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Canal Lift Bridge GN5 at Rothersthorpe, Northampton

by

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SUMMARY

A building record was made of Lift Bridge GN5 immediately prior to its dismantling in October 2004. It was built in 1815 as part of the Grand Union Canal, Northampton Arm to enable the farmer, whose land it was built on, to continue access with carts to fields otherwise cut off by the new canal. Although the Lift Bridge was renovated in 1914 and in the 1960s, several of the original iron fittings are thought to have been re-used in the structure.

INTRODUCTION

Lift Bridge GN5 on the Grand Union Canal at Rothersthorpe, Northampton is a Grade II Listed Building (Fig 1). It is part of a group of two bridges, twelve locks and a lock-keeper's cottage on the Grand Union Canal, Northampton Arm, south of Rothersthorpe (NGR SP 72550 56590, Fig 2). It had become unstable and dangerous so the former Built and Natural Environment section at Northamptonshire County Council's Natural and Historic Environment Team requested that a record of the structure was made prior to its removal. Listed Building Consent was granted for its demolition and replacement during October 2004.

The geology is mapped as Boulder Clay, though it is sands and gravels less than 200m to the south and Upper Lias clay and alluvium 120m west (BGS 1978).

Fig 1 Rothersthorpe Lift Bridge GN5 in the up position, and lock number 5, looking south-west

ACKNOWLEDGMENTS

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THE HISTORICAL BACKGROUND TO THE SITE

THE GRAND UNION CANAL

The canal, constructed as the Grand Junction Canal, was open by 1800, connecting the Oxford Canal at Braunston, Northamptonshire to the Thames at Brentford, thus linking the industrial Midlands to London. The Northampton Arm was built in 1815, linking the main line at Gayton to the River Nene in Northampton, falling through 17 locks in five miles. In 1929, Regent's Canal bought the Grand Junction Canal and three Warwick canals and they became part of The Grand Union Canal (Wikipedia).

SITES AND MONUMENTS INFORMATION

The Lift Bridge is one of a group of twelve scheduled lock gates on the Grand Union Canal (Fig 3). The closest locks to Rothersthorpe Lift Bridge GN5 are as follows in Table 1.

HISTORIC MAPS AND DOCUMENTS

The first depiction of Rothersthorpe was on the *Plan Made on the Inclosure of Rothersthorpe to which the annexed Award Refers by Stephen Godfer 1810* (NRO 2872a-c), which recorded the inclosure of the common fields by Act of Parliament. At this time, prior to the construction of the canal, the site of the lift bridge was within a 185 acre field on the eastern side of Rothersthorpe.

From the 1843 First Edition Ordnance Survey Map (1 inch series, sheet LIII SE) to the 1925 Edition (6 inch series 1899, revised 1925), the maps show the Grand Junction Canal, as it was then called, and the surrounding landscape in almost the same form as today, with several field boundaries added since 1810. Three swing bridges

