

SALTHOUSE ROAD, BARROW-IN-FURNESS, CUMBRIA

Archaeological Recording



Client: Esh Group

NGR: 320426 468803

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Non-Technical Summary

Greenlane Archaeology recorded a brick-built flue, which was broken into during work to upgrade services at Salthouse Road, Barrow-in-Furness, where it meets Rawlinson Street, on the 3rd May 2017. The area was entirely undeveloped agricultural land on the edge of what was to become Barrow-in-Furness until the middle of the 19th century, when the arrival of the railway a short distance from the site heralded the beginning of the development of the modern town. The flue was probably built in the mid-to-late 19th century; it would have passed beneath Salthouse Road, and the point where it was broken into is close to the location of a chimney recorded in the area, which was built between in the late 19th century, probably 1864, and vented the forges and foundries in the Furness Railway's engineering works on the opposite side of Salthouse Road.

As it was not possible to safely enter the flue, a record was made from the surface at the point where the flue had been newly opened. Some internal measurements and a video of the inside of the flue were made available by staff from Andidrain Limited, who were carrying out a CCTV pipe survey at the time of the archaeological recording. The flue was oval-shaped in section and measured c1.45 by c1.9m internally and was generally intact. The CCTV survey also allowed the approximate route of the flue to be traced on the surface and across Salthouse Road, by tracking their remote controlled camera. The video showed various details internally, including a change in the brickwork approximately 30m from the opening and an overhead opening near a blockage to the south side of Salthouse Road.

The recording provided an opportunity to examine this otherwise invisible piece of the wider industrial complex forming the railway engineering works.

Acknowledgements

Greenlane Archaeology would like to thank Esh Group for commissioning the project, and in particular Andy Biggs, Paul Hinton, Paul Lovell, and Gareth Dawson. Thanks are also due to Andidrain for their assistance on site, in particular Jimmy Young.

The project was carried out and this report was written by Tom Mace and Dan Elsworth. The illustrations were produced by Tom Mace and the report was edited by Jo Dawson. Dan Elsworth managed the project.

1. Introduction

1.1 Circumstances of the Project

1.1.1 During work to upgrade services at Salthouse Road, Barrow-in-Furness, Cumbria (NGR 320426 468803), where it meets Rawlinson Street, a brick-built flue was broken into. Following a request by the Historic Environment Service at Cumbria County Council for a record of this to be made, Greenlane Archaeology was commissioned by Esh Group (hereafter 'the client') to carry out the work, which was undertaken on the 3rd May 2017.

1.2 Location, Geology, and Topography

1.2.1 The site is at the junction of Rawlinson Street and Salthouse Road at approximately 6.5m above sea level (Ordnance Survey 2005). It lies within the urban area of Barrow-in-Furness on the north side of Cavendish Docks on the edge of Walney Channel (Figure 1).

1.2.2 Barrow-in-Furness is largely situated on an area of red Sherwood sandstone of St Bees type, but there is a large area of Carboniferous limestone to the north-east (Moseley 1978, plate 1). The overlying drift deposits comprise glacial material such as boulder clay, which forms a hummocky rolling landscape outside the urban area (Countryside Commission 1998, 27).

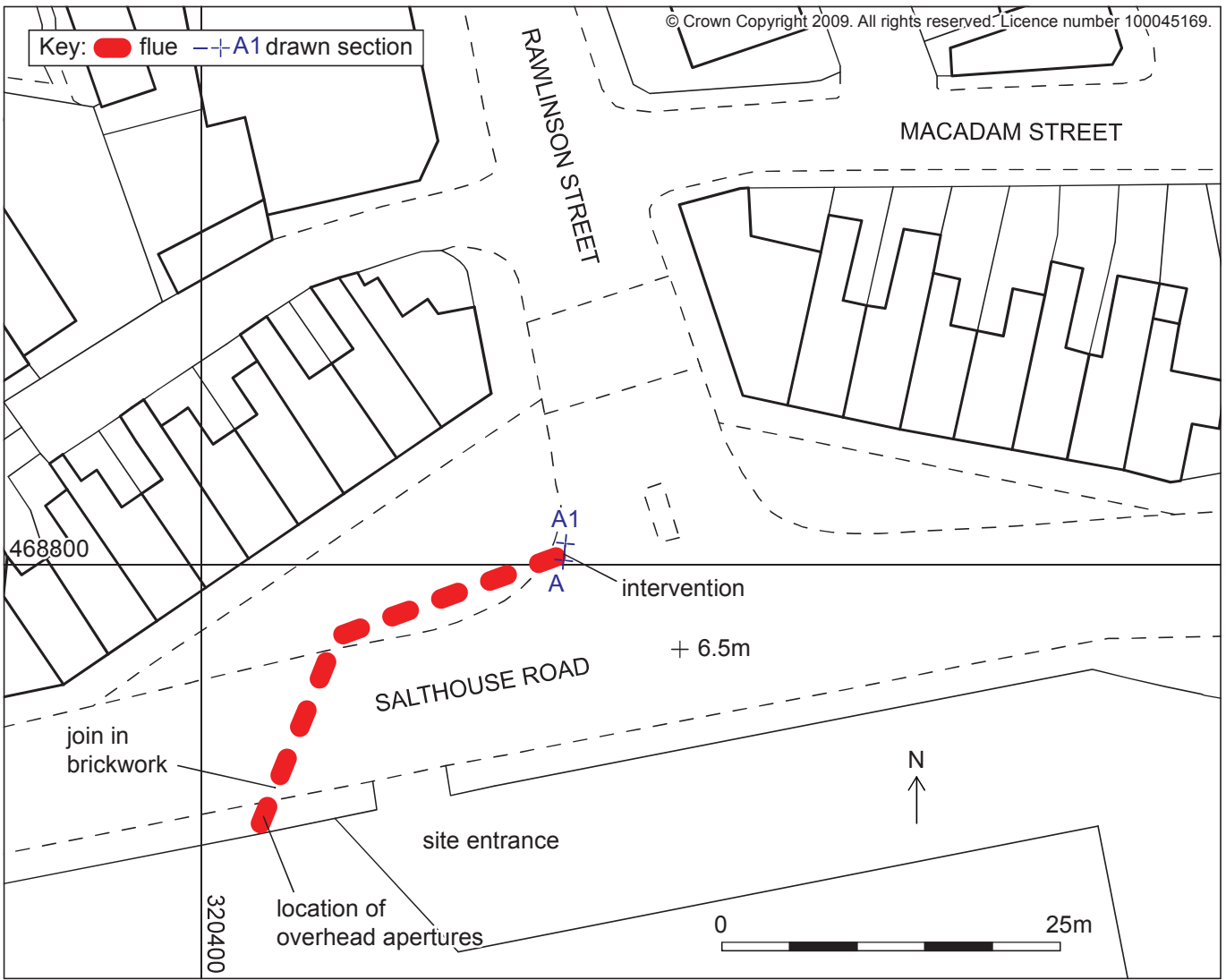
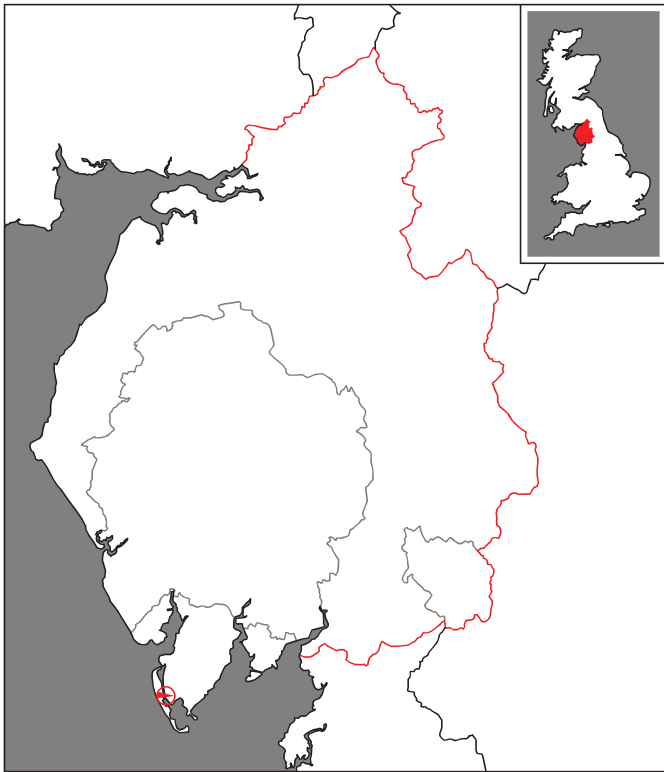


