

ARCHAEOLOGICAL WATCHING
BRIEF AND BUILDING
RECORDING AT
LICHFIELD BASIN,
SEVERN SIDE, STOURPORT-ON-
SEVERN, WORCESTERSHIRE

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Project 2765
Report 1464
WSM 34481

Contents

Part 1 Project summary

1

Part 2 Detailed report

1.	Background.....	3
1.1	Reasons for the project	3
1.2	Project parameters	3
1.3	Aims	3
2.	Methods	3
2.1	Documentary search	3
2.2	Fieldwork methodology.....	5
2.2.1	Fieldwork strategy	5
2.2.2	Structural analysis	5
2.3	Artefact methodology, by Laura Griffin.....	5
2.3.1	Artefact recovery policy	5
2.3.2	Method of analysis	5
2.4	Building recording methodology.....	6
2.5	The methods in retrospect	6
3.	Topographical and archaeological context	6
4.	Results	8
4.1	Structural analysis	8
4.1.1	Phase 1 Natural deposits.....	8
4.1.2	Phase 2 Post-medieval/modern deposits and structures	8
4.1.3	Phase 2 timber vessels.....	9
4.2	Artefact analysis, by Laura Griffin.....	9
4.3	Results of the building recording	10
4.3.1	Late 18 th / early 19 th century.....	11
4.3.2	Mid 19th century	11
4.3.3	Late 19th century.....	11
4.3.4	Early 20th century onwards.....	12
5.	Synthesis.....	12
5.1	Lichfield Basin, Cheapside Lock and dry docks	12
5.2	The vessels	12
5.3	The buildings.....	13
5.4	Significance	14
6.	Publication summary	15
7.	The archive.....	15
8.	Acknowledgements.....	16
9.	Personnel.....	16
10.	Bibliography.....	16

Archaeological watching brief and building recording at Lichfield Basin, Severn Side, Stourport-on-Severn, Worcestershire

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With contributions by Laura Griffin

Part 1 Project summary

A project of archaeological monitoring and building recording was undertaken at Lichfield Basin, Severn Side, Stourport-on-Severn, Worcestershire (NGR: SO 8110 7100). It was requested by Woodford Land Limited, who intends residential redevelopment for which planning permission has been obtained.

The aim of the watching brief was to observe and record archaeological deposits, and to determine their extent, state of preservation, date and type, as far as reasonably possible. In particular the watching brief aimed to record the canal basin walls and any buried boats, especially Droitwich trows. The aim of the building recording was to produce a discussion of the history and function of the sail buildings. This should then feed into the research cycle, taking into account local, regional and national research frameworks.

The watching brief of the groundworks revealed the basin, dock and dry dock walls, which comprised brick courses, with occasional timber insertions, sealed by a sandstone block capping course. Little was identified by way of alteration, with the exception of blocking walls inserted into Cheapside Lock. Few fittings were observed, most notably vertical recessed slots for gates along the inlet from the Upper Basin and a crane base at the corner of the north-west dock. Three very poorly preserved timber vessels of the type known as Joeys or Birmingham Day Boats were exposed within the north-west dock. These were the most common form of un-powered cargo boat in use along the canals of the West Midlands.

Two buildings were recorded, the Sail House in Mart Lane and an adjoining warehouse to the rear. There was no definitive evidence to indicate that the Sail House was ever used for the production or storage of sailcloth, although the building is known locally as 'The Sail House' and there are suggestions that it was once a sailcloth and tarpaulin workshop. The building, which was described as a warehouse in 1810, dates from the late 18th century with modifications over the following century and a half. A narrow building, which was probably open to the rear, was built onto the Sail House in the mid-19th century. This was enclosed when the warehouse was constructed on the eastern side of the Sail House in the early 20th century.

Part 2 Detailed report

1. Background

1.1 Reasons for the project

An archaeological watching brief and building recording was undertaken at Lichfield Basin, Severn Side, Stourport-on-Severn, Worcestershire (NGR 8110 7100; Fig 1). It was requested by Woodford Land Limited. They intend to redevelop the site for residential use and have obtained planning permission from Wyre Forest District Council (reference WF/1208/2004), who considered that a site of archaeological interest would be affected (WSM 32858).

1.2 Project parameters

The project conforms to the *Standard and guidance for an archaeological watching brief* (IFA 1999) and *Standard and guidance for the archaeological investigation and recording of standing buildings or structures* (IFA 1999).

The project also conforms to a brief prepared by the Planning Advisory Section of Worcestershire County Council (HEAS 2005a) and for which a project proposal (including detailed specification) was produced (HEAS 2005b; HEAS 2005c).

1.3 Aims

The aim of the watching brief was to observe areas of ground disturbance associated with construction; to record archaeological structures, horizons, features and deposits associated with the extant buildings, to determine their extent, state of preservation, date and type, as far as reasonably possible. In particular the watching brief aimed to record the structure of the canal basin: the walls, accesses, fixtures and associated structures and any buried historic vessels (boats), especially Droitwich trows.

The aim of the building recording was to record fixtures and fittings within the warehouse, and to produce a discussion of the history and function of the Sail House.

- This should then feed into the research cycle, taking into account of local, regional and national research frameworks (HEAS 2005b; HEAS 2005c).

2. Methods

2.1 Documentary search

Prior to fieldwork commencing a search was made of the Historic Environment Record (HER). In addition to the sources listed in the bibliography the following were also consulted.

Cartographic sources

- <1802, A survey taken by James Sherriff of lands in Lower Mitton and attested to be the situation of the lands previous to the making of the canal, WCRO BA 6507/3 ref. f900.9:3
- 1802, A survey of land taken by James Sherriff, May 1802, situated in the hamlet of Lower Mitton in the parish of Kidderminster and County of Worcester, WCRO BA 6507/3 ref. f900.9:3 (Fig 2)

- 1810, Plan of Land & Buildings at Stourport, belonging to the Staffordshire & Worcestershire Canal Company, surveyed by Thomas Smith 18th January 1810, WCRO BA 6507/4, f900.9:3 (Fig 3)
- 1826, Plan of Stourport canal basins 'for Anglesa proposed variation', dated 1st April 1826, WCRO BA 6507/7, f900.9:3 (Fig 4)
- 1826, Plan of Stourport canal basins and part of the Staffordshire and Worcestershire Canal. Drawn by William Stephens, WCRO BA 6507/3 ref. f900.9:3
- 1835, Survey of the Lower Mitton / Chapelry of Lower Mitton, by John Broadfield, WCRO BA 1569/2 s261.94
- mid 19th century, Plan of Stourport, WCRO BA 6507/4, f900.9:3 (Fig 5)
- 1845, Lower Mitton tithe map, WCRO BA 1572, parcel 428, ref s760:428 (Fig 6)
- 1878, Plan of the Parish of Lower Mitton with its additions of Upper Mitton and West Hartlebury, copied from the Tithe Maps of Lower Mitton and Hartlebury, TD Baker, surveyor, Kidderminster (Fig 7)
- 1884, 1st edition Ordnance Survey map, scale 25":1 mile/1:2,500, Worcestershire, sheet XIV, XIV.10, and XIV.14 (Fig 8)
- 1888, 1st edition Ordnance Survey map, scale 6":1 mile/1:10,560, Worcestershire, sheet 14 SW
- 1903, Ordnance Survey map, scale 25":1 mile/1:2,500, Worcestershire, sheet XIV, XIV.10, and XIV.14
- 1903, Ordnance Survey map, scale 6":1 mile/1:10,560, Worcestershire, sheet 14 SW
- 1927, Ordnance Survey map, scale 25":1 mile/1:2,500, Worcestershire, sheet XIV, XIV.10, and XIV.14
- 1929, Ordnance Survey map, scale 6":1 mile/1:10,560, Worcestershire, sheet 14 SW
- 1938, Ordnance Survey map, scale 6":1 mile/1:10,560, Worcestershire, sheet 14 SW
- 1947, Ordnance Survey map, scale 6":1 mile/1:10,560, Worcestershire, sheet 14 SW (Fig 9)
- 1954/5, Ordnance Survey map, scale 6":1 mile/1:10,560, Sheet SO 87SW
- 1955, Ordnance Survey map, scale 1:2,500, Plans SO 70 NW, 71 SW, and 71SE
- 1965/6, Ordnance Survey map, scale 1:2,500, Plans SO 70 NW, 71 SW, and 71SE
- 1974, Ordnance Survey map, scale 1:10,000, Sheet SO 87SW
- 1984, Ordnance Survey map, scale 1:10,000, Sheet SO 87SW
- 1994, Ordnance Survey map, scale 1:10,000, Sheet SO 87SW
- 2000, Ordnance Survey map, scale 1:10,000, Sheet SO 87SW

- 2005, Conservation Area Consent Location Plan, Woodford drawing no. 7136.2 (Fig 10)

Pictorial sources

- 1776, Engraving of Stourport by James Sherriff

Aerial photographs

- post 1927 Stourport Basins from the south and south-west (two views; kindly provided by Mrs Martin, Lichfield Street, Stourport-on-Severn; Plate 16)
- post 1927 Aerial of view of Stourport Basins (Waterway Environment Services 2001, 56, Plate 2)

2.2 **Fieldwork methodology**

2.2.1 **Fieldwork strategy**

A detailed specification has been prepared by the Service (HEAS 2005b; HEAS 2005c).

Fieldwork was undertaken between 6th July 2005 and 3rd August 2006. The site reference number and site code is WSM 34481.

Sixty-six test pits were monitored, each approximately 3m by 3m and 0.10-2.20m deep, within the former canal basin and adjacent arms and sluice. The excavation of the entire north-west arm of the canal was also observed, along with sections of the canal basin and arm walls (Areas 1-11).

Observation of the excavated areas was undertaken both during and after machine excavation. The exposed surfaces were generally sufficiently clean to define structural remains and observe well-differentiated archaeological deposits, although any less clear may not have been identified. Clean surfaces were inspected, selected deposits and structures were excavated to determine their nature. Deposits were recorded according to standard Service practice (CAS 1995). Access to deep trenches and test pits was not made for safety reasons.

2.2.2 **Structural analysis**

All fieldwork records were checked and cross-referenced. Analysis was effected through a combination of structural, artefactual and ecofactual evidence, allied to the information derived from other sources.

2.3 **Artefact methodology, by Laura Griffin**

2.3.1 **Artefact recovery policy**

The artefact recovery policy conformed to standard Service practice (CAS 1995; appendix 2). This in principal determines that all finds, of whatever date, must be collected. However, in this case only a sample of later material was collected from the spoil during machining. These comprised the majority of the finds recovered from the site.

2.3.2 **Method of analysis**

All hand retrieved finds were examined. They were identified, quantified and dated to period. A *terminus post quem* date was produced for each stratified context. The date was used for determining the broad date of phases defined for the site. All information was recorded on *pro forma* sheets.

2.4 Building recording methodology

The project conformed to the specification for a photographic/level 3 survey as defined by the English Heritage guidelines contained in *Understanding Historic Buildings* (EH 2006), with the following additional recording, which is not detailed in the guidelines:

- Photographs of external detail relevant to the building's design, development and use.

The building recording consisted of a photographic record being made of the exterior and interior of the subject buildings, scaled drawn plans and detail of relevant internal features where applicable and a desk-based assessment to place the buildings in their historic context. The photographs were taken with a Nikon D70 digital camera and on an SLR using conventional film; an index made containing a basic description and direction of the view. Notes on the buildings' construction were made on pro-forma record sheets from the Archaeology Service catalogue.

For ease of reference and interpretation the recorded buildings are referred to as the "Sail House" and the "Warehouse", although this does not necessarily reflect the usage of space for their entire lifespan. The location of the buildings is shown in Figure 2.

2.5 The methods in retrospect

Access to, and visibility of, deposits and structures allowed a high degree of confidence that the aims of the project have been achieved.

3. Topographical and archaeological context

The site is located on the north side of the River Severn, south of Stourport on Severn town centre. It comprises a roughly flat sub-rectangular area of approximately 1.7 hectares at a height of approximately 23m AOD. The site is bounded by the rear of residential properties off Lichfield Street to the north, Severn Side road to the east, a public footpath to the south and Mart Lane to the west. It was previously under industrial use as a timber yard, the buildings associated with which have been demolished. Extant buildings remain to the south-west corner of the site, including the former sail house and warehouse.

The predominant soils of the area belong to the Wharfe Soil Association (561a) comprising deep stoneless permeable fine soils and some similar soils variably affected by groundwater (Soil Survey of England and Wales, 1983). The solid geology comprises Triassic Bunter Sandstone overlain by alluvium and the first gravel terrace of the River Severn (Ragg *et al* 1984).

Stourport, the canal basins and associated industries have been the subject of a number of archaeological investigations (Buteux, 1996; Cook 1996; Cook 1999a; Dalwood 2000; Miller 2005). The following is a summary:

Prior to development in 1768 the area comprised enclosed meadowland, subject to seasonal flooding, to the south-west of the hamlet of Lower Mitton. It is thought to have formed part of an open field system surrounding the hamlet in the medieval and post-medieval periods, which was enclosed in the early/mid 18th century. The only buildings along this stretch of the river recorded in the mid/late 18th century were Ferry House (WSM 19716), the Angel Inn (WSM 17478) and a cottage off Price's Wharf known as Price's House or Cottage. The two fields to the rear of the wharf, also owned by Mr Peter Price and collectively known as Severn Pieces, occupied the site of the future Lichfield Basin (Fig 2).

Work on the Staffordshire and Worcestershire Canal commenced in 1768 under the auspices of James Brindley and was completed by 1771, linking the River Severn with the River Trent. The town of Stourport was established around the Severn terminus of the canal, which

was completed in 1768. Prior to 1771 it was known as *Stourmouth* and then *Newport*. Docks were constructed for the transshipment of goods between canal barges and river vessels. By the early 19th century a total of four large basins (Upper, Clock, Lichfield and Cheapside Basins) and three smaller (Engine Basin and two Lower Basins) had been constructed, covering an area of approximately 10 hectares, bounded by the River Severn, Bridge Street, York Street and Severn Road (WSM 12855, 19651-5; Fig 5).

The town developed rapidly as the canal company built the Tontine Hotel (originally known as the Stourport Inn; WSM 12797) by 1773, entrepreneurs rented quayage and built private dwellings of varying grandeur. In the later 18th century Stourport was noted for its fine Georgian houses and for a short time it even became a resort town. However the docks fell into decline following the completion of the Worcester and Birmingham Canal in 1816 and later the Birmingham to Gloucester railway in 1840, from which it didn't recover. However commercial traffic on the canal did not cease entirely until the mid 20th century. Cheapside Basin was filled-in during expansion of the gasworks in the 1866 (although this is not shown on the plan of 1878; Fig 7).

To meet increasing demands for dock facilities Lichfield Basin itself was constructed between 1806 and 1810, although an un referenced source places its completion as late as 1812 (Bradford 2000, 87). It had been planned for a number of years prior to construction and the design redrafted at least twice. The final layout comprised a rectangular basin with two long arms to the north, three narrow dry docks to the south, and a lock connecting with Cheapside Basin to the south (Figs 2-6). Lichfield Basin has also been known as the New or Furthestmost Basin. The bridge over Mart Lane was similarly known as New Basin Bridge (Fig 8). The middle dry dock was backfilled between 1903 and 1927 and a building constructed over it, alongside an existing warehouse (Plate 16). During the 19th century the basin was used for general goods and from 1927 to 1949 it was the terminus for barges on the "Light Run" bringing coal to Stourport Power Station located adjacent to the south-east. However this function ceased in 1949 when coal began to be transported via the railway and between 1955 and 1965 the basin was gradually filled. The material used largely comprised waste from the production of ceramic electrical insulators, from a disused nearby factory, coupled with building rubble from the demolished canal warehouses adjacent. The partially infilled basin was also used for the storage of logs as late as 1961.

The Larch Lap timber Company was established in 1930/1 by Jo Corbett, when an open shed was set-up off Lichfield Street. It had a 42ft saw-bench, the longest in the West Midlands at this time and a crane was erected close to the shed. The premises were leased to Larch Lap by British Waterways until 1998, when it moved to Hartlebury Trading Estate. The site has subsequently lain derelict (WSM 12859; Bradford 2000, 55 and 60; Bradford 2000/1; Waterway Environment Services 2001, 59).

The first cartographic reference to the Larch Lap works is the identification of a "timber yard" on the OS map of 1955. The OS map of 1966 denotes the northern half of the site as a "wooden fencing works", presumably the Larch Lap Company; and the southern half of the site, including the Sail House and warehouse, as an "engineering works".

The study area has been the subject of a previous archaeological investigation, during initial remediation works. This involved the monitoring of three test pits; north of the canal basin, on the east side of the canal basin, and within the south-eastern dry dock. These determined the location and form of the canal walls, as shown on Ordnance Survey maps prior to 1965. They comprised regular brick courses bonded with hard white lime mortar, below a single course of squared red sandstone blocks, which frequently had not survived to its full height. A drain and sluice gate were also noted in the east wall of the dry dock, the base of which was recorded at 2.60m depth. The floor of the canal basin toward the east side was not observed, even though excavation was undertaken to 4.50m below the existing surface (WSM 29159; Miller 2000).