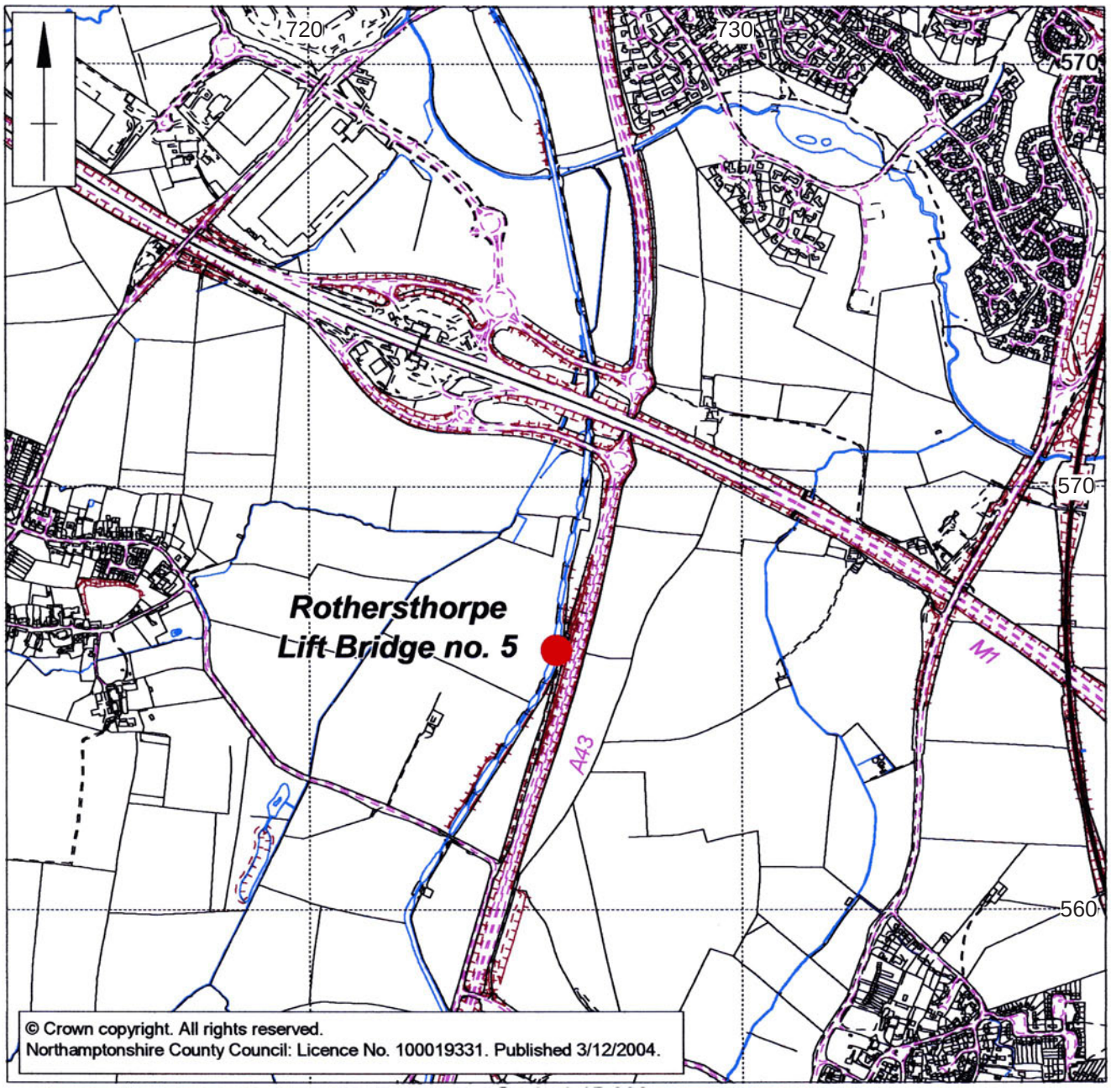

Fig 2 Site Location, scale 1:15,000

are shown, one being this site, with two more further to the north. The Northampton and Peterborough Branch Line of the London and North-West Railway was still present, thereby still providing a boundary for fields cut by the canal. The canal was named Grand Union Canal in 1929.

The new A43 road was first depicted in 1956, running roughly parallel to the Grand Union Canal. In more recent times the character of the area changed even more dramatically with the construction of the M1 in 1958-9, but the motorway did not have a direct impact upon the fabric of the lift bridge and its immediate surroundings, as it was carried above the canal on a flyover.

None of the maps suggest that there were alterations made to the lift bridge nor its associated banks and locks, which suggests that any repairs and replacements would have been made in the exact footprint.

OTHER SOURCES

Records suggest that the bridge was installed so that the farmer who owned the land bisected by the new canal could continue to access the eastern part with carts. The second footbridge further north was to enable the footpath to continue in operation (David Roche, pers comm).

