

Butterley Tunnel

Written by and using photographs taken by Tina Cordon between 15th October and 9th November 2006



View of the Eastern Portal. 2006. Water is entering via a spillway from a stream in the right foreground. This stream passes under the line of the Golden Valley Light Railway at the top of the spillway. 53°03'26.0"N, 1° 22'22.8"W according to my GPS.

Place	Distance from East Portal		Latitude	Longitude
	Chains	Yards		
East Portal	0	0	53°3'26.82"	1°22'23.07"
Blockage	10	220	53°3'27.61"	1°22'33.58"
Butterley Park Pump Outlet	13.5	297	53°3'27.91"	1°22'37.9"
Shaft 4	30	660	53°3'29.31"	1°22'55.16"
Shaft 3	42.3	930.6	53°3'30.66"	1°23'8.30"
Michael and Valerie's Mound	54	1190	53°3'31.23"	1°23'21.25"
Shaft 2	73.7	1621.4	53°3'33.71"	1°23'41.52"
Collapse	83	1826	53°3'34.55"	1°23'51.84"
Loading Shafts	95.5	2101	53°3'35.86"	1°24'5.21"
Butterley Reservoir Adit	114.5	2519	53°3'37.72"	1°24'25.48"
Butterley Reservoir Surface Valves			53°3'37.54"	1°24'23.13"
Shaft 1	119	2618	53°3'38.49"	1°24'30.96"
Old West Portal	138	3039	53°3'40.13"	1°24'50.59"
West Portal	138.5	3049	53°3'40.36"	1°24'51.34"

The above table gives distances from the Eastern Portal for notable structures within and above the tunnel together with approximate locations. Michael and Valerie's mound is the mound identified by Michael Harrison and Valerie Roberts in "A Walker's Guide to the Cromford Canal" as a possible airshaft location. This mound may indicate the presence of one of the 33 construction shafts but it is not in the correct place for Shaft 3. The concrete building may not be relevant at all.



This spillway is to the left (South) of the tunnel portal when facing the portal. At the top of the spillway is a culvert leading off to the right facing the way the picture is taken. The culvert is below a well maintained path with park benches leading towards the Midland Railway Centre. It once brought water from the Butterley Park Reservoir.



Water flowing down the spillway to the right (North) of the tunnel portal when facing the portal.



View from inside the tunnel through the Eastern Portal. The grill covering the entrance is not locked. The silt here is well packed and supports a person's weight. Other footprints are evident here so others do visit although there is little rubbish (drinks cans, crisp bags, etc) present.



Closer view of Eastern Portal.



Eastern Portal from the inside. The silt within the tunnel at this point is greater than 4 feet 3 inches deep. This is the length of the auger used. The height of the tunnel above the silt is 5 feet 4 inches. The width of the tunnel at the level of the silt is 9 feet 6 inches.



The silt at the Eastern Portal supports a person's weight for a short distance into the tunnel from the Eastern Portal. Water flows West along the tunnel in the channel which can be seen to the right of this picture. A small amount of rain increases this flow markedly.



The silt gets softer and more dangerous as you proceed and other people's footprints become less evident.



This is almost the safe limit for walkers into the Eastern Portal. The silt is too soft and sucks your feet down if you struggle. Near to the “Chain 2” marker.



This is the first distance marker encountered when entering the Eastern Portal. It is 44 yards (2 chains) from the Eastern Portal.



You can just see wooden roof shoring in this picture from Chain 2.



This is the roof shoring about 3 chains, 66yards from the Eastern Portal. You cannot safely proceed by walking along the tunnel from the Eastern Portal due to the softness of the silt. Subsequent photographs were taken utilizing a canoe for transport. On the silt the canoe was pushed with most my weight supported by the canoe; modern day legging.



Looking backwards after passing the first shoring at Chain 3, the Eastern Portal can be seen. There is not yet enough water to float the canoe.



A section without shoring and with straw stalactites at about Chain 4 from the East. The vertical walls near to water/silt level are bowed inwards.



Second set of shoring in reasonable condition just before Chain 5.



Chain 5 marker.



Third set of shoring starts at about chain 6.



Chain 8 marker is within the third set of shoring. An iron number on a wooden back.



Some of the third set of shoring has collapsed. Much of that which is standing is no longer supporting the roof.



This stone or concrete cofferdam (called a stank in the 1915 Wide Hole drawing) is across the tunnel with the tunnel floor behind it backfilled with rubble. I got out of the canoe and walked from here.



Floor filled with rubble, and the roof quite low.



