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LINDSEY ARCHAEOLOGICAL SERVICES

**Cowbit Signal Box, Spalding
Building Survey**

NGR: TF 2501 1800

Site Code: CSB 05

LCNCC Accession No.: 2005.183

Planning Application: H01/1577/04

Report

for

Samantha Turton

by

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Cowbit Signal Box, Lincolnshire Building Survey

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Summary

The signal box is an increasingly rare survival of a fast disappearing part of the nation's social and engineering heritage. The signal box at Cowbit has typical 19th century railway architectural features throughout. The signal levers and their frame are of a widely used type and are difficult to date accurately. The mechanism is fairly complete and probably contemporary with the signal box and its future preservation has been assured at a railway museum.

Introduction

Lindsey Archaeological Services was commissioned by Samantha Turton in August 2005 to undertake a building survey at the above site (Fig. 1). The work was carried out in accordance with a brief dated March 2005 by the Lincolnshire County Council Built Environment Assistant, and requirements specified in the Royal Commission on the Historical Monuments of England 'Recording Historic Buildings – A Descriptive Specification' (1996) and 'Analysis and Recording for the Conservation and Control of Works to Historic Buildings' (ALGAO 1997). The work took one day and was undertaken by Richard Pullen MA PIFA on the 8th August 2005.

Site Location and Description

Cowbit is located to the south-east of Spalding in the Lincolnshire Fens. The site of the station is to the north-east of the village. The signal box is situated on the south side of Station Road and was part of a complex of railway buildings including the Railway Hotel to the east and the station building to the west, on the opposite side of the line.

Planning Background

Planning permission was granted for the conversion of Cowbit signal box into a single two storey dwelling, subject to a photographic written record being made prior to the commencement of any works.

Archaeological and Historical Background

In 1867 Cowbit station was opened on the London and Great Eastern Line between Spalding and March. The signal box is immediately adjacent to the station and appears to be of the same date and construction style. The signal box is similar to several others including those at Deeping St. James

and Heckington. The station closed in the 1960s and much of the route of the former line has since been redeveloped as housing.

Aims and Objectives

The aim of the building survey was to record the fabric of the building and any architectural features both internally and externally. Of particular interest were the signalling levers, mechanism and supporting wooden framework which were to be removed as part of the conversion.

Description

The surrounding area is quite overgrown with self seeded shrubs, small trees and weeds covering almost the entire area. Most of the original wrought iron railings around the perimeter of the site have been replaced by modern pine fencing.

Immediately to the west of the signal box the original station building has been converted into housing and stands on the western side of the platform. The track between the two platforms now forms a turfed area and sunken garden (Pl. 1). The platform is mostly overgrown, but in the areas where grass and weeds do not occur it can be seen that the platform is paved with blue engineering brick faced along the edge with granite blocks. Both sides of the platform still survive and are constructed from red brick.

The Signal Box

Cowbit signal box is now in a neglected condition, but appears structurally sound and still retains many original features, both internally and externally. The building is an ivy covered two-storey construction with a brick lower floor and a half-brick, half-timber upper floor. The brickwork is in Flemish bond. The Welsh slate roof appears to be in good condition, with the exception of several slates that have slipped. The interlocking blue ridge tiles are all present and are typical of those found on many 19th century buildings. A single galvanised steel chimney flue protrudes through the roof on the eastern side with lead flashing forming a seal. The chimney coating has weathered away leading to rust and rapid deterioration of the flue itself (Pl. 2).

West Elevation

The western elevation faces the railway line with the platform and station building in front of it. It has a brick lower floor and glass fronted upper floor (Pl. 3 and Fig. 4). There are three ground floor windows in recessed brick panels defined by projecting pilasters. The windows have nine small panes and all have sandstone lintels and painted sandstone sills.

At ground level there is an opening beneath the north and centre windows with a steel girder lintel which is the point of exit for the cables connecting the internal lever mechanism to the signalling and points along the line. A single row of headers runs above the steel lintel.

Four brick steps lead south to the track. These steps are partially covered with soil and also lead to a path which runs round to the door in the southern side of the building.

The upper storey comprises seven glazed panels, each one with six panes. The panels at each end slide open giving access to the balcony which runs the full length of this elevation and continues around the south and western sides of the building. The pine plank walkway is supported on six cast-iron brackets with cast-iron railings. The planks are secured to the frame with large bolts (Pl. 4).

Two large oak timbers protrude through the wall at ground level. These timbers are the ends of the lever frame that holds the internal signalling mechanism (Fig. 4). Corresponding ends can be seen in the eastern elevation.

The gutter boards are of pine in good condition with the cast iron guttering attached by eight cast-iron brackets. The down pipe at the south end of the elevation turns along the south gable just below the platform to meet the downpipe on the east elevation (Pl. 4).

South Elevation

The lower part of the south gable and the upper east side is constructed in brick. The remainder of the upper floor comprises three window panels, the same size as seen on the west elevation, each one separated into six single panes (Pl. 5, Fig. 5). The windows do not slide or open. The first floor balcony continues around the south side of the building, to the end of the windows. Above the windows pine tongue and groove panelling runs to the apex of the roof. The ornate fretted pine bargeboards (fixed beneath the eaves of a gable to cover and protect the rafters) each consist of six semicircular sections with triangular spacings and circular terminals. The terminal to the east shows slight damage due to shrinkage and cracking in the wood. The finial is also damaged with the entire lower half missing.

A drainpipe runs beneath the balcony connecting the downpipe on the west elevation to that on the east. A single door at ground level provides the only access to the interior of the building. The door lintel is of common red brick stretchers. The only furniture on the door is a bakelite knob, brass key escutcheon and swing cover. A series of steps lead up the slope from the doorway, towards the platform, to the west. These have been buried, but continue around to the western side of the building.

East Elevation

This elevation forms the rear of the building and is of brick construction throughout (Pl. 6). There are two cast iron air vents incorporated into the courses (Fig. 6). There is a small four-pane window in the centre of the elevation just below the eaves. It has a vertical sliding sash pine frame in good condition that opens from the bottom upwards. The lintel and sill are sandstone, painted grey to match the window surround. The lintel and sill do not show any tool marks, but the underside of the lintel has regular circular scoring indicating it has been sawn using a machine-operated circular saw.

The rainwater guttering and drain pipe are cast iron. The downpipe runs down the southern corner of elevation and is linked to the downpipe on the west elevation by a single pipe which crosses the south gable just above the door lintel.

