

**An Archaeological Watching Brief
At Butterley Works, Butterley Hill, Ripley,
Derbyshire, (SK 407 517)**

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Client: WSP Environmental

on behalf of Morris Homes (East Midlands) Ltd.

Planning Application No.AVA/2005/0375

Planning Authority Derbyshire County Council

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By Greg Farnworth-Jones

1. Summary

1.1 An archaeological watching brief was carried out on land at Butterley Works Site, Butterley Hill, Ripley, Derbyshire, (SK 407 517) on the 29th and the 31st January 2007 during the capping of former loading shafts associated with the Butterley Tunnel of the Cromford Canal, Butterley, Derbyshire. This work was commissioned by WSP Environmental on behalf of Morris Homes (East Midlands) Ltd. And undertaken by University of Leicester Archaeological Services (ULAS). The results of this investigation seem to confirm that the shafts were indeed loading shafts connected with 'The Wide Hole', or Butterley Wharf section of the Butterley Tunnel, Cromford Canal. No other archaeological remains or structures were revealed during the watching brief, but it is impossible to say whether or not any other structures exist in the vicinity that not revealed during the ground-works.

2. Introduction

2.1 An archaeological watching brief was undertaken by University of Leicester Archaeological Services (ULAS) during the capping of former air/construction shafts associated with the Butterley Tunnel of the Cromford Canal, Butterley, Derbyshire (SK 407 517).

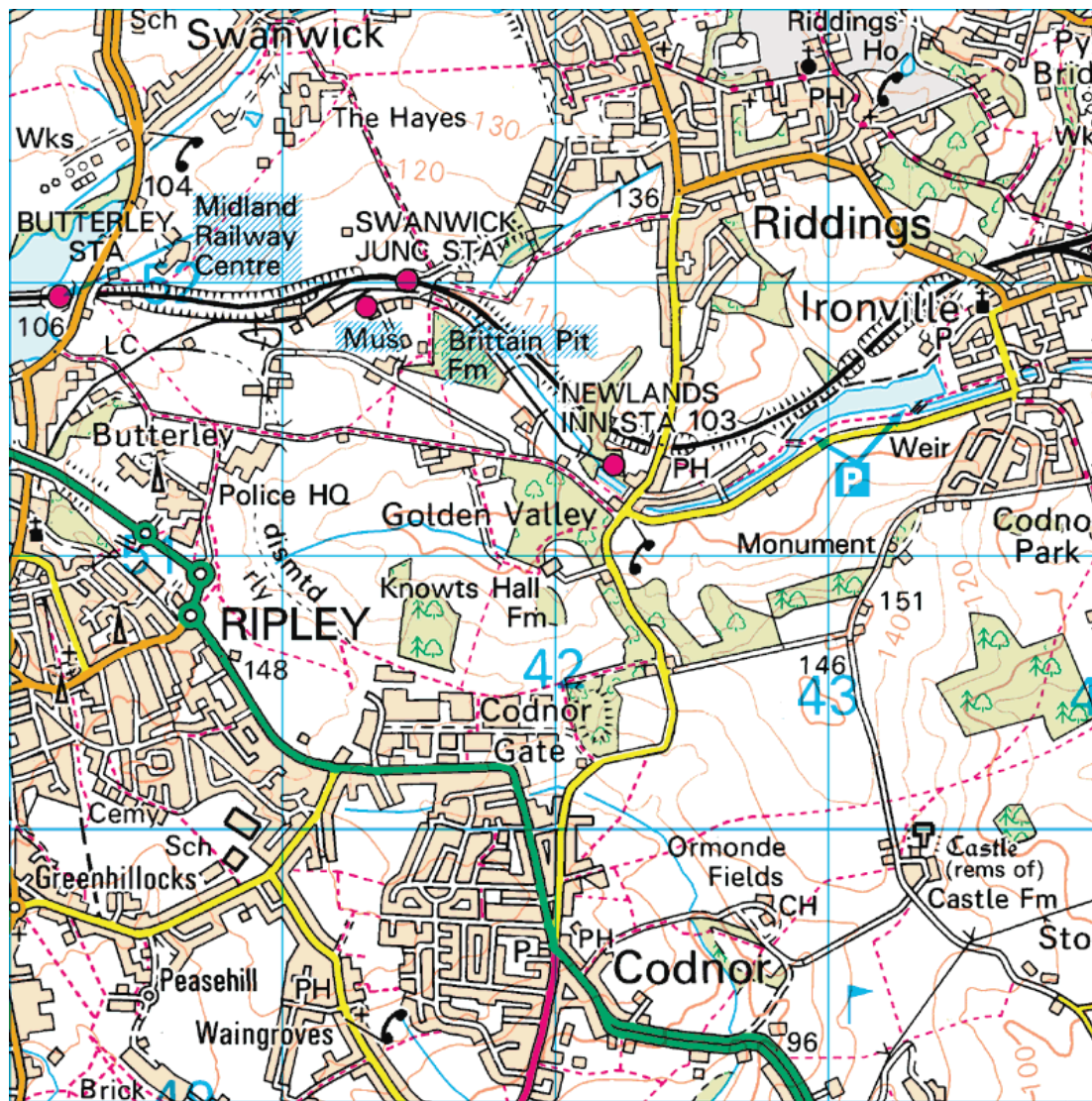
2.2 The Senior Development Control Archaeologist of the Conservation and Design Group of Derbyshire County Council, in his capacity as archaeological adviser to the planning authority, requested that an archaeological watching brief be undertaken during ground-works to observe and record any remains of archaeological/historical interest associated with the removal of the upper c. 8.5m of the shafts leading to the canal to allow the insertion of a concrete cap over the mouth of the shaft at the level of surrounding bedrock.

