Saw Shed, Lee Quarry, Bacup

An Archaeological Recording and Monitoring Programme

By J.M. Trippier Archaeological and Surveying Consultancy

Part 1: Recording Prior to Conservation

March 2010

Clients: Pennine Lancashire Groundwork

CONTENTS

EXECUTIVE SUMMARY
Stone was being quarried from Lee Delph from the early 1800s at least but the mid to late-19th century was characterised by a significant expansion in quarrying brought about by increased urban growth, mechanisation and improved stone-working techniques. As with the Rossendale Quarries generally the most sought-after rock comprised Haslingden Flags from which was produced flags, setts, kerbs, manhole covers, and later concrete flags and kerbs, and roadstone. The Sawshed at Lee Quarry, which is the subject of this report, was built between 1910 and 1930 and probably went out of use in the 1950s. It is now in a ruinous condition and urgent conservation work is required to prevent further deterioration. Groundwork Pennine Lancashire, acting on behalf of the Partnership involved in the *Valley of Stone* project, has commissioned such work, two requirements of which were an archaeological recording programme and archaeological monitoring of the conservation work. J.M. Trippier Archaeological and Surveying Consultancy of Bolton was retained to carry out this work. This report fulfils the first requirement for an archaeological recording programme.

1. INTRODUCTION

1.1 The borough of Rossendale is located in Southeast Lancashire and covers an area of approximately 140 square kilometres. Whilst it is situated on the edge of industrialised towns such as Burnley and Rochdale, with the city of Manchester only 29 kilometres to the south, the landscape character is one of enclosed uplands, cut by steep valleys lined with linear development, with a large moorland plateaux in the south east of the borough *(Supplementary Planning Guidance Landscape and Heritage Adopted SPG 2001 – 2016).* The moorland plateau contains an unusually complex cluster of quarry sites ranging from the 18th Century to the present day. The main landowners are Lancashire County Council, Rossendale Borough Council and United Utilities. The *Valley of Stone* project is intended to create a regionally significant resource focused on the stone quarrying industry but not exclusive to it. The overall importance of the conservation value of the *Valley of Stone* is reflected in its inclusion within the South Pennines Heritage Strategy.

1.2 The *Valley of Stone* Management Plan has been prepared on behalf of the Heritage Lottery Fund and a working party comprising representatives from the agencies who hold management responsibilities for sites within the *Valley of Stone*. The Plan is not prescriptive or binding on landowners and management agencies, but aims to be framework for co-ordinated management and the development of partnerships. The Plan comprises a statement of the objectives necessary for the long term preservation of the Valley of Stone and its landscape setting, aiming to balance the interests of conservation, public access, and the interests of those who live and work in the area. It provides a framework for the holistic and proactive management of the landscape, helping to ensure that the special qualities of the *Valley of Stone* are sustained and preserved for future generations.

1.3 The implementation of the Plan will be achieved by the various agencies adopting the *Valley of Stone* objectives and carrying out their management responsibilities within this strategy. Groundwork Pennine Lancashire is monitoring and working with landowners to manage the sites for the duration of the project. Short and medium-term objectives include, inter alia, the enhancement and conservation of the landscape character of the *Valley of Stone* and the halting of ongoing degradation of sites and monuments that have been considered archaeologically

significant. Lee Quarry Sawshed is one such monument. It is now in an extremely poor state of repair being roofless and with much of its wall structure collapsed and remedial conservation work is urgently needs to be carried out, in order to preserve its significance within the quarry system and as a local landmark. Groundwork Pennine Lancashire prepared a brief to guide the conservation process. This specified that a suitably qualified archaeologist should photographically record, monitor and report on the findings during the conservation of the structure. J.M. Trippier Archaeological and Surveying Consultancy of Bolton was awarded the contract for this work. Mr. John Trippier BA (Hons.), MRICS, PIFA is a Chartered Surveyor and Practitioner of the Institute of Field Archaeologists with over 30 years experience of surveying and recording buildings of many types. This report details the findings of the archaeological survey.

2. SITUATION OF PROPERTY

2.1 Location: Lee Quarry is located on the west side of the A6066 road which runs east-west from Bacup to Rawtenstall. It is approximately 1 km south of Rockcliffe, with Lee Moss to the south and Holden Moor to the east. Historically, the quarry lay within the Brandwood Lower End subdivision of the Spotland township and the ancient parish of Rochdale. The quarry is accessed by a long unmetalled track along the line of the former tramway from the quarry. There are public footpaths running from Britannia via Stubbylee Moss, Brandwood and Cowpe. The quarry extends between SD 863208 and SD 870210, The Sawshed is situated at NGR 86742086 and at an elevation of approximately OD 360m. Its general location is indicated on the accompanying Plan 1 by a red arrow and it is shown more precisely edged red on Plan 2.

2.2 Geographical setting: The geology of the Rossendale district is dominated by the Millstone Grit series which is interspersed with deposits of shale and finer sandstones. These sandstone deposits have particular geological qualities which have been recognised and exploited in varying degrees since at least the medieval period. Until the late-18th century this consisted of relatively small-scale, *ad hoc*, extraction in order to obtain building stone for local requirements. With improvements in transport between 1770 and 1840, coupled with the increased demand for local building stone, the scale of quarrying in the region increased, and saw the rise of a number of substantial workings. The mid to late-19th century was characterised by a significant expansion in quarrying brought about by increased urban growth, mechanisation and improved stone-working techniques. This period also saw the construction of railways into Rossendale, the construction of the mineral tramways and the establishment of a number of large stone processing sites (UMAU, 2003*, 4 - 5)*. As with the Rossendale Quarries generally the most sought-after rock comprised Haslingden Flags from which was produced flags, setts, kerbs, manhole covers, and later concrete flags and kerbs, and roadstone.

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3. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

3.1 There have been a number of earlier archaeological surveys of Lee Quarry. The major one was an archaeological assessment by the then Lancaster University Archaeological Unit (LUAU) carried out for Lancashire Council in 1997. This was followed by a photographic survey in 2000 also by LUAU for Lancashire Council. In 2003 University of Manchester Archaeological Unit (UMAU) carried out an assessment of the various tramways and allied features associated with the quarries as part of the *Valley of Stone* project. The following archaeological and historical summary relies largely on that contained in the 1997 report.

3.2 In the 1997 survey it was said that '*the quarry is extremely rich in associated quarry features (see gazetteer and survey plan), including the remains of numerous structures and earthwork platforms (representing quarrymen's shelters, storage buildings, and processing areas), heaps of part finished quarry products and stone offcuts, crane bases, and extensive tramway remains, including the bases for travelling cranes*' (LUAU 1997, 29) However there were only two entries for the quarry on the Lancashire Count Council Sites and Monuments Record. These were. SMR No 1125 -Fairwell Farmstead (LBll) and SMR No 7577 -Sandstone quarries (as 6" OS map 1st edn).

3.3 LUAU's assessment was that Lee Quarry is an important site with *high* archaeological value, although the integrity of the site as a whole has been reduced by reworking and motorbike scrambling activities; it also has a series of very deep pits which pose a potential danger to visitors. The modem quarrying and reworking of the spoil (since 1950's) has been concentrated around the southern, central and western parts of the site and the nineteenth/early twentieth century remains consequently survive around the eastern and northern parts of the quarry. Despite the recent reworking there is a *high* level of survival on parts of the site and a *high* potential for further archaeological investigation. Associated features are numerous and aid considerably in the understanding of how the quarry functioned. Lee quarry is exceptionally well documented and the potential for the preservation of structural evidence was regarded as *high*.

3.4 The sawshed itself was recorded as item **Lee 6** in the gazetteer for the 1997 survey (IUAU 1997, where it was described as ' *a rectangular two-celled stone structure, with brick additions, shown on the OS map of 1928 as "Stone Crusher". It is located in the central working area of the quarry. Surviving walls vary in height from cO.30m to c3m. Entrances (c2m wide) were observed into the southern elevation of both cells, and two apertures, probably large windows, were observed in both end elevations. Dimensions in plan c21m x cl5m. Remains of fallen timber and steel roof trusses suggest that structure would have had a pitched roof. A few metal supports were all that remained of the crushing equipment.*' The author was obviously misled as to the uses by the 1928 OS map.

3.5 The Brandwood survey of 1810 names James Hoyle as .owner/occupier of 'A farm call'd Lee' and by 1820 a James Hoyle was a running a quarry firm (at Lee Delf ?) from where stone was carted or sleighed down to Lee Farm and through Lee Wood or to Stubbylee. The OS 6" 1st edn of 1849 (sheet 81) shows a small 'Sandstone Quarry' at the approximate centre of what became Lee Quarry, with 'Lee Delf' to the south. At least 14 separate firms of quarry owners worked at Lee quarries between 1848 and 1873. Amongst those with the greatest longevity appears to be the Hoyles who wee there until at least 1885; Thomas Peel from 1885 to 1894; William Jackson from 1898 to 1908; Myles Hardman (and executors) in the 1900s-1910s and Thomas Ratcliffe (later Messrs Ratcliffe and Sons who operated there from the 1900s -1956 along with Lovick and Philipson in the 1900s and Messrs Henry Wood and Sons in the l910s. Castleton Sand and Gravel Quarries Ltd were there from 1956 into the I960s and, Eskett Quarries Ltd after 1974. The most recent operators were Bardon Roadstone.

3.6 Between 1878 and 1882 there were a series of advertisements for sale and letting of quarries and plant at Lee Quarries. These adverts name several specific quarries which were presumably part of the complex: Top Hole Quarry, Face Quarry, Inghams Quarry, Dowhole Quarry and Steam Crane Quarry. Named plant includes: polishing mill, steam engine and boiler, gearing and tackle, hand cranes, steam crane, smithy, cartwrights shops, stone carts an draught horses, stables, tram wagons, steel hammers, barrows, trestles, crow bars, picks, shovels, wedges, drills, cabins (wood and stone).

It is interesting to note that there is no reference to a saw shed at this time although by 1908 there was a saw mill at Holts sidings as an accident to one of William Jackson's workers is recorded

3.7 Lee Quarry covers a large area the basic formation of which has been through the quarrying of outcropping stone. The main working face, with three very deep open pits (LEE 21-23), runs along the east and south side of the quarry with extensive spoil to the north incorporating multi-fingered spoil heaps. These features are all clearly visible on the 1892 OS 25" map (sheet 81.1) which also shows a major quarry tramway network, inclined plane to Holts sidings and numerous 'cranes'. It also shows extensive 'Greens Moor Quarry' to the west. In 1894 Thomas peeel' polishing mill was up for sale but by1901 William Jackson was building another one, albeit without planning permission (LUAU 1997, 27).

