

Ridsdale Ironworks

Corsenside, Northumberland

CONSERVATION OF ENGINE HOUSE
AND PROVISION OF GATED ACCESS

ARCHAEOLOGICAL MONITORING
DURING SITE WORKS

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SUMMARY

As part of the National Lottery Heritage Fund's (NLHF) Revitalising Redesdale Landscape Partnership Scheme conservation and consolidation works were carried out on the engine house at Ridsdale - one part of the scheduled Ridsdale ironworks - over the winter of 2018-2019. This has saved the building from further deterioration and collapse and will remove it from the Historic England Heritage at Risk Register. Associated works have facilitated public access to the engine house.

Structural issues in the fabric of the mid 19th-century engine-house and its broad historical context were set out in a management plan prepared for the project by Doonan Architects in 2017. The following report sets out the scope of the conservation and access works and archaeological monitoring carried out to record them carried out by Alan Williams Archaeology. Appendices include a statement of significance describing the historical context of the site.

Better public understanding of the ironworks is a wider aim of the Revitalising Redesdale Scheme. This will include a walking trail taking in the site and on and off-site interpretation, explaining its relevance in the development of the iron industry in the North East and more widely.

1. PROJECT BACKGROUND: REVITALISING REDESDALE

Conservation works carried out at the scheduled Ridsdale Ironworks over the autumn and winter of 2018-2019 formed one part of the National Lottery Heritage Fund's (NLHF) Revitalising Redesdale Landscape Partnership Scheme celebrating the Rede valley's historic and cultural heritage, supported by the NLHF both through a grant to develop the project and as part of its Landscape Partnerships Scheme. Two scheduled monuments (Ridsdale Ironworks and High Rochester Roman Fort) have been restored and conserved as part of the scheme and works described below on the engine house at Ridsdale will remove the monument from the Historic England Heritage at Risk Register.

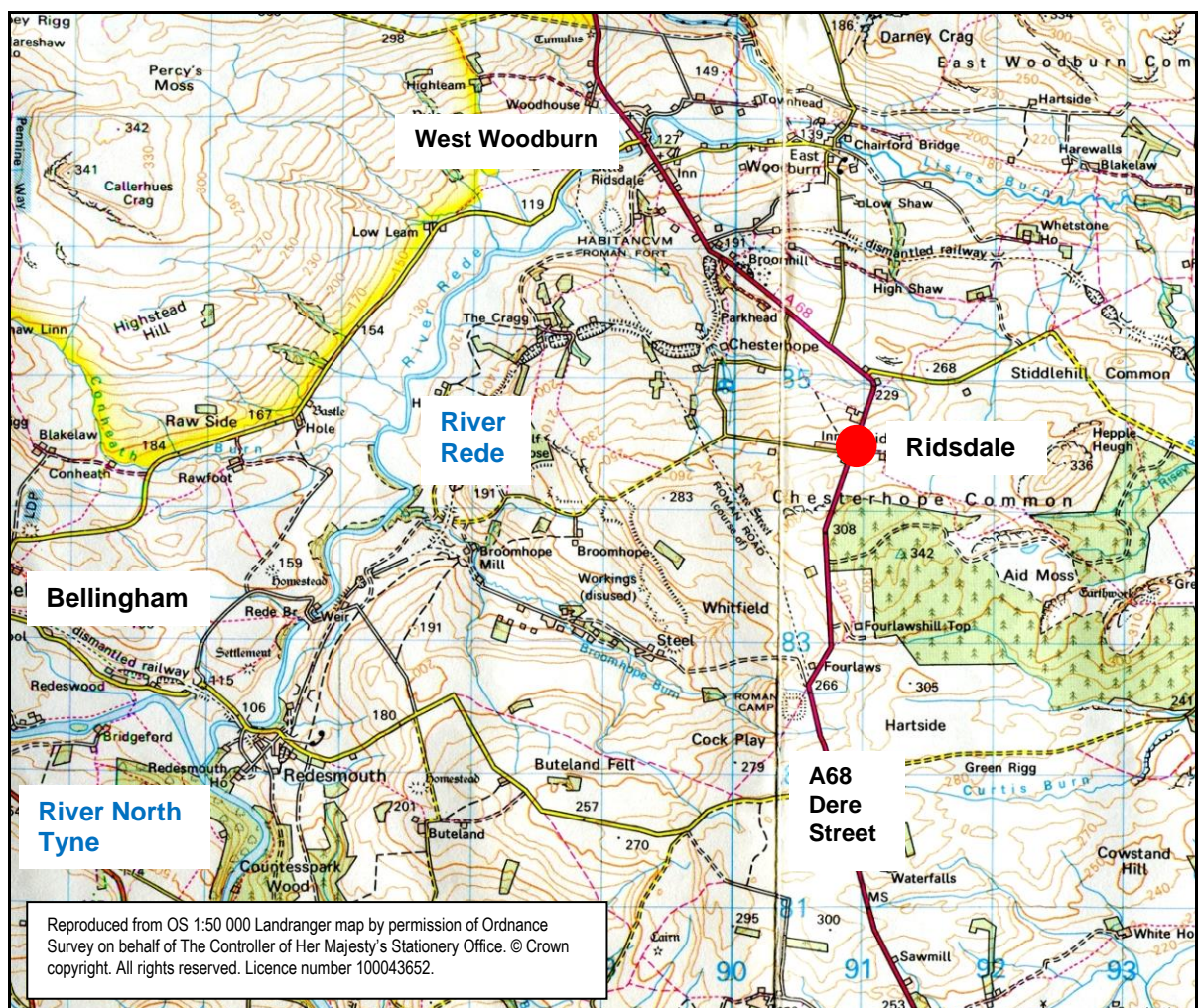


Figure 1: Ridsdale (red dot) on the eastern edge of the valley of the River Rede

2. RIDSDALE IRONWORKS

The scheduled Ridsdale Ironworks (SM No. 1006420) lies immediately to the north of the settlement of Ridsdale, parish of Corsenside and west of the A68 at NY 909 844.

The engine house, a prominent and iconic feature of the local landscape, is just one part of the extensive mid 19th-century works which includes earthwork remains of coke ovens and ore-roasting kilns and also extends across properties to the north of the engine house. The broad history of the site is set out in Roberts 1999 and 2000. The monument was included on the Historic England Heritage at Risk Register because of structural concerns over the engine house.

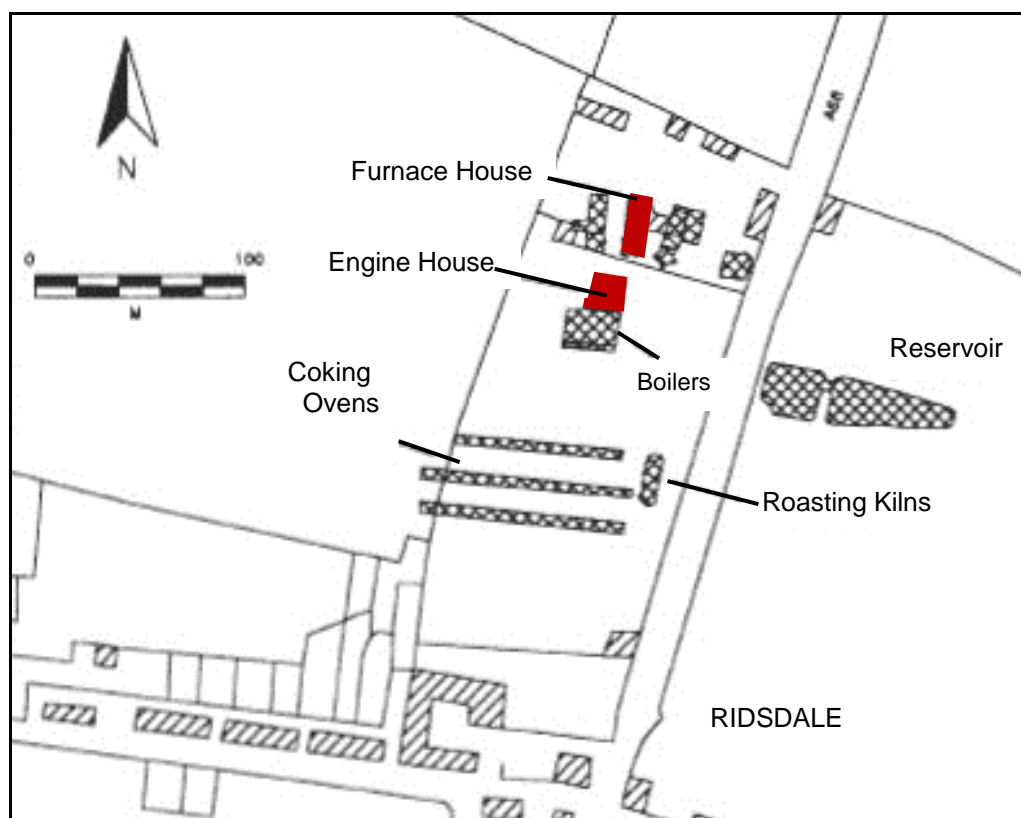


Figure 2: Indicative plan of the Ironworks. The Engine House and Furnace House are in red.

3. THE ENGINE HOUSE (see figure 3 for wall elevation codes used in text)

The engine house was constructed in 1839-40 to hold two steam-powered beam engines which provided air blast for three blast-furnaces lying downslope to the north. The substantial rectangular cavity alongside the engine house to the south is the site of boilers supplied with water from the (now dry) reservoir across the A68. Although roofless, floorless - and engineless - and with areas of tumble, most markedly the east wall, the shell of the building remains fairly complete and intelligible, forming a footprint 17.5m north-south by 13m east-west, formerly with basement, ground and first floor levels and a very substantial internal wall dividing the interior longitudinally into two compartments. It is constructed of coursed

sandstone-rubble with dressed and tooled quoins and margins to windows. The elevations are fairly symmetrical with round and segmentally-arched openings to the basement and ground floors and square headed openings above. A partially-rebuilt brick-lined stone chimney sits on the south-west corner of the building. The form and covering of the roof is uncertain. The remnants of a wall can be seen extending south from the chimney, presumably part of the boiler house, now a cavity, to the south.



Plate 1: The engine house in its landscape. Looking north-west.

4. MANAGEMENT PLAN

As part of the Revitalising Redesdale scheme, Doonan Architects, acting as advisors to Natural England, developed a management plan (MP) for the engine house addressing a range of issues including the immediate physical need for conservation and consolidation of the structure, its long-term maintenance and ecological issues which affect the management of the building. It also included a statement of significance for the building and the historic ironworks site prepared by Alan Williams Archaeology (Appendix 1 in this report).

5. CONSERVATION WORKS

Required conservation works were carried out over the autumn and winter of 2018-2019 by the conservation builders Heritage Consolidation of Greenhead to a specification and schedule of works prepared by DA. Scheduled monument consent

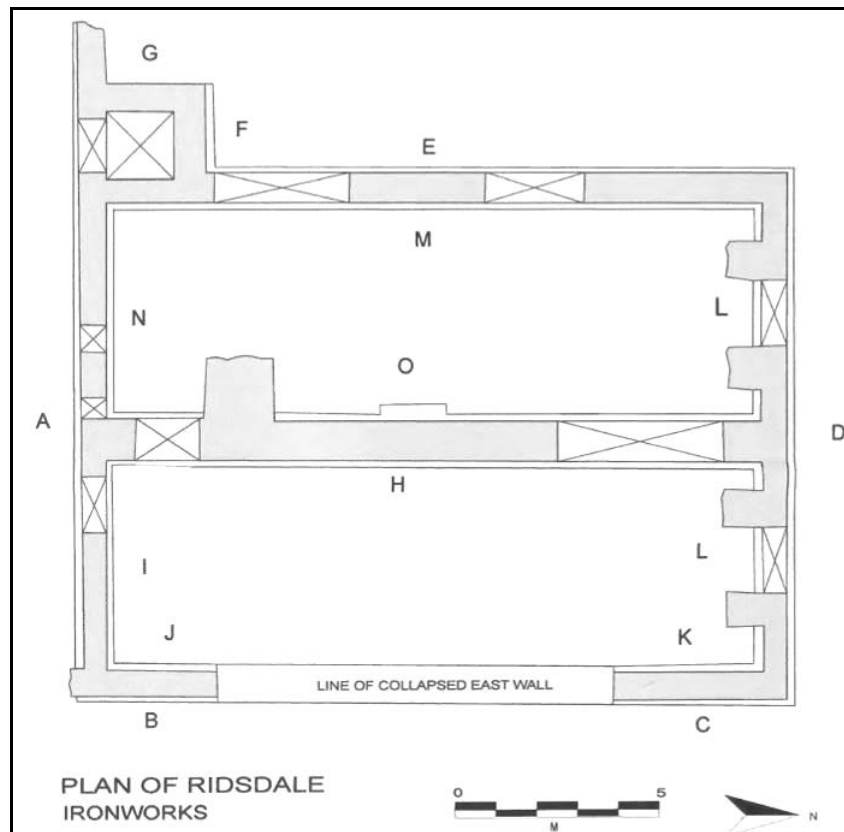


Figure 3: *Plan of the Engine House after Tylecote (1971). Elevations are each given a letter code used in this report.*

(SMC) to carry out the conservation and access works was received on 23rd August 2017 (Appendix 3, this report). Archaeological monitoring of the works was carried out by Alan Williams Archaeology (AWA) to a written scheme of investigation prepared by AWA and agreed with Historic England. A number of problem-areas were identified for particular attention in the schedule of works including the eastern opening in the south wall (Elevations A and I) and the adjacent opening through the longitudinal wall (Elevations H and O); the southern part of west wall (Elevations E and M) and the opening in the south face of the corner chimney (Elevation A). In these areas, repairs were addressed by some re-insertion of fallen facework including voussoirs at the south end of the west wall, where two round-headed arches had partially tumbled. Stonework used in the re-insertions was recovered from tumbled material within or around the engine house. Other identified conservation issues were more minor, including vegetated wall-heads, loss of mortar from facework joints and within areas of exposed corework.

Archaeological monitoring of the above works is recorded in sections 7.1 to 7.5 below.

6. GATED ACCESS TO THE SITE

In addition to conservation works, permissive access to the Engine House was enabled as a part of the project. This involved the installation of a gated entrance through the present drystone wall bounding the A68. The gate is set in a discrete 'titula' opening, extending west from the current line of the roadside wall. Works involved:

- Excavation of shallow trench (0.6m wide by 150mm deep) to provide a suitable foundation for the new length of drystone wall;
- Construction of a new length of drystone wall to form passage way into field;
- Provision of hard-standing along the passage;
- Installation of wicket gate.

All works were within or contiguous to the scheduled monument of Ridsdale Ironworks.



Plate 2: *The engine house from the south-west in 2017. A square chimney forms the corner of the building.*



Plate 3: *The engine house from the north-west in 2020. The building is set above a steep slope falling to the north.*



Plate 4: *The engine house from the west in 2017 showing the tumbled arches to the left of the chimney.*



Plate 5: West wall of the Engine House in 2017. Looking east showing the two tumbled arches.

7. ARCHAEOLOGICAL MONITORING

Monitoring was carried out alongside conservation works over the late autumn and winter of 2018-2019 as per the WSI (Appendix 2, this report).

7.1 General Works

This included work on wall heads and upper openings around the structure where vegetation had built up, pointing was defective or gaps had appeared. This was a frequent issue and required input on the south wall, the chimney at the south west angle, the north end of the east wall, the north wall and the west wall. Access was provided by a mobile platform. Work in these areas was not monitored.

Other general work involved the raking out of defective joints and re-pointing, rough-raking of corework and minor replacement of corework at low and medium levels including work on the north wall (Elevation D plates 33 and 34) and using scaffolding if required. This work was monitored intermittently.

7.2 Tumbled Arches in the West Wall: Elevations E and M (plates 6-21)

This work, encompassing the rebuilding of areas of face and corework as well as the insertion of voussoirs, was the most problematic and extensive of the conservation tasks. Most of two round-headed arches had tumbled in fairly recent times allowing the continued slow loss of adjoining unsupported masonry and a risk of more

substantial collapse. Most tumbled material, including voussoirs, lay within the building. The level of *in-situ* core and facework was established by AWA before any of this material was re-used by the conservation builders (plate 18). Core and facework was then built up both internally and externally (areas of rebuild shown on plates 15, 19 and 20) prior to the insertion of voussoirs. Timber centring was used on the lower arch; voussoirs on the upper arch were pinned in place. Corework was also pieced in on the external face of the wall to the north of the lower arch.