Archaeological investigations have also been undertaken on adjacent sites. These include building recording at Parkes Quay, a wharf and warehouse area *c* 300m to the north-west (Joyce 1997); photographic survey of extant historic canal features (Cook 1996b); an evaluation on land off Lodge Road *c* 150m to the north-east, which identified remains of an 18th century water feeder leading from the Stour to the contemporary Upper Basin (WSM 27991; Bretherton and Jones 2000); and a public-access evaluation around the Tontine buildings to the west of the study area, which revealed an early 19th century octagonal tollhouse and earlier phases of the layout of the Tontine gardens (WSM 34767; Hughes 2006).

4. Results

4.1 Structural analysis

The test pits and open areas monitored are shown in Figs 15-17 and Plates 17-50. The results of the structural analysis are presented in Appendix 1.

4.1.1 Phase 1 Natural deposits

The natural matrix comprised a compact and cohesive brownish orange to fawn grey clay with areas of orange sand and pebble gravel.

4.1.2 Phase 2 Post-medieval/modern deposits and structures

The canal basin, dry dock and lock walls were of similar construction along all sections observed. There were no clearly defined breaks or alterations in the brickwork, which would indicate different phases of construction or repairs. The only observed area of abutting walls was at the inlet from Upper Basin to the west. The walls generally comprised a single uppermost course of sandstone quay stones, 0.30m deep. This lay over varying courses of blue engineering bricks, occasionally with two-three course thick timbers inset within the dock arms, over the main body of red bricks. These were generally laid in alternating courses of headers and stretchers (English Bond). The foundation simply comprised up to four brick courses slightly stepped out up to one brick wide. The wall was generally four bricks wide in the upper courses, and up to seven bricks wide elsewhere. Sandstone quoins were also used on all external corners of the basin and docks and at the lock gates. The deepest section was, unsurprisingly, the lock to Cheapside Basin, at 4.30m deep. Elsewhere the basin itself was up to 3.20m deep, the north docks 2.45m and the dry docks 2.30m deep.

The lock to the former Cheapside Basin was blocked by two inserted walls. The southernmost, toward the southern boundary of the development area, was of brick with two inset sluices (later infilled with reinforced concrete). These were fed from two channels divided by a brick dividing wall down the centre of the lock. The bricks appeared to be keyed into the main walls of the lock, although close inspection was not possible due to health and safety constraints prohibiting access (Plate 43). The spring of a brick barrel vault was recorded on either wall toward the southern end of the lock. It appears to remain intact in the southern wall of the site and below the ginnell (passageway) alongside the site perimeter. North of this a wall had been inserted within the line of the former lock gates. This comprised two brick skins on the south side, the innermost of which was of stretchers laid on edge, and a battered-back reinforced concrete northern face (Plate 42).

The south-west corner of the south-western dry dock was noted to have a 45° angle rather than simply at 90° as was anticipated (Plate 44). The form of the dry dock gates at their northern extent was not observed or recorded at any point.

Vertical slots were noted in the walls both within and outside the eastern end of the inlet from Upper Basin. Those within the inlet itself contained a cast iron lining. They were presumably the setting for gates although their exact form is unclear (Plates 47 and 50).

A mixed organic silt deposit was observed at the base of the canal basin. This contained occasional long sawn timber logs. It was sealed by a modern backfill deposit comprising variably ceramic industrial waste, soil and building rubble, all overlain in turn by gravel hardcore.

A defined puddled-clay lining for the canal basin was not observed at any stage, below the mixed organic silt and infill layers. The base of the canal within the inlet from the Upper Basin comprised a brick floor. The foundations below were not observed.

4.1.3 Phase 2 timber vessels

Three timber vessels were partially excavated and recorded within the north-west dock (Area 1; Fig 17, Plates 19-33).

Two were fully exposed (104 and 106); the third was partially revealed but flooded immediately (105). They were of comparable size, with internal dimensions of 21.50m length and 1.95m width; and wooden construction with keelson beams (an internal fore and aft timber often fitted to vessels above the lowest frames in the hull to assist in securing these and imparting longitudinal strength to the hull; <http://www.mda.org.uk/waterw/alphan.htm>). One vessel (104) had wooden ribs, a single keelson, dung and tar sealant between planks and traces of iron sheeting over the exterior of the hull. Another vessel (105) had a single keelson, iron ribs and external double planking. And the final vessel (106) had three keelsons, iron ribs and external double planking.

4.2 Artefact analysis, by Laura Griffin

The artefactual assemblage recovered is summarised in Table 1.

The artefactual assemblage recovered from the site consisted of 17 encaustic floor tiles weighing 33kg and is summarised in Table 1. The assemblage came from a single stratified context within the south-west dry dock. Level of preservation was extremely good with some tiles still attached to the underlying mortar.

Material	Count	Weight (kg)
Square pavement tile	15	30
Rectangular edging tile	2	3

Table 1: Quantification of the assemblage

All material came from context 901, which was located in the fill of the south-west dry dock and is likely to have originated from one of the nearby warehouse buildings. The group comprised 17 encaustic floor tiles with a combination of a red/brown and/or blue ground with buff inlaid decoration in Gothic revival style. A total of 11 different designs were present within the group, all of which clearly belonged to larger multi-tile pavements. Such tiles were first produced from 1830 onwards.

All were of sandwich plastic clay manufacture with a layer of coarse clay sandwiched between two layers of much finer clay, which was then used as the blank. This technique reduced shrinkage during firing and was also more economical. Those without mortar adhered are clearly stamped on the underside with the words 'MINTON & CO. PATENT

STOKE UPON TRENT'. Each is also keyed on the underside with a series of 20 holes to the depth of the outer layer of clay.

Of particular interest, was a series of three tiles which were embedded into a large piece of mortar and still as they were originally lain. These consisted of one undecorated red quarry tile, which was butted by one rectangular edging tile with a foliate scroll running the length, which in turn adjoined one fragment of a larger square tile. Based on other tiles of the same design within the assemblage, this latter tile was clearly incomplete and it would appear that it had been deliberately broken to fill in a specific gap towards the edge of the floor, either as a repair or due to the tiles not quite filling the full dimensions of the underlying floor surface.

4.3 **Results of the building recording**

The Sail House stands with its north-western elevation fronting Mart Lane, with the warehouse to the rear, on the south-eastern side (Fig 1; Plates 1-3). The two buildings do not share a common dividing wall, with the buildings separated by a narrow central building.

The Sail House is a two-storied rectangular building measuring some 22 metres long by 7 metres wide. The geometry of the ground-floor plan is broken by a ginnell (passageway) that runs approximately north-west to south-east from Mart Lane to Severn Road, north of the former Cheapside Basin. This is incorporated into the corner of the structure and under sails the upper floor, with the external wall of the building curving round to provide access to the ginnell (Plate 5).

The structure is constructed of 9" solid brick and mortar with a flat felted roof that has a run-off to the south-east. The external elevations of the structure are currently painted white, though this is unlikely to be the traditional finish. There are a series of 3 elliptical brick arches centrally at ground floor level, with a single semi-circular arch at either end and a further semi-circular arch above the entrance to the ginnell at the southern end of the Mart Lane fenestration (Fig 11; Plates 6-9). It appears that the spaces below the arches were once open to the road frontage, although the evidence is clouded by the brickwork of the blocked openings being carried through at each course, which would have removed evidence of the abutments projecting down from the arch springers. These abutments would have carried bullnose bricks at the edges. Evidence to support the theory that the spaces were open to the frontage is; a set of remaining iron gate hinges set into the stone springers below the southernmost arch; remnant quoin stones at ground level in line with the arch springers; and a drop-kerb along this length of road frontage. This also indicates that the doors and windows below the arches are not original, and were most likely inserted at the same time as the blocking brickwork.

The evidence suggesting that the building was open onto Mart Street indicates that the ground floor was originally a loading bay, which in turn suggests that storage was at the upper floor level (Fig 11; Plates 6-9).

There are a series of window and door apertures to the rear (south-eastern) elevation, which have been blocked with breezeblocks (Plates 4 and 15). The main workshop entrance is via a sliding timber door to the northern elevation (Plate 2), although this is a later insertion and must be contemporary with the blocking of the frontage bays.

The interior of the building is architecturally un-spectacular and the internal spaces are created by studwork partitioning to the upper floor and 4 ½" brickwork walls at ground floor level (Fig 11).

The warehouse is a single storey building extending to the south-east from the covered central division between the building and the Sail House. The construction is of brick and mortar in English bond with five courses of stretchers between the header courses. The visible end elevation wall (northern) rises to a brick parapet against the end of the curved roof, the southern elevation could only be seen from beyond an area of waste ground and was

partially obscured by overgrown vegetation, though it could be determined that this elevation had windows spanning the entire width, with corrugated iron above to the curved roof line. The main access to the space is via a double sliding timber door to the northern elevation. Three large windows to the northern elevation provide light to the space; these sit below concrete lintels and above Staffordshire blue plinth brick cills (Fig 12).

The curving roof of the warehouse spans some 12.50 metres from east to west and the roof cover is of sheet lead, sealing a timber base (Plates 10 and 11) laid over thin square section timber purlins supported on a series of seven curved lattice girders, often referred to as *Belfast trusses* (Plate 12). The trusses are elevated on cast-iron fluted shaft columns with bell capitals on the west of the roof span (Plate 13; Fig 14) and on RSJ stanchions on the opposite eastern side. The columns had been encased within brick piers, but were exposed during the demolition works. The structural steelwork is stamped by the manufacturer Dorman, Long & Company of Middlesbrough (Plate 14), but it is not known if the same company also manufactured the cast-iron columns.

The Belfast trusses are fabricated entirely in timber, with a two-piece top chord forming the roof profile and a two-piece lower chord forming the bridge between the supporting columns. The upper and lower chords are connected and strengthened by latticework timbers nailed between (Fig 13). This type of truss was lightweight and could provide a wide span, making them ideal for industrial buildings.

4.3.1 **Late 18th / early 19th century**

Sherriff's map of 1802 shows a building on the site of the Sail House, but extending further to the north-east (Fig 2). A more detailed plan of 1810 showing the proposed 'New Basin' (Fig 3) indicates this to actually be two buildings, with a step back from the road around midway along the frontage to be the building division. The plan shows that the buildings belonged to the Staffordshire and Worcestershire Canal Company; the southernmost building was a warehouse occupied by Mr Ames and the northern building, also a warehouse and occupied by Mr Worthington. Mr Ames warehouse equates with the footprint of the Sail House. The plan shows the buildings to the south as stables belonging to the Stourport Inn, pigsties and 'necessaries'.

4.3.2 **Mid 19th century**

A plan of the canal basins dated to 1st April 1826 (Fig 4) shows the building configuration to be the same as in 1802 and 1810. There is no reference to use or occupancy. A detailed mid 19th century plan (Fig 5), which unfortunately is faded, shows the buildings in the same configuration, but with further detached buildings to the rear (east) of the Sail House. This does not equate with the subject warehouse. The plan also shows an 'air shaft', which appears to derive from the Sail House and run in two directions, directly to the west across Mart Lane and to the south, down Mart Lane and along the riverside to Cheapside. The 1845 tithe plan of Lower Mitton (Fig 6) shows the buildings in similar configuration to the earlier maps, although the Sail House appears to have now been extended to the east. This extension is interpreted as the narrow building that separated the Sail House from the warehouse at the time of the survey and the identified cast-iron columns suggest that this part of the building was open onto the wharfage.

4.3.3 **Late 19th century**

The 1st edition Ordnance Survey map of 1884 (Fig 8) shows that by this time Mr Worthington's warehouse had been demolished, leaving the Sail House detached along the Mart Lane frontage. Buildings are still shown abutting the Sail House to the east and there appears to be a projection at the northern corner, which was probably a lean-to outbuilding.

4.3.4 Early 20th century onwards

An aerial photograph kindly supplied by Mrs Martin of Lichfield Street, Stourport (Plate 16), shows the Sail House and abutting narrow central building with the subject warehouse on the eastern side. The broad span of the curved roof can clearly be seen. This layout, first noted on the OS map of 1927, is confirmed on the 1947 edition (Fig 9) and the buildings remained in a similar configuration, with an additional extension to the south-east between 1966-75, until the time of the historic building recording.

The map evidence, however, can only confirm a ground floor plan and it is clear from the post 1927 aerial photograph that the original roof of the Sail House was pitched and was probably altered to a flat roof during the 1950's, when it appears from the fabric evidence that new upper windows were also added.

5. Synthesis

5.1 Lichfield Basin, Cheapside Lock and dry docks

The consistent form of construction of the basin, lock and dock walls indicate that they were planned and built in one phase, which is documented to between 1806-1810/12. There was no evidence for alteration or repair during their use. The only exceptions to this are the clear abutment of the inlet walls from Upper Basin, which is documented to have been built *c* 1771 prior to Lichfield Basin; and the inserted walls within Cheapside Lock to block it off, when the gasworks was extended over Cheapside Basin in 1866.

The apparent break between the lock and Cheapside Basin to the south, noted on maps of the early 19th century, was clarified by the observation of the northern side of a brick barrel vault built over the southern end of the lock. This was determined to be an original, which allowed direct pedestrian access between the basins and has remained as a public footpath down to the present day (Cook 1996, 15).

The 45° corner of the south-westernmost dry dock is hinted at in the small-scale plans of the site, which depict a slight curve to this corner of the dock, although it is not entirely clear. This was determined to be an original feature, and not a later alteration. The walls of the middle of the three dry docks were noted to be in the worst state of preservation. This is probably the result of this particular dock having been infilled and built over in the first decades of the 20th century, much earlier than the other two.

The cast iron base for a crane bedded on the sandstone quay stones on the north-east corner of the north-west dock may be the same as that indicated on the Ordnance Survey map of 1955, although it is depicted some distance from the basin wall itself.

5.2 The vessels

The vessels recorded within the north-west dock are of a type known as 'Joeys' or 'Birmingham Day Boats'. These were un-powered doubled ended cargo boats, either open, or with a simple closed cabin at the stern. They were based on the design of the original Worsley mine boats, which are considered to be the forerunners of the narrow boat and were also known as 'starvationers', because of the exposed ribs. Such vessels were built in their thousands during the 19th and early 20th century, making them the most common boats on the canals of the West Midlands. Built in wood, iron or steel, or a combination, they vary in size and capacity according to builder, company or cargo specification. The maximum size of a day boat using locks was 71ft 6in x 7ft 2in (21.8 x 2.18m), loading up to 40 tons on a draught of 3ft 10in (1.17m) (<http://www.le.ac.uk/ulas/annualreports/ar2001/boats/boats.html>; <http://www.mda.org.uk/waterw/alphan.htm>).

The buildings

The subject building fronting Mart Lane is included on the Stourport-on-Severn local list (www.wyreforestdc.gov.uk) as a 'sail loft' and is referred to in this report as the Sail House as there are suggestions locally that the building was used in the manufacture of sailcloth, with a later associated use as a tarpaulin house. Unfortunately, the background documentary research found no conclusive evidence for either of these processes having taken place within the Sail House. It is clear that sail making was taking place in Stourport during the 19th century; Pigot's Directory of Worcestershire of 1835 lists two sailcloth manufacturers in the town, one in Union Row and the second in Foundry Street; Bentley's Trade Directory of 1841 lists John Barnfield of Mart Lane as a sailcloth maker and a sail maker was said to 'live in Mart Lane' (Bradford 2000, 87), presumably identified as such from census information. The background research located a printed photograph of one Samuel Danby at work in a tarpaulin workshop, although this is described as in the 'Long Warehouse' (Bradford 2000, 33), which is on the opposite side of Mart Lane; a panoramic version of the same photograph, said to date from the 1930's, is reproduced in a volume of old Stourport photographs (Carter 2000, 17), which states that 'the unidentified worker is posing in the sail loft of the tarpaulin workshop of the Severn and Canal Carrying Company, which was over the arched passageway at the top of Severn Side', clearly there is a conflict of fact. The photograph shows the internal space of the building with a pitched king-post roof, with skylights, but no windows to the visible side elevation. The aerial photograph of Stourport (Plate 16) also shows the Sail House with skylights along the eastern slope of the pitched roof, indicating that the two photographs could possibly be of the same building, however, the replacement of the roof around the 1950's has made this evidence inconclusive.

The Sail House was owned by the Staffordshire and Worcestershire Canal Company in 1810 and leased as a warehouse to Mr Ames (Fig 3). Lewis's Worcestershire Directory lists a J.G. Ames and Company as canal carriers with routes to Chester, Derby, Gainsborough, Gloucester, Kidderminster, Lichfield, Liverpool, Newcastle-under-Lyme, Newport, the potteries, Stourbridge and Wolverhampton; Bentley's Trade Directory of 1841 lists a John Adams Ames as a carrier based at Stourport Basin. Further scrutiny of various trade directories produced no evidence for specific activity at the Sail House.