Two large wooden beams protrude through the wall of the lower floor. These beams are the ends of the oak frame that holds the internal lever mechanism; corresponding beam ends can be seen in the western elevation (Fig. *).

The gutter boards are of pine in good condition with the cast iron guttering attached by eight iron brackets, as on the west elevation. Although the guttering is overgrown with moss and weeds it is in surprisingly good condition with no apparent cracking.

An outside toilet has been added onto the eastern side of the signal box. The new extension is one brick thick in stretcher bond with a reinforced concrete slab roof. A small cast-iron half-hinged window is present in the east wall of the extension with a concrete lintel above and a row of soldier headers forming a sill below. There is a two-course high ceramic air brick to the north of the small window. A pine plank door gives access into the toilet block from the north. The interior of the extension is whitewashed brick and contains a ceramic toilet bowl with a wooden seat and a high, lever operated cast-iron cistern, probably dating to the mid 20th century.

North elevation

The north elevation is almost a mirror of the south gable in construction with the lower half and west side of the upper storey being built in brick (Pl. 7, Fig. 7). There are two window panels on this elevation with six panes in each. The windows do not slide or open and several are cracked or broken. The sill is supported by a slightly protruding row of brick stretchers. Above the windows pine tongue and groove panelling runs up to the ridge. Some of the panelling is missing, exposing the reverse of the interior panels. A tongue and groove pine door, with glass upper panels, is located immediately to the west of the windows, and originally provided access to the first floor. The door has a bakelite knob and brass keyhole escutcheon. At the time of the survey the door was not in use as the wooden staircase that led up to it from ground level had been removed. The only surviving evidence for the staircase is the sawn off ends of three pine joists that protrude through the wall beneath the first floor door. The balcony does not continue round this elevation, presumably because the staircase would have been in the way

There is a small three-pane window above the door inside the building, but this has been boarded over on the exterior. The bargeboards and finial are identical to those on the south elevation but are in better condition.

Ground Floor Interior

Access to the ground floor is through a door in the south elevation. The door step is 0.40m higher than

the interior ground level and there is no step on the inside. The floor is a mid grey/brown dry earth with no floor boards or tiles of any kind. Most of the ground floor space of the signal box is taken up with the large wooden lever frame and its associated mechanism that supports the levers above. The frame is constructed from ten separate timbers 0.15m wide x 0.30m thick (Fig. 8). The timbers are bolted together with long dome-headed threaded coach bolts. The mechanism appears complex, but is a simple and effective piece of engineering contained by the wooden frame.

The mechanism basically consists of a series of cams and cast-iron pulleys. The cams transfer the linear motion of the movement from the conditional tappet locking levers into a rotary motion at the pulley end of the mechanism which in turn changes the track points or alters the signals via cables or chains. There is no makers mark or date of manufacture apparent on the mechanism, although the connecting levers on the first floor were produced by Tyer and Co. Ltd.

The three windows noted in the exterior western elevation are the only source of light into the ground floor. They have no internal sills and cannot be opened. There is a fireplace in the north-east angle of the room. It is 0.80m wide and 1.50m high with a lintel formed by two arched rows of header bricks. The fireplace is undecorated and contains no furniture or hearth or any kind.

The ground floor ceiling is formed by the pine floor boards of the first floor above. The boards are supported on 0.10 x 0.15m pine joists running east-west.

First Floor Interior

Access to the first floor is currently via a ladder through a hole made by the removal of two of the pine floor boards (Fig. 9). The first floor interior extends to the apex of the roof with no loft or ceiling. The north, west and south walls within the apex of the roof space is panelled with pine tongue and groove planking similar to that on the exterior of the building. The lower parts of the north, east and south walls, where not glazed or panelled, are plastered (Pl. 9). The plaster is in good condition although its covering of light blue paint is flaking. The angle between the northern and eastern walls is filled with the flue for the ground floor fireplace which exits through the galvanised chimney noted from outside. There is no built-in fireplace on the first floor. However, section of cast iron flue is suspended from the roof on three pieces of threaded bar. The presence of the internal flue suggests the presence of a wood burning stove at some time (Pl. 10). However, with the exception of the flue there is no sign of a stove ever having been present. The roof consists of exposed rafters 0.39m apart with tongue and groove panelling between. Each of the rafters is identical (Pl. 10). A small three-panelled window was noted above the door in the north wall. The window opens inwards and is operated by a string attached to the catch (Pl. 10). This window has been boarded over on the outside.

A pair of cast-iron brackets is set into the chimney breast on the eastern wall of the first floor. The brackets are 0.25m long and 0.55m apart (Pl. 11). The most likely use for the brackets would be to support a large ceramic Belfast sink. There is no evidence for taps, so the facility would have been

more a washstand than a plumbed in sink with running water. Modern trip switches, metal trunking and several redundant fuse boxes appear on the north wall.

The main feature of the upper floor is the signalling lever grid (Pls 9, 12-14). This consists of a cast iron tappet lock frame that holds thirty-five full length large catch-brake levers spaced at c.0.10m intervals with 1.25m appearing above the grid (Fig. 9). The levers retain full and free movement although the cables linking them to the mechanism below are now gone. They are still painted in their various signal recognition colours. The four blue levers would have been for either the locking bars or the facing point blocks, the yellow lever would have operated the clearance bars, the signals with interlocking facility would have been changed by the three red and white striped levers with all other standard signals being operated by the five red ones. The detonators that would warn oncoming trains of workmen on the line would have been fired by pulling the levers with the black and white chevrons. The direction of the chevrons indicates the line they are connected to, the chevrons point upwards for the up line and downwards for the down line. The lever painted in yellow and blue is of unknown usage. The remaining twenty levers are painted in white indicating that they are spare levers. This would have been due to the fitment of a standard model lever set, rather than a purpose-built set with fewer levers for a smaller signal box. This was common practice as a large number of spare levers would allow for future expansion on the railway with the addition of new track or signals.

A 0.30m wide oak footboard stretches the full length of the lever grid and is bolted through the floor onto the mechanism frame in the ground floor. This addition is common to most signalling lever frames to give the operator a firm platform from which to throw the levers.

A single dark-stained, glass-fronted pine cabinet in the south-eastern corner of the upper floor is the only surviving furniture (Fig. 9). The cabinet is 2.75m high, 1.85m wide and 0.60m in depth (Pls 12 and 13). The body of the cabinet has eight glass-fronted sections with two small cast-iron handles screwed onto the front of each section. This cabinet is standard railway furniture and would have contained charts, posters and other official railway information.