2.3 The works form part of planning application AVA/2005/0375, proposed by Morris Homes (East Midlands) Ltd for the erection of 145 residential dwellings with associated garages, roads, sewers and ancillary works at Butterley Works Site, Butterley Hill, Ripley, Derbyshire, (SK 407 517).

2.4 The University of Leicester Archaeological Services (ULAS) was then commissioned to carry out the watching brief by WSP Environmental on behalf of the clients, Morris Homes (East Midlands) Ltd. The archaeological watching brief was undertaken by ULAS on the 22nd and on the 29th and the 31st of January 2007.

3. Site Location and Description

3.1 The Butterley Tunnel lies on the northern edge of Ripley in Derbyshire (approximately SK 407 517; Figure 1).



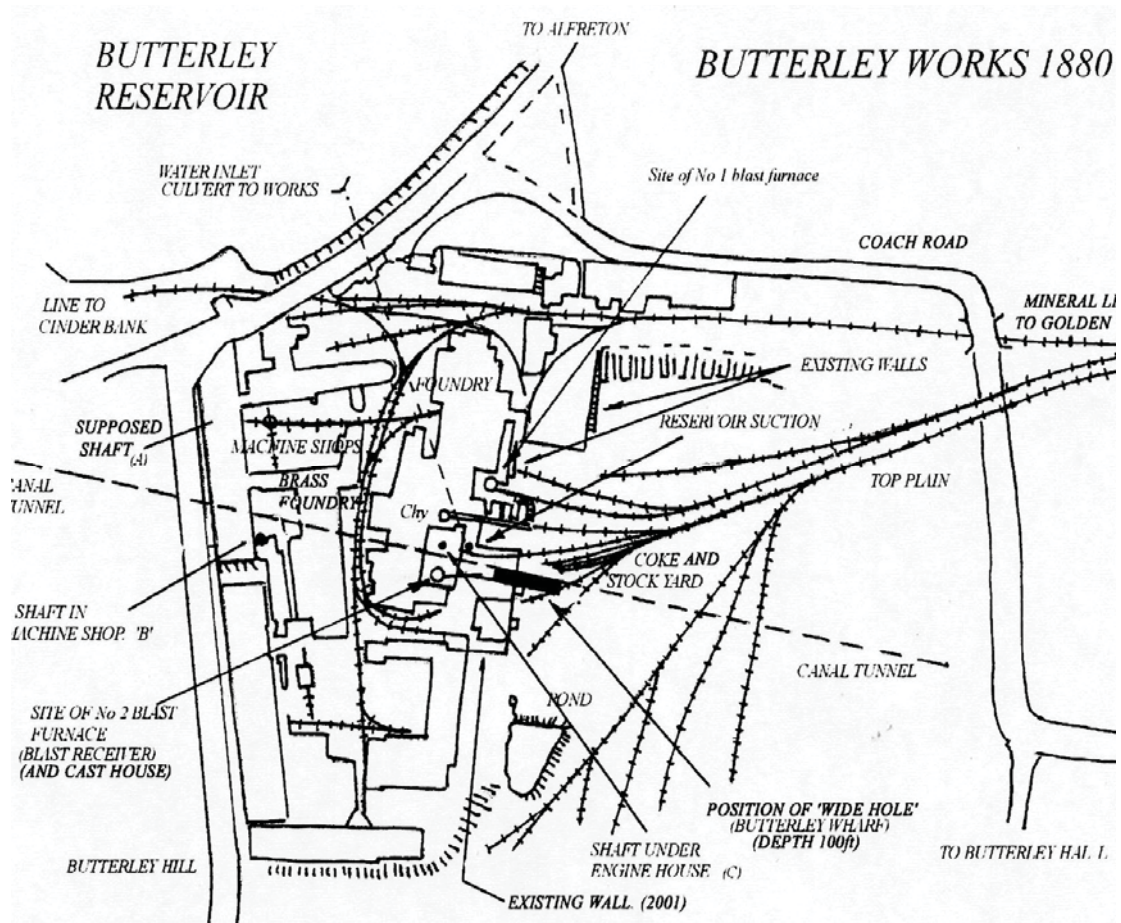
1. Site location

