

Railway Station Water Tower
St George's Square, Huddersfield, West Yorkshire:
Historic Building Record



July 2012
NGR: SE 14400 17010
Historic township: Huddersfield

STEPHEN HAIGH
Buildings Archaeologist

11 Browcliff Silsden Keighley West Yorkshire BD20 9PN
Tel/Fax: 01535 658925 Mobile: 07986 612548
www.stephenhaigh.co.uk enquiries@stephenhaigh.co.uk

This report is formatted to allow printing on both sides of the paper

Railway Station Water Tower

St George's Square, Huddersfield, West Yorkshire:

Historic Building Record

CONTENTS

List of photographs.....	overleaf
1 Introduction	1
2 Location and current use.....	1
3 Planning background.....	2
4 Previous investigative work	2
5 Historical background.....	2
6 Recording methodology.....	4
7 Description of the water tower	5
8 Conclusion	10
9 Acknowledgements	10
Appendix 1: WYAAS Specification	11
Appendix 2: List of digital photographs.....	23
Appendix 3: Contents of the project archive	24

Figures

1: Location maps	9: Ground floor & basement plans
2: Site plan	10: Elevations
3: 1851 OS map	11: Cross section
4: Extract from plan c.1875	12: Longitudinal section
5: 1890 OS map	13: Plan of water tank
6: 1907 OS map	14: Site plan with key to photographs
7: 1918 OS map	15: Floor & basement plans with key to photographs
8: 1947 OS map	16: Plan of water tank with key to photographs
Addendum	
Photographs	

SUMMARY

The water tower at Huddersfield railway station (NGR: SE 14400 17010) was built in the late 1870s or the 1880s as part of an enlargement scheme for the station, where it served as the main reservoir for distributing water to steam locomotives using the railway. It comprises a stone building of four bays, originally mess rooms, surmounted by a water tank of cast iron panels with a capacity of about 265m³, and with its principal features intact. This record comprises scale drawings and photographs, made in early 2012 for the Association of Community Rail Partnerships, to fulfil a condition of planning consent for the structure's refurbishment.

July 2012

STEPHEN HAIGH

B u i l d i n g s A r c h a e o l o g i s t

11 Browcliff Silsden Keighley West Yorkshire BD20 9PN
Tel/Fax: 01535 658925 Mobile: 07986 612548
www.stephenhaigh.co.uk enquiries@stephenhaigh.co.uk

LIST OF BLACK AND WHITE PHOTOGRAPHS

Photo Subject

- 1 The water tower, viewed from the south-west
- 2 The water tower, viewed from the south-east across John William Street
- 3 The water tower, viewed from the south-west
- 4 The water tower, viewed from the north-east across John William Street
- 5 The water tower, viewed from the north-east across John William Street
- 6 The water tower, viewed from the south-west
- 7 West elevation, from the north-west
- 8 The north elevation
- 9 The west elevation
- 10 The west elevation (south part)
- 11 The west elevation; the right hand doorway is secondary
- 12 The north elevation
- 13 The east elevation, across John William Street
- 14 Cast iron number plate on north elevation
- 15 Bay 1: fireplace in south wall (before refurbishment)
- 16 Bay 1: fireplace in south wall (during refurbishment)
- 17 Bay 1: partition in north-west corner (before refurbishment)
- 18 Bay 1: original feed pipe to tank (pipe no 5) (before refurbishment)
- 19 Bay 1: north-east corner, showing later doorway and original feed pipe to tank
- 20 Bay 1: basement, from the south-west
- 21 Bay 1: basement, from the north-east
- 22 Bay 1: arch below west side (during refurbishment)
- 23 Bay 2: south-west corner, before refurbishment
- 24 Bay 2: north-west corner, showing hearth for corner fireplace, during refurbishment
- 25 Bay 2: vertical pipe (outlet from tank – pipe no 4), in west side
- 26 Bay 2: vertical pipe (outlet from tank – pipe no 4), in west side
- 27 Bay 2: basement, from the south-west
- 28 Bay 3: south-east corner, showing inserted doorway
- 29 Bay 3: basement, from the north
- 30 Bay 3: basement, from the south-west
- 31 Bay 3: basement, from the north-west
- 32 Bay 3: arch to west side of basement, from the south-west
- 33 Bay 4: north-west corner, with original door and window
- 34 Bay 4: north-east window
- 35 Bay 4: blocked fireplace, north wall
- 36 Bay 4: basement, from the south-west
- 37 Bay 4: inserted corrugated iron ceiling, from the west
- 38 Bay 4: pipes in west side (overflow and later feed, nos 1, 2 & 3)
- 39 Bay 4: pipes in west side (overflow and later feed, nos 1, 2 & 3)
- 40 Bay 4: detail of overflow pipe (no 1)
- 41 Bay 4: pipes in west side, at base of tank (overflow and later feed, nos 1 & 2)
- 42 Bay 4: pipes in west side, below ground floor level
- 43 Bay 4: later feed pipe, with junction and drain cock
- 44 Bay 4: later feed pipe, emerging from west side below ground floor level
- 45 Bay 4: base of tank, south-west corner
- 46 Bay 4: base of tank, south side
- 47 Bay 4: detail of cast iron beam supporting tank
- 48 Bay 4: detail of cast iron beam supporting tank
- 49 Bay 4: base of tank, north-west corner
- 50 Bay 4: gas light fitting, below base of tank
- 51 Bay 3: base of tank, with gas pipes for lighting
- 52 South-west corner of water tank
- 53 Square cast iron panel forming side of water tank
- 54 Cast iron panels at south-east corner of water tank

- 55 Cast iron panels forming base of water tank
- 56 Cast iron panels forming base of water tank
- 57 Cast iron panels forming east side of water tank
- 58 Side of water tank with existing and former struts
- 59 General view of the tank, from the south
- 60 General view of the tank, from the north
- 61 General view of the tank, from the south-west
- 62 General view of the tank, from the south-west
- 63 General view of the tank, from the south-west, during repairs
- 64 Later feed, and overflow pipes, within tank, from the north-east
- 65 Overflow pipe (no 1), from the south-west
- 66 Detail of overflow pipe, from the south-west
- 67 Later feed, and overflow pipes, within tank, from the south
- 68 Later feed, and overflow pipes, within tank, from the south-east
- 69 Head of later feed pipe, from the south-west
- 70 Head of later feed pipe, from the south-east
- 71 Level gauge on west side of tank
- 72 Level gauge on west side of tank
- 73 Pulley for level gauge, on west side of tank
- 74 General view of south-west corner of tank
- 75 Detail of outlet pipe at base of tank, with stopper
- 76 Detail of outlet pipe at base of tank, with stopper
- 77 Detail of outlet pipe at base of tank, with stopper
- 78 Detail of outlet pipe at base of tank, with stopper and control lever
- 79 Control lever and chain on outside of tank
- 80 South end of tank, showing original feed pipe
- 81 Detail of original feed pipe, with adjacent ladders
- 82 Pipe supplying adjacent building to west of water tower
- 83 Pipe supplying adjacent building to west of water tower (inside building)

RAILWAY STATION WATER TOWER, ST GEORGE'S SQUARE, HUDDERSFIELD, WEST YORKSHIRE:

HISTORIC BUILDING RECORD

1 Introduction

- 1.1 This report presents the results of historic building recording of a disused water tower at Huddersfield Railway Station, in West Yorkshire. The work was carried out between January and May 2012 for the developer of the building, the Association of Community Rail Partnerships (ACoRP), to discharge a condition attached to planning consent from Kirklees Council, for the refurbishment of and repairs to the building.
- 1.2 The water tower was built in the second half of the nineteenth century to supply steam trains, and comprises a rectangular stone building located at the edge of the station complex, supporting a tank made up of cast iron plates, which could hold approximately 265m³ or 58,291 gallons of water. The ground floor, divided into four rooms, served as offices.
- 1.3 The recording work was carried out in accordance with a specification from the West Yorkshire Archaeology Advisory Service (WYAAS) (Appendix 1), and involved historical research, and drawn, photographic and written recording. This report will be submitted to the client, the West Yorkshire Historic Environment Record and the West Yorkshire Archive Service, and will be published on the internet via the OASIS project.

2 Location and current use

- 2.1 The water tower stands in Huddersfield town centre, alongside and above John William Street, to the north-east of the main buildings at Huddersfield railway station, which themselves face east-south-east onto St George's Square. The national grid reference for the site is SE 14400 17010 and the postcode is HD1 1JB (figure 1).
- 2.2 The tower comprises a rectangular building of one storey with basement below and tank above, with its long axis aligned close to north-south. Although formerly situated immediately next to railway sidings, these have been removed or covered over for the most part and now form a car park. The east side of the building stands above a high retaining wall forming the west side of John William Street.
- 2.3 The building appears to have been disused for a number of years and is the property of Network Rail.

3 Planning background

- 3.1 Huddersfield railway station is listed (grade I; National Heritage list no 1277385), and the water tower forms part of its curtilage. It also lies within the Huddersfield Town Centre conservation area.
- 3.2 Listed building consent for works and the installation of services equipment was granted by Kirklees Council on 1 September 2011 (application number 2011/65/90736/W1), and a condition (number 3) attached at the request of the council's archaeological advisor, WYAAS, requires archaeological and architectural recording before development.

4 Previous investigative work

- 4.1 No previous archaeological investigation of the water tower appears to have been undertaken, although the main station buildings, and the goods warehouse to the west, have been subject to study and recording in recent years.¹ The listed building description makes no reference to the structure.

5 Historical background

Huddersfield Railway Station

- 5.1 The establishment in 1830 of the first steam railway service to carry passengers, which ran between Liverpool and Manchester, was followed by the rapid expansion of the railway system in Britain, and the route between Manchester and Leeds (later known as the Lancashire and Yorkshire Railway or L&YR) was opened in 1841; this took the Calder valley route however, passing to the north of Huddersfield. Although a Huddersfield and Leeds Railway company had been formed in 1835, that was abandoned the following year, and it was not until 1845 that a line was begun to connect the town to the rail network, initially as a scheme of the Huddersfield and Manchester Railway, later to become part of the London and North Western (LNWR).
- 5.2 The town's railway station, which was begun in 1846 and built to a neoclassical design by J P Pratchett, was a joint venture between LNWR and L&YR, and came to form the centre-piece of the town, which was re-developed around the station forecourt and St George's Square. The large scale OS map of

¹ eg Chadwick, S 1984 *Railway Wonder Development of a Town: Part One, The Authentic Story*; the West Yorkshire Historic Environment Record also contains the following reports: Ed Dennison Archaeological Services 1997 *Wagon Lift, Railway Goods Warehouse, Fitzwilliam Street, Huddersfield, West Yorkshire: Archaeological Survey*; English Heritage 2000 *Interim Report: Railway Warehouse, New North Parade, Huddersfield, West Yorkshire*; Wessex Archaeology 2010 *The Stables, Huddersfield Railway Station, St George's Square, Huddersfield, West Yorkshire: Historic Building Recording*, and *Photographic Record of Platform Façade of Booking Hall*

Huddersfield, surveyed in 1848 (figure 3), shows that the water tower was not a component of the station at that time.

- 5.3 Although the railway station was architecturally outstanding, its usefulness was limited by the fact that it was only served by a single platform, and so a major redevelopment was planned in the 1870s, intended to double its capacity. Details of one version of this scheme (which seems not to have been realized in its entirety) are shown on an undated plan held by Network Rail Archives², and this included the water tower, labelled "proposed site for tank and mess room" (figure 4). It has not been possible to establish an accurate date for the tower's construction (the station's redevelopment was not completed until 1886), beyond noting that it had been built by 1889, when the OS re-surveyed the town and showed the building as divided into four "offices" (figure 5). Later maps all show the tower similarly, albeit unnamed (figures 6 to 8).

Railway water towers

- 5.4 Steam locomotives use large amounts of water simply for propulsion, the more powerful examples requiring around 30 gallons per mile, and although they normally incorporate tanks to carry their immediate needs, trackside replenishment facilities were a fundamental part of the railway infrastructure throughout the steam era. The transfer of water to the locomotives themselves was usually achieved by a "water crane", consisting of an upright pipe, with a horizontal, swinging arm to feed the locomotive or its tender, though other methods were also used, such as the water trough set between the rails, which allowed uptake while moving. The supply pipe to the crane was by necessity of large bore in order to hasten filling, up to 0.3m or so in diameter, and was fed by gravity from a header tank rather than directly from a main. The water tower at Huddersfield was built to serve this purpose, the stone building simply being a means of elevating the tank to achieve the pressure necessary to feed the cranes around the station, and it is a large example appropriate to the size of the station and the volume of traffic using it. The inclines on many of the Pennine lines which it served would have increased water consumption by locomotives, and so may also have necessitated a relatively large tank.
- 5.5 The principle of holding water in a tank or reservoir to maintain a supply is an ancient one, and the opportunities presented by cast iron for constructing vessels of this type were exploited by engineers as this material became widely adopted in the late eighteenth century. Rectangular cast iron panels were easily manufactured, and could be bolted together at their flanges, using "rust cement" or bituminous gaskets as a sealant. The railway companies built countless such tanks, usually surmounting towers or gantries, though with the replacement of

² Network Rail Archives, document reference 005869LNE

steam by diesel and electric locomotives for commercial traffic in the 1960s, the tanks and towers became obsolete and the vast majority have been demolished. Examples can still be seen in the region however, at Keighley and Settle stations.



Water tower of c.1883 at Keighley railway station (listed, grade II)

- 5.6 The operation of a railway water tower and tank was generally straightforward, and rather like a domestic WC cistern, usually employed three pipes. One provided the inlet supply or feed, which would normally discharge into the tank above the maximum fill level, and this was usually equipped with a drain cock at a low level to allow maintenance. A second pipe served as the outlet, which fed one or more cranes by gravity, while a third was the overflow, set just below the top of the tank, and usually of larger bore than the inlet pipe to ensure that its flow could exceed the supply. A simple float valve controlled the filling, by rising and falling with the water level, and a second float was linked to an external gauge, to indicate the level in the tank.³
- 5.7 There is no known historic documentation specifically relating to the water tower at Huddersfield, perhaps because the majority of railway records are not held in local repositories, but at the National Archives. There is a local tradition that the tank was fed by water drained from the Standedge tunnel to the west of Marsden, a distance of about 8 miles, but this cannot be verified and seems unlikely, given the distance and the possibilities of using more immediate sources.

6 Recording methodology

- 6.1 The recording was carried out in accordance with the specification issued by WYAAS (Appendix 1), between 31 January and 8 May 2012, and comprised drawn, photographic and written records. Initially, the building was recorded as found (with the exception of the tank, which was then inaccessible), and this work was approved by WYAAS before refurbishment began. Further recording

then took place during construction work, as a “watching brief”, and when scaffolding enabled access to the tank.

- 6.2 The drawn record, based on an original survey by the chartered architects Potts Parry Ives & Young (PPIY), was achieved by hand measurement, and includes plans of basement, ground floor and water tank, at 1:100 or 1:50 scale, external elevations, and cross and longitudinal sections at 1:50 scale. These are intended to show all significant archaeological detail, and use conventions based on those specified by English Heritage⁴.
- 6.3 The photographic record was made using a medium format camera with perspective control and other lenses, and black and white film for archival permanence. External and internal photographs were taken, in most cases with a scale, either a 1m or 2m ranging pole marked with 0.5m graduations, or a 1m baton marked with 0.1m graduations, and their locations are shown on copies of the plans. All the photographs are copied in this report, and in the following description they are referred to by numbers in **bold**. A small number of external photographs was also taken using a digital camera (see Appendix 2).

7 Description of the water tower

The masonry structure

- 7.1 Twentieth century changes to the station and adjacent facilities mean that the water tower no longer occupies a location immediately next to sidings as it once did, but stands at the end of a car park to the north-east of the main station buildings, at the very edge of the premises, alongside a substantial retaining wall above John William Street (**1-5**). The masonry structure which supports the water tank comprises a rectangular building, 22.6m long and 7.1m wide, and about 5.5m high, whose long axis runs from south-south-east to north-north-west (for the sake of simplicity here considered to run south to north).
- 7.2 The building's walls are faced with sandstone “bricks” of local provenance, with a few ashlar dressings, and vary in thickness, as structurally the tower comprises four bays (in this account numbered 1 to 4, from south to north), each linked by cross walls with corner piers, between which are thinner, recessed panels. There are also projecting chimney stacks to the centres of the south, west and north elevations, all with moulded corbels where they are offset to accommodate the tank above, which rests on a string course at the top of the building (**6-8**).

³ Barton, B 2003 *Water Towers of Britain*

⁴ English Heritage 2006 *Understanding Historic Buildings: A guide to good recording practice*

- 7.3 It appears that the original pattern of openings was symmetrical about the building's short axis, though changes over time mean this is not now obvious. When built, the four ground floor rooms each had its own entrance and windows: both of the outer two (bays 1 and 4) were reached through doorways in the west parts of the end elevations, while bays 2 and 3 had doorways in their centres, in the west elevation. Fenestration comprised a regular row of eight large, sash windows in the east side, one pair per room, and two pairs of windows in the west elevation, serving only the two end rooms; the inner rooms (bays 2 and 3) would therefore have been less well-lit. At the south end, the original doorway has been altered to form a window, with the present access into bay 1 being through a former window in the west elevation, and a small, new window has also been inserted to serve WCs in bay 3, in the same elevation. Another alteration to the windows has been the removal of the glazing bars from most of the sashes, with unaltered frames surviving only in bay 4 (9-13).
- 7.4 A cast iron plate attached to the north-west corner of the building bears the number "182", no doubt an identification for the tower from some point in its history (14). Other appendages to the masonry structure include the iron ladder serving the water tank, attached to the west elevation, and various electrical fixtures.
- 7.5 As indicated by the proposed plan of the building (figure 4), the ground floor was intended as mess rooms, in other words rooms for staff to take breaks and eat, to store and change clothing, shelter, and perhaps wash. More recently, it is reported to have housed the station's "permanent way office" as well.
- 7.6 The four ground floor rooms are all of equal size (5.0m x 5.8m), though all have been altered in some way. Before the present refurbishment, Bay 1 had been equipped as an office or mess room; the original fireplace in the south wall had been replaced (15,16), and a partition built around the inserted doorway in the west side, to create an entrance lobby with wash basin (17). This partition partly concealed a vertical, cast iron pipe which seems to have been a former supply to the water tank (pipe no 5; 18,19), apparently superseded by another pipe in bay 4 (no 3); its lower end was not fully revealed during excavation. It seems that originally the ceiling over this bay was formed simply by the cast iron base of the water tank, but a corrugated iron ceiling supported by timber joists had been inserted below, with a later, modern ceiling below that one; the most likely purpose of the corrugated iron, which has a noticeable pitch down to the south, was to prevent dripping of condensation or leaks from the tank above. (See bay 4 for a more detailed account of this arrangement.) Below the timber floor of bay 1 is a basement void, occupying only the east part of the building; its walls are faced with brick, and that on the west side incorporates a small hatch: beyond this the void had been back-filled with rubble and soil up to a level close to the floor joists (20-22). Access was by a timber ladder below a trap door, and rows

of nails set in the joists suggest the space was used for storing small items which could be hung from them – perhaps lamps. At basement level, both east and west walls incorporate substantial brick arches, presumably intended to give structural strength: those on the west side are set almost directly below the outer wall, but to the east they project into the building by 0.6m, a difference probably attributable to the need for broader foundations on this side.

- 7.7 The doorway from bay 1 through the brick cross wall into bay 2 appears to have been inserted, as do all three such internal doorways. Bay 2 was similarly modern in appearance, having been used as a mess room in recent years (23), but evidence for a fireplace or stove having been located in the north-west corner was revealed during refurbishment, in the form of a triangular slab, and this would have been served by the central chimney on the west elevation (24). Two other aspects of this room are worth noting: firstly, a large diameter cast iron pipe (no 4) rises up the west side, and this appears to have been the outlet from the tank to serve the water distribution system around the station (25,26). Secondly, the basement appears never to have provided a usable space, and had been largely back-filled (27). Bay 3 was also modern in appearance (28) but appears to have been heated by a stove or fireplace in the centre of its south wall, from which a flue pipe leads to the chimney shared with bay 2. It also differs from bay 2 in that its basement was accessible, although in this case, the backfill which occupied its western part was retained by a wall of timber planks (29-32).
- 7.8 Bay 4, at the north end of the building, had not been altered to the same degree as the rest of the interior in the twentieth century, manifested by its unplastered walls and unaltered sashes, and it seems to have been used as a store rather than as an office, though it too was provided with a fireplace originally, in this case in the north wall (33-35). It is not clear whether its basement was ever used for storage, but it lacked a ladder and retaining wall, in the manner of those in bays 1 and 3, and had been largely backfilled (36). This room had also been fitted with a later corrugated iron ceiling, in this case with the joists placed longitudinally and with the pitch sloping down to the east (37). That this was a later insertion can be seen from the manner in which the joists had been cut into the masonry.
- 7.9 Three vertical pipes occupy the west side of bay 4, numbered here as 1, 2 and 3 (38). Number 1, the northernmost (39,40), is 180mm in diameter and forms the overflow from the tank (narrower than the supply pipe), descending in a dog-leg before passing through the wall of the building just above ground floor level (41,42). The other principal pipe is number 2, a larger diameter pipe which supplied the tank with water; number 3 is a capped branch of it, equipped with a drain cock just above the junction (43). Pipe 2 enters the building at a lower level than pipe 1, below the relieving arch in the west side, where the brickwork

has been altered (44), taken as an indication that this supply was introduced when the original feed pipe (no 5) was found to be inadequate.

- 7.10 It appears that originally, the base of the tank was exposed above all four rooms, and its form is consistent throughout the building, though during this project it was only recorded in detail above bay 4. Its weight is carried by four longitudinal cast iron I-section beams with stiffeners, the beam ends set on larger blocks at the level of a set-back within the end and cross walls. The positions of the beams correspond with the longitudinal joints of the panels making up the tank base (45-48). A timber fastened between the central two beams holds the remains of a gas light fitting, supplied by a steel pipe which runs through the building (49-51), which might be an original feature, although the manner in which the pipe runs suggests otherwise.

The water tank

- 7.11 As alluded to in the previous paragraph, the water tank itself is constructed from cast iron panels bolted together at their flanges, the flanges all being on the tank's interior (52). Three forms of panels were used, with consistent dimensions: a square one, 1.4m wide (53) (122 of these in total) a round edge one, 1400mm long and with a radius of 260mm (54) (46 in total); and a corner panel, representing an eighth of a sphere, with the same radius (four in number). The tank base comprises five rows of square panels (55,56), each row 16 panels long, and the sides a single row of the same placed vertically, joined to the base by the round-edged and corner panels (57). A pair of struts at each joint holds the sides in place; the present struts are believed to be replacements however, and a number of the original, more slender ones were recovered during refurbishment (58).⁵ A sealant has also been used between the flanges, though its exact nature is unknown and before refurbishment the base of the tank remained largely watertight, but at least one cracked panel in the east side meant that it could hold only a shallow depth of water (59-63).
- 7.12 Various individual features survive within the tank, all located near the west side. At the north end, pipes no. 1 and 2 rise through the tank floor (64). The former, the overflow pipe, has a distinctive funnel shape, and its top is at a level some 110mm below that of the tank edge, presumably to account for variations in the water level caused by wind or other disturbances (65,66). Close to it, the inlet pipe has a head which discharged vertically downwards, incorporating a valve which was at one time no doubt controlled by a float, perhaps associated with two horizontal brackets fastened to the tank side (67-70). It is not clear whether anything was attached to the flange at the base of the pipe's head.

⁵ John Ives, PPIY, pers comm

- 7.13 The remains of a defunct gauge are fixed to the outside of the tank near the middle of the west side, and comprise vertical timbers bolted to the cast iron so as to form a slot, within which a timber marker was able to move up and down (71,72). It must have been connected to a float on the water surface via a rope and the extant pulley wheel (73), presumably with the benefit of a counterweight (perhaps attached by means of the chain which is still fastened to it). This gauge would have risen and fallen in the direction opposite to that of the water level (ie when the tank was full, the gauge would have been at its lowest position), though the precise means of operation cannot be established from the surviving arrangement.
- 7.14 Further south is the principal outlet from the tank, set at its base where it would benefit from maximum pressure, and be capable of maintaining flow when the tank was all but empty (74,75). It is fitted with a closure device in the form of a stopper which could be operated from ground level, but this is likely only to have been used for maintenance, and the supply to the watering points around the station was, one imagines, maintained automatically throughout the day by leaving the pipe open. Closure was effected by a lever with connecting rod, pivoting on a vertical stanchion, and operated from ground level by means of a chain, with the counterweight presumably sufficient to allow the stopper to descend of its own accord, once the chain was released – in which case the operating chain must have been securely fastened, to allow the pipe to remain in the open position (76-79). As with the gauge, though, some of this interpretation is supposition.
- 7.15 Near the south-west corner, pipe no 5 (80,81) has a horizontal flanged face from which a head appears to have been removed, and its similarity to pipe no 2 leads to the presumption that this was the original supply pipe, its narrower diameter probably having been inadequate, and grounds for its replacement by the larger one to the north. The iron ladder fixed to the outside of the tower stands next to this, with a short length of movable ladder used to enter the tank, and implying that this was the most important part of the tank for maintenance, as was probably the case if the control valve needed adjustment.

The adjacent building

- 7.16 The brick building standing close to the west of the water tower and now used as a paint store was not investigated in detail as it does not form part of the scheme of refurbishment. It is a single storey structure 7.7m by 3.6m in plan, with a flat roof, which on map evidence post-dates 1930. It was however observed that a substantial pipe enters its east side and is visible on the inside, where it seems to have been used as a supply, though quite what function this served, and its relationship with the pipes within the main building, remain unknown (82,83).

8 Conclusion

- 8.1 The water tower is a substantial and well preserved example of a once common but now rare building type, dating from the railways' heyday when Huddersfield station underwent a major expansion, although exactly when it was built remains to be established. The building forms a landmark within the town centre, but just as importantly much of the way in which it operated can be elucidated, by the fact that much of its equipment remains in situ. The present, sensitive refurbishment will, it is hoped, mean that the building and its fixtures survive for some time to come.

9 Acknowledgements

- 9.1 The author is grateful to John Ives of PPIY for assistance throughout the project and to the archivists at Network Rail for providing the plan from which figure 4 is taken.

Appendix 1: WYAAS Specification

**Specification For Archaeological Photographic and Drawn Building Recording
The Water Tower, Huddersfield Railway Station, St. George's Square,
Huddersfield HD 1 1J B
(414400 417010)**

**Specification prepared at the request of John Ives, of PPIY Limited
Chartered Architects in response to planning application 2011/65/90736/W1.**

1 Summary

1.1 A building record (photographic and drawn survey) is required to identify and document items of archaeological and architectural interest prior to and during the conversion and upgrading of this former railway water tower which lies within the curtilage of the Grade I listed station and dates to the later 19th century. This specification for the necessary work has been prepared by the West Yorkshire Archaeology Advisory Service (WYAAS), the curators of the West Yorkshire Historic Environment Record.