Discussion

Many different types and configurations of signal levers were produced during the 19th and 20th centuries. The equipment in the signal box at Cowbit is of a familiar lever activated locking type first introduced by McKenzie and Holland. The design became the standard and was copied by various large and small manufacturers including Westinghouse, Tyer and Co Ltd, The Railway Signal Company and GKN Duplex. This type of lever set was manufactured uninterrupted from the mid 1800s until the 1970s. The levers at Cowbit have the legend '*Tyer and Co Ltd London and Carlisle*' cast into the base of each one.

The company of Tyer and Co Ltd was founded in 1851 by Edward Tyer and had large premises at Dalston in London. The company were the largest suppliers of block instruments for the railway and

specialised in block telegraph systems and other electrical apparatus. The firm is best known for its electric train tablet system patented in 1878 and introduced two years later in 1880. In the 1860s the company acquired the small mechanical signalling equipment manufacturers, Tweedy and Co and started to produce their own lever sets, of the type installed at Cowbit in 1867. Equipment produced after the takeover was marked London and Carlisle instead of just London as had previously been the case. Tyer and Co. became B.P. & Tyer Signals Ltd after a merger with British Pneumatic in 1934. This merger was the beginning of the end for Tyer and Co Ltd and the company's business was eventually taken over by Field and Grant, who were, in turn, taken over by the large Westinghouse Corporation. The lever sets produced by Tyer and Co Ltd were used extensively on many lines including the Great Eastern, Great Northern, Great Central Railways, Great Western, Lancashire and Yorkshire, London and North Eastern and the Midland & Great Northern.

The levers and mechanism in the Cowbit signal box are likely to be the original equipment dating from the boxes opening in the 1860s. There is certainly no evidence for any earlier machinery ever having been fitted. Despite its age the lever set and its mechanism is still a relatively common and widely used type. Although the levers will obviously be removed prior to the buildings conversion, they will not be lost having already been purchased by a local railway museum for eventual inclusion in their collection.

Conclusion

The signal box is an increasingly rare and relatively complete surviving example of a fast disappearing part of the nation's social and engineering heritage.

Richard Pullen MA PIFA

Lindsey Archaeological Services

23rd September 2005

Revised by Naomi Field November 29th 2006

Acknowledgements

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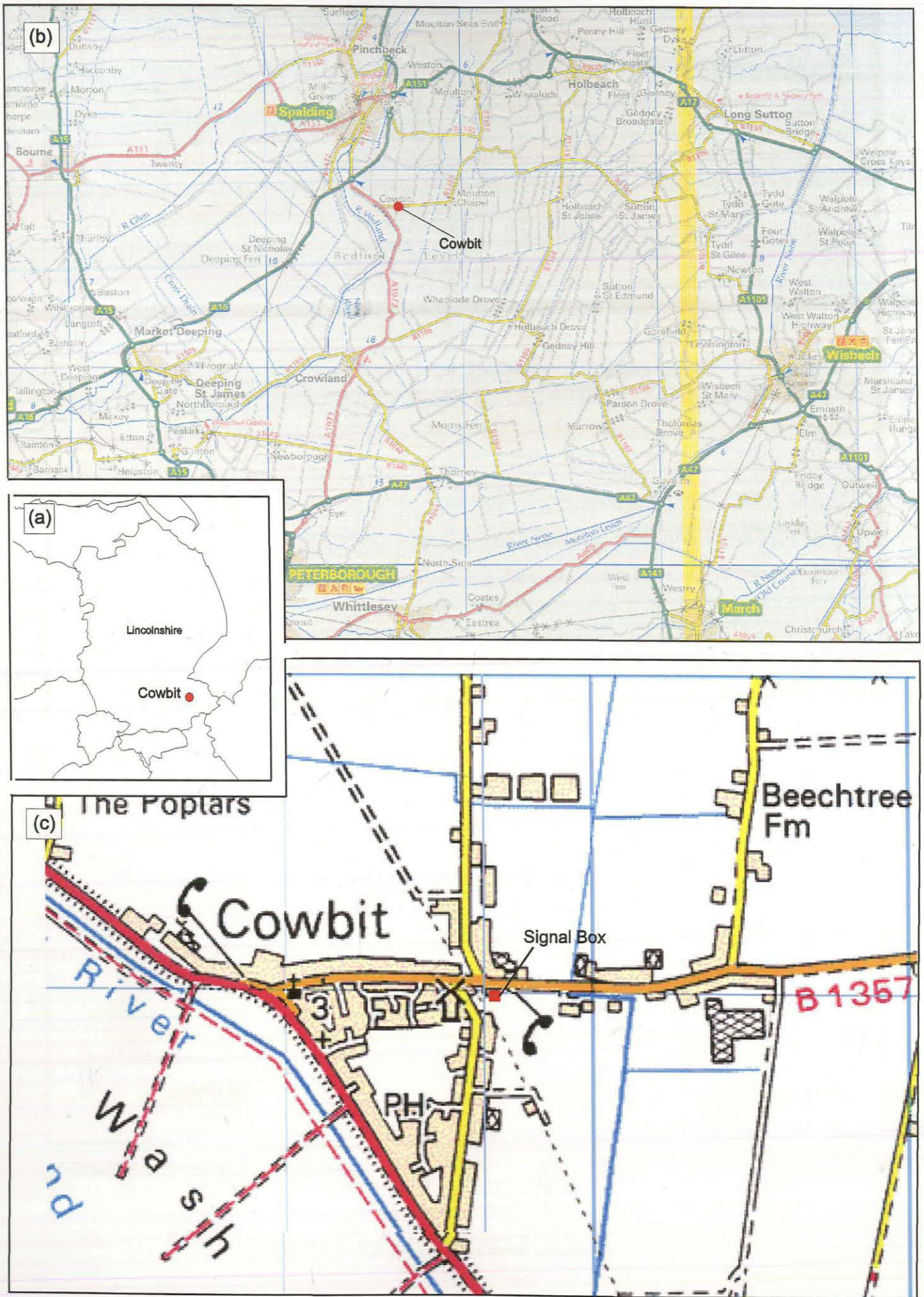


Fig.1 Location of Cowbit (Crown copyright: c reproduced from the 1:50,000 Explorer Ordnance Survey map. With the permission of the Controller of the HMSO. LAS Licence No. AL 10002165)