Fig 3 (opposite) Location of Sites and Monument Record sites, scale 1:1250

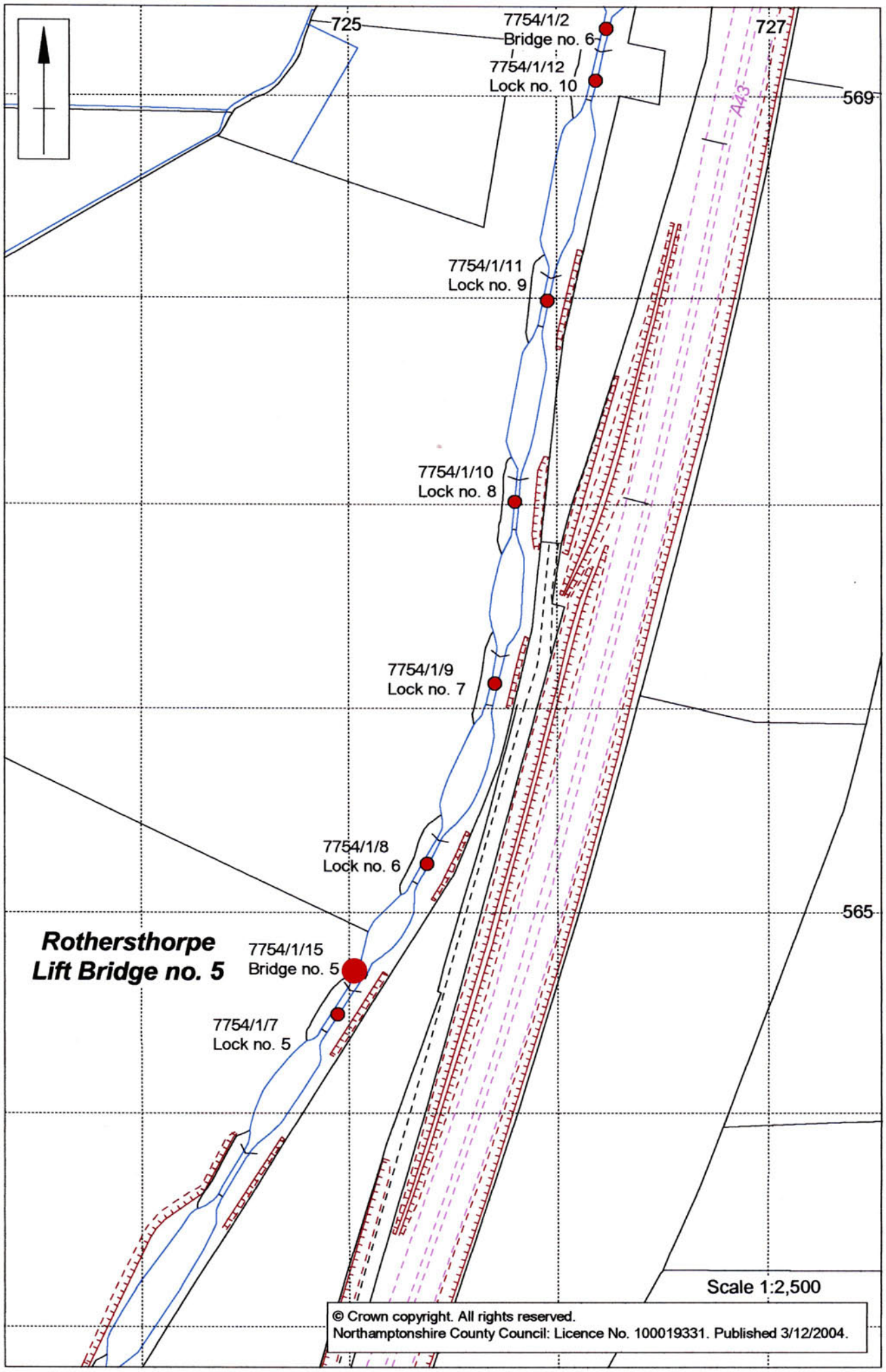
725
7754/1/2
Bridge no. 6
7754/1/12
Lock no. 10
727
569
A43
7754/1/11
Lock no. 9
7754/1/10
Lock no. 8
7754/1/9
Lock no. 7
7754/1/8
Lock no. 6
565
Rothersthorpe
Lift Bridge no. 5
7754/1/15
Bridge no. 5
7754/1/7
Lock no. 5
Scale 1:2,500
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Table 1: Sites and Monuments Record data for the Bridge GN5 and neighbouring locks, Northampton Arm of the Grand Union Canal

SMR Number	NGR Grid ref	Description
7754/1/15	**SP 72500 56470**	**Bridge no. 5 Drawbridge, *c* 1815, restored 19th and 20th centuries. Timber construction with iron chains.**
7754/1/7	SP 72490 56470	Lock no. 5, *c* 1815 restored 1883 and in the 20th century. Red brick with metal gates. Single lock width, single upper gate and double lower gates, with an overflow channel.
7754/1/8	SP 72530 56530	Lock no. 6, *c* 1815 restored late 19th and 20th centuries. Red and blue brick with metal gates. Single lock width, single upper metal gate and double timber lower gates, with an overflow channel.
7754/1/9	SP 72560 56610	Lock no. 7, *c* 1815 restored 1888 and in the 20th century. Red brick with timber and metal gates. Single lock width, single metal upper gate and double timber lower gates, with an overflow channel.
7754/1/10	SP 72570 56700	Lock no. 8, *c* 1815 restored 1882 and in the 20th century. Red brick with metal gates. Single lock width with single upper gate and double lower gates, with an overflow channel.
7754/1/11	SP 72590 56800	Lock no. 9, *c* 1815 restored 1891 and in the 20th century. Red brick with metal gates. Single lock width with single upper gate and double lower gates, with an overflow channel.
7754/1/12	SP 72600 56900	Lock no. 10, *c* 1815 restored 1878 and in the 20th century. Red and blue brick with metal gates. Single lock width with single upper gate and double lower gates, with an overflow channel.

Two photographs of the lift bridge and its associated lock have been published (Blagrove 1990, 145-6). The first photograph is accompanied by a caption which draws attention to the lack of clearance beneath the bridge for barges using the canal. The second photograph shows that the central sections of the interior face of the counterbalancing beams were painted white, presumably as a warning for pedestrians to be aware that the bridge could be moved. A short length of 45° angled timber acting as a stop for any accidental dropping of the bridge was sited between the two upright timbers in the up position. The accompanying caption reads as follows: *The massive timbers of the drawbridge are no longer matched by the balancing beams of the lock gate for these latter are made of steel. Very noticeable is the smart new brickwork* . . which refers to the new steps and circular retaining wall around the eastern lock gate.

A search of English Heritage's Listed Buildings web database (http://www.imagesofengland.org.uk) includes a variety of cantilever and tilting lift bridges. No directly similar examples were present to suggest whether this was a common or unusual type.