The tunnel is blocked at about Chain 10. This does not appear to be a roof fall. What I see is shoring timbers and other debris which has been washed against other partially collapsed shoring timbers blocking the tunnel. The roof appears to be in place.



The end. I'm fairly certain that the Beer Barrel is empty otherwise I would have got closer. Subsequent photos are from the Western Portal inwards.



Western Portal found by following the footpath next to Geeson's in Hammersmith, Ripley.



A better view of the Western Portal. Latitude $53^{\circ}03'26.0''$ Longitude $1^{\circ}24'51.0''$ according to my GPS. This gives a length of 3,045 yards which fits within the error of my GPS with the 3,063 yards reported.



This is the conduit placed at the Western Portal when the A38 was built on top of the existing railway line. I have now measured this conduit, it is 20 yards long and 6' 8" in diameter. The gap between the top of the conduit and the old tunnel is sealed with concrete.



Once through the conduit you enter the section added when the railway was built over the Western Portal. It is brick lined, but also has iron arches which support timber shoring supporting the brickwork. The water is 5 feet deep here and walking is slow and cold. There are 116 of these iron arches supporting the roof up till marker 7, 18 more to marker 8 and 8 more to a change in tunnel size.



The tunnels height changes several times as you walk in. This may be the point where the original Western Portal was sited. This section is supported by 7 iron arches. After this it changes back to the original size.



Looking back towards the light of the Western Portal.



Bolts at the top of each iron arch.



This mark on the shoring timbers supported by the iron arches appears to say 13/2/26. It is at the 126th iron arch with marker 8 at the 134th arch.



This wooden shoring seems intact. The first met traveling into the tunnel from the West. This shoring starts after the 156th iron arch. Marker 9 is at iron arch 150. There are 9 of these wooden supports. They finish at marker 10 where unsupported tunnel starts. This is about 17 iron arches per marker.



Close up of shoring showing slight damage to one beam.



Further along the tunnel the shoring is less secure. This set of 8 wooden shoring timbers starts at marker 11. The second (shown) and third cross beams are loose. This shoring finishes 30 bricks length (these bricks including mortar are about 10 ½" long) before marker 12. The Western Portal can be seen.



Shoring of the roof which might have allowed a narrowboat to pass.



This is the same shoring looking East.



A leak in the Southern wall showing that the water level outside the tunnel is greater than that inside. This is just after marker 14. There is water coming from the roof from before marker 14 to where the tunnel increases in size again just before marker 16. 6 iron arches 4 bricks apart start at marker 18.



Straw Stalactites growing from the roof.



This rubbish has been thrown down the first airshaft encountered when walking from the West. This airshaft is at marker 19. I have found that wood released from this pile and left in the canal makes its own way to the gate. I'll clear it out when it arrives.



Looking up the airshaft, the items visible are RSJs and scaffold poles which have been thrown into the tunnel.



Daylight can be seen up the airshaft.



Shaft One at the surface has an iron grill across the top to prevent access. Someone has left a convenient ladder for photographers.



Looking down shaft one.



It was raining outside in the world.



More timber shoring. This time with just a 1 foot gap between the lowest timbers and the water. There are 15 of these sets of shoring 7 bricks (about 6') apart.



This shoring is in reasonable condition but very low to the water, it is necessary to get out of the canoe here. There is room under the horizontal beams for the canoe but not for me. Anyone who decides to enter from the West will need to take account of this and wear appropriate clothing for immersion in 5 feet of water. Sorry about the gloves.



This is a view along the Butterley Reservoir adit. There are iron beams across the adit just below water level. My theory is that they are there to support scaffold batons to facilitate servicing. This adit is halfway between markers 23 and 24.



The adit from the tunnel



The top of the adit.



This is part of a long bar descending the shaft at the end of the adit. Perhaps it controls the water flow.



The entrance to Butterley Reservoir Adit next to Butterley Reservoir. This has a good quality lock.



Photograph of Butterley Reservoir Adit Valve taken over the top of the locked door.



Midland Railway Centre's mainline steam locomotive, ex-British Rail 4-6-0 class 5MT 73129 crossing the stone causeway over the Butterley Reservoir.



View from inside the adit towards the tunnel.



Looking up the entrance shaft of the adit.



Another change in the tunnel's dimensions at marker 24.

Just beyond this point in the tunnel the amount of soft silt on the bottom of the tunnel combined with the water depth (up to my neck) made progress very slow. I was getting cold and tired, therefore I decided to retreat, just after marker 26. The following photographs were taken during a subsequent visit using a canoe for transport.