Figure 1: Site location

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2. Methodology

2.1 Desk-based Assessment

2.1.1 The site background is based on an earlier desk-based assessment carried out prior to the demolition of a group of buildings at Davey's Yard, Salthouse Road, Barrow-in-Furness, Cumbria (NGR 320432 468751), which formed part of the Furness Railway's engineering works (Greenlane Archaeology 2010; 2015). This principally comprised an examination of early maps of the site and published secondary sources.

2.2 Archaeological Recording

2.2.1 It was not possible to safely access the flue, so a record was made from the surface of the point where the flue had been breached. Video of the inside of the flue was provided by Andidrain Limited and screenshots from this video are included here. The course of the flue was marked on the surface by Andidrain Limited by tracking their remote-controlled camera and this was plotted by Greenlane Archaeology using a Total Station. All aspects of the archaeological recording were carried out according to the standards and guidance of the Chartered Institute for Archaeologists (CIfA 2014) and Greenlane Archaeology's own excavation manual (2007). All of the features exposed were recorded in the following manner:

- **Written record:** descriptive records were made using Greenlane Archaeology *pro forma* record sheets;
- **Photographs:** photographs in both 35mm colour print and colour digital format were taken of all archaeological features uncovered during the archaeological recording and included in this report. A written record of all of the photographs was also made using Greenlane Archaeology *pro forma* record sheets;
- **Instrument survey:** points along the surface, which were marked by Andidrain Limited, showing the approximate centreline of the flue, were surveyed using a Leica reflectorless total station;
- **Drawings:** a measured sketch section was drawn by hand on site at a scale of 1:20.

2.3 Finds and Environmental Samples

2.3.1 No finds were recovered and no environmental samples were taken as no appropriate deposits were encountered.

2.4 Archive

2.4.1 A comprehensive archive of the project has been produced in accordance with the project design and current CIfA and English Heritage guidelines (Brown 2007; English Heritage 1991). The paper and digital archive and a copy of this report will be deposited in the Cumbria Archive Centre in Barrow-in-Furness (CAC(B)) on completion of the project. A digital copy of this report will be provided for the Historic Environment Service at Cumbria County Council for inclusion in the Historic Environment Record. In addition, a paper copy will be provided to the client if requested and one will be retained by Greenlane Archaeology. A digital record of the project will also be made on the *Online Access to the Index of Archaeological Investigations* (OASIS) scheme.

3. Site History

3.1 Map and Image Regression

3.1.1 **Introduction:** although there are early, typically county-wide, maps that include the area, they are generally very small scale and so the first useful maps of the area do not appear until the mid-19th century. As a result, it is only maps from that date onwards that are discussed below. In each case the approximate route of the flue is marked with a dashed red line.

3.1.2 **Ordnance Survey 1851:** this map (Plate 1) shows the location of the engine house near Barrow Station, prior to the construction of Salthouse Road. There are no structures shown which obviously relate to the flue.

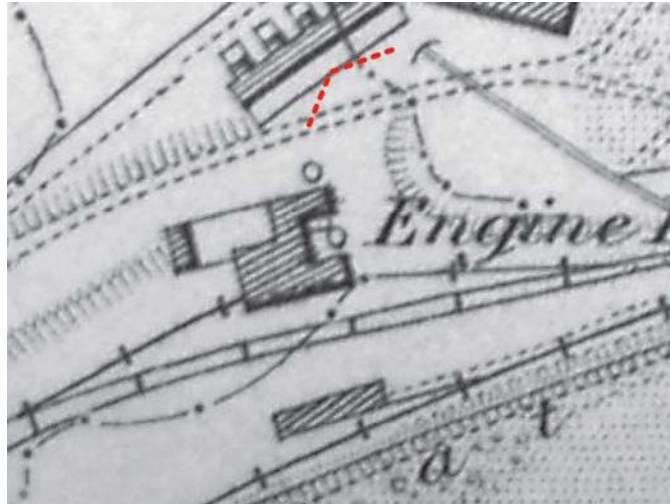


Plate 1: Ordnance Survey map 1851

3.1.3 **Ordnance Survey c1873:** the flue passes from a chimney to the north side of Salthouse Road to the 'Furness Railway Company's Works' to the south (Plate 2; Plate 3; Plate 4).