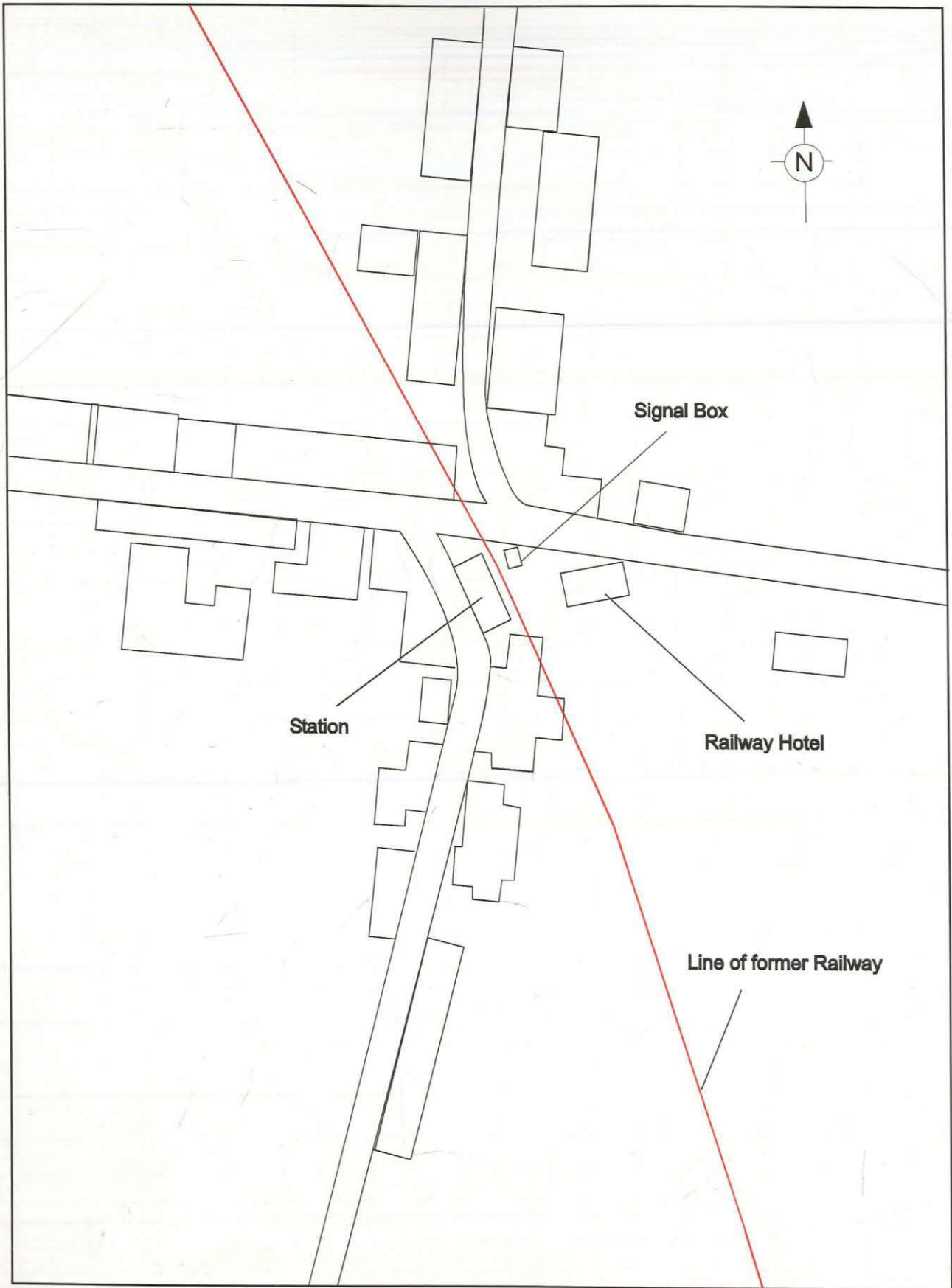


Fig. 2 Location plan of the Cowbit Signal Box

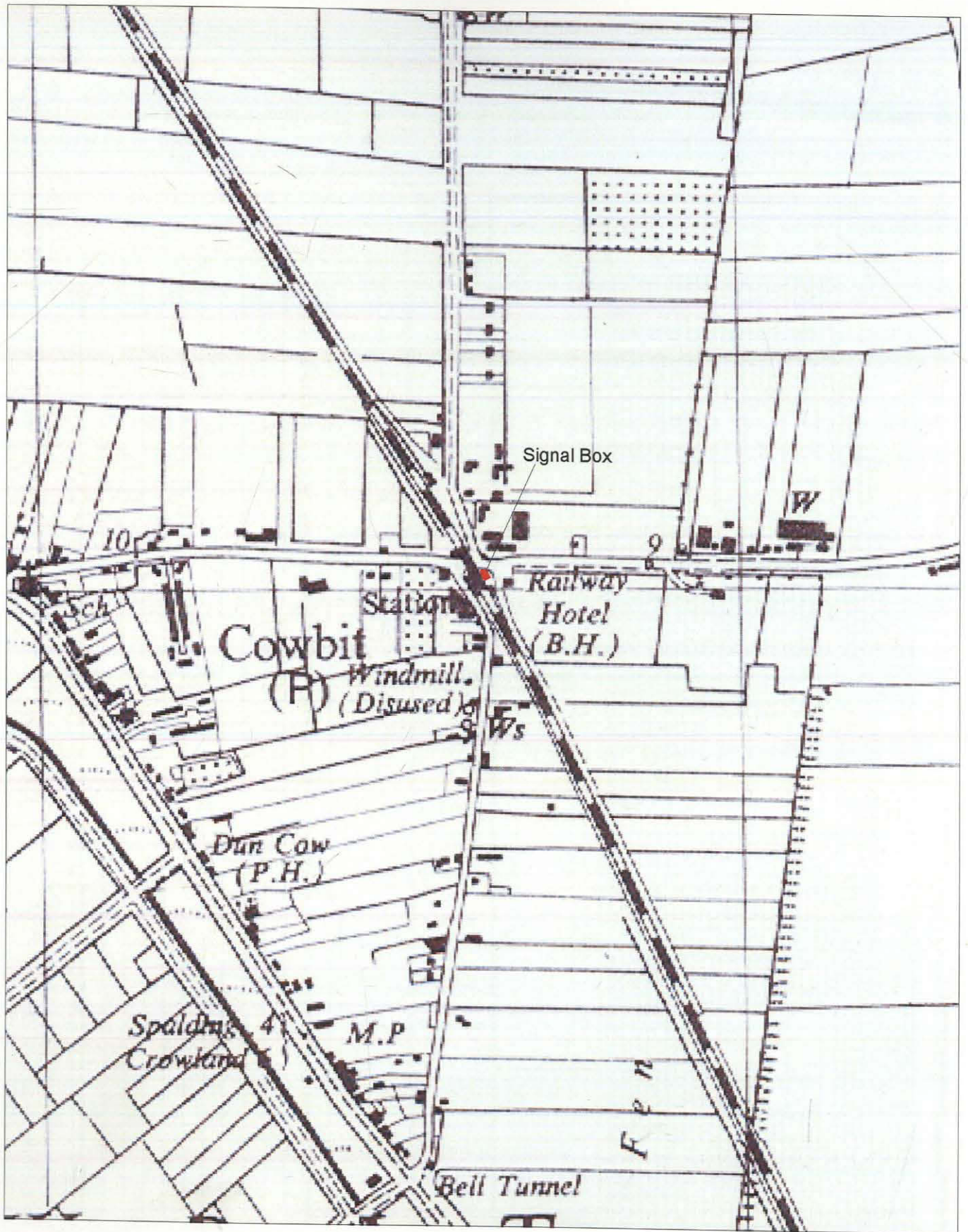


Fig. 3 1955 Ordnance Survey TF 21 1:25,000 map of Cowbit showing the railway in situ and the signal box marked in red. With the permission of the controller of the HMSO. LAS Licence Number AL 100002165