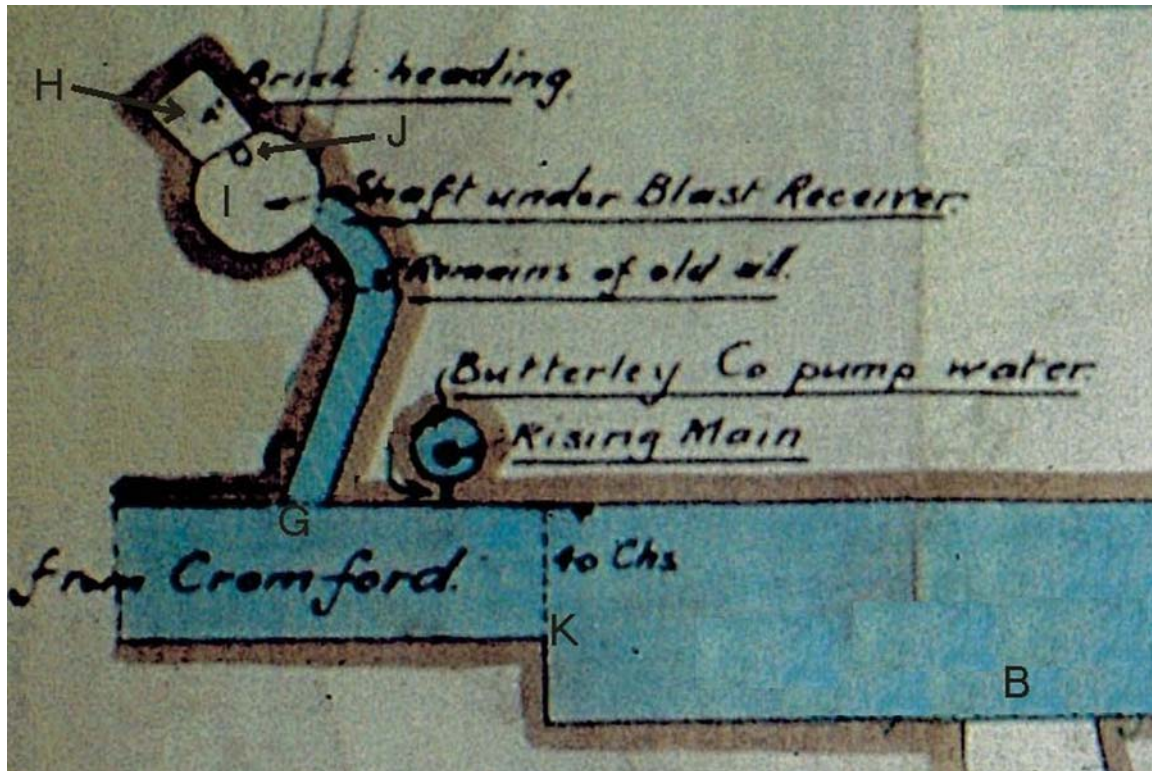
The blue bricks in the centre are a not very well bonded brickwork patch at marker 28. At marker 29 there is water dripping through the roof.



The roof supports here are iron and high enough to allow boats to pass. This section is at marker 36. The Northern wall under this shoring appears more vertical than the Southern as if the top of the tunnel had moved about 1 foot Northwards. The cross-section is from a 1919 Midland Railway drawing of the tunnel.



This tunnel on the North wall of the tunnel is the one which leads to the shaft under the Butterley Company's blast receiver. The sound of water falling can be heard from the far end of this tunnel. This photograph was taken from point 'G' in the following diagram.



This drawing is part of a larger drawing of the Wide Hole drawn during 1915 when the wide hole was being shortened. The photographs of the Shaft under the Blast Receiver and its associated tunnels refer to the letters in this diagram.



Inside the blast receiver tunnel. Photographed from point 'G'.



Another view of the blast receiver tunnel photographed from point 'G'. It is necessary to crawl through this tunnel.



This approximately 5 feet long passage leave the bottom of the blast receiver shaft. The plastic peanut jar is mine. I use it to keep my camera dry. There is evidence of other people here recently. To the right is a polystyrene cup, there was also an empty lighter fuel tube, a broken plastic lighter and a neatly folded up Walkers crisp packet. I suspect that these were left when the shaft was capped in the 1980s. This is the Brick Heading labelled 'H' in the diagram.