7.3 Opening in the Chimney Flue: Elevation A (plates 22-24)

This is an original opening in the south face of the chimney set at the south-west corner of the Engine House. The original form of the opening is now uncertain due to loss of fabric from its jambs and head. Conservation work was carried out to stabilise the opening and facework, both stone and brick, within the flue. A helibar was used to stitch the course above the opening and stainless-steel pins secured the facing stones one to another. Cracked and loose masonry was filled and pointed. The work was monitored intermittently.

7.4 Opening at the East End of the South Wall: Elevation A and I (plates 25-32)

This tall opening in the south wall of the Engine House was in a very poor state prior to works commencing, the timber lintel of insufficient depth to serve its purpose and both east and west jambs tumbled and corbelling out to ground level. Scaffolding had already been placed under the lintel as a temporary measure. Works involved the replacement of the lintel with a more substantial timber of greater depth and the piecing in of both core and where necessary facework (this on the east side of the inner face), the extent of this shown on plates 31 and 32 to support the lintel at both ends. Work on the adjacent opening in the longitudinal wall involved piecing in limited core and facework. Monitoring on this work was intermittent.

7.5 Access Works: Permissive Gated Path (plates 35-41)

As part of the project, works were carried out to allow access to the Engine House from the A68. A short section of drystone field wall to the east of the Engine House was dismantled and an entrance inserted. This involved the construction of a passage with a length of newly-built drystone wall and a wicket gate. The new stretch of wall was set above a very shallow foundation slot cut to 0.6m wide and c. 150mm deep. This was monitored but no features revealed or artefacts found during the work. Stone for the new wall was brought in to the site. Posts for the gate were driven into shallow foundation pits.

Plates

Tumbled Arches in the West Wall (Elevations E and M)



Plate 6: *The west wall of the Engine House in 2019. Looking east. Scaffolding has been added to support the surviving parts of the arches.*



Plate 7: *West wall of the Engine House looking south-east at scaffolding supporting the tumbled arches.*



Plate 8: Mason working on a voussoir for its re-insertion
Into an opening.



Plate 9: West wall of the Engine House looking south-east.
Working on masonry built up to the south of one of the arches.



Plate 10: West wall of the Engine House, looking east.
Rebuilt masonry to right.



Plate 11: West face of the Engine House with timber centring being brought in to rebuild fallen arch.



Plate 12: West face of Engine House. Centring in place, voussoirs going in.



Plate 13: West face of the Engine House. Working on the arch and adjacent rebuilt masonry.



Plate 14: West face of the Engine House. Lower Arch completed. Work on upper arch underway.



Plate 15: West face of the Engine House, both arches completed. Yellow broken line indicates rebuilt fabric.



Plate 16: Inside the Engine House in 2017. Looking at tumbled arches in the west wall.



Plate 17: Inside the western half of the Engine House. Looking south at the west wall and tumbled stone below fallen arches. 2m scale.



Plate 18: Inside the western half of the Engine House. The west wall following clearance of rubble down to solid core. Broken line shows line of wall face.

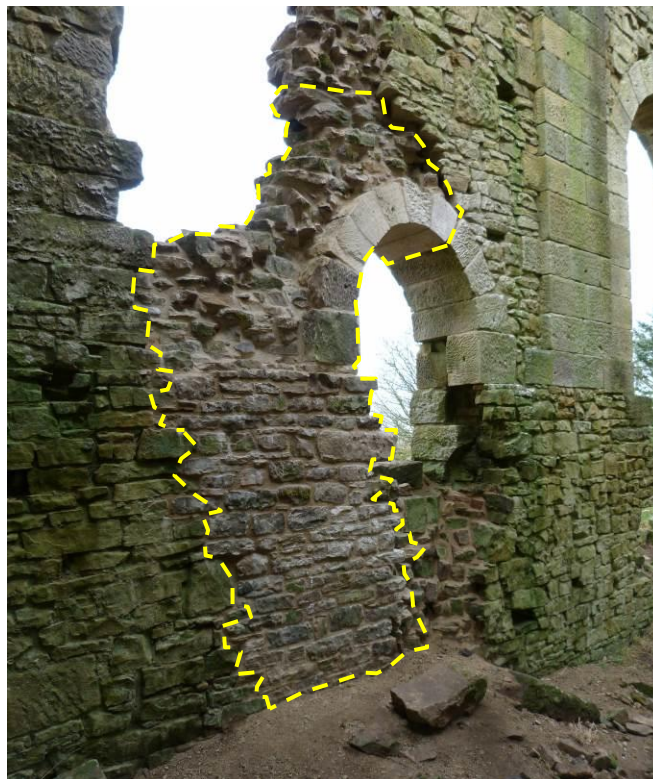


Plate 19: Inside the Engine House. Looking north-west at the west wall following insertion of new face and corework within the broken yellow line.

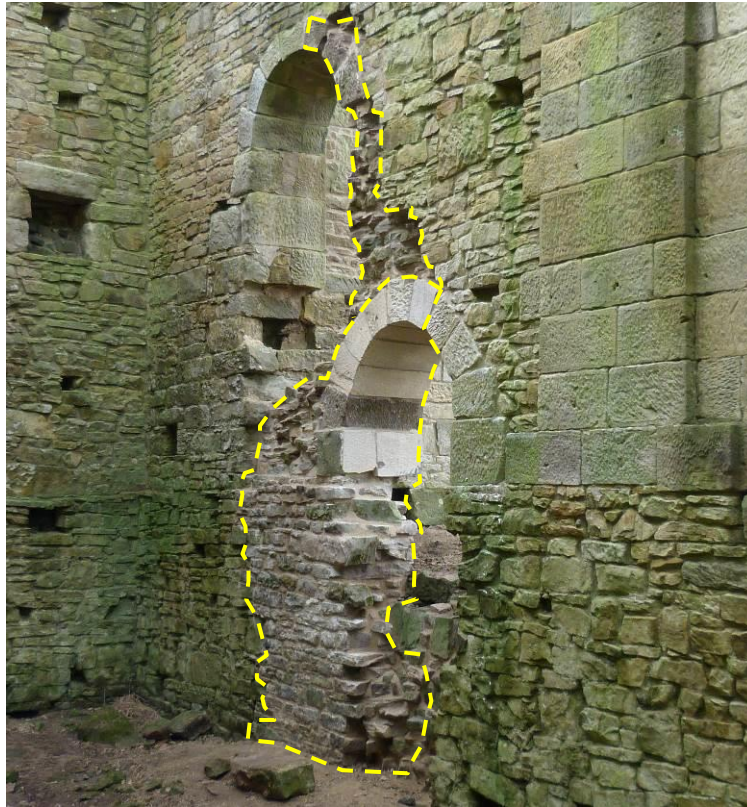


Plate 20: Inside the Engine House. Looking south at the west wall following insertion of new fabric within the broken yellow line.



Plate 21: The rebuilt south end of the west wall. Looking west.

Opening in the Chimney Flue



Plate 22: *Opening in south face of the chimney flue prior to conservation works.*



Plate 23: *Repointing in the chimney flue.*



Plate 24: *Work completed on the opening and the adjacent walls.*

Opening at the East End of the South Wall



Plate 25: Opening in the south wall of the Engine House in 2017.



Plate 26: Defective lintel in the south wall of the Engine House in 2017.



Plate 27: South wall of the Engine House. Scaffolding in place in 2018.



Plate 28: The opening in the south wall of the Engine House. Looking South-west during conservation works.



Plate 29: *The opening in the south wall of the Engine House. Looking north-west during conservation works.*



Plate 30: *The opening in the south wall of the Engine House. Work completed in late 2018 with a new substantial timber lintel. Looking north-west.*



Plate 31: *Opening in the south wall of the Engine House in 2019. Looking north. Inserted work in broken yellow line.*

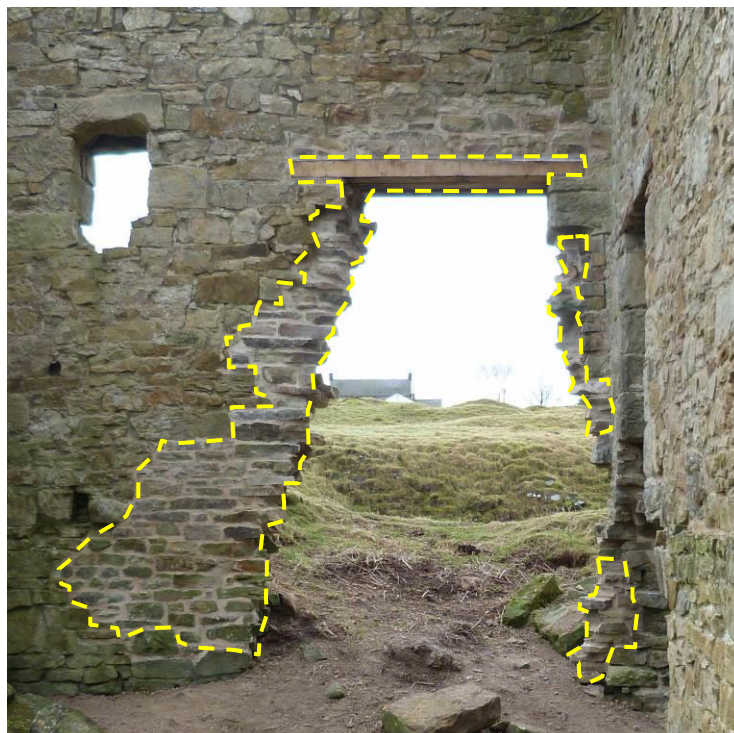


Plate 32: *Opening in the south wall of the Engine House in 2019. Looking south. Inserted work in broken yellow line.*

Work on the North Wall

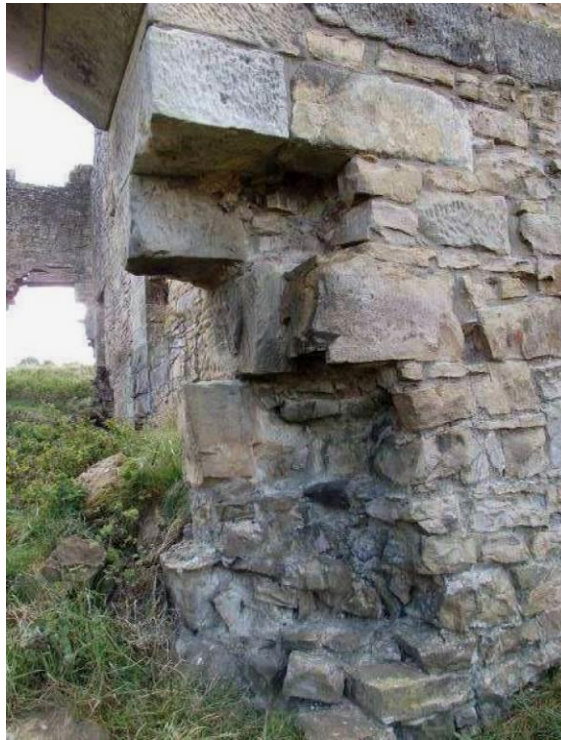


Plate 33: Cavities in the west jamb of east opening in the north wall of the engine house in 2017. Looking south.



Plate 34: West jamb of east opening in the north wall of the engine house in 2019. Corework pieced in to support existing fabric.

Access Works (Permissive Gated Path)



Plate 35: Ridsdale Ironworks 2017. Tumbled area of drystone wall along the A68, the location of the new gated access. Looking north-west (courtesy Lydia Speakman).



Plate 36: Ridsdale Ironworks 2017. Location of new gated access point is arrowed. Looking north along the A68 (courtesy Lydia Speakman).



Plate 37: *Beginning de-turfing for the foundation Slot of the new wall. Looking north-west.*



Plate 38: *The slot completed. Looking north.*



Plate 39: The new wall under construction; gate posts and gate in place. Looking north.



Plate 40: Working on the wall.



Plate 41: Entrance completed with crushed stone walkway.

8. SOURCES

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Tylecote, R.F (1971) 'Recent research on nineteenth century Northumbrian blast furnace sites' in *Industrial Archaeology* (vol VIII 1971) 341-359.

Historic England (HE):

Scheduling Document for Monument List No. 1006420

Northumberland County Council (NCC):

HER information; unpublished 'Event' reports

Newcastle City Council Archaeological Unit (NCCAU):

Building survey of Ridsdale Engine House by Newcastle City Council Archaeology Unit (including photogrammetric survey of Ridsdale Engine House by Mason Land Surveys Ltd. in 1995 (1997).

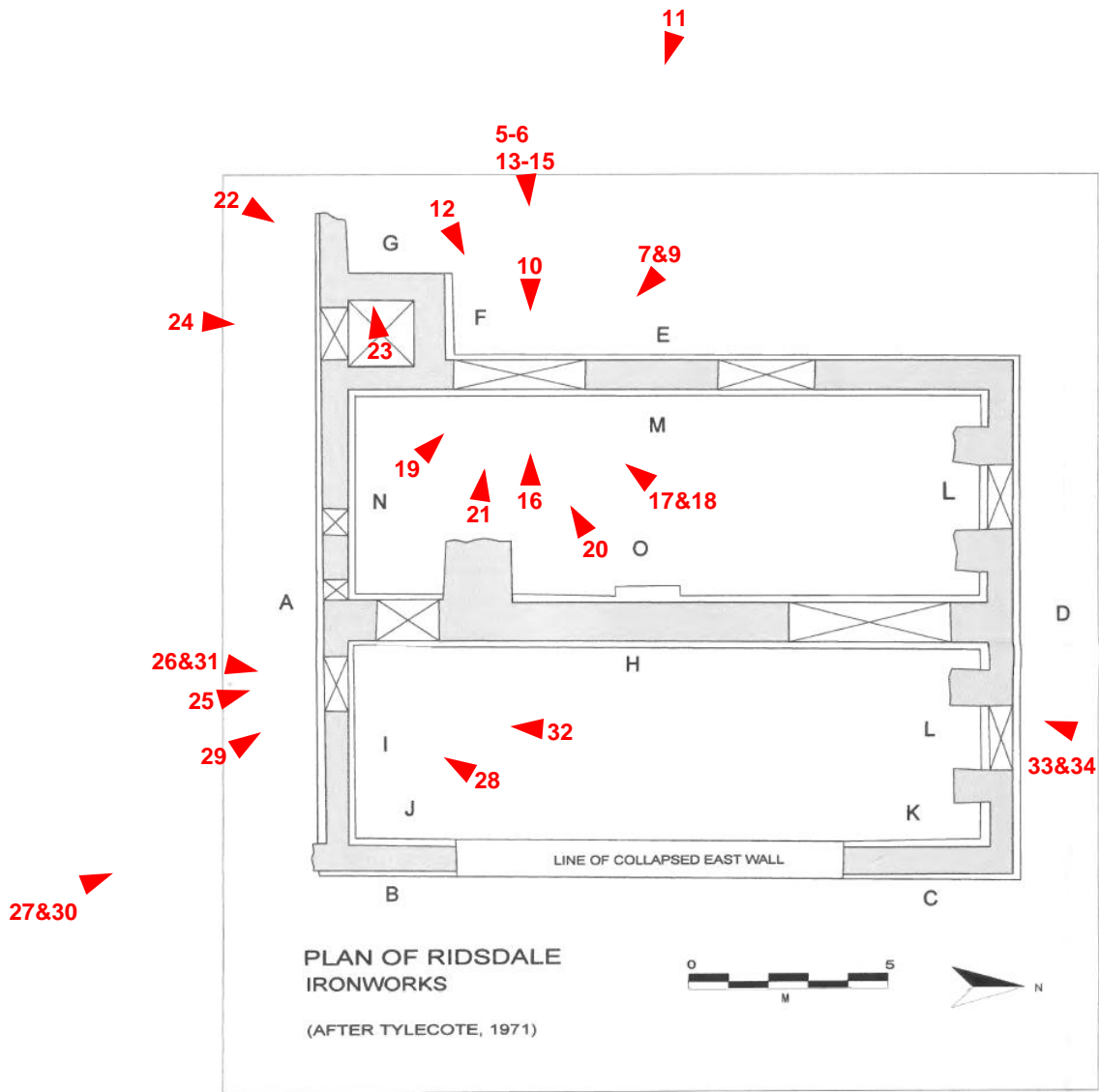


Figure 4: The Engine House: Key to location of plates 5-7, 8-34.