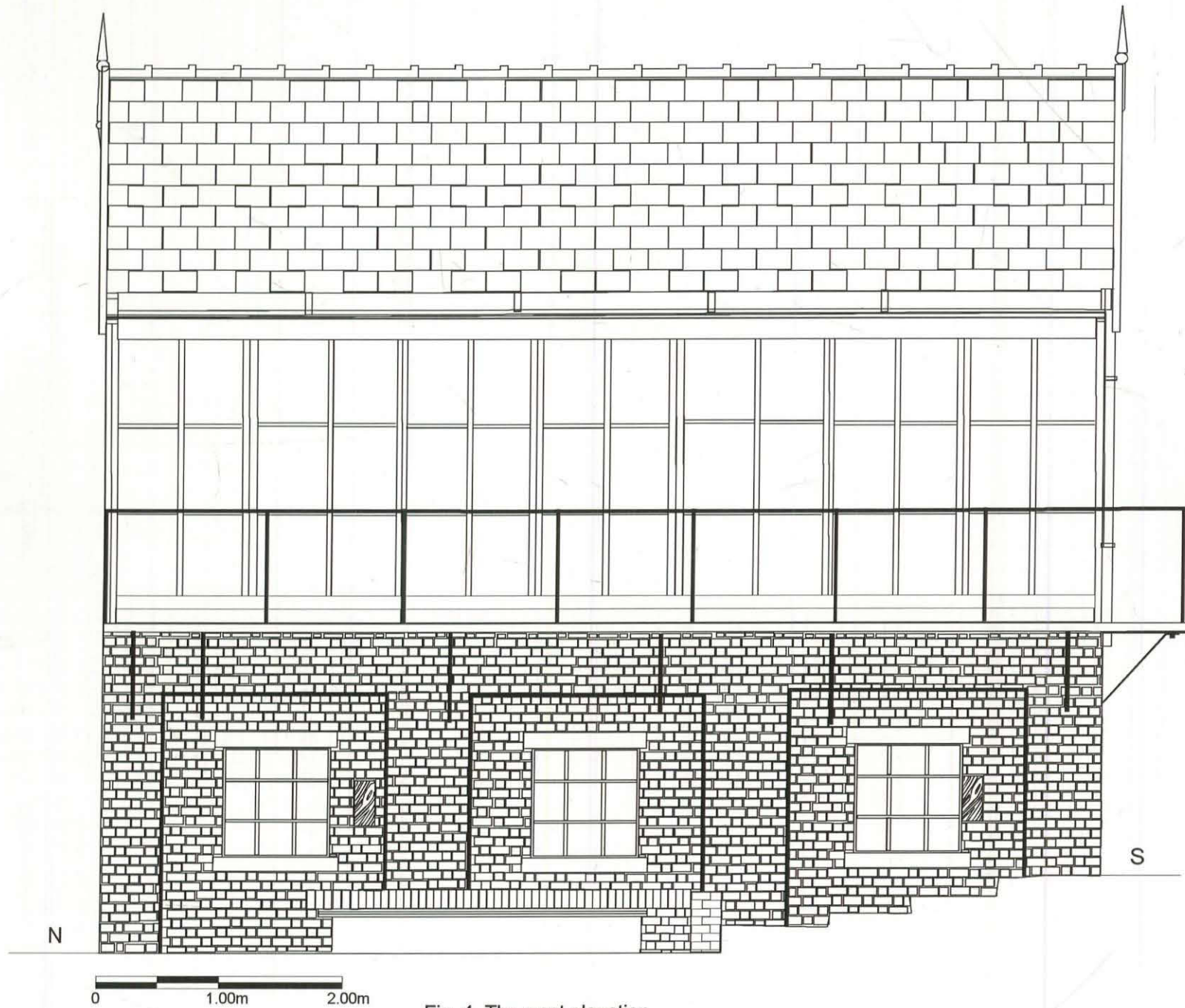


Fig. 4 The west elevation