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3.3 The background geology beneath the site consists of coal measures in-dispersed with sandstone, including the first EII, Second EII and Clay Cross Marine Band coal measures (British Geological Survey Map Sheet 125; Derby).

3.4 The works that require an archaeological watching brief are those associated with the capping of former shafts that were used in the construction of and ventilation of

the canal tunnel in order to make the ground safe and enable redevelopment of the site area above.



2. Site Plan of Butterley Works 1880
(Reproduced from 'Portal to Portal' by kind permission of D. Greenwood).

4. Archaeological Background

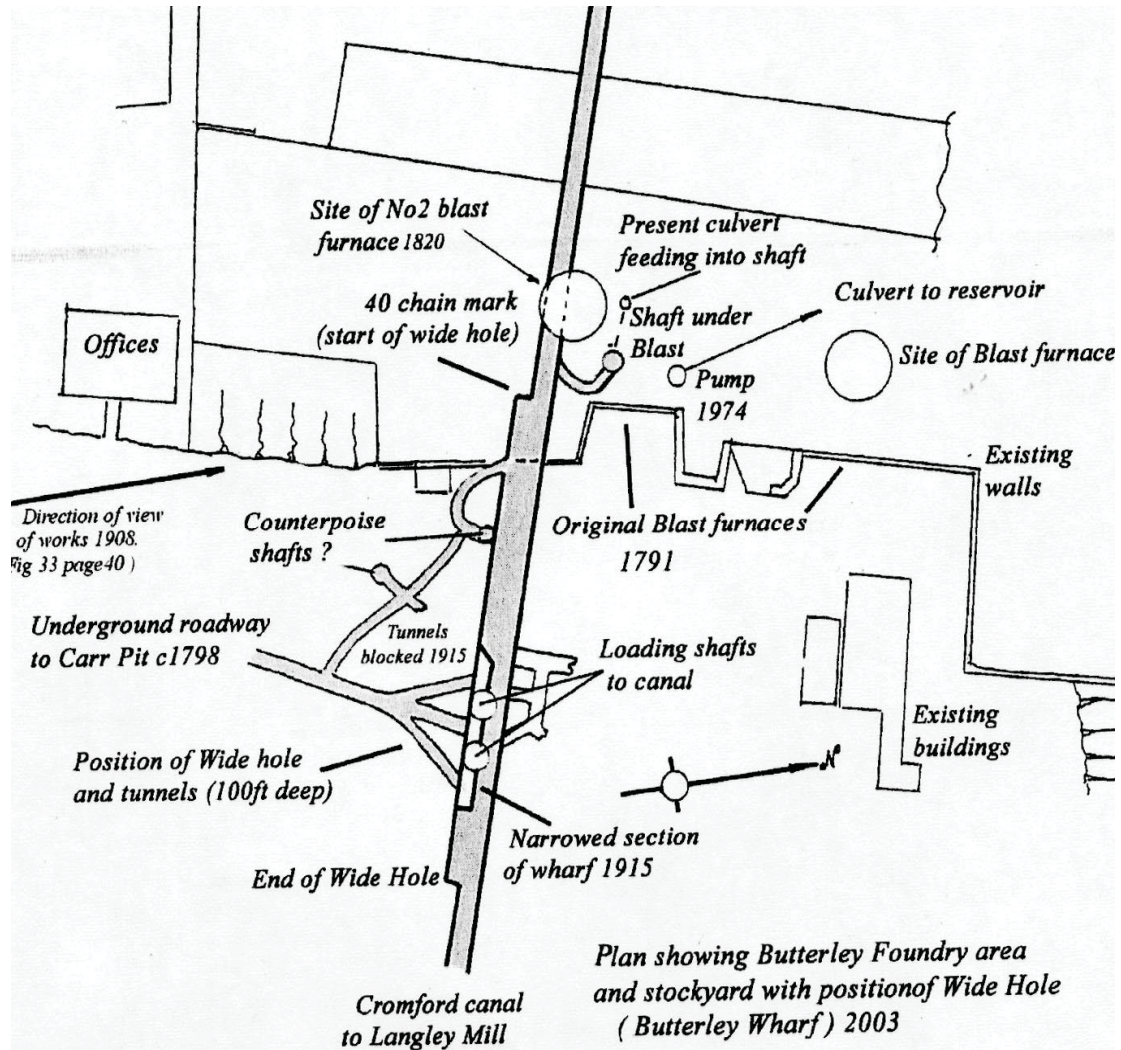
4.1 The proposed development area lies on the site of the former Butterley Works, the home of the Butterley Company, which was an engineering works to the north of Ripley on Butterley Hill (from where the name originates).