Tarpaulin and sailcloth were both made of canvas, tar or paint being added to the canvas to waterproof the fabric (tarpaulin), making it ideal for protective sheeting, frequently used by canal and railway companies to cover transported goods. Tarpaulin houses do not seem to have a standard form and a recently recorded tarpaulin house in Chester was simply a medium sized, prefabricated corrugated iron shed (Cook and Gardner 2003) whereas a recorded 19th century tarpaulin house at Castlefield, West Yorkshire was a five story structure with heavy load bearing masonry and massive bridging beams set at every 2.50 metres, later strengthened with a pair of upright columns supporting each beam (www.cube.org.uk).

The Sail House was generally devoid of architectural interest and perhaps surprisingly; the warehouse was more significant in this respect. A series of Belfast trusses carried the roof cover, supported on one side by re-used 19th century cast-iron columns, which were encased in brick. This type of ornamental column would originally have been used to support beams to span a large internal space, or often would be used along the open side of a lean-to structure or canopy, such as a railway platform, loading bay or walkway. The columns date from the mid to late-19th century and therefore, quite possibly relate to the eastern extension to the Sail House, which appears on the 1845 tithe map, suggesting that this building was originally open on the eastern side, facing towards the wharfage of the New Basin. The columns were re-used as part of the warehouse structure in the early 20th century, when they were encased in brick. Belfast trusses developed from the mid-19th century as a response to the requirement for lightweight wide-span trusses to provide cover for ever-expanding workshops and storage facilities during the Industrial Revolution and into the 20th century (Gilfillan and Gilbert 2003, 45).

The Gothic Revival floor tiles were found in association with a substantial deposit of building debris dumped into the south-western dry dock. Their exact origin is unknown although they are conjectured to have come from offices associated with warehouses alongside the basin, dating from the mid 19th century, which were demolished before 1965.

5.4 **Significance**

The structure, form and fabric of the Lichfield Basin and dry docks are of more local archaeological significance, especially given the survival of the majority of the Stourport Basins complex adjacent, which is largely contemporary and of very similar construction.

The three timber vessels recorded within the north-west dock were produced in their thousands during the 19th and early 20th century, and hence are similarly of little significance.

The recorded buildings were of little architectural significance, the Sail House having been substantially altered in the second half of the 20th century, when the original pitched roof was replaced with a flat roof, new windows and doors and internal modifications removed any trace of a discernable former use. The building does, however, form the northern end of a group of associated buildings, including former stables, piggeries and a lock keepers house, which are now listed buildings within their own right. This group represents the early pre-Lichfield Basin development of this end of Mart Lane and are an integral part of the urban character of the late 18th century inland port of Stourport.

The warehouse utilised Belfast trusses in its roof construction, which were a common form of truss used in wide-span industrial, military and commercial buildings during the earlier decades of the 20th century. These trusses are, however, thought to survive in 'thousands' across Britain (Gilfillan and Gilbert 2003, 45), suggesting they have no rarity value, but it is apparent that the trusses reside mainly in buildings of little architectural value, that offers limited scope for non-original use and are frequently not well maintained and at risk. Therefore, whilst common, the truss form may rapidly become a rarity as large, unmanageable spaces become redundant.

6. Publication summary

The Service has a professional obligation to publish the results of archaeological projects within a reasonable period of time. To this end, the Service intends to use this summary as the basis for publication through local or regional journals. The client is requested to consider the content of this section as being acceptable for such publication.

An archaeological watching brief and building recording was undertaken on behalf of Woodford Land Limited at Lichfield Basin, Severn Side, Stourport-on-Severn, Worcestershire (NGR ref SO 8110 7100; HER ref. WSM 34481).

Monitoring of the groundworks revealed the basin, dock and dry dock walls, which comprised brick courses, with occasional timber insertions, sealed by a sandstone block capping course. Little was identified by way of alteration, with the exception of blocking walls inserted into Cheapside Lock. Few fittings were observed, most notably vertical recessed slots for gates along the inlet from the Upper Basin and a crane base at the corner of the north-west dock. Three timber vessels of the type known as Joeys or Birmingham Day Boats were exposed within the north-west dock. These were the most common form of un-powered cargo boat in use along the canals of the West Midlands.

Two upstanding buildings were recorded, the Sail House in Mart Lane and an adjoining warehouse to the rear. There was no definitive evidence to indicate that the Sail House was ever used for the production of sailcloth, although the building is known locally as 'The Sail House' and there are suggestions that it was once a sailcloth and tarpaulin workshop. The building, which was described as a warehouse in 1810, dates from the late 18th century with modifications over the following century and a half. A narrow building, which was probably open to the rear, was built onto the Sail House in the mid-19th century. This was enclosed when the warehouse was constructed on the eastern side of the Sail House in the early 20th century.

7. The archive

The archive consists of:

11	Fieldwork progress records AS2
5	Photographic records AS3
669	Digital images
1	Context number catalogues AS5
10	Abbreviated context records AS40
1	Trench record sheets AS41
2	Test pit record sheets AS-
1	Scale drawings
1	Computer disk

The project archive is intended to be placed at:

Worcestershire County Museum
Hartlebury Castle
Hartlebury
Near Kidderminster
Worcestershire DY11 7XZ

Tel Hartlebury (01299) 250416

8. **Acknowledgements**

The Service would like to thank the following for their kind assistance in the successful conclusion of this project, Jefferson Mashaie, Tristram Hughes, Richard Barker and Richard Wright (Woodford Group plc), Nicky Lister and Nigel Crowe (British Waterways), Mike Turpin and Ken Catford (Boat Museum Society), Emma Righton-Corrick (Worcestershire County Council, Health and Safety Adviser), Clive Werrett (Human Resources, Worcestershire County Council), Martin Cook, Sam Danks, and Mike Glyde (Worcestershire County Council Historic Environment Planning Advisor).

9. **Personnel**

Report preparation was undertaken by Tom Vaughan and Paul Williams (Mercian Archaeology). The project manager responsible for the quality of the project was Simon Woodiwiss. Fieldwork was undertaken by Shona Robson-Glyde, Andrew Mann, Alvaro Ottoman, Tom Rogers, Tom Vaughan and Simon Woodiwiss, finds analysis by Laura Griffin and illustration by Carolyn Hunt.

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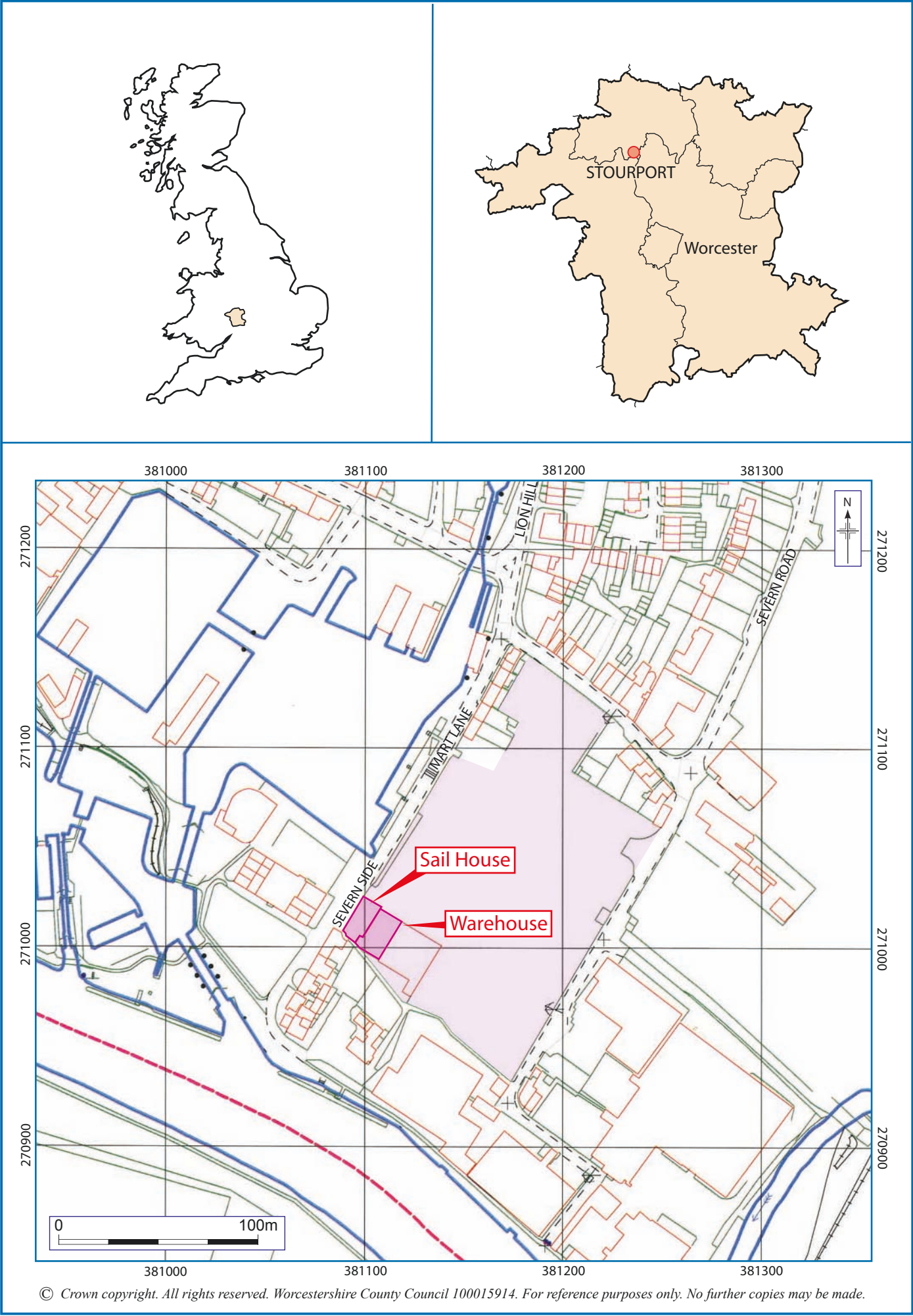
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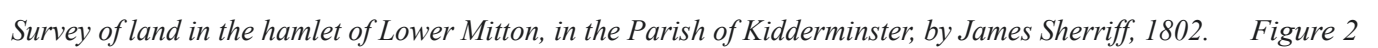
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Figures



Location of the site

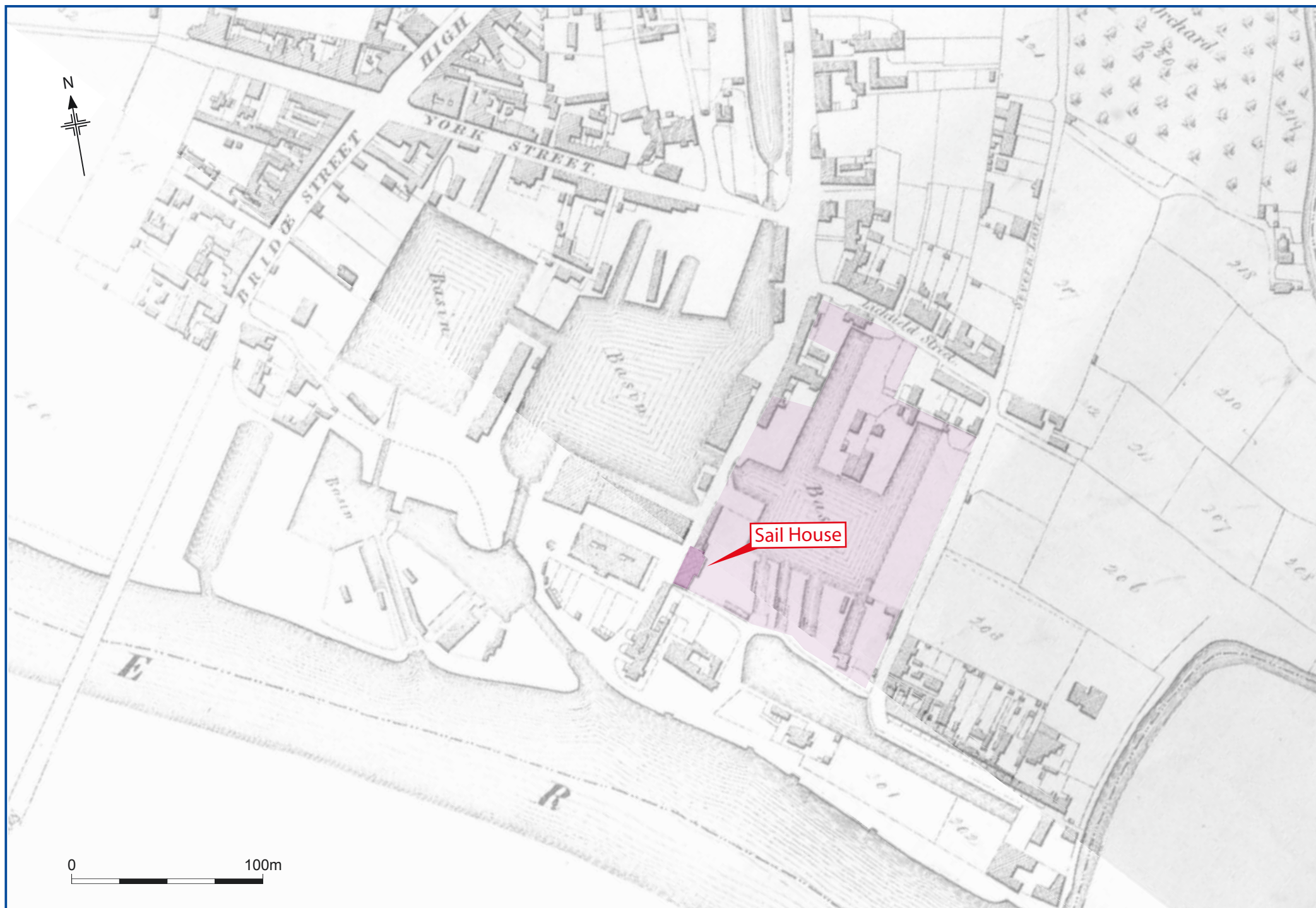
Figure 1





Extract from mid 19th century map of Stourport

Figure 5



Part of Lower Mitton tithe map (1845)