NOTE: The requirements detailed in paragraphs 6.1.1 to 6.1.5 inclusive, 8.3 and 8.4 are to be met by the archaeological contractor **prior** to the commencement of fieldwork by completing and returning the attached form to the WY Archaeology Advisory Service.

2 Site Location and Description

2.1 Location

(Grid ref. **414400 417010**) The former water is located to the north-east of the main station building and accessed off St. George's Square. John William Street lies to the east of the water tower at a lower level; there is no access between the site and this thoroughfare.

2.2 Description

The water tower is a rectangular building comprising a tall single storey structure and basement in stone with a water tank, fabricated from cast iron plates, forming its roof. The ground floor is accessed by two doors on its western side and has a mix of contemporary and modern windows; cranked chimneys served grates within the ground floor accommodation. Internally the water tower is subdivided into a number of office rooms with suspended ceiling and finishes dating to the later 20th century. Above these and below the water tank's base is a cambered corrugated iron roof. Several large bore cast iron pipes run vertically through the ground floor. The basement is currently full of rubble and rubbish and could only be superficially inspected.

The Water Tower has a foot print of c. 179m².

3 Planning Background

The site owners, through their agents PPIY Ltd. (PPIY Limited Chartered Architects 94 The Mount York YO24 1AR, contact John Ives ☎ 01904 623034) have obtained planning consent (Planning Application No. 414400 417010) for refurbishment of office accommodation within the water tower's ground floor, repairs to the cast iron tank and the introduction of service equipment within the tank. The WYAAS (as Kirklees' archaeological advisor) has prepared this specification in order to allow the

Issued by WY Archaeology Advisory Service

October 2011

developers to meet the terms of an archaeological condition which has been placed on the consent.

4 Archaeological Interest

4.1 Historical Background

The water tower lies within the curtilage of the grade I listed station (National Heritage List For England No. 1,277,385) and grade II railings to station yard (1232086). Whilst the main range of the station dates to late 1840s and early 1850s the water tower which once lay in an area of sidings with a turn table most likely dates to the 1870s or 1880s when the station was expanded to allow the working of multiple platforms. Interestingly a fountain is shown at this location on the large scale (1:1056) Ordnance Survey map of 1849. Elements of historic features and water distribution equipment survive within the building. Steam locomotives consumed prodigious quantities of water while working the Pennine lines which would have been replenished at the station. The water tank would have acted as a reservoir for various watering points distributed around the station. It therefore represents an important physical link between the modern railway landscape and the steam railway's foret from the late 19th century to mid 20th century.

Although once essential to the operation of the railways the introduction of diesel and electric traction rendered water towers redundant by the late 1960s. Many were cleared to make space for new buildings and car parking and even fewer survive with a water tank in place. The example at Huddersfield Station was adapted and used as offices. Its survival, along with its setting, make the Huddersfield example nationally significant.

4.2 Impact of proposed development

The proposed work is generally sympathetic to the historic structure of the water tower and will return the building to a productive and sustainable use. However, there is potential for elements of the building's historic uses to be removed and other features revealed during building works (e.g. while clearing the cellar/basement area).

5 Aims of the Project

5.1 The aim of the proposed work is to identify and objectively record by means of photographs and annotated drawings any significant evidence for the original and subsequent historical form and functions of water tower, and to place this record in the public domain by depositing it with the WY Historic Environment Record (Registry of Deeds, Newstead Road, Wakefield WF1 2DE). The archaeologist on site should give particular attention to recording as far as possible the functional arrangements and division of the buildings.

6 Recording Methodology

6.1 General Instructions

6.1.1 Health and Safety

The archaeologist on site will naturally operate with due regard for Health and Safety regulations. Prior to the commencement of any work on site (and preferably prior to submission of the tender) the archaeological contractor may wish to carry out a Risk Assessment on Water Tower in accordance with the Health and Safety at Work Regulations. The archaeological contractor should identify any contaminants which

constitute potential Health and Safety hazards (e.g. chemical drums) and make arrangements with the client for decontamination/making safe as necessary and appropriate. The WY Archaeology Advisory Service and its officers cannot be held responsible for any accidents or injuries which may occur to outside contractors engaged to undertake this survey while attempting to conform to this specification.

6.1.2 Confirmation of adherence to specification

Prior to the commencement of any work, the archaeological contractor must confirm in writing adherence to this specification (using the attached form), or state in writing (with reasons) any specific proposals to vary the specification. Should the contractor wish to vary the specification, then written confirmation of the agreement of the WYAAS to any variations is required prior to work commencing. Unauthorised variations are made at the sole risk of the contractor (see para. 8.3, below). Modifications presented in the form of a re-written project brief will not be considered by the WYAAS.

6.1.3 Confirmation of timetable and contractor's qualifications

Prior to the commencement of work on site, the archaeological contractor should provide the WYAAS in writing with a projected timetable for the site work, and with details regarding staff structure and numbers. *Curriculum vitae* of key project members (the project manager, site supervisor, photographer, any proposed specialists etc.), along with details of any specialist sub-contractors, should also be supplied to the WYAAS if the contractor has not previously done so. All project staff provided by the archaeological contractor must be suitably qualified and experienced for their roles. In particular, staff involved in building recording should have proven expertise in the recording and analysis of industrial buildings.

6.1.4 Site preparation

Prior to the commencement of work on site the archaeological contractor should identify all removable modern material (including 20th century partitions, dry-boarding, suspended ceilings, modern machinery etc.) which may significantly obscure material requiring an archaeological record, and should contact the developer in order to make arrangements for its removal (if necessary, under archaeological supervision). It is not the intention of this specification that large-scale removal of material of this type should take place with the archaeological contractor's manpower or at that contractor's expense.

6.1.5 Documentary research

A file on Huddersfield Railway Station is held in the West Yorkshire Historic Environment Record (Registry of Deeds, Newstead Road, Wakefield WF1 2QP ☎ 01924 306797 wyher@wyjs.org.uk). Prior to the commencement of work on site, the contractor should consult the HER record in order to inform the archaeological recording by providing background information with regard to function and phasing. Please note that the HER makes a charge for commercial consultations.

6.1.6 Site/building plans

PPIY Ltd. have produced plans and elevations as existing of the Water Tower. With the agreement of the copyright holder these may be used as a base for the present recording.

6.2 Sequence of recording

6.2.1 Initial record

As a result of the modern partitioning and remodelling of water tower, recording work should take place in two stages. The structures should initially be recorded as extant, with due provision made for the removal of any debris or modern material which may obscure fabric or features requiring an archaeological record (para 6.1.4 above).

6.2.2 Watching Brief

Subsequent to the commencement of structural work on site, a watching brief should be maintained by the contracting archaeologist to record any pertinent historic structural or functional detail which may be exposed during the course of refurbishment but which are currently inaccessible, overbuilt or obscured by later alterations to a degree not remediable under normal circumstances of site preparation e.g. the cellar/basement area which will be cleared of rubble. This record should be obtained by means of notes, drawings and photographs as appropriate, to the standards outlined elsewhere in this specification. This detail should then be incorporated into the completed record.

6.3 Written Record

The archaeologist on site should carefully examine all parts of building prior to the commencement of recording, in order to identify all features relevant to its original use and to obtain an overview of the development of the building and of the site as a whole. As part of this exercise, the archaeologist on site should produce written observations (e.g. on phasing; on building function) sufficient to permit the preparation of a report on the structure.

6.4 Drawn Record

6.4.1 Drawings required

The drawn record should comprise:

- ∞ All 4 external elevation
- ∞ Floor plans of ground floor and basement with reflected ceiling plans
- ∞ The north-west to south-east internal elevation (water pipes) and
- ∞ A south - west to north-east section showing construction and form of tank and building

Drawings should be made at an appropriate scale (not smaller than 1:100 for plans; not smaller than 1:50 for sections). The structures should be recorded as existing, but a clear distinction should be made on the final drawings between surviving as-built features and all material introduced in the structure during the late 20th-century.

6.4.2 Provision for Additional Drawings

6.4.2a The recording requirements outlined above are based on a brief inspection of the site by the WY Archaeology Advisory Service. However, detailed examination and analysis of the site by the archaeological contractor may reveal features which merit detailed recording beyond what has been specifically required. In addition to what is requisite to complete the work specified above, the archaeological contractor should tender for a contingency period of two days recording on site (with two days drawing-up time off site - four days in total) in order that features so identified may be adequately recorded. This contingency should be clearly and separately identified in any tender document.

6.4.2b If features requiring additional drawing are identified during the course of work on site, the WY Archaeology Advisory Service should be contacted as soon as possible, and should be provided in writing with a schedule of proposed additional work. A site visit will then be arranged by the WYAAS to examine the features in question and to assess the need to apply the contingency (this visit will usually be combined with a routine monitoring visit). Implementation of the contingency will be at the decision of the West Yorkshire Archaeology Advisory Service, which will be issued in writing, if necessary in retrospect after site discussions.

6.4.3 Scope of record

All features of archaeological and architectural interest identified during the process of appraisal should be incorporated into, and clearly identified in, the final drawn record. Typically, items of interest would include:

- ∞ Means of Ventilation and heating
- ∞ Supply of water to tank and station

but this list should not be treated as exhaustive. The archaeologist on site should also identify and note:

- ∞ any significant changes in construction material - this is intended to include significant changes in stone/brick type and size
- ∞ any blocked, altered or introduced openings
- ∞ evidence for phasing, and for historical additions or alterations to the building.

6.4.4 Dimensional accuracy

Dimensional accuracy should accord with the normal requirements of the English Heritage Architecture and Survey Branch (at 1:20, measurements should be accurate to at least 10mm; at 1:50, to at least 20mm; at 1:100, to at least 50mm).

6.4.5 Drawing method

The survey may be executed either by hand or by means of reflectorless EDM as appropriate. In accordance with national guidelines¹, drawings executed on site should be made either on polyester-based film (minimum thickness 150 microns) with polymer-bonded leads of an appropriate thickness and density, or on acid-free or rag paper. If finished drawings are generated by means of CAD or a similar proven graphics package, recorders should ensure that the software employed is sufficiently advanced to provide different line-weight (point-size); this feature should then be used to articulate the depth of the drawings. CAD repeats or cloning of features should **not** be used. What is required as an end product of the survey is a well-modelled and clear drawing; ambiguous flat-line drawings should be avoided. Drawing conventions should conform to English Heritage guidelines as laid out in English Heritage 2006, *Understanding Historic Buildings - a guide to good recording practice*, and the WYAAS would recommend that the CAD layering protocol detailed in the same volume (8.3, Table 2) should be adhered to.

6.5 Photographic Record

6.5.1 External photographs

An external photographic record should be made of all elevations of the building, from vantage points as nearly parallel to the elevation being photographed as is possible within the constraints of the site. The contractor should ensure that all visible elements of each elevation are recorded photographically; this may require

¹ English Heritage 2006, *Understanding Historic Buildings - a guide to good recording practice*, 7.1.1ff

photographs from a number of vantage points. A general external photographic record should also be made which includes a number of oblique general views of the building from all sides, showing it and the complex as a whole in its setting. In addition, a 35mm general colour-slide survey of the building should also be provided (using a variety of wide-angle, medium and long-distance lenses). While it is not necessary to duplicate every black-and-white shot, the colour record should be sufficiently comprehensive to provide a good picture of the form and general appearance.

6.5.2 Internal photographs

A general internal photographic record should be made of the building. General views should be taken of *each room* or discrete internal space from a sufficient number of vantage points to adequately record the form, general appearance and manner of construction of each area photographed. In areas which are wholly modern in appearance, character and materials, a single shot to record current appearance will suffice.

6.5.3 Detail photographs

In addition, detailed record shots should be made of all individual elements noted in section 6.4.3 above. Elements for which multiple examples exist (e.g. each type of roof truss, column or window frame) may be recorded by means of a single representative illustration.

- ∞ Large bore water pipes
- ∞ Corrugated-iron roof
- ∞ Tank construction

N.B. Detail photographs must be taken at medium-to-close range and be framed in such a way as to ensure that the element being photographed clearly constitutes the principal feature of the photograph.

6.5.4 Equipment

General photographs should be taken with a Large Format camera (5" x 4" or 10" x 8") using a monorail tripod, or with a Medium Format camera which has perspective control, using a tripod. The contractor must have proven expertise in this type of work. Any detail photographs of structural elements should if possible be taken with a camera with perspective control. Other detail photographs may be taken with either a Medium Format or a 35mm camera. All detail photographs must contain a graduated photographic scale of appropriate dimensions (measuring tapes and surveying staffs are not considered to be acceptable scales in this context). A 2-metre ranging-rod, discretely positioned, should be included in a selection of general shots, sufficient to independently establish the scale of all elements of the building and its structure.

6.5.5 Film stock

All record photographs to be black and white, using conventional silver-based film only, such as Ilford FP4 or HP5, or Delta 400 Pro (a recent replacement for HP5 in certain film sizes such as 220). Dye-based (chromogenic) films such as Ilford XP2 and Kodak T40CN are unacceptable due to poor archiving qualities.

6.5.6 Digital photography

As an alternative to our requirement for colour slide photography, good quality digital photography may be supplied as an alternative, using cameras with a minimum resolution of 4 megapixels. Note that conventional black and white print photography is still required and constitutes the permanent record. Digital images will only be acceptable as an alternative to colour slide photography if each image is supplied in three file formats (as a RAW data file, a DNG file and as a J P E G file). The contractor must include metadata embedded in the DNG file. The metadata must include the following: the commonly used name for the site being photographed, the relevant centred OS grid coordinates for the site to at least six figures, the relevant township name, the date of photograph, the subject of the photograph, the direction of shot and the name of the organisation taking the photograph. Images are to be supplied to WYAAS on gold CDs by the archaeological contractor accompanying the hard copy of the report.

6.5.7 Printing

6.5.6a Record photographs should be printed at a minimum of 5" x 7". In addition, a small selection of photographs (the best 4 of the exterior setting shots and interior shots) should be printed at 10" x 8". Bracketed shots of identical viewpoints need not be reproduced, but all viewpoints must be represented within the report.

6.5.6b Prints may be executed digitally from scanned versions of the film negatives, and may be manipulated to improve print quality (but **not** in a manner which alters detail or perspective). All digital prints must be made on paper and with inks which are certified against fading or other deterioration for a period of 75 years or more when used in combination. If digital printing is employed, the contractor must supply details of the paper/inks used in writing to the WY Archaeology Advisory Service, with supporting documentation indicating their archival stability/durability. Written confirmation that the materials are acceptable must have been received from the WYAAS prior to the commencement of work on site.

6.5.7 Documentation

A photographic register detailing (as a minimum) location, direction and subject of shot must accompany the photographic record; a separate photographic register should be supplied for any colour slides or for colour digital photographs. The position and direction of each photograph and slide should be noted on a copy of the building plan, which should also be marked with a north pointer; separate plans should be annotated for each floor of each building

7. Post-Recording Work and Report Preparation

7.1 After completion of fieldwork

Prior to the commencement of any other work on site, the archaeological contractor should arrange a meeting at the offices of the WY Archaeology Advisory Service to present a draft of the photo-location plan, and photographic contact prints adequately referenced to this plan (material supplied will be returned to the contractor). **N.B.** if full-sized prints or digital versions of contact sheets are supplied for this purpose, they must be accompanied by a sample of the processed negatives. If appropriate,

the WY Archaeology Advisory Service will then confirm to Kirklees Planning Services that fieldwork has been satisfactorily completed and that other work on site may commence (although discharge of the archaeological condition will not be recommended until the watching brief has been undertaken and a completed copy of the full report and photographic record has been received and approved by the West Yorkshire Archaeology Advisory Service). Please note that as of the 1st April 2011, the WYAAS will charge the archaeological contractor a fee for each fieldwork verification meeting.

7.2 Report Preparation

7.2.1 Report format and content

A written report should be produced. This should include:

- ∞ an executive summary including dates of fieldwork, name of commissioning body, and a brief summary of the results including details of any significant finds
- ∞ an introduction outlining the reasons for the survey
- ∞ a brief architectural description of the buildings correlated to the drawn and photographic record, presented in a logical manner, (as a walk around and through the building, starting with setting, then progressing to all sides of the structure in sequence, and finally to the interior from the ground floor up) and correlated/fully referenced to the photographic record.

The architectural description should be fully cross-referenced to the photographic record, sufficient to illustrate the major features of the site and the major points raised. It is not envisaged that the report is likely to be published, but it should be produced with sufficient care and attention to detail to be of academic use to future researchers. A copy of this specification and a quantified index to the field archive should also be bound into the back of the report. The cover sheet should include a centred eight-figure OS grid reference and the name of the township in which the site is located (Huddersfield).

7.2.2 Report Illustrations

Illustrations should include:

- ∞ a location map at a scale sufficient to allow clear identification of the buildings in relation to other buildings in the immediate area
- ∞ a complete set of site drawings (plans, elevations and sections) at the specified scale
- ∞ a complete set of site drawings at a legible scale, on which position and direction of each photograph has been noted
- ∞ any relevant historic map editions, with the position and extent of the site clearly indicated
- ∞ any additional illustrations pertinent to the site
- ∞ a complete set of good-quality laser copies of all photographs. All photographs should be accompanied by detailed captions clearly locating and identifying any pertinent features.

The latter should be bound into the report, appropriately labelled (numbered, and captioned in full) and fully referenced within the report. When captioning, contractors

should identify the individual photographs by means of a running sequence of numbers (e.g. Plate no. 1; Plate no. 2), and it is this numbering system which should be used in cross-referencing throughout the report and on the photographic plans. However, the relevant original film and frame number should also be included in brackets at the end of each caption.

7.3 Report deposition

7.3.1 General considerations

7.3.1a The report should be supplied to the client and to the National Monuments Record (English Heritage, Kemble Drive, Swindon SN2 2GZ - for the attention of Mike Evans, Head of Archives) and an identical copy (but including the photographic prints and colour slides) supplied to the West Yorkshire HER. The finished report should be supplied within eight weeks of completion of all fieldwork, unless otherwise agreed with the WYAAS. The report will become publicly accessible once deposited with the WYAAS, unless confidentiality is explicitly requested, in which case it will become publicly accessible six months after deposit. Any comments made by WYAAS in response to the submission of an unsatisfactory report will be taken into account and will result in the reissue of a suitably edited report to all parties, within a timescale which has been agreed with WYAAS.

7.3.1b The West Yorkshire HER supports the Online Access to Index of Archaeological Investigations (OASIS) project. 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 archaeological contractor must therefore complete the online OASIS form at <http://ads.ahds.ac.uk/project/oasis/>. Contractors are advised to contact the West Yorkshire HER officer prior to completing the form. Once a report has become a public document by submission to or incorporation into the HER, the West Yorkshire HER may place the information on a web-site. Please ensure that you and your client agree to this procedure in writing as part of the process of submitting the report to the case officer at the West Yorkshire HER.

7.3.1c With the permission of the client, the archaeological contractor are encouraged to consider the deposition of a copy of the report for this site with the appropriate Local History Library.

7.3.2 Deposition with WYAAS (the West Yorkshire Historic Environment Record)

The report copy supplied to the WY Archaeology Advisory Service should also be accompanied by both the photographic negatives and a complete set of labelled photographic prints (mounted in KENRO display pockets or similar, and arranged in such a way that labelling is readily visible) bound in a form which will fit readily into a standard filing cabinet suspension file (not using hard-backed ring-binders). Labelling should be on the *back* of the print in pencil giving film and frame number only (taking care not to damage the print) and on applied printed labels stuck on the front of the relevant photographic sleeve and which should include:

- ∞ film and frame number
- ∞ date recorded and photographer's name
- ∞ name and address of building

- ∞ national grid reference
- ∞ specific subject of photograph.

Negatives should be supplied in archivally stable mounts (KENRO display pockets or similar), and each page of negatives should be clearly labelled with the following:

- ∞ Township name
- ∞ Site name and address
- ∞ Date of photographs (month/year)
- ∞ Name of archaeological contractor
- ∞ Film number

Colour slides should be mounted, and the mounts suitably marked with - 'Huddersfield' (the Township name) with 'Huddersfield Railway Water Tower under, at the top of the slide; grid reference at the bottom; date of photograph at the right hand side of the mount; subject of photograph at the left hand side of the mount. Subject labelling may take the form of a numbered reference to the relevant photographic register. The slides should be supplied to the WY Archaeology Advisory Service in an appropriate, archivally stable slide hanger (for storage in a filing cabinet). In all other respects, standards for archive compilation and transfer should conform to those outlined in *Archaeological Archives - a guide to best practice in creation, compilation, transfer and curation* (Archaeological Archives Forum, 2007).

7.3.3 Copyright - Please note that by depositing this report, the contractor gives permission for the material presented within the document to be used by the WYAAS, in perpetuity, although The Contractor retains the right to be identified as the author of all project documentation and reports as specified in the *Copyright, Designs and Patents Act 1988* (chapter IV, section 79). The permission will allow the WYAAS to reproduce material, including for non-commercial use by third parties, with the copyright owner suitably acknowledged

7.4 Summary for publication

The attached summary sheet should be completed and submitted to the WYAAS for inclusion in the summary of archaeological work in West Yorkshire published on the WYAAS website.

7.5 Preparation and deposition of the building recording archive

After the completion of all recording and post-recording work, a fully indexed field archive should be compiled consisting of all primary written documents and drawings, and a set of suitably labelled photographic contact sheets (only). Standards for archive compilation and transfer should conform to those outlined in *Archaeological Archives - a guide to best practice in creation, compilation, transfer and curation* (Archaeological Archives Forum, 2007). The field archive should be deposited with the Kirklees Office of the West Yorkshire Archive Service (Central Library, Princess Alexandra Walk Huddersfield, HD1 2SU England Tel: 01484 221966), and should be accompanied by a copy of the full report as detailed above. Deposition of the archive should be confirmed in writing to the WY Archaeology Advisory Service.

8 General considerations

8.1 Technical queries

Any technical queries arising from this specification should be addressed to the WYAAS without delay.

8.2 Authorised alterations to specification by contractor

It should be noted that this specification is based upon records available in the West Yorkshire Historic Environment Record and on a brief examination of the site by the WYAAS. Archaeological contractors submitting tenders should carry out an inspection of the site prior to submission. If, on first visiting the site or at any time during the course of the recording exercise, it appears in the archaeologist's professional judgement that

- i) a part or the whole of the site is not amenable to recording as detailed above, and/or
- ii) an alternative approach may be more appropriate or likely to produce more informative results, and/or
- iii) any features which should be recorded, as having a bearing on the interpretation of the structure, have been omitted from the specification,

then it is expected that the archaeologist will contact the WYAAS as a matter of urgency. If contractors have not yet been appointed, any variations which the WYAAS considers to be justifiable on archaeological grounds will be incorporated into a revised specification, which will then be re-issued to the developer for redistribution to the tendering contractors. If an appointment has already been made and site work is ongoing, the WYAAS will resolve the matter in liaison with the developer and the Local Planning Authority.

8.3 Unauthorised alterations to specification by contractor

It is the archaeological contractor's responsibility to ensure that they have obtained the WYAAS's consent in writing to any variation of the specification prior to the commencement of on-site work or (where applicable) prior to the finalisation of the tender. Unauthorised variations may result in the WYAAS being unable to recommend discharge of the archaeological recording condition to the Local Planning Authority and are made solely at the risk of the contractor.

8.4 Monitoring

This exercise will be monitored as necessary and practicable by the WYAAS in its role as 'curator' of the county's archaeology. The WYAAS should receive at least one week's notice in writing of the intention to start fieldwork. A copy of the contractor's Risk Assessment should accompany this notification.

8.5 Valid period of specification

This specification is valid for a period of one year from date of issue. After that time it may need to be revised to take into account new discoveries, changes in policy or the introduction of new working practices or techniques.

Any queries relating to this specification should be addressed to the WYAAS without delay.