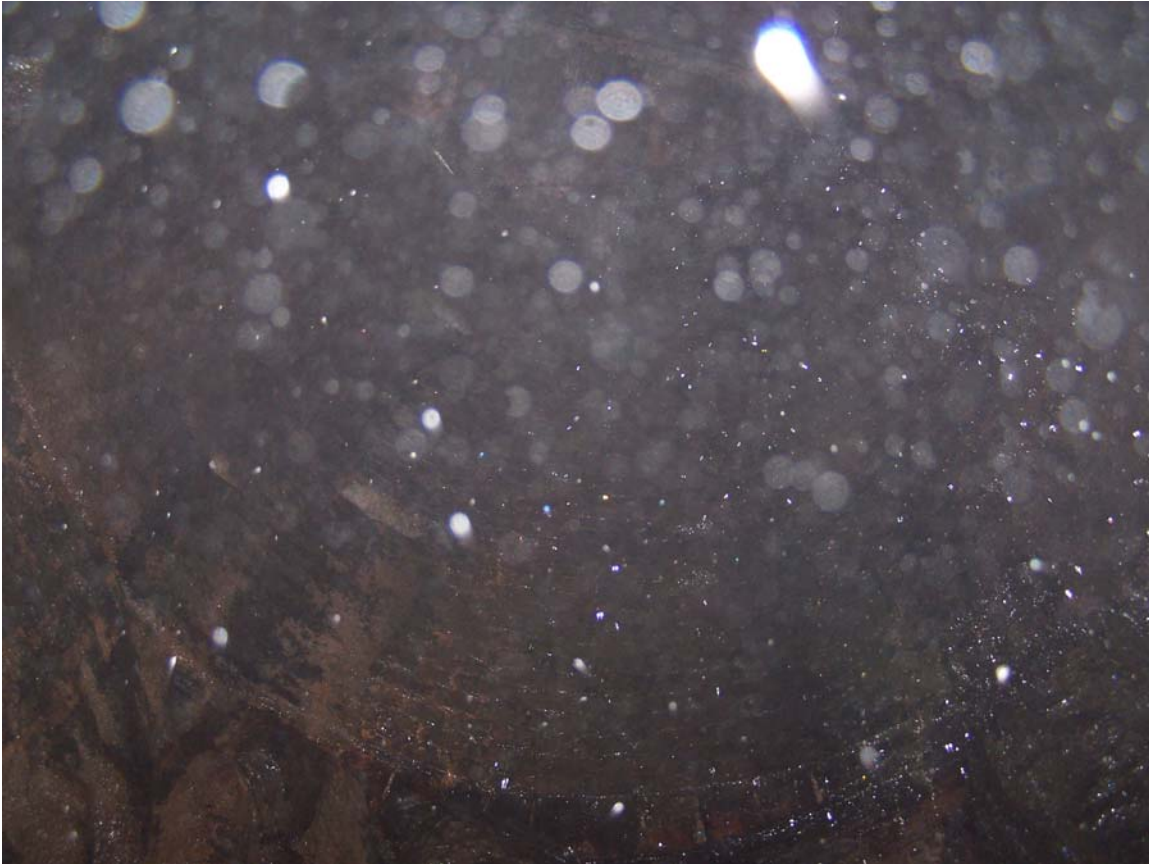
This flange plate is fixed to the floor of the blast receiver shaft. Labelled 'J' in the diagram.



This is the entrance tunnel to the blast receiver shaft leading back to point 'G' in the Main tunnel. On the floor of the shaft there are bricks. Mr. Hatfield of Butterley, an eye witness of the shaft capping in 1985 reported bricks on the floor of the shaft and water flowing East. This shaft fits the description of the shaft near the old Brass foundry reported by Des Greenwood in "Portal to Portal".