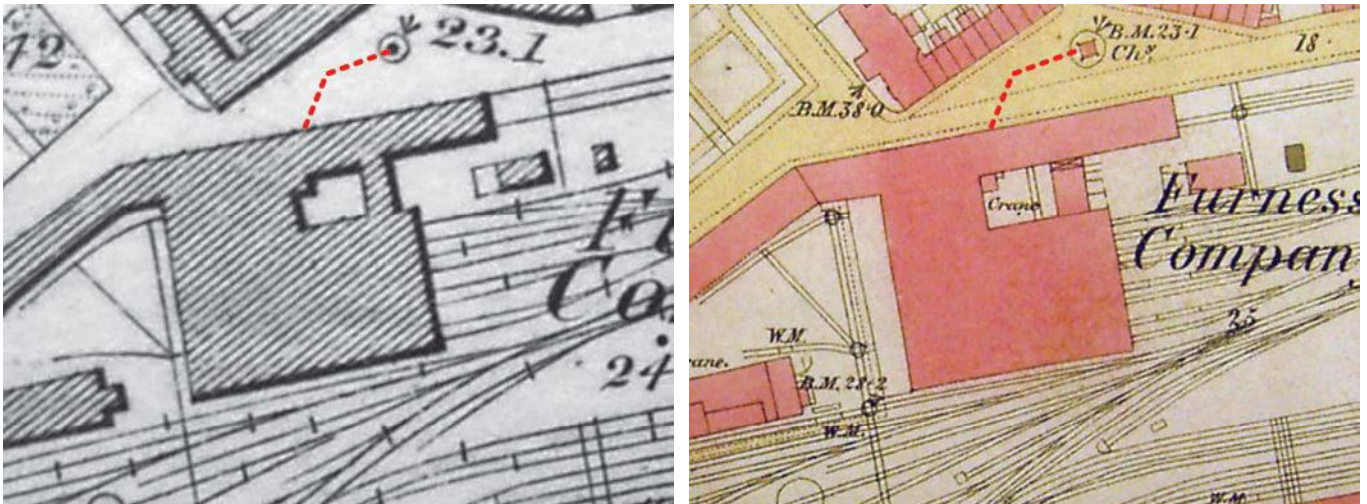


Plate 2 (left): Ordnance Survey 1:10,560 map c1873

Plate 3 (right): Ordnance Survey 1:2,500 map c1873

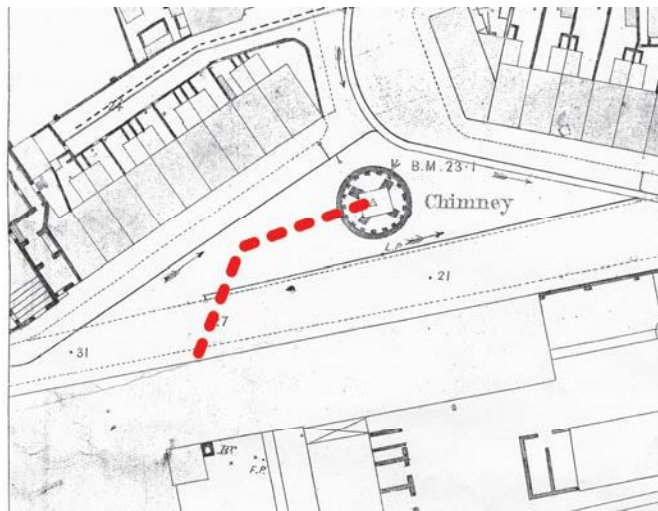


Plate 4: Ordnance Survey 1:500 map c1873

3.1.4 **Undated illustration (CAC(B) LC 260 260 CY SAL 1 nd)**: this picture shows the view of the chimney from the west-south-west; although undated it appears likely to be 19th century given the lack of traffic (Plate 5). The view is looking along Salthouse Road from the south-west, with the viewer stood at approximately the corner of School Street where it meets Salthouse Road. The near building on the left is the school, with the perspective emphasising the closeness of the chimney to that structure, with the buildings at the junction of Rawlinson Street and Salthouse Road visible behind.