APPENDIX 1:

Ridsdale Ironworks

Corsenside, Northumberland

BACKGROUND AND STATEMENT OF SIGNIFICANCE

December 2016



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Plate 12: Looking west along the eastern end of Armstrong Street the terraced housing a product of Ridsdale Ironworks.

Plate 13: Looking west beyond the engine house towards Corsenside and across the River Rede.

SUMMARY

It is likely that most people who drive through Ridsdale and who notice the stark, stone structure set in rough grassland a little way beyond, see a medieval castle or Border stronghold. The truth - it is a 19th century engine house, one part of an ironworks - although very different, is every bit as interesting. The building is one of the few standing structures along the Rede which mark the short-lived expansion of heavy industry into the north-western uplands of Northumberland, and of its speedy retraction; it marks the creation of a community – Ridsdale is a product of the ironworks – which has survived and long outlived its original purpose. The engine house is also a link with famous names: Robert Stephenson and William Armstrong, iconic figures of British industry both, in different ways, involved with the ironworks. Just as importantly, it is a link with many less well-known individuals who were drawn to live and work at Ridsdale.

As part of the Revitalising Redesdale Scheme, conservation works are to be carried out on the engine house at Ridsdale, part of the scheduled ironworks site and currently entered on the Historic England Heritage at Risk Register. These works will ensure its survival and well-being. As part of the scheme, a management plan has also been prepared for the engine house and its environs to ensure their long-term future. The following report, a statement of significance for the ironworks, forms one part of this management plan. It provides an historic and archaeological background to the remains within their local, regional and national context; identifies the components of the ironworking site of which the engine house is only one part and shows how these are important survivals locally, regionally and nationally.



...the blowing engine house remains, resembling, in this windswept spot, nothing less than a Border stronghold (Linsley in Pevsner 1992, 632).

1. INTRODUCTION

1.1 Revitalising Redesdale

Revitalising Redesdale is a scheme developed by Natural England to celebrate the Rede valley's historic and cultural heritage. Supported by Heritage Lottery Funding (HLF) both through a grant to develop the project and as part of its Landscape Partnerships Scheme, it aims to encourage better management of habitats along the valley including areas of peat, grassland and woodland by creating a management plan for these landscapes, and for the river itself, reducing silting and pollution. Five scheduled ancient monuments and five listed buildings are to be restored and conserved. Two of the scheduled sites, Ridsdale Ironworks Engine House and Bremenium Roman Fort, will be removed from the Historic England Heritage at Risk Register as a result of these works.

1.2 Management Plan for Ridsdale Engine House and Environs

As part of the Revitalising Redesdale scheme, Doonan Architects, acting as advisors to Natural England, has developed a management plan (MP) for Ridsdale Engine House, a key component of the scheduled ironworks site. This addresses a range of issues including the immediate physical conservation and consolidation of the structure, its long-term maintenance, ecological issues which affect the management of the building and includes a statement of significance for the building and the historic ironworks site.

1.3 Statement of Significance for Ridsdale Ironworks

The following document forms the statement of significance for Ridsdale Ironworks. This has been prepared with reference to the Historic England publication *Conservation principles, policies and guidance for the sustainable management of the historic environment* (2008) which notes that significance is a collective term for the sum of all the heritage values attached to a place, be it a building an archaeological site or a larger historic area such as a whole village or landscape, and groups these values into four categories (see section 6):

- Evidential value: the potential of a place to yield evidence about past human activity;
- Historical value: the ways in which past people, events and aspects of life can be connected through a place to the present;
- Aesthetic value: the way in which people draw sensory and intellectual stimulation from a place;

- Communal value: the meanings of a place for the people whom relate to it, or for whom it figures in their collective experience or memory.

2. RIDSDALE TODAY

2.1 Location

Ridsdale lies in the valley of the River Rede, a tributary of the River North Tyne, within the parish of Corsenside, Northumberland (at NY 909 844) and along the A68. Corbridge lies 15 miles to the south-east, Bellingham four and a half miles to the west. The small settlement of Ridsdale straddles the A68, terraced housing along Armstrong Street running to the west, Rendle Terrace to the east. The remains of Ridsdale ironworks lie within rough pasture immediately to the north of the settlement and west of the A68 as it falls steadily towards the crossing of the Chesterhope Burn just under half a mile to the north. The site is open and windswept with a magnificent backdrop of hills to west and north. The stone shell of the ironworks' blowing engine house is a prominent, stark and enigmatic feature of this landscape.

2.2 Remains of the Ironworks

The shell of the blowing engine house, along with less exposed buildings to the north - Furnace House and an adjacent, heavily adapted range, both formerly tapping or casting houses - are the only structural remains of the works still standing. However, a wide area to the south of the engine house contains substantial turf-covered earthworks, the remains of coke ovens, roasting kilns, waste heaps and tubways. To the south of these are large quarry pits. And to the east of the A68 are the now dry banks of a reservoir which once supplied water to the boilers of the blowing engines.

2.3 Status of the Remains

The engine house and the grazing land around is owned by Mr and Mrs Grieve of Fourlaws Farm, Fourlaws, Bellingham. Parts of the site to the north, including Furnace House, are under separate ownership. Much of historic Ridsdale ironworks is protected as a scheduled monument (List No: 1006420) which extends over the area shown on figure 2. This includes the ruins of the former engine house, earthwork remains of coke ovens and ore-roasting kilns etc. The scheduling also extends across properties to the north which includes the listed Furnace House (listing ID: 239434). Although within the scheduled area, this building is excluded from it. The reservoir to the east of the A68 lies outwith the scheduled area.

The scheduled monument is included on the Historic England *Heritage at Risk* Register because of concerns over the remains of the engine house (classified in the register as: *generally satisfactory but with significant localised problems. Principal vulnerability: collapse; trend: declining*). Ridsdale lies outside Northumberland National Park - its border running along a stretch of the road between Bellingham and West Woodburn.

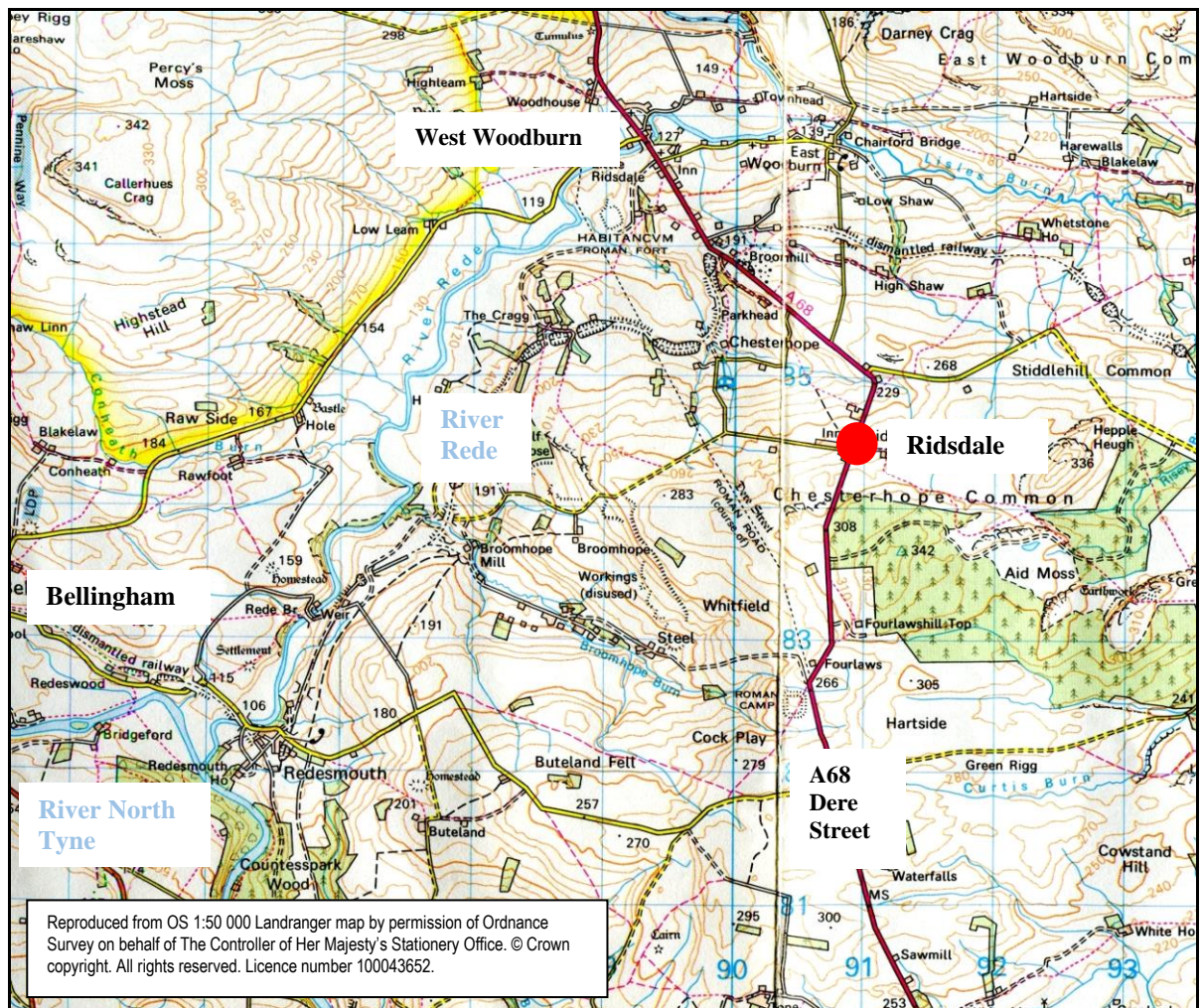


Figure 1: Ridsdale (red dot) on the eastern edge of the valley of the River Rede

2.4 Previous Accounts of Ridsdale

Recent accounts by Roberts (in Addyman and Fawcett (1999) and in *Northern History* (2000) on the development of the 19th century iron industry in the north west of Northumberland at Hareshaw and Ridsdale have benefited from access to previously unseen business papers of the Duke of Northumberland held at Alwick Castle archives. This has refined understanding of the expansion and contraction of the industry in this area, previously based on Hoskison's 1947 paper

'Northumberland Blast Furnace Plants in the Nineteenth Century' which only drew on published material and is, in some parts, inaccurate. Subsequent accounts up to Roberts' work (Tylecote (1971), Linsley (1978), Charlton (1987) and McCord and Thompson (1998), for instance), although all adding new information, largely followed Hoskison's narrative.

2.5 Archaeological Input at Ridsdale

No archaeological excavation has been carried out at Ridsdale within or beyond the area of the scheduled monument. Photogrammetric survey of the engine house has been carried out on two separate occasions: It was undertaken first by Tylecote in 1971 (figures 5 to 8 in this report), accompanying his description of the site and its environs. The survey was carried out 'As the building is in a very bad state and might collapse any day'. Fortunately, most of it did not, and further recording (including photogrammetric and rectified photographic survey) was carried out by Mason Land Surveys in 1995 as part of a broader conservation scheme, including archaeological recording by Newcastle City Council Archaeology Unit and consolidation of the structure. The drawings produced were an 'as found' record and copies then annotated with areas of consolidation by Michael Haggie, the project architect. Copies of these drawings have been used in the current project as part of the management plan.

3. GEOLOGY

The solid geology of the Rede and North Tyne valleys around Ridsdale is of the Carboniferous Limestone (Visean) Series, formed of beds of limestone, sandstone and shales. Ironstone is interleaved within this succession often as nodules in a shale matrix. Bell (1864, 733) was told by a local informant that around Hareshaw, there were on average 8470 tons of ironstone per acre. Allowing one third for loss, he said the practical produce per acre was about 5647 tons with a yield of around 33% of iron per ton of ore. All of the ironstones of the area are classed as low grade deposits; only 20-25% Fe was quoted for the black band ironstone at Haydon Bridge. Output of the ore was limited – less than one million tons in total - insufficient to meet the demands of the industry (Highley et al 2000, 36).

In his survey of the Northumbrian iron industry, Tylecote visited Ridsdale Ironworks and carried out a thorough inspection of an adjacent ore quarry:

...one face was cleaned with the aid of a bulldozer. This revealed a vertical section 44 feet long and about 6 feet high. Above this was a well-weathered, less vertical face. The [iron ore] nodules were confined to a few bands totalling in all less than 6 feet in thickness. The nodules varied in size from as much as 12-18 inches across down to 1-2 inches. There was also a well-marked shell band of continuous stone. The shell band had a high calcite content both as shells and cavity infilling in the ironstone, and some of this could be used as a fluxing material. (Tylecote 1971, 357)

Layers of coal are also interleaved within the Carboniferous succession. The ironworks at Ridsdale used coal from the Aid Pit on Aid Moss to the south-east of the works. Limestone, for flux during smelting, was also quarried from the same Carboniferous deposits.

4. HISTORIC BACKGROUND

4.1 Regional Development of the Iron Industry

Only one blast furnace (converting iron ore to pig iron on a casting or tapping floor) is known to have been in production in the North-East during the 16th century. This was at Wheelbirks, near Stocksfield. Only two other blast furnaces were at work over the 17th century, at Hunwick (1632- c.1689) and at Allensford (1670- c.1715) (Daniels *et al* 2015, 92)

4.1.1 Production of Iron Goods in the North East

The North East of England was an important focus of iron manufacture by the first half of the 18th century. The Crowley's works on Tyneside (Flynn 1962) formed a substantial centre of the industry. There were other firms, Bedlington being a notable example (Evans 1992). However, the focus of the North-East iron industry was largely on the production of goods from iron – not the production of iron itself. Although blast furnaces were set up by the Cooksons at Chester-le-Street in the 1740s and by the Maling family at Bedlington from 1759, neither proved long-lived nor successful. At least one attempt was made in the 18th century to establish a blast furnace in the north-west of Northumberland. This was at Lee Hall near Wark-on-Tyne in North Tynedale (Roberts 2000, 287). Again, it was a short-lived failure.

4.1.2 Production of Iron in Britain

By the late 1770s, there was no locally-produced iron in the North East. The centre of British production was far to the south in Shropshire, Staffordshire and South

Wales where supplies of coal and iron were abundant and adjacent. Coal was also very abundant in the North East, but iron ore not as plentiful nor frequently of good quality; so whilst the Chester-le-Street blast furnace of the Cooksons initially exploited thin seams of iron ore on Waldrige Fell, it soon had recourse only to remote supplies from Robin Hood's Bay in North Yorkshire; and the Bedlington blast furnace used iron ore exposed in seams along the banks of the River Blyth which was both difficult to extract and of a low yield. By 1770, blast furnaces in Shropshire alone were producing 40% of the total British production of pig iron of nearly 90,000 tons a year. The French Wars of the late 18th and early 19th century massively increased demand for iron goods and stimulated both the techniques of the producing firms and their output. But the main centres of production remained static. By 1806, Shropshire, Staffordshire and South Wales were still producing 70% of the 400,000 tons of pig iron produced in the country.

4.1.3 Iron Production in the North East

Eventually, with the cost of iron rising, the North East began to produce iron once again. The Tyne Iron Company opened at Lemington on the banks of the River Tyne in 1797, and brought two blast-furnaces into use by 1801 as the price of iron rose to £8 per ton. By 1820, it was producing over 2,000 tons of iron a year. Another company set up blast furnaces nearby at Newburn in 1810.

4.1.4 Fluctuations in the Market

Growth in the production of iron in the North East was stifled by a fall in demand for pig iron following the end of the French Wars - a period of general economic depression - which lasted through the 1820s. A local factor in the stagnation of the iron industry in the North East was, again, the restricted supply of iron ore and high costs for transporting it.

The 1830s and 1840s saw renewed growth in the British economy, and a rapid advance in that of the North East where the coal industry, its transport arms on land and sea, and the rapidly expanding rail system, required increasing quantities of iron goods and equipment. The price of pig iron rose and new ironworks opened. Roberts (2000, 286) mentions the foundry of Perkins and Company at Birtley which was producing 3,000 tons of pig iron per year by 1830; a firm at Wylam opened in 1836 as well as other works at Shotley Bridge and at Walker on Tyneside which opened in 1840 and 1842 respectively. A problem still experienced by a number of these firms

was sourcing local supplies of iron ore. Wylam had local reserves, but they soon proved problematic due to difficulties with extraction and had to import ore from the Grosmont mines near Whitby. Walker Ironworks used Grosmont iron ore from start-up although it was a relatively low-grade ore.