BUILDING RECORDING AND WATCHING BRIEF

The bridge was secured in the up position due to its dangerous condition, and was recorded fully whilst it was in this mode (Fig 4). The watching brief on the dismantling then enabled the bridge to be inspected in the lowered position. The buildings record comprised

Fig 4 Rothersthorpe Lift Bridge GN5 in the up position, prior to dismantling, looking south-west

Fig 5 The date stone (1914) of the rebuild of bank surrounds, looking west

written notes to accompany annotations made to existing plans and elevations of existing fabric provided by the client.

The Rothersthorpe Lift Bridge GN5 is situated on the west side of the canal, 1m to the north of the steps belonging to a single canal lock. The lock fabric is dated

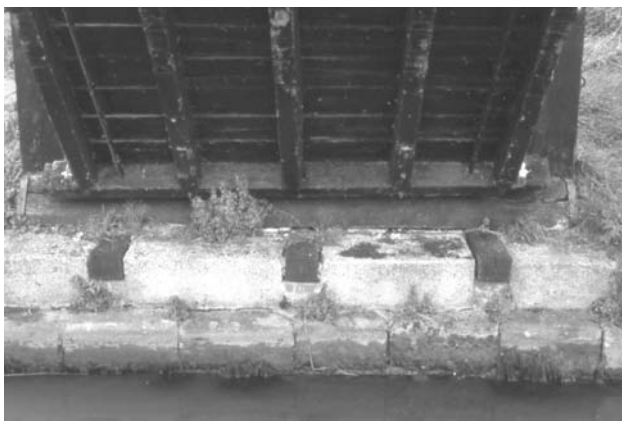

Fig 6 Detail of bank structure below the raised footbridge, looking west

1895. It is probable that the sandstone edging, or rubbing blocks on the sides of the bank around the footbridge dated to the original construction rather than the 1914 renovation, which seems to have used concrete (Fig 5).

The 1960s work involved further consolidation work of the bank with a concrete slab inserted below the footbridge structure with a timber and brick lacing (Figs 5, 6 and 14). The adjacent brick-lined overflow for the lock was rebuilt in the last ten year period. The timber structures are likely to date from the last works in the 1960s. All timbers are machine-cut and finished so that there are no saw or cut marks visible. All are probably made of oak, though this was not determined with certainty.

The tilting footbridge as a whole measures 3.60m long, spanning the canal and overlapping the east bank, by 0.20-0.25m and the west bank by 0.50m (Fig 7). A timber beam on the east bank acts as a stop; that on the west bank acts as an integral pivot to the structure but is only fastened to the footbridge by means of large strap hinges (Fig 6). It is prevented from moving backwards by a bank of concrete laid between the two uprights. The foot bridge is estimated to weigh between 1-2 tons.

Fig 7 Lift Bridge GN5 in the lowered position, during dismantling, looking north-east