West Yorkshire Archaeology Advisory Service

David hunter

October 2011

**West Yorkshire Archaeology Advisory Service
Registry of Deeds
Newstead Road
Wakefield
WF1 2DE**

**Telephone: (01924).
Fax: (01924) 306810
E-mail: dhunter@wyjs.org.uk**

Appendix 2: List of digital photographs

CD of photographs (in JPG, ORF(RAW) & DNG formats) deposited with the West Yorkshire Historic Environment Record

Number	Subject
D1	The water tower, viewed from the south-west
D2	The water tower, viewed from the south-east across John William Street
D3	The water tower, viewed from the south-west
D4	West elevation, from the north-west
D5	The north elevation
D6	The west elevation
D7	The west elevation (south part)
D8	The west elevation; the right hand doorway is secondary
D9	The north elevation

Appendix 3: Contents of the project archive

To be deposited with the Kirklees office of the West Yorkshire Archive Service

1 file, containing:

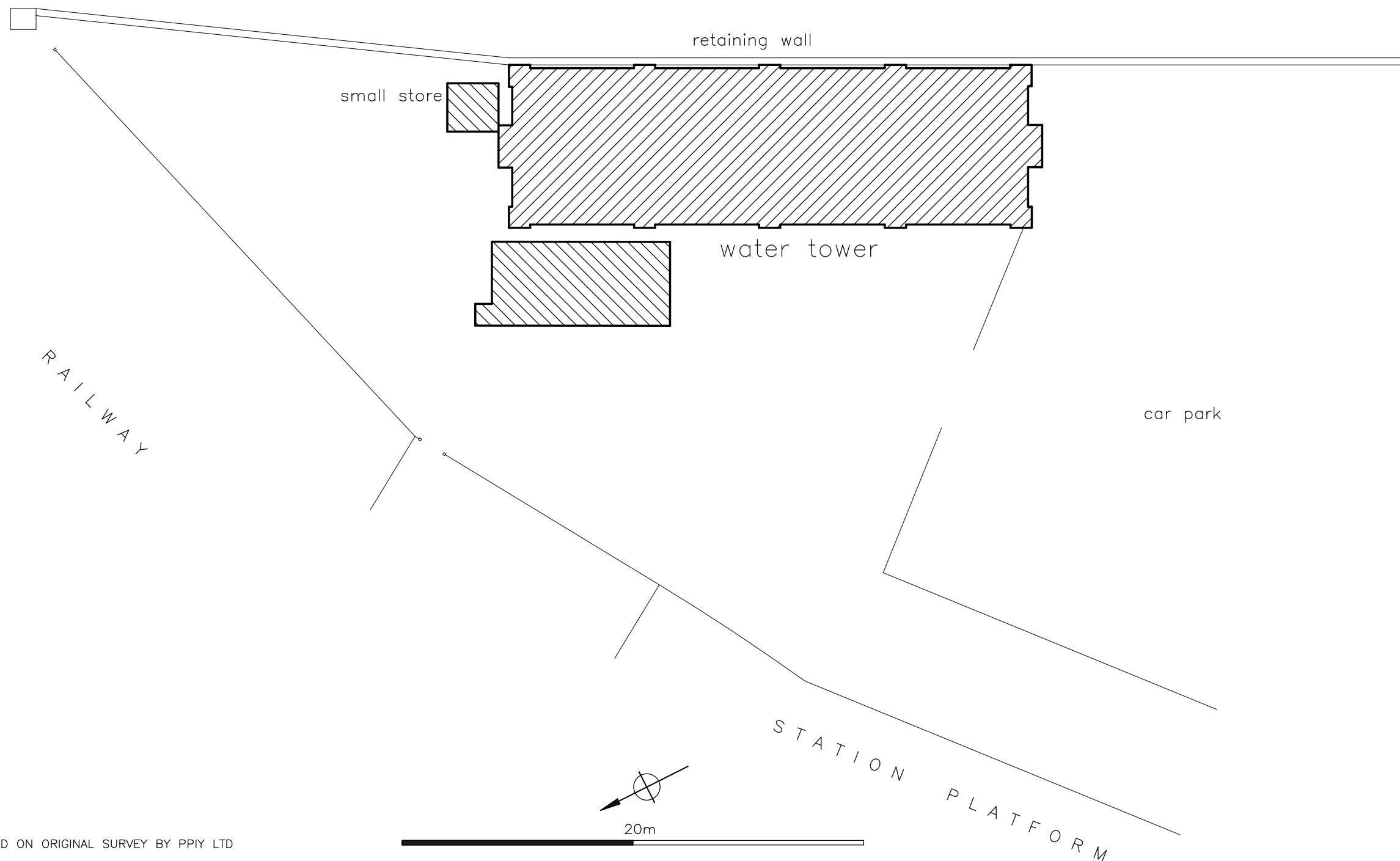
- a copy of the report
- photographic contact sheets (8 no)
- site notes (annotated plans etc)

Complete list of black and white photographs taken, in film order

Photo	Film	Frame	Subject
30	1	2	Bay 3: basement, from the south-west
29	1	4	Bay 3: basement, from the north
6	1	5	The water tower, viewed from the south-west
1	1	6	The water tower, viewed from the south-west
9	1	7	The west elevation
11	1	9	The west elevation; the right hand doorway is secondary
10	1	10	The west elevation (south part)
7	1	12	West elevation, from the north-west
12	1	13	The north elevation
8	1	14	The north elevation
14	1	16	Cast iron number plate on north elevation
71	1	17	Level gauge on west side of tank
79	1	18	Control lever and chain on outside of tank
52	2	1	South-west corner of water tank
3	2	3	The water tower, viewed from the south-west
2	2	4	The water tower, viewed from the south-east across John William Street
13	2	5	The east elevation, across John William Street
5	2	6	The water tower, viewed from the north-east across John William Street
4	2	9	The water tower, viewed from the north-east across John William Street
15	2	11	Bay 1: fireplace in south wall (before refurbishment)
17	2	12	Bay 1: partition in north-west corner (before refurbishment)
18	2	13	Bay 1: original feed pipe to tank (pipe no 5) (before refurbishment)
23	2	15	Bay 2: south-west corner, before refurbishment
26	2	16	Bay 2: vertical pipe (outlet from tank – pipe no 4), in west side
28	2	17	Bay 3: south-east corner, showing inserted doorway
38	3	2	Bay 4: pipes in west side (overflow and later feed, nos 1, 2 & 3)
37	3	4	Bay 4: inserted corrugated iron ceiling, from the west
34	3	5	Bay 4: north-east window
33	3	6	Bay 4: north-west corner, with original door and window
35	3	7	Bay 4: blocked fireplace, north wall
43	3	9	Bay 4: later feed pipe, with junction and drain cock
40	3	10	Bay 4: detail of overflow pipe (no 1)
49	4	1	Bay 4: base of tank, north-west corner
39	4	3	Bay 4: pipes in west side (overflow and later feed, nos 1, 2 & 3)
41	4	4	Bay 4: pipes in west side, at base of tank (overflow and later feed, nos 1 & 2)
44	4	5	Bay 4: later feed pipe, emerging from west side below ground floor level
51	4	6	Bay 3: base of tank, with gas pipes for lighting
25	4	8	Bay 2: vertical pipe (outlet from tank – pipe no 4), in west side

20	4	9	Bay 1: basement, from the south-west
21	4	10	Bay 1: basement, from the north-east
19	4	11	Bay 1: north-east corner, showing later doorway and original feed pipe to tank (pipe no 5) (during refurbishment)
16	4	12	Bay 1: fireplace in south wall (during refurbishment)
36	5	1	Bay 4: basement, from the south-west
42	5	3	Bay 4: pipes in west side, below ground floor level (overflow and later feed, nos 1 & 2)
46	5	4	Bay 4: base of tank, south side
45	5	5	Bay 4: base of tank, south-west corner
31	5	6	Bay 3: basement, from the north-west
32	5	7	Bay 3: arch to west side of basement, from the south-west
24	5	9	Bay 2: north-west corner, showing hearth for corner fireplace, during refurbishment
27	5	10	Bay 2: basement, from the south-west
59	6	7	General view of the tank, from the south
64	6	9	Later feed, and overflow pipes, within tank, from the north-east
60	6	10	General view of the tank, from the north
75	6	12	Detail of outlet pipe at base of tank, with stopper
53	6	13	Square cast iron panel forming side of water tank
54	6	14	Cast iron panels at south-east corner of water tank
56	6	16	Cast iron panels forming base of water tank
65	6	17	Overflow pipe (no 1), from the south-west
67	6	18	Later feed, and overflow pipes, within tank, from the south
68	7	2	Later feed, and overflow pipes, within tank, from the south-east
73	7	3	Pulley for level gauge, on west side of tank
78	7	4	Detail of outlet pipe at base of tank, with stopper and control lever
76	7	5	Detail of outlet pipe at base of tank, with stopper
81	7	6	Detail of original feed pipe, with adjacent ladders
58	7	8	Side of water tank with existing and former struts
69	7	9	Head of later feed pipe, from the south-west
70	7	10	Head of later feed pipe, from the south-east
66	7	11	Detail of overflow pipe, from the south-west
61	7	12	General view of the tank, from the south-west
80	7	14	South end of tank, showing original feed pipe
62	7	15	General view of the tank, from the south-west
74	7	16	General view of south-west corner of tank
72	7	17	Level gauge on west side of tank
57	7	18	Cast iron panels forming east side of water tank
48	8	1	Bay 4: detail of cast iron beam supporting tank
50	8	4	Bay 4: gas light fitting, below base of tank
47	8	5	Bay 4: detail of cast iron beam supporting tank
22	8	6	Bay 1: arch below west side (during refurbishment)
63	8	7	General view of the tank, from the south-west, during repairs
77	8	9	Detail of outlet pipe at base of tank, with stopper
55	8	10	Cast iron panels forming base of water tank
82	8	11	Pipe supplying adjacent building to west of water tower
83	8	13	Pipe supplying adjacent building to west of water tower (inside building)

JOHN WILLIAM STREET



RAILWAY STATION WATER TOWER
ST GEORGE'S SQUARE
HUDDERSFIELD, WEST YORKSHIRE
NGR: SE 14400 17010
HISTORIC BUILDING RECORD

FIGURE 2:
SITE PLAN

SCALE: 1:200
DATE OF SURVEY: JAN - MAY 2012

STEPHEN HAIGH
Buildings Archaeologist

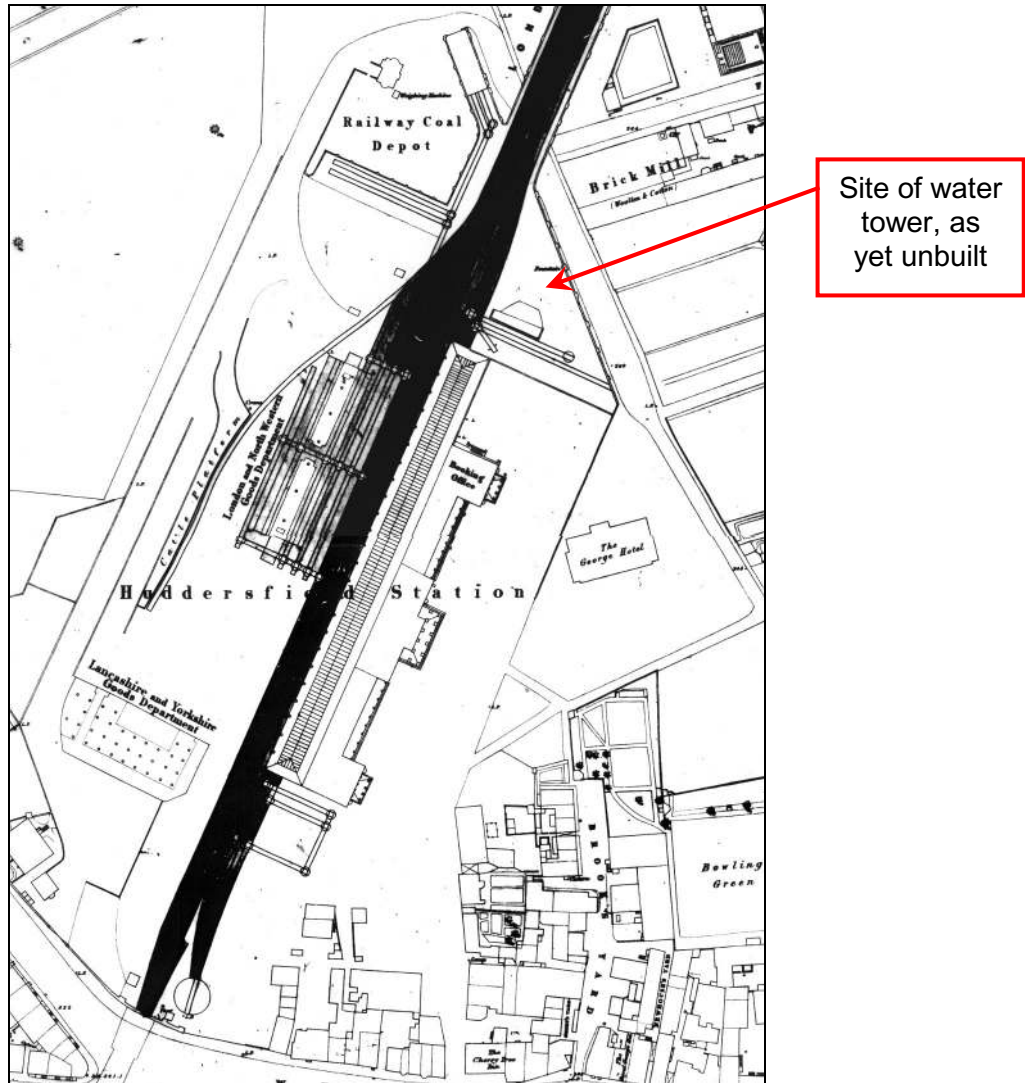


Figure 3: Ordnance Survey 1:1056 map, published 1851 (surveyed 1848)
Sheet no: Huddersfield, 5; reduced to approx 1:2500

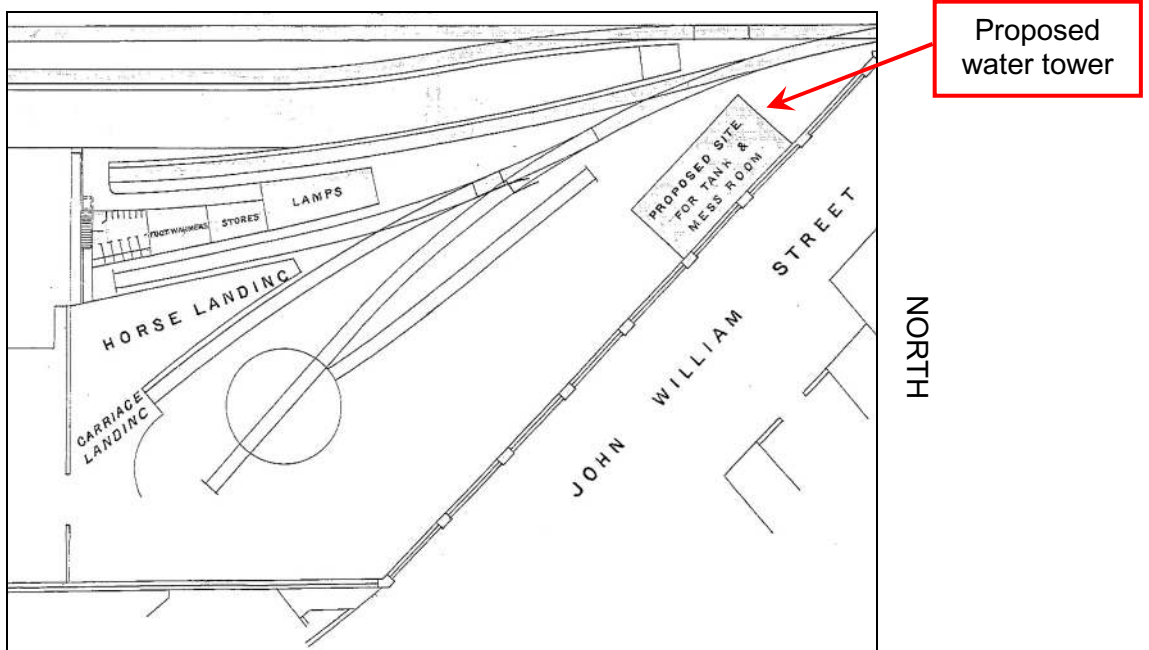


Figure 4: Extract from plan showing proposed enlargement of station (undated, c.1875)
L & NW and L & YR^{YS} Proposed Enlargement of Huddersfield Station
Reproduced by courtesy of Network Rail Archives, document ref 005869LNE

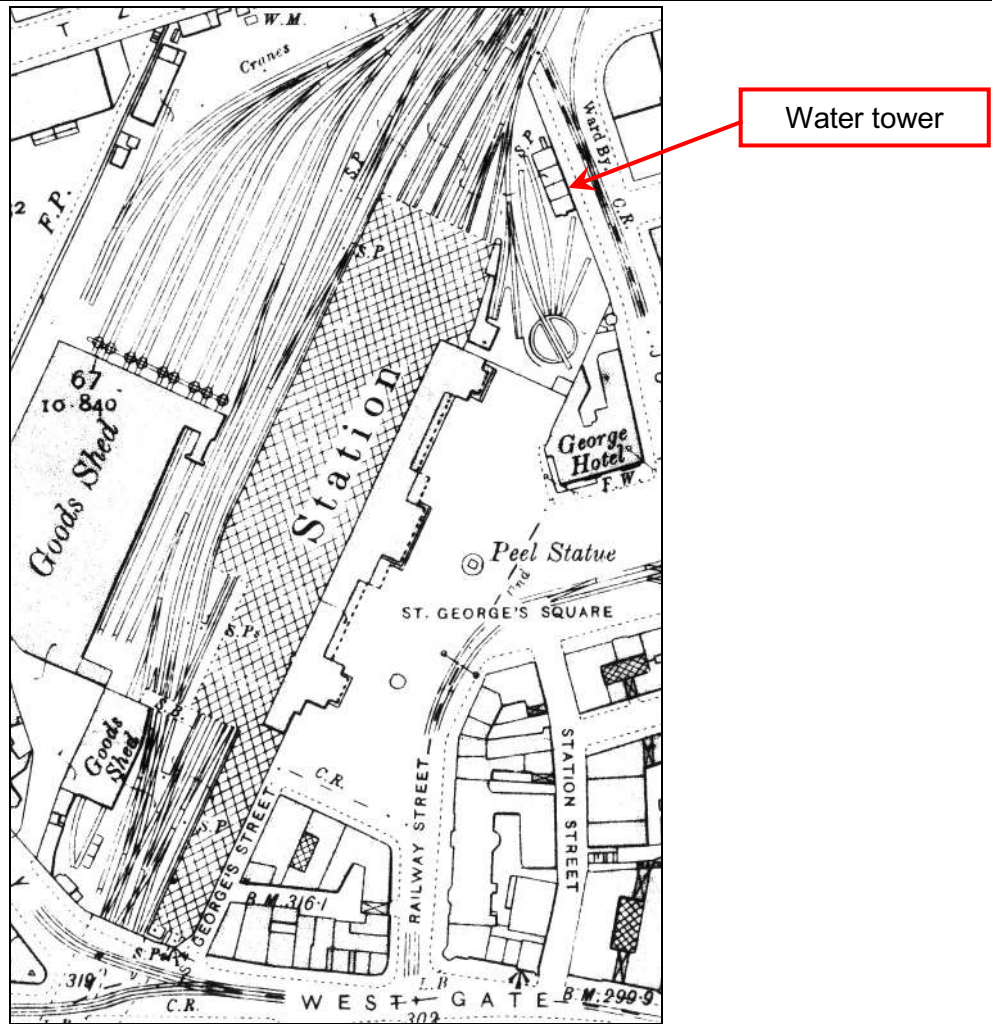


Figure 6: Ordnance Survey 1:2500 map, published 1907 (revised 1905)
Sheet no: Yorkshire, 246.15

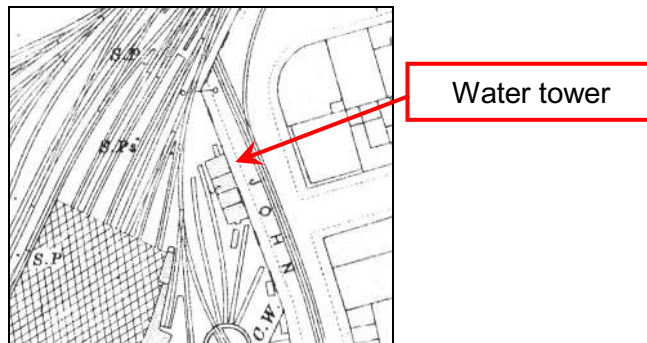


Figure 7: Ordnance Survey 1:2500 map, published 1918 (revised 1913)
Sheet no: Yorkshire, 246.15

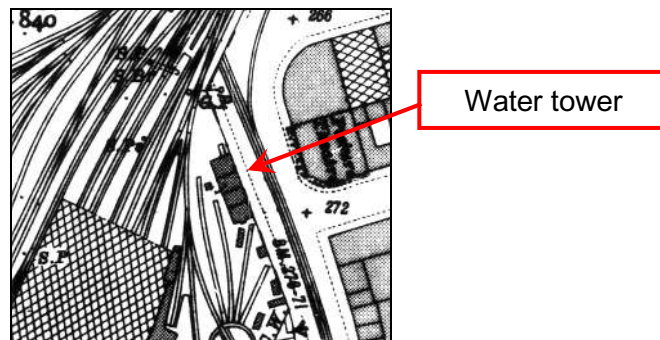
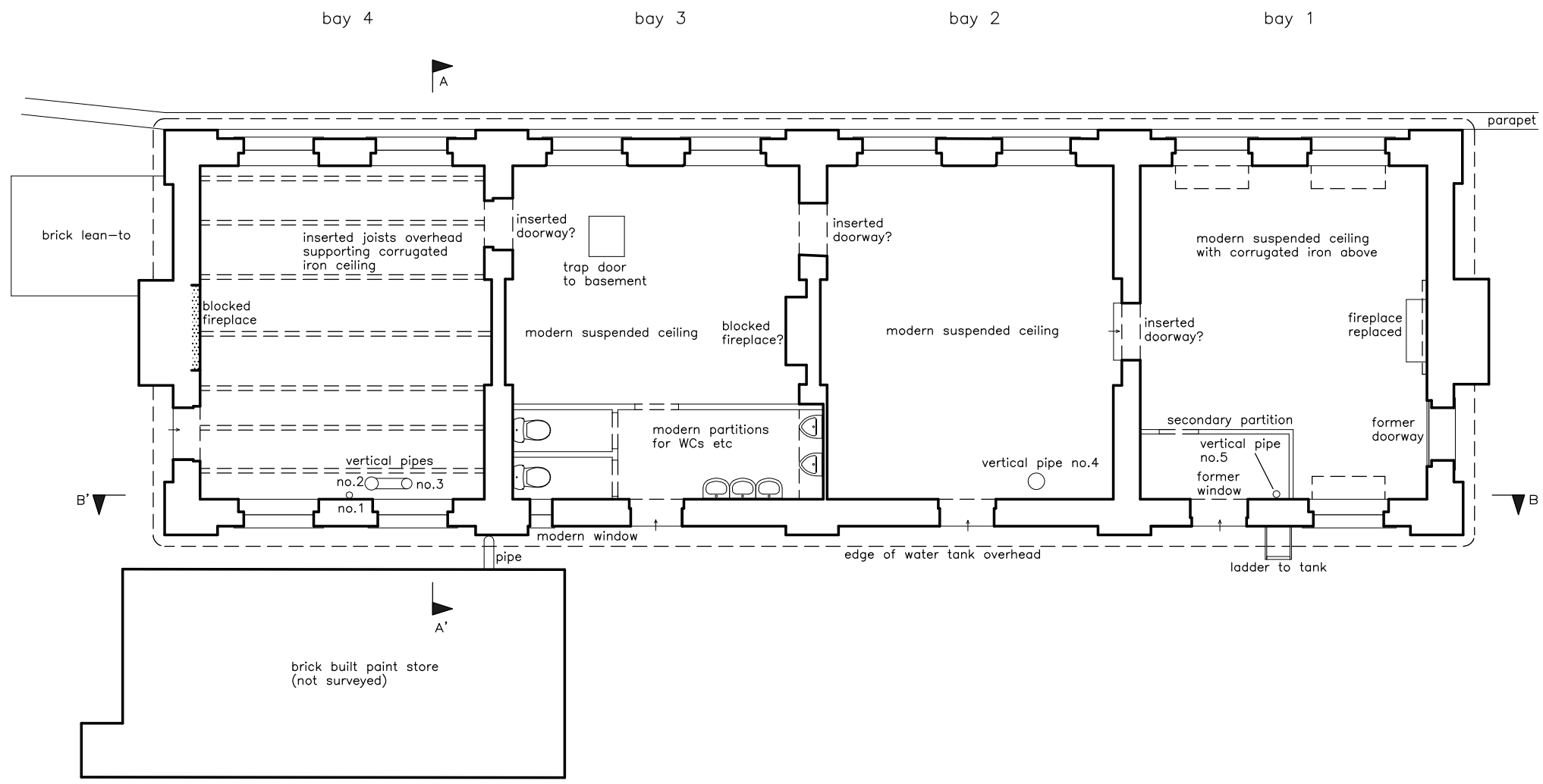
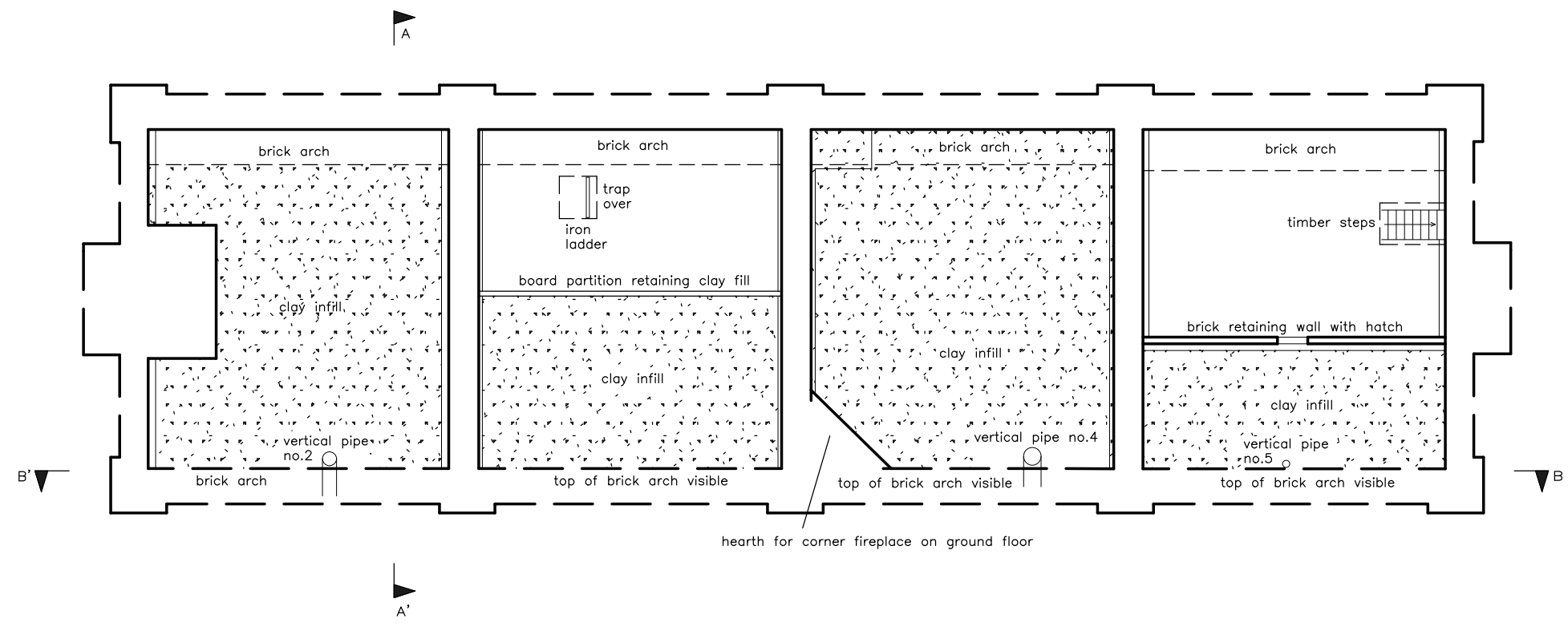


Figure 8: Ordnance Survey 1:2500 map, published 1947 (revised 1930)
Sheet no: Yorkshire, 246.15



GROUND FLOOR PLAN
showing arrangements visible before 2012 work

- KEY TO VERTICAL WATER PIPES**
- No.1: overflow
 - No.2: feed/feed pipe
 - No.3: capped off below tank
 - No.4: outlet to water cranes etc
 - No.5: disused feed/feed pipe



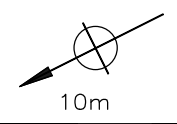
BASEMENT PLAN
as revealed during 2012 work
(NB: basement voids not fully excavated)

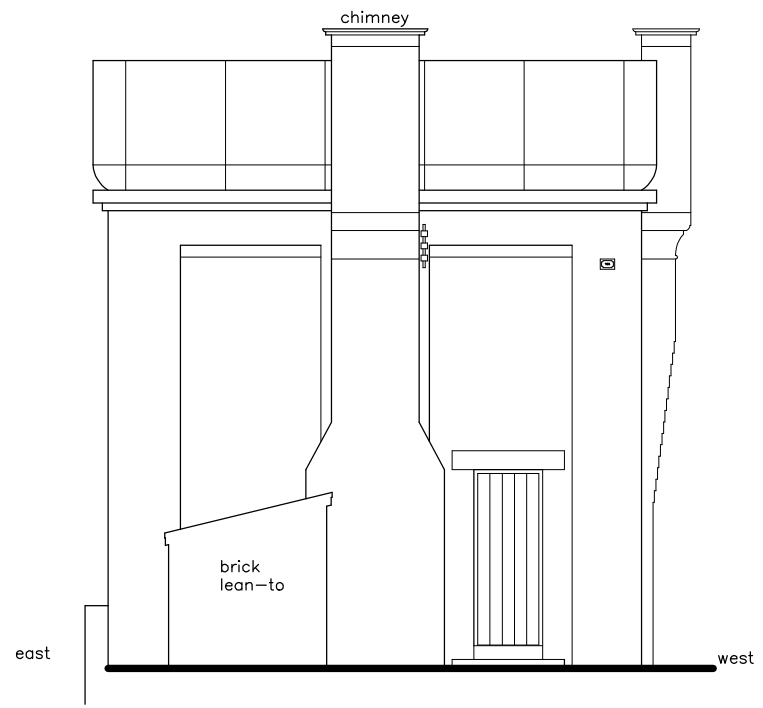
RAILWAY STATION WATER TOWER
ST GEORGE'S SQUARE
HUDDERSFIELD, WEST YORKSHIRE
NGR: SE 14400 17010
HISTORIC BUILDING RECORD