4.2 The Butterley Company was the later name of Benjamin Outram and Company, which was formed in 1790 and was responsible for the construction of the Cromford Canal.

4.3 Butterley Tunnel is one and three quarter miles long, and was opened in 1794. The construction of the tunnel included the excavation of adits into the hillside as well as the sinking of thirty three shafts and subsequent tunnelling at the correct level (giving a number of different faces on which to work). This method was also

employed a number of years later at the Clay Cross Railway Tunnel some 10 miles to the north.

4.4 The Cromford Canal was supplied by water from the Butterley Reservoir on the hill above the tunnel and entered the canal via an adit linked to the tunnel.



3. Site Plan Showing Loading Shafts to Canal (Reproduced from 'Portal to Portal' by kind permission of D. Greenwood).

4.5 The tunnel was linked to coal mines associated with the Butterley Company (Butterley Carr Pit). A number of vertical shafts were also linked from the canal directly to the Butterley Works, in an area of the tunnel known as the 'Wide Hole', or Butterley Wharf (figure 3) on which the proposed development area is situated.

Goods were transported vertically in containers to and from the canal boats to tram wagons that were transported to the Butterley Works on top of the hill. The lifting system initially used a water bucket counter balance system and later steam engines. A similar containerisation system of goods movement was used at Castlefield in Manchester on the Bridgewater Canal, in the 1760's at the Grocers Warehouse (although the vertical distance of the goods were moved far less). Potentially the shafts to be capped as part of this project may have been those used for loading/unloading containers and therefore may have associated headgear at the tops of the shafts as well as tramway links and other features.

4.6 The tunnel has suffered from a number of episodes of subsidence, including in 1889 when it was closed for 4 years to allow repairs, a partial collapse in 1900 and another collapse in 1907. The tunnel was considered beyond economic repair in 1909 and was finally closed in 1914. The following year most of the shafts were capped.

4.7 In 1979 an extensive survey of the Butterley Tunnel was conducted by Robin Witter who demonstrated that most of the tunnel was still safe and intact. In recent years a group of volunteers has been set up called "The Friends of Cromford Canal" with the aim of fully restoring the canal, including Butterley Tunnel.

5. Aims of the Investigation

5.1 Watching Brief

5.1.1 An archaeological watching brief is defined by the Institute of Field Archaeologists as 'a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.' *IFA Standards and Guidance for Archaeological Watching Briefs* (1994, revised 2001).

5.2 The main objectives of the watching brief, through archaeological supervision were:

- To determine the extent, condition, nature, character, quality and date of any archaeological deposits encountered during ground-works within the area of the two shafts, as dictated by best practice.
- Define the presence or absence of archaeological deposits associated with the two former shafts, including any headgear, tramways or other structures that may have been associated with the movement of containers to and from the canal below.
- Establish whether any further salvage archaeological excavation works may be necessary at the site.
- Prepare a site report and archive to the required standard.

6. Methodology

6.1 The archaeological watching brief carried out on land at the former Butterley Works Site, Butterley Hill, Ripley, Derbyshire, (SK 407 517), involved the observation of all intrusive ground-works associated with excavation of the shafts down to bedrock. This also included an inspection of the ground surface surrounding the shafts that were disturbed by the excavation works, observing for evidence relating to former headgear, drains, brickwork or other structures relating to the use or construction of the shafts.