Figure 6

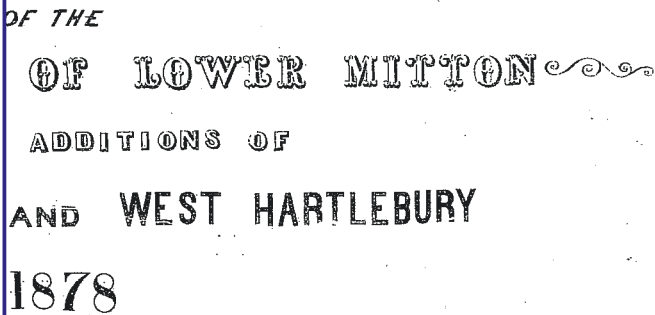
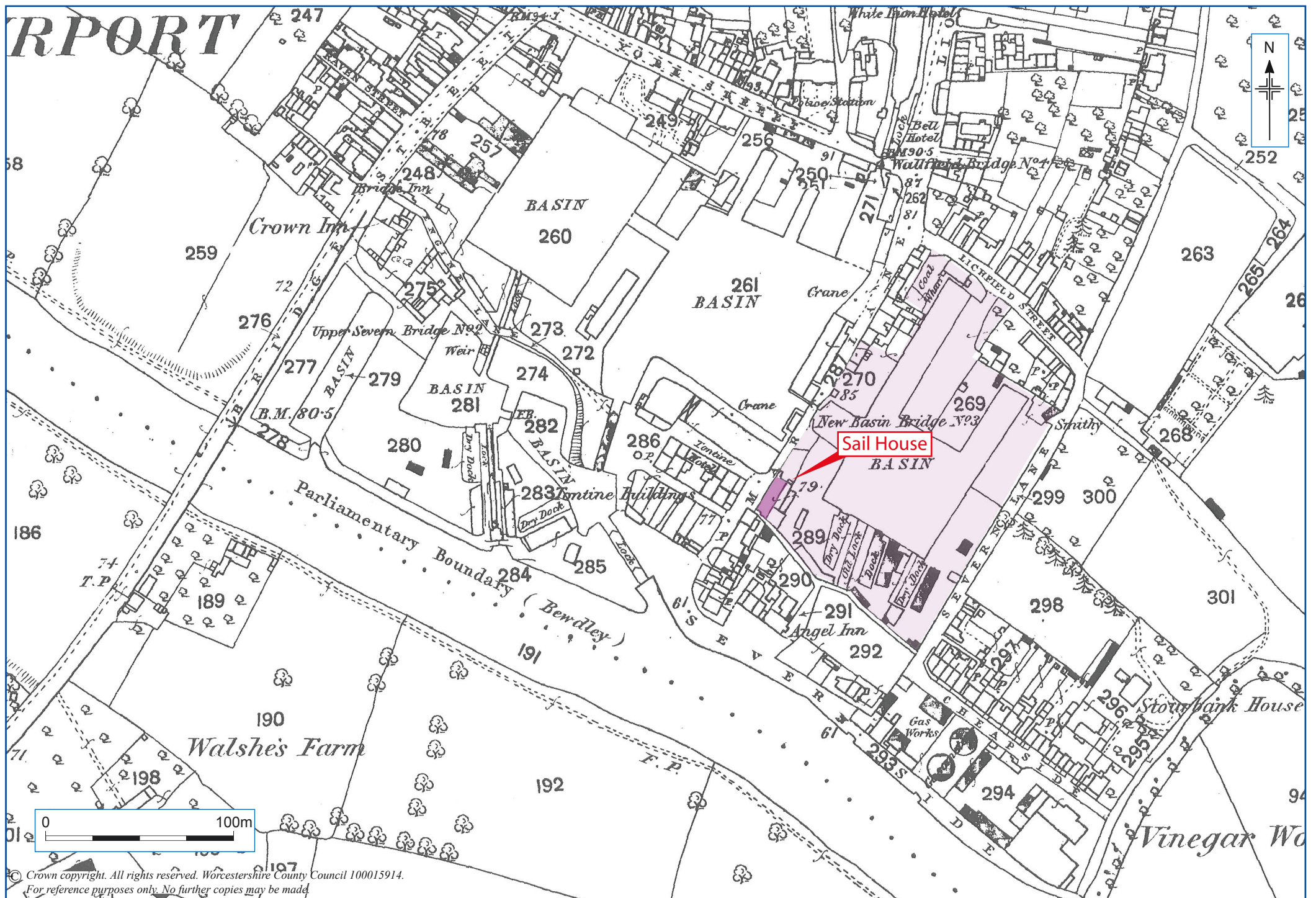
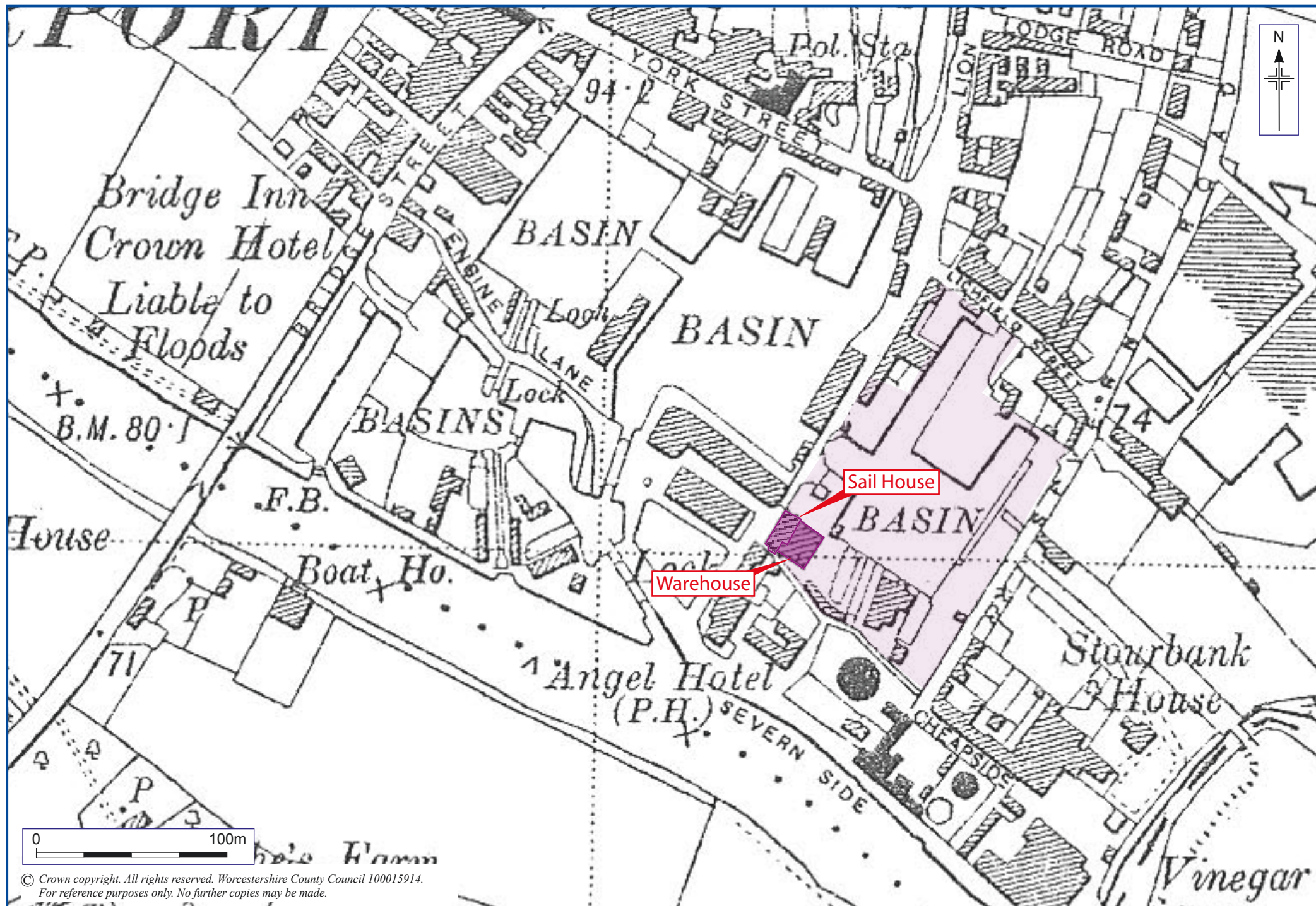


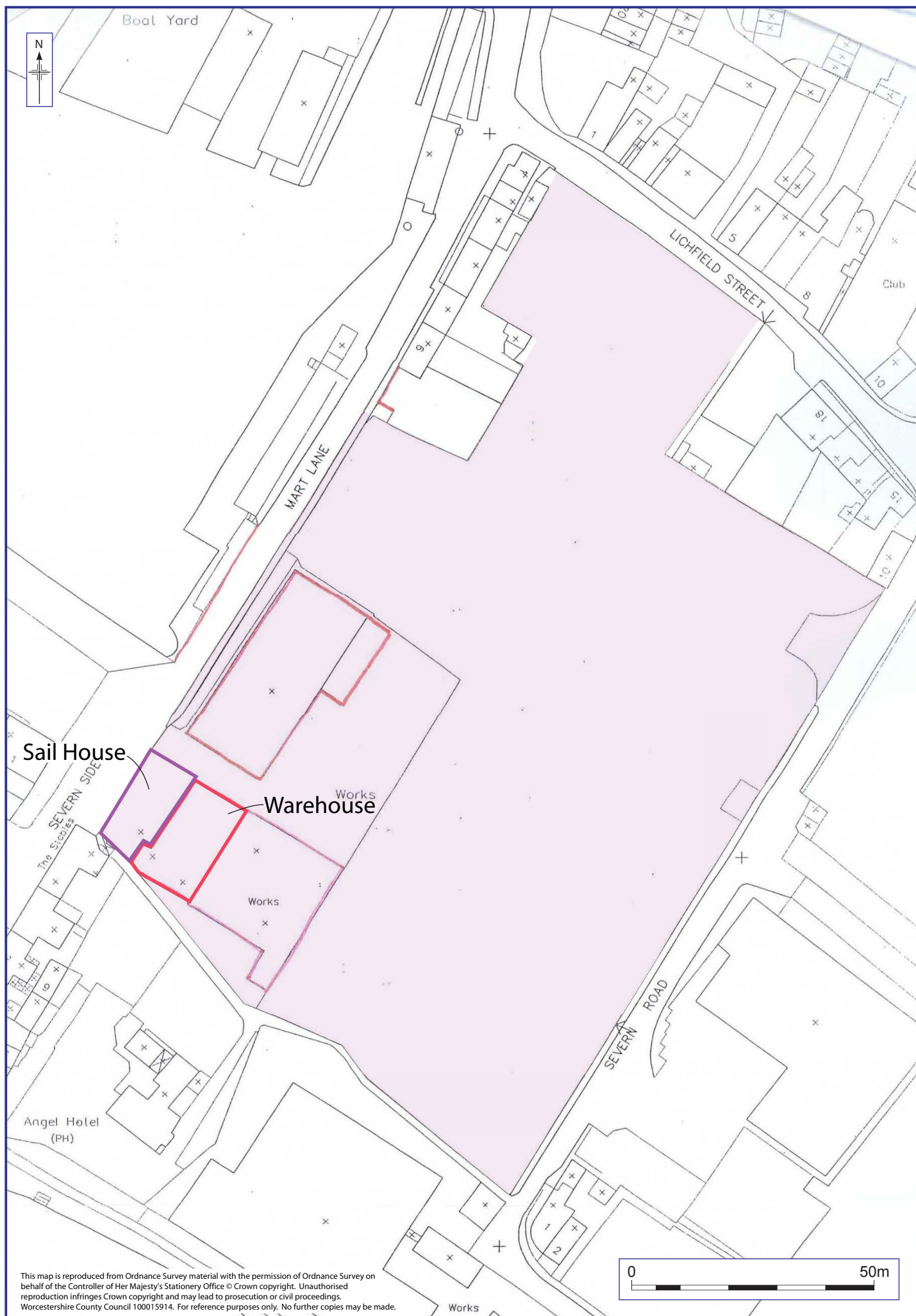
Figure 7





Plan of OS provisional edition (1947)

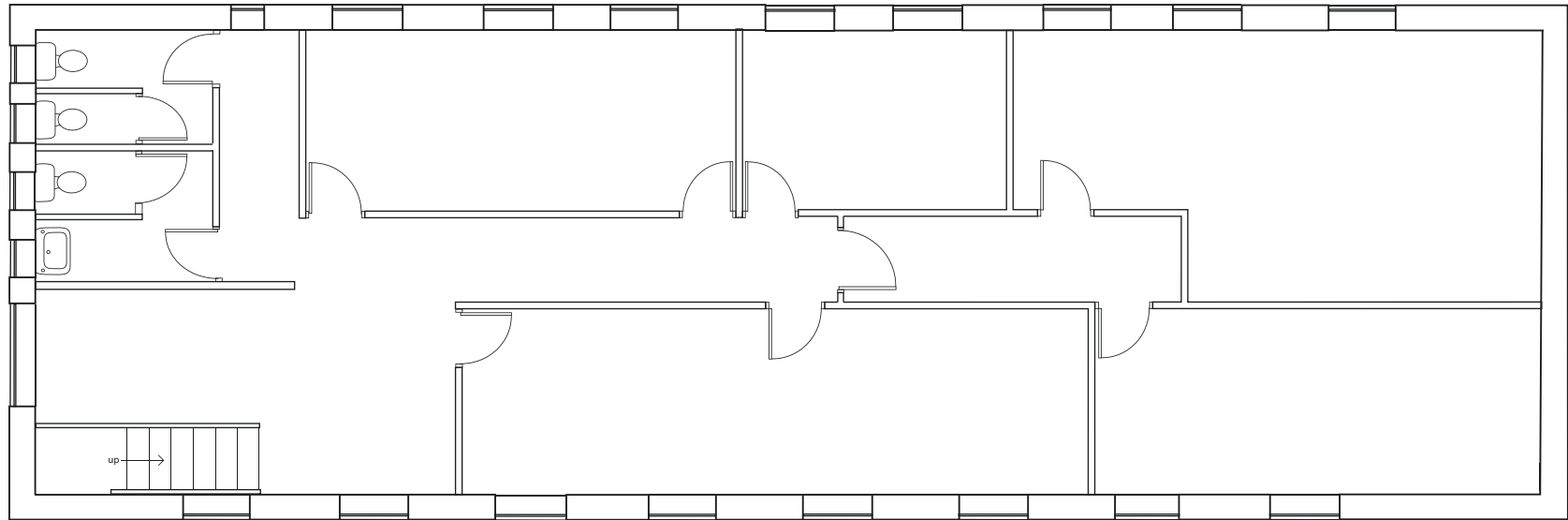
Figure 9



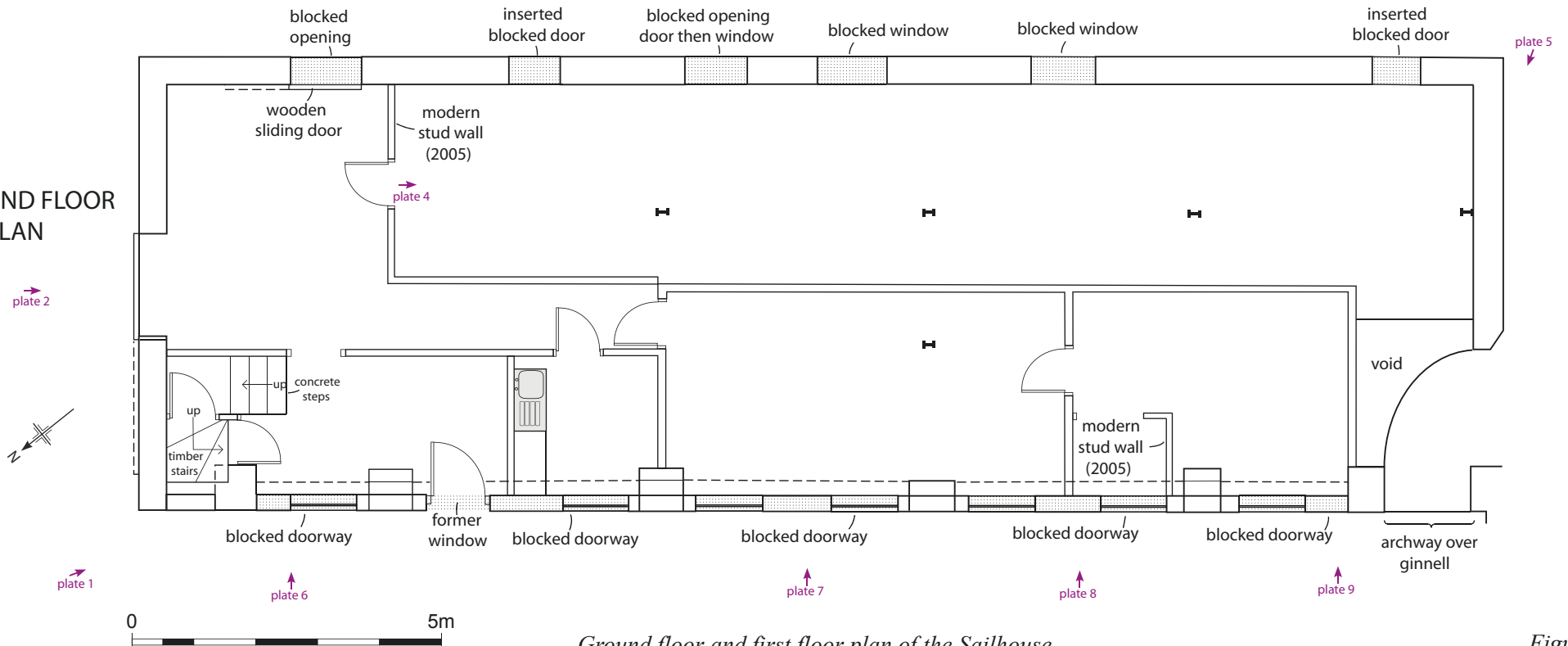
Site as existing (2005), based upon Conservation Area Location Plan dwg no. 7136.2