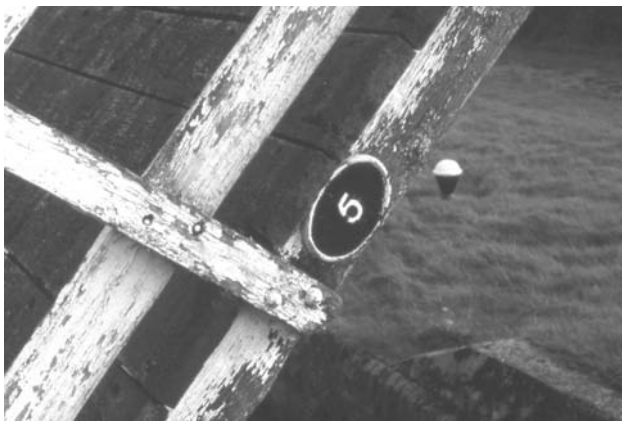

Fig 8 Detail of the footbridge assembly and cast number plate

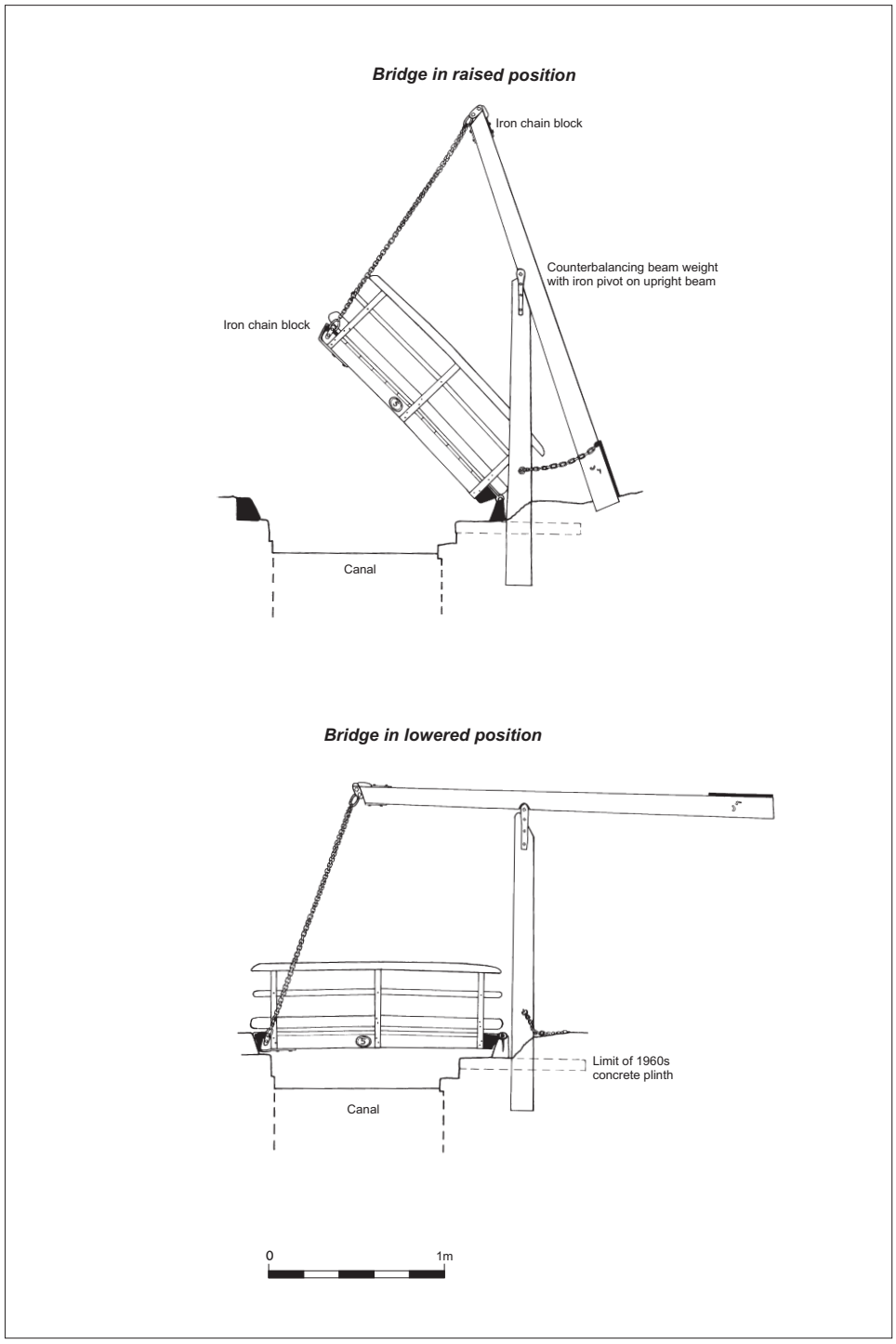

Fig 9 Plan and elevations of the bridge, scale 1:40

The footbridge is of wooden plank deck construction, with twelve 2.85m by 250mm x 50mm- planks nailed onto five 120 x 150mm rectangular-sectioned beams held together at either end by a series of iron straps bolted onto a further, wider and angled beam (Figs 6-9 and 15). An additional longitudinal iron rod lends extra support to each side of the structure.

Wooden hand rails, 3.59m long by 75mm x 90mm, on either side of the bridge are tenoned and nailed to the three uprights, which in turn are bolted onto the outside of the footbridge and to two additional horizontal timbers (Figs 7, 9 and 16). All are painted white. A cast iron number plaque is fastened to each exterior side (Fig 8). The iron chain block which attaches to the chain between the uprights is a 1960s machine-made replacement fitting (Fig 10).

The bridge is raised and lowered by means of counter-balancing beam weights supported by two uprights, each

Fig 10 Detail of the replacement chain block fitting from the top of the counterbalancing beam

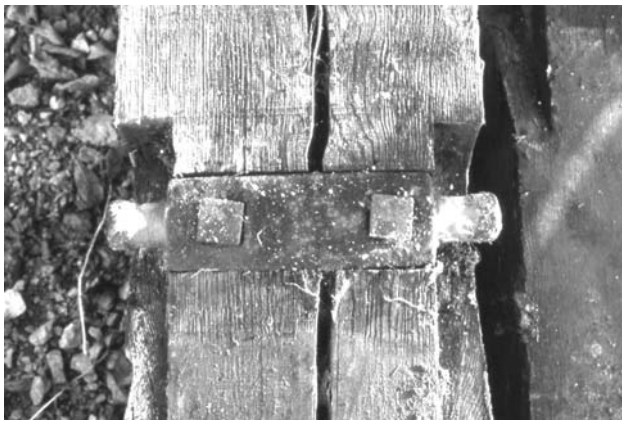

Fig 12 Detail of the cast iron fitting in the underside of the counterbalancing beam

Fig 11 Detail of the iron plates at the base of the counterbalancing beam and upright post