6.2 Recording was by means of written notes, high-resolution digital photography, black and white archive quality photography, the annotation of existing maps and base plans, and, where required, the production of measured or sketch plans and elevations.

6.3 The excavated spoil was examined for any archaeological finds and artefacts associated with the shafts.

6.4 All archaeological work adhered to the Institute of Field Archaeologist's (IFA) *Code of Conduct* and *Standard and Guidance for Archaeological Watching Briefs* and the design specification as laid out in *Written Scheme of Investigation for Archaeological Watching Brief at Butterley, Derbyshire* (Meek 2007) (Appendix).

7. Results

7.1 The watching brief took place on the 29th and 31st January 2007. On arrival on the 29th of January the first of the two shafts had already been capped with the top demolished down to eight metres, leaving a large pit. Therefore any investigation of the first shaft was not possible.

7.2 The second shaft (002) was exposed down to approximately two metres from the top and close inspection was difficult due to the hazardous conditions on site with the proximity of the large pit. Due to these health and safety concerns the site foreman allowed the author supervised access to the shaft for a limited time to allow for a closer inspection.

7.3 Once inside the fenced off area, the author was able to briefly get a close look at the stratigraphy of the site in section. From ground level down to the base of pit of the first shaft (approximately eight metres in depth), the entire stratigraphy consisted of mixed industrial waste deposits (001), presumably connected with the industrial processes which occurred when the site formed part of the Butterley Works.

7.4 On close inspection of the second shaft (002), it was immediately apparent that the top had been capped in brick (003) (figure 4) forming a dome over the shaft, and measuring 1.5m from the summit to the bottom where it was bonded to the earlier structure. The diameter at this point was 2.13m (see below). The bricks used for the construction of the domed cap were red brick and measured approximately: 0.23m by 0.1m. The bonding material appeared to be dry lime mortar, slightly pink in colour

with very small black and white inclusions and the bond itself appeared to be a stretcher bond. Earlier machining had punctured a hole into the top of the domed cap which enabled the author to take some photographs looking into the shaft (Figure 5).

7.5 The shaft itself (002) measured 2.13m (7ft) in diameter and was exposed down to a depth of nearly 2m. The shaft was constructed out of yellow sandstone blocks measuring approximately 0.18m x 0.26m x 0.07m. These were also bonded with what appeared to be a dry lime mortar, which was mid-grey in colour with small white inclusions.

7.6 The surrounding ground surface by the shafts that were disturbed by the excavation works were inspected closely for evidence relating to former headgear, drains, brickwork or any other structures relating to the use or construction of the shafts. However, no other archaeological finds or features were located during the watching brief.

7.7 On the second visit to the site on the 31st January 2007, the ground workers had machined around the second shaft, without damaging it down to the depth of eight metres. Close inspection of the shaft on this visit was impossible due to the on site hazards. The author was able however to photograph the demolition and capping of the top eight metres of the shaft (Figures 7 & 8).

7.8 During the demolition of the second shaft for capping, it was apparent that the shaft had a 'groove' every *c.* 2m, dividing the shaft into 'drums' (Figure 7). Also clearly visible were the putlog holes (Figure 7) which were spaced out every few feet vertically for wooden planks to be inserted one above each other to create a scaffold for loading and unloading containers.



4. Shaft (002) Shaft Cap (003) Looking North



5. Looking inside the Shaft (002).



6. Shaft (002). Facing North-West



7. Demolition of Shaft (002) Showing 'Groove' and Putlog holes.



8. Shaft (002) ready for capping.

8. Discussion

8.1 Figure 4 and the following extracts are taken from ‘*Portal to Portal, A Short History of the Butterley Tunnel*’ (Greenwood 2003):

‘The loading shafts [9 & 10] are clearly marked on the updated plan of the Wide hole...a cross section of the second shaft is seen on the MR plan in section ‘A B’ (Fig 5). This shows the extent of the strengthening works narrowing the wide hole to 9ft and the blocking up of the shaft, leaving a 1’ – 9” vertical shaft to a height of 12ft, the top of which was faced off with cement. This along with the other shaft [10] would have been some 100 feet deep from the level of the present stockyard....The position of the shafts to the original tunnel profile indicates they would enable goods to be loaded directly into barges on the south side of the tunnel whilst leaving the north wall clear.’