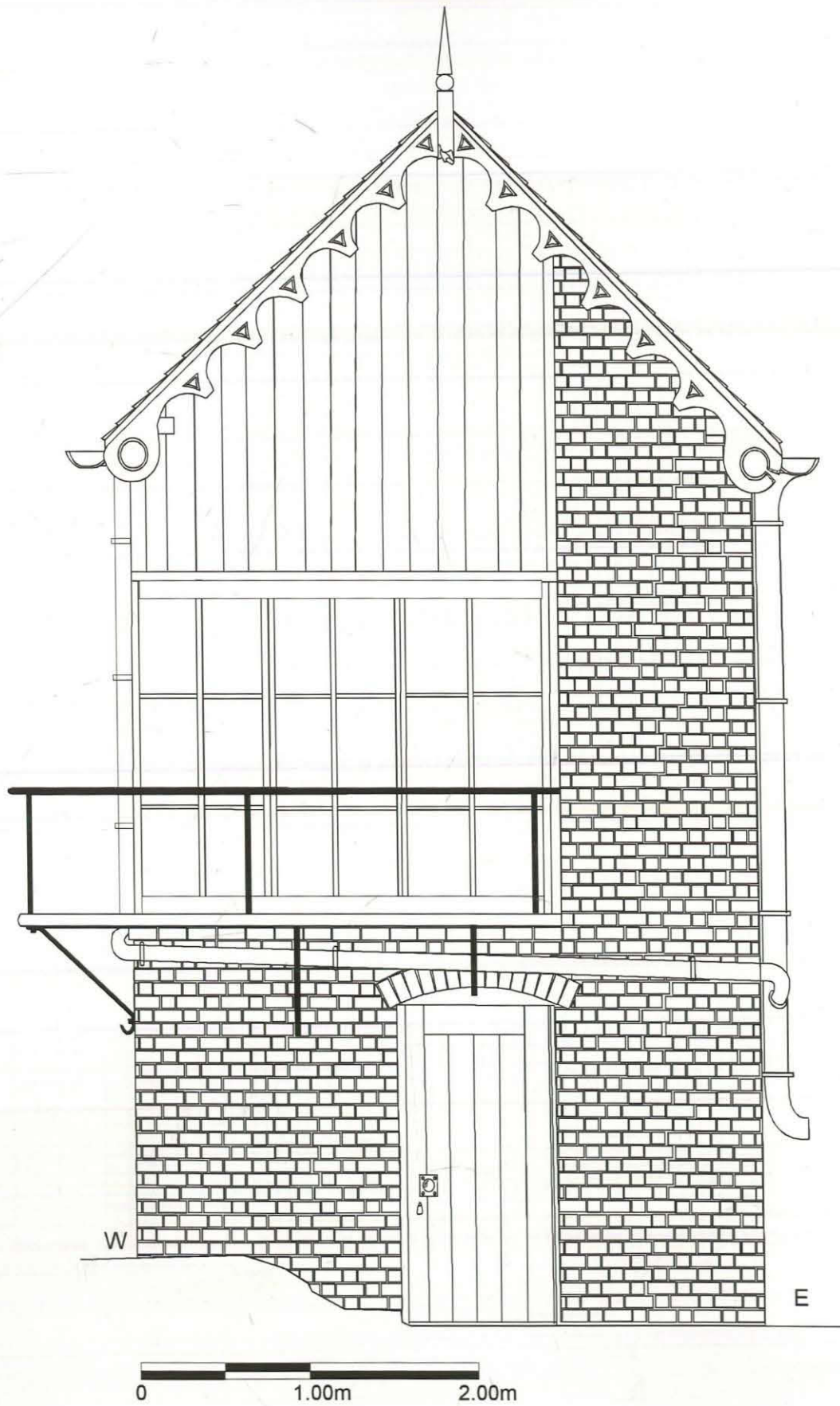
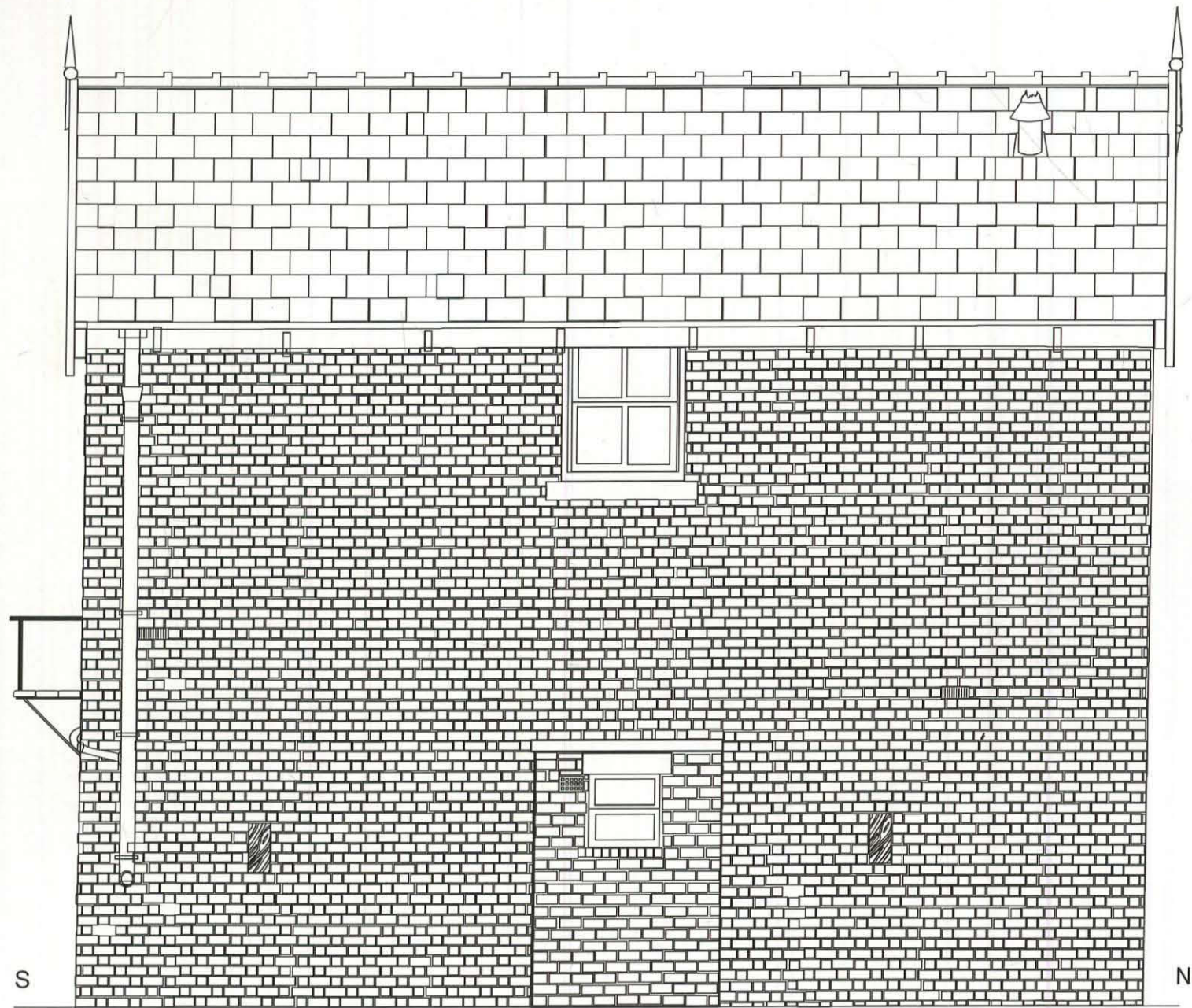