Fig 13 Detail of the original iron straps reused on the upright post and one of the bolt attachments, top, and detail of the 1960s refurbished chain assembly on the top of the counterbalancing beam, below

weighing around ½ ton (Figs 9 and 17). When the bridge is lowered the counterbalancing arms lie horizontal to the uprights, and when upright, at a 70 degree angle to them. Both sets of timbers are painted black. The top end counterbalancing beam weights are angled to allow easy movement of the chain block, and are thus 5.82m or 5.95m long on either face, and taper from 300mm to 260mm at the angled end. The chain block is attached by bolts through the timber to two steel plates, again a recent replacement. Four sheets of 960mm x 160mm x 25mm cast-iron plate are bolted onto the far end of the uprights as counterweights (Fig 11). They lack any identifying marks and are not obviously machine-made and therefore could have been original fittings re-used on the replacement timbers. An iron chain tied round the counterbalancing arm and the upright post prevents the beams from being raised.

A cast-iron fitting was inserted into the underside of the beams, 2.20m in from the angled end with an angled cut-out on the sides to allow the beams to pivot freely over the stationary upright posts (Fig 12). The iron fitting is rectangular with projecting, rounded terminals which show considerable wear, bolted through the entire timber. It is not certain whether it had been cast or wrought, but it is unlike any fittings from other dismantled structures at the nearby yard, which are obviously fresh and machine-made; this fitting is thought to be an original re-used one. The chain between the footbridge and the counterbalancing arms is machine-made and a 1960s replacement.

The upright beams are buried 1.60m below ground, giving a total length of 5.94m. These beams are also tapered, from 340mm square at the buried end to 250mm at the start of a taper at the top end, to 120mm at the rounded terminal. Two wrought-iron straps project up from the ends of the beams, with a circular hole into which the pivot on the counterbalanced beams fit. The straps are also bolted through the beam to each other (Fig 13). Both the ends of the uprights are heavily rotted and waterlogged from being in direct contact with clay, but on the underside of one a circular aluminium disc has survived with the number 5633 stamped onto it.

CONCLUSIONS

The footbridge appears to have been reconstructed in the 1960s, when it is known that renovation works took place. It is presumed that it was rebuilt in the same style as the original bridge as there is no apparent difference observed between the map editions. Several iron fittings which were re-used within the structure support this, although it is possible that the footbridge element was modified to give extra strength in the 1960s with the additional iron-ties, perhaps to cope with mechanised vehicles. It is likely that the iron bolts widely used in the footbridge would have been wooden pegged in the original structure.

Historic maps show how the existing fields at the far eastern edge of the Rothersthorpe parish boundary were bisected by both the London and Western Railway and the Grand Union Canal, and the necessity of adding swing bridges to enable continued access to them by the landowners.

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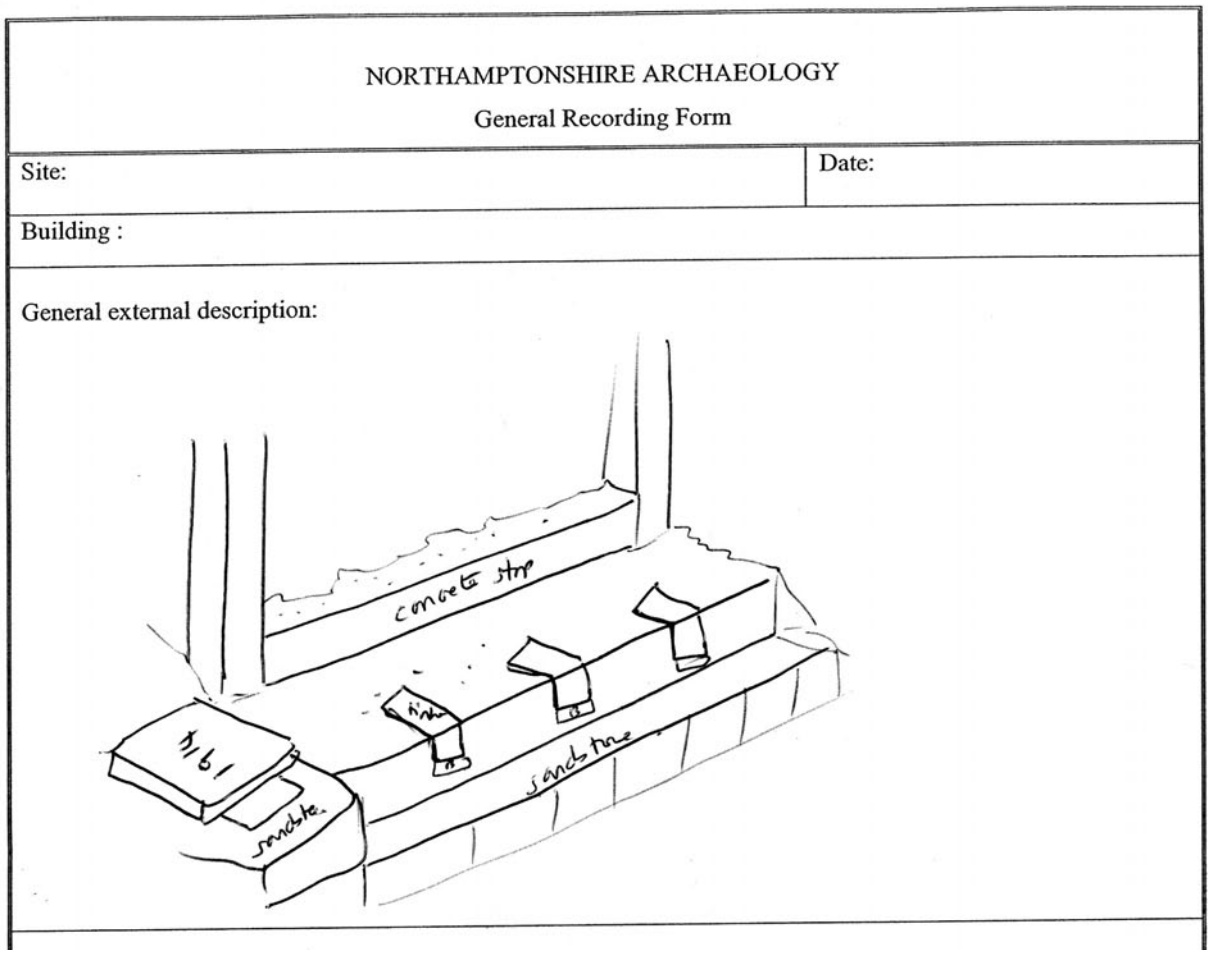