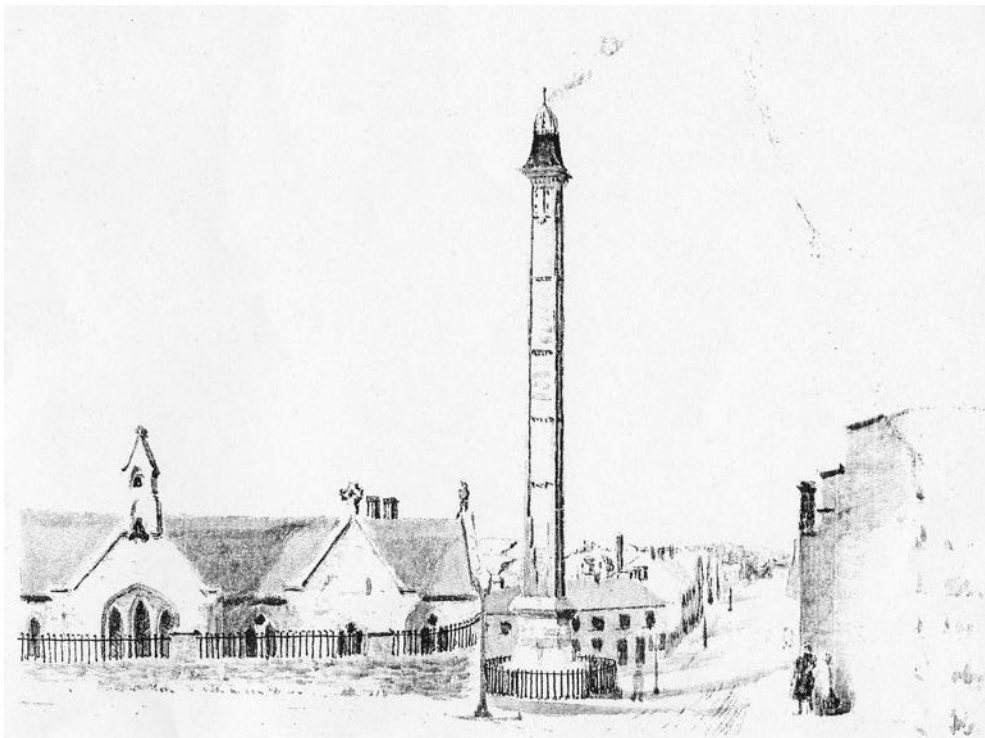


Plate 5: Undated view of the chimney from the south-west, at the junction of School Street and Salthouse Road

3.1.5 **Ordnance Survey 1891**: the chimney, possibly marking the end of the flue, is still shown on this map (Plate 6). Tramlines now pass above it.

3.1.6 **Map from the Iron and Steel Institute, Barrow Meeting, September 1903**: this map shows that the block immediately adjacent to Salthouse Road at this point was a smithy (Plate 7).

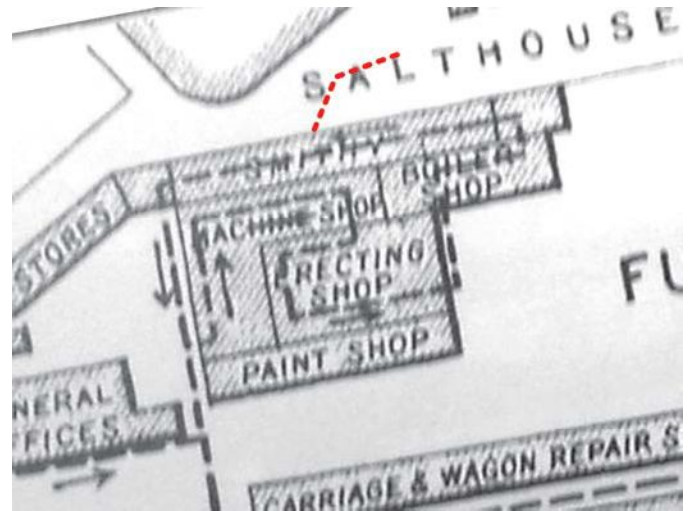
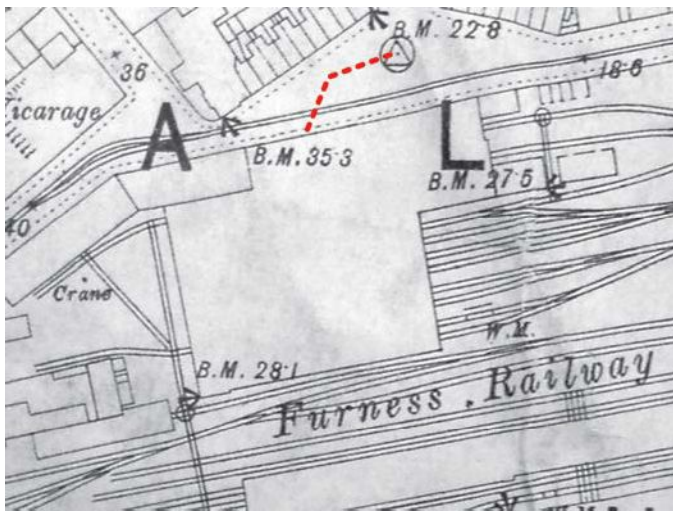


Plate 6 (left): Ordnance Survey map 1891

Plate 7 (right): Iron and Steel Institute, Barrow Meeting, map 1903 (after Andrews 2003, 75)

3.1.7 **Ordnance Survey 1911:** the area around the flue is essentially unchanged (Plate 8).

3.1.8 **Photograph of the Furness Railway Company Engineering Works c1920:** the chimney is clearly visible in this photograph from c1920 (Plate 9). Nothing else is obviously connected with the flue.

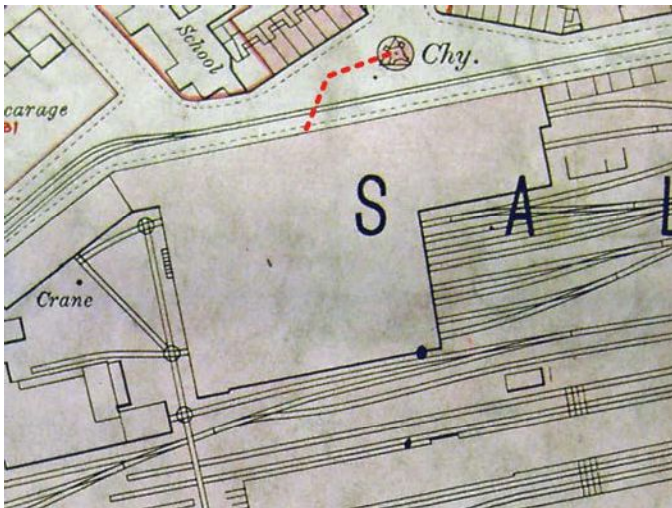


Plate 8 (right): Ordnance Survey map 1911

Plate 9 (right): The Furness Railway Company Engineering Works, c1920 (after Andrews 2003, 35)

3.1.9 **Ordnance Survey 1933:** this map shows the same information as the 1911 edition (Plate 9; cf. Plate 8).

3.1.10 **Barrow Air Raid Precautions (A.R.P.) plan 1939 (BT/BR 1/8 Bundle 5 BW 12/39 1939):** this plan shows that all of the buildings that were formerly part of the engineering works to the south side of Salthouse Road were out of use by this date as although the function of each part of the building is marked the word 'disused' also appears in brackets underneath in each case (Plate 11).