Fig. 5 The south elevation



0 1.00m 2.00m

Fig. 6 The east elevation

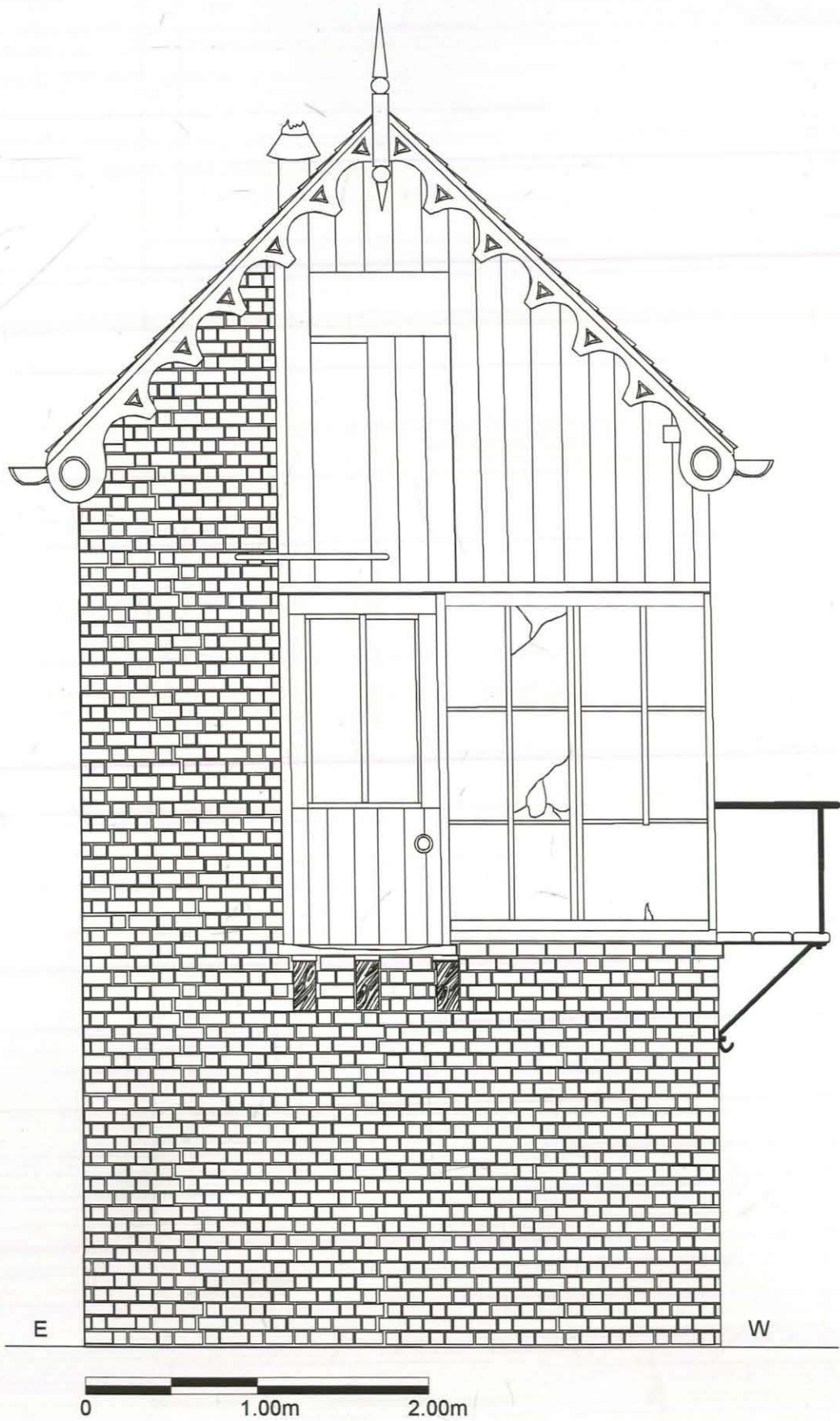


Fig. 7 The north elevation

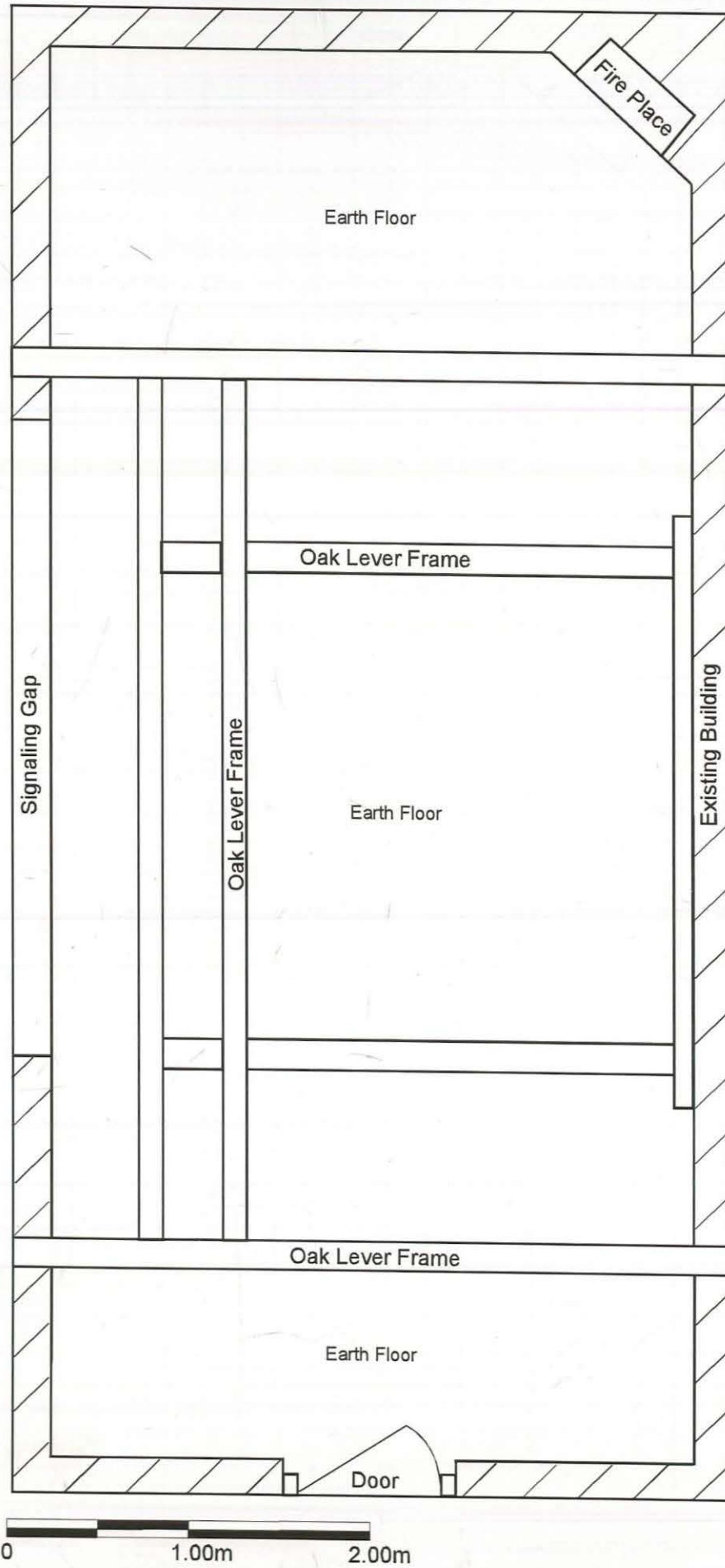
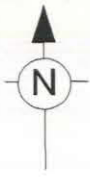