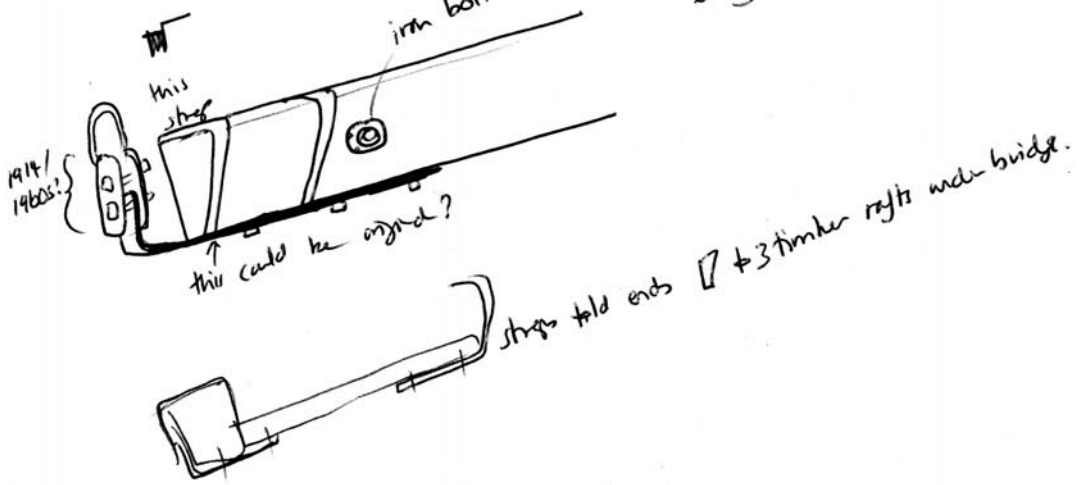
Fig 14 Working sketch of detail of bank structure below the raised footbridge, looking west

NORTHAMPTONSHIRE ARCHAEOLOGY

General Recording Form

Site:	Date:
Building :	

General external description:



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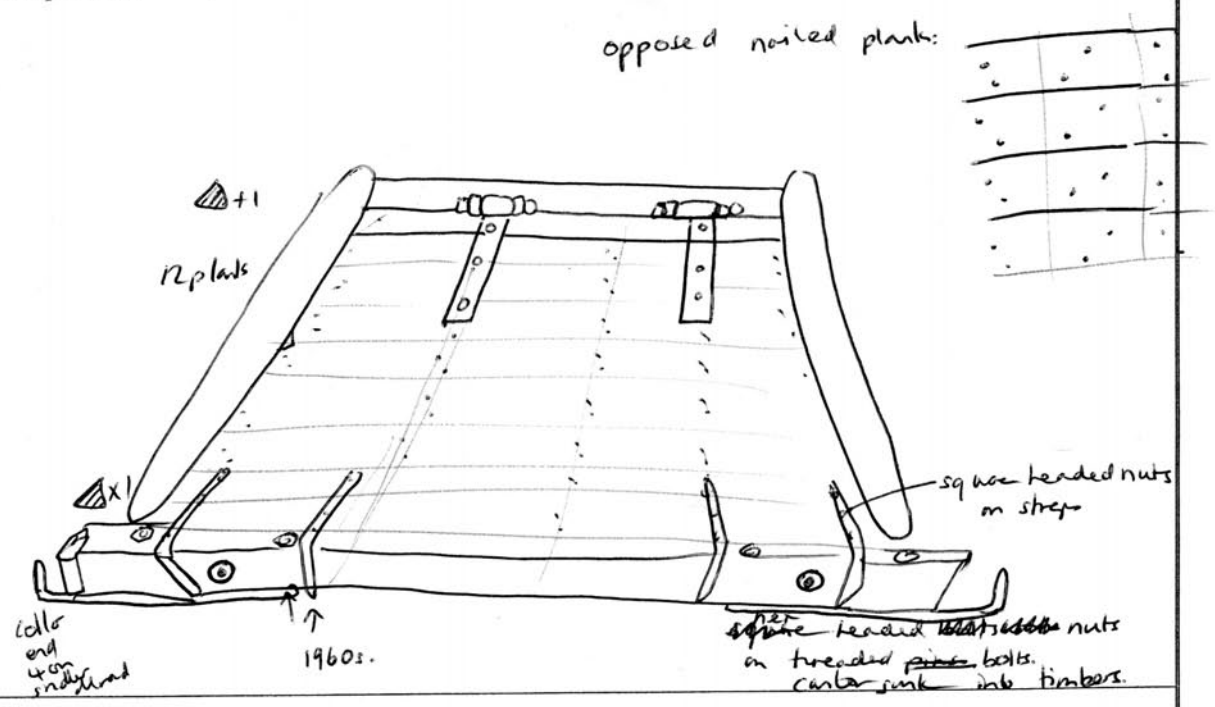