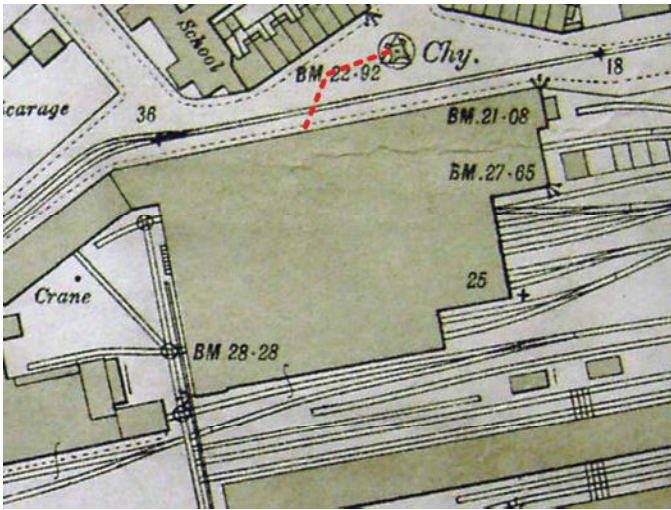


Plate 10 (left): Ordnance Survey map 1933

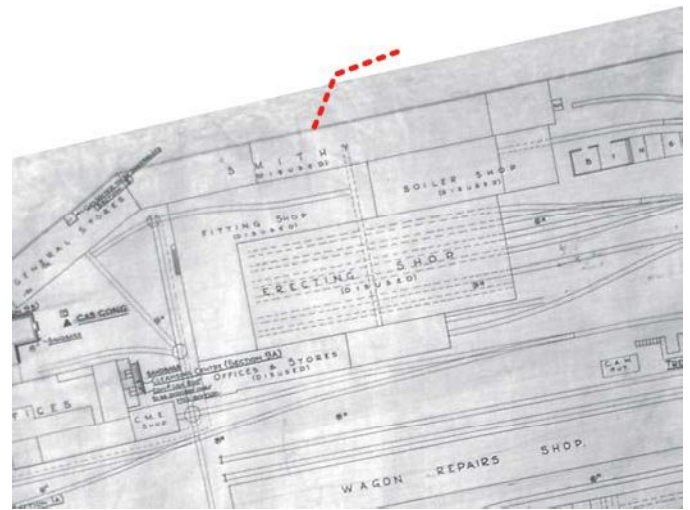


Plate 11 (right): Barrow Air Raid Precautions (A.R.P.) map, 1939

3.1.11 **Plan of Buildings – 1940 (BTBR/Bundle 10/BW 44-40 1940)**: the internal divisions of the offices and stores of the engineering works are shown but the chimney to the north side of Salthouse Road is no longer shown (Plate 12).

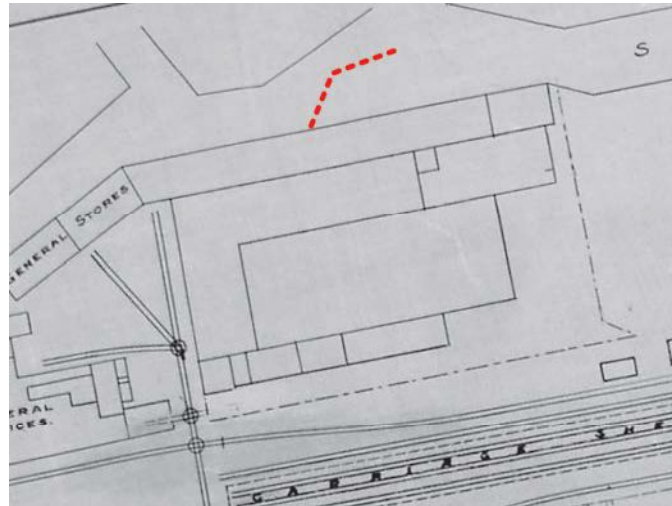


Plate 12: Internal divisions of the buildings, 1940

3.1.12 **Undated and untitled plan of the Barrow works c1950 (BT/BR/Bundle 1/16-38 c1950)**: in c1950 the whole block formerly forming the engineering works is occupied by 'Messrs. Roberts, Davy & Co' (Plate 13). The chimney is not shown.

3.1.13 **Proposed District Engineer's Workshops and Stores 1953 (BTBR/Bundle 4/BW 47/53 1953)**: this plan shows the same as the c1950 plan (Plate 14; cf. Plate 13).

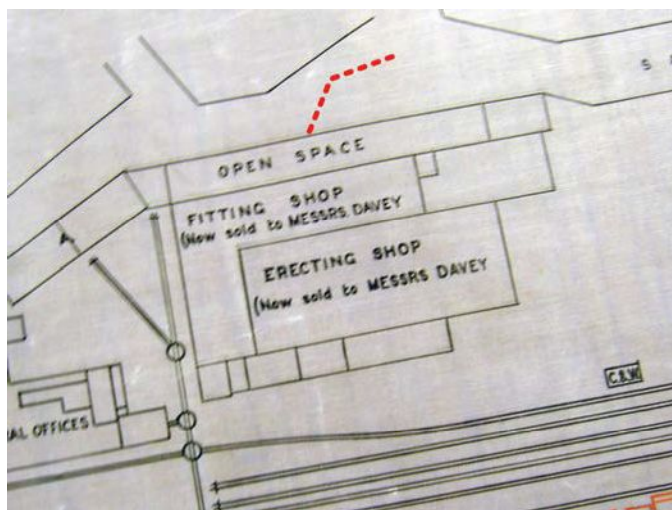
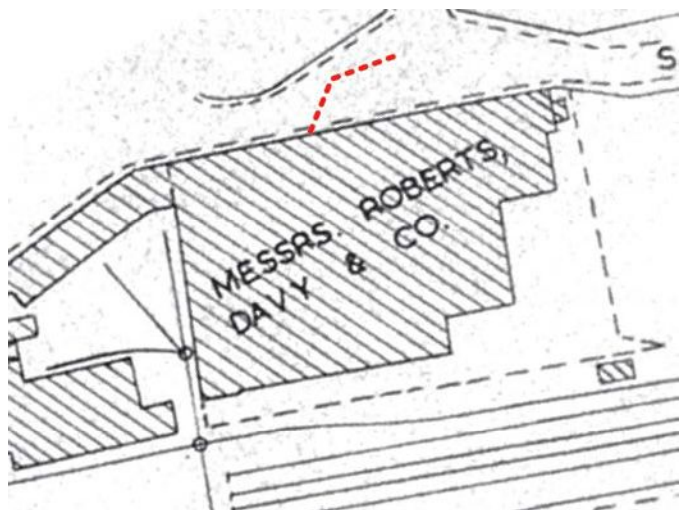