8.2 Robin Mitton during his investigation of the Butterley Wharf in 1979 reported seeing ‘two shafts out of this wide hole, being 9yds-2ft from the Eastern end to the first shaft and 19yds-1ft to the second. These shafts are 7ft in diameter and I am informed they were used for loading and unloading barges to the works in the past but are now closed’ (Greenwood 2003).

8.3 Looking at the plans originally drawn by the Midlands Railway (but reproduced here from ‘*Portal to Portal*’, Greenwood 2003) clearly show the two loading shafts below Butterley works. The positioning and dimensions of the two shafts are

identical to the two shafts which were capped, both of 2.13m diameter which is equal to the 7ft diameter of the shafts shown on the plans and the dimensions noted by Mitton.

8.4 The width of the shafts is considered too wide for a simple ventilation shaft and the existence of putlog holes seems to confirm that the shafts were indeed for loading.

9. Conclusion

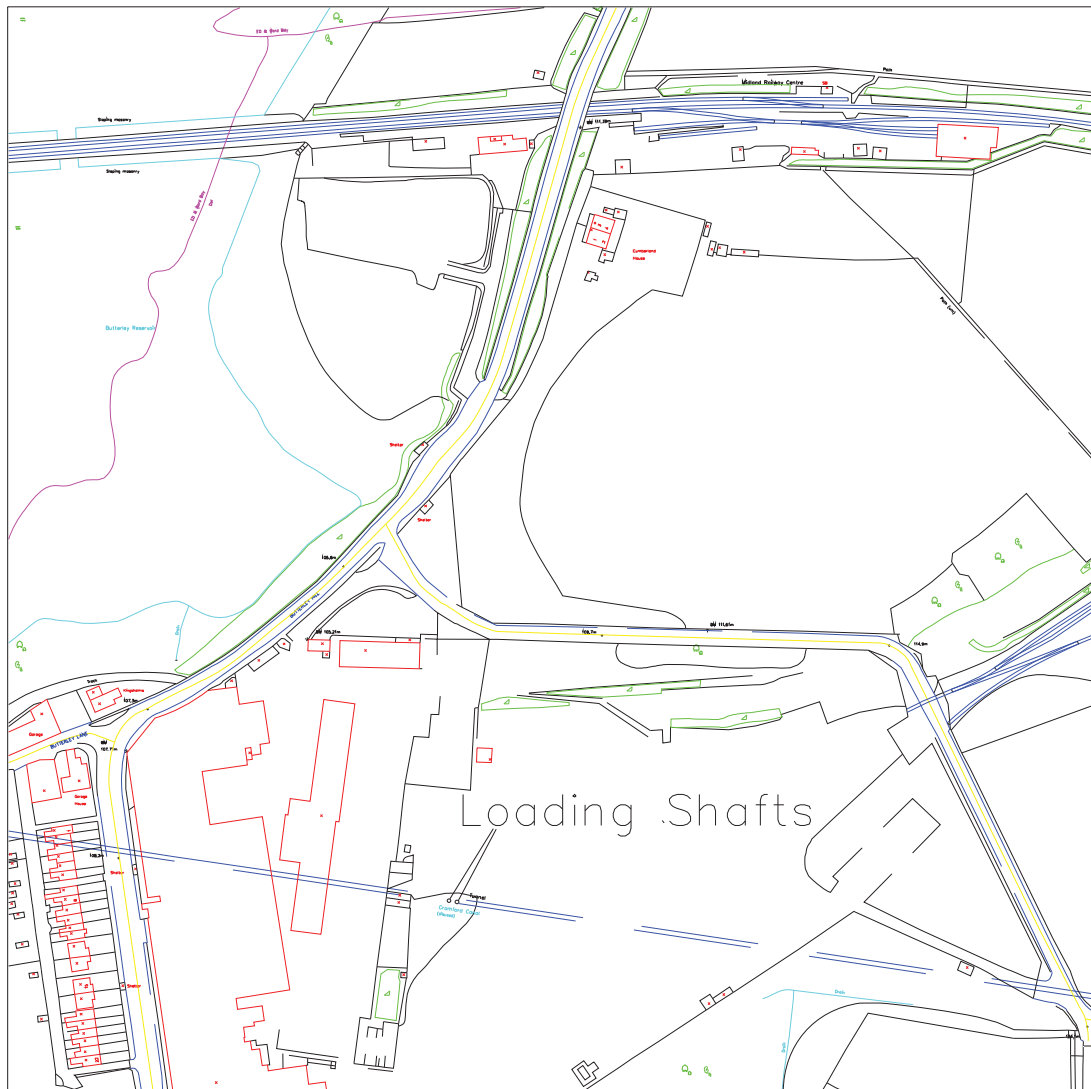
9.1 Unfortunately the first loading shaft had already been capped before the author arrived on the site on the 29th January 2007 which meant that recording and observation of this structure was impossible. Despite this problem however, the two shafts were indeed identical meaning that the premature capping of the shaft was ultimately not actually a problem as the second shaft was still intact for recording purposes.