FIGURE 9:
GROUND FLOOR AND BASEMENT PLANS

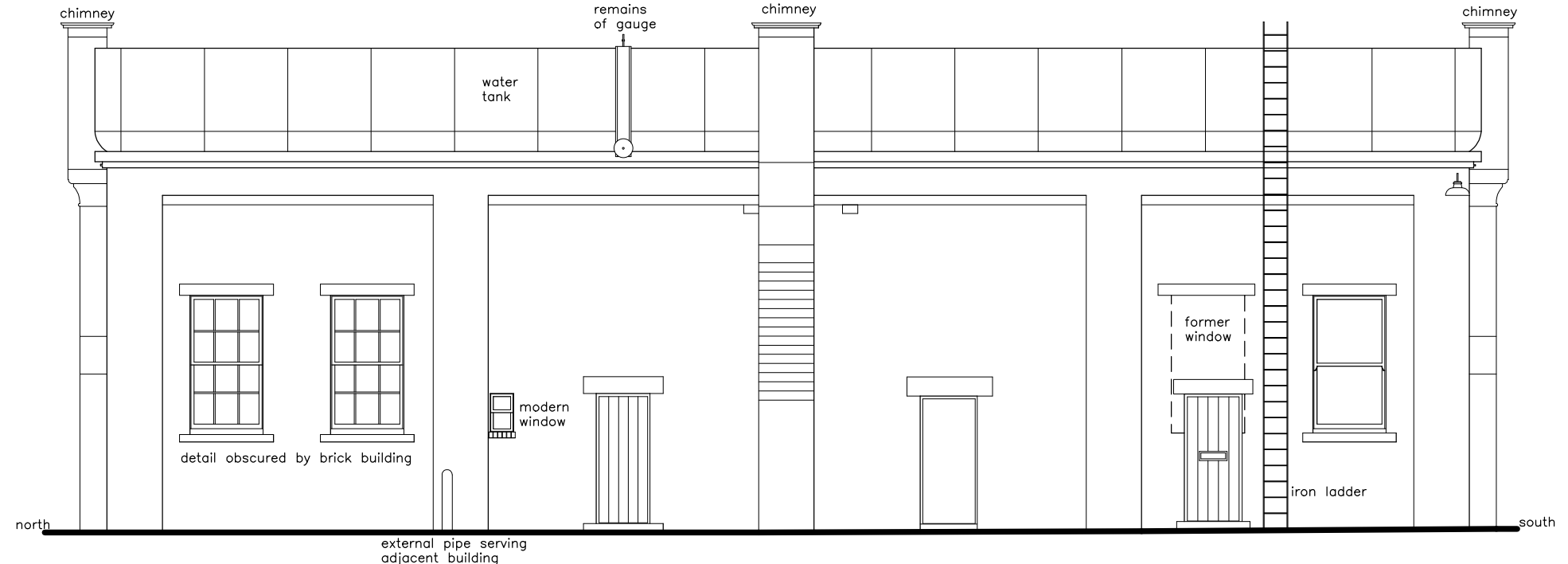
SCALE: 1:100
DATE OF SURVEY: JAN - MAY 2012

STEPHEN HAIGH
Buildings Archaeologist

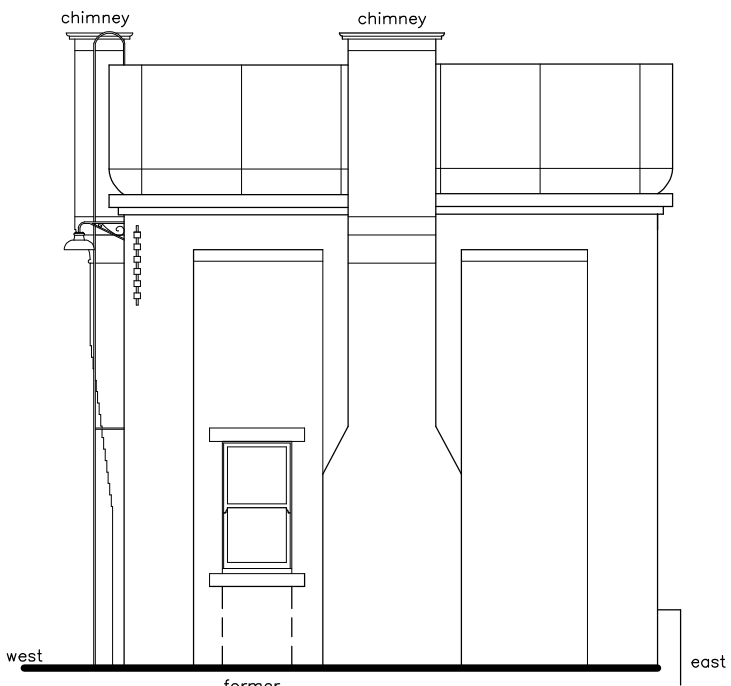




NORTH ELEVATION



WEST ELEVATION



SOUTH ELEVATION



EAST ELEVATION

10m



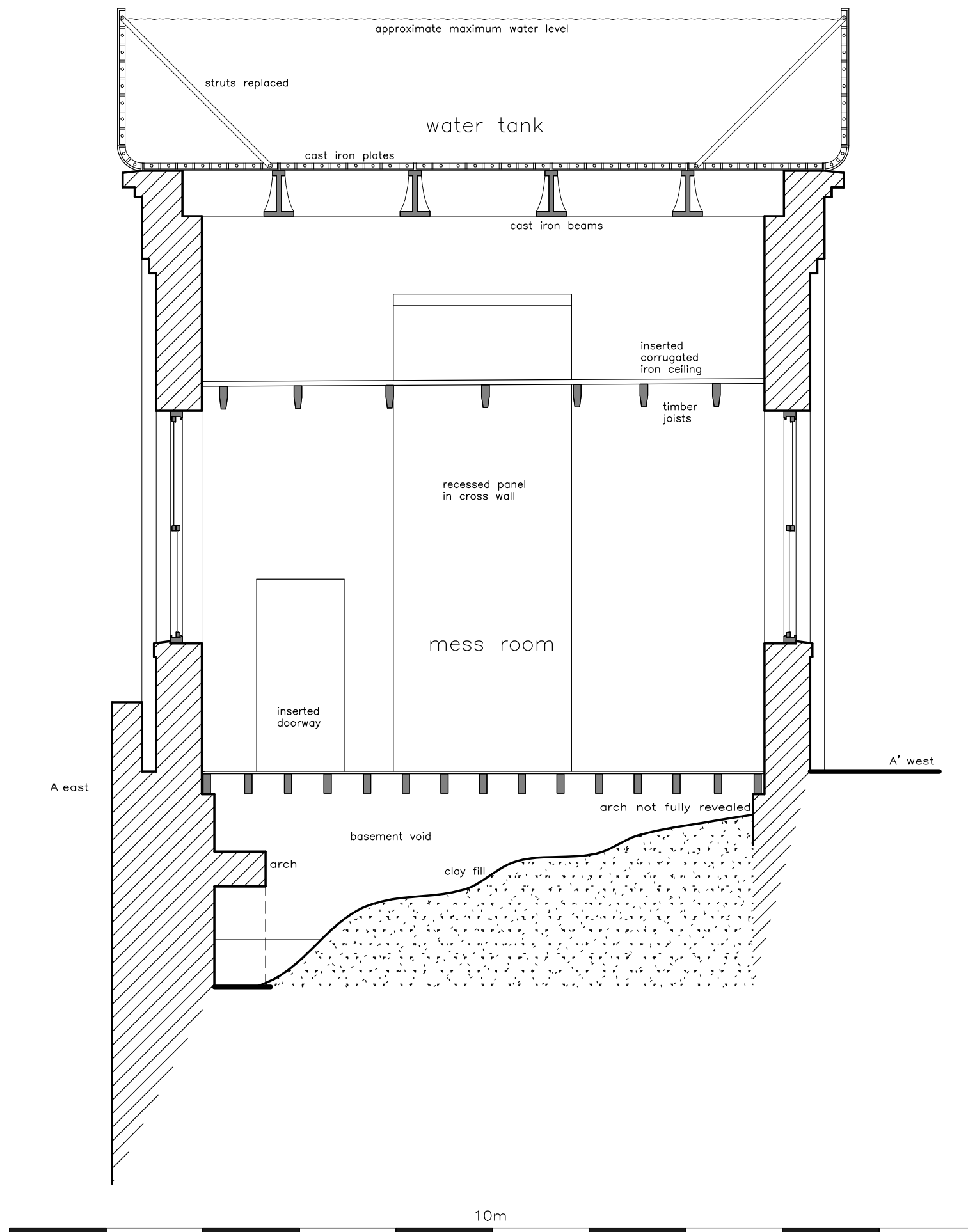
RAILWAY STATION WATER TOWER
ST GEORGE'S SQUARE
HUDDERSFIELD, WEST YORKSHIRE
NGR: SE 14400 17010
HISTORIC BUILDING RECORD

FIGURE 10:
ELEVATIONS

SCALE: 1:100

DATE OF SURVEY: JAN - MAY 2012

STEPHEN HAIGH
Buildings Archaeologist



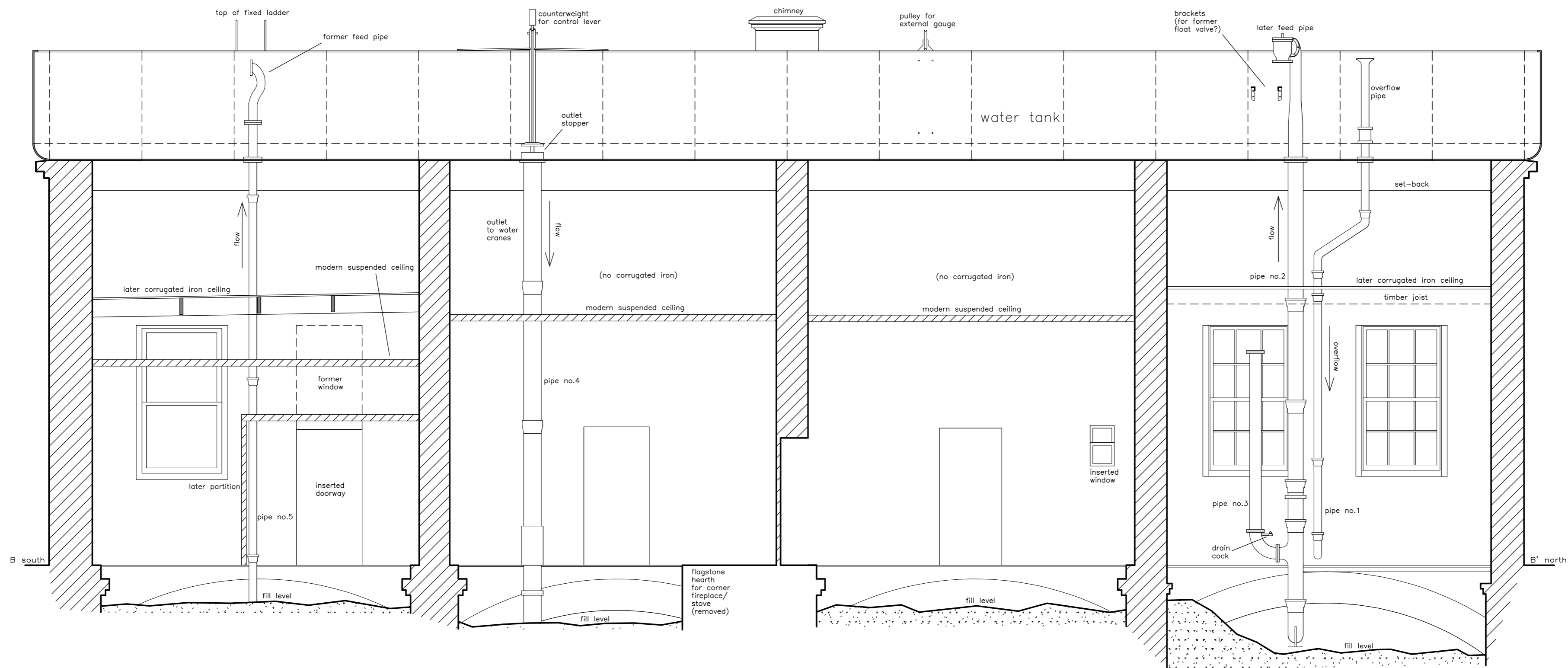
RAILWAY STATION WATER TOWER
 ST GEORGE'S SQUARE
 HUDDERSFIELD, WEST YORKSHIRE
 NGR: SE 14400 17010
 HISTORIC BUILDING RECORD

FIGURE 11:
 CROSS SECTION

SCALE: 1:50

DATE OF SURVEY: JAN - MAY 2012

STEPHEN HAIGH
 Buildings Archaeologist



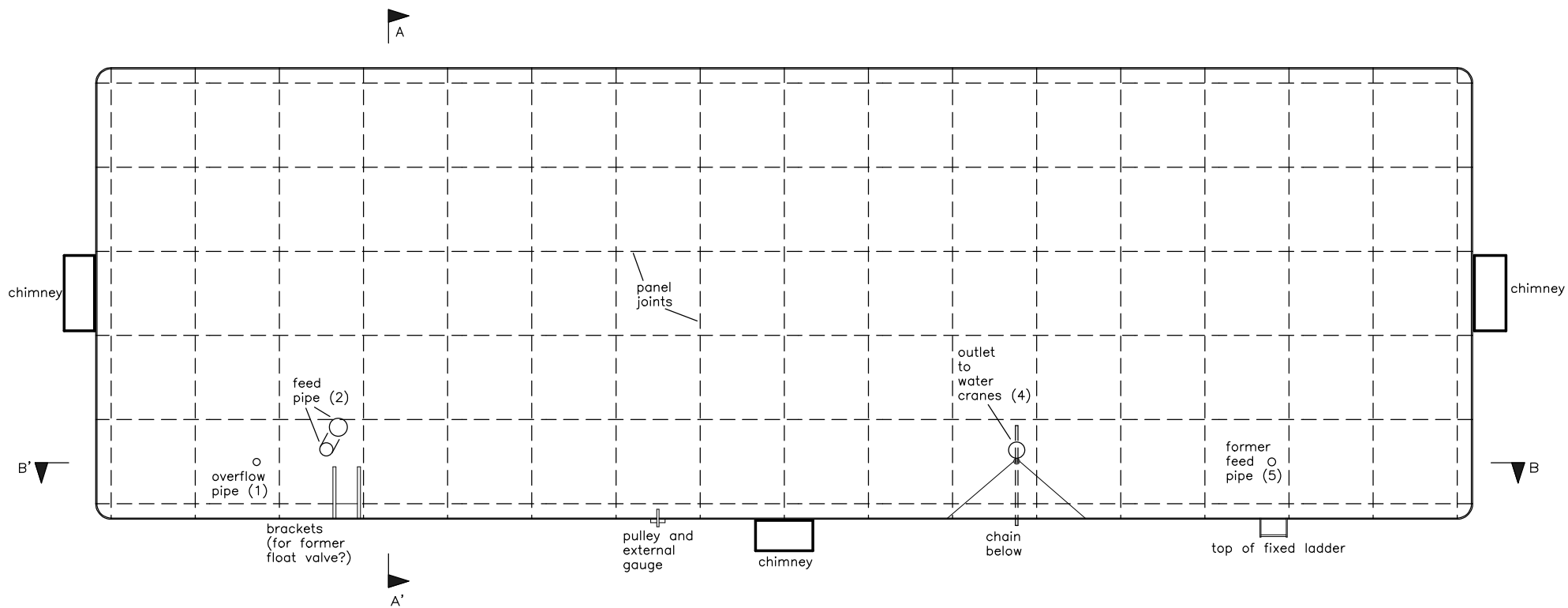
10m

RAILWAY STATION WATER TOWER
 ST GEORGE'S SQUARE
 HUDDERSFIELD, WEST YORKSHIRE
 NGR: SE 14400 17010
 HISTORIC BUILDING RECORD

FIGURE 12:
 LONGITUDINAL SECTION

SCALE: 1:50
 DATE OF SURVEY: JAN - MAY 2012

STEPHEN HAIGH
 Buildings Archaeologist



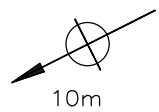
RAILWAY STATION WATER TOWER
 ST GEORGE'S SQUARE
 HUDDERSFIELD, WEST YORKSHIRE
 NGR: SE 14400 17010
 HISTORIC BUILDING RECORD

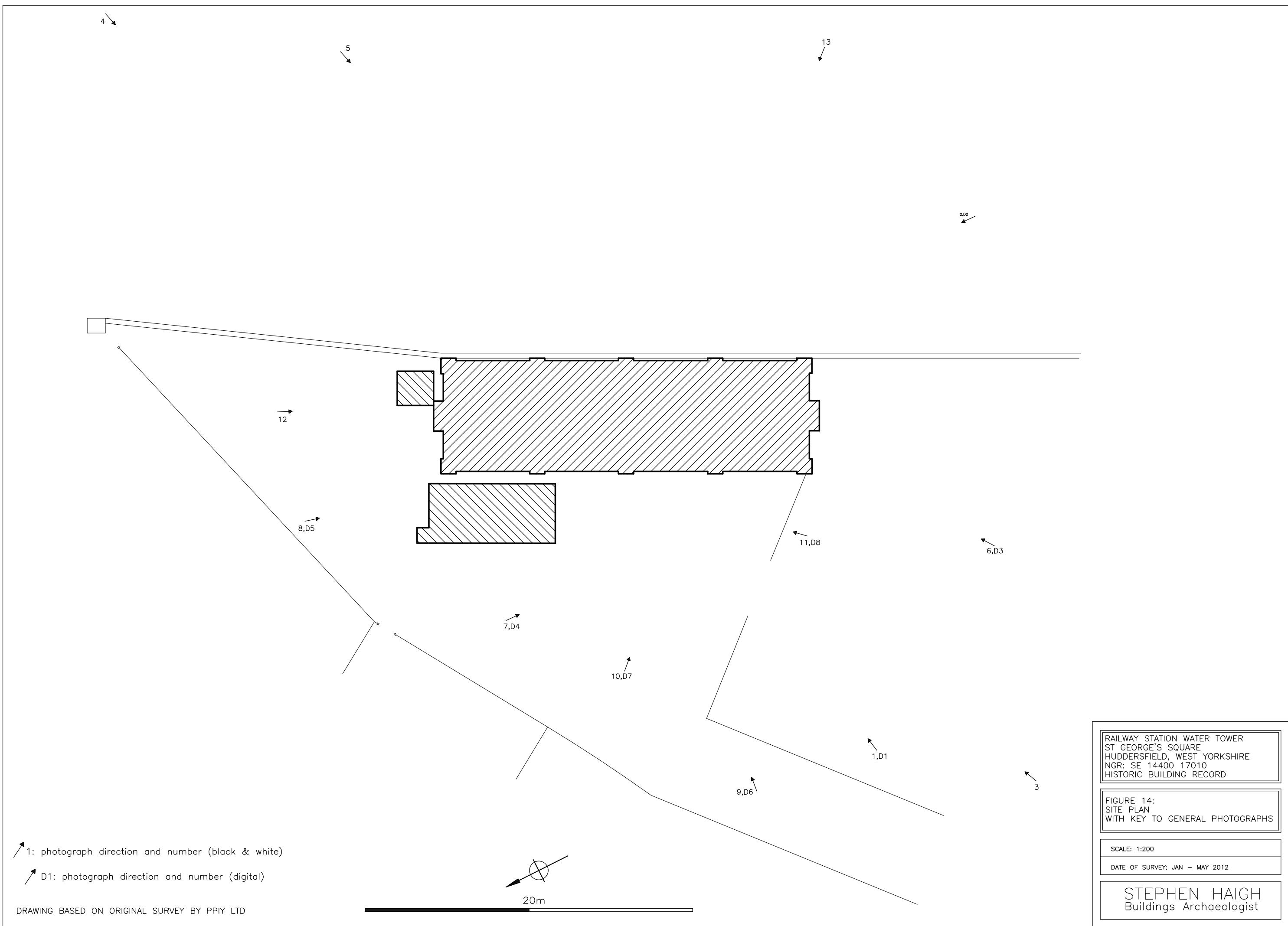
FIGURE 13:
 PLAN OF WATER TANK

SCALE: 1:100

DATE OF SURVEY: JAN - MAY 2012

STEPHEN HAIGH
 Buildings Archaeologist





↗ 1: photograph direction and number (black & white)

↗ D1: photograph direction and number (digital)

DRAWING BASED ON ORIGINAL SURVEY BY PPIY LTD

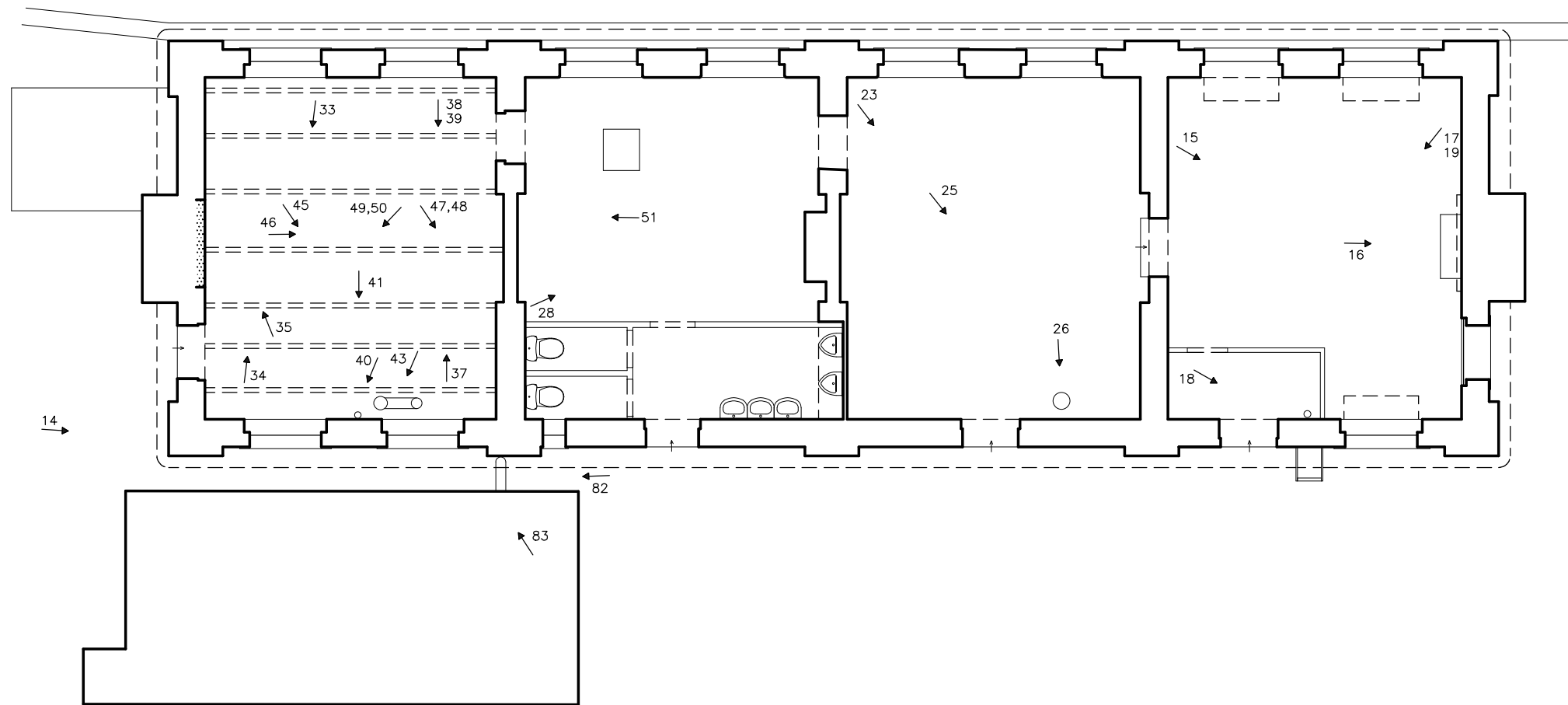
RAILWAY STATION WATER TOWER
 ST GEORGE'S SQUARE
 HUDDERSFIELD, WEST YORKSHIRE
 NGR: SE 14400 17010
 HISTORIC BUILDING RECORD