Plate 13 (left): Plan of the site, c1950

Plate 14 (right): Plan of the workshops, 1953

3.2 Background History

3.2.1 The site is to the south-west of the hamlet of Salthouse, south of the original village of Barrow. Until the middle of the 19th century the area was entirely undeveloped agricultural land on the edge of what was to become Barrow-in-Furness, but this changed in 1846 with the coming of the railway linking the iron mines of Dalton and the slate quarries at Kirkby-in-Furness with the port at Barrow (Battye and Peascod 1996, 41). Crucially for Salthouse on January 16th 1846 the directors of the railway company 'decided upon the erection of a small colony of cottages at Salthouse... Ten small cottages were to be built "as cheaply as possible"' for the accommodation of the railway employees and labourers (*op cit*, 182; although Pollard and Marshall (1953, 115) state that the railway colony was established in 1849). At around the same time they also decided to build an engine shed and smith's shop nearby at a cost of £1,000 (*ibid*). This building is shown on the first Ordnance Survey map and marked 'Engine House' (Plate 1).

3.2.2 After the completion of the original terminus station, associated engine shed, and workers' cottages in 1846-1847 it was not until the 1850s that the site was remodelled. There is conflicting information about the development at this stage, although the most recent and comprehensive survey of the Furness Railway states that its general offices, which stood in front the engineering works to the west facing onto the Strand, were built to the designs of Edward G Paley, more famously later part of Sharpe, Paley and Austin of Lancaster, in stages between 1855 and 1857 (Andrews 2012, 23). The associated area, known as 'The Strand', contained a number of notable commercial and architecturally important buildings (CCC and EH c2002, 9) including those associated with the railway and on which their development had depended. The cartographic evidence shows that the area saw considerable development from the mid to late 19th century which continued into the 20th century (see *Section 3.1* above). The Furness Railway Company was amalgamated with the London Midland and Scottish Railway (LMSR) in 1923, which may have led to the closure of the works at Barrow as such activities were centralised at four main sites, which did not include Barrow (Norman 1994). Certainly by 1939 the buildings are shown as disused (see *Section 3.1.10* above) and elements seem to have been demolished by at least the 1950s.

3.2.3 As is apparent from the map regression the flue clearly connects to a large chimney that formerly stood at the junction of Salthouse Road and Rawlinson Street and formed part of the railway engineering works. There are a number of accounts of the works contemporary with its period of operation, the full extracts of which are reproduced in *Appendix 1*, which mention the chimney. It is evident that it acted as a vent for a range of forges and workshops within the works, although it is not clear from these accounts if it was fed by only one flue or several. The chimney was apparently constructed with bricks supplied by Messrs Woodhouse, Son and Andrews at the Lancashire Brick and Tile Works on Walney Road

(according to a letter by a Mr McGrady in an undated newspaper cutting held by the client). Despite the closure of the engineering works in 1923 it was apparently repaired in 1926 by H Pankhurst and Sons of Edmonton, London (according to an undated newspaper article held by the client) and it stood until 1938 (CAC(B) LC 206 260 CY SAL 1 nd), at which point it was demolished brick by brick through March and April.

3.3 Conclusion

3.3.1 It is evident from the cartographic sources that the area first saw extensive development in the mid-19th century. There is nothing obviously connected with the flue on the 1851 edition of the Ordnance Survey map. The intervention is approximately where a chimney is marked after the construction of Salthouse Road, between 1851 and 1873. The flue would have passed underneath Salthouse Road and evidently connected with the Furness Railway Company's Works on the south side of the road, the nearest building of which is marked as a smithy in 1903. The closure of the works in 1923 did not lead to the immediate demolition of structures; the chimney was clearly still standing in 1933 but was demolished in 1938.

4. Archaeological Recording

4.1 Introduction

4.1.1 As noted in the methodology, it was not possible to safely enter the flue (see *Section 2.2.1*). The point where it had been opened was also partially obscured by shuttering, which had been put in place to prevent the sides of the excavation from collapsing. Fortunately, it was possible to record some internal details from measurements and video footage provided by Andidrain Limited, who were undertaking a CCTV pipe survey at the time of the archaeological recording.

4.2 Results

4.2.1 **Surface record:** the flue was below a layer of mid-brown gravelly rubble, c0.25m thick, below the tarmac, which was 0.1m thick (Plate 15 and Plate 16). The outside of the flue was three courses thick of mostly unfrogged, handmade, reddish-orange brick, each of which measured c0.235m by 0.115m by 0.075m (9¼" by 4.5" by 3"). The sides then were 0.4m thick and the base was filled with rubble at the point where it had been opened.



Plate 15 (left): General view of the section through the flue from street level

Plate 16 (right): Detailed view of the section through the flue from street level

4.2.2 **Internal record:** internally the culvert was clear for at least 32m, curving round and passing beneath Salthouse Road (Figure 1). It was oval-shaped in section and internally it measured 1.45m across and had a maximum height of 1.9m (Plate 17; Figure 2). At around 29m to 30m in from the point where it had been broken into there was a clear join in the brickwork (Plate 18 and Plate 19) and at slightly over 32m there was at least one overhead opening (Plate 20), possibly a manhole or ventilation shaft. The end to the south side of Salthouse Road was blocked with rubble (Plate 21).