Figure 10

FIRST FLOOR PLAN

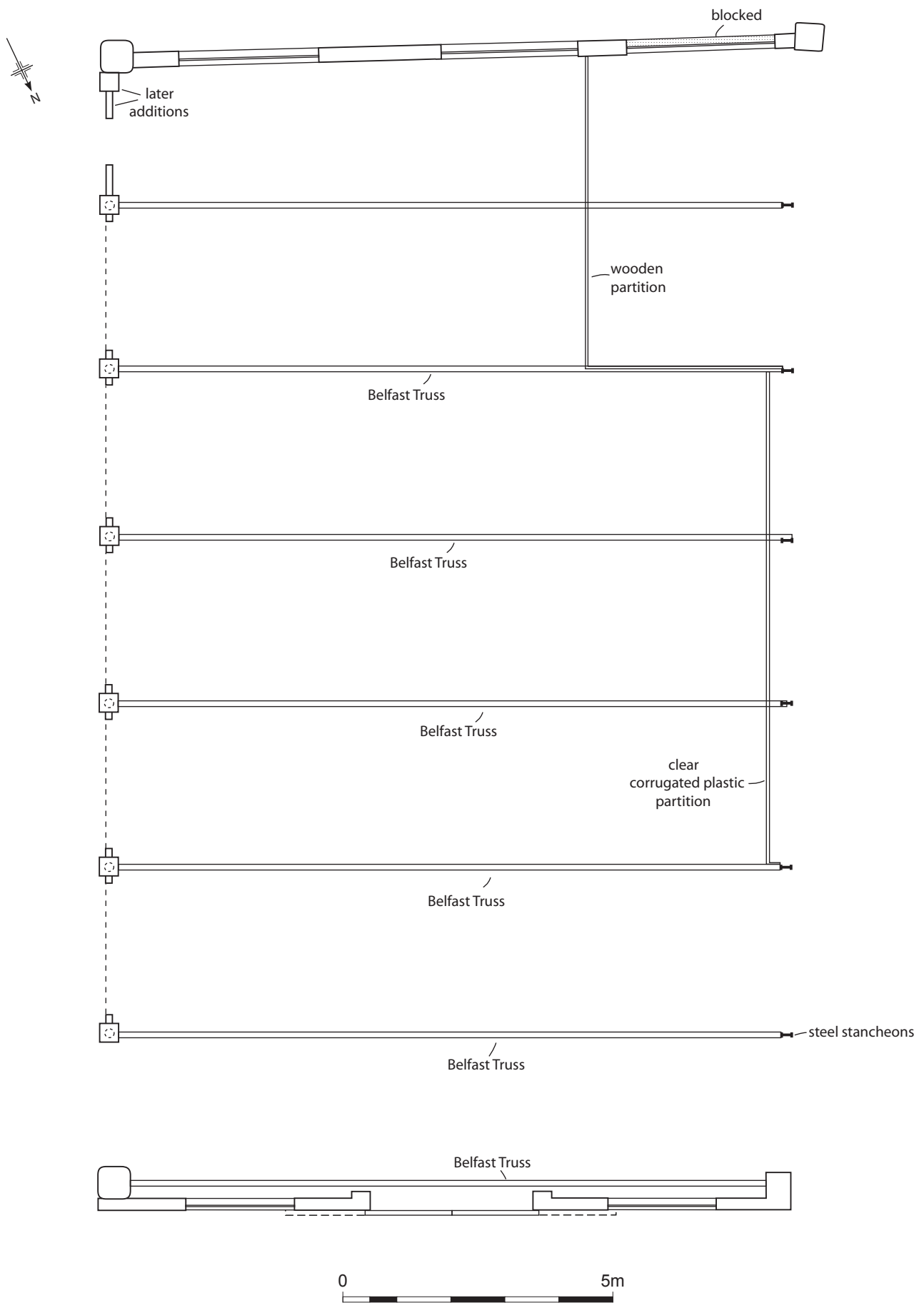


GROUND FLOOR PLAN



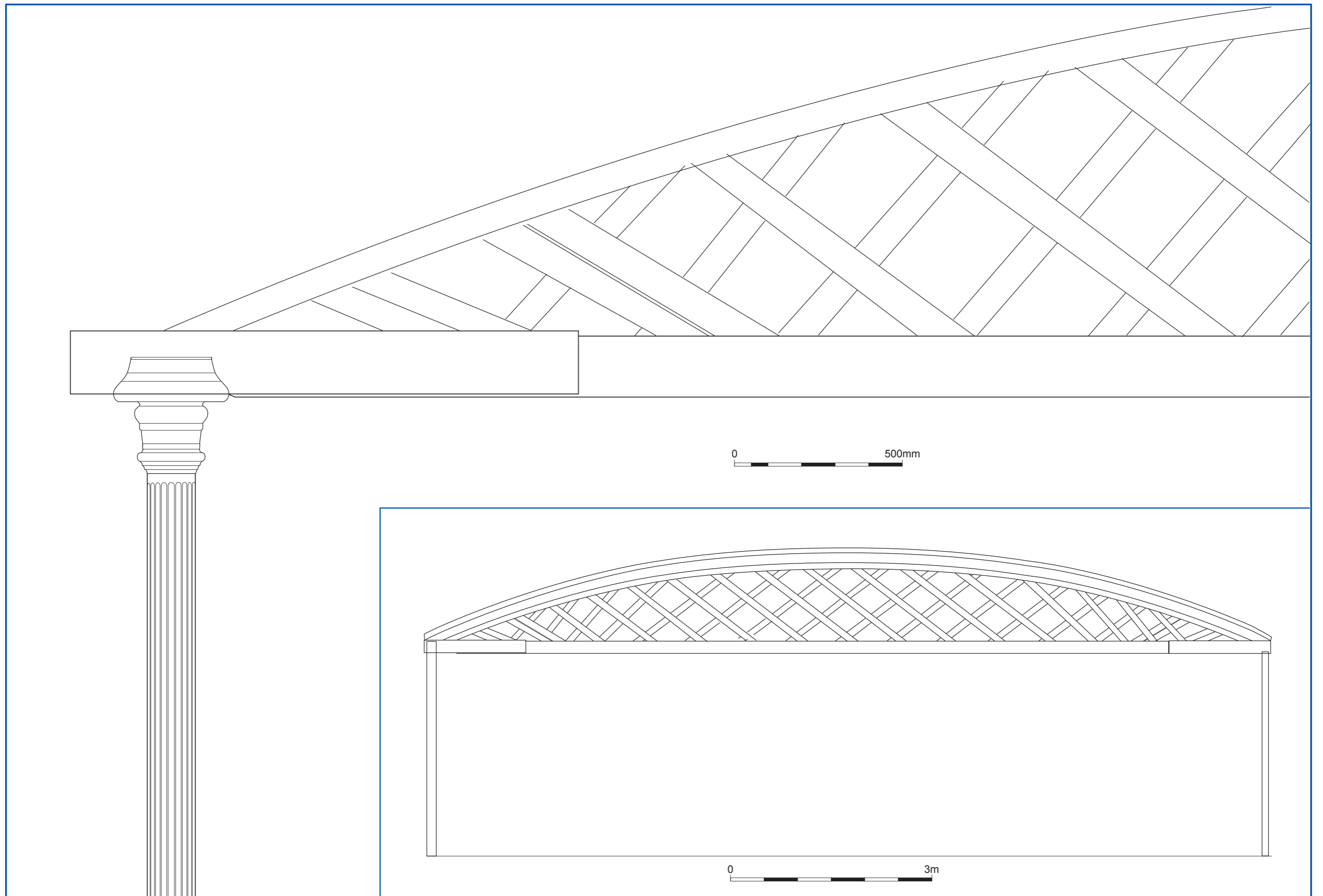
Ground floor and first floor plan of the Sailhouse