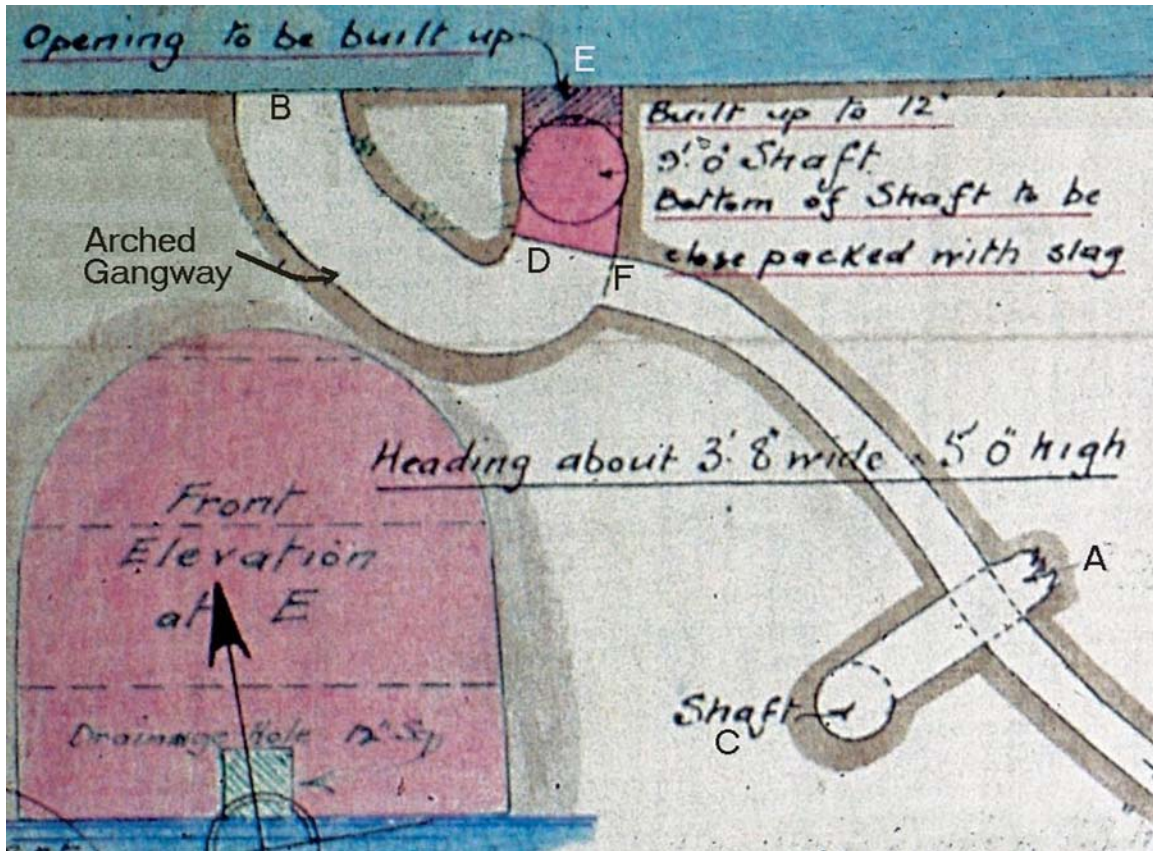
This is a view of the wall of the blast receiver shaft labelled 'I' in the diagram.



It is difficult to see in this view up the blast receiver shaft (point 'I') because of the water raining down, but this shaft is capped only about 20 feet above the floor. There is a bar or pipe crossing the shaft just below the base of the cap.



Main loading point on South side of Wide Hole. This shown as point 'B' on the accompanying diagram.



This is part of a drawing of the Wide Hole from 1915. The letters will be referred to in order to indicate the positions of photographs.



Very narrow boats still dock at the underground wharf. Photo taken from point 'B'



The two recesses in the wall next to the wharf are at about the level of the rubble on the wharf. There are two in the Western wall as well. These could have supported timbers to allow loading. At point 'B'.



Looking back towards the Western Portal. Notice the small square hole on the North wall (right side of picture) about 2 feet above water level.



Close up of the masonry bumpers on the corner of the tunnel entering the wharf. Labelled point 'J' on the "Shaft under Blast Receiver" diagram.



This is a close up of the aforementioned hole. It looks deliberately made. There are several along the walls on both sides of the wharf.



The bricked up entrance next to the main wharf. Labelled as point 'E' on the preceding drawing. The drawing also has a detail of this entrance.



This opening in the arch in front of the bricked up shaft can be seen high up on the preceding picture. A similar opening can be seen in the Western part of the arch. The bricks above it appear distorted. At point 'E'.



Another view of the bricked up entrance at point 'E'.



At the bottom of the bricked up entrance is an outlet to the canal shown on the detail drawing of point 'E'.