3.8 1909 OS 25" map shows 'Lee Quarries' further expanded, with working faces pushed back to the south-east and now continuous with Greens Moor Quarry to the west; again with a (modified) tramway network, inclined plane and 'cranes'. In addition, there was a 'travelling crane'; a 'mineral railway' running south-west to north-east across the site; and a series of sub-rectangular features, possibly small reservoirs, east of the quarry. In 1910 there was an accident involving an employee of William Jackson t Holt Mill Sidings Saw Mill. This is the only documentary reference to a saw mill relating to Lee Quarry

3.9 In 1913 there was another sale of the quarry plant of Messrs Henry Wood and Sons at Lee Quarry which included steam cranes, hand cranes, stone waggons (3'3" gauge), chains, barrows, wood shelters, tool houses, hammers, picks, spades, drills, wedges (Davies 1985-96). And in 1931 there was a visit by North of England Quarry Owners and Managers to Messrs Thomas Ratcliffe (Bacup) Ltd at Lee Quarries where there was a demonstration of rock getting; hand and machine cutting (into flags, setts and kerbs); and dressing by masons. The tour also looked at: electric plant and transformer house, air compressor and pneumatic tools, steam cranes, joiners shop, mechanics shop, blacksmiths shop, two crushing plants, storage (for 1,000 tons of stone), planing machines, railway and road transport arrangements. At that 200 men were employed, compared to ten 25 years before.

3.10 The OS map of 1930 clearly shows the subject building for the first time although it is described as a 'stone crusher'. However Groundwork officials are content that the is incorrect and that it was a sawshed. There is a tramway system immediately to the north and east and two travelling cranes immediately outside the west elevation.

3.11 In 1936 the winding house and drum on the incline at Messrs Ratcliffe and Sons, Lee Quarries was destroyed by fire (and in the same year that firm announced that they intended to begin manufacturing hydraulic pressed concrete flags (a large press being built), and concrete kerbs with vibratory plant.

3.12 The building is still shown on the 1961 OS Map although most of the surrounding plant has now gone. There is a substantial spoil heap outside the north elevation and another smaller building beyond this.

4 METHODOLOGY

4.1 This "as built" record accords with the requirements of English Heritage's Level 2/3 record and

comprises a written account, a drawn record comprising scaled elevations and a photographic record. It has been carried out in accordance with the client's project brief contained at Appendix 1. The photographic record was made using a Pentax 35mm SLR Cameras and Ilford HP5 films to enable the production of 5"x 7" monochrome prints and Fujichrome Sensia film to provide colour slides for archive purposes. A Fuji 5700 digital camera was also used to provide the colour pictures in this report. A two metre ranging rod was included in general shots and a smaller scale bar was used in the more detailed ones. A full photograph index and direction plan is included with this report. The scaled elevations were measured using electronic distance measuring (EDM) equipment and were drawn with an Autocad package The above ground remains of a large 2-bay rubblestone building was surveyed by S.Baldwin and J.Trippier over 2.5 days in May 2008 and July 2009. The building was surveyed using a Leica TL 705 Total Station and TheoLite drawing software. Internal measurements and fine detail were added by J.Trippier and Steven Price using steel hand tapes and a laser level and the Autocad survey was amended accordingly by Steven Price.

5. PHYSICAL DESCRIPTION

5.1 General Description

5.1.1 The building (**Plate 1**) is located on a level platform terraced into the rock face and close to the main quarry working face with large spoil heaps on its north and east sides. The dimensions of the building measured externally are 19.65m (north-south) and 15.55m (east to west). A sandstone rubble wall crosswall orientated east-west and located off-centre to the north divides the building into 2 bays or rooms (**Plate 2**). These are labelled Bay 1 and Bay 2 on the measured drawing (**Fig.7**). Bay 1 measures 14.12 x 6.45 m and forms the northernmost room. Bay 2 measures 14.2 x 10.65 m and forms the southernmost room.

5.1.2 The building is constructed of rough sandstone blocks laid to courses with dressed squared gritstone blocks forming quoins at the north-west and south-west corners (**Plates 3 & 4**). It is now largely ruinous and roofless although a photo made available by Mr Dominic Cooper, the sometime project manager for Groundwork, indicated two double pitched roofs orientated east-west (**Front Cover**). It appears from this photograph that there is a 'straight joint' between Bays 1 & 2 suggesting that they may have been built as separate phases with Bay 2 being later. However it was not possible to explore this further at this time due to the heavily degraded state of the wall at this point and the large amount of rubble overlay (**see Plate 6**). Surviving wall heights range from 2.1m at the highest to the lowest at 0.6m. The walls were generally no more than 0.5m thick. Block sizes ranged on average from 0.5 x 0.2 x 0.2m to 0.25 x 0.15 x 0.10m. These were set in a greyish-white lime mortar.

5.1.3 The west elevation appears to comprise the front of the building. As mentioned above it was constructed of sandstone blocks laid to courses with dressed squared gritstone blocks forming quoins at the north-west and south-west corners (**Plates 3 & 4**) There are four openings (**Figs. 7 and 8a**). All have lost their lintels and no cills or thresholds are visible The surround to the northern opening is most intact with the north jamb being exposed to half height and the lower part of the south one still in place (**Plate 5**). The lower courses of the wall between the northern opening and the next to the south are still visible although overlain with rubble on the west side. The north jamb of this second opening has gone although its southern jamb is still partially visible low down (**Plate 6**). There are very small sections of wall between this 2nd opening and the next one south (3rd) and between the 3rd opening and the final (4th) (**Plate 7**).

Only the lowest courses of the jambs of the third opening are intact. The section of wall between this opening and the southernmost (4th) one is extremely degraded and largely covered with rubble to the west (**Plate 8**). However the south jamb of the southernmost opening is in good condition at its lower level as is the adjoining wall which is linked with good quoin stones to the south wall of the building (**Plate 4**).

5.1.4 The south elevation is intact continuously for its whole length but only at its lower courses (**Plate 4**). It is largely a blank wall although at its eastern end there is a cill (**Plate 9-**see scale bar) suggesting the presence of a former window. In common with the other window openings surviving (notably in the east elevation) this cill comprises two elongated blocks of dressed stone laid end to end.

5.1.5 The east elevation is built immediately to the west of the hillside or spoil heap which sits hard up against it to the eastern exterior. There is a substantial element of this wall still upstanding in the south bay (Bay 2) (**Plate 10**). This contains two window openings (**Plates 10 and 11**). In common with all other openings in the building the lintels are gone and the cills comprise two elongated blocks of dressed stone laid end to end. In the case of the north window the lower parts of both jambs are intact and are splayed outwards from the exterior (**Plate 10).** In the case of the south window only the north jamb is extant, the wall having collapsed to cill level south of the window. In the north bay (Bay 1) the state of collapse of this elevation is much more severe and the wall has all but gone (**Plate 12**) although it appears that there are in situ remains under the adjoining/overlying spoil or land slip. See for example an in situ block which appears to be a lintel for an opening of some kind and which still sits on it jamb which is now largely buried (**Plate 13**).

5.1.6 The north elevation also contains significant elements of upstanding masonry (**Plates 1 & 14**) and there are three openings in this elevation (**Figs 7 & 8b**). It seems unlikely that these would all be doorways and, although there are no cills or lintels extant, their splayed jambs suggest that they are most likely to have been windows. Their proximity to the hillock immediately to the north suggests that this is a build up of spoil which occurred after the building went out of use. The westernmost opening is well defined by the adjoining walls and jambs, the westernmost of which forms the junction with the equally well defined north end of the west wall of the building (**Plate 15**). The central opening is well defined on its west side but less so on its east where the adjoining spoil/slip from the adjacent heap or hillside is now overlying the opening (**Plate 16**). The east opening is poorly defined on its west side but the remains are rather more upstanding on the east side where the splay on the opening is more clearly visible (**Plate 17).**

5.2 Internal Description

5.2.1 The central dividing wall between Bays 1 & 2 is of matching construction to the external walls (**Plate 2**). This wall is continuous for its whole length but is degraded to a low level and the eastern end is heavily overlain with rubble. Towards its eastern end is a standing stone which may have been the jamb for the doorway giving access from Bay 1 into Bay 2 (**Plate 14**). A number of other similar blocks adjacent but no longer in situ may have formed part of this doorway (see **Plate 14**).

5.2.2 Bay 1 contains a large irregular indented concrete buttress and a rectangular

concrete block c.1m west of the buttress (**Plates 2 & 18)**. At the time of the survey the internal area was littered with stone debris making it difficult to ascertain the nature of the flooring. However, a small test area was cleared to reveal hints of a sandstone flagged floor.

5.2.3 Bay 2 contains a series of massive indented concrete buttresses attached to the eastern wall and orientated east-west (**Plate 19**). Some of the buttresses contain steel pins- possibly machine mounts ((**Plates 20 & 21**). It is worth noting that one of these beds sits hard up against the east end of the south wall of the building and immediately to the north of some large rough hewn stone blocks which may support the south wall itself (**Plate 9**). Although on first sight these appear natural it seems more likely that they were brought here from the quarry workings. At the time of survey the floor area was waterlogged and water reeds masked the floor area preventing identification of the flooring material (**Plate 22)**.

6. CONSERVATION REQUIREMENTS

6.1 Conservation will take place in accordance with the specification contained at Appendix 4 of this report.

6.2 Some existing areas require rebuilding to ensure stability. Loose and unstable stonework should be carefully dismantled, recording the location of stones. The contractor will be required to ensure reconstruction follows existing style and is well executed. Full photographic recording will be required prior to any dismantling. The recording and supervision of the conservation will be the responsibility of the archaeologist..

6.3 For reconstruction, some stones e.g. quoins will be clearly identifiable, but the remainder would need to follow the style of existing/photographic evidence. There may be insufficient stone in some areas to reconstruct; in this case consideration would have to be given to different facing in additional "new" stone (clearly identifiable to an experienced eye, but blending in with the existing). Existing doorposts/window surrounds/internal features should be preserved or reconstructed to indicate positions of openings and give insight into the remains of the buildings. To prevent further deterioration wall tops should be protected and the cleared floor surfaces should be covered with a protective layer to prevent the re-growth of vegetation.