Figure 11

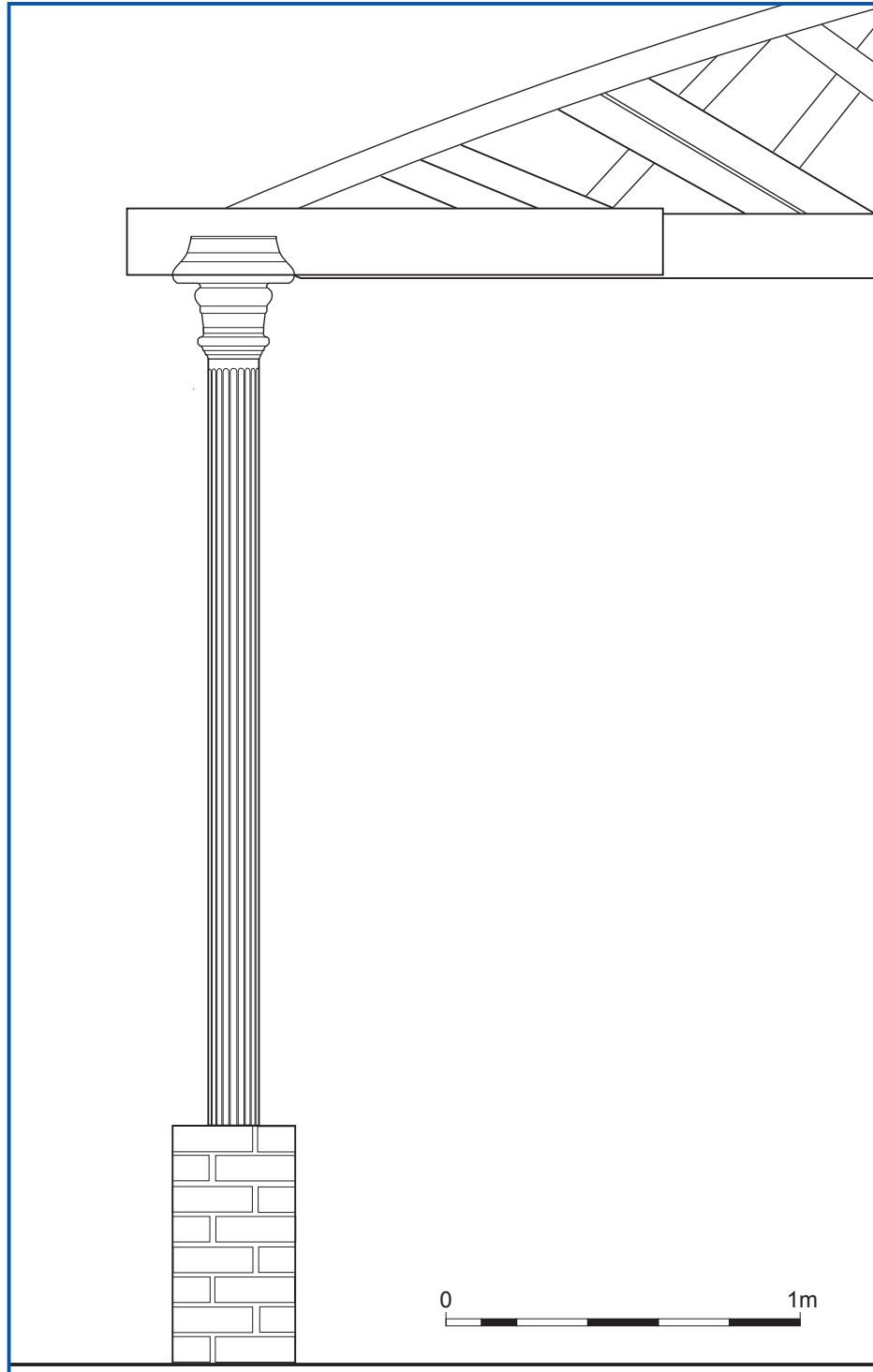


Ground floor plan of Warehouse

Figure12

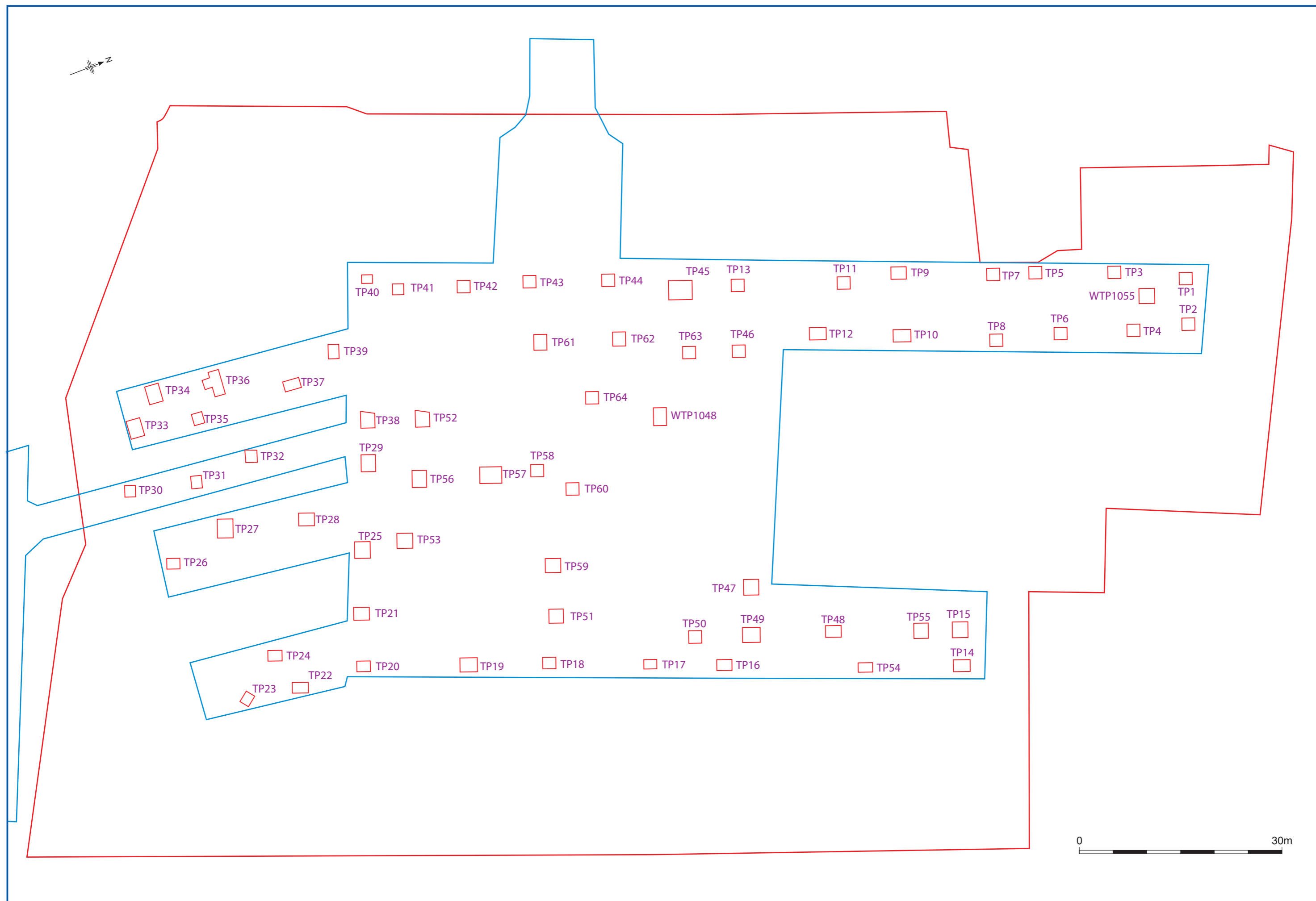


Belfast Truss



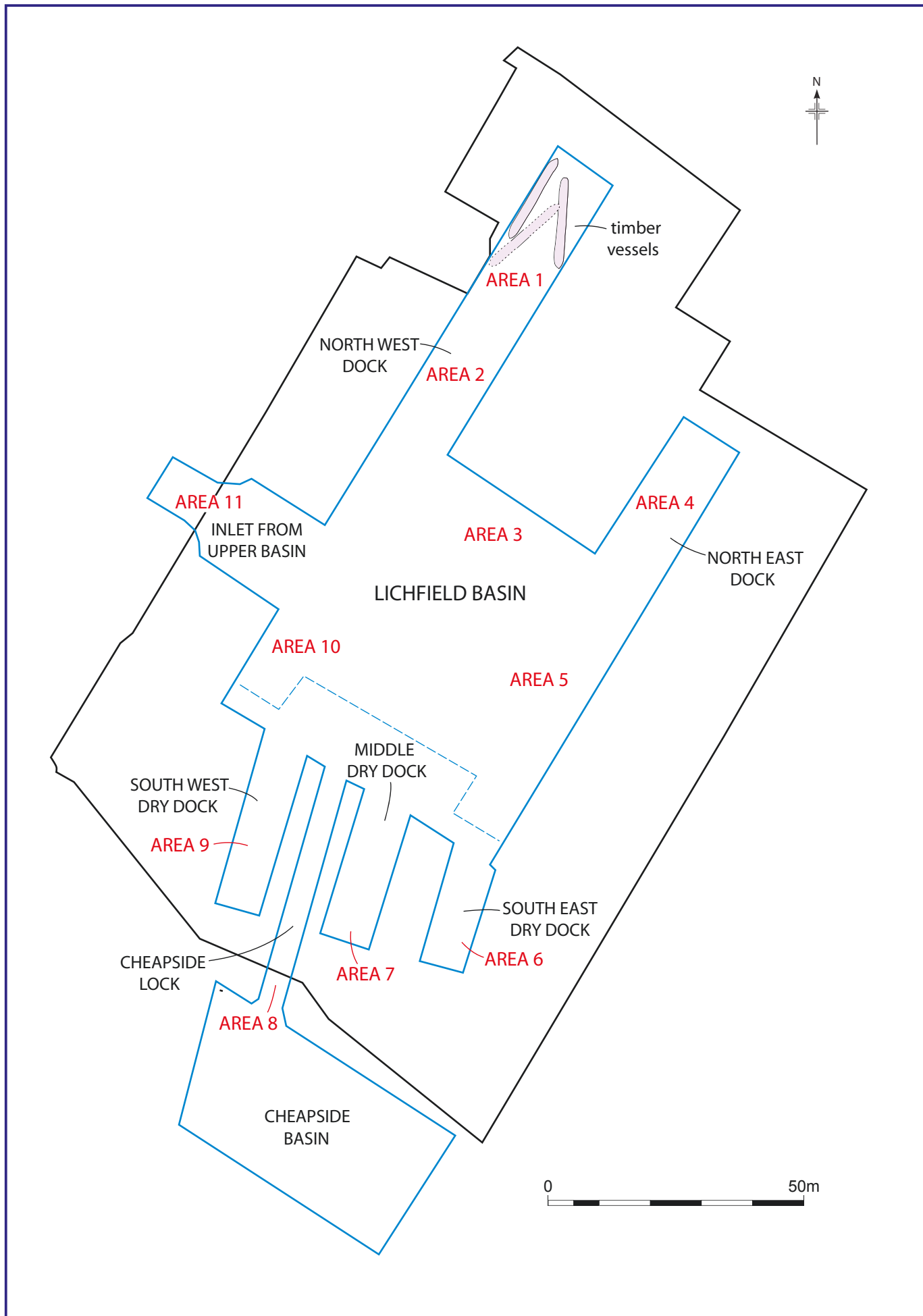
Detail of iron pillar

Figure 14



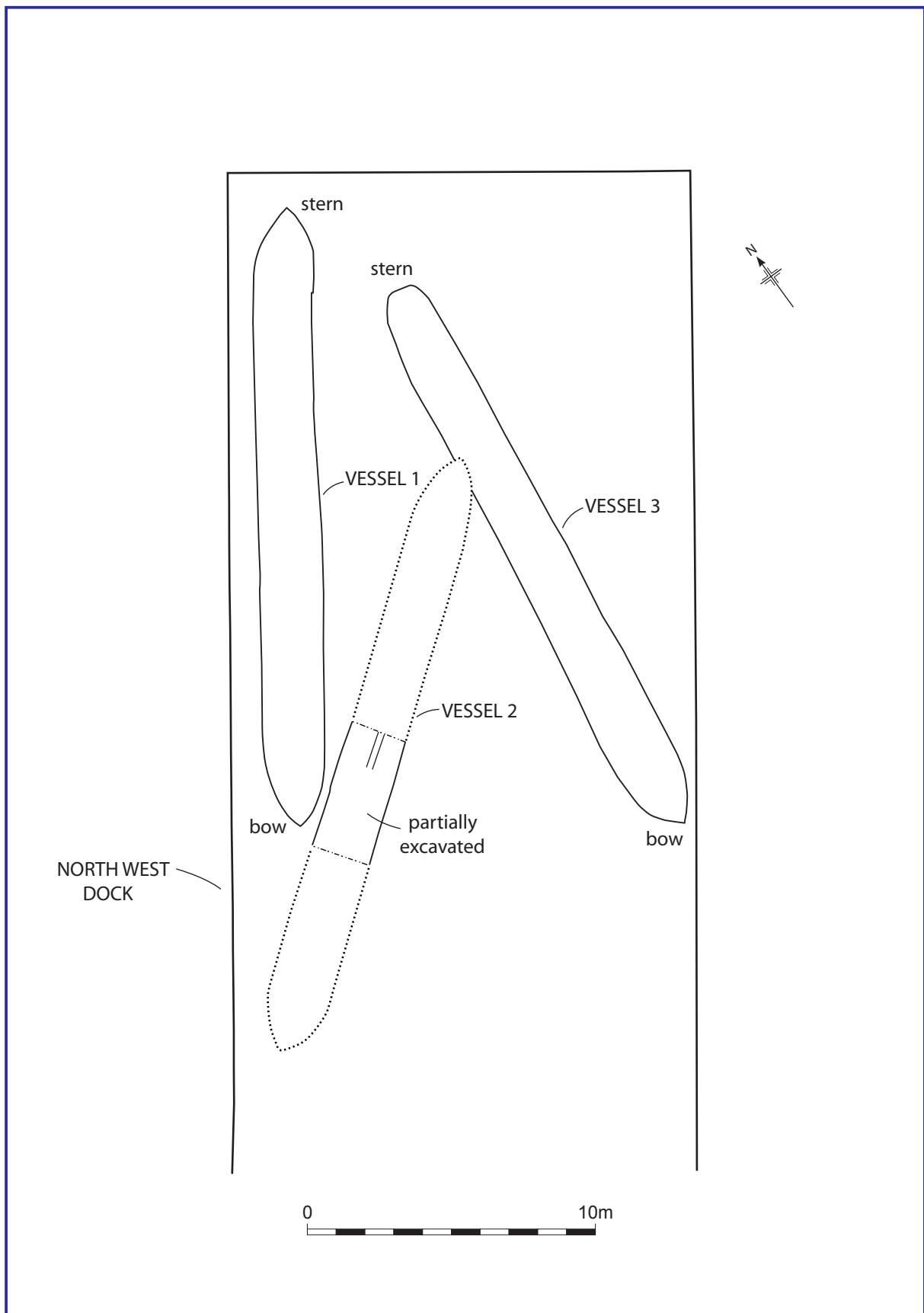
Location of test pits

Figure 15



Lichfield Basin: areas recorded

Figure 16



Area 1 timber vessels in North West Dock

Figure 17

Plates



Plate 1. Sail House, north-west elevation onto Mart Lane, view south



Plate 2. Sail House, north-east elevation, view south-south-west



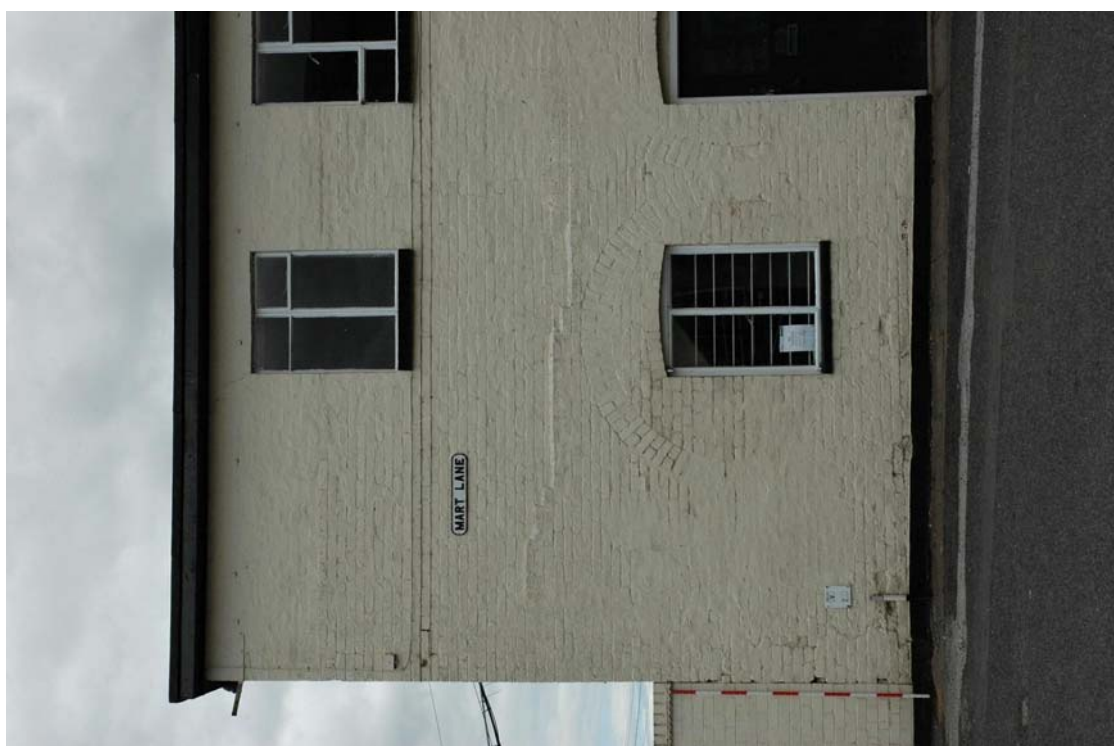
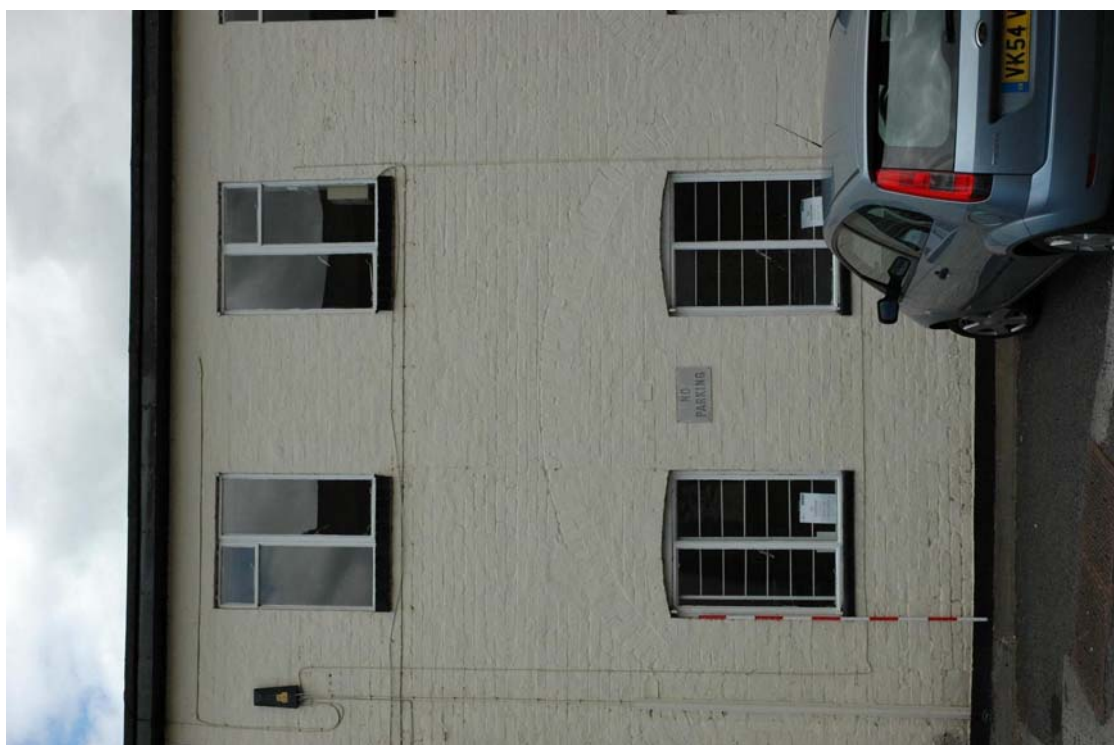
Plate 3. Warehouse, north-east elevation, view south-west



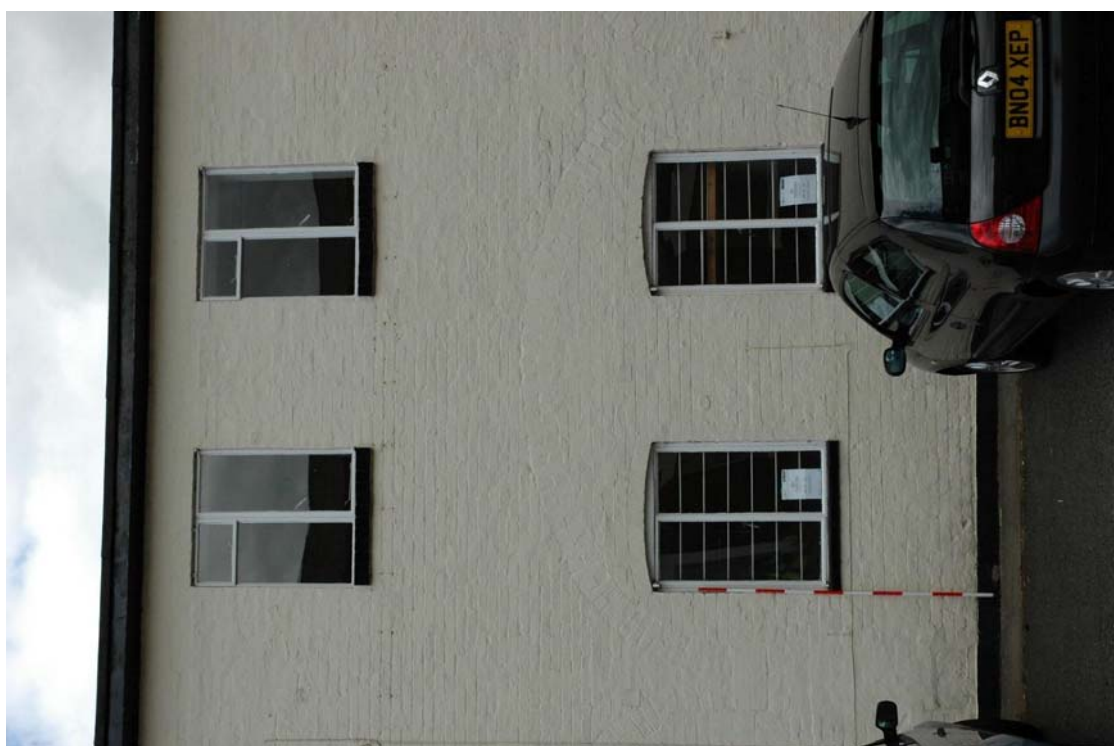
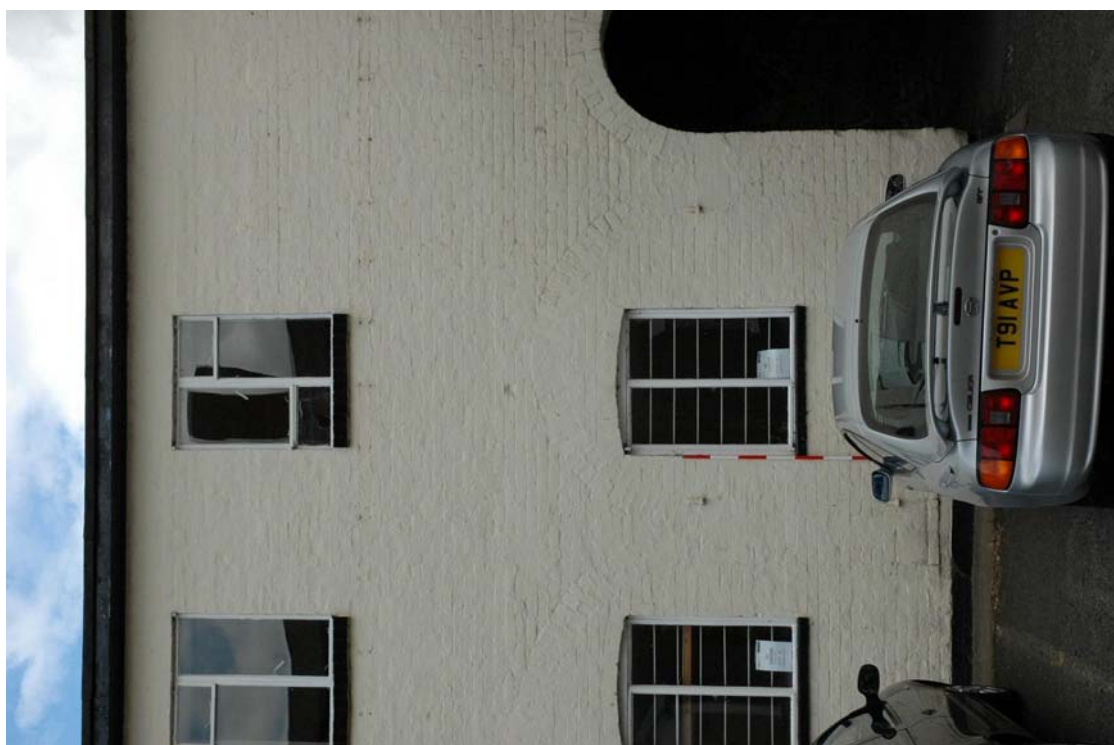
Plate 4. Internal room space, ground floor, between Sail House and warehouse



Plate 5. Ginnell between Mart Lane and Severn Lane, south of Sail House, view west



Plates 6 and 7. Sail House, north-west elevation onto Mart Lane, northern half, view south-east



Plates 8 and 9. Sail House, north-west elevation onto Mart Lane, southern half, view south-east



Plate 10. Warehouse roof, external, view north-west



Plate 11. Warehouse roof, internal with detail of Belfast truss



Plate 12. Warehouse, detail of Belfast truss



Plate 13. Warehouse, cast-iron fluted shaft column supporting Belfast truss



Plate 14. Warehouse, detail of stamped structural steel joist



Plate 15. Sail House south-east elevation after demolition of warehouse, view south-west



Plate 16. *c* 1920s aerial photo, view north (supplied by Mrs Martin).