9.2 Due to on site Health and Safety concerns regarding unsafe ground surrounding the pits dug for the shafts and other hazards, full archaeological survey including scale elevation drawings and detailed description was impossible. However limited and supervised access to the area around the second shaft was given by the site foreman, allowing the access to the site

9.3 The results of the archaeological watching brief carried out on land at the former Butterley Works, Butterley, Ripley, Derbyshire (SK 407 517), on the 29th and the 31st January 2007 adds little to the existing body of knowledge of the Butterley Tunnel loading shafts. What can be ascertained however is that the two loading shafts do indeed seem to be the same shafts that were marked on the Midlands Railway plans (Fig.9), and the same as those observed by Robbin Mitton during his investigation of the Butterley Wharf in 1979, due to the identical dimensions and to the similar location. Moreover, the width of the shaft and evidence of putlogs does seem to confirm that the shafts were used for loading and not merely for ventilation, indicating that the shafts must equate with the loading shafts marked on the MR plans (Fig. 9).

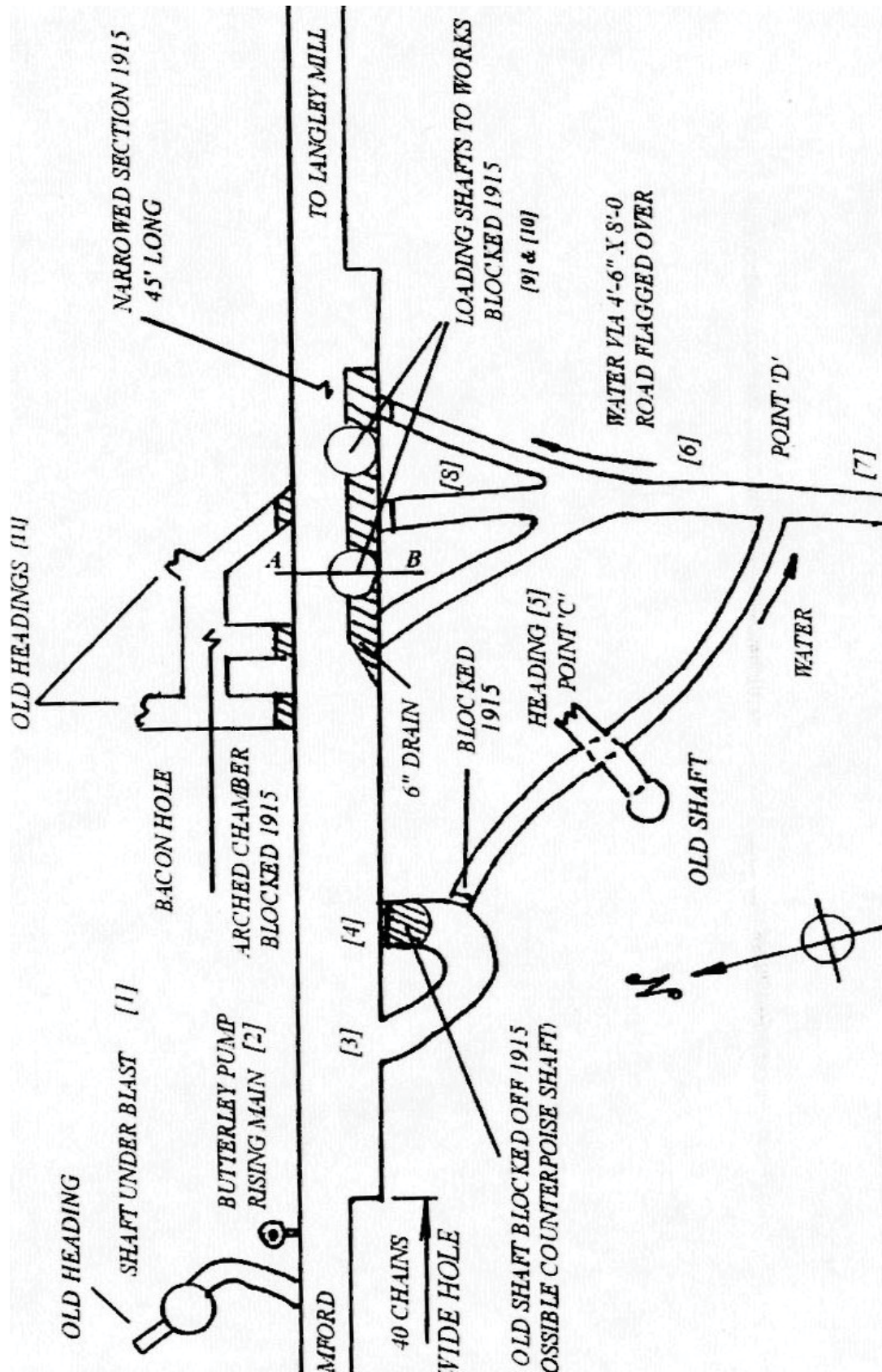
10. Acknowledgements