FIGURE 14:
 SITE PLAN
 WITH KEY TO GENERAL PHOTOGRAPHS

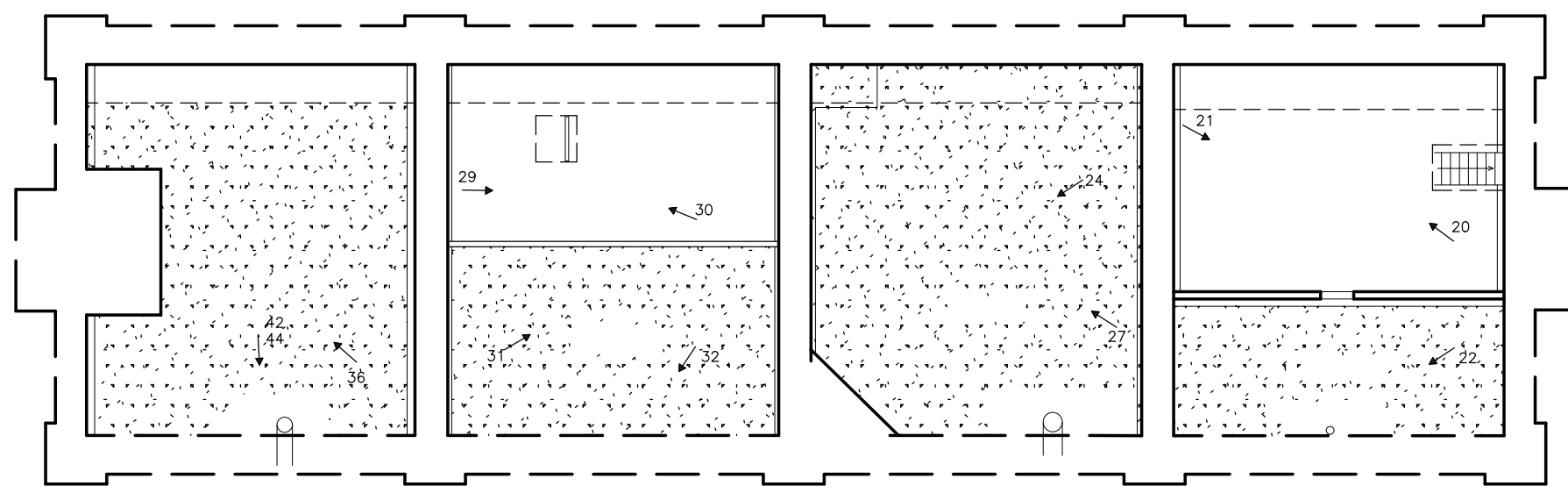
SCALE: 1:200

DATE OF SURVEY: JAN - MAY 2012

STEPHEN HAIGH
 Buildings Archaeologist



GROUND FLOOR PLAN



BASEMENT PLAN

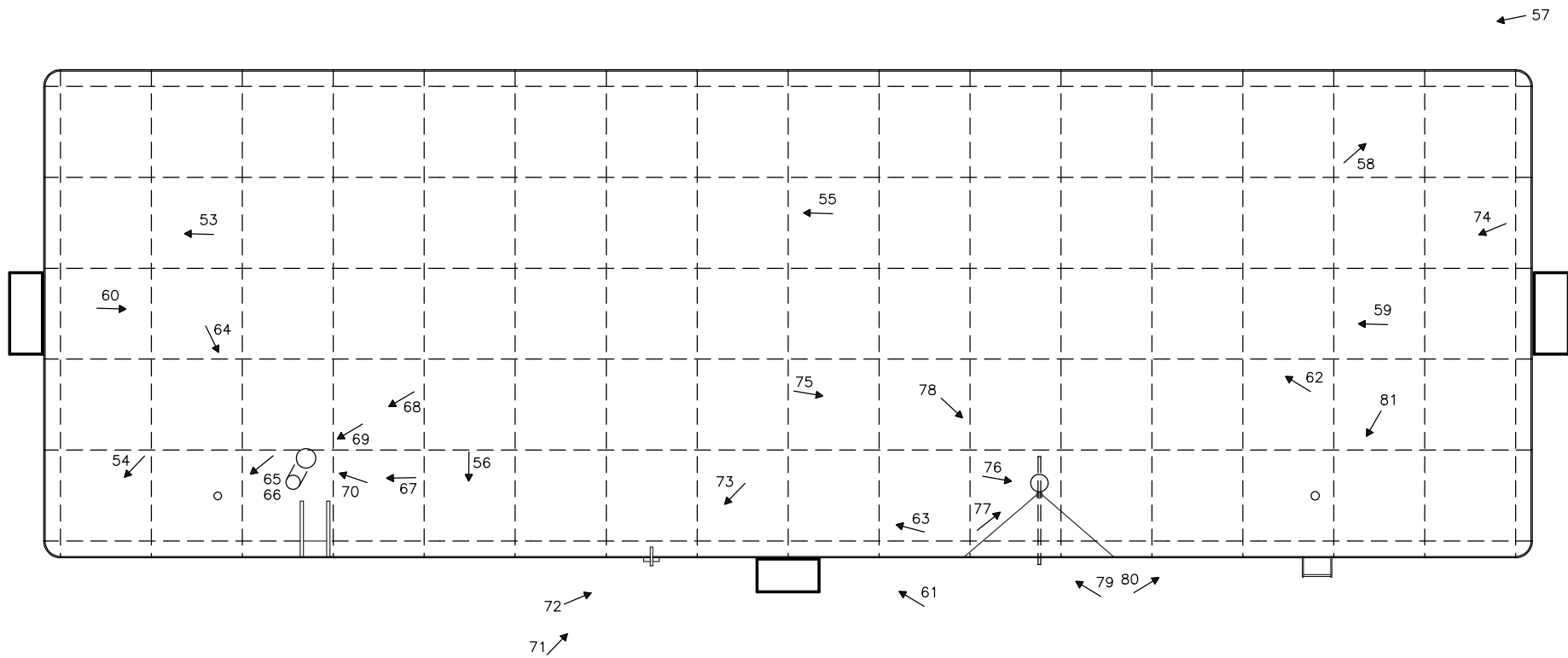
RAILWAY STATION WATER TOWER
 ST GEORGE'S SQUARE
 HUDDERSFIELD, WEST YORKSHIRE
 NGR: SE 14400 17010
 HISTORIC BUILDING RECORD

FIGURE 15:
 GROUND FLOOR AND BASEMENT PLANS
 WITH KEY TO PHOTOGRAPHS

SCALE: 1:100

DATE OF SURVEY: JAN - MAY 2012

STEPHEN HAIGH
 Buildings Archaeologist



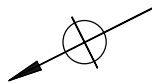
RAILWAY STATION WATER TOWER
 ST GEORGE'S SQUARE
 HUDDERSFIELD, WEST YORKSHIRE
 NGR: SE 14400 17010
 HISTORIC BUILDING RECORD

FIGURE 16:
 PLAN OF WATER TANK
 WITH KEY TO PHOTOGRAPHS

SCALE: 1:100

DATE OF SURVEY: JAN - MAY 2012

STEPHEN HAIGH
 Buildings Archaeologist



10m

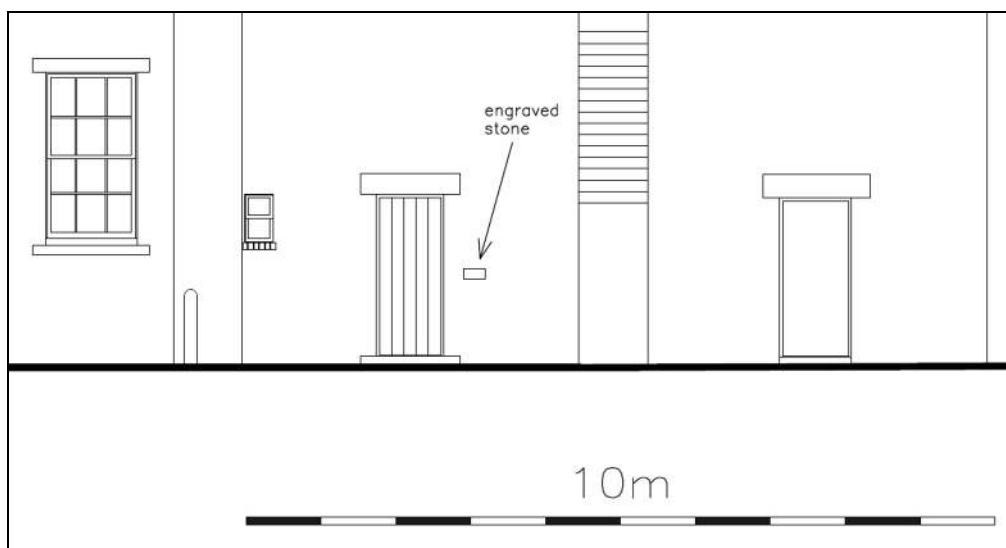


ADDENDUM

Following production of this report, John Ives of PPIY brought to notice the existence of a faint engraving on a stone within the water tower's east elevation, next to the entrance to bay 3. This bears the letters V, S and O, with an arrow in the form of an arc pointing towards the S, and has been interpreted as indicating the direction for shutting a valve. It is not clear whether this related to the surviving equipment within the tank itself, or a valve at ground level near this point, which is no longer visible or extant.



Photograph of the engraved stone (by John Ives)



Extract from figure 10 showing location of the engraved stone

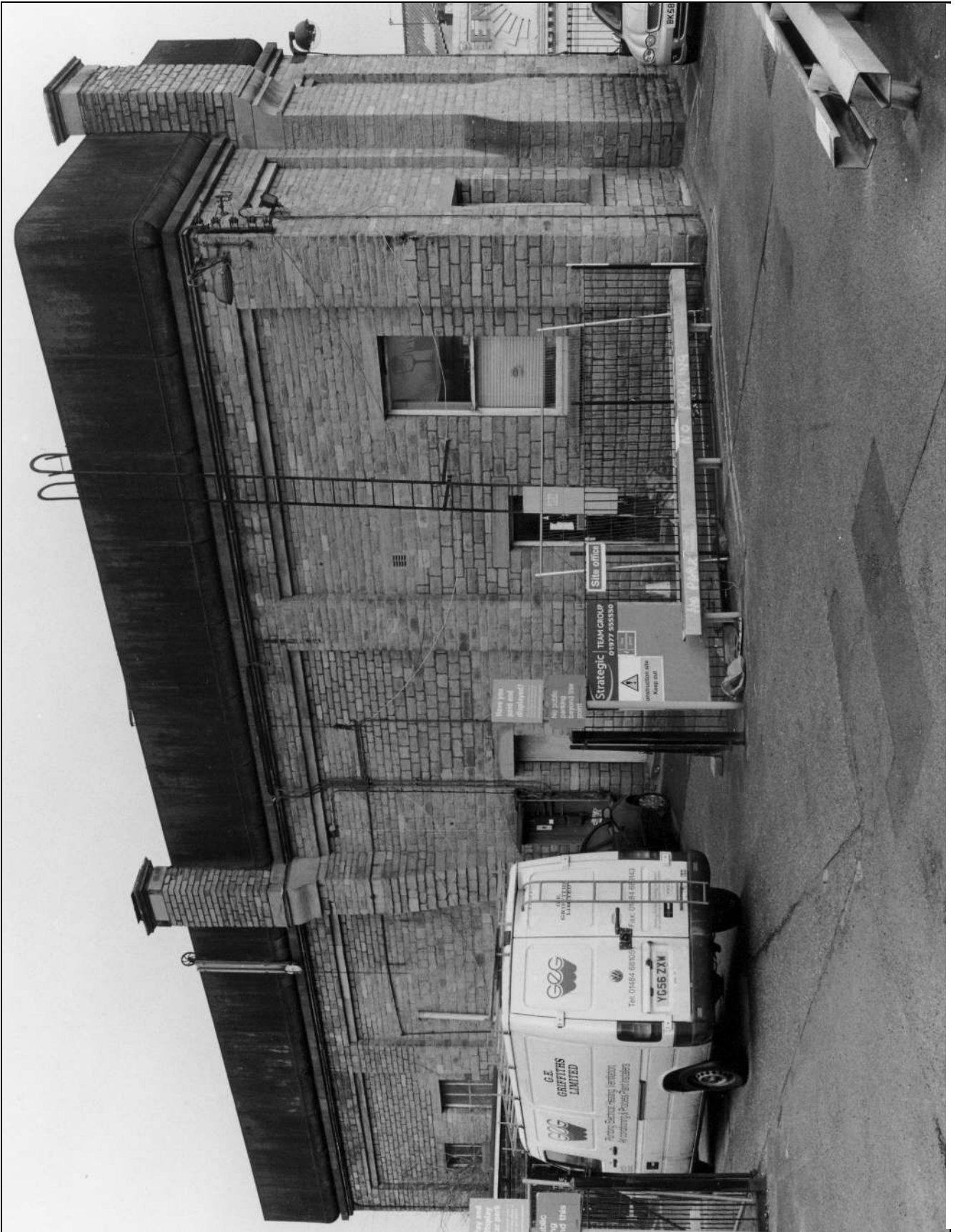


Photo 1: The water tower, viewed from the south-west (film 1, frame 6)

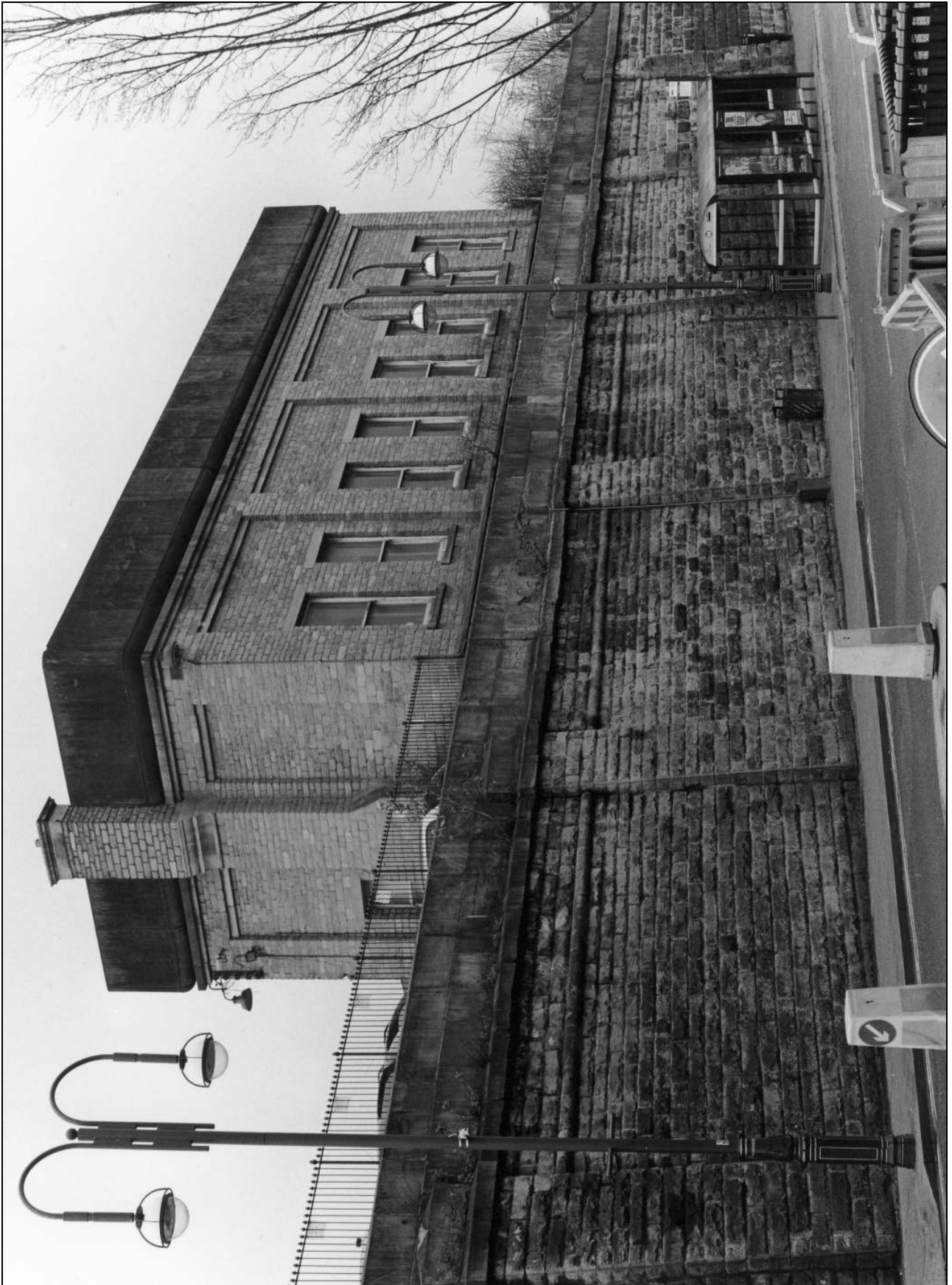


Photo 2: The water tower, viewed from the south-east across John William Street (film 2, frame 4)



Photo 3: The water tower, viewed from the south-west (film 2, frame 3)



Photo 4: The water tower, viewed from the north-east across John William Street (film 2, frame 9)

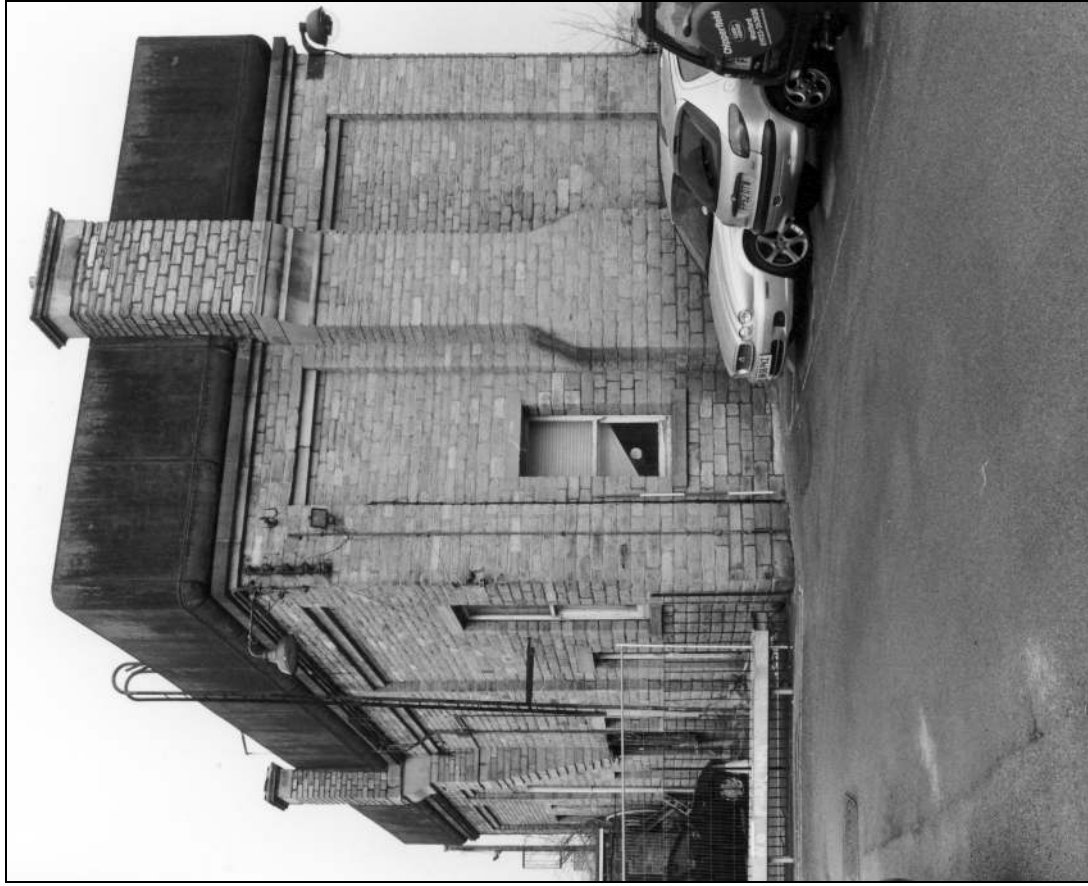


Photo 6: The water tower, viewed from the south-west (film 1, frame 5)



Photo 5: The water tower, viewed from the north-east across John William Street (film 2, frame 6)



Photo 7: West elevation, from the north-west (film 1, frame 12)



Photo 8: The north elevation (film 1, frame 14)



Photo 9: The west elevation (film 1, frame 7)



Photo 10: The west elevation (south part) (film 1, frame 10)



Photo 11: The west elevation; the right hand doorway is inserted (film 1, frame 9)

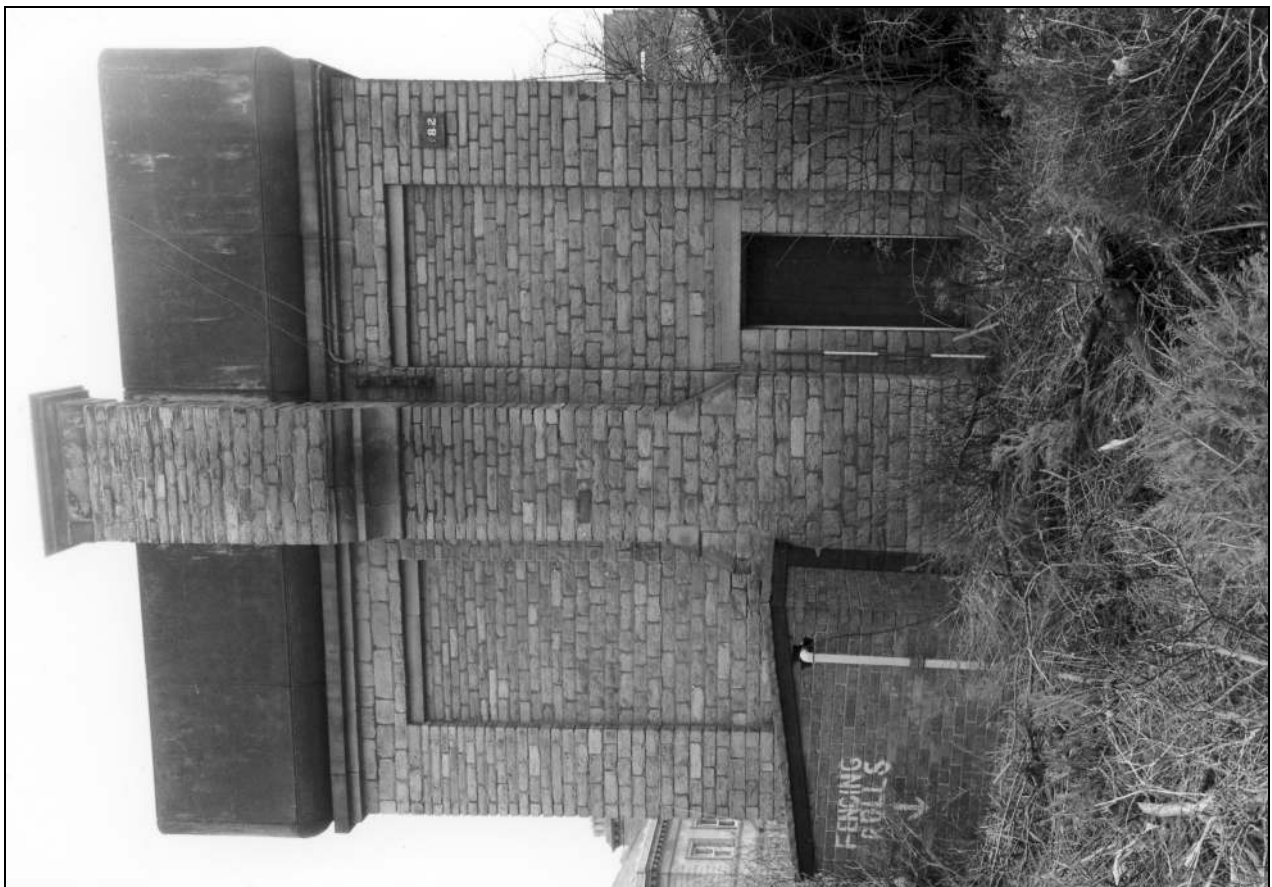


Photo 12: The north elevation (film 1, frame 13)



Photo 13: The east elevation, across John William Street (film 2, frame 5)



Photo 14: Cast iron number plate on north elevation (film 1, frame 16)



Photo 15: Bay 1: fireplace in south wall (before refurbishment)
(film 2, frame 11)



Photo 16: Bay 1: fireplace in south wall (during refurbishment) (film 4, frame 12)



Photo 17: Bay 1: partition in north-west corner (before refurbishment) (film 2, frame 12)

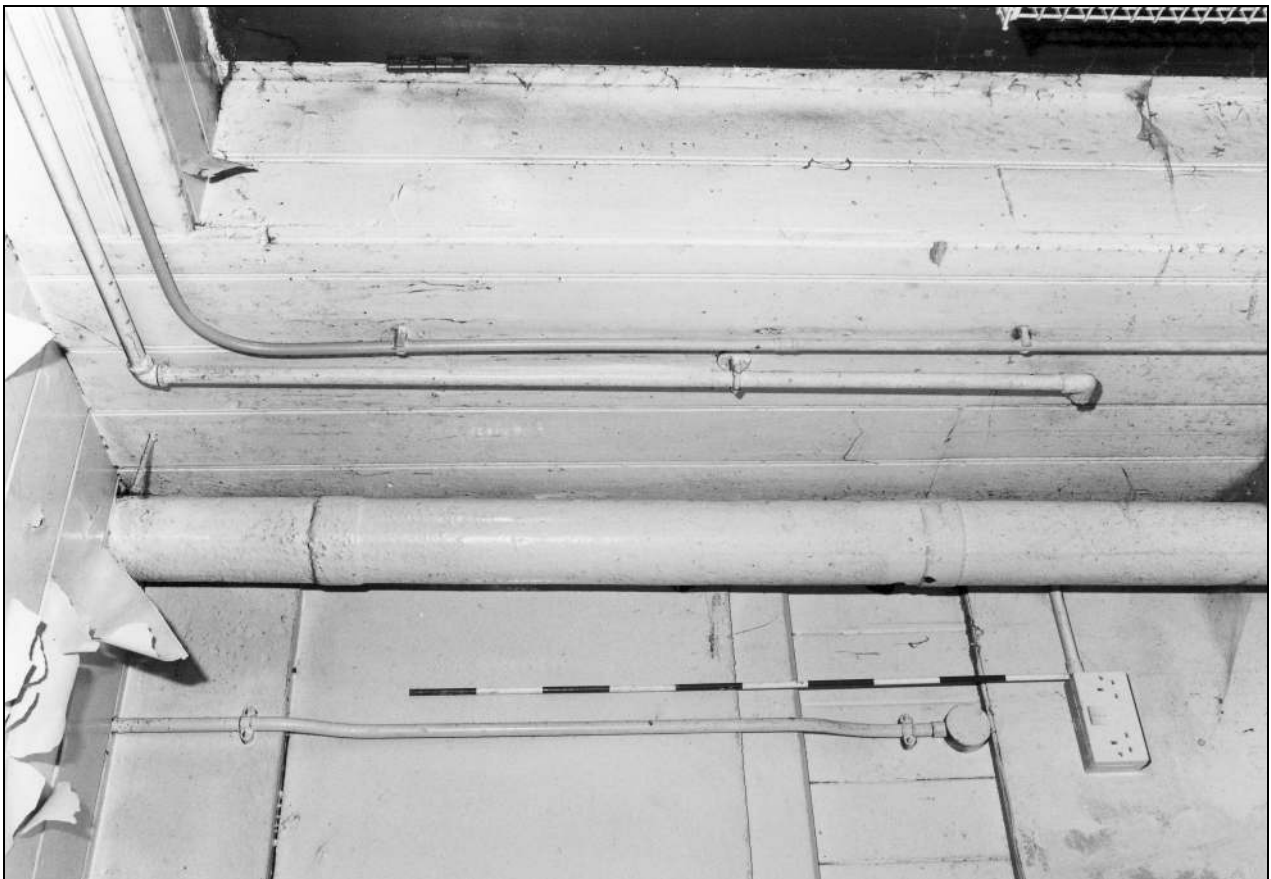


Photo 18: Bay 1: original feed pipe to tank (pipe no 5) (before refurbishment) (film 2, frame 13)