6.4 For mortared stonework, re-pointing would need to make assumptions about the final appearance of the joints. The contractors at Facit Chimney had the existing lime mortar sampled and analysed to establish its composition. Their resultant specification for mortar is included at Appendix 4 of this report. Unless there are obvious variations in the exiting mortar at the sawshed there is no archaeological objection to it being used at this site also.

6.5 The conservation and continuing maintenance of the site will be undertaken to the relevant standards set by relevant bodies such as the Institute of Field Archaeologists.

7. RESULTS

8. ARCHIVING

8.1 An archive has been prepared in accordance with the recommendations of The Management of Archaeological Projects 2nd ed.1991. The archive

will be deposited at the Lancashire County Record Office in Preston. Copies of this report will be sent to the in Lancashire County Historic Environment Record also in Preston.

9. BIBLIOGRAPHY

Abbreviations

LUAU Lancaster University Archaeological Unit
OS Ordnance Survey
UMAU University of Manchester Archaeological Unit

Unpublished manuscripts

LUAU 1997. *Rossendale Quarries Lancashire: Assessment Survey*
LUAU 2000, *Lee and Greenmoor Quarries, Rossendale Lancashire Photographic Survey*
UMAU 2003, *The Rossendale Quarrying Industry: Archaeological Assessment Report*

Published works

English Heritage, 1991, *The Management of Archaeological Projects,* 2nd edition, London
English Heritage, 2006, *Understanding Historic Buildings: a guide to good recording Practice*, Swindon
Rothwell, M., 2008, *Industrial Heritage A Guide to the Industrial Archaeology of Whitworth*, Bridgestone Press
UMAU, 2003, *The Rossendale Quarrying Industry: Archaeological Assessment Report,* unpublished client report

Maps

OS 1849, 1:10560 scale Lancashire Sheet 72, Southampton
OS 1893, 1: 2500 scale Lancashire Sheet 72:15, Southampton
OS 1810, 1: 2500 scale Lancashire Sheet 72:15, Southampton
OS 1930, 1: 2500 scale Lancashire Sheet 72:15, Southampton
OS 1961, 1: 2500 scale Lancashire Sheet SD 8620, Southampton

APPENDIX 1
Schedule of Work

for

Archaeologist

June 2007

1.1 Summary of brief
This brief has been produced to guide the conservation process at Lee Quarry Saw Shed, Facit Chimney and 4 Quarrymen's huts at Thurns Head. The site archaeologist will photographically record , monitor and report on the findings during the conservation of the structures *in situ*.

1.2 Site location and description

LEE QUARRY SAW SHED BACKGROUND INFORMATION

Introduction
Lee quarry extends between SD 863 208 and SD 870 210, approximately 1km south of Rockcliffe, with Lee Moss to the south and Holden Moor to the east. Historically, the quarry lay within the Brandwood Lower End subdivision of the Spotland Township (Rochdale parish).

Historical Summary
Working life: early nineteenth century to 1980's
Geology: Upper Haslingden Flags and shale with Rough Rock to south east.
Methods included hillside outcroppings, open pit working and mining. Extensive mechanisation from at least 1880's, including steam powered cranes, blasting, pneumatic drills.
Products: including flags, kerbs, manhole covers, later concrete flags and kerbs and road stone.

1.3 Planning background
Lee quarry Saw shed and Facit chimney are owned by Lancashire County Council. Thurns Head is owned by United Utilities but leased to Rossendale Borough Council and Cragg Quarry is owned by Rossendale Borough Council.

The designations for the sites include:

Lee Quarry is the site of a geological SSSI,

Thurns Head SMR Entry and RIGS site

1.4 Archaeological and historical background

Historical background for the conservation sites can be found in Lancaster Universities Quarry survey 97 and Manchester Universities Archaeology Unit's survey 2003

1.5 Requirement for work

The archaeologist will photographically record the heritage structures before any intervention and the following conservation process and provide a report of the results. The results should be illustrated where necessary by the use of drawings and photographs, and by supporting data contained in the

appendices.

The archaeologist will work to the By-laws of the Institute of Field Archaeology Code of approved practice for the regulation of contractual arrangements in field archaeology Sept 2002.

1.6 Stages of work and techniques

1. Pre intervention phase (recording *in situ* structures)

2. Watching Brief during conservation of structures Archaeologist to spend four days per week whilst conservation work is in progress.

3. Post-fieldwork analysis and report

1.7 Monitoring arrangements

Work will be monitored and approved by the county archaeologist.

1.8 Archive deposition

The final destination of the archive (records and finds) should be noted in the report.

1.9 Publication and dissemination

Technical terminology (including dating or period references) should be explained where necessary for the conclusions to be understood be a non-archaeological audience.

1.10 Other factors (including contingency)

The field archaeologist will have the power to suspend the conservation phase if unexpected finds call for further investigation. The county archaeology service will be informed of any significant finds and their approval will be necessary before work can resume.

GROUNDWORK Pennine Lancashire (Archaeologist) SCHEDULE OF WORKS

A. Recording, Watching Brief, Reporting

ITEM	DESCRIPTION	NO	UNIT	RATE	£	p
	Preliminaries					
A.1	Basic level of measured survey, along with photographic record, before conservation works start. This would equate to a survey between levels 2 and 3, as set out in '*Understanding Historic Buildings'* a guide to good recording practice' (EH, 2006). Including all elements of a level 2 survey (p.140 with addition of a general site plan at 1:500 – 1:1250 (based on OS Mastermap) of each site; measured plans and elevations at an appropriate scale (1:20) sufficiently detailed as to allow full understanding of the remains when used in conjunction with the site photographs (i.e. a 'stone by stone' drawing is not required, but an appropriate outline should be drawn, with openings, building lines, etc. marked) If clear and unimpeded photograph(s) can be produced, however, that render a drawn elevation superfluous, then this may be done. Sites to be included: Lee Quarry Saw Shed, Facit Chimney, Quarry Men's Huts at Thurns Head x 3, Quarry mans hut at Cragg x 1, flag fence at Back Cowm.	34	Days			
A.2	Watching Brief Archaeologist to be on site 24	7	Days			
A.3	Reporting Archaeologist to produce a report of the conservation and any finds/ recommendations	7	Days			