Plate 17. Woodford Test Pit 1055, vessel timbers, view east-south-east

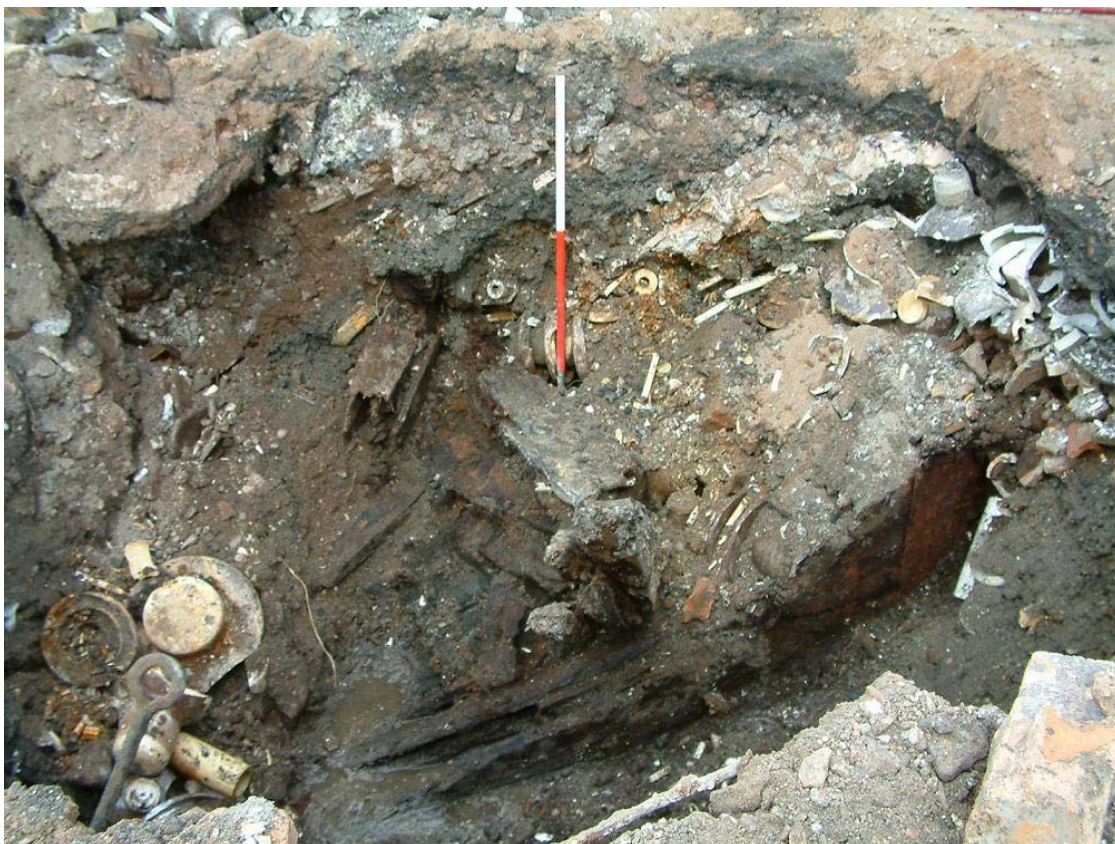


Plate 18. Woodford Test Pit 1055, vessel timbers, view north-west



Plate 19. Area 1, timber vessels, general shot, view north-east



Plate 20. Area 1, timber vessels, general shot, view north-west



Plate 21. Area 1, vessels 1 and 3, general shot, view south-west



Plate 22. Area 1, vessel 1, south end, bow detail



Plate 23. Area 1, vessel 1, south end, bow detail

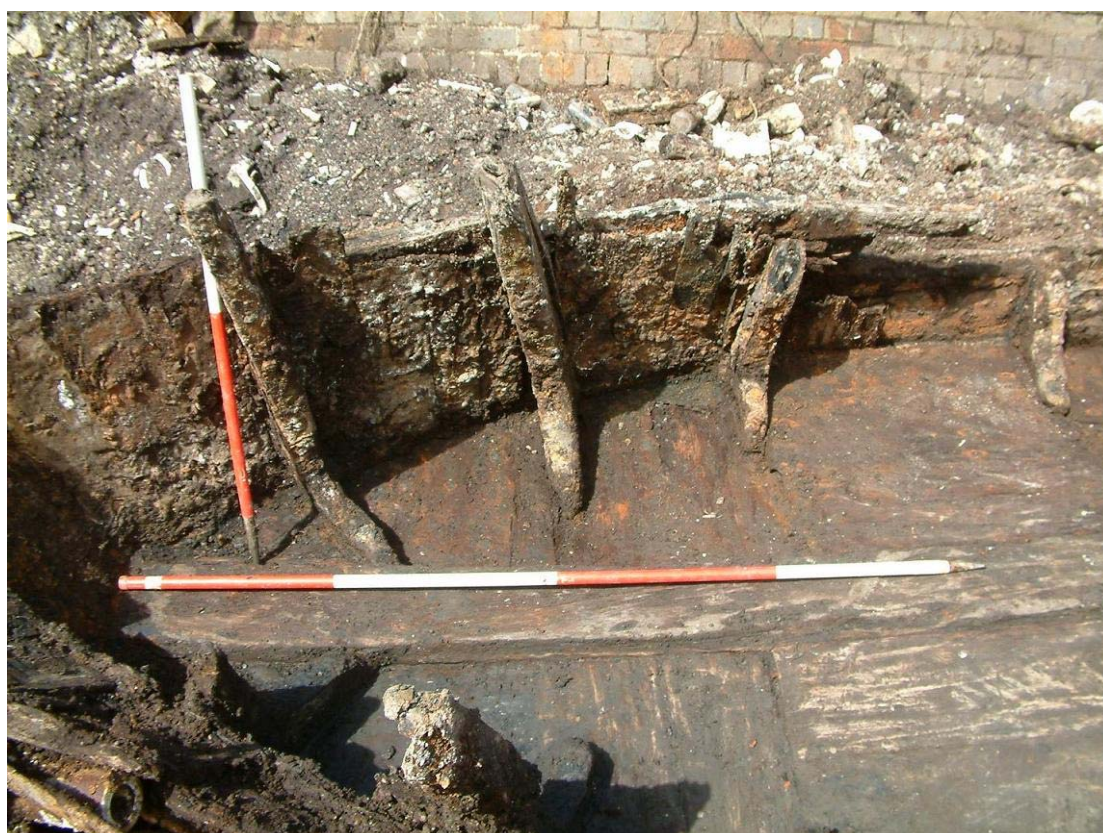


Plate 24. Area 1, vessel 1, south end, bow detail



Plate 25. Area 1, vessel 1, north end, stern detail



Plate 26. Area 1, vessel 1, west side detail



Plate 27. Area 1, vessel 2, side detail, partially excavated and flooded



Plate 28. Area 1, vessel 3, general shot from bow, view north



Plate 29. Area 1, vessel 3, south end, bow detail



Plate 30. Area 1, vessel 3, stern, north end, general shot, view south



Plate 31. Area 1 vessel 3, view south to bow

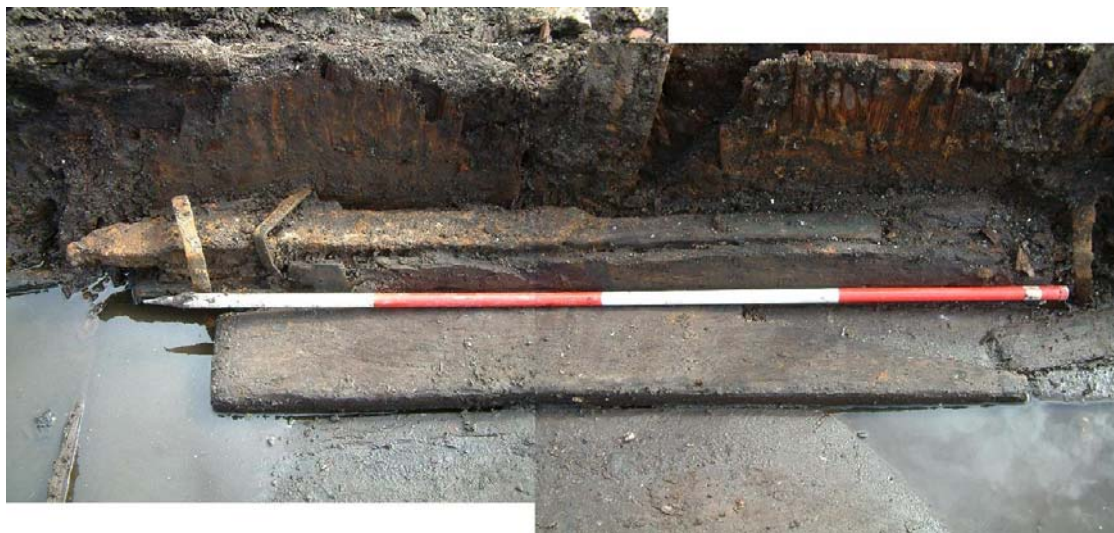


Plate 32. Area 1, vessel 3, east side detail



Plate 33. Area 1, vessel 3, west side detail



Plate 34. Area 2, crane base at north-east corner of north-west dock



Plate 35. Area 2, east wall of north-west dock partially exposed



Plate 36. Area 2, North wall of north-west dock partially exposed



Plate 37. Area 3, main basin, north wall



Plate 38. Area 4, north-east dock, north corner



Plate 39. Area 4, north-east dock, section through wall



Plate 40. Area 5, main basin, east wall



Plate 41. Area 7, middle dry dock, west wall



Plate 42. Area 8 Cheapside Lock, concrete blocking wall, view south-west



Plate 43. Area 8 Cheapside Lock inserted wall with sluices



Plate 44. Area 9, south-west dry dock, southern end, view south-south-east



Plate 45. Area 9, south-west dry dock, detail of upper south wall



Plate 46. Area 10, main basin, south-west wall



Plate 47. Area 10, main basin, vertical recessed slot in south-west wall



Plate 48. Area 11, inlet from Upper Basin, brick base and north wall, view north-east



Plate 49. Area 11, inlet from Upper Basin, abutment in south wall



Plate 50. Area 11, inlet from Upper Basin, recessed vertical slot in south wall

Appendix 1 Test Pit and Area descriptions

Woodford Test Pit 1048

Site area: north-west arm

Maximum depth: c 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
1004	Modern dump deposits	Same as 1000. Continues below depth of TP. Creosote in water to base.	0.00- c 2m +

Woodford Test Pit 1055

Site area: north-west arm

Maximum depth: 1.95m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
1000	Modern dump deposits	Distinct layers of compact greyish orange sand, black gritty cinders and occasional brick rubble and iron waste; large ceramic/porcelain electrical insulation fittings, occasional concrete and iron waste with occasional brick rubble; bands & patches of mid brown loam, mid grey clinker, cinders, iron and porcelain waste. Seals 1001 & 1002 (same as 101 in Area 1). Continues below base of TP.	0.00-1.95m +
1001	Timbers vessel?	Timbers, c 0.05m thick; generally loose, not in situ, except one vertical timber, aligned NNE/SSW, c 0.80m tall with thin wooden cladding on ESE side and iron brace plates. On west side of TP. Same as 1002 to ESE? Part of Boat 2 in Area 1?	0.82m +
1002	Timbers vessel?	Timbers, planks c 0.05m thick; in situ, vertical and horizontal, fixed with iron brace and flattish beams, aligned c NNE/SSW. On south-east side of TP. Internal width c 1.90m. Same as 1001 to WNW? Part of Boat 2 in Area 1?	0.98m +
1003	Brick wall	Blue engineering bricks, 7.5x11.5x22.5cm, in alternate header/stretcher courses, bedded in hard off-white cement mortar. Red bricks used behind façade. Below capping course of red sandstone blocks, 0.40m high, 0.60m wide and 0.73-1.51m long, with rounded upper edge. (Not observed in TP, but in clearance adjacent).	c 0.15- 0.60m +

Test Pit 1

Site area: north-west arm

Maximum depth: 1.05m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
1005	Modern dump deposits	Same as 1000. Seals 1006 below. Continues below base of TP.	0.00-1.05m +
1006	Timber vessel? –	Timber: upright plank, c 2m long, aligned north-south. Sealed by 1005 above. Part of Boat 1 in Area 1?	1.05m +

Test Pit 2

Site area: north-west arm

Maximum depth: 1.50m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
2000	Modern dump deposits	Same as 1000. Seals 2001 and 2002 below.	0.00-1.50m
2001	Timber vessel? –	Timber: large flat shaped piece, aligned north-east to south-west. No defined boat structure associated. Sealed by 2000 above.	1.50m +
2002	Silt deposits	Same as 103. Sealed by 2000 above.	1.50m +

Test Pit 3

Site area: north-west arm

Maximum depth: 0.80m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
3000	Modern dump deposit	Same 1000. Seals 3001. Continues below base of TP.	0.00-1m +
3001	Timber vessel? –	Slanting timber, aligned north-south; possible hull of Boat 1. Sealed by 3000.	1m +

Test Pit 4

Site area: north-west arm

Maximum depth: 1.80m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
4000	Modern dump deposit	Same as 1000. Seals 4001 below. Continues below base of TP.	0.00-1.80m +
4001	Timber	Single large timber, no associated boat structure. Within 4000.	1m +

Test Pit 5

Site area: north-west arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
5000	Modern dump deposits	Same as 1000. Creosote in base of TP. Single large timber – not structural. Continues below base of TP.	0.00-2m +

Test Pit 6

Site area: north-west arm

Maximum depth: 1.80m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
6000	Modern dump deposit	Same as 1000. Seals 6001 below.	0.00- c 1.80m
6001	Silt deposits	Same as 103. Sealed by 6000 above.	c 1.80m +

Test Pit 7

Site area: north-west arm

Maximum depth: 1.50m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
7000	Modern dump deposits	Same as 1000. Seals 7001 below.	0.00-1.50m
7001	Concrete	Modern steel re-enforced concrete slab.	1.50m +

Test Pit 8

Site area: north-west arm

Maximum depth: c 1.60m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
8000	Modern dump deposits	Same as 1000. Continues below base of TP.	0.00-1.60m +

Test Pit 9

Site area: north-west arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
9000	Modern dump deposits	Same as 1000. Continues below base of TP.	0.00-2m +

Test Pit 10

Site area: north-west arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
10000	Modern dump deposits	Same as 1000, including timber and burnt debris. Continues below base of TP.	0.00-2m +

Test Pit 11

Site area: north-west arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
11000	Modern dump deposits	Same as 1000, with predominantly ceramic waste. Continues below base of TP.	0.00-2m +

Test Pit 12

Site area: north-west arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
12000	Modern dump deposits	Same as 1000. Seals 12001 below.	0.00-2m
12001	Silty deposit	Same as 103, with mussel shells. Sealed by 12000 above.	2m +

Test Pit 13

Site area: north-west arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
13000	Modern dump deposits	Same as 1000. Creosote at base. Continues below base of TP.	0.00-2m +

Test Pit 14

Site area: north-east arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
14000	Modern dump deposits	Same as 1000. Creosote at base. Continues below base of TP.	0.00-2m +

Test Pit 15

Site area: north-east arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
15000	Modern dump deposit	Same as 1000. Seals 15001 below.	0.00-2m
15001	Silty deposit	Same as 103, with mussel shells. Sealed by 15000 above.	2m +

Test Pit 16

Site area: main basin - north-east corner

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface – top and bottom of deposits
16000	Modern dump deposits	Same as 1000. Seals 16001 below.	0.00-1.80m
16001	Silty deposits	Same as 103. Sealed by 16000 above.	1.80m +

Test Pit 17

Site area: main basin - east side

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
17000	Modern dump deposits	Same as 1000. Seals 17001 below.	0.00-1.80m
17001	Silty deposits	Same as 103. Sealed by 17000 above.	1.80m +
17002	Canal basin wall	Same as 1003. Within east section of TP; c 22 courses, base not observed, red machine made bricks, bedded in cement mortar; frequently laid in alternating rows of headers and stretchers; upper course or sandstone blocks not extant.	c 0.40m +

Test Pit 18

Site area: main basin - east side

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
18000	Modern dump deposits	Same as 1000, without ceramic, mainly loose grey clay. Continues below base of TP.	0.00-2m +

Test Pit 19

Site area: main basin - east side

Maximum depth: 0.90m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
19000	Modern dump deposits	Same as 1000. Seals 19001.	0.00-0.90m
19001	Concrete	Concrete surface/slab. Sealed by 19000.	0.90m +

Test Pit 20

Site area: main basin - south-east corner

Maximum depth: 1m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
20000	Modern dump deposits	Same as 1000. Seals 20001.	0.00-1m
20001	Concrete	Concrete surface/slab. Sealed by 20000.	1m +

Test Pit 21

Site area: main basin - south side

Maximum depth: 1.50m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
21000	Modern dump deposits	Same as 1000, with frequent red bricks. Seals 21001.	0.00-1.50m
21001	Silty deposits	Same as 103. Sealed by 21000.	1.50m +

Test Pit 22

Site area: south-east arm

Maximum depth: 1m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
22000	Modern dump deposits	Same as 1000. Seals 22001.	0.00-1m
22001	Sand	Compacted sand surface. Sealed by 22000.	1m +

Test Pit 23

Site area: south-east arm

Maximum depth: 1.80m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
23000	Modern dump deposits	Same as 1000. Seals 23001.	0.00-1.80m
23001	Sand	Compacted sand surface. Sealed by 23000.	1.80m +

Test Pit 24

Site area: south-east arm

Maximum depth: 0.10m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
24000	Modern dump deposits	Same as 1000.	0.00-0.10m
24001	Brick structure	Red bricks bedded in creamy/off white mortar. Canal basin wall or other structure?	0.10m +

Test Pit 25

Site area: main basin - south side

Maximum depth: 1.90m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
25000	Modern dump deposits	Same as 1000. Seals 25001.	0.00-1.90m
25001	Silty deposits	Same as 103. Sealed by 25000.	1.90m +