Fig. 8 Ground floor plan of the signal box showing the lever frame and fireplace

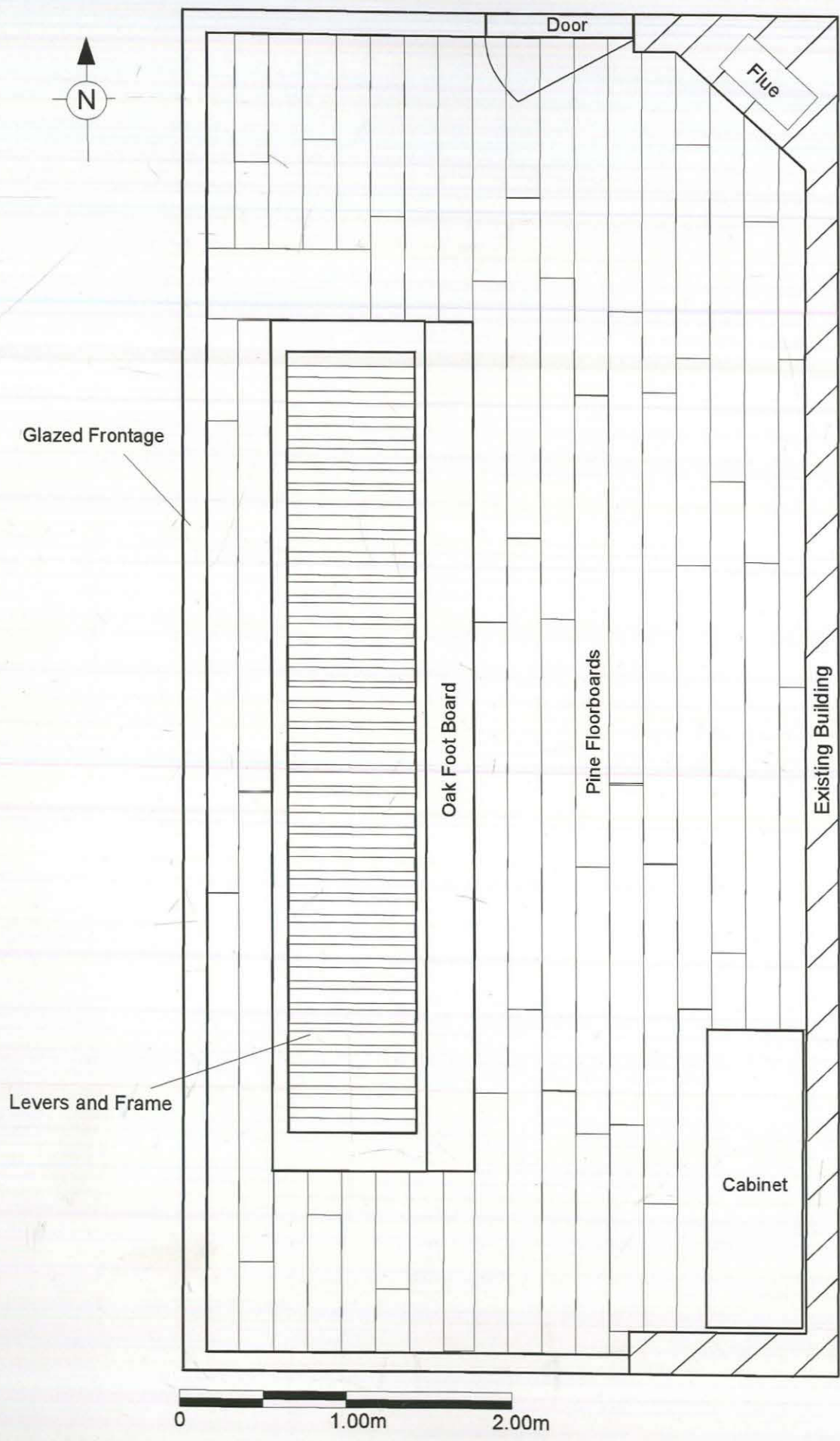


Fig. 9 First floor plan of the signal box showing the lever grid

THE PLATES



Pl. 1 The former railway line and station platforms to the immediate west of the signal box



Pl. 2 The roof, finial, guttering and chimney flue on the eastern side of the signal box



Pl. 3 The west elevation



Pl. 4 The west elevation detail showing the cast iron down pipes, recessed window, glazing and balcony on the south-western corner of the building.



Pl. 5 The south elevation



Pl. 6 The east elevation showing the later toilet block



Pl. 7 The north elevation



Pl. 8 The north elevation, detail of the bargeboards and finial



Pl. 9 The first floor with the signaling levers in the foreground, looking north



Pl. 10 The first floor detail of internal panelling and rafters, looking south



Pl. 11 The sink brackets and various fuse boxes in the south-west angle



Pl. 12 The signaling levers with the chart cabinet in the south-east corner, looking south.



Pl. 13 General view Looking south-east across the first floor



Pl. 14 The levers



Pl. 11 A detail view of the south western corner of the signal box showing the cast iron guttering and the eaves of the roof



Pl. 12 A detailed view of the underside of the eaves on the north-eastern corner of the building



Pl. 13 A view showing the cast iron down pipes, recessed window, glazing and balcony on the south-western corner of the building.



Pl. 14 The roof, finial, guttering and chimney flue on the eastern side of the signal box



Pl. 15 Detail of the ornate gable end and tongue and grove planking on the northern face of the building



Pl. 16 The line of the former railway and station platforms to the immediate west of the signal box ✓