Plate 17: General view inside the flue



Plate 18 (left): General view of the join in the brickwork

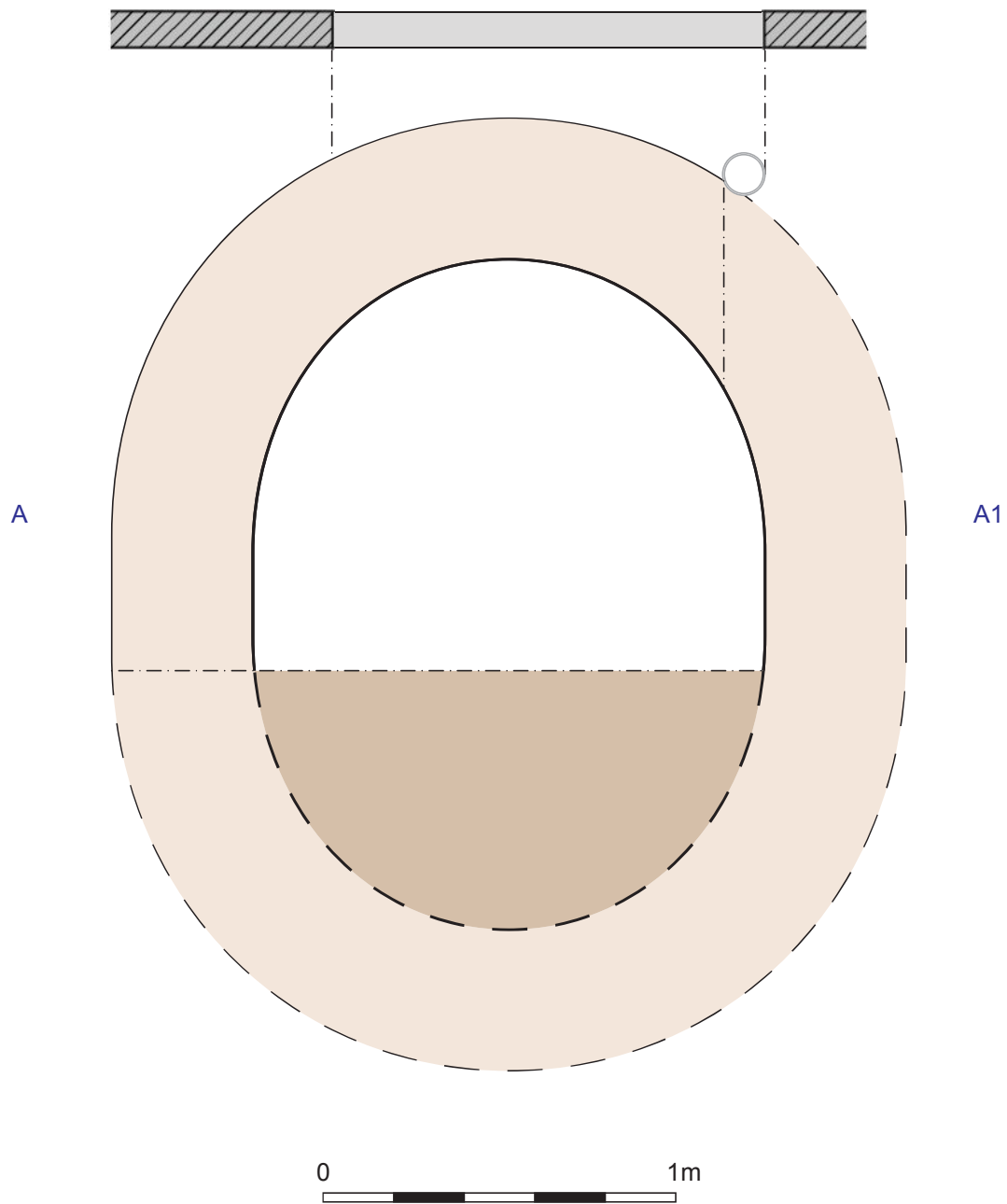
Plate 19 (right): Detailed view of the join in the brickwork



Plate 20 (left): General view of overhead apertures at the south-west end of the flue

Plate 21 (right): View of the blockage at the south-west end of the flue

CROSS-SECTION A-A1 THROUGH THE FLUE



Key: ○ service pipe --- edge uncertain - - - limit of excavation
■ sawn through tarmac ▨ tarmac in place ■ brick ■ rubble

Figure 2: Cross-section A-A1 through the flue

5. Discussion

5.1 Introduction

5.1.1 While the recording of the flue from the surface was very limited it was able to demonstrate the method of construction, the materials used, and depth of the structure below the present ground surface. In addition, the camera inspection allowed further information to be acquired and, although it was not possible to survey this in detail, it was also possible to use this information to locate a number of structural elements within the flue.

5.2 Discussion

5.2.1 The flue was evidently built in the mid-to-late 19th century to serve the buildings at the Furness Railway's engineering works. These were completed in 1864, albeit on the site of an earlier railway terminus, and it seems likely that the culvert belongs to this initial phase. The style of the bricks, although not possible to date accurately in their own right, are suggestive of a relatively early date since they typically had no frog. This would normally indicate a date before the middle of the 19th century, but slightly later examples are known on other structures in Barrow that are known to have been constructed in the 1860s (Greenlane Archaeology 2007). The bricks were apparently supplied by Messrs Woodhouse Son and Andrews, although they are very similar in style to those produced by a better known local brick maker, William Gradwell, who was involved in most of the major building projects in the town in this period and had close connections to the 'syndicate' of businessmen that essentially controlled Barrow's development in the later 19th century (Trescaheric 1985, 61-64) who is recorded as having constructed a shed at the engineering works in 1875 (Wignall 1982, 16). The culvert was clearly connected to a massive chimney that formerly stood on an island in the junction between Rawlinson Street and Salthouse Road and connected to the engineering works after passing beneath Salthouse Road. The various documentary sources describe how the chimney vented the numerous forges and foundries that operated within the engineering works; it is possible that there was more than one flue of this type, but this is not confirmed by any of the available sources. The engineering works were certainly disused by 1939 and may have gone out of operation as early as 1923, while the chimney was demolished in 1938. The blockage at the south end of the flue presumably dates to this period or later.