I would like to thank the clients, Morris Homes (East Midlands) Ltd, for their assistance and co-operation. I would also like to thank Des Greenwood for his kind permission to use illustrations from his work *'Portal to Portal, A Short History of the Butterley Tunnel'* and to the members of the Friends of Cromford Canal. James Meek of WSP Environmental was Archaeological Consultant for the project, Lynden Cooper was the manager and the fieldwork was carried out by the author, both of ULAS.



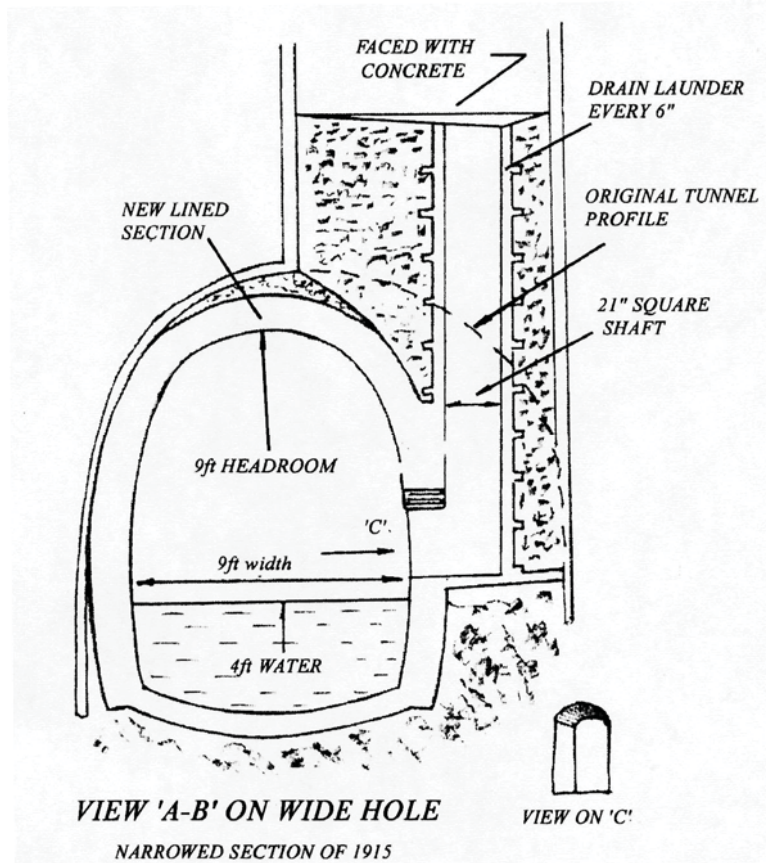
9. OS Map Showing Butterley Tunnel and Approximate Location of the Loading Shafts.

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10. Plan of Wide Hole

(Reproduced from 'Portal to Portal' by kind permission of D. Greenwood).



11. Section Through Wide Hole Showing Loading Shaft
(Reproduced from 'Portal to Portal' by kind permission of D. Greenwood).

11. Bibliography

Greenwood, D., (2003) "*Portal to Portal, A Short History of the Butterley Tunnel*".
The Friends of Cromford Canal

Meek, J., 2007, *Written Scheme of Investigation for Archaeological Watching Brief at Butterley, Derbyshire*. WSP Environmental.

http://en.wikipedia.org/wiki/Butterley_Tunnel

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