Recorder(s):

Projects/Standards/Building recording form 2

Fig 15 Working sketch of footbridge wooden plank deck construction

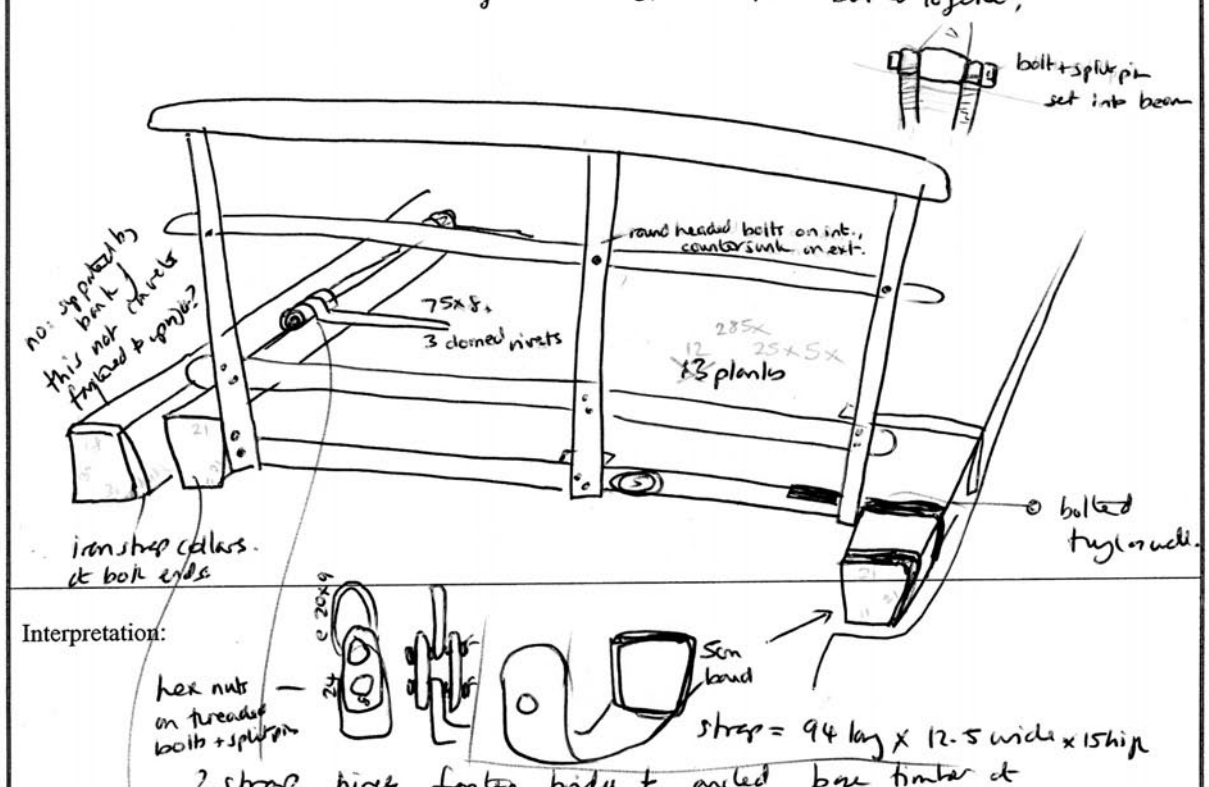
NORTHAMPTONSHIRE ARCHAEOLOGY

General Recording Form

Site: | Date:

Building :

General external description:



Interpretation:

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Fig 16 Working sketch showing handrail construction of footbridge