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Appendix 1: Contemporary Descriptions of the Furness Railway Company Engineering Works

(information specifically relating to the chimney is highlighted in bold)

Leach 1872, 47-50

The head quarters and general offices of the Railway Company are at the east end of the Strand, and occupy a large and commodious structure built of red sandstone and pleasantly situated in a court yard, on one side of which there is a beautiful green lawn running from the level of the yard to the roadway, which is considerably higher, and on the other side is a verandah extending from the time-keeper's office at the entrance gates to the company's works. The offices, which have a frontage of 260 feet, present an imposing appearance. The entrance hall is situate almost in the centre of building, and is surmounted by a large clock, which is illuminated every evening. To the right of the entrance on the ground floor is the audit office, in which there is accommodation for thirty clerks. Immediately behind this are the stationery store, and further back still are the general stores for all classes of small articles used by the company in the several mechanical departments. This store is 80 feet by 50 feet. To the left of the entrance hall is the secretary's and traffic manager's department, the permanent way inspector's office, and the men's pay office. On the first floor in the offices over the audit department are the managing director's room and the board room; above the stationary and general stores are the accountant's and pay clerk's offices; the room above the secretary's offices and permanent way stores is occupied by the managing director's correspondent, lavatories, offices, safes, and storing rooms, and at the extreme end are the resident engineer's office and drawing offices. Every preparation is made in the case of fire – rows of buckets are kept under the principal entrance to the works, and new patent fire extinguishers are placed in different parts of the premises. The offices and stores are heated by hot water apparatus. Behind the offices is a large yard, extending to the fitting shops, which is used for locomotive stores, wheels, axles, &c. Commencing at the north-west corner of the works, there are store for keys, spikes, bolts, &c., beyond these are the stables, and still further on the permanent way stores for signals, lamps, and other appliances for the main line. Then there is the blacksmiths' shop, a spacious floor 310 feet long by 40 feet wide, and of more than ordinary height. This is fitted up with twenty fires blown by a steam fan. **Each fire communicates with a large iron flue which is connected with the lofty chimney-shaft in the square in Salthouse-road.** Here there is also a large steam hammer and a shearing and punching machine. To the right of the blacksmiths' shop is the braziers' department, in which there is a small furnace, together with the usual appliances for this particular kind of work. Almost immediately adjoining is the fitting shop, which is replete with the most modern machinery, and presents a scene of activity not often witnessed. This shop is 170 feet long by 50 feet broad. There are four lathes for "turning up" wheels, six boring machines, ten ordinary lathes, two machines for planing railway points, &c. &c. Lines of rails are laid into the shop by which the locomotives can be brought in for repairs. Every facility is here provided for doing repairs with expedition and with permanency. Hydraulic machinery is used to lift the locomotives from their wheels when undergoing repairs. Over the fitting shop are the locomotive superintendant's office and the drawing office, with a spacious room occupied by the pattern-makers. To the left of the fitting shop is the locomotive shed, which is 170 feet by 120 feet, and which accommodates fifty engines. This shed is fitted up on the most approved principle with smoke troughs, ash pits, &c. The timber and heavy stores yard is a very extensive one, measuring 500 yards by 200 yards. Here are situated the buildings for providing the engines with their daily consumption of coke and water. The waggon building and renewal shop occupies a large building at the opposite end of the yard, and is 300 feet long by 160 feet wide. There are six lines of rails across it, each holding seven waggons, which are brought in by two side entrances by Dumb's patent traversers. Overlooking the shop is the foreman's office. There are the usual lathes and other wood machinery in this place, which are driven by a horizontal engine of fourteen horse power. One corner of the room is set apart for the repairing of signals &c. At the east end of the shed there is a room specially used for the erection of passenger carriages, and which will accommodate six at one time. Behind this again is the paint shop, which is of equal size. This part of the building is two stories high, and the floor is occupied at one end by the upholstering department, and at the other by the joiners' shop. To the west of the waggon shop is the blacksmith's shop for this department, in which there are six fires, together with store rooms for the requirements of

waggon building. In connection with the works there is an extensive library, and commodious reading room, billiard room, &c., and there is also a sick and funeral society, of which every employé [sic] is a member. There are upwards of 300 men employed at these works.

Pettigrew 1901, 754-755; Anon 1906, 72-75

FURNESS RAILWAY LOCOMOTIVE, CARRIAGE AND WAGON WORKS.

These works, founded in 1864, are situated in Barrow, and have the same entrance at the general offices of the Company, with a frontage in St. George's Square. They occupy an area of about thirty acres. The first locomotive shop and running shed is now the machine shop and turnery, in which are the wheel lathers, planing, slotting, drilling and other machines. The power for driving this shop is obtained from two small horizontal steam-engines, the various cross-shafts being driven by means of bevelled gearing with the exception of one driving the cross-shop, this being driven by means of cross belts. Adjoining this is the smith's shop, with fifteen smiths' hearths, and with a furnace for heating the tyres for locomotives, carriages and wagons. **All the smoke from the plate and forge furnaces, stationary boilers, and smiths' fires leads through an underground flue into a large chimney shaft, which stands outside the works in the middle of Salthouse Road.** The boiler shop contains a 15-ton overhead travelling crane, steam punching machine, bending rolls etc. Adjoining this is the boiler house containing three Galloway boilers working at a pressure of 50 lbs. per square inch for supplying steam for the shop engines, steam hammers and other appliances.

The second running shed is now the erecting shop, which, owing to its low roof, has no overhead crane, the engines having the wheels taken from them and replaced by means of dropping pits. The shop consists of three bays each 30 feet span by 160 feet in length. It contains six roads, with engine pits accommodating four engines on each road. Adjoining this shop are the spare gear stores. Beyond this is the Locomotive Superintendent's office, running department, and drawing offices, the latter being on the upper storey on the same floor as the pattern and joiners' shop. The present running shed is a stone building 310 feet in length by 150 feet in width, and capable of holding sixty engines. Close to the engine shed is the new shed for coaling engines on the high level system. There are two platforms, the coal wagons being in the centre, and the incoming roads being at each side, enabling four engines to be coaled at one time. Beyond the sheds and between the roads is the ashbin, with pits at each side for the driver to examine his engine whilst he fire is being withdrawn.

The carriage and wagon shops have recently been enlarged. The wagon shop is 300 feet in length by 160 feet in width, and consists of a carriage body shop, carriage underframe, wagon building, smiths', wheelwrights', and machine shops, and saw mill. The carriage paint shop is 195 feet in length by 40 feet in width, but a new and larger shop has been constructed, capable of holding twenty carriages. There is also a wagon repairing shop and a timber drying shed.