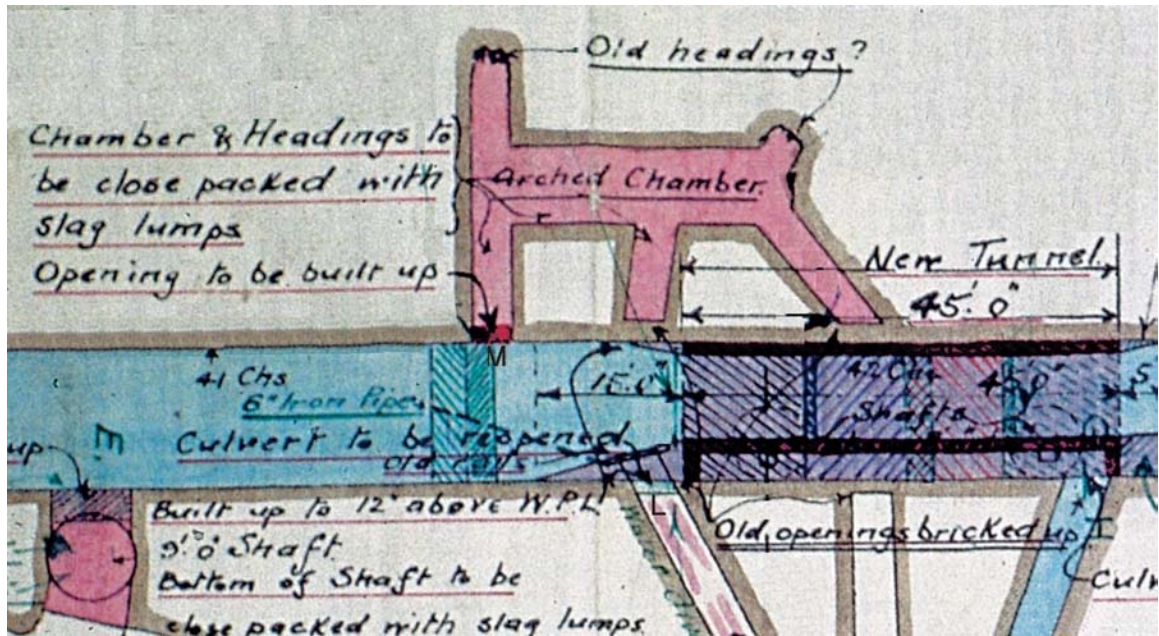
The brickwork put in when the Wide Hole was shortened.



Another view of the new tunnel lining for the shortened Wide Hole. The canoe here is resting on the silt just below water level. This silt does not support a person's weight. By assuming that this new tunnel section is 9' wide at water level and then scaling to find the total width I get a width of about 15' 4". I don't know where figures of 25' came from.



To the right of the new brickwork is the remaining entrance to the Carr Pit heading labelled as point 'L' on the accompanying diagram.



This diagram shows the points at which the Carr Pit Headings entered the Wide Hole. The heading labelled 'L' is the only one still open.



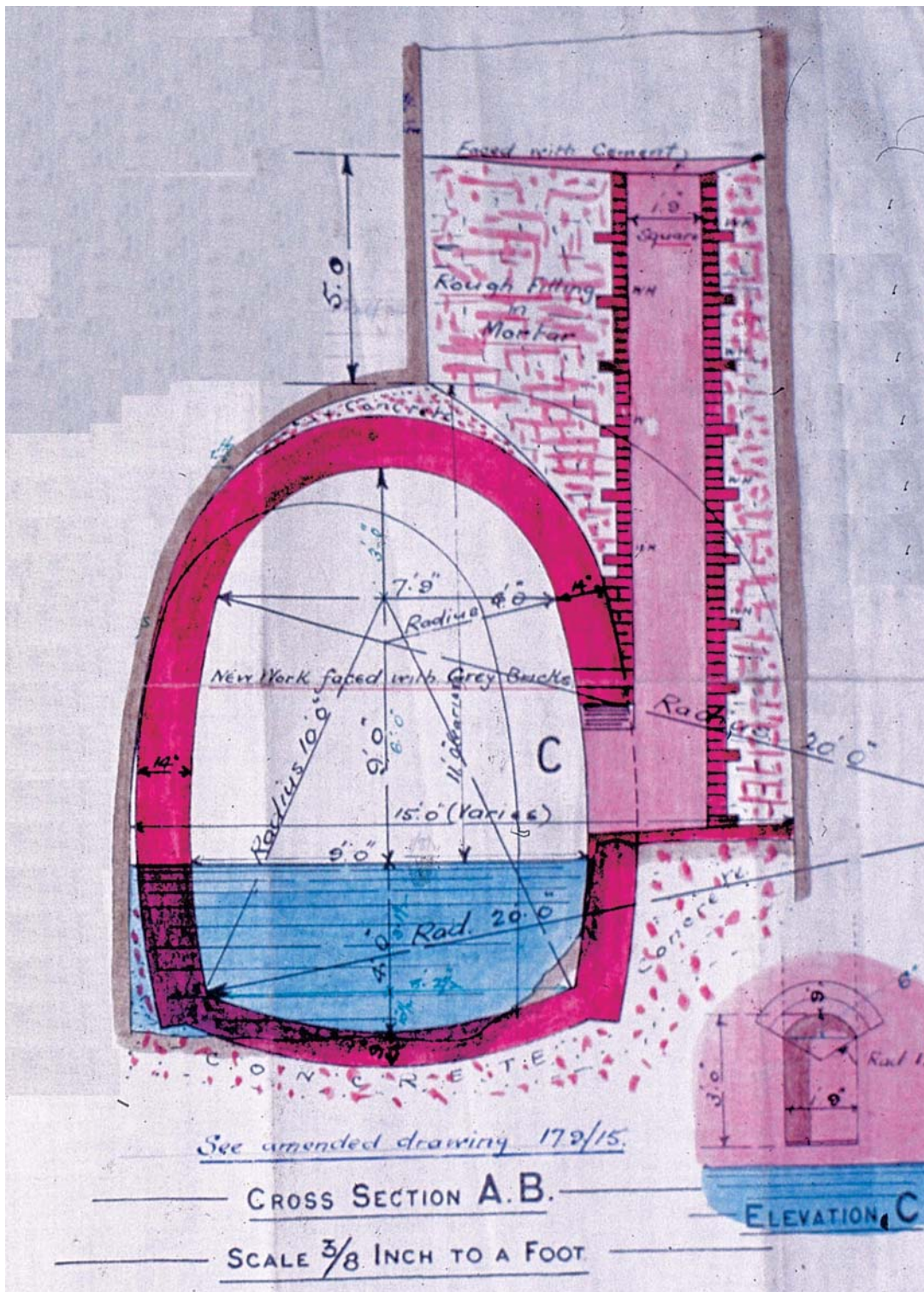
There is a stone barrier in front of the Carr pit heading's exit. There is a path for water under this barrier. This is at point 'L' on the associated diagram.