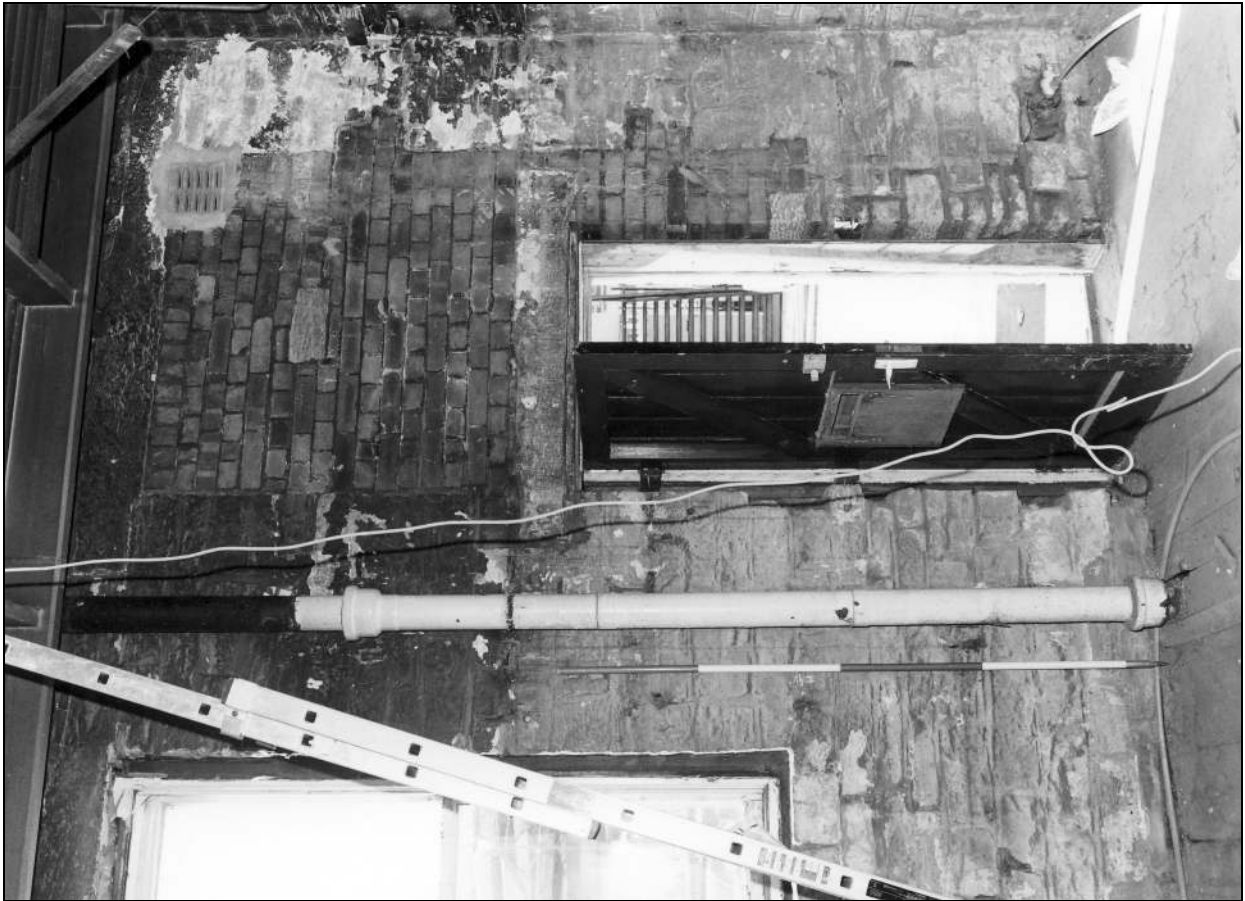


Photo 19: Bay 1: north-east corner, showing later doorway and original feed pipe to tank (pipe no 5) (during refurbishment) (film 4, frame 11)

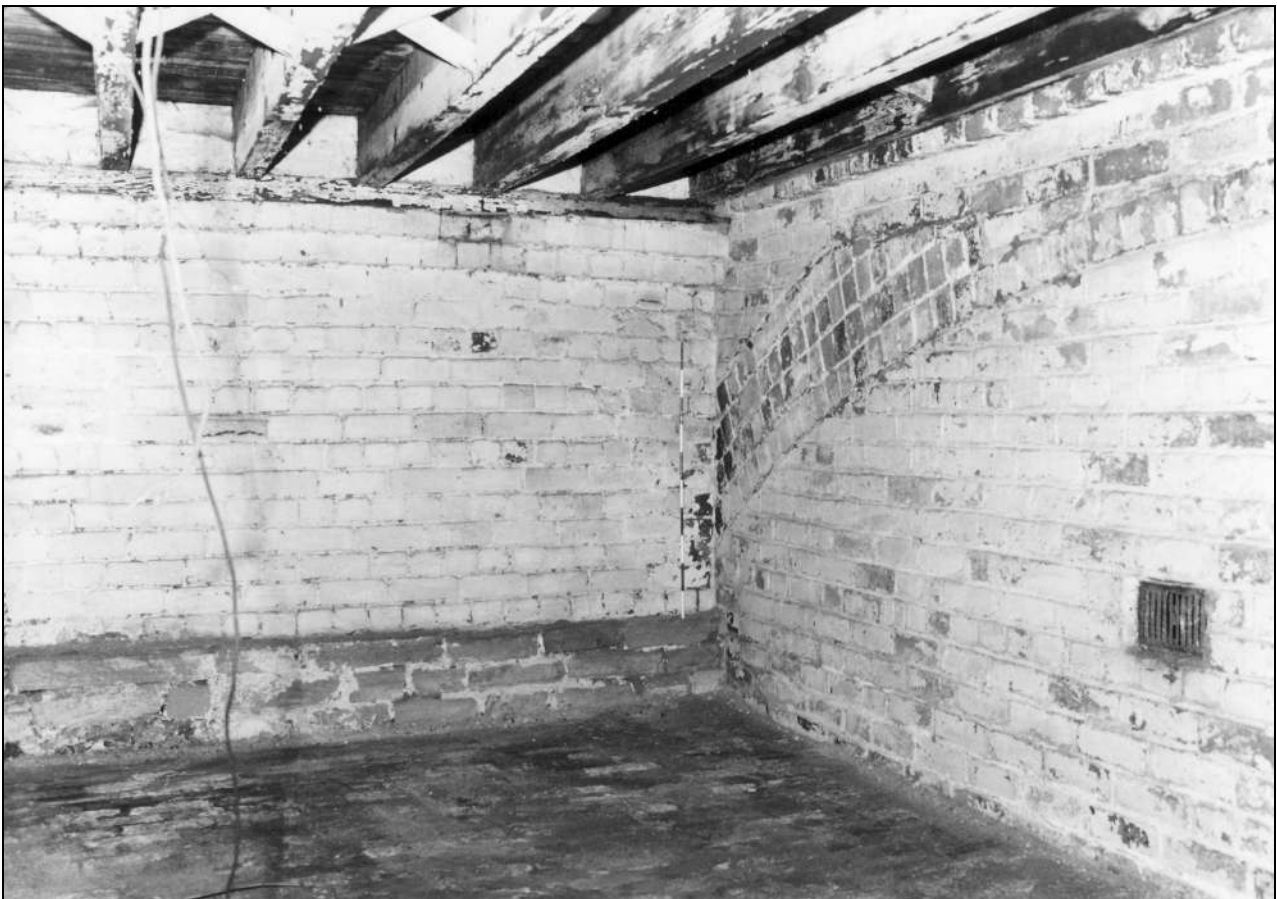


Photo 20: Bay 1: basement, from the south-west (film 4, frame 9)



Photo 21: Bay 1: basement, from the north-east (film 4, frame 10)

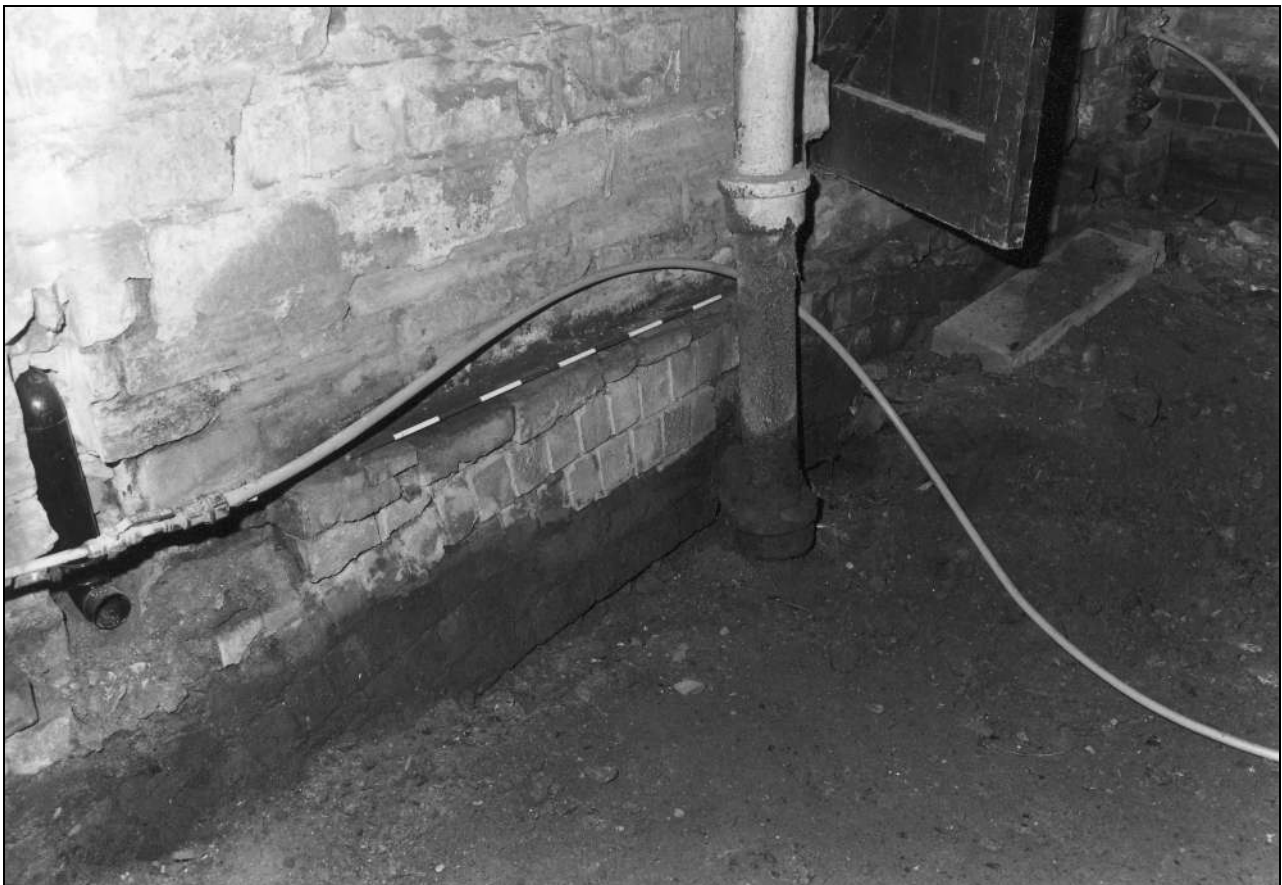


Photo 22: Bay 1: arch below west side (during refurbishment) (film 8, frame 6)



Photo 23: Bay 2: south-west corner, before refurbishment (film 2, frame 15)



Photo 24: Bay 2: north-west corner, showing hearth for corner fireplace, during refurbishment (film 5, frame 9)

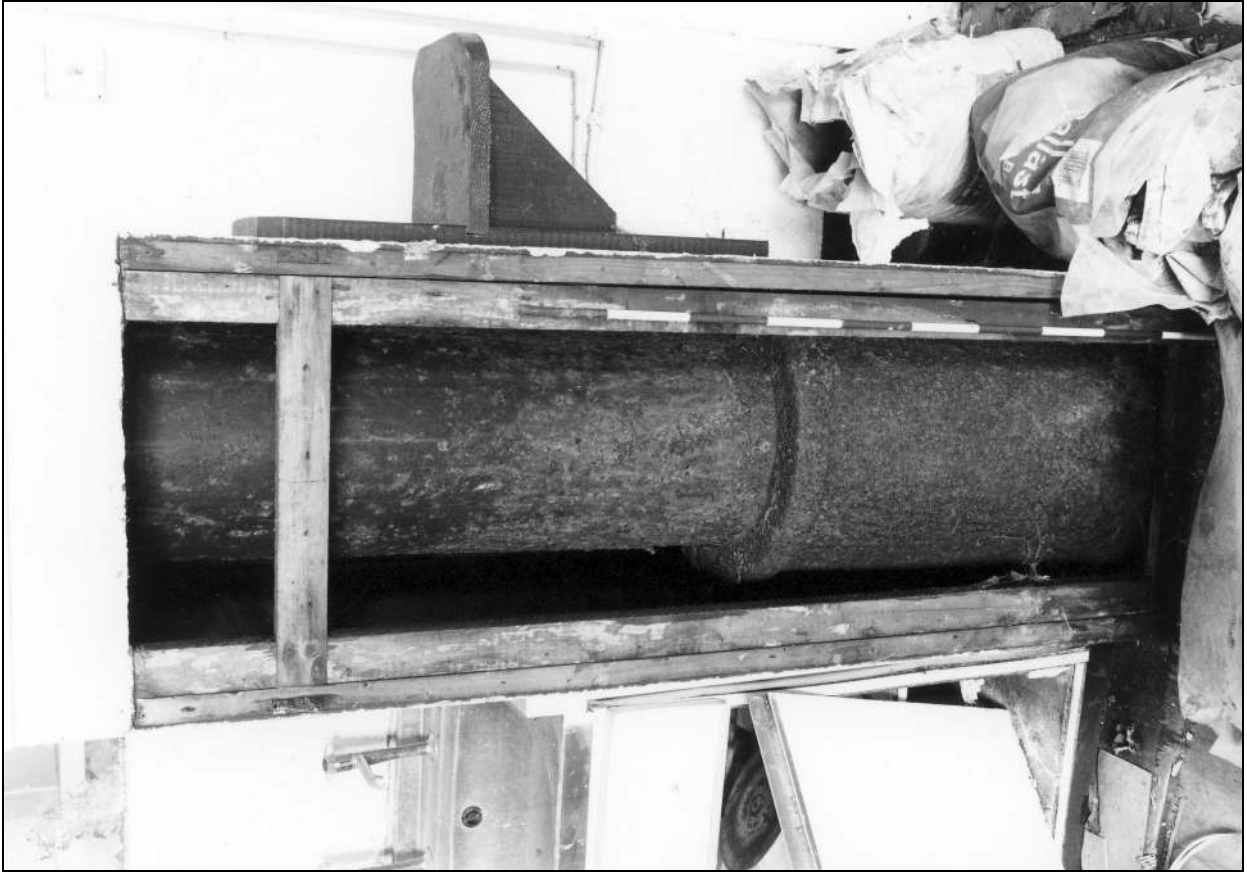


Photo 26: Bay 2: vertical pipe (outlet from tank – pipe no 4), in west side (film 2, frame 16)

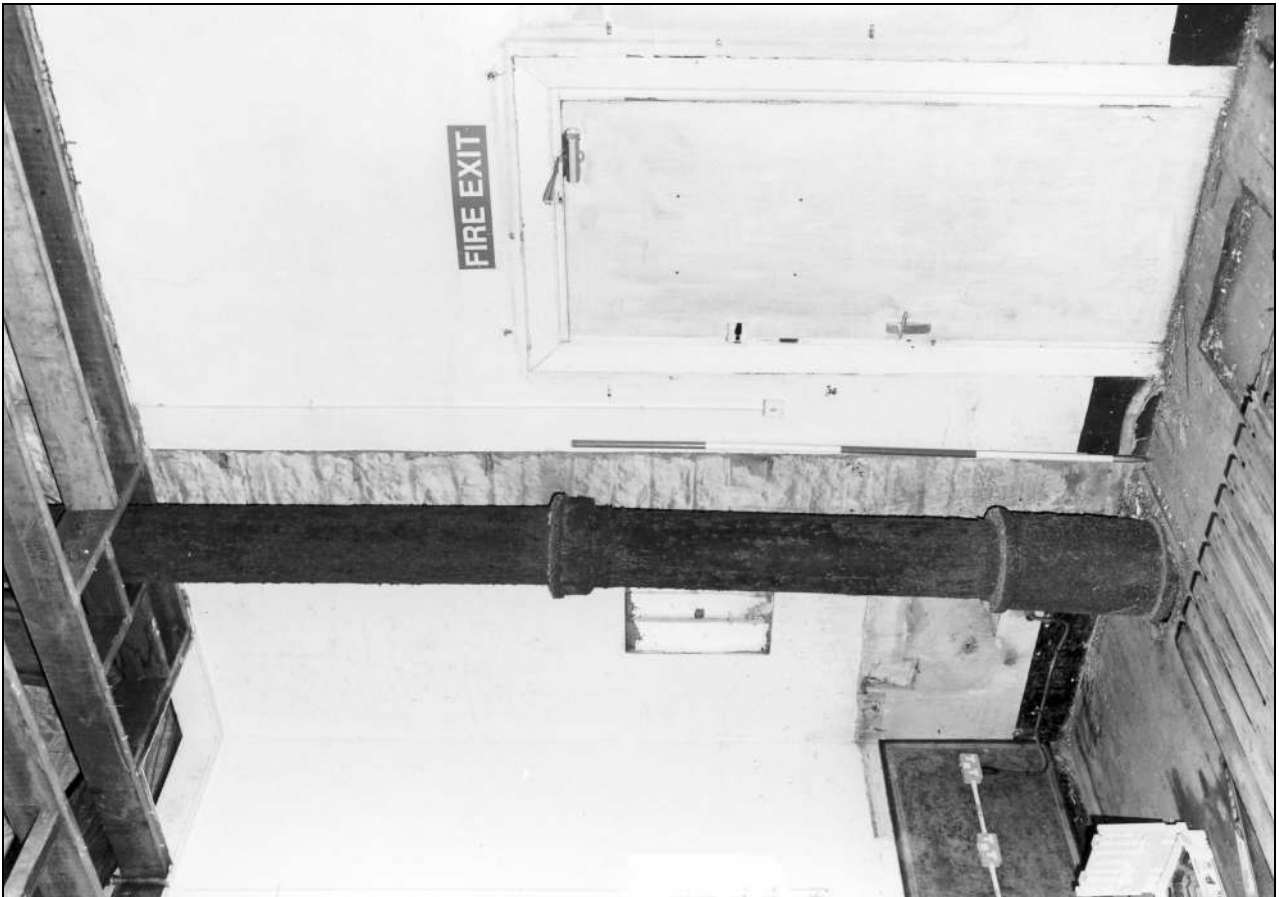


Photo 25: Bay 2: vertical pipe (outlet from tank – pipe no 4), in west side (film 4, frame 8)



Photo 27: Bay 2: basement, from the south-west (film 5, frame 10)



Photo 28: Bay 3: south-east corner, showing inserted doorway (film 2, frame 17)



Photo 29: Bay 3: basement, from the north (film 1, frame 4)



Photo 30: Bay 3: basement, from the south-west (film 1, frame 2)



Photo 31: Bay 3: basement, from the north-west (film 5, frame 6)



Photo 32: Bay 3: arch to west side of basement, from the south-west (film 5, frame 7)



Photo 34: Bay 4: north-east window (film 3, frame 5)



Photo 33: Bay 4: north-west corner, with original door and window (film 3, frame 6)



Photo 35: Bay 4: blocked fireplace, north wall (film 3, frame 7)



Photo 36: Bay 4: basement, from the south-west (film 5, frame 1)



Photo 38: Bay 4: pipes in west side (overflow and later feed, nos 1, 2 & 3) (film 3, frame 2)



Photo 37: Bay 4: inserted corrugated iron ceiling, from the west (film 3, frame 4)

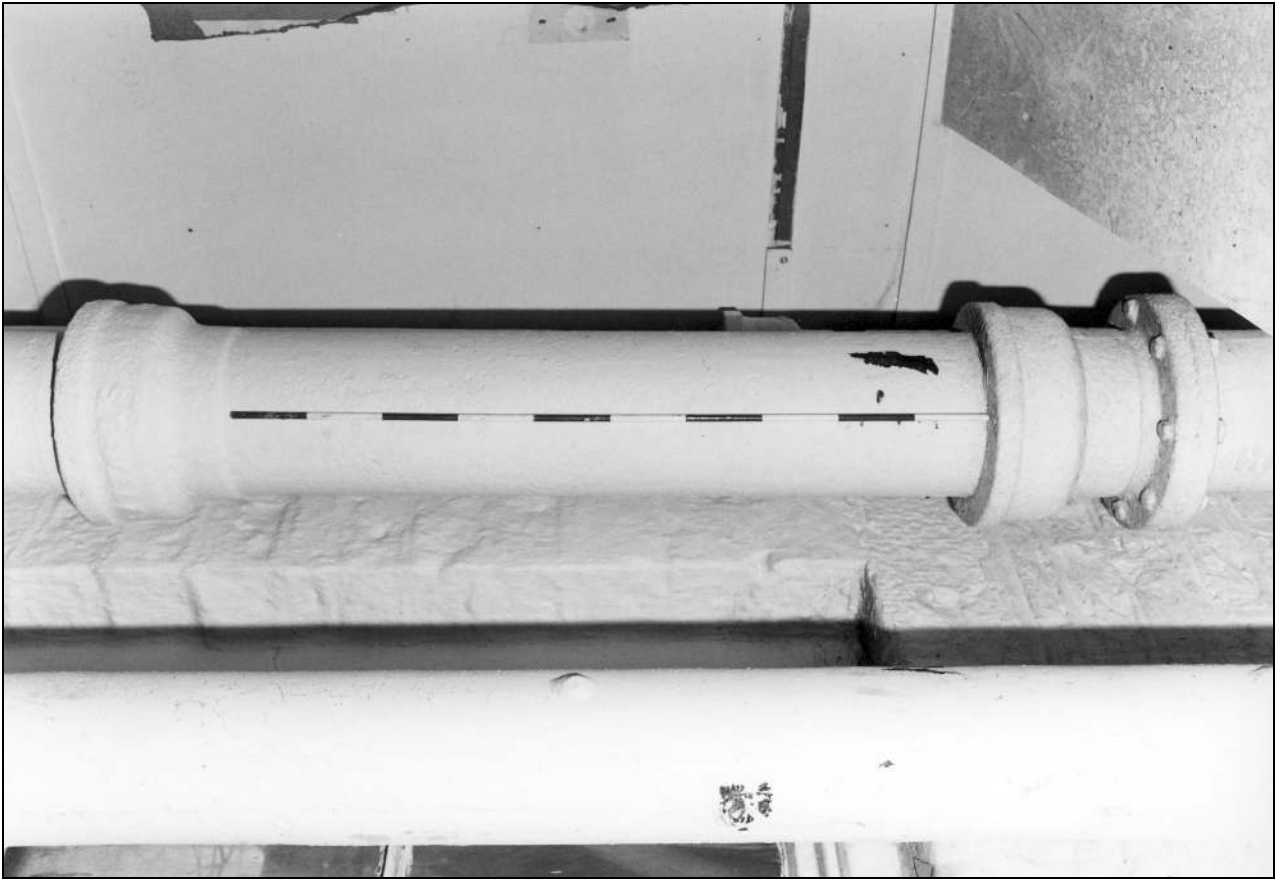


Photo 40: Bay 4: detail of overflow pipe (no 1) (film 3, frame 10)



Photo 39: Bay 4: pipes in west side (overflow and later feed, nos 1, 2 & 3) (film 4, frame 3)

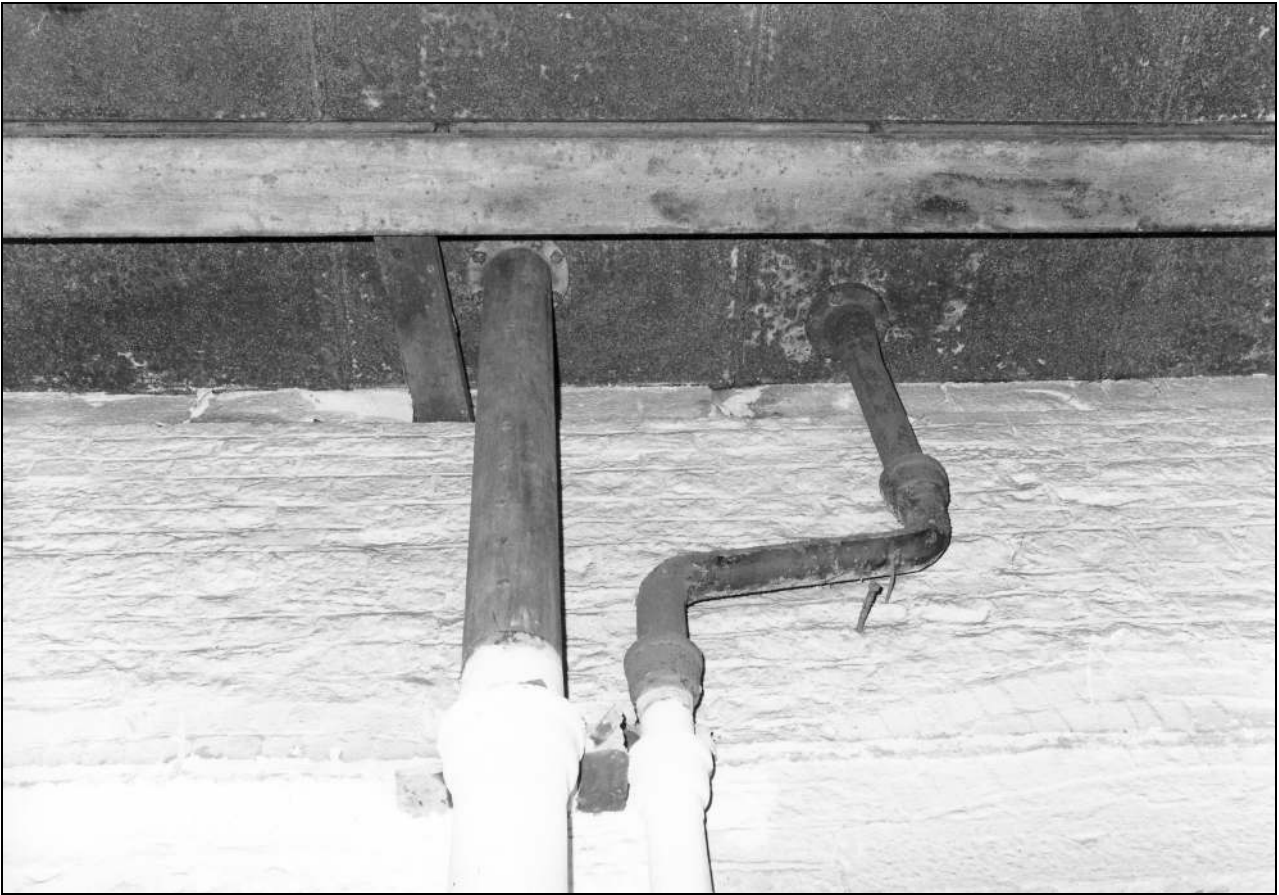


Photo 41: Bay 4: pipes in west side, at base of tank (overflow and later feed, nos 1 & 2) (film 4, frame 4)



Photo 42: Bay 4: pipes in west side, below ground floor level (overflow and later feed, nos 1 & 2) (film 5, frame 3)



Photo 43: Bay 4: later feed pipe, with junction and drain cock (film 3, frame 9)



Photo 44: Bay 4: later feed pipe, emerging from west side below ground floor level (film 4, frame 5)



Photo 45: Bay 4: base of tank, south-west corner (film 5, frame 5)

