing but generally at 450mm vertical centres and extending a minimum of 500mm to either side of the fractures.	
5.4	Remove all dust and mortar from the slots and thoroughly flush with clean water.	
5.5	Provide and install 6mm HeliFix HeliBars into the slots in full accordance with manufacturer's recommendations (appended).	

5.6	Allow grout to set and re-point as Section 2.0.	

6.0 AREA 4

A small area of the boundary wall has been pushed in by vandals. This is a retaining wall as the ground level outside the site is significantly higher than the ground level within the site. The visible outer skin of the wall is constructed from thin coursed stones, this is above ground level and is non-retaining, the rubble core and inner skin are more random in construction with through stones tying the skins together and much larger stones in evidence to the internal elevation of the wall. It appears that the wall may have been of drystone construction, or have had only minimal bedding mortar but it has historically been consolidated and pointed using mortar. Certainly the outer skin in the area of collapse has been pointed and given its vulnerability to vandalism and theft it would be appropriate to point the repaired section in lime mortar to match the surrounding masonry.

6.1	Remove all debris and loose masonry from the area of collapse. Note: it may be necessary to take down some of the adjacent standing masonry in order to successfully rebuild the wall section. Sort through the salvaged stone to identify facing masonry, core rubble, through stones etc, clean off and set aside for reuse.	
6.2	Carefully rebuild the collapsed wall section using the salvaged masonry available on site, construction is to match exactly the existing standing masonry adjacent to the area of collapse. Allow for bedding on lime mortar as required and pointing up joints as appropriate.	
6.3	On completion ensure that the wall is stable and structurally sound, plumb with, and tied into, the adjacent standing masonry with no voids or loose stones which are vulnerable to theft.	

7.0 COMPLETION

7.1	On completion leave site clean and tidy to the satisfaction of the owner.	

TOTAL COST OF WORKS

£_____

APPENDIX 3

ENGLISH HERITAGE
YORKSHIRE OFFICE

Ms Tegwen Roberts
East Peak Innovation Partnership
Town Hall House
Shrewsbury Road
Penistone
South Yorkshire
S36 6DY

Direct Dial: 01904 601897
Direct Fax: 01904 601999

6 August 2013

Dear Ms Roberts

Ancient Monuments and Archaeological Areas Act 1979 (as amended); Section 2 control of works
Application for Scheduled Monument Consent

MOUSEHOLE FORGE, MALIN BRIDGE, SHEFFIELD, S6 5FF
Scheduled Monument No: SM SY 1284, HA 1004804
Our ref: S00064490
Application on behalf of East Peak Inovation Partnership

1. I am directed by the Secretary of State for Culture, Media & Sport to advise you of the decision regarding your application for Scheduled Monument Consent dated 28 June 2013 in respect of proposed works at the above scheduled monument concerning vegetation clearance and conservation works to dam wall. The works were described in the following documentation submitted by you:

Brief for Works to Retaining Dam Wall (May 2013)
Brief for Tree Works (June 2013)

2. In accordance with paragraph 3(2) of Schedule 1 to the 1979 Act, the Secretary of State is obliged to afford you, and any other person to whom it appears to the Secretary of State expedient to afford it, an opportunity of appearing before and being heard by a person appointed for that purpose. This opportunity was offered to you by English Heritage and you have declined it.

3. The Secretary of State is also required by the Act to consult with the Historic Buildings and Monuments Commission for England (English Heritage) before deciding whether or not to grant Scheduled Monument Consent. English Heritage considers the effect of the proposed works upon the monument to be (b) beneficial for the preservation of the monument, with arrangements for necessary archaeological

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recording included within the application.

I can confirm that the Secretary of State is agreeable for the works to proceed providing the conditions set out below are adhered to, and that accordingly Scheduled Monument Consent is hereby granted under section 2 of the 1979 Act for the works described in paragraph 1 above, subject to the following conditions:

(a) The works to which this consent relates shall be carried out to the satisfaction of the Secretary of State, who will be advised by English Heritage. At least 4 weeks' notice (or such shorter period as may be mutually agreed) in writing of the commencement of work shall be given to Neil Redfern, Inspector of Ancient Monuments, English Heritage 37 Tanner Row, York, YO1 6WP, Tel: 01904 601897, Email: neil.redfern@english-heritage.org.uk, in order that an English Heritage representative can inspect and advise on the works and their effect in compliance with this consent.

(g) The consented works shall be undertaken under the overall archaeological supervision of Tegwen Roberts who must be given at least 4 weeks' written notice of the work (or such shorter period as may be mutually agreed) together with a timetable for it and essential documentation such as site plans and specifications.

(i) Original material shall be reused wherever possible.

(j) Any replacement material shall be of a type, texture and colour which matches the original material.

(k) Any replacement brick/ stone shall be of a suitable size, and laid in courses to match the original courses and joint widths.

(l) All fixings shall be made into the joints and not into the brick/ stone.

(m) All pointing and mortar work shall be in a mixture and finish to match the existing in composition, colour, texture and style.

(n) Care shall be taken that fittings do not rust so as to stain the brickwork/ masonry.

(o) Any vegetation growing in the masonry shall be cut off level with the surface of the stonework and the roots poisoned/ carefully removed.

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(p) All those involved in the implementation of the works granted by this consent must be informed by the owner, occupier and/or developer that the land is designated as a scheduled monument under the Ancient Monuments and Archaeological Areas Act 1979 (as amended); the extent of the scheduled monument as set out in both the scheduled monument description and map; and that the implications of this designation include the requirement to obtain Scheduled Monument Consent for any works to a scheduled monument from the Secretary of State prior to them being undertaken.

(q) Equipment and machinery shall not be used or operated in the scheduled area in conditions or in a manner likely to result in damage to the monument/ ground disturbance other than that which is expressly authorised in this consent.

(v) All existing trees, shrubs and woody growths shall be cut off at ground level and the roots poisoned, the stumps being left *in situ* and not grubbed out.

(gg) A report on the archaeological recording shall be sent to Neil Redfern at English Heritage and Dinah Saich, Team Leader, South Yorkshire Archaeology Service, Development Services, Howden House, 1 Union Street, Sheffield, S1 2SH, within 3 months of the completion of the works (or such other period as may be mutually agreed).

4. By virtue of section 4 of the 1979 Act, if no works to which this consent relates are executed or started within the period of five years beginning with the date on which this consent was granted (being the date of this letter), this consent shall cease to have effect at the end of that period (unless a shorter time period is set by a specific condition above).

5. This letter does not convey any approval or consent required under any enactment, bye law, order or regulation other than section 2 of the Ancient Monuments and Archaeological Areas Act 1979.

6. Your attention is drawn to the provisions of section 55 of the 1979 Act under which any person who is aggrieved by the decision given in this letter may challenge its validity by an application made to the High Court within six weeks from the date when the decision is given. The grounds upon which an application may be made to the Court are (1) that the decision is not within the powers of the Act (that is, the Secretary of State has exceeded the relevant powers) or (2) that any of the relevant requirements have not been complied with and the applicant's interests have been substantially prejudiced by the failure to comply. The "relevant requirements" are

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defined in section 55 of the 1979 Act: they are the requirements of that Act and the Tribunals and Inquiries Act 1971 and the requirements of any regulations or rules made under those Acts.

Yours sincerely

A Sutherland

PP. **Neil Redfern**
Principal Inspector of Ancient Monuments
E-mail: Neil.Redfern@english-heritage.org.uk
For and on behalf of the Secretary of State for Culture, Media and Sport

cc Dinah Saich, SYAAS

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