This bricked up arch is in the North wall just to the West of the Carr Pit exit and is labelled 'M' on the accompanying diagram.



Just inside the new brickwork placed to shorten the Wide Hole is this vertical shaft with steps on the South wall. This is marked as point 'C' in the diagram below.



This cross section of the new section of tunnel built in 1915 during the shortening of the wide hole also shows the preceding entrance to the ladder marked as point 'C'.



The Steps at point 'C'.



The ladder leading upwards from point 'C'. The 1915 Wide Hole drawing shows that this ladder leads to the base of the most westerly loading shaft. There are twelve steps 14 inches apart.



Above the steps in the Western loading shaft looking back down to point 'C'.



Flowstone on the wall of the loading shaft which is between 6' and 6' 6" not 7' wide.



View up loading shaft. Nothing to be seen.



This picture is looking out of the heading behind the main arched gangway towards the arched gangway. The ammunition tube is 1' 10" long therefore this tunnel is about 3' wide at the dirt level.



This is the heading behind the arched gangway pictured from the arched gangway. To the left is the stacked stone closing the rear of the shaft shown as a bricked up entrance earlier.



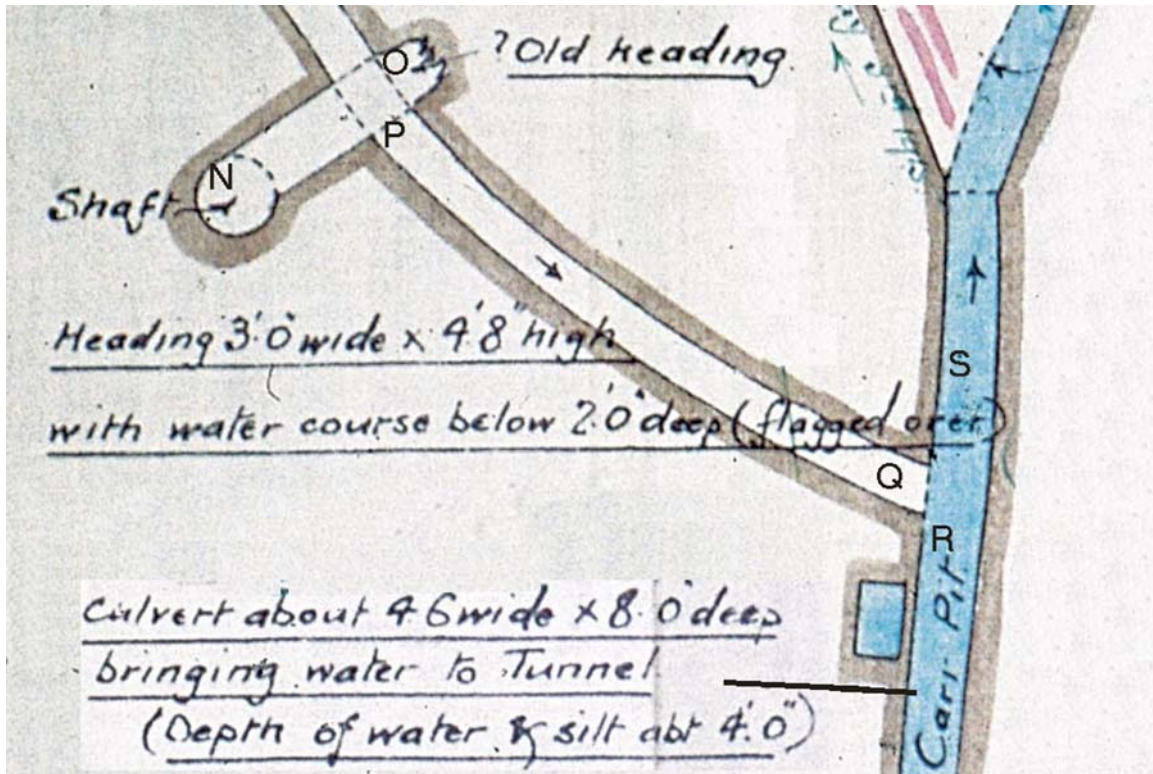
The stacked up stone closing off the shaft picture from the arched gangway. The canal entrance to this shaft is shown as the bricked up entrance earlier.