APPENDIX 2: FIGURES

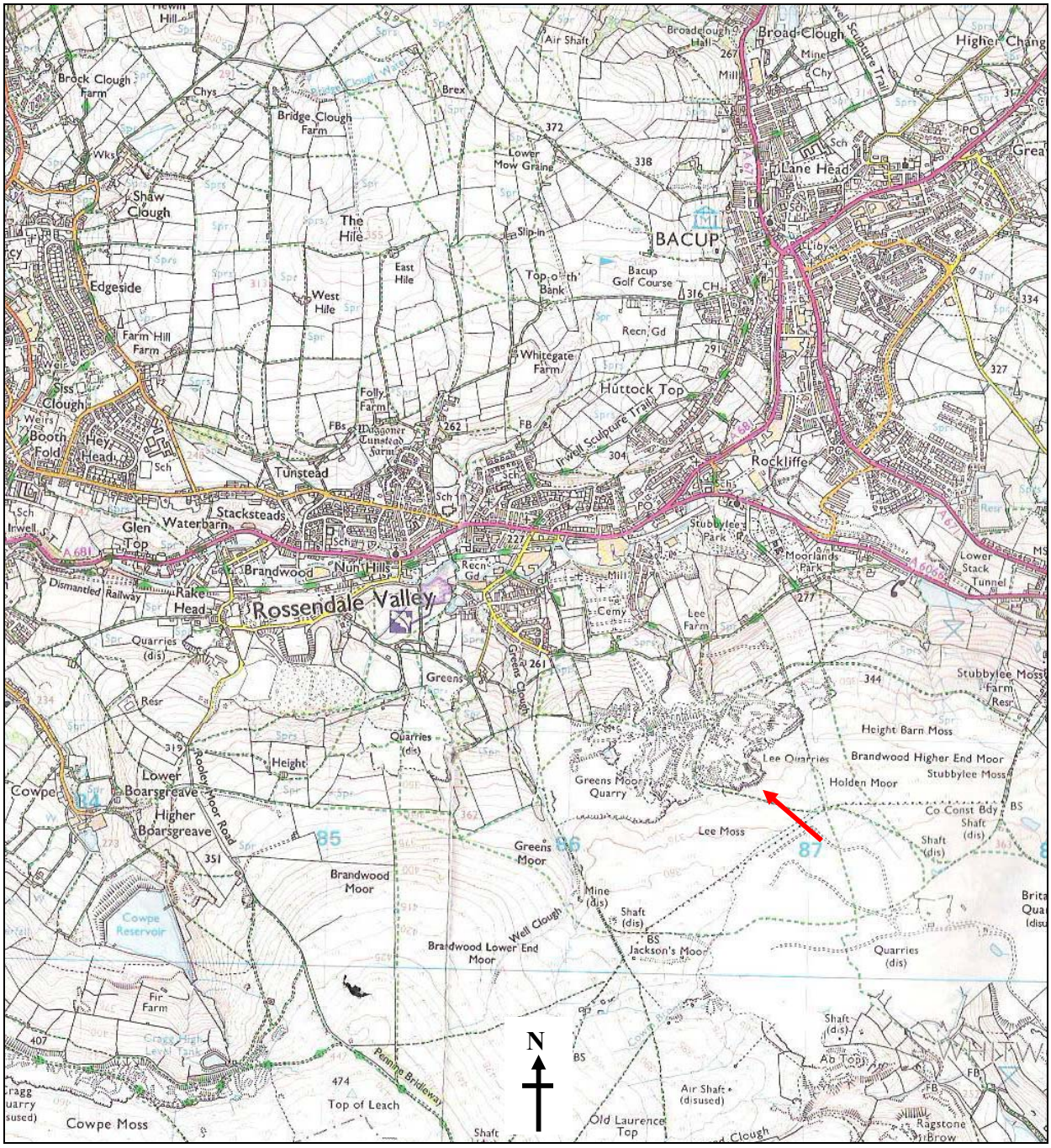


FIG.1: LOCATION PLAN

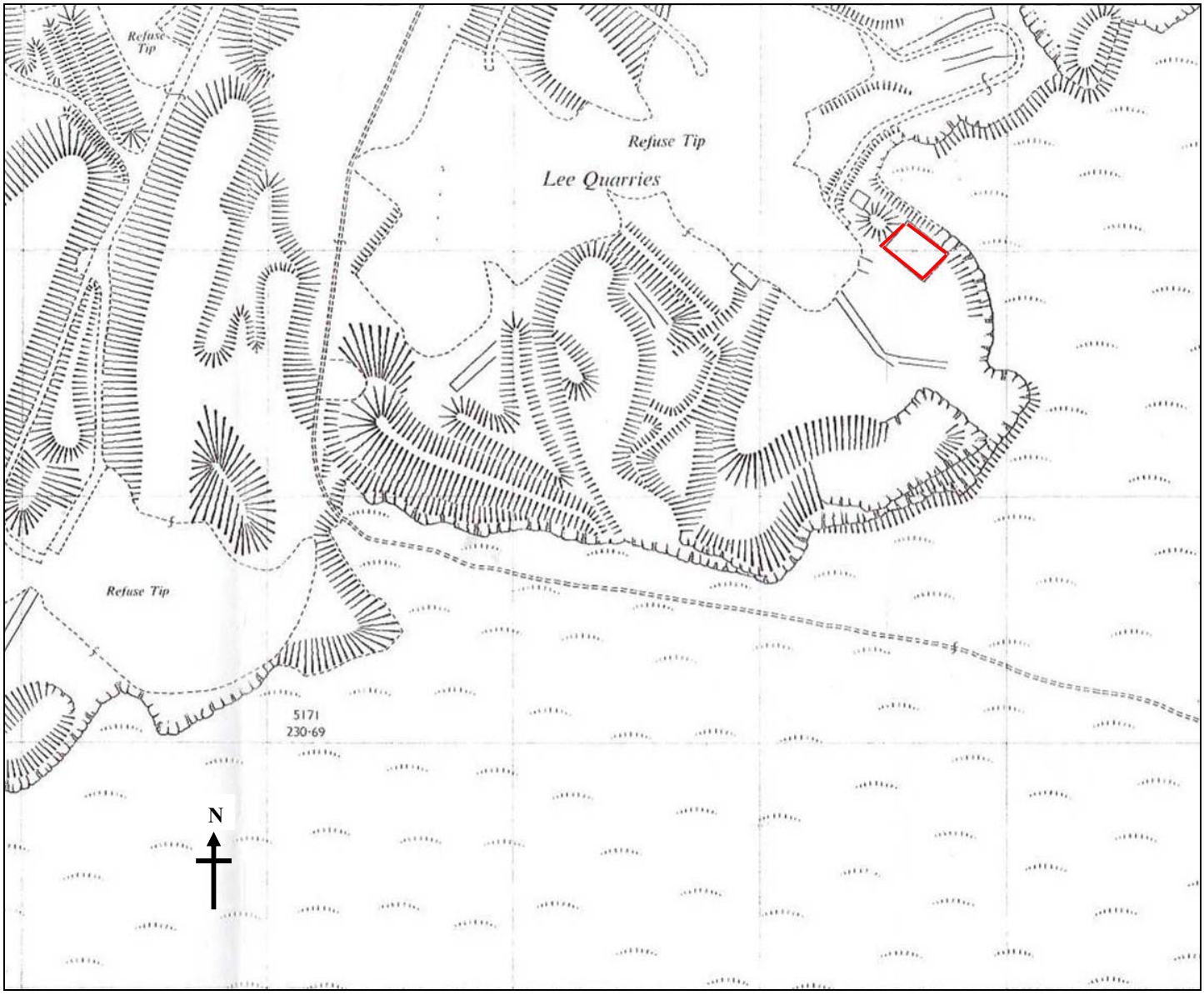


FIG. 2: SITE PLAN

Fig. 3: O.S. 6" Scale Map 1849

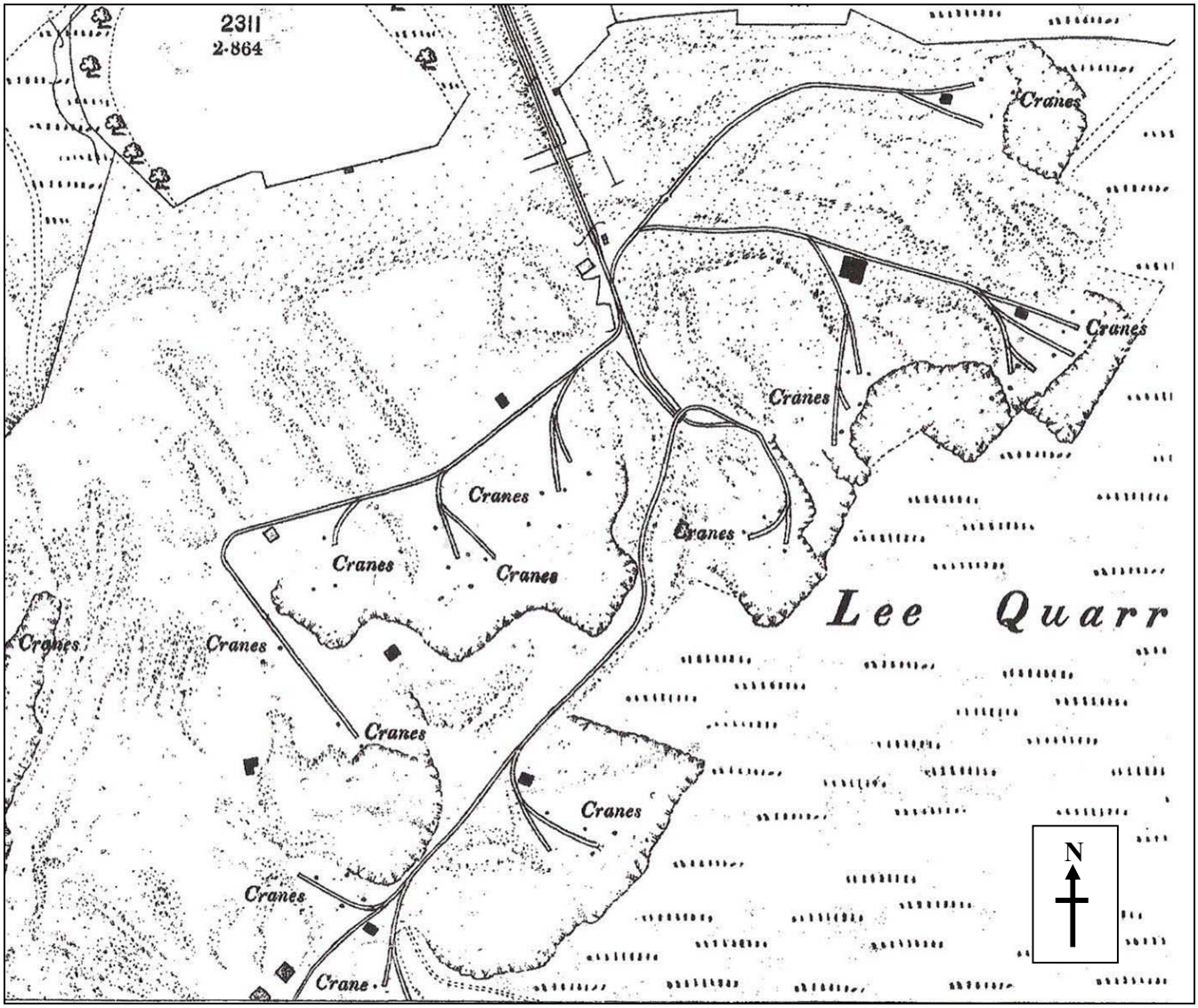


Fig. 4: OS 25" Lancashire Sheet 72.15, 1893

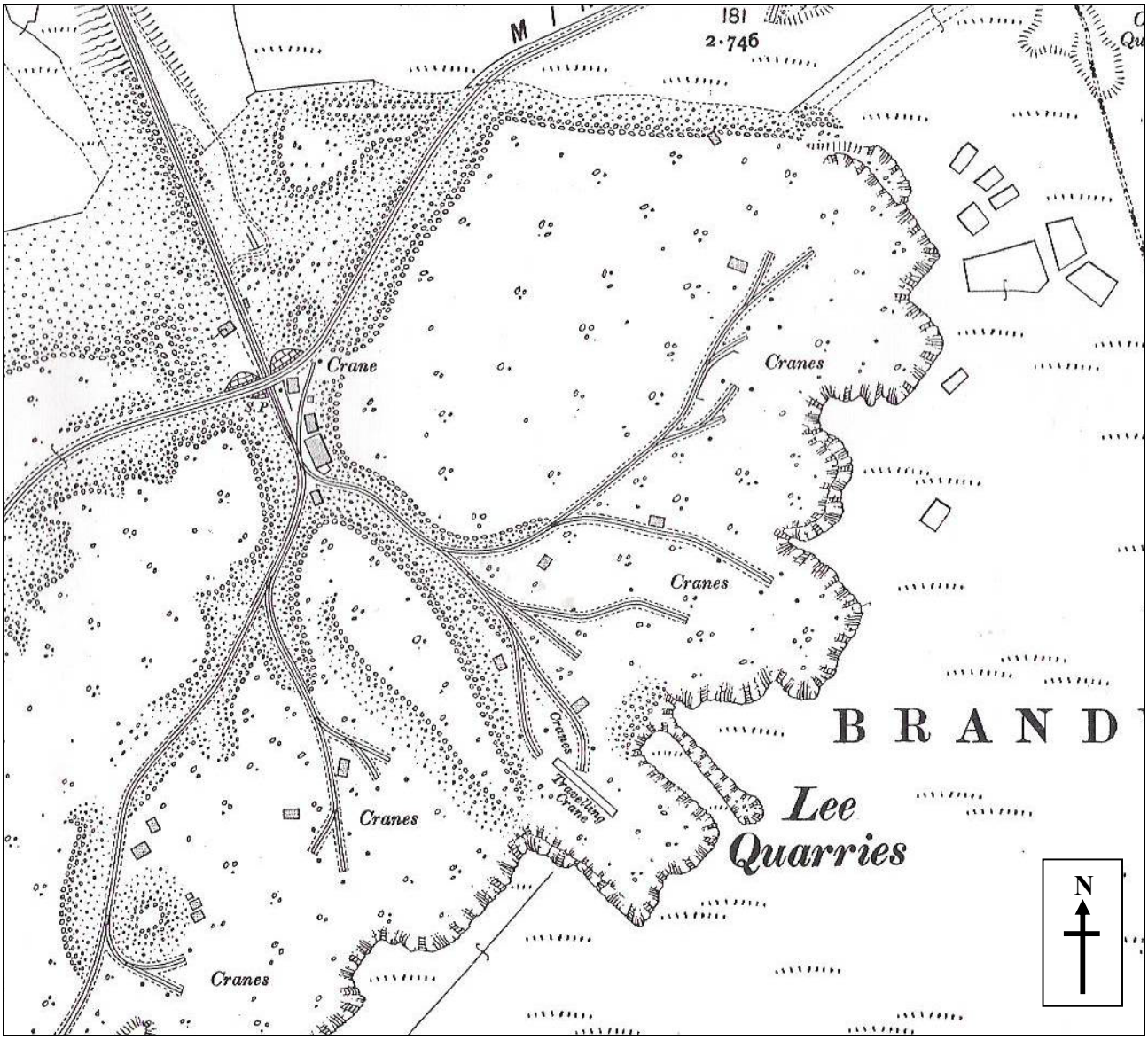


Fig. 5: OS 25" Lancashire Sheet 72.15, 1910

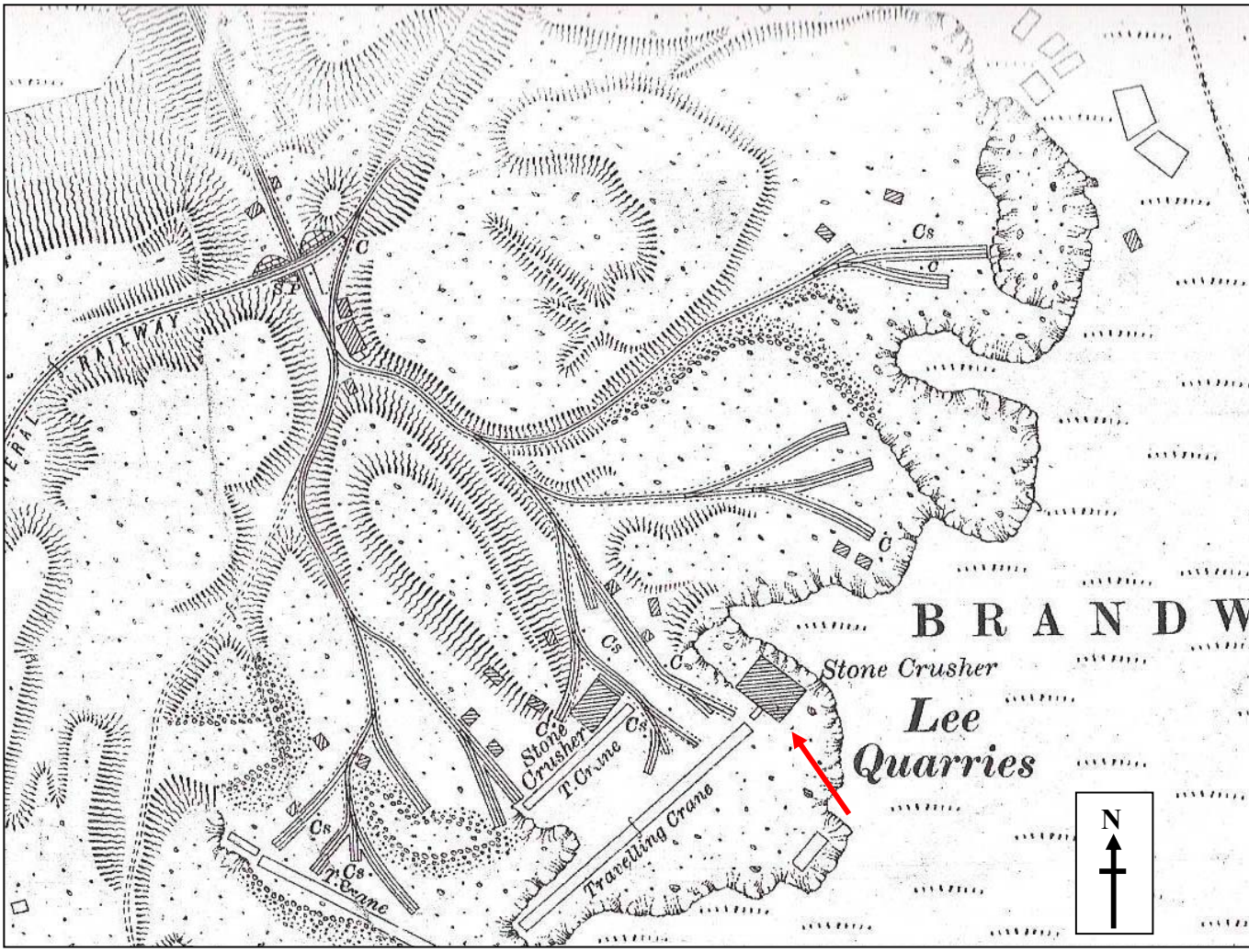


Fig. 6: OS 25" Lancashire Sheet 72.15, 1930

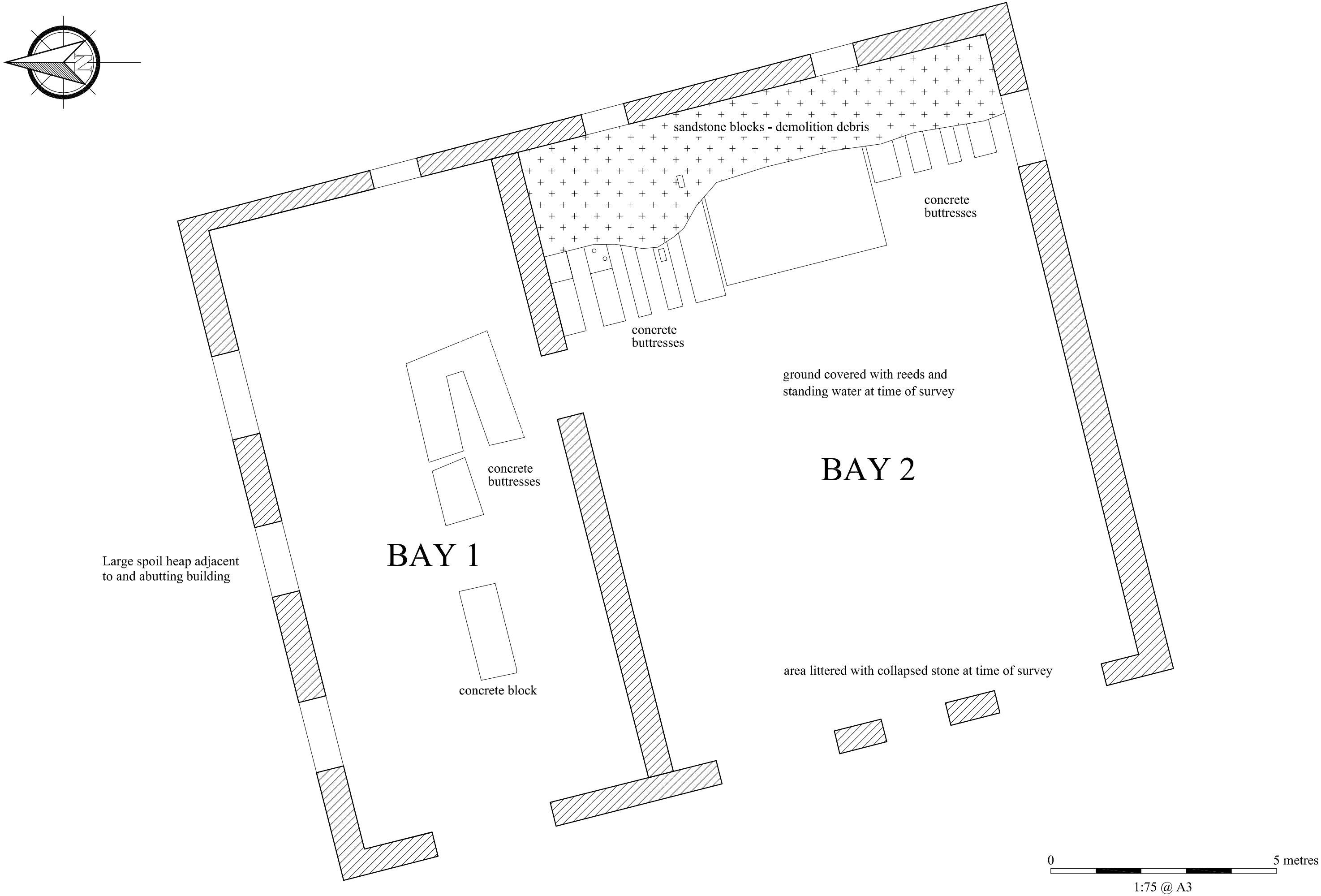
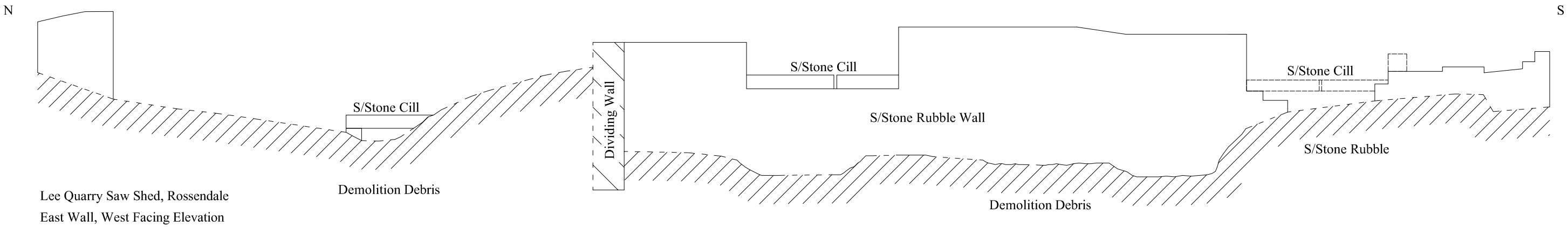
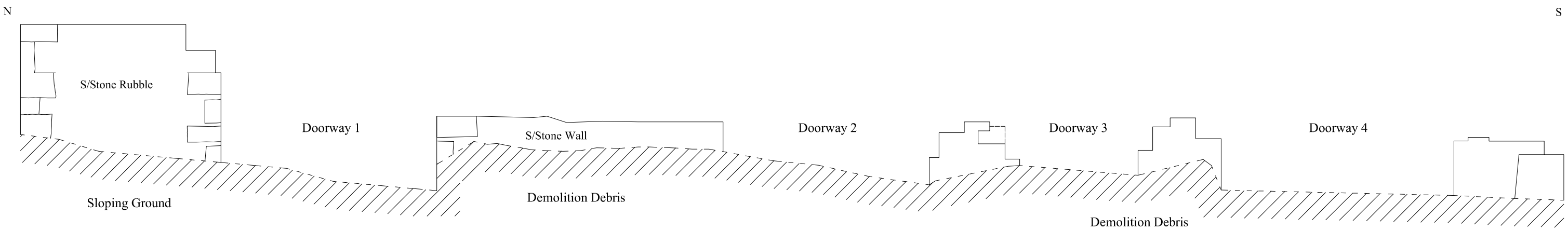


Figure Number 7 Saw Shed Plan



Lee Quarry Saw Shed, Rossendale
East Wall, West Facing Elevation
Drawn By: SB & SP 19-05-2008
1:50 Scale

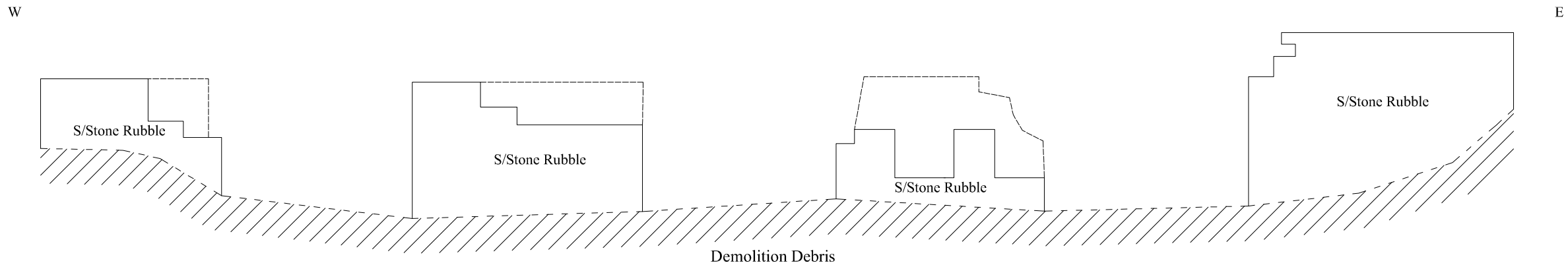


Lee Quarry Saw Shed, Rossendale
West Wall, West Facing Elevation
Drawn By: SB & SP 19-05-2008
1:50 Scale

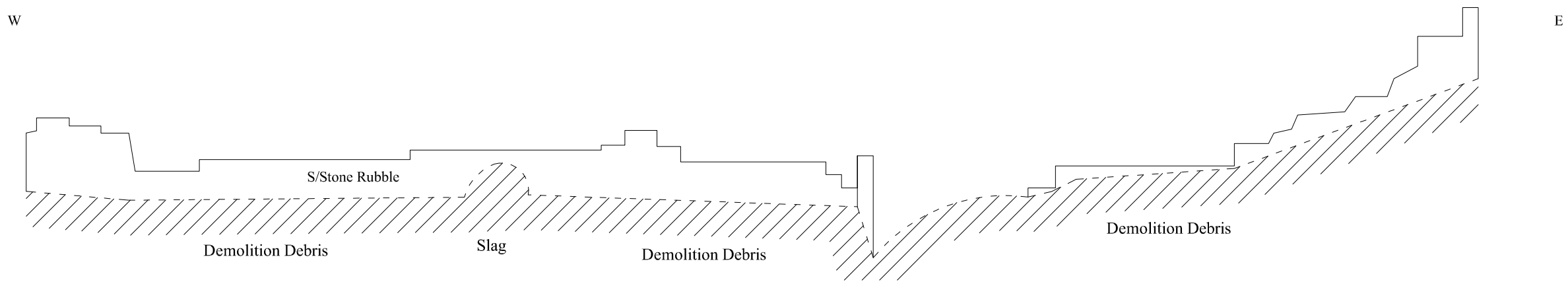
0 3m
1:50 @ A3

Figure Number 8a Saw Shed Elevations

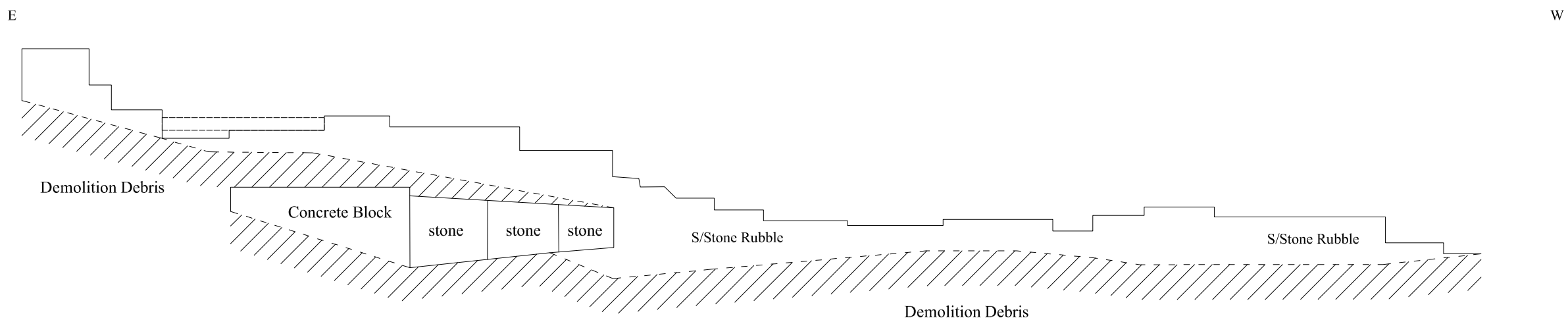
Lee Quarry Saw Shed, Rossendale
North Wall, South Facing Elevation
Drawn By: SP 12-04-2010
1:50 Scale



Lee Quarry Saw Shed, Rossendale
Dividing Wall, South Facing Elevation
Drawn By: SP 12-04-2010
1:50 Scale



Lee Quarry Saw Shed, Rossendale
South Wall, North Facing Elevation
Drawn By: SP 12-04-2010
1:50 Scale



0 3m
1:50 @ A3

Figure Number 8b Saw Shed Elevations

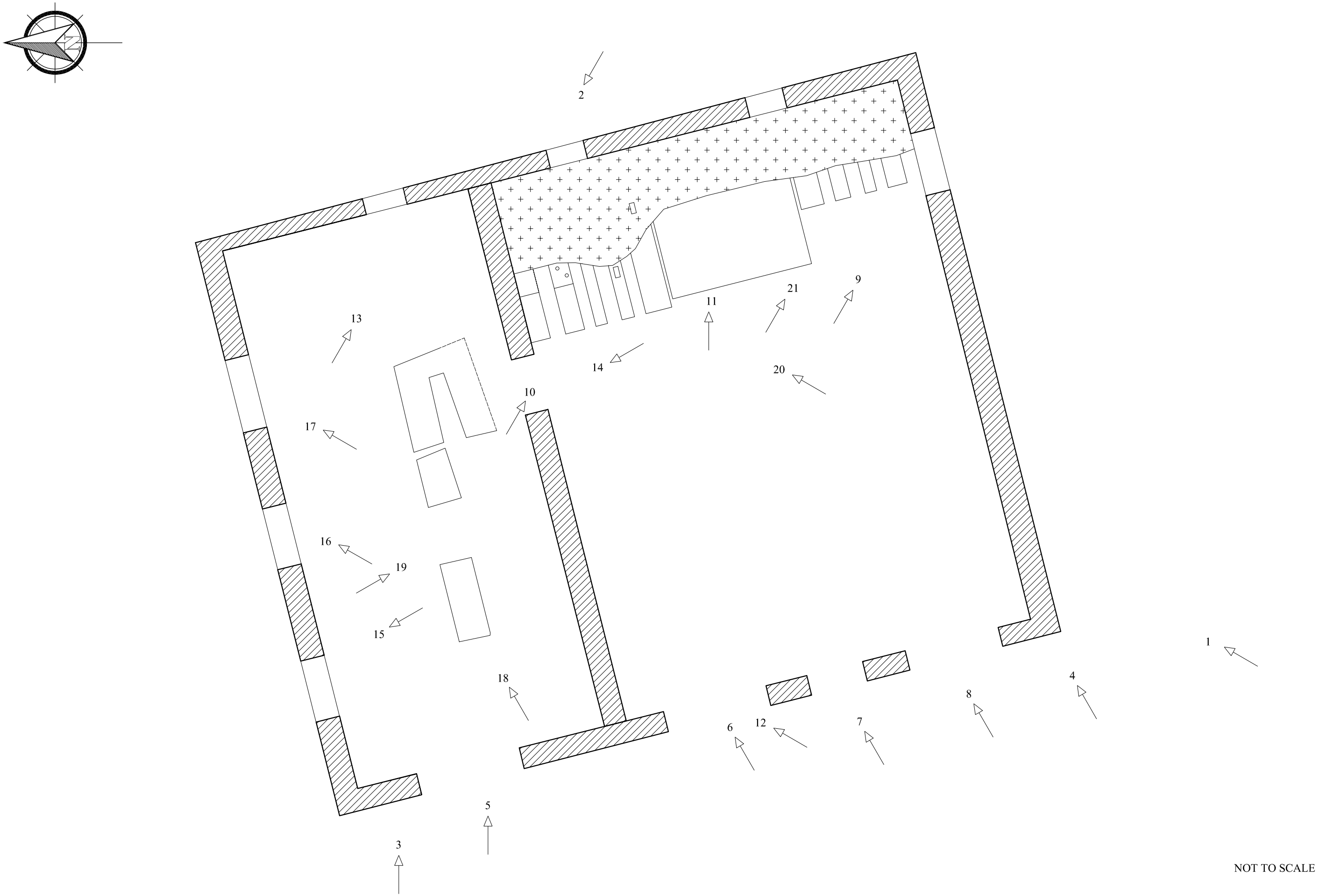


Figure Number 9 Photo Location Plan

FIG. 10: PHOTOGRAPHIC REGISTER

Plates In Report	Monochrome Prints Film/exposure	Digital Jpegs	Description	Direction Of Shot (from)
	1/14	1	Saw shed –general	SW
1	1/11	5	View of saw shed	SW
	1/10	6	Overhead view of saw shed	SE
2		7	Overhead view of machine bases	SE
	1/9	9	Close-up of north-west corner	W
3	1/9	10	Close-up of north-west corner with scale bar	W
4		29	South wall and junction with west wall	NE
5		23	Door opening in west wall of Bay 1	E
		24	Door opening in west wall of Bay 1	E
6		25	North door opening in west wall of Bay 2	E
		26	North opening in west wall of Bay 2	E
7		27	Central opening in west wall of Bay 2	E
8		28	Door jamb for south opening in west wall of Bay 2	E
9		30	Window cill at east end of south wall	SE
10	1/12	3	Internal view of north window in east elevation	W
11		18	Window cill in east wall of Bay 2	SE
		19	Window cill in east wall of Bay 2	NE
12	1/13	2	Saw shed –general	SW
13		16	Possible window lintel in rubble east wall of Bay 1 and east wall of Bay 2 beyond	SE
		15	Possible window lintel in rubble east wall of Bay 1	SE
14		17	Doorway in east end of dividing wall	S
15		11	North wall, west opening	N
16		12	North wall, central opening and wall to west	SW
17		13	North wall, east opening and walls either side	SW
		14	North wall to east of east opening	SW
18		22	Machine beds in Bay1	W
19		8	Overhead view of machine bases	N
20		20	Machine beds at north side of Bay 2	SW
21		21	Machine beds at south side of Bay 2	NW
22		4	Water logged floor of Bay 2	SE

APPENDIX 3: PLATES

Plate 1: View of saw shed
Plate 2: Overhead view of machine bases
Plate 3: Close-up of north-west corner
Plate 4: Close-up of south wall and junction with west wall
Plate 5: Door opening in west wall of Bay 1
Plate 6: North door opening in west wall of Bay 2
Plate 7: Central opening in west wall of Bay 2
Plate 8: Central door jamb for south opening in west wall of Bay 2
Plate 9: Window cill at east end of south wall
Plate 10: Internal view of north window in east elevation
Plate 11: Window cill in east wall of Bay 2
Plate 12: View of saw shed
Plate 13: Possible window lintel in rubble east wall of Bay 1
Plate 14: Doorway in east end of dividing wall
Plate 15: North wall, west opening
Plate 16: North wall, central opening and wall to west
Plate 17: North wall, east opening and walls either side
Plate 18: Machine beds in Bay1
Plate 19: Overhead view of machine bases
Plate 20: Machine beds at north side of Bay 2
Plate 21: Machine beds at south side of Bay 2
Plate 22: Water logged floor of Bay 2

Plate 1: View of saw shed

Plate 2: Overhead view of machine bases

Plate 3: Close-up of north-west corner

Plate 4: Close-up of south wall and junction with west wall

Plate 5: Door opening in west wall of Bay 1

Plate 6: North door opening in west wall of Bay 2

Plate 7: Central opening in west wall of Bay 2

Plate 8: Central door jamb for south opening in west wall of Bay 2

Plate 9: Window cill at east end of south wall

Plate 10: Internal view of north window in east elevation

Plate 11: Window cill in east wall of Bay 2

Plate 12: View of saw shed

Plate 13: Possible window lintel in rubble east wall of Bay 1

Plate 14: Doorway in east end of dividing wall

Plate 15: North wall, west opening

Plate 16: North wall, central opening and wall to west

Plate 17: North wall, east opening and walls either side

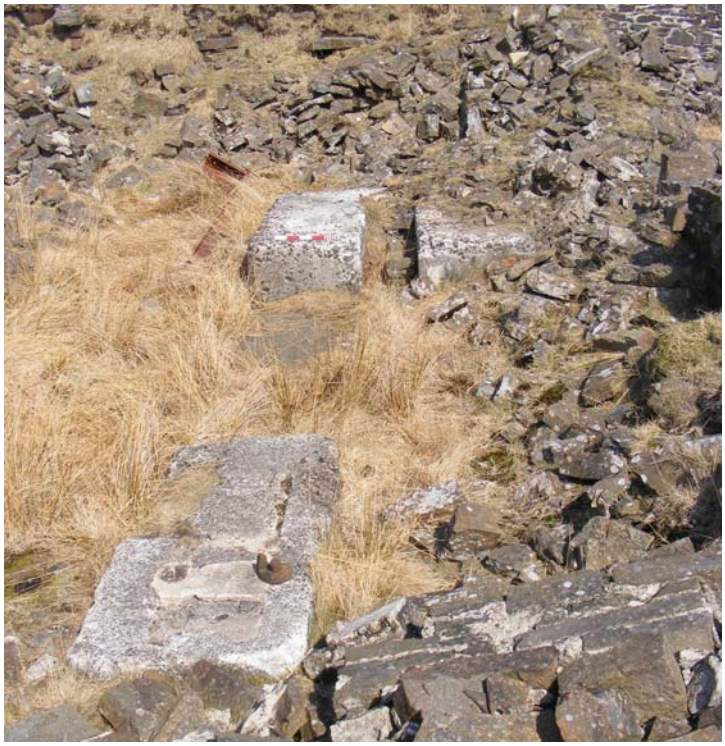


Plate 18: Machine beds in Bay1

Plate 19: Overhead view of machine bases

Plate 20: Machine beds at north side of Bay 2

Plate 21: Machine beds at south side of Bay 2

Plate 22: Waterlogged floor of Bay 2

Appendix 4: Conservation Specification

Item	Description	No.	Unit	Rate	£ p
A1	To bring and remove from site all vehicles and machinery required for the works. Contractors to acquaint themselves with the site conditions and access problems when deciding which vehicles to use. Only tracked vehicles or 4x4 vehicles will be able to access the site.	1	item	included	included
A2	The setting out and taking levels of all works as specified and required through the implementation of the works	1	item	included	included
A3	Design and resolution time on site which may arise	1	item	included	included
A4	Provision, erection, maintenance and removal on completion of all offices, welfare facilities, dry room and toilets, mess rooms, stores, workshops and all ancillary items required by the contractor. A location for the site compound has been agreed with the landowner, approximately 100m away from the saw shed. Access to this area is still difficult - this will need to be assessed thoroughly.	1	item		
A5	Making good any external works not included within this contract which may be damaged by the contractor during the contract period (including clearing all debris and making good tyre ruts in access track with crushed local stone) and making good around the compound area.	1	item		
A6	All necessary warning signs, pedestrian detours and safety barriers to be used during the contract. Heras fencing to be erected around saw shed and debris piles at all times throughout the construction period	1	item	included	included
A7	**PROVISIONAL ITEM** - Erection and dismantling of sign boards from funders to advertise the project. Boards to be supplied by Groundwork. Signs should be able to be fixed to the heras fencing around the shed.	1	item	included	included
A8	Contractors to be present on site with Contract Administrator and Archaeologist when photographic record of existing condition of mill and record of all stones within sections of wall to be dismantled and rebuilt is undertaken.	1	item	included	included
A9	Meeting Contract Administrator, Archaeologist and Heritage Officer at field gate in vehicle roughly twice a week to drive to site for site inspections.	1	item	included	included

TOTAL FOR PAGE					
C11 Site Investigation					
Item	Description	No.	Unit	Rate	£ p
C11.1	PROVISIONAL ITEM - Undertake a minor investigation of existing drain/culvert and low area of ponding above sawshed. Aim of investigation is to find source of water ingress to saw shed and determine if culvert can be used to shed water from within shed. Culvert is approx. 2m in front of shed. Investigations to include a small amount of hand excavations and possibly dye testing to show direction of flow of water. Price to include for making good ground around any excavations.	1	item		
TOTAL FOR PAGE					
D Groundwork					
D20 Excavating and Filling					
Item	Description	No.	Unit	Rate	£ p
D20.1	PROVISIONAL QUANTITY - Clear all debris from within walls of shed and from front of shed to expose original surface material. Approx overall depth of debris 400mm and consists of fallen masonry, timber beams and soil/grass. Machinery can be used for excavations but care to be taken around edges of walls and features to prevent further damage. Process and method to be agreed with Archaeologist on site. See Dwg no. LR617/L03. All arisings that cannot be reused in repair of the shed are to remain on site at Lee Quarry in positions as agreed with landowner.	290	m2		
D20.2	PROVISIONAL QUANTITY - move pile of unused building stone (not needed in the shed restoration) to elsewhere within the quarry as agreed with LCC. Site will be no more than 300m from shed.	50	m3		
D20.3	PROVISIONAL QUANTITY - any soil/grass arisings from within shed base to be spread around Lee Mill, no more than 200m away from shed.	50	m3		
D20.4	PROVISIONAL QUANTITY - Take down unstable masonry around perimeter walls (full and part sections of wall). Exact sections to be confirmed on site with CA/archaeologist.	50	lin.m		
D20.5	PROVISIONAL ITEM - lightly power wash interior and exterior of building to remove vegetation. Use Joss technique for cleaning which is more gentle. Approx. Quantity - 200 sq.m surface area of wall	1	item		
D20.6	PROVISIONAL ITEM - spray base of cleared shed with glyphosate based herbicide before new surface is laid.	270	sq.m		

D20.7	PROVISIONAL ITEM AND QUANTITY (BUDGET PERMITTING) - reposition existing industrial stone features/products from around the saw shed to elsewhere in the quarry (their known previous position). New positions will be agreed on site with Heritage Officer and archaeologist. Ground beneath new stone positions to be levelled before positioning new stones and made good to base of stones. Maximum weight of stones up to 2 tonnes each. Distance to move stones, no more than 500m, but paths are steep and uneven. See photo 3 on dwg no. LR617/L03.	30	no.		
D20.8	PROVISIONAL ITEM - create canopy/shelter from tarpaulin and posts/fencing to create dry space to work during wet weather. Canopy to be only large enough to secure immediate area of work and well secured to prevent being blown down in high winds.	1	item		
TOTAL FOR PAGE					
F Masonry					
F20 Natural Stone Rubble Walling					
Item	Description	No.	Unit	Rate	£ p
F20.1	PROVISIONAL QUANTITIES - Make good, repair and consolidate all sections of wall using arisings taken fro in item D20.1. Walls to be repaired and repointed using lime mortar (with Pozzolanic additive to a specificatio match original pointing) to height they are at present - not trying to rebuild to any significant height. Joints to b flush to match original pointing and no wider than 30mm thick. Finish and specification of mortar to be agreec Archaeologist/CA. Sample repair/pointing at 1x1m to be completed for approval before beginning on remaind walls. See dwg no. LR617/L02.				
a	Wall height between 500 - 750mm high	32.5	lin.m		
b	Wall height between 750 - 1000mm high	11.5	lin.m		
c	Wall height between 1000 - 1250mm high	4.58	lin.m		
d	Wall height between 1250 - 1500mm high	7.15	lin.m		
e	Wall height between 1500 - 1750mm high	5.17	lin.m		
f	Wall height between 1750 - 2000mm high	5.3	lin.m		
F20.2	Secure top of wall using concrete mix to ensure there is a contrast between original building and modern repairs. Concrete to be used to form a 'coping' at 100mm high and 470mm wide (width of wall varies slightly). Copings to be created in sections of 1000mm length on top of visquine membrane with mortar joints. This will allow coping to be removed at later date, returning structure to original form.	66	lin.m		

F20.3	PROVISIONAL ITEM - Build stone lectern from stone arisings that is not used in shed repairs. Lectern to be 900x700x500mm, with recessed lime mortar joints no wider than 30mm thick. Height of lectern to be 900mm at rear and 700mm at front. Top of lectern to be created using large, flat stones to allow signs to be securely fixed. Stone lectern will have plaque installed to top at later date (see item Q50.1). Price to include 100mm depth compacted mot type 1 (800x800mm) and concrete plinth 800x800x150mm, all excavations and making good around foundations. See dwg no LR617/L03.	1	item		
TOTAL FOR PAGE					
F21 Natural Stone/ashlar walling/dressing					
Item	Description	No.	Unit	Rate	£ p
F21.1	PROVISIONAL QUANTITY - Install large stone jambs to original doorways. Stones to be installed into the ground to a depth of 500mm and set into concrete by 600mm. Stone approx. 2000x300x150mm. Use stone from site that was cleared in item D20.1.	2	no.		
F21.2	PROVISIONAL QUANTITY - install stone quoins to all edges of building (including around doors and large entranceways to re-form openings) to height of existing wall and secure with lime mortar. Stones approx. 400x300x300mm. Use stone from site that was cleared in item D20.1.	30	no.		
F21.3	PROVISIONAL QUANTITY - install stone sills to bottom of windows and secure with lime mortar. Approx size of stones 1500x300x150mm. Use stone from site that was cleared in item D20.1.	6	no.		
TOTAL FOR PAGE					
Q Paving/Planting/Fencing/Site Furniture					
Q20 Granular sub bases to roads/pavings					
Item	Description	No.	Unit	Rate	£ p
Q20.1	PROVISIONAL ITEM - Supply and lay geotextile membrane and mot type 1 (local crushed sandstone to match quarry type) onto area cleared in item D20.1 to create base for shed. Stone to be laid to a depth of 100mm, well compacted. Falls to be to existing doorways at front of building. See dwg no LR617/L03.	270	m2		
TOTAL FOR PAGE					

Q23 Gravel/hoggin/woodchip roads/pavings				

Item	Description	No.	Unit	Rate	£ p
Q23.1	PROVISIONAL ITEM - supply and lay 10mm stone to dust top dressing to hardcore base within shed to a compacted depth of 30mm. To be local crushed sandstone.	270	m2		
TOTAL FOR PAGE					
Q50 Site/street furniture/equipment					
Item	Description	No.	Unit	Rate	£ p
Q50.1	PROVISIONAL ITEM - install information board in front of building onto stone lectern built in item F20.4. Board to be 700x500mm (A2), fitted with approx 8 no. recessed bolts to rear. Bolts to be fixed into stone lectern (created in item F20.4) and secured with resin. Board to be supplied by Groundwork. Material to be confirmed - either fully zinc or metal frame with encapsulated plastic image.	1	item		
Q50.2	PROVISIONAL ITEM - install small metal plaque to large stone in front of building (with details of funders). Plaque to be approx. A4 size and supplied by Groundwork Pennine Lancashire. To be installed using approx 4 no. Bolts, resined into holes drilled into large stone. Exact position to be agreed on site with CA.	1	item		
TOTAL FOR PAGE					
R Disposal Systems					
R13 Land drainage - ALL ITEMS ARE PROVISIONAL					
Item	Description	No.	Unit	Rate	£ p
R13.1	PROVISIONAL ITEM - Supply and install drain from front of building to existing culvert. Price to include for all excavations, supply and installation of flexible plastic pipe (150mm dia) and clean drainage stone surround with geotextile membrane around stone, and connections with existing culvert. Material from excavations to be used to cover over new drain and spread on site as directed by CA. Approx total length 23m.	23	lin.m		
R13.2	PROVISIONAL ITEM - Supply and install drain from area of ponding above saw shed to existing culvert. Price to include for all excavations, supply and installation of plastic pipe (150mm dia) and clean stone surround with geotextile membrane around stone, and connections with existing culvert. Material from excavations to be used to cover over new drain and spread on site as directed by CA. Approx total length 30m.	30	lin.m		

R13.3	PROVISIONAL ITEM - block up culvert entrance around new drain using left over stones from shed restoration. Create small low 'wall' with lime mortar to secure the entrance and access by animals. Approx size 1200x500mm.	1	item		
TOTAL FOR PAGE					
TOTALS CARRIED FORWARD					
A	Preliminaries/general requirements				
C11	Site investigation				
D20	Excavating and filling				
F20	Natural stone rubble walling				
F21	Natural stone ashlar walling/dressings				
Q20	Granular sub bases to roads/pavings				
Q23	Gravel/hoggin/woodchip roads/pavings				
Q50	Site/street furniture/equipment				
R13	Land drainage				

Appendix 5: Lime Mortar Specification

Specification for hydraulic lime mortar mix at Facit Chimney
3 x Waddington grit sand
3 x Leighton Buzzard sand
2 x St Astier NHL 5

Data from St Astier web site below for information

Natural Lime NHL 5 (Chaux 100 naturelle Pure) Product Data
St Astier Natural Hydraulic Limes (NHL)

Conforms to European Norms EN 459 and BS 459
Strength factor: 5 (Eminently hydraulic)
Residue @ 0.09 mm: 7%
Density (volumetric weight) typical: 700 gr. / litre
Available (free) lime $Ca(OH)_2$ after slaking: 20-22%
Shelf life: 8-12 months kept sealed and dry

Contains no additives.
Whiteness index: 67
Surface cover (cm^2per gram): 8000
Expansion : < 1mm
Residue of quick lime after slaking: < 1%

MORTARS	Compressive strengthN/mm^2				Elasticity Moduli (Mpa)		
MIX RATIO	EN459*	1 : 2	1 : 2.5	1 : 3	1 : 2	1:2.5	1 :3
7 DAYS		1.96	1.00	0.88	n/a	n/a	n/a
28 DAYS	5*	2.20	2.00	1.5	10800	1100	10000
6 MONTHS		7.31	5.91	5.31	18000	17050	16900
12 MONTHS		9.28	8.84	6.50	18510	17280	16150
24 MONTHS		10.81	8.81	7.8	21500	18020	17430
Consumption for $1m^3$ of mortar Kg. +/- 10%		350	280	233			
EN 459/BS 459 (mortar ratio 1:1 by volume, with ISO 679 Sand)							

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MIX RATIO	EN459*	1 : 2	1 : 2.5	1 : 3	1 : 2	1:2.5	1 :3
7 DAYS		1.96	1.00	0.88	n/a	n/a	n/a
28 DAYS	5*	2.20	2.00	1.5	10800	1100	10000
6 MONTHS		7.31	5.91	5.31	18000	17050	16900
12 MONTHS		9.28	8.84	6.50	18510	17280	16150
24 MONTHS		10.81	8.81	7.8	21500	18020	17430
Consumption for 1m^3 of mortar Kg. +/- 10%		350	280	233			
EN 459/BS 459 (mortar ratio 1:1 by volume, with ISO 679 Sand)							

APPENDIX 5: Structural Engineers' Report

Ref: P&A/1370-08/RGT/SJ

25th September 2008

GCS Groundwork Pennine Lancashire
Bob Watts Building
Nova Scotia Wharf
193 Bolton Road
BLACKBURN
Lancashire
BB2 3GE

For the attention of Mr N Riley, Director for Contracts Division

Dear Sirs

Re: Inspection of Facit Chimney, Facit, Rossendale

We refer to our inspection of the above chimney on Wednesday 17 September 2008. Further to our inspection we report as follows.

1.0 Terms of Reference

This report has been prepared at the request of Mr N Riley on behalf of Groundwork Contract Services, the contractors renovating the above chimney.

2.0 Preamble

At the present time Facit Chimney which is located on the hillside above Facit is undergoing external renovation works.

The specification for the works include providing stainless steel reinforcing bars fixed into the stone joints at approximately 1m vertical centres.

Since starting the works and carrying out initial back pointing and filling-in of the major voids within the stonework the contractors have suggested that the steel reinforcing bars are no longer required.

3.0 Purpose of Report

Groundwork Pennine Lancashire have requested Partington Associates Ltd to carry out an inspection of the renovation works carried out to date and assess whether or not the reinforcement specified is now required.

4.0 Inspection of Chimney

The 11.8m high, 1850mm square chimney is built in random stone. The walls approximately 450mm thick consist of two leaves of Stonework. The small and large random stones are tied together at the corners with regular shaped stone quoins. The chimney has a slight taper over its full height.

At the time of our inspection a number of loose stones at the top of the chimney had been removed and the whole of the outer face of the stonework raked out and the voids back pointed and filled with lime mortar prior to the final repointing.

Except for minor undulations in the stonework particularly noticeable on the corners, the stonework to the chimney is in sound structural condition. We note vertical stress cracks in some of the larger stones particularly in the stone quoins. We would not consider these to be of any major structural significance.

The voids in the stonework have been filled in a satisfactory manner and we would now consider the outer leaf of the chimney to be in a stable condition

In respect of providing stainless steel reinforcement in the outer leaf, the random stone bed joints will make it very difficult to carry out this operation and could be more detrimental to the strength and appearance of the wall than if this work was not carried out.

5.0 Conclusions and Recommendations

Raking out the joints and filling the voids in the outer stone leaf has effectively re-bonded and strengthened the outer leaf. We are of the opinion that the chimney stack is now in sound structural condition. We would therefore recommend that the stainless steel reinforcing bars are omitted from the building specification

With respect to the repairs at the top of the chimney we recommend that a layer of stainless steel 'Expamet' or similar light reinforcement is placed within the stone courses during reconstruction and or through stones are introduced to the walling to reinforce the inner and outer leaf bond. We would also suggest that stainless steel anchor bars are placed between the coping stones on the chimney to both tie them together and strengthen the top of the chimney.

We trust that the above comments are satisfactory for your present needs, however should you have any queries or require any further information in respect of the remedial works already carried out please do not hesitate to contact us.

Yours faithfully

R G Taylor
PARTINGTON ASSOCIATES LTD