Test Pit 26

Site area: middle south arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
26000	Modern dump deposits	Same as 1000, with extensive red bricks. Continues below base of TP.	0.00-2m +

Test Pit 27

Site area: middle south arm

Maximum depth: 1.80m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
27000	Modern dump deposits	Same as 1000. Seals 27001.	0.00-1.80m
27001	Concrete	Concrete surface/slab. Sealed by 27000.	1.80m +

Test Pit 28

Site area: middle south arm

Maximum depth: 0.50m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
28000	Modern dump deposits	Same as 1000. Seals 28001.	0.00-0.50m
28001	Concrete	Concrete surface/slab. Sealed by 28000.	0.50m +

Test Pit 29

Site area: main basin - south side

Maximum depth: 1.80m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
29000	Modern dump deposits	Same as 1000. Seals 29001.	0.00-1.80m
29001	Silty deposit	Same as 103. Sealed by 29000.	1.80m +

Test Pit 30

Site area: south culvert/sluiice

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
30000	Modern dump deposits	Same as 1000, with layer of red bricks at c 0.75-1m. No ceramics. Continues below base of TP.	0.00-2m +

Test Pit 31

Site area: south culvert/sluiice

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
31000	Modern dump deposits	Same as 1000, with dense layer of bricks at c 0.75-1m. No ceramics. Continues below base of TP.	0.00-2m +

Test Pit 32

Site area: south culvert/sluiice

Maximum depth: unrecorded

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
32000	Modern dump deposits	Same as 1000. Dense layer of mortar at c 1.30-1.50m. Continues below base of TP.	0.00- c 2m +

Test Pit 33

Site area: south-west arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
33000	Modern dump deposits	Same as 1000, with extensive red bricks. Continues below base of TP.	0.00-2m +
33001	Canal sluice /culvert wall	Same as 1003. South wall of sluice / culvert. No extant sandstone capping blocks. Base not observed.	0.20m +

Test Pit 34

Site area: south-west arm

Maximum depth: 1.90m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
34000	Modern dump deposits	Same as 1000, with extensive red bricks. Seals 34001 below.	0.00-1.90m
34001	Surface	Compacted surface of unknown material. Sealed by 24000	1.90m +

Test Pit 35

Site area: south-west arm

Maximum depth: 0.20m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
35000	Modern dump deposits	Same as 1000. Seals 35001.	0.00-0.20m
35001	Concrete	Concrete surface/slab. Sealed by 35000.	0.20m +

Test Pit 36

Site area: south-west arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
36000	Modern dump deposits	Same as 1000. Continues below base of TP.	0.00-2m +
36001	Timber	Large timber; no associated structure. Within 36000.	c 1.80m +

Test Pit 37

Site area: south-west arm

Maximum depth: 1.80m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
37000	Modern dump deposits	Same as 1000. Seals 37001.	0.00-1.80m
37001	Concrete	Concrete surface/slab. Sealed by 37000.	1.80m +

Test Pit 38

Site area: main basin - south side

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
38000	Modern dump deposits	Same as 1000. Water at base. Continues below base of TP.	0.00-2m +

Test Pit 39

Site area: main basin - south side

Maximum depth: 0.75m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
39000	Modern dump deposits	Same as 1000. Seals 39001.	0.00-0.75m
39001	Concrete	Concrete surface/slab. Sealed by 39000.	0.75m +

Test Pit 40

Site area: main basin - south-west corner

Maximum depth: 1m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
40000	Modern dump deposits	Same as 1000. Seals 40001.	0.00-1m
40001	Concrete	Concrete surface/slab. Sealed by 40000.	1m +

Test Pit 41

Site area: main basin - south-west corner

Maximum depth: c 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
41000	Modern dump deposits	Same as 1000, with extensive reinforced concrete. Continues below base of TP.	0.00- c 2m

Test Pit 42

Site area: main basin - west side

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
42000	Modern dump deposits	Same as 1000, predominantly sand with frequent red bricks. Continues below base of TP.	0.00-2m +

Test Pit 43

Site area: main basin - west side

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
43000	Modern dump deposits	Same as 1000, predominantly clean sand without inclusions. Seals 43001 below.	0.00-2m
43001	Silty deposit	Same as 103. Sealed by 43000 above.	2m +

Test Pit 44

Site area: main basin - west side

Maximum depth: 0.20m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
44000	Modern dump deposits	Same as 1000. Seals 44001 below.	0.00-0.20m
44001	Structure	Brick foundation on concrete base of unknown function. Sealed by 44000.	0.20m +

Test Pit 45

Site area: main basin - north-west corner

Maximum depth: 0.20m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
45000	Modern dump deposits	Same as 1000. Seals 45001 below.	0.00-0.20m
45001	Concrete	Concrete pad. Sealed by 45000 above.	0.20m +

Test Pit 46

Site area: north-west arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
46000	Modern dump deposits	Same as 1000, with large sawn logs toward base. Seals 46001 below. Continues below base of TP.	0.00-2m +
46001	Canal arm wall	Same as 1003. Canal arm wall in east section. Indeterminate number of courses of red brick below red sandstone capping course. Base not observed. Sealed by 46000 above.	c 0.15-2m +

Test Pit 47

Site area: main basin - north side

Maximum depth: 1.75m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
47000	Modern dump deposits	Same as 1000. Seals 47001 and 47002 below.	0.00-0.75m
47001	Silty deposit	Same as 103. Sealed by 47000 above.	0.75-1.75m +
47002	Canal basin wall	Same as 1003. Canal basin wall in north section. Indeterminate number of courses or red bricks. No sandstone course observed, nor the full depth. Sealed by 47000 above.	unknown

Test Pit 48

Site area: north-east arm

Maximum depth: 1.75m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
48000	Modern dump deposits	Same as 1000, with extensive ceramic debris. Seals 48001 below.	0.00-1.75m
48001	Silty deposit	Same as 103. Sealed by 48000 above.	1.75m +

Test Pit 49

Site area: north-east arm

Maximum depth: 2.20m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
49000	Modern dump deposits	Same as 1000. Seals 49001 below.	0.00-2.20m
49001	Silty deposit	Same as 103. Sealed by 49000 above.	2.20m +

Test Pit 50

Site area: main basin - north-east corner

Maximum depth: 2.10m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
50000	Modern dump deposits	Same as 1000, with extensive ceramic debris. Continues below base of TP.	0.00-2.10m

Test Pit 51

Site area: main basin - east side

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
51000	Modern dump deposits	Same as 1000. Continues below base of TP.	0.00-2m +

Test Pit 52

Site area: main basin - south/middle

Maximum depth: 1.90m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
52000	Modern dump deposits	Same as 1000, with extensive loose red bricks. Water at base. Continues below base of TP.	0.00-1.90m +

Test Pit 53

Site area: main basin - south/middle

Maximum depth: 2.10m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
53000	Modern dump deposits	Same as 1000. Seals 53001 below.	0.00- c 2.m
53001	Silty deposit	Same as 103. Sealed by 53000 above.	c 2m +

Test Pit 54

Site area: north-east arm

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
54000	Modern dump deposits	Same as 1000, with extensive ceramic debris. Continues below base of TP.	0.00-2m +

Test Pit 55

Site area: north-east arm

Maximum depth: c 1.70m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
55000	Modern dump deposits	Same as 1000. Seals 55001 below.	0.00- c 1.70m
55001	Silty deposit	Same as 103. Sealed by 55000 above.	c 1.70m +

Test Pit 56

Site area: main basin - south/middle

Maximum depth: 0.20m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
56000	Modern dump deposits	Same as 1000, with north-south aligned plastic pipe at base of TP. Deposit continues below base of TP.	0.00-0.20m

Test Pit 57

Site area: main basin - middle

Maximum depth: 1.50m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
57000	Modern dump deposits	Same as 1000, with extensive ceramic debris. Water at base. Continues below base of TP.	0.00-1.50m +

Test Pit 58

Site area: main basin - middle

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
58000	Modern dump deposits	Same as 1000, with extensive large ceramic debris. Water at base. Continues below base of TP.	0.00-2m +

Test Pit 59

Site area: main basin - middle

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
59000	Modern dump deposits	Same as 1000, with extensive large ceramic debris. Water at base. Continues below base of TP.	0.00-2m +

Test Pit 60

Site area: main basin - middle

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
60000	Modern dump deposits	Same as 1000, with extensive sand and occasional ceramic debris. Water at base. Continues below base of TP.	0.00-2m +

Test Pit 61

Site area: main basin – west/middle

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
61000	Modern dump deposits	Same as 1000, with extensive sand and occasional ceramic debris. Water at base. Continues below base of TP.	0.00-2m +

Test Pit 62

Site area: main basin - west/middle

Maximum depth: 0.20m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
62000	Modern dump deposits	Same as 1000. Seals 62001 below.	0.00-0.20m
62001	Concrete	Concrete pad. Sealed by 62000 above.	0.20m +

Test Pit 63

Site area: main basin - north side

Maximum depth: 0.20m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
63000	Modern dump deposits	Same as 1000. Seals 63001 below.	0.00-0.20m
63001	Concrete	Concrete pad. Sealed by 63000 above.	0.20m +

Test Pit 64

Site area: main basin - middle

Maximum depth: 2m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
64000	Modern dump deposits	Same as 1000, with extensive sand. Seals 64001 below.	0.00-2m
64001	Silty deposit	Same as 103. Sealed by 64000 above.	2m +

Area 1 – north-west dock

Site area: north-west arm

Maximum depth: c 2.20m

Main deposit description

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
101	Brick wall	Same as 1003. Courses of red and blue engineering bricks, bedded in hard off-white mortar below capping course of long red sandstone blocks.	0.00-1.95m +
102	Modern dump deposits	Same as 1000. Seals 104-106.	0.00-1.95m +
103	Silt deposits	Dark brown/black organic rich silts, frequent wood - boat fragments? and frequent large logs. Below 102.	1.95m +
104	Timber vessel - Boat 1	Aligned north-south along west side of canal arm, 21.5m long, 1.95 wide; wood construction with thin iron plate along top plank, 8cm wide, 0.5cm thick; possible iron sheets over entire external hull? main planks 5.5cm wide; vertical planks on internal hull, 15cm wide, 1.5cm thick; dung & tar sealant; wooden ribs spaced at 70-80cm; planks in base aligned along vessel length, approx 16m wide; perpendicular planks located below, 15-16cm wide; keelson beam along centre of vessel; bow contains larger boards, not planks.	-
105	Timber vessel - Boat 2	Aligned south-west to north-east; similar to Boat 3, but only 1 keelson beam and no double planking to outer hull; planks 4.5cm; metal ribs spaced at 88-89cm. Not fully excavated. Same as WTP 1001 & 1002?	-
106	Timber vessel - Boat 3	Aligned north-west (stern) to south-east (bow), 21.5m long, 1.95 wide; hard wood hull with iron ribs, 1cm thick, spaced at 89cm, fixed with iron bolts; planks 5cm thick, 24cm wide, sealed with hair, dung and tar lining; external double planking - repair? Planks 4cm thick, 23cm wide, possibly of softer wood? No evidence of sealant; cabin to north end: vertical plank 3.10m from stern and planks across vessel base, 58cm wide; 3 keelsons along vessel length; internal hull has vertical planks, 15cm wide, 1.5cm thick;	-

Area 2 – north west dock - walls

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
200	Modern dump deposits	Same as 1000.	0.00-1.40m +
201	Brick wall	Same as 1003. Courses of red bricks with occasional blue engineering bricks and sandstone blocks. Capped by red sandstone quoins. Upper seven courses blue engineering bricks. Generally comprise alternating courses of headers and stretchers. Occasional headers laid on edge. Base not observed. 4 bricks wide. Cast iron crane base bolted onto sandstone quay stones at north-east corner of dock.	1.40m +

Area 3 – canal basin – north wall

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
300	Modern dump deposits	Same as 1000, with extensive ceramic debris.	0.00- c 2.15m
301	Brick wall	Same as 1003. 26 courses, 4 lowest courses slightly stepped out, 4 uppermost are larger, slimmer engineering bricks, below red sandstone capping course of quay stones. Occasional sandstone blocks in lower wall. Generally 4 bricks wide.	0.00-2.15m
302	Natural	Orange sand and pebble gravel, sealed by 1000.	c 0.70m +

Area 4 – north-east dock

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
400	Modern dump deposits	Same as 1000.	0.00-2.45m
401	Brick wall	Same as 1003. Approximately 25 red brick courses, below red sandstone capping course, bedded on 402 below. 5 bricks wide. Generally alternating courses of headers and stretchers. Timber beam set into wall 4 courses below brick wall top (3 courses high). Occasional course of headers set on edge in upper 4 courses. Arm is 15m wide max.	0.00-2.45m
402	Natural	Fawn grey clay. Compact and cohesive.	2.45m +

Area 5 – canal basin – east wall

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
500	Modern dump deposits	Same as 1000, with extensive ceramic debris.	0.00- c 3.00m
501	Brick wall	Same as 1003. Approximately 30 courses of red bricks, lowest courses stepped out. Sandstone quoins not extant. Generally alternating courses of headers and stretchers. 4 bricks wide.	c 0.30-3.20m

Area 6 – south-east dry dock

Not observed – see Miller 2000.

Area 7 – middle south dry dock

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
700	Modern dump deposits	Same as 1000, with extensive brick debris.	0.00-2.24m
701	Brick wall	Same as 1003. No extant sandstone capping course. 20 courses of alternating headers and stretchers. Lowest three+ courses stepped out to 1 brick width. Base not observed. Bricks 22-23x10.5-11x7.5 cm. Generally 7 bricks wide, uppermost extant 6 courses are 4 brick wide, courses 7-10 are 5 bricks wide.	0.28-2.24m +

Area 8 – south lock to Cheapside Basin

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
800	Modern dump deposits	Same as 1000, dark greyish brown clayey silt over extensive building debris. Later manhole built toward basin end.	0.00-4.30m
801	Brick wall	Same as 1003. Capping course of sandstone blocks, over 47 courses of red bricks laid in alternating courses of headers and stretchers. No stepped foundation as elsewhere. Greyish yellow sandstone blocks down wall at probable location of lock itself.	0.20-4.30m
802	Concrete wall	Wall inserted within former lock to block and seal. Butts lock wall either side. Reinforced concrete to north face, two separate brick skins to south face (not keyed in) – rear skin bricks laid on edge.	0.20-4.30m
803	Wall and sluice	Brick wall to south end of lock, of same construction as 801, with two channels and sluice gates, below brick arch, appears to be contemporary with main lock walls but must be a later insertion? Sluices blocked with steel reinforced concrete.	0.15-3.50m +

Area 9 – south-west dry dock

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
900	Modern dump deposits	Same as 1000, with extensive building debris.	0.00-2.30m
901	Brick wall	Same as 1003. Capping course of blue chamfered pavers occasionally extant; uppermost courses of blue engineering bricks, bedded in Portland Cement, 5 bricks wide; over red bricks, 23x10.5x6.5cm, in hard sandy light fawn mortar. No stepped foundation as elsewhere. South wall slightly battered back and generally 7 bricks wide with alternating courses of headers and stretchers. South-west corner is not at right-angles but at 45° angle.	0.20-2.30m
902	Natural	Brownish orange clay. Compact and cohesive.	2.30m +

Area 10 – canal basin – south-west wall

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
110	Modern dump deposits	Same as 1000.	0.00- c 2.40m
111	Brick wall	Same as 1003. 27 courses, 4 lowest courses slightly stepped out, 2 uppermost are blue engineering bricks, over timber beam set into wall (2 courses thick), below red sandstone capping course of quay stones.	c 0.15-2.60m

Area 11 – canal basin entrance from Upper Basin

Context	Classification	Description	Depth below ground surface - top and bottom of deposits
120	Modern dump deposits	Same as 1000.	0.00-2.45m
121	Brick wall	Same as 1003 and 122. Brown sandstone capping course, 0.30m high, over 1.77m of red handmade bricks, 23x10.5x7 cm, over 4 stepped out courses (0.38m), in alternating header and stretcher courses, no mortar extant at face; vertical slots in either wall for gate at west end of inlet, 12.5cm wide with iron lining, 7.5cm wide inside lining;	0.00-2.45m
122	Basin wall	Same as 1003 and 121. 15 red brick courses over jutting pinkish brown sandstone course, over c 20 courses of red bricks, in alternating header and stretcher courses, over c 4 stepped out foundation courses. Bricks 22-23.5x10.5x7cm. Abutting 122, only keyed in at stepped out foundation courses. Sandstone quoins on external corners. Vertical slots in either wall at flared section of inlet, slots 22.5cm wide and contain wood fragments.	0.00-2.10m
123	Concrete wall	Blocking inlet. At west end of Lichfield Basin inlet from Upper Basin. Thick concrete wall, stepped out twice to base, bedded on brick base of basin and abutting brick basin walls.	0.00-2.50m
124	Brick base	Bricks laid to form base of canal within inlet from Upper Basin, sloping from west to east.	c 2.10m +