Looking out of the Arched Gangway to the Wide Hole. My canoe has been pulled up onto the wharf.



Short tunnel leading to a shaft. This is the shaft opposite the old heading labelled on the “Proposed Shortening of Wide Hole” diagram in Hugh Potter’s book “The Cromford Canal”. This shaft is labelled ‘N’ in the following diagram.



This diagram shows the tunnel which leaves the back of the loading wharf at 'B' and proceeds to the junction with the Carr Pit heading at 'Q'.



This heading is at the junction with the short “shaft” tunnel at point ‘P’. It continues on to the Carr Pit heading. The base of this heading has stone flags spanning the tunnel just below water level.



This is the entrance to the “old heading” labelled ‘O’ in the above diagram.



The old heading is not brick lined but in native rock. I kept a sample for identification. According to my eldest brother Ryan Cordon who just happens to be a geologist, the rock is micaceous, carbonaceous siltstone. I also retrieved samples of coal and Blast Furnace Slag from the Wharf. Labeled 'O' on the accompanying diagram.



A view up the remaining shaft labelled 'N' on the diagram. No light to be seen.



View from the shaft 'N' looking back at its entrance tunnel towards point 'P'.



Looking up the old heading 'O'. This is not a horizontal view it is a view up the beginnings of a vertical shaft entirely in virgin rock, the siltstone earlier mentioned. About 20 feet of this shaft is visible from the base.



Another view of the old heading labelled 'O'.



And another view of the old heading 'O'.



Inside the heading traveling towards Carr Pit heading looking towards point 'Q'. This section had stone flags spanning the tunnel just below water level. My impression is that this heading provided access for people to the Carr Pit heading, not goods. If the shaft behind and to the right of this tunnel was indeed part of the counterpoise system mentioned by Des Greenwood in "Portal to Portal", water from the counterbalancing tubs could be emptied at the shaft's base and would have flowed under the flags in this tunnel to the Carr Pit Heading.



The Carr pit heading shown here at 'Q' is both waist deep in water and covered in a thick layer of ochre scum. I did not enter. There are no stone flags spanning the Carr Pit heading at this point. This is a larger tunnel (about 4' 6" wide) than the flagged heading, I doubt that this tunnel was spanned by stone flags. On the opposite wall the brickwork is recessed another tunnel that has been bricked up maybe.



Looking South along the Carr Pit heading in the direction of point 'R'.



The Carr Pit heading looking towards point 'S', viewed from point 'Q'.



A few steps back from Carr Pit heading at point 'Q'. I can't do much about the steam, it is coming from me.



More Carr Pit Scum. This time photographed from the Wide Hole where the Car Pit heading enters at point 'L'.



And there is more again at point 'L'.



Shortly after the Wide Hole the floor of the tunnel is built up with rubble and the roof is heavily shored up.



Some of the shoring is easier to negotiate than others. Iron beams and wooden shoring are used here.



This example may have passed boats at some time.



There are short sections without shoring.



And sections in which the shoring has collapsed.



Robin Witters bulge at about marker 50.



Damaged South wall just after Robin Witter's bulge.



Despite the smears I am sure this says 50.



The tunnel is blocked just after marker 55. The markers from 51 onwards are illegible so I counted back.



This is the style of shoring just before the collapse.



The roof shoring has these marks suggesting that the timbers came from a railway line.





Looking down Shaft Two. Water is visible at the bottom.



Shaft Four at the surface on the other side of the Coach Road. 53 degrees 3.487' N, 1 degree 22.917' W.