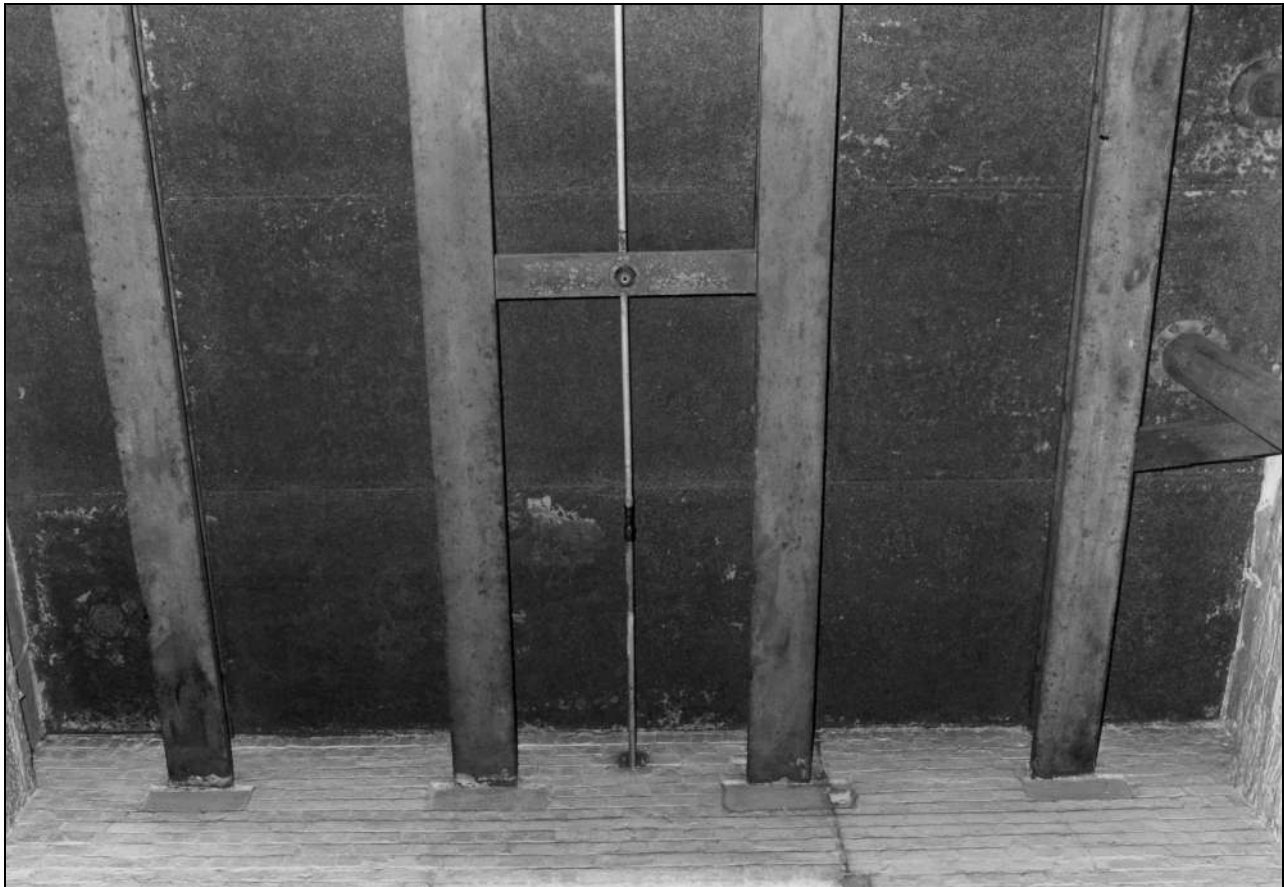


Photo 46: Bay 4: base of tank, south side (film 5, frame 4)



Photo 47: Bay 4: detail of cast iron beam supporting tank (film 8, frame 5)

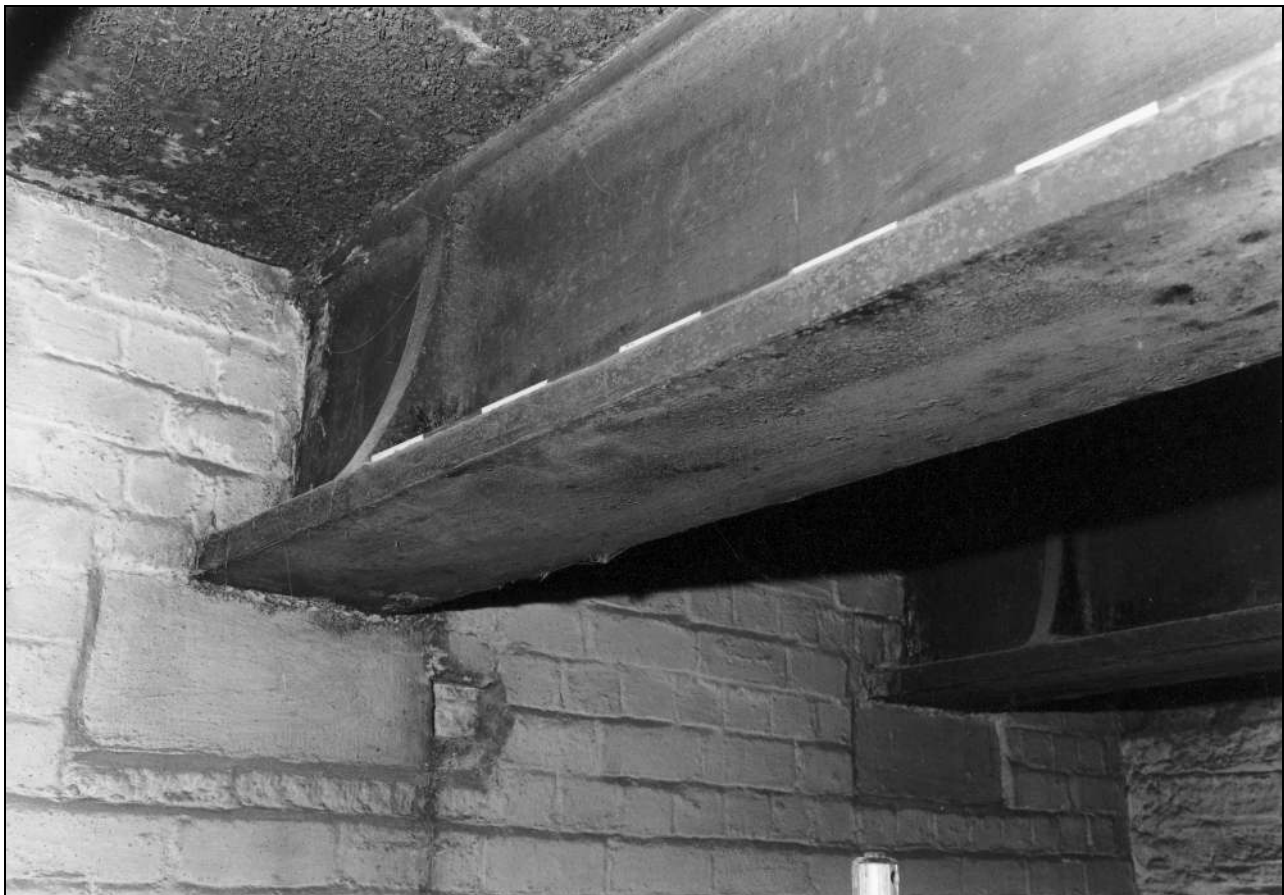


Photo 48: Bay 4: detail of cast iron beam supporting tank (film 8, frame 1)



Photo 49: Bay 4: base of tank, north-west corner (film 4, frame 1)



Photo 50: Bay 4: gas light fitting, below base of tank (film 8, frame 4)



Photo 51: Bay 3: base of tank, with gas pipes for lighting (film 4, frame 6)



Photo 52: South-west corner of water tank (film 2, frame 1)



Photo 53: Square cast iron panel forming side of water tank (film 6, frame 13)



Photo 54: Cast iron panels at south-east corner of water tank (film 6, frame 14)



Photo 55: Cast iron panels forming base of water tank (film 8, frame 10)

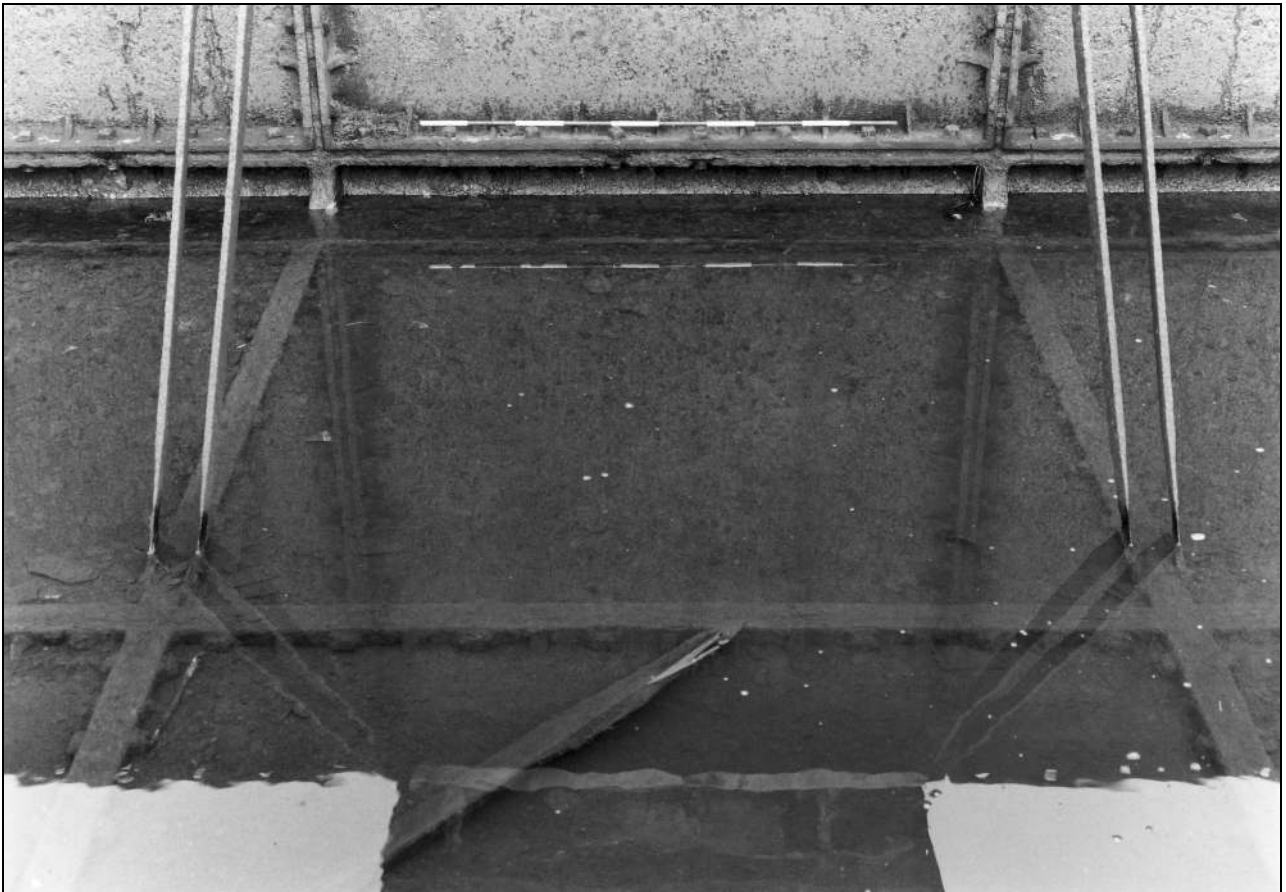


Photo 56: Cast iron panels forming base of water tank (film 6, frame 16)



Photo 57: Cast iron panels forming east side of water tank (film 7, frame 18)

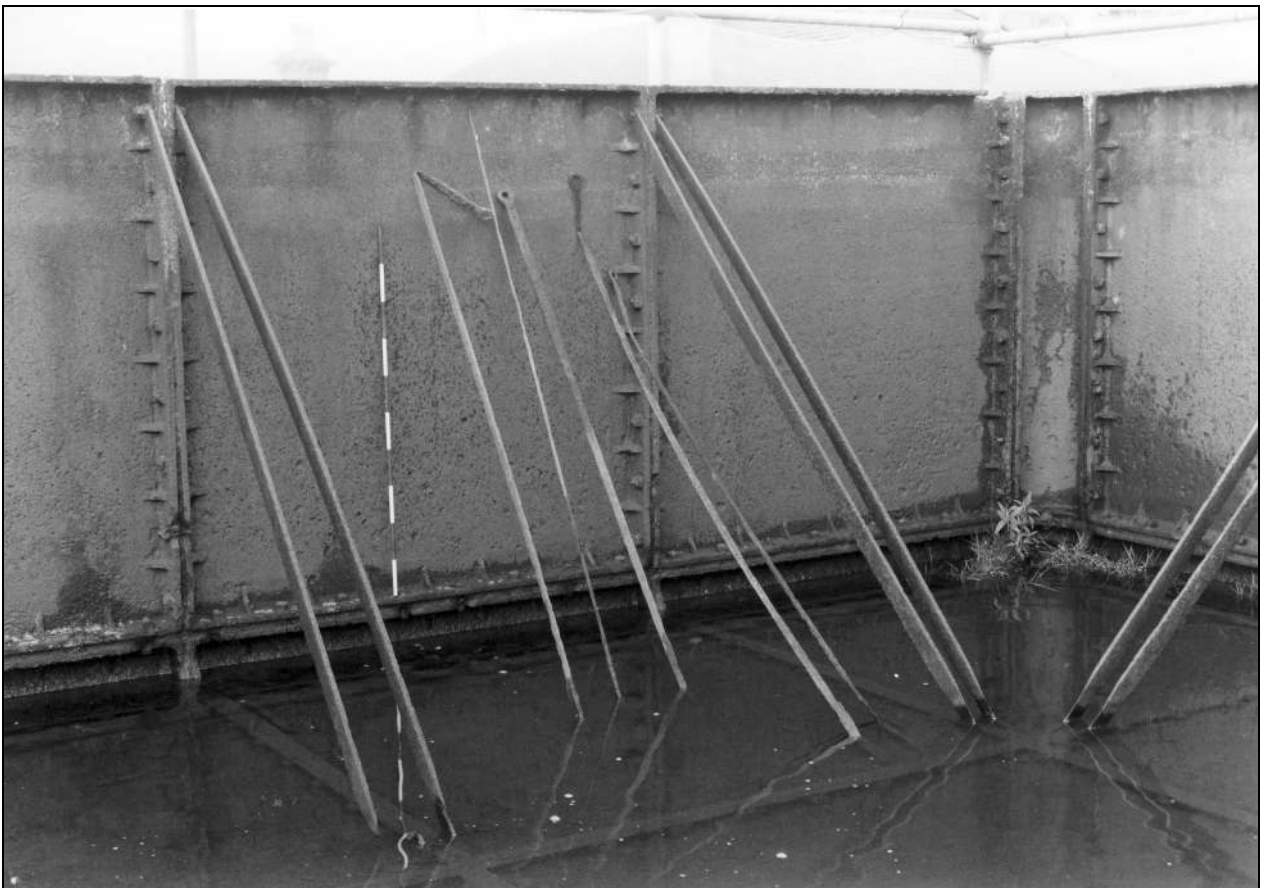


Photo 58: Side of water tank with existing and former struts (film 7, frame 8)



Photo 59: General view of the tank, from the south (film 6, frame 7)



Photo 60: General view of the tank, from the north (film 6, frame 10)



Photo 61: General view of the tank, from the south-west (film 7, frame 12)



Photo 62: General view of the tank, from the south-west (film 7, frame 15)



Photo 63: General view of the tank, from the south-west, during repairs (film 8, frame 7)



Photo 64: Later feed, and overflow pipes, within tank, from the north-east (film 6, frame 9)

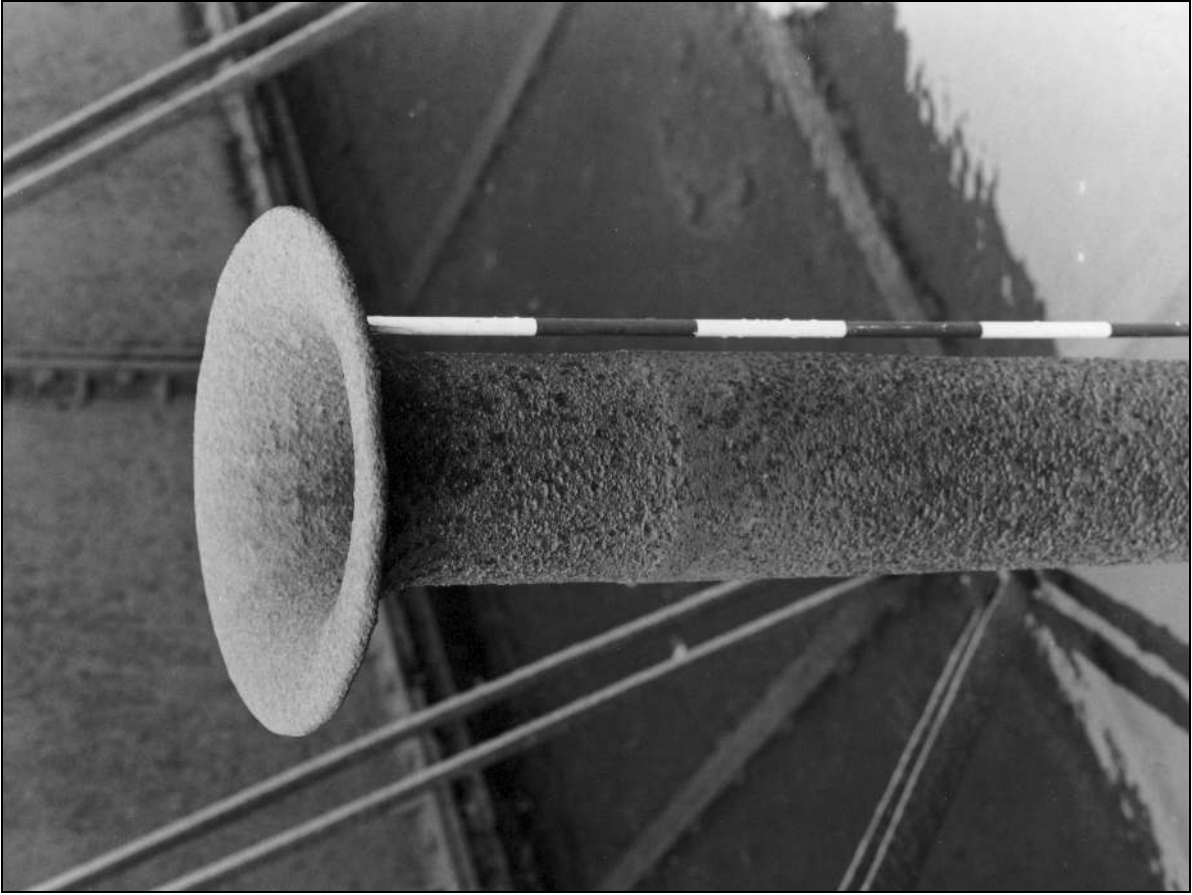


Photo 66: Detail of overflow pipe, from the south-west (film 7, frame 11)



Photo 65: Overflow pipe (no 1), from the south-west (film 6, frame 17)

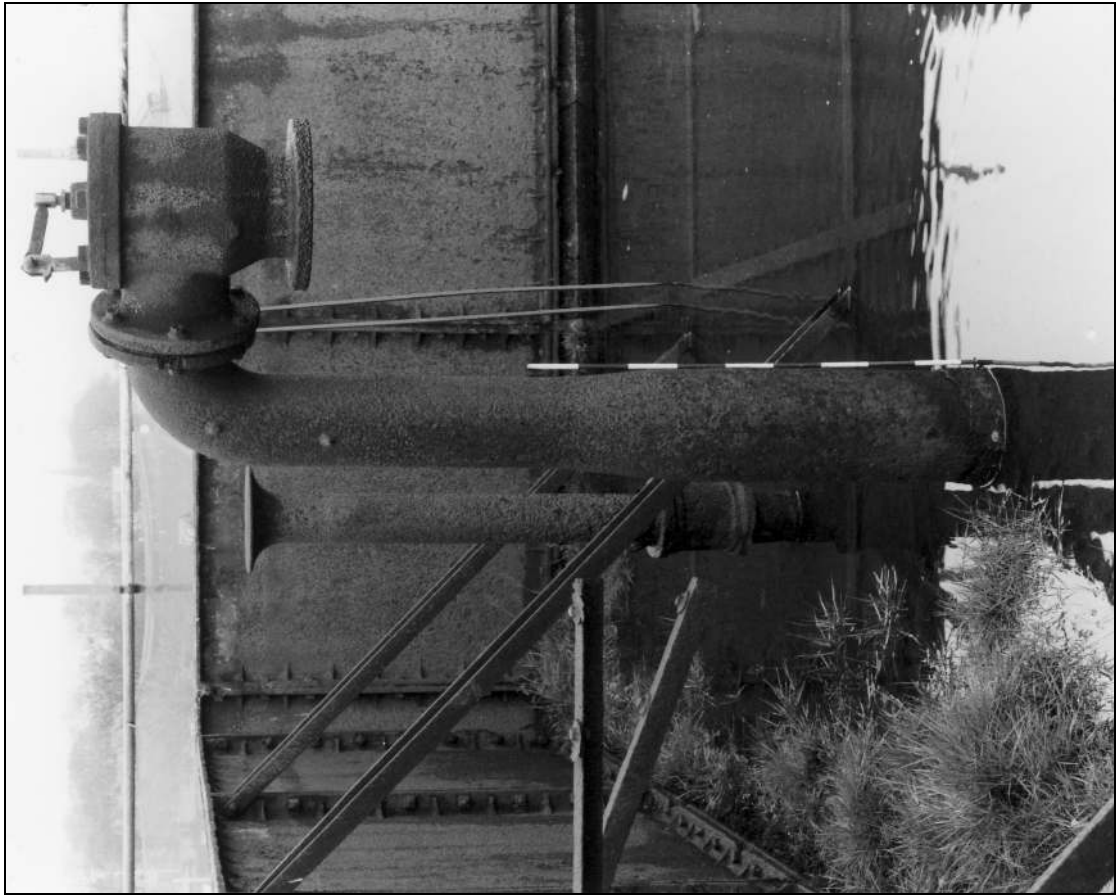


Photo 67: Later feed, and overflow pipes, within tank, from the south (film 6, frame 18)



Photo 68: Later feed, and overflow pipes, within tank, from the south-east (film 7, frame 2)



Photo 69: Head of later feed pipe, from the south-west (film 7, frame 9)

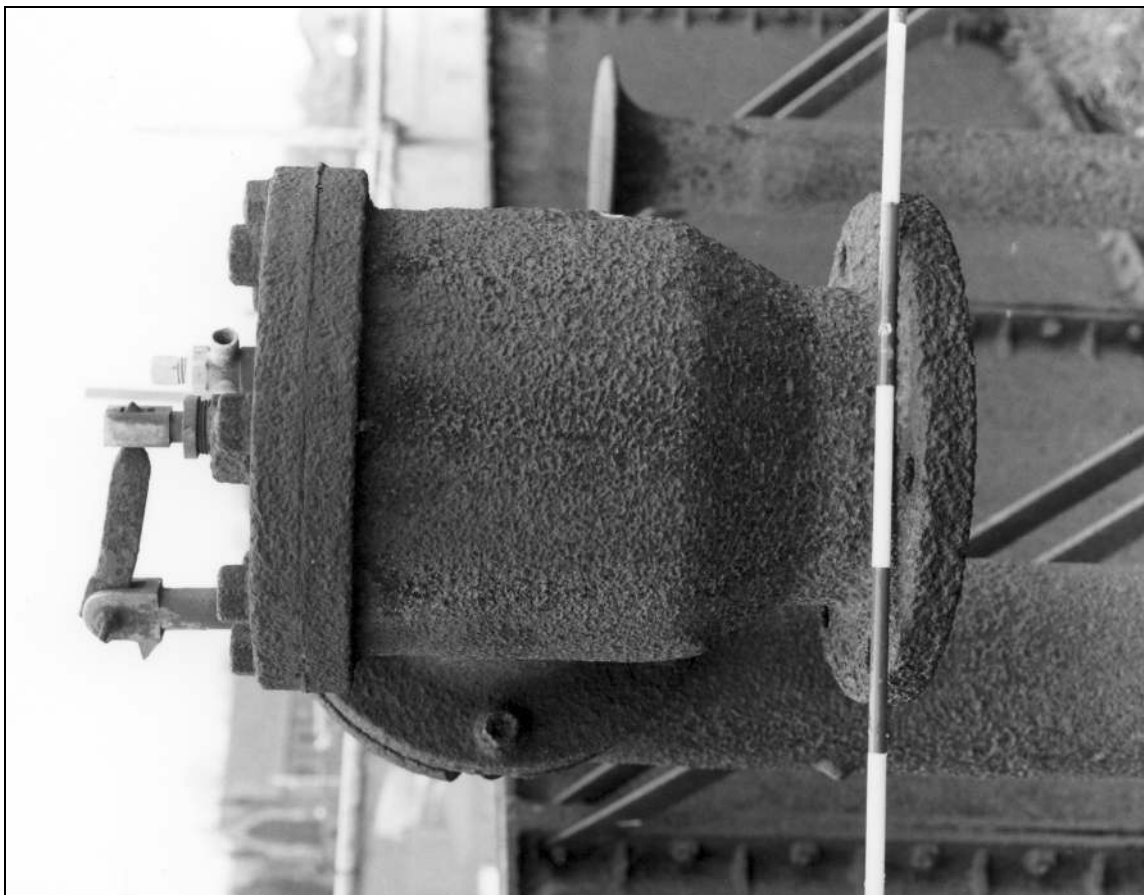


Photo 70: Head of later feed pipe, from the south-east (film 7, frame 10)