4.2 Development of an Iron Industry in North-West Northumberland

With the national increase in demand for iron from the 1830s, finding exploitable, and ideally adjacent, sources of iron ore and coal became the imperative. North-west Northumberland contains abundant seams of both. Coal had been mined in North Tynedale and Redesdale from at least post-medieval times. Iron ore extraction and iron working was carried out in the area from late prehistoric times and continued in the 12th and 13th centuries under licence from the Bishops of Durham. Turbulent times which followed led to its abandonment.

Roberts (2000, 283) sets the local scene - and the dynamics - for the development of iron production deep in the upland heart of north-west Northumberland in the 1830s:

The more peaceful seventeenth and eighteenth centuries witnessed an increase in the number of people living in North Tynedale and Redesdale but the economic base of this society was narrow being centred largely on upland pastoral husbandry and subsistence grain cultivation. That type of agriculture yielded limited rentals, and there was therefore a willingness on the part of most landowners to introduce new industries to the area in an effort to increase the income from their estates, many of which were rich in minerals.

4.2.1 An Ironworks at Ridsdale: Chesterhope Iron Company

Following widespread prospection of North Tynedale and Redesdale for exploitable sources of iron ore and coal over the early 1830s, both were found towards the eastern end of the valley of the Chesterhope Burn, a tributary stream of the River Rede, south of West Woodburn. A 21 year lease on mineral rights of the area was taken out in 1838 between the Chesterhope Iron Company and the Duke of Northumberland. Two prominent members of the company were local men, Thomas Hedley and Stephen Reed, the latter a landowner in the area (Roberts 2000, 284).

A production plant was established in 1839 on the recently enclosed Chesterhope Common at a junction along a newly aligned stretch of Dere Street, making for an easy crossing of the Rede at West Woodburn (Greenwood's map shows the new route, see figure 13). One blast furnace was constructed alongside coking ovens and ore-roasting kilns, and the production of pig iron began in the same year. But

development of the ironworks was not as simple as that. Because the site lay in uninhabited Chesterhope (West Woodburn to the north - a tiny hamlet - was the only settlement bigger than a farmstead in the vicinity) a new community had to be constructed for workers who were brought in to the remote area. The present settlement of Ridsdale, extending along Armstrong Street and Rendle Terrace, is a product of the ironworks.

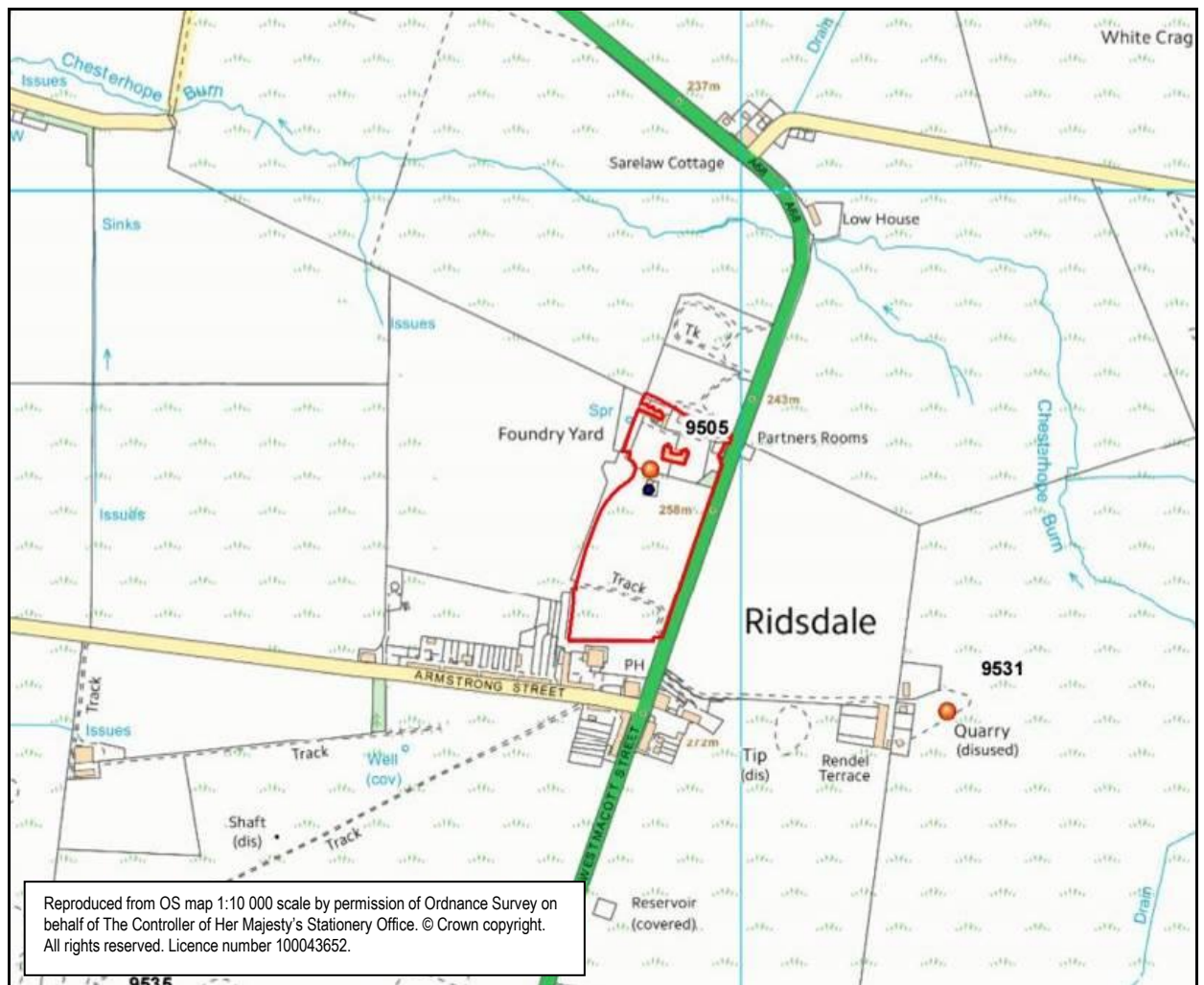


Figure 2: Ridsdale (Armstrong Street and Rendle Terrace) with Ridsdale ironworks (HER 9505) to the north. The scheduled monument is outlined in red.

4.2.2 Derwent Iron Company

Possibly because of the costs incurred constructing both plant and housing, the finances of Chesterhope Iron Company were strained from the start and in 1839 the concern was offered for sale to a newly formed partnership, the Derwent Iron Company, which had a number of other ironworking plants on Tyneside and in north Durham. Ridsdale was bought by this company for £30,000 in early 1840. By 1841,

and re-financed, two more blast furnaces had been constructed, were in production, and the workforce – and the number of houses in the

village - increased. Pig iron produced at Ridsdale was sent to the Derwent Iron Company's plant at Bishopwearmouth for re-processing prior to sale.

4.2.3 High Level Bridge – High Quality Iron

Weathering recession in 1842-3, for a period the ironworks prospered. It was certainly turning out a high-quality product: Looking for the best cast-iron with which to construct his High Level Bridge over the River Tyne at Newcastle, Robert Stephenson undertook comparative tests on 15 different types sourced nationally. Ridsdale iron was the strongest. Up to 20% of the cast-iron arches of the bridge was formed of Ridsdale iron alloyed with other material. By 1848, 'malleable' (wrought) iron was also being produced at Ridsdale following investment of around £10,000 to set up the required puddling furnaces and other plant.

4.2.4 Failure of Ridsdale Ironworks

By 1849, coal reserves from Aid Pit were running low. Costs for the sinking of a new shaft may have brought the company to insolvency and the furnaces fell out of blast. In 1852, the dormant ironworks was put up for sale and the Duke of Northumberland offered first refusal. This was declined and the works were bought by a Mr Forster, a former employee of Derwent Iron Company. A new lease for mineral rights of the area was drawn up by Forster in 1860, part of an intent to bring the works back into production. He then set about trying to raise £14,000 to re-equip and fund the ironworks but died before this was achieved.

4.2.5 William Armstrong

The disused works, houses, and 180 acres of land around were bought for £3500 by William Armstrong in 1862 (figure 15 shows the sale plan). He dismantled the three blast furnaces and transported them to Elswick and his integrated ironworks and shipyard. From 1864, iron ore was mined both at Ridsdale and close by at Broomhope where Armstrong had rented 1,000 acres of land with easily exploited resources of iron ore adjacent to a spur line from the newly opened Border Counties Railway. Although ore was still extracted from the pits at Ridsdale, none was roasted on the site; this was carried out at Broomhope, at the rail head. All the ore was sent

to Elswick for smelting, a journey continued until the late 1870s at which time the smelting of iron ore at Elswick was discontinued and the supply from Redesdale made superfluous to any requirement. Stiddle Hill Colliery developed in the area over the 1870s (listed in Durham online Mining Museum). It had a number of pits to the north-east and east of Ridsdale. It remained open until 1931, presumably largely for the landsale market.

Armstrong retained an interest in the remote area. A gun testing range had been set up at the Steel a little way to the south in 1867 and this continued after the ironworks was abandoned. Workers at the range were accommodated at Ridsdale for some time. BAE still has a testing range at the Steel.

5. SITE COMPONENTS

The following section provides a summary of the visible remains of Ridsdale Ironworks. It incorporates information gathered during a site visit by Alan Williams on 22nd September 2016 as well as earlier descriptions of the site including a visit to the site by Tylecote in 1971 and a 1995 survey of the engine house by Newcastle City Archaeology Unit. Information is also used from the SAM description and the listing description of Furnace House to the north. The area inspected included the engine house and the surrounding rough pasture field in which lie earthworks of coking ovens, roasting kilns and quarries.

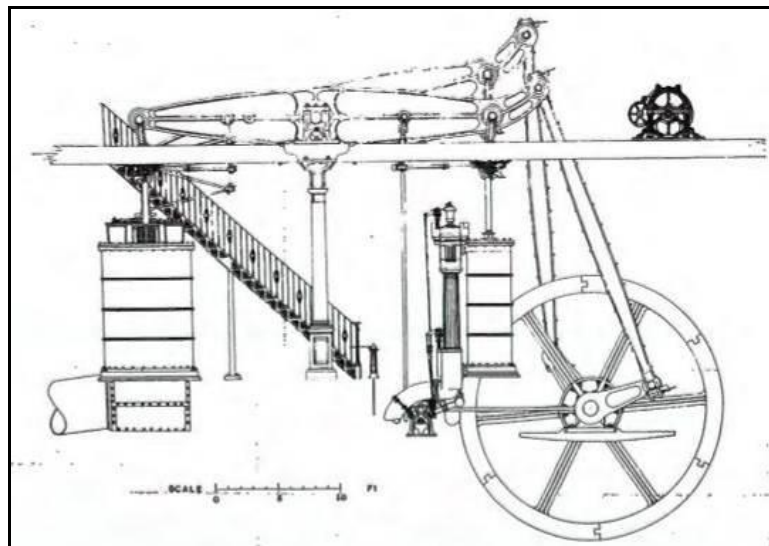


Figure 3: A beam blowing-engine from Blists Hill, Telford. (From Arnott and Sayer 'Beam engines in blast furnace blowing' *Industrial Archaeology Review*, vol 3, No 1 1978)

5.1 The Blowing Engine House (figures 5-9 and plates 1-5) is the most prominent structural survival of the ironworks. It was constructed in 1839-40 to hold two steam-powered beam engines which provided the air

blast for three blast furnaces lying downslope to the north. The substantial rectangular cavity alongside the engine house to the south is the former site of boilers (Tylecote noted that foundations of the boilers could be seen: 1971, 350) which were supplied with water from the (now dry) reservoir to the east across the A68. Although roofless, floorless - and engineless - and with areas of tumble, most markedly the east wall, which has fallen only since 1985 (NCCAU 1996, 20), the shell of the building remains substantially complete and intelligible. It is built into ground falling steadily towards it from the south and then sharply from it to the north, forming a footprint 17.5m north-south by 13m east-west with basement, ground and first floor levels and a very substantial internal wall dividing the interior longitudinally into two compartments. It is constructed of coursed sandstone-rubble with dressed and tooled quoins and margins to windows. The elevations are fairly symmetrical with round and segmentally-arched openings to the basement and ground floors and square headed openings above. A partially-rebuilt brick-lined stone chimney sits on the south-west corner of the building. The form and covering of the roof is uncertain. The remnants of a wall can be seen extending south from the area of the chimney, presumably part of the boiler house, now a cavity, which sat to the south of the engine house.

According to Tylecote (1971, 350) the engine house 'obviously housed two beam blowing engines side by side' presumably one to each longitudinal compartment (as per NCCAU 1997, 23), the rocking arms of the engines pivoting on 'bob' or 'lever' beams set up transversely across the building. But there may be other options. Whatever their dispositions, the engines would have been connected to the boilers, positioned in a sunken lean-to structure to the south. Although the above ground structure has now entirely gone, foundations of the boilers certainly survive (aerial photograph TMG-14750-066 for evidence of these) and pipework to channel the air blast would have run to the blast furnaces a little way to the north via a regulator to keep the supply constant.

5.2 Furnace House is a grade II listed building and lies some way to the north of the blowing engine house amongst a range of later buildings now mostly in residential

use, an area known as Foundry Yard. This would once have been the core of the ironworks with the ancillary ranges for carpenters, blacksmiths and offices etc. Although within the area of the scheduled monument, Furnace House itself is excluded from the designation. Originally, the building was attached to one of the blast furnaces and may have functioned as a covered tapping (or casting) house, where molten iron tapped from the furnace was cast into pigs. A building to the east of Furnace House is of a similar form, probably another tapping floor, but has now been significantly altered and is not listed. It is likely that remains of the blast furnaces will lie to the south of the buildings.

Furnace House is a long, one storey structure, orientated north-south and formed of randomly-coursed sandstone rubble with squared and tooled quoins and a gabled roof covered with Welsh slate. A later porch with double doors has been added to the north end. Both of the long sides of the building has three tall 12-pane windows. There are two square chimney stacks set against the eastern long side of the building, each with a cornice and dripstone moulding.

5.3 Coking Ovens were required at Ridsdale to fuel the blast furnaces. Locally mined coal was coked by heating in a low-oxygen atmosphere to around 1100C. This drove off impurities in the coal which would have contaminated the iron if not removed (most grades of coke are around 90% pure carbon) leaving a light, porous structure, strong enough to support iron ore in the blast furnace and producing a clean and intense heat when burned.

Three rows, or batteries, of coke ovens running east-west are shown on the first edition Ordnance Survey of 1860 at Ridsdale and can still be seen today as prominent and coherent earthworks. Whether the kilns were all built at one time is not known, but as shown on the map they pre-date Armstrong's input in the works which began in 1861. Exactly how the ovens were disposed along the batteries is not certain but they would presumably have been of beehive type, of stone or brick construction, with individual hemispherical chambers and a charging hole at the top of each oven. Aerial photographs suggest this was the case (TMG-3887-012 from May 1988, for instance). Each battery would have been covered with turf for insulation and a wall with an entrance into each chamber for unloading the coke would have fronted the ovens.

5.4 Roasting Kilns also known as calcining kilns were another requirement at Ridsdale. They were used to process iron ore from the local deposits before smelting. Iron ore was heated to drive off carbon dioxide as well as moisture and other impurities such as sulphur. The first edition Ordnance Survey shows a bank of roasting kilns to the east of the coke ovens. It is not possible to tell from the survey how many kilns formed the bank; perhaps nine or 10. Ore would have been loaded in to the kilns from the top and removed from entrances at the base. To ease loading, roasting kilns were frequently set into a bank. At Ridsdale, ore was taken to the top of the kilns along a railed tubway set on a trestle ramp. This, or its remains, can be seen on the Ordnance survey to the south of the kilns. An earthwork survives today over the remains of the roasting kilns. How much of the structure survives is uncertain.

5.5 Waste Dump. A prominent turf-covered earthwork lies to the north of the site of the roasting kilns (5.4) today and is shown on the first edition Ordnance Survey. The composition of the dump is not certain.

5.6. Scoria - slag removed from a blast furnace – forms a very substantial dump, now a rather well-bedded rockery-like feature, a little way to the west of the engine house. The mound of waste is shown on the first edition Ordnance Survey. There is probably a badger sett within it.

5.7 Tubways, rail lines with man or horse-powered tubs for moving coal and iron ore, would have served the site. Although there are tracks across the site today, there is no reason to think that they overlie the lines used when the ironworks was in production. Nor is it certain that the tracks shown on the first edition Ordnance Survey represent rail lines. Linear earthworks seen on a number of aerial photographs from the 1980s and 1990s show embankments which probably mark tubways (TMG 3887-012 from May 1988, for instance)

5.8 A Reservoir supplied water to boilers for the steam engines powering the air blast for the furnaces. It lay to the east of the A68 and can still be seen as an earthwork, although it is now dry. The first edition Ordnance Survey shows an upper and lower pond with a dividing dam and a sluice through it towards the north bank. The water source for the reservoir was a stream running in from the south. Water

was fed to the boilers via an underground pipe, the line of which can be made out on a number of aerial photographs (TMG 14750-066 from June 1994, for instance).

5.9 An **Old Quarry** is shown on the first edition Ordnance Survey a little way to the north of Armstrong Street. It remains today. Although presumably a source of iron ore, it is not certain when it was in use.

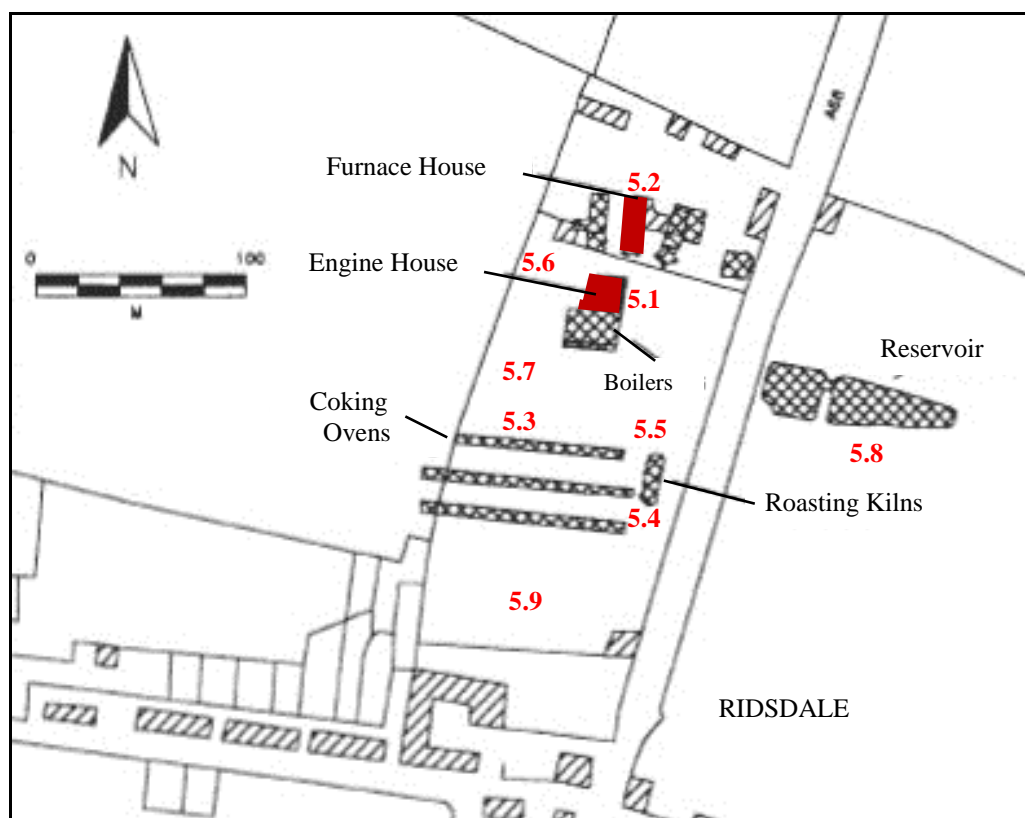


Figure 4: Plan of the Ironworks as shown by NCCAU in 1997. Numbers in red refer to components described in section 5. Engine House and Furnace House in red.

6. SIGNIFICANCE OF THE IRONWORKS

6.1 Protected Status

The site of Ridsdale ironworks – at least most of it - is protected by law as a scheduled monument, denoting that the remains are considered to be of national importance. Furnace House, formerly a tapping house, whilst within the area of the monument, is excluded from this designation and is protected as a listed building (grade II).

6.2 Technical Significance

Historic ironworks were assessed nationally as part of the Historic England (then English Heritage) Monument Protection Programme (MPP) in the late 1990s to

establish preservation, condition and relative value of sites. This assessment included grading sites from three stars to one star. Ridsdale ironworks was graded as two stars: a site of clear national importance with surviving components including the engine house, coke ovens, calcining kilns, casting houses, reservoir, slag mounds, and (sub-surface remains of) blast furnaces. Ridsdale can be compared locally with the remains of Hareshaw ironworks at Bellingham (graded one star: a site of national importance but of a lesser priority than two and three stars). Both sites reflect the expansion of the iron industry in the 1830s and early 1840s and its retraction at the end of the decade (Roberts 2000). Ridsdale carried on as an industrial plant – although functionally reduced – as a part of Armstrong’s empire: He removed the blast furnaces and set them up at Elswick on the River Tyne. Iron ore was exported from Ridsdale to the Elswick works.

Process-wise, there is nothing innovative about the works at Ridsdale. In fact, it was already slightly archaic when it went into production: the blast furnaces were set up for cold, rather than hot blast, the latter much more efficient and already a well-known technology when the plant was constructed (Roberts 2000, 296). Nor was production of iron integrated; before conversion to useful castings, iron from Ridsdale had to be transported cold. And although malleable iron was eventually produced, this was an afterthought requiring £10,000 additional investment in 1847 (Roberts *ibid*).

It is the preservation of a wide range of components which is of considerable significance at Ridsdale along with the standing engine house, unique in the region:

The site remains spectacular for the survival of the shell of the engine house, which is sited at the charging level south of the site of the furnaces (MPP Stage 3, 1997).

6.3 Comparison of the Engine House

Ridsdale engine house can be compared with a cluster of blowing-engine houses which survive in South Wales. They form a chronologically (1830s – early 1850s) and structurally discrete group:

Ynysfach Engine House Grade II* listed stone-built blowing engine house of 1836 constructed as part of an iron and steel works complex at Cyfarthfa, near Merthyr Tydfil (SO 04524 06096); **Llynfi Engine House** Grade II listed stone-built blowing engine at Llynfi Ironworks, Maesteg (SS 84857 91515) in 1839; **Tondu Engine**

House A stone-built blowing engine house. Listed grade II*, it was built before 1854 as a single house with a second block added soon after as a part of the Tondy ironworks, Ynysawdre, Bridgend (SS 89145 84429).

More locally, although less structurally similar, are blowing engine houses in Cumbria at **Backbarrow** (SD 35513 84670) within scheduled monument No. 1007084, and **Newland** (SD 29998 79709) a grade II listed building.

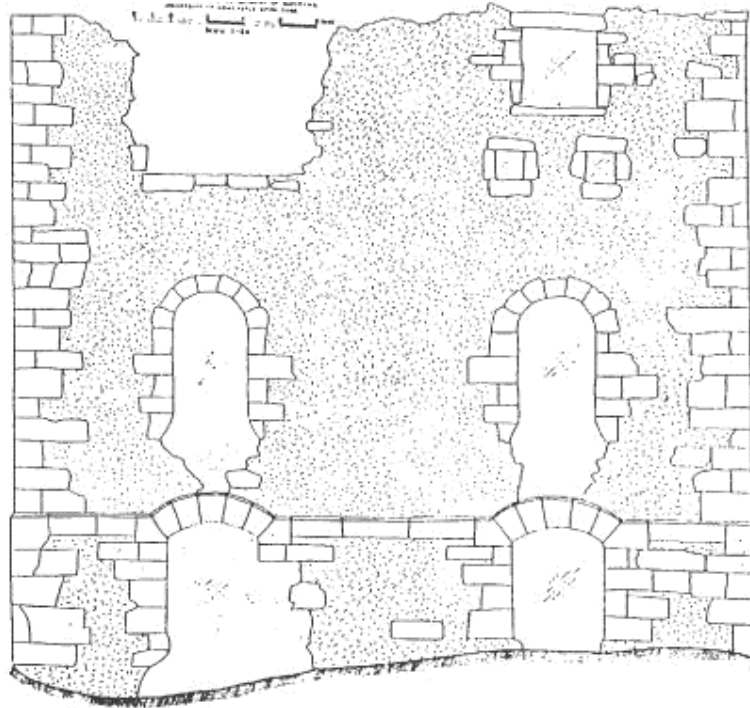


Figure 5: Tylecote's 1971 photogrammetric elevation of the north wall of Ridsdale Engine House.

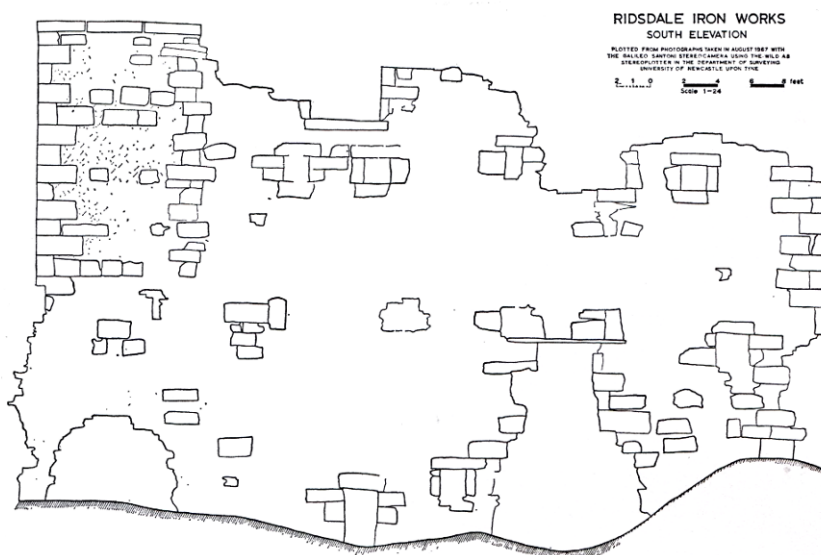


Figure 6: Tylecote's 1971 photogrammetric elevation of the south wall of Ridsdale Engine House.

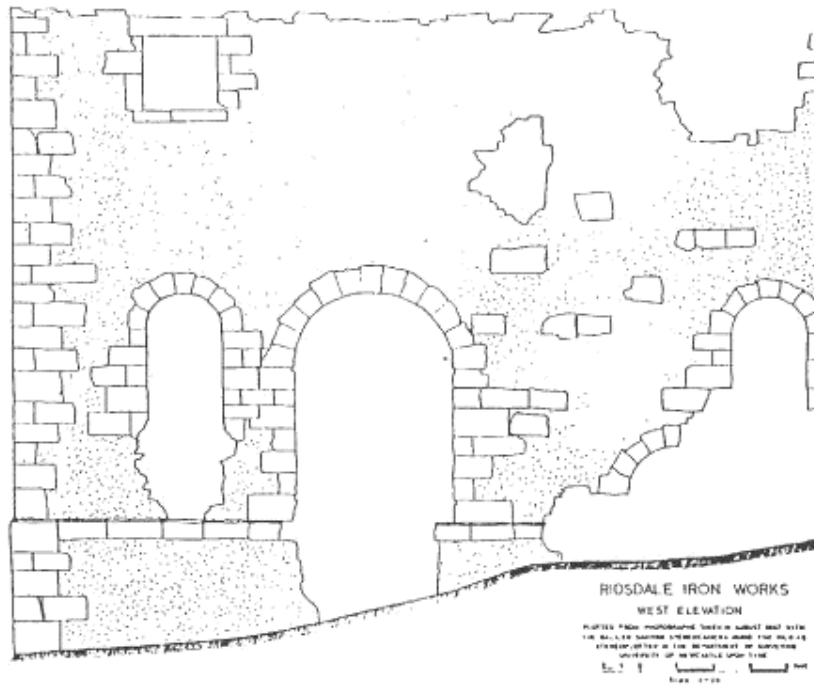


Figure 7: Tylecote's 1971 photogrammetric elevation of the west wall of Ridsdale Engine House.

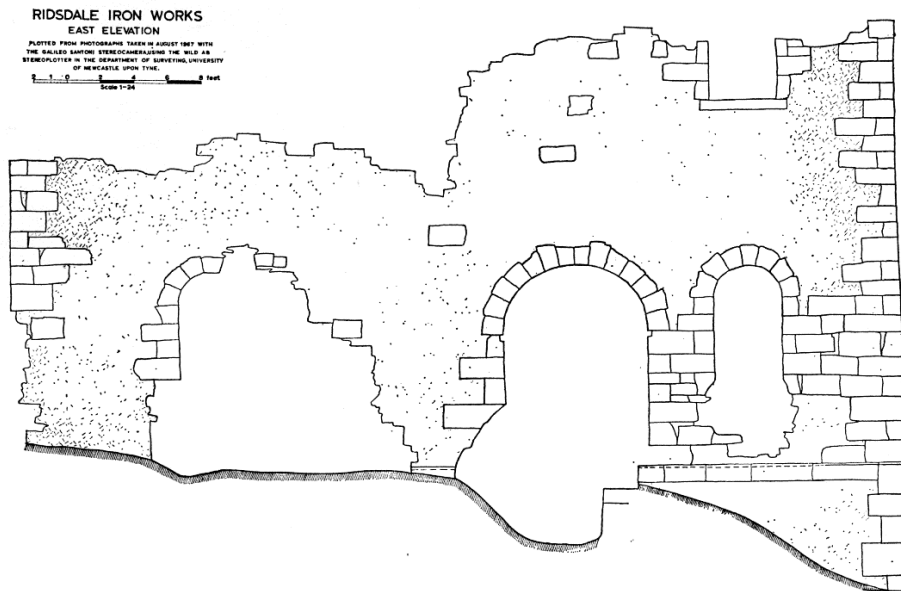


Figure 8: Tylecote's 1971 photogrammetric elevation of the east wall of Ridsdale Engine House. This has now fallen.

6.4 Elements of Value

It is useful when trying to determine the significance of a heritage asset to consider its various values. The following section is informed by the English Heritage publication *Conservation Principles Policies and Guidance* (2008) and in particular the section ‘Understanding Heritage Values’ (27-32) from this work:

Evidential Value	
<p>Evidential value is present in the physical remains which survive at Ridsdale. This includes:</p> <ul style="list-style-type: none"> • the standing fabric of the ironworks’ ruined blowing engine house; • buried remains of coke ovens, calcining kilns, tubways and banks of a reservoir which once fed the blowing engine which lie to the south and east of the engine house and are visible as earthworks; • the standing building called Furnace House to the north of the engine house (now converted and in residential use) formerly a covered tapping or casting floor running from one of the blast furnaces north of the engine house. • Other scattered remains of the iron industry in the wider landscape • Ridsdale village, itself a product of the ironworks 	
Historical Value	
<ul style="list-style-type: none"> • The illustrative value of the ironworks is limited by its ruined condition, the survival of the wider site as buried remains, albeit as earthworks, and the conversion of some surviving buildings to residential use (e.g. Furnace House); • Associative value derives from the selection of Ridsdale iron by Robert Stephenson to construct his High Level Bridge in Newcastle upon Tyne; the ironworks produced a high quality cast iron that in comparative tests surpassed the strength of 15 different types from across the country. The ironworks was owned first by the Chesterhope Iron Company, who took a 21-year lease on mineral rights in the area in 1838 and established the ironworks in 1839, and later the Derwent Iron Company who bought it in 1840. The ironworks were established in response to the demand for increasing quantities of iron goods and equipment that was driven by the growth of the British economy and rapid advance of that of the North East in the 1830s and 1840s. It was only one of a number of ironworks established in the North East at this time, but perhaps one of the most remote and isolated examples of the age. After the ironworks went out of use in 1849 the works was eventually bought by William Armstrong who dismantled three blast furnaces and transported them to his works at Elswick on the River Tyne. From 1864 to 1880, the Ridsdale works roasted iron ore which was sent to Elswick until 	

production ceased because of the import of cheap iron ore from Spain.	
Aesthetic Value	
<ul style="list-style-type: none"> • The design value of the blowing engine house derives from its form and function as part of a once operational ironworks. It was a purposefully impressive building. • The fortuitous value of the ironworks derives from its open and windswept location with a magnificent backdrop of hills to west and north. This is enhanced by its abandonment and the action of nature that has resulted in the isolated stone shell of the ironworks' blowing engine house being a prominent and stark feature of the landscape and, as Linsley notes, resembles 'nothing less than a Border stronghold' (Pevsner 1992, 632). 	
Communal Value	
The commemorative value of the ironworks, and the engine house in particular, is that they are the only physical mementoes of a short-lived working community from an industry which has now entirely gone.	
Natural Value	
Geology is the reason that the ironworks and hence the engine house are at Ridsdale. It is located where exploitable sources of iron ore, coal and limestone were available nearby and close to the Chesterhope Burn for water stored in a reservoir.	

7. CONSOLIDATION AND CONSERVATION

Conservation works to Ridsdale Engine House, carried out as part of the Revitalising Redesdale Scheme will ensure the continued good preservation of the building. The last round of conservation works was carried out in 1996. These are summarised in section 2.4 of the Management Plan (MP). The works were preceded by rectified photography and photogrammetry of wall elevations, allowing deterioration in the structure over 20 years to be assessed. Section 2.6 of the MP notes that the building remains in reasonable condition, albeit with localised issues. Three problem-areas have been identified for particular attention in the MP (section 6 Defects and Repairs in the MP):

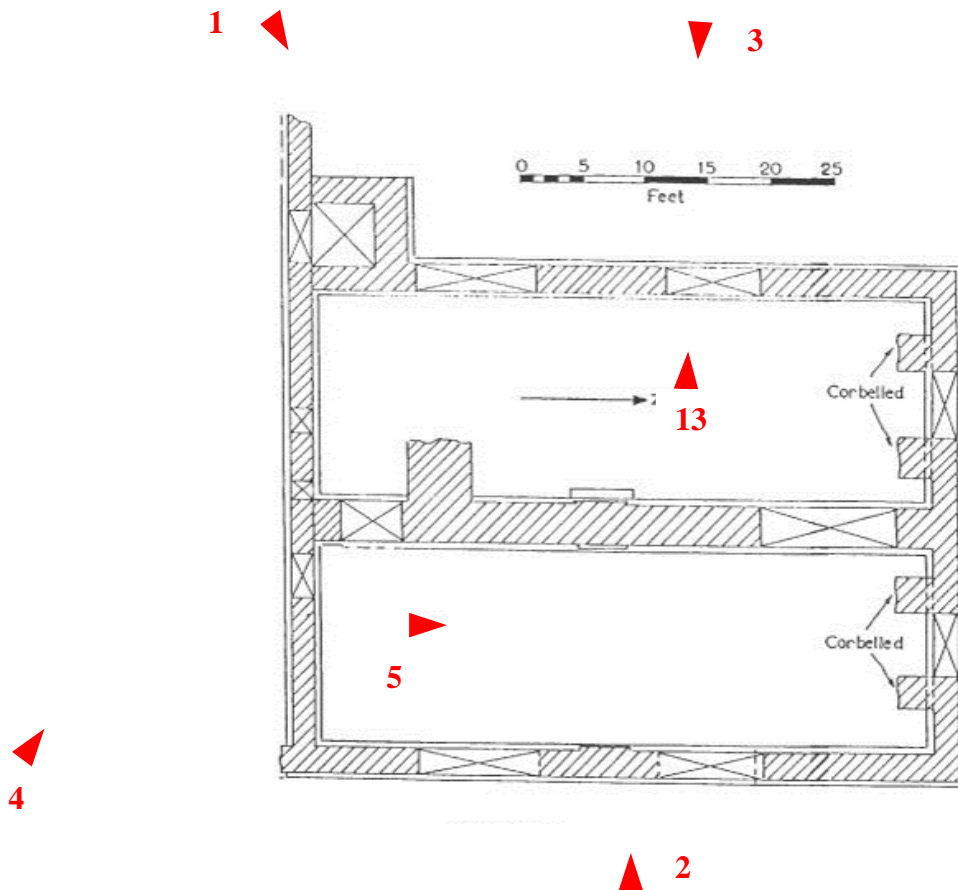


Figure 9: Tylecote's plan of the Engine House (1971) annotated with locations of plates 1-5 and 13.

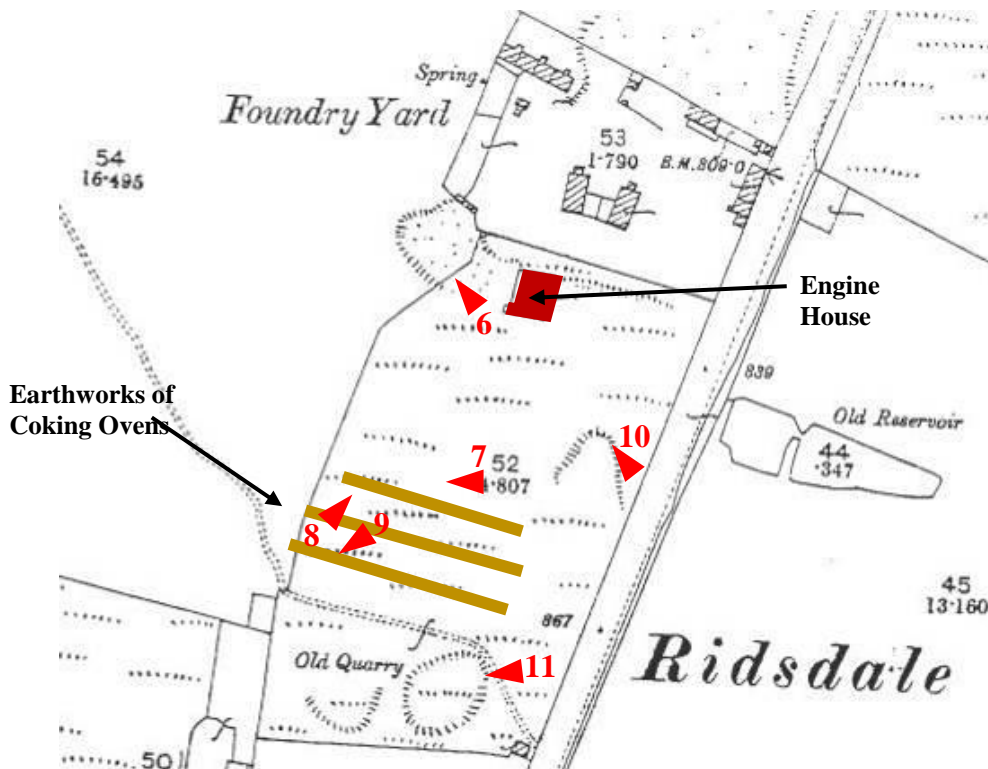


Figure 10: Modern Ordnance Survey of the site of Ridsdale ironworks showing location of plates 6 to 11. Engine House in red.

1. Eastern opening on the south elevation (section 6.7 in MP);
2. Internal junction between southern and longitudinal wall (6.20 in MP);
3. South end of east wall (6.22 in MP)

The problems are described and solutions proposed. They are sensible and sympathetic to the nature of the building, involving limited re-use of fallen materials including voussoirs for 3, where two round arches have partially tumbled.

Other works are minor, involving limited clearance of vegetation from otherwise sound wall heads; limited pointing, addition of core-work to a number of openings and recesses where jambs have been robbed out or have fallen.

Conservation works will not have an adverse impact on the structural nature or significance of the engine house.

8. PLATES



Plate 1: *The engine house from the south-west looking across the turf-covered depression, formerly the boiler house for the steam-powered blowing engines within the house. A square chimney forms the corner of the building.*



Plate 2: *The engine house from the east. Much of the east wall has fallen since the 1970s, exposing in this picture the central longitudinal wall.*



Plate 3: *The engine house from the west, a square chimney forming the south-west corner.*



Plate 4: *Part of the south face of the engine house from the south-east, looking across the former boiler house.*



Plate 5: Looking at the inner face of the north wall of the engine house, the east wall to the right mostly fallen.



Plate 6: Looking north-west across a dump of scoria a little way west of the engine house.



Plate 7: Looking west along the western end of the northern row of coke ovens. 2m scale.



Plate 8: Looking north towards the engine house. Exposed stonework in the foreground lies at the western end of the northern row of coke ovens. 2m scale.



Plate 9: *The middle row of coking ovens. Rabbit burrows.*



Plate 10: *Looking north-west. A waste heap, north of the roasting kilns to the left, the engine house to the right.*



Plate 11: Looking south-west across a substantial quarry, presumably for ironstone, immediately to the north of Armstrong Street.



Plate 12: The eastern end of Armstrong Street, the terraced housing a product of Ridsdale Ironworks.



Plate 13: Looking west beyond the engine house to Corsenside across the Rede.

9. MAPS



Figure 11: A section of Armstrong's Map of the County of Northumberland 1769. The future location of Ridsdale is marked by the red dot (east of the early course of Dere Street).

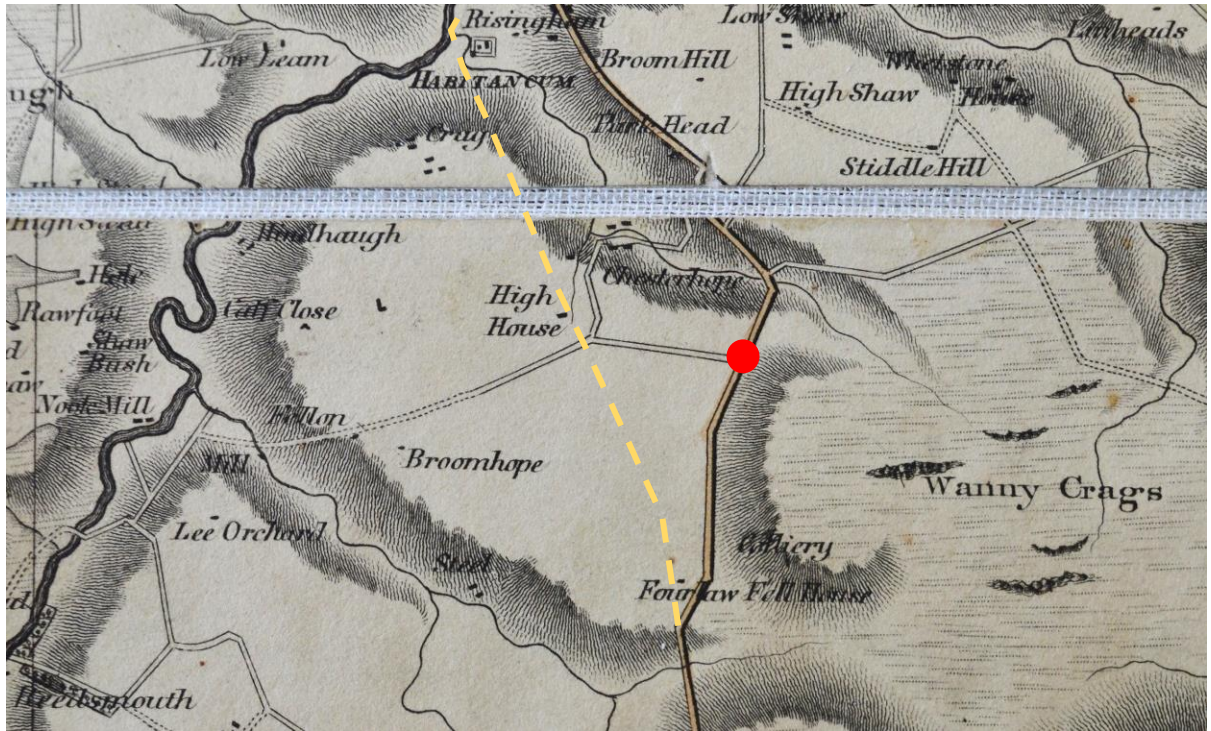


Figure 12: A section of Fryer's Map of the County of Northumberland 1822. By this time, to afford an easier gradient and crossing of the Rede, the early line of Dere Street (annotated in broken line) was diverted to the east. A minor road running west from the new course of Dere Street preceded the construction of a settlement at Ridsdale (marked by red dot) when the map was surveyed.



Figure 13: Part of Greenwood's map of the County of Northumberland 1828. There was still no settlement at Ridsdale (red dot).



Figure 14: First Edition Twenty Five Inches to One Mile Ordnance Survey of Ridsdale (1860). The ironworks is dormant. At the time, Forster was negotiating for funds to re-open the site prior to his premature death the same year. The map shows all the structural components of the works and specifically names the blast furnaces, ore roasting kilns and coke ovens. Also shown are waste heaps and quarries. A reservoir lies to the east of the A68. This supplied water to boilers of steam engines located immediately to the south of the engine house.

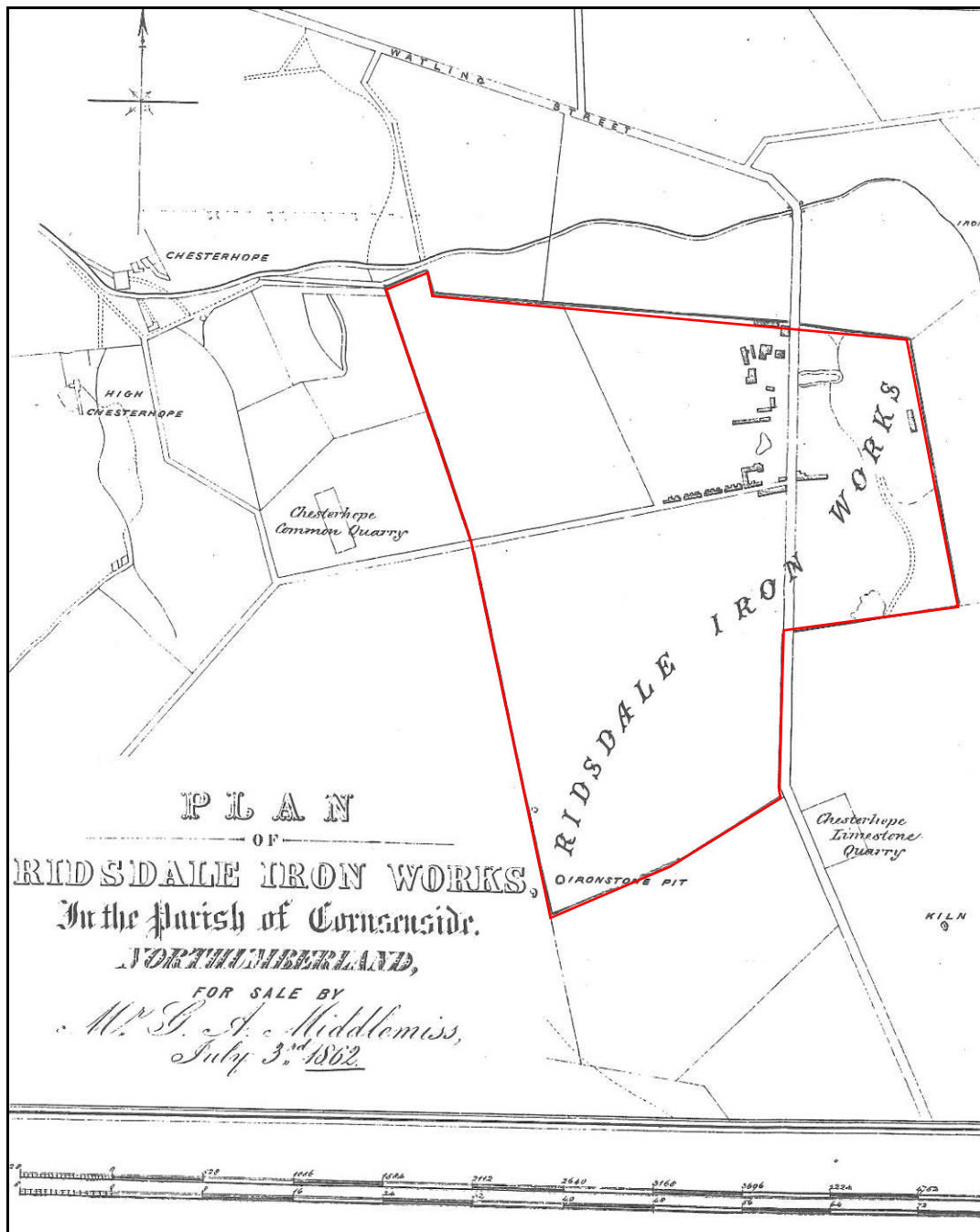


Figure 15: Plan of Ridsdale Iron Works (area of sale bounded by red line) in the Parish of Corsenside, Northumberland. For sale by Mr G A Middlemiss. July 3rd 1862 (NRO 691/6/7). Copy from Dr I Roberts: Record Office map and accompanying sales announcement mislaid.

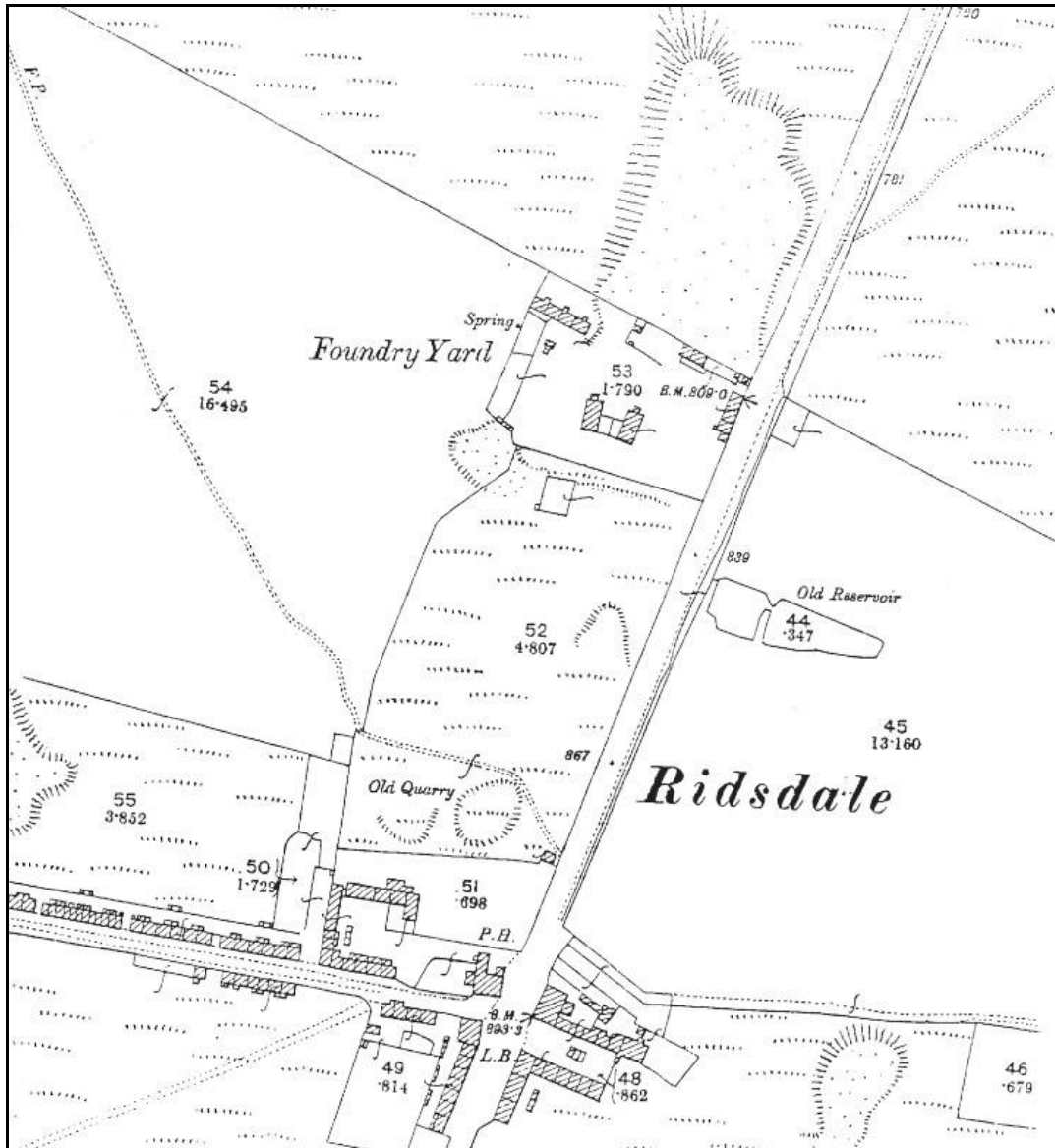


Figure 16: Third Edition Ordnance Survey showing the remains of Ridsdale Ironworks.

10. AERIAL PHOTOGRAPHS

The Historic England Aerial Photographic Archive was accessed for this project. A search located 20 historic photographs covering or including part of the site of the ironworks. These are listed below: For copyright reasons images cannot be currently included in the report.

14 vertical frames:

RAF-106G-UK-627-RP-3022. 10th August 1945
RAF-541-A-442-RS-4402 to 4403. 30th July 1948
RAF-58-2847-F21-0096 to 0098. 11th May 1959
OS-73432-V-196 to 197. 11th September 1973
OS-73484-V-340 to 340 to 341. 18th October 1973

6 specialist oblique frames:

TMG-3887-011 to 012. 16th May 1988
TMG-14750-064 to 067. 13th June 1994

11. PUBLISHED SOURCES

Bell, I.L (1864) Report of the 33rd Meeting (1863) of the British Association for the Advancement of Science

Charlton, D.B (1987) *Upper North Tynedale*

Charlton, R (1980) Redesdale and Vickers in Redewetter (No. 4 1980) 8-15.

Flynn, M W (1962) *Men of Iron: The Crowleys in the early iron industry*

Highley, D.E *et al* (2000) *British Geological Survey Technical report WF/00/5 Northumberland and Tyne and Wear: Resources and Constraints.*

Hoskison, T.M (1947) 'Northumberland blast furnace plants in the nineteenth century' in *Transactions of the Newcomen Society* (vol XXV 1945-47) 73-81.

Linsley, S.M (1978) 'Hareshaw and Ridsdale Ironworks' in *Northumbriana* 12 and 13, 15-17 and 11-14.

Linsley, S.M (2000) 'Ridsdale Ironworks' in Pevsner, N *et al.* *The buildings of England: Northumberland.*

McCord, N and Thompson, R (1998) *The Northern Counties from AD 1000*

Pevsner, N (1992) *The Buildings of England: Northumberland*

Roberts, I.D (1999) 'Ridsdale Ironworks' Appendix 2 in Addyman, J and Fawcett, B *The High Level Bridge and Newcastle Central Station* 136-137.

Roberts, I.D (2000) 'Iron making in Redesdale and North Tynedale in the nineteenth century: The problems of rural exploitation and diversification' in *Northern History* XXXVI, 283-298

Tylecote, R.F (1971) 'Recent research on nineteenth century Northumbrian blast furnace sites' in *Industrial Archaeology* (vol VIII 1971) 341-359.

12. ARCHIVES

The following sources of information have been accessed for the statement:

Historic England:

Scheduling document; Monuments Protection Programme unpublished report; *Iron and Steel Industry Step 3* (1996); Historic England Photographic Archive (aerial photographs) see section 10 of this report.

Northumberland County Council:

HER information; unpublished 'Event' reports: Photogrammetric survey Ridsdale Engine House by Mason Land Surveys Ltd (1995); Building survey of Ridsdale Engine House by Newcastle City Council Archaeology Unit (1997)

Northumberland Archives (Woodhorn):

Ordnance Survey maps;

Unfortunately, NRO, 691/6/7 an annotated copy of the announcement of the sale of Ridsdale Ironworks together with a plan of the works (as mentioned by Roberts (2000, 294, fn.) could not be located by NRO staff.

13. ACKNOWLEDGEMENTS

The writer would like to thank Lydia Speakman of Natural England for providing background information for the description of the engine house and ironworks at Ridsdale and to Dr Ian Roberts for advice on the site and its environs.

APPENDIX 2:

**CONSERVATION OF RIDSDALE ENGINE HOUSE
AND PROVISION OF PERMISSIVE ACCESS**

NY 909 844

(Part of Scheduled Monument No. 1006420)

WRITTEN SCHEME OF INVESTIGATION FOR
ARCHAEOLOGICAL MONITORING
DURING SITE WORKS

July 2017



Prepared for Doonan Architects by:

Alan Williams Archaeology, 216 Wingrove Road
Fenham, Newcastle upon Tyne, NE4 9DD
alanwilliamsarchaeology@gmail.com

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1.2 Conservation of the Engine House

1.3 Formation of Gated Access to the Engine House

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2.2 Access Works (Permissive Gated Path)

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Plate 2: The engine house from the east. Much of the east wall has fallen since the 1970s, exposing in this picture the central longitudinal wall.

Plate 3: The engine house from the west, a square chimney forming the south-west corner.

Plate 4: The roadside wall looking towards the engine house at proposed Location for gated access.

Plate 5: Looking north along the west verge of the A68 with the engine house to the left. Yellow arrow indicates proposed access location and green line approximate line of mown path.

SUMMARY

As part of Natural England's Revitalising Redesdale Scheme, conservation works, and works to enable public access, are to be carried out on the engine house and its environs at Ridsdale, Northumberland. The engine house, one component of a scheduled 19th-century ironworks in the valley of the River Rede is currently entered on the Historic England Heritage at Risk Register. Conservation works to address structural issues have been set out in a management plan prepared by Doonan Architects which also includes a statement of significance for the site and its environs prepared by Alan Williams Archaeology.

The following report forms a written scheme of investigation, setting out the form of archaeological monitoring which will accompany conservation and access works.

1. PROJECT BACKGROUND

1.1 Management Plan for Ridsdale Engine House

In 2017, as one part of the wider Natural England (NE) Revitalising Redesdale scheme, Doonan Architects (DA), acting as advisors to NE, prepared a management plan (MP) for the scheduled Ridsdale engine house. Lying immediately to the north of the settlement of Ridsdale, the engine house, a prominent feature of the local landscape, is one part of the scheduled 19th century ironworks which includes earthwork remains of coke ovens and ore-roasting kilns and extends across properties to the north of the engine house including the listed Furnace House. The broad history of the works is set out in Roberts 1999 and 2000 and in the Statement of Significance (AWA 2016).

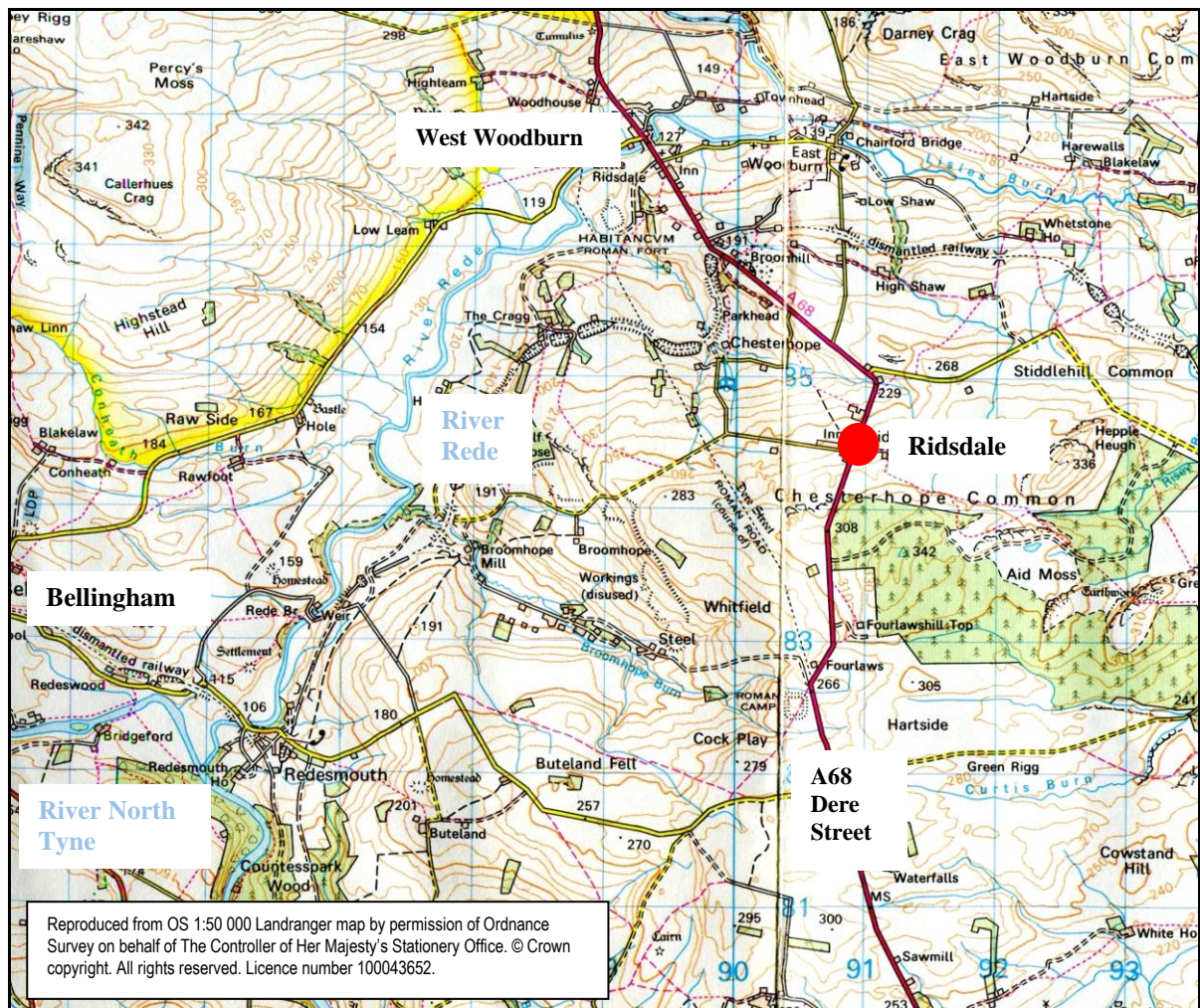


Figure 1: Ridsdale (red dot) on the eastern edge of the valley of the River Rede

The scheduled monument is currently included on the Historic England *Heritage at Risk Register* because of structural concerns over the engine house (classified in the register as: *generally satisfactory but with significant localised problems. Principal vulnerability: collapse; trend: declining*). The MP addresses these structural issues and the longer-term maintenance of the structure as well as ecological issues affecting the management of the building. It also includes a statement of significance for the building and the wider ironworks prepared by Alan Williams Archaeology (AWA 2016).

1.2 Conservation of the Engine House

The MP noted that the engine house remained in reasonable condition, albeit with localised structural issues. Three problem-areas were identified for particular attention (section 6 Defects and Repairs):

1. Eastern opening on the south elevation (section 6.7);
2. Internal junction between southern and longitudinal wall (6.20);
3. South end of west wall (6.22)

In these areas, repairs would be addressed by some re-insertion of fallen facework including voussoirs in area 3, where two round-headed arches have partially tumbled. Other identified conservation issues were relatively minor, including vegetated wall-heads, loss of mortar from facework joints and within areas of exposed corework.

Following review of the MP, DA prepared a schedule of works, specification and drawings (R1 to R9) suitable for conservation builders to tender for works on the engine house. Generic works to be carried out (all located on elevation drawings R2 to R9) include:

- Repointing of stonework;
- Rough raking of joints;
- Deep tamping of existing joints;
- Rebuilding of corework;
- Rebuilding of facework utilising salvaged stone;
- Insertion of new timber lintels;
- Pinning and stitching of fabric

Respectively, the three problem-areas, identified in section 1.2, above, will be addressed by:

1. Tasks A5, A7-9 (Drawings R2 and R8, elevations A and I);
2. Tasks H2-3, I1 and I2 (Drawings R5 and R9, elevations H and O);
3. Task E (Drawings R4 and R8, elevations E and M).

1.3 Formation of Gated Access to the Engine House (Drawing R10)

In addition to conservation works, permissive access to the Engine House will be enabled as a final part of the project. This will involve the installation of a spring-closing wicket gate through the present drystone wall bounding the A68 to the east of the engine house (the site of a currently tumbled area of wall). A mown grass path from this gate will delineate access to the building. The gate will be set in a discrete 'titula' opening, extending marginally west from the current line of the roadside wall and incorporating sufficient space for an interpretation panel. Works will involve:

- Grading of level (by c. 150mm) to provide a smooth transition between higher roadside verge and field;
- Rebuilding of a limited length of the drystone boundary wall on new alignment to incorporate titula opening and wicket gate;
- Provision of hard-standing;
- Installation of wicket gate and interpretation panel.

All works lie within or contiguous to the scheduled monument of Ridsdale Ironworks.

1.4 Scheduled Monument Consent

Application for scheduled monument consent (SMC) is to be made to carry out identified conservation and access works on the engine house at Ridsdale. This document forms a written scheme of investigation (WSI) for the appropriate archaeological monitoring of these works (as per discussions with Historic England) and for the preparation of a report providing the results of the works once completed which would be supplied to Historic England North East as advisors to the Secretary of State. It has been prepared by Alan Williams Archaeology.

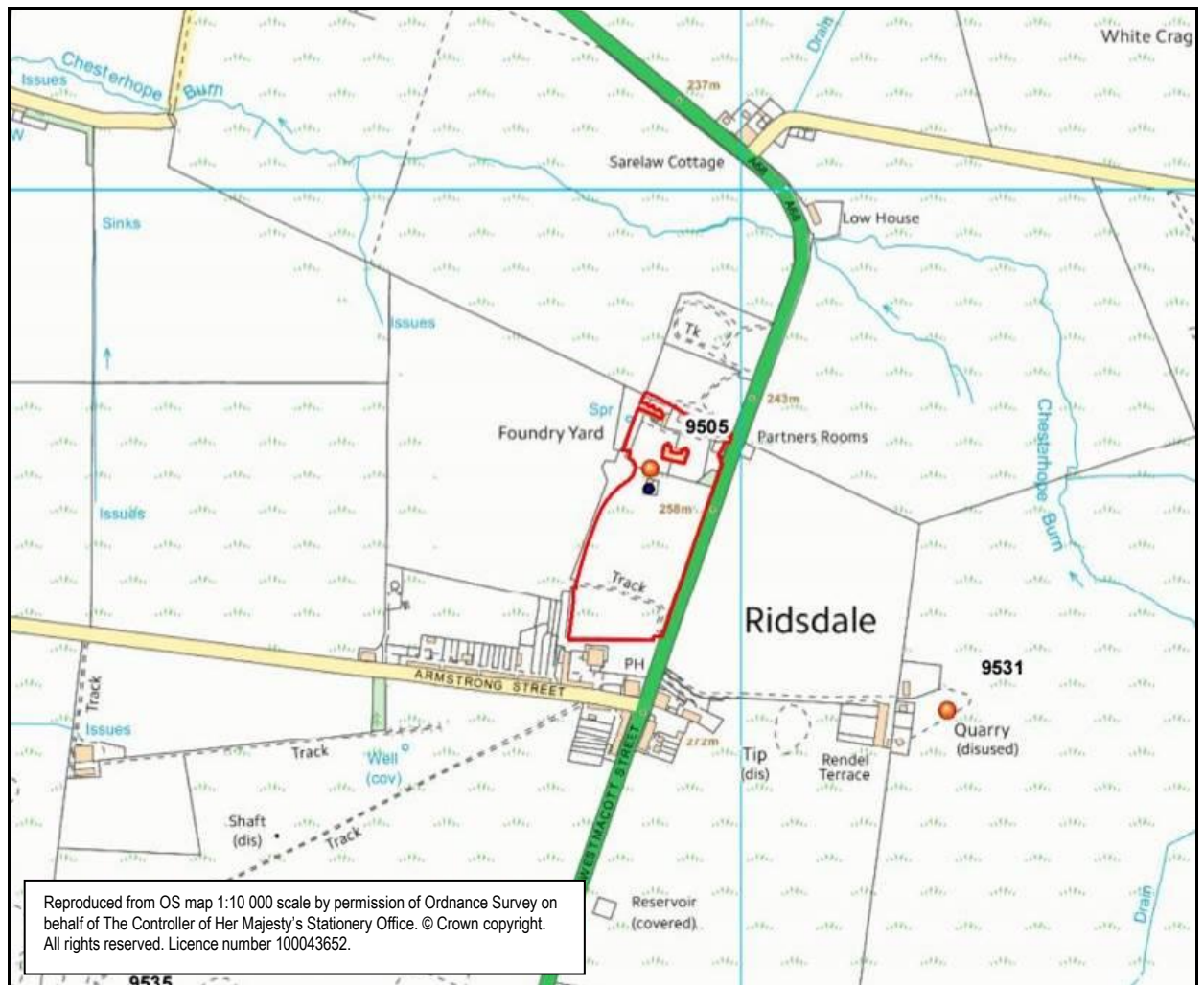


Figure 2: Ridsdale (Armstrong Street and Rendle Terrace) with Ridsdale ironworks (HER 9505) to the north. The scheduled monument is outlined in red.

2. ARCHAEOLOGICAL REQUIREMENT

2.1 Conservation Works on the Engine House

2.1.1 A photographic record of the building will be prepared prior to conservation work starting on the site. This will provide overall views of wall faces and will detail areas where fabric is to be obscured, inserted or replaced;

2.1.2 A continuous archaeological watching-brief will be maintained throughout the duration of works to salvage tumbled stones for rebuilding;

2.1.3 An intermittent archaeological watching-brief will be put in place to monitor general conservation works on the engine house. Liaison will be maintained between the monitoring archaeologist and conservation builder to effectively timetable monitoring input.

2.2 Access Works (Permissive Gated Path)

2.2.1 A photographic record will be prepared prior to access work starting on the site;

2.2.2 A continuous archaeological watching-brief will be maintained throughout the grubbing-out of lower stones from the drystone wall and during grading works between road verge and field. Liaison will be maintained between the monitoring archaeologist and conservation builder to timetable monitoring input.

2.2.3 Gateposts and posts for the interpretation panel will be driven in. No monitoring will be required.

3. ARCHAEOLOGICAL METHODOLOGY

3.1. A photographic, written and, where necessary, drawn record, will be maintained before, during and after conservation and access works have been completed. An appropriate recording system will be maintained. Plans and sections will be produced at 1:10 or 1:20 scale. A digital camera will be used to record all features. The photographic archive will be deposited with Archaeological Data Service (ADS) as a digital archive.

3.2 Pottery, metalwork and animal bone will be retained and located by context. Loose architectural fragments will be treated as small finds and recorded individually.

3.3 Finds of significance will be deposited with the North East Museum (Hancock) Newcastle upon Tyne.

3.4 Specialist Analyses

3.4.1 Although very unlikely on the current project, the potential requirement for specialist analyses is an unavoidable risk in all archaeological work.

3.4.2 On completion of the fieldwork, any samples will be processed and artefacts cleaned, conserved, identified, labelled and packaged. An appropriate programme of analysis and publication of the results will be completed if no further archaeological investigations are to be carried out.

3.5 Archive

3.5.1 A digital archive (photographs) will be retained within the archive/report.

3.5.2 Final drawings will be provided in digital format.

3.6 If appropriate, arrangements will be made to publish the results of the investigations through a local or national journal.

3.7 AWA supports the Online Access to Index of Archaeological Investigations (OASIS). The overall aim of the OASIS project is to provide an online index to the mass of archaeological grey literature that has been produced as a result of the advent of large-scale developer funded fieldwork. The online OASIS form will be completed at <http://ads.ahds.ac.uk/project/oasis/>.

3.8 Site Archive and Report

3.8.1 The site archive will be prepared to the standards specified in the Management of Research Projects in the Historic Environment (MoRPHE), English Heritage, 2006. Archive preparation and deposition will be undertaken with reference to the repository guidelines and standards, and where necessary the Museums and Galleries Commission (MGC), United Kingdom Institute for Conservation (UKIC) standards and guidelines.

3.8.2 An illustrated report will be supplied within 2 months (or shorter period by mutual agreement) on completion of the fieldwork. Copies of the report will be sent to the client, Historic England (one bound and one digital copy in Word or PDF format) and the County Historic Environment Record. The report will contain:

- SMC document
- Non-technical summary
- Introductory statement
- Aims and objectives
- Methodology
- Results
- Any further recommendations
- Index and location of archive
- References and bibliography
- Copy of project design (WSI)

4. HEALTH AND SAFETY

4.1 AWA will comply with the Health and Safety at Work Act and subsequent additions and amendments.

4.2 If the Provisions of Construction, Design and Management (CDM) Regulations 2007 are appropriate the employer will appoint a CDM Coordinator who will prepare a Health and Safety Plan which will be made available to the archaeological contractor prior to the commencement of work.

5. SOURCES

Roberts, I.D (1999) 'Ridsdale Ironworks' Appendix 2 in Addyman, J and Fawcett, B *The High Level Bridge and Newcastle Central Station* 136-137.

Roberts, I.D (2000) 'Iron making in Redesdale and North Tynedale in the nineteenth century: The problems of rural exploitation and diversification' in *Northern History* XXXVI, 283-298

Tylecote, R.F (1971) 'Recent research on nineteenth century Northumbrian blast furnace sites' in *Industrial Archaeology* (vol VIII 1971) 341-359.

Historic England (HE):

Scheduling Document for Monument List No. 1006420

Northumberland County Council (NCC):

HER information; unpublished 'Event' reports (see below)

Newcastle City Council Archaeological Unit (NCCAU):

Building survey of Ridsdale Engine House by Newcastle City Council Archaeology Unit (including photogrammetric survey of Ridsdale Engine House by Mason Land Surveys Ltd. in 1995 (1997).

6. PLATES



Plate 1: *The engine house from the south-west looking across the turf-covered depression, formerly the boiler house for the steam-powered blowing engines within the house. A square chimney forms the corner of the building.*



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Plate 4: *The roadside wall looking north-west towards the engine house at proposed Location for gated access.*



Plate 5: Looking north along the west verge of the A68 with the engine house to the left. Yellow arrow indicates proposed access location and green line approximate line of mown path.

(Plates 4 and 5 courtesy of Lydia Speakman, Natural England).

APPENDIX 1: The Engine House

The engine house is the most prominent structural survival of the ironworks. It was constructed in 1839-40 to hold two steam-powered beam engines which provided the air blast for three furnaces to the north. The substantial rectangular cavity alongside the engine house to the south is the former site of boilers which were supplied with water from the (now dry) reservoir to the east across the A68. Although roofless, floorless - and engineless - and with areas of tumble (most markedly the east wall, which has fallen only since 1985 (NCCAU 1997, 20)), the shell of the building remains substantially complete and intelligible. It is built into ground falling steadily towards it from the south and then sharply from it to the north, forming a footprint 17.5m north-south by 13m east-west with basement, ground and first floor levels and a substantial internal wall dividing the interior longitudinally into two compartments. It is constructed of coursed sandstone-rubble with dressed and tooled quoins and margins to windows. The elevations are fairly symmetrical with round and segmentally-arched openings to the basement and ground floors and square-headed openings above. A partially-rebuilt brick-lined stone chimney sits at the south-west corner of the building. The form and covering of the roof is uncertain.

APPENDIX 2: Previous Work

No archaeological excavation has been carried out at Ridsdale within or beyond the area of the scheduled monument. Photogrammetric survey of the engine house has been carried out on two previous occasions: firstly by Tylecote in 1971, accompanying his description of the site and its environs and secondly, including photogrammetric and rectified photographic survey, by Mason Land Surveys in 1995 as part of a broader conservation scheme, including archaeological recording by Newcastle City Council Archaeology Unit and consolidation of the structure (NCCAU 1997). The drawings produced in 1995 were an 'as found' record and copies then annotated with areas requiring consolidation by Michael Haggie, the project architect. Copies of these drawings have been used in the current project as part of the management plan.

APPENDIX 3: SCHEDULED MONUMENT CONSENT



Historic England

NORTH EAST OFFICE



Mr Tristan Spicer
Doonan Architects
16 Hallstile Bank
Hexham
Northumberland
NE46 3PQ

Direct Dial: 0191-269-1239

Our ref: S00172585

23 August 2017

Dear Mr Spicer

Ancient Monuments and Archaeological Areas Act 1979 (as amended); Section 2 control of works

Application for Scheduled Monument Consent

RIDSDALE IRONWORKS, NORTHUMBERLAND
Scheduled Monument No: SM ND 587, HA 1006420
Our ref: S00172585

Application on behalf of Mr & Mrs Grieves

1. I am directed by the Secretary of State for Digital, Culture, Media & Sport to advise you of the decision regarding your application for Scheduled Monument Consent received 28 July 2017 in respect of proposed works at the above scheduled monument concerning the repair of the existing standing masonry walls of the monument. This will involve re-bedding of the top courses of stone, removal of vegetation, deep tamping, re-pointing, the re-instatement of walling to provide support to masonry above, the salvaging of fallen stone to enable the re-building and a new access gateway through the field wall. The works were detailed in the following documentation submitted by you:

- Kevin Doonan Architects Ltd drawings:
 - 1139 R1 Repair Works_Plan
 - 1139 R1 Repair Works_Elevations A and B
 - 1139 R1 Repair Works_Elevations C and D
 - 1139 R1 Repair Works_Elevations E and F
 - 1139 R1 Repair Works_Elevations G and H
 - 1139 R1 Repair Works_Elevations J, I and N
 - 1139 R1 Repair Works_Elevations K and L
 - 1139 R1 Repair Works_Elevations M
 - 1139 R1 Repair Works_Elevations O
 - 1139 R1 Repair Works_New Access



BESSIE SURTEES HOUSE 41-44 SANDHILL NEWCASTLE-UPON-TYNE NE1 3JF

Telephone 0191 269 1255
HistoricEngland.org.uk



Historic England is subject to the Freedom of Information Act 2000 (FOIA) and Environmental Information Regulations 2004 (EIR). All information held by the organisation will be accessible in response to an information request, unless one of the exemptions in the FOIA or EIR applies.

Historic England will use the information provided by you to evaluate your application for Scheduled Monument Consent. Information contained in this application and any information obtained from other sources will be retained in all cases in hard copy form and/or on computer for administration purposes and future consideration where applicable.



Historic England

NORTH EAST OFFICE

- Kevin Doonan Architects Ltd documents:
 - Management Plan: Repair and Consolidation of Ridsdale Ironworks - December 2016
 - Preliminaries - April 2017
 - Specification - April 2017
 - Schedule of Works Rev 1 - March 2017
- Alan Williams Archaeology document:
 - Conservation of Ridsdale Engine House and Provision of Permissive Access Written Scheme of Investigation for Archaeological Monitoring during Site Works - July 2017

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 Historic England 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 (Historic England) before deciding whether or not to grant Scheduled Monument Consent. Historic England considers the effect of the proposed works upon the monument to be beneficial for the preservation of the monument, with arrangements for necessary archaeological 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 Historic England. 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 Ms. Lee McFarlane, Inspector of Ancient Monuments, Historic England, Bessie Surtees House, 41-44 Sandhill, Newcastle, NE1 3JF; 0191-269-1239; lee.mcfarlane@HistoricEngland.org.uk, in order that an Historic England representative can inspect and advise on the works and their effect in compliance with this consent.
- (b) The specification of work for which consent is granted shall be executed in full.
- (c) All those involved in the implementation of the works granted by this consent



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Historic England will use the information provided by you to evaluate your application for Scheduled Monument Consent. Information contained in this application and any information obtained from other sources will be retained in all cases in hard copy form and/or on computer for administration purposes and future consideration where applicable.

NORTH EAST OFFICE

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.

- (d) 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.
- (e) The agreed archaeological works to which this consent relates shall be carried out only by Alan Williams Archaeology and his/her nominated excavation team.
- (f) The archaeological written scheme of investigation (including analysis, post-excavation and publication proposals) for which consent is granted shall be executed in full, unless variations have been agreed under the terms of condition 1.
- (g) A report on the archaeological recording shall be sent to the Northumberland Historic Environment Record and to Lee McFarlane at Historic England within 3 months of the completion of the works (or such other period as may be mutually agreed).
- (h) The contractor shall complete and submit an entry on OASIS (On-line Access to the Index of Archaeological Investigations - <http://oasis.ac.uk/england/>) prior to project completion, and shall deposit any digital project report with the Archaeology Data Service, via the OASIS form, upon completion.

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



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Historic England is subject to the Freedom of Information Act 2000 (FOIA) and Environmental Information Regulations 2004 (EIR). All information held by the organisation will be accessible in response to an information request, unless one of the exemptions in the FOIA or EIR applies.

Historic England will use the information provided by you to evaluate your application for Scheduled Monument Consent. Information contained in this application and any information obtained from other sources will be retained in all cases in hard copy form and/or on computer for administration purposes and future consideration where applicable.



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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 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

Lee McFarlane

Inspector of Ancient Monuments

E-mail: lee.mcfarlane@HistoricEngland.org.uk

For and on behalf of the Secretary of State for Digital, Culture, Media and Sport

cc: Mrs Karen Derham, Assistant County Archaeologist, Northumberland County Council



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