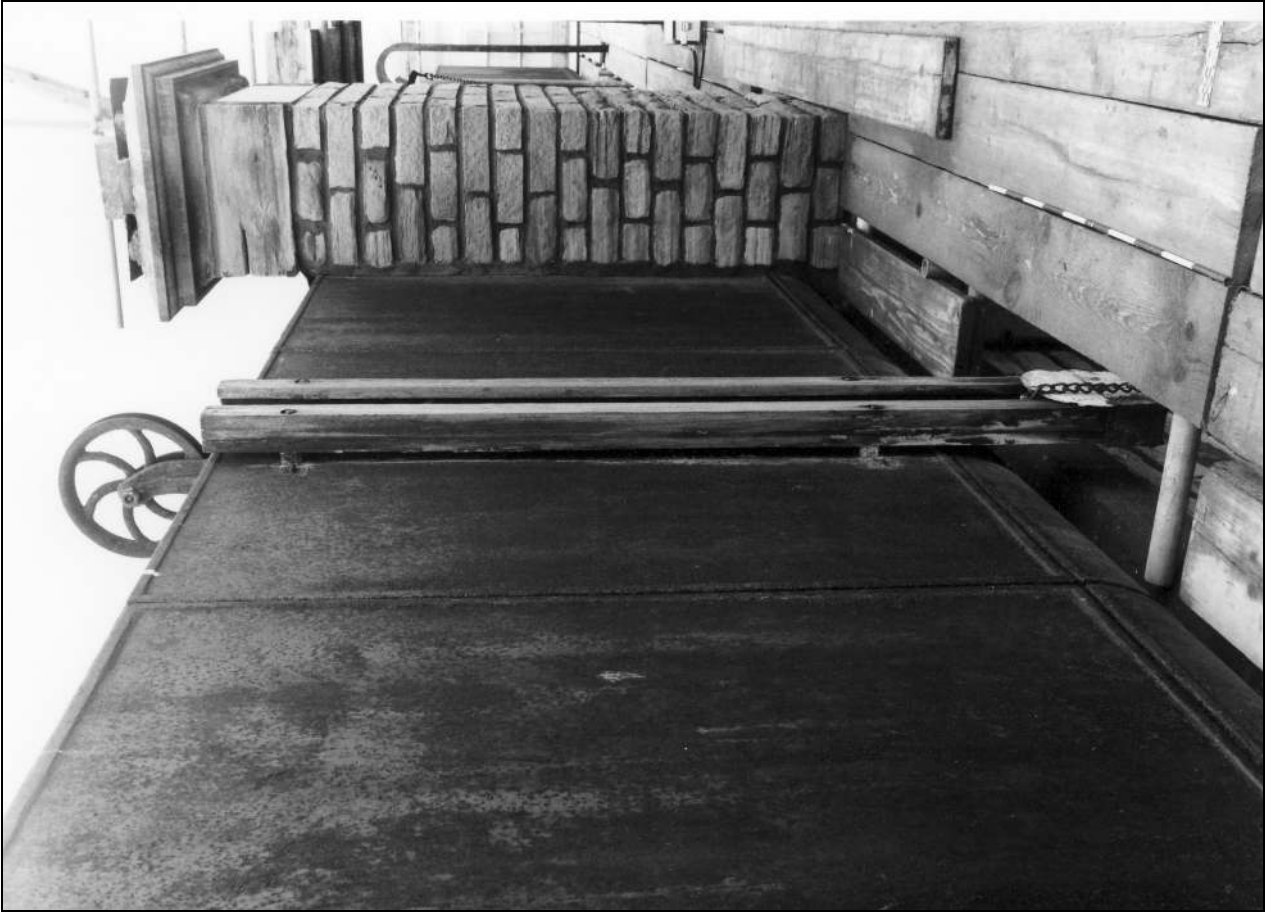


Photo 72: Level gauge on west side of tank (film 7, frame 17)



Photo 71: Level gauge on west side of tank (film 1, frame 17)

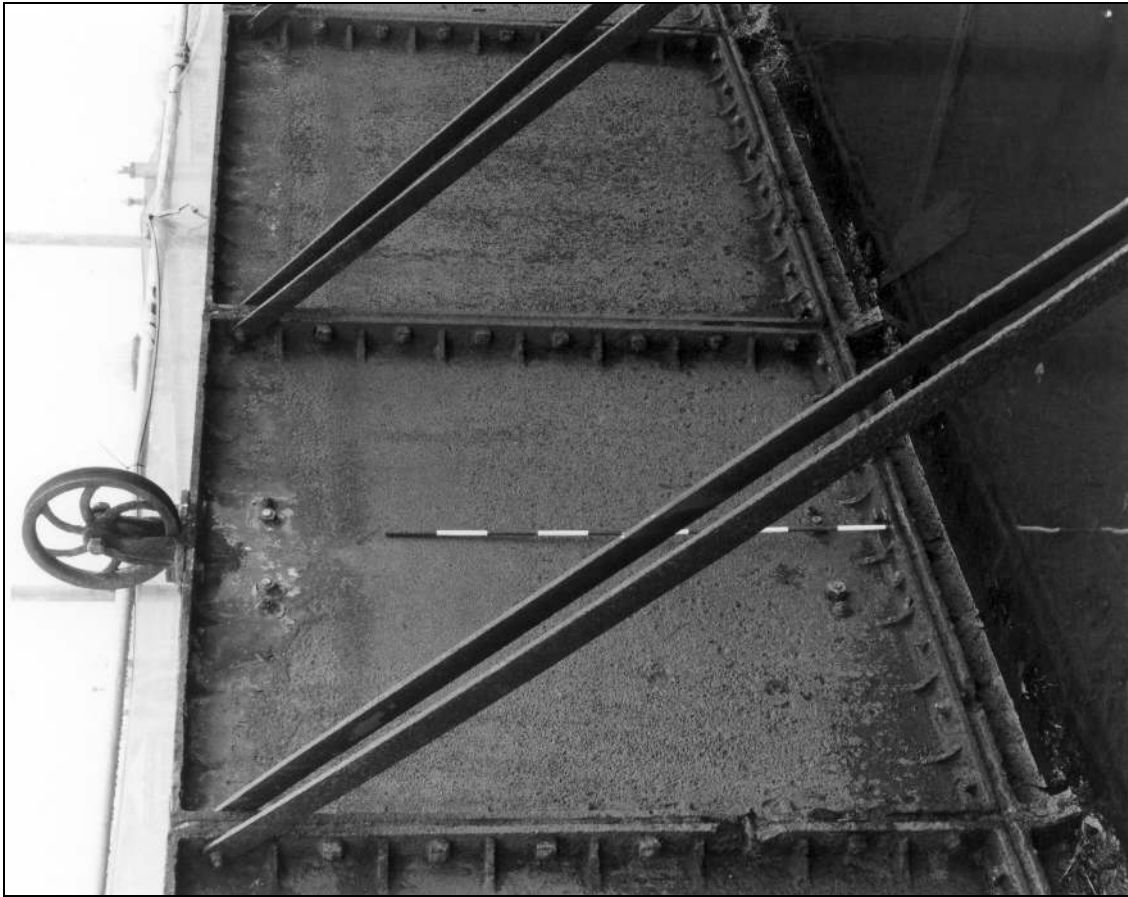


Photo 73: Pulley for level gauge, on west side of tank (film 7, frame 3)

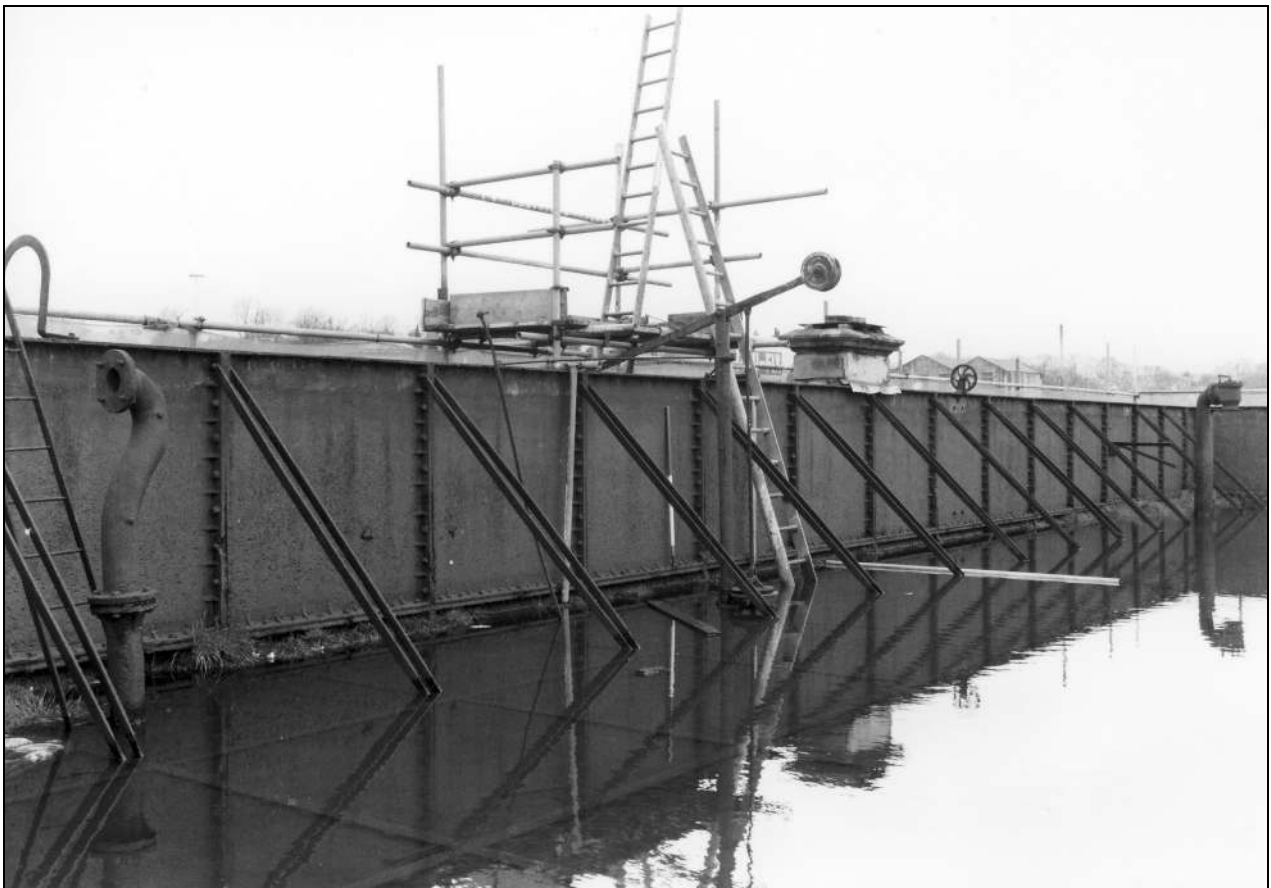


Photo 74: General view of south-west corner of tank (film 7, frame 16)



Photo 75: Detail of outlet pipe at base of tank, with stopper (film 6, frame 12)

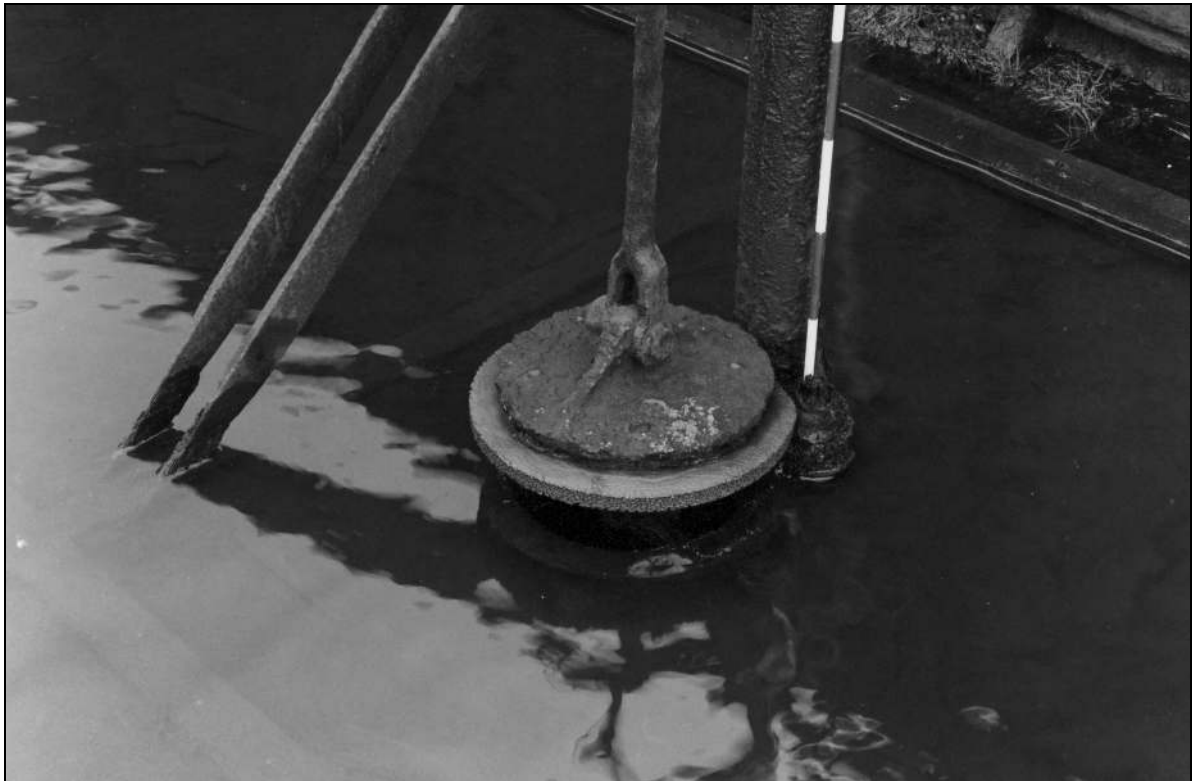


Photo 76: Detail of outlet pipe at base of tank, with stopper (film 7, frame 5)



Photo 77: Detail of outlet pipe at base of tank, with stopper (film 8, frame 9)

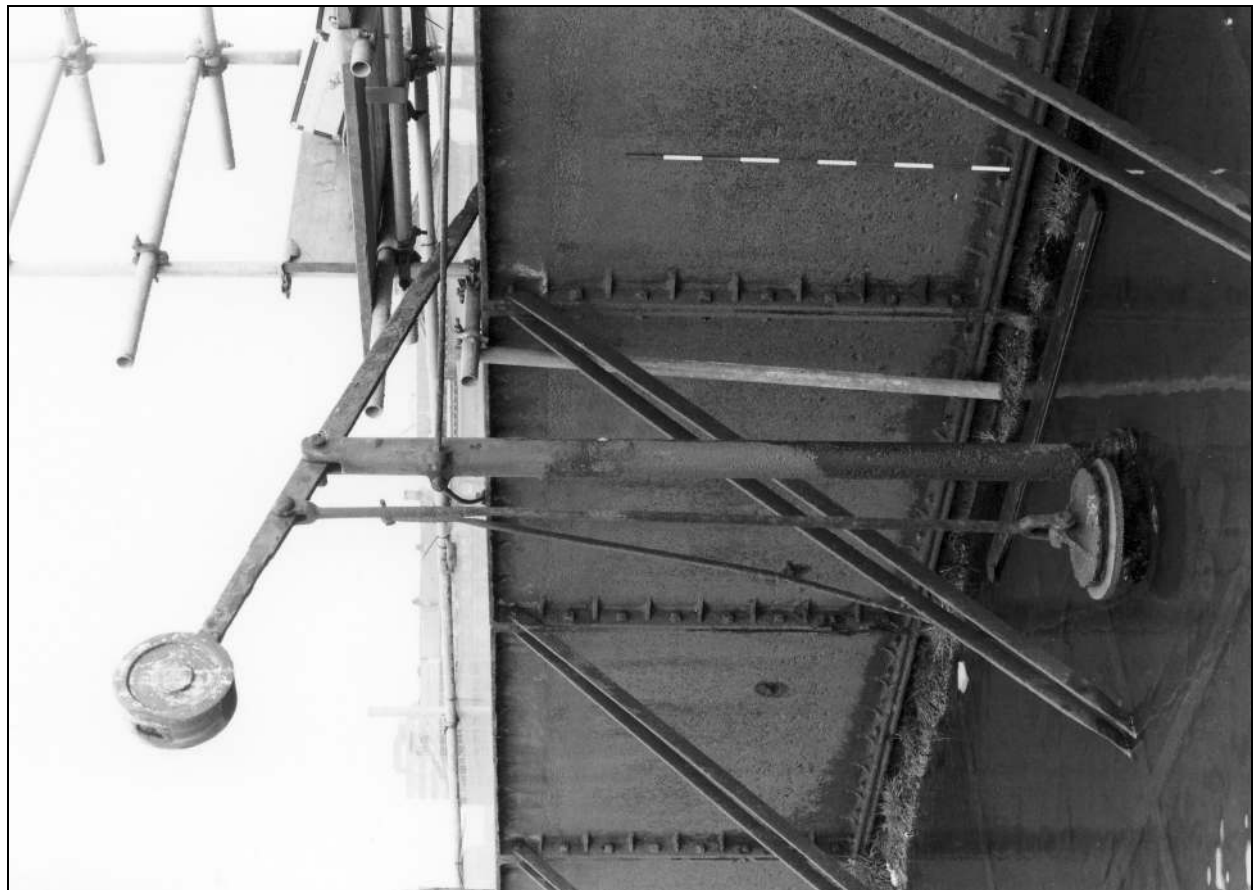


Photo 78: Detail of outlet pipe at base of tank, with stopper and control lever (film 7, frame 4)



Photo 79: Control lever and chain on outside of tank (film 1, frame 18)



Photo 80: South end of tank, showing original feed pipe (film 7, frame 14)

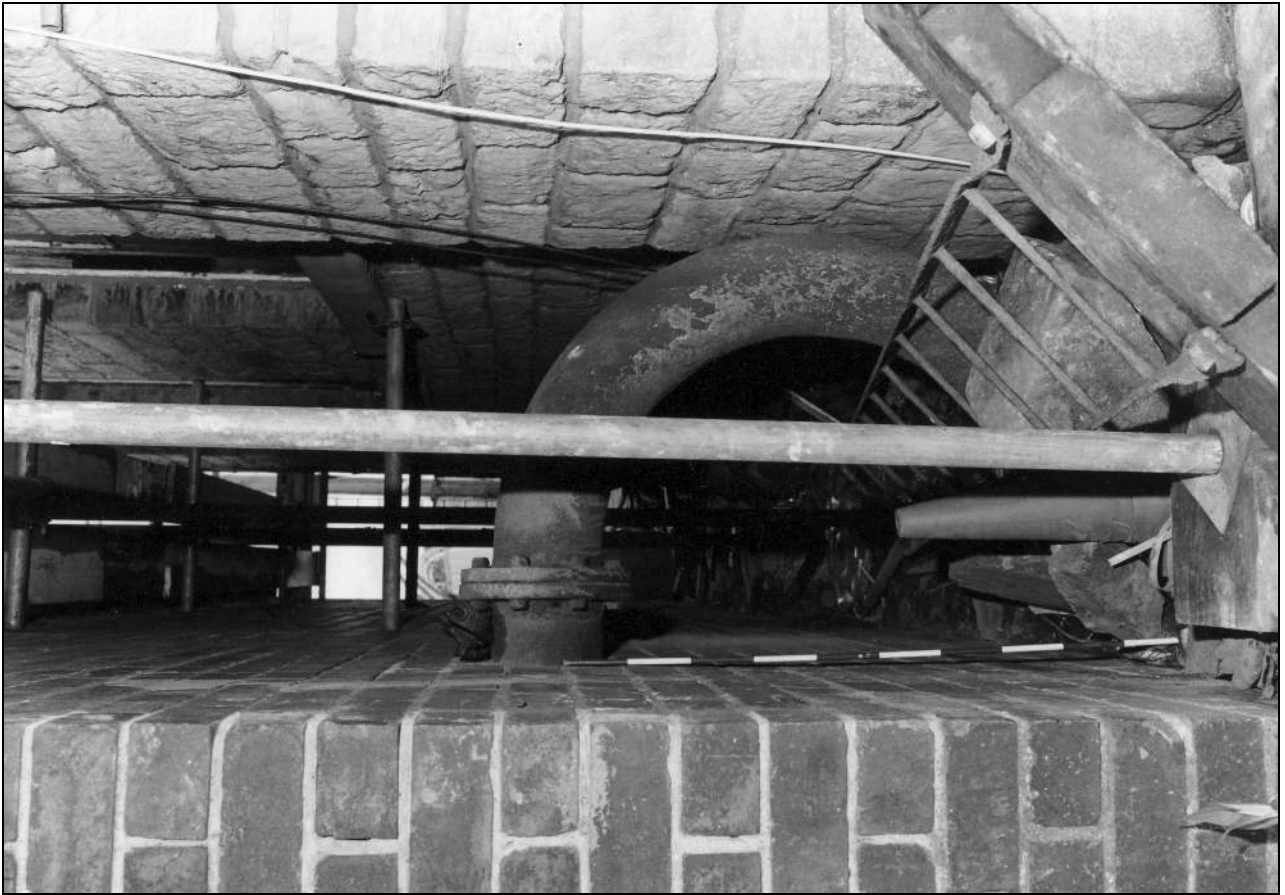


Photo 82: Pipe supplying adjacent building to west of water tower
(film 8, frame 11)

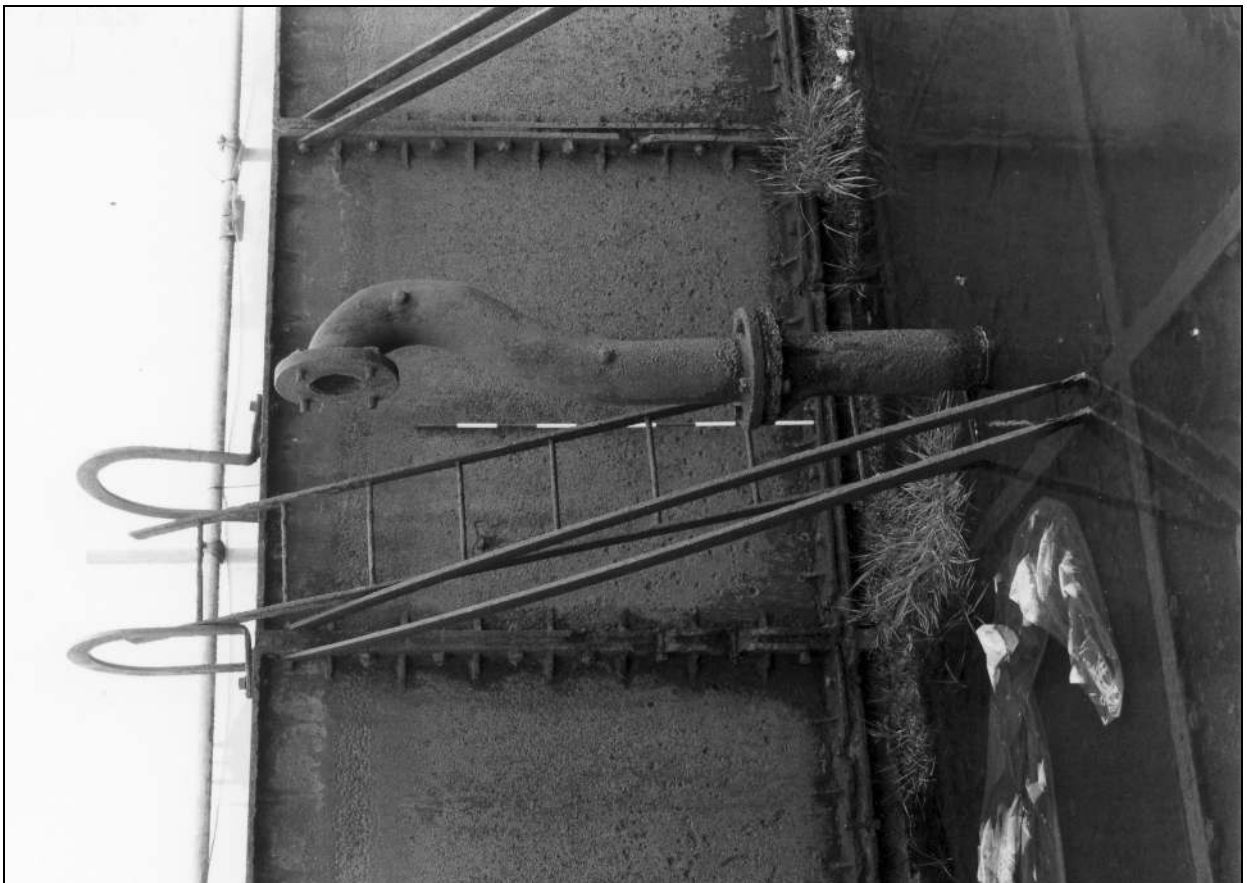


Photo 81: Detail of original feed pipe, with adjacent ladders (film 7, frame 6)

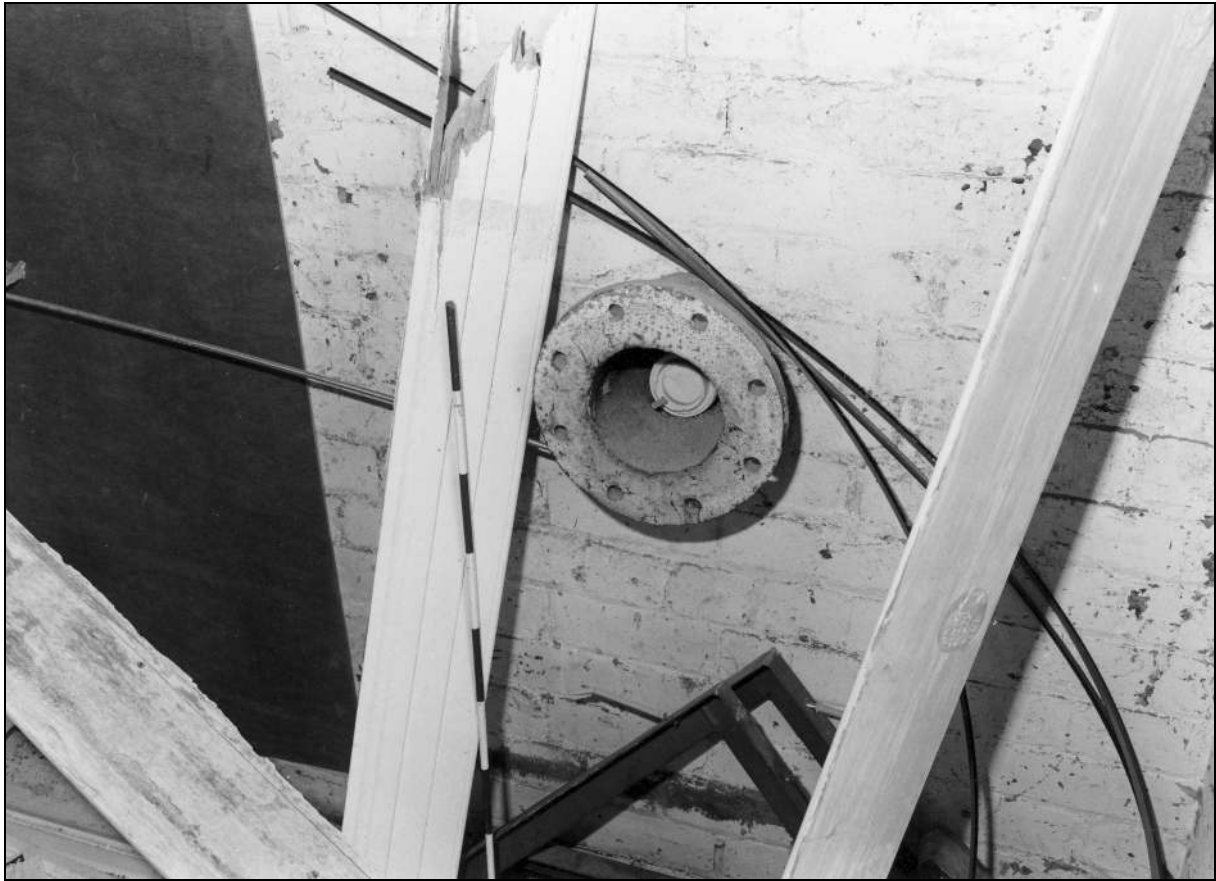


Photo 83: Pipe supplying adjacent building to west of water tower (inside building) (film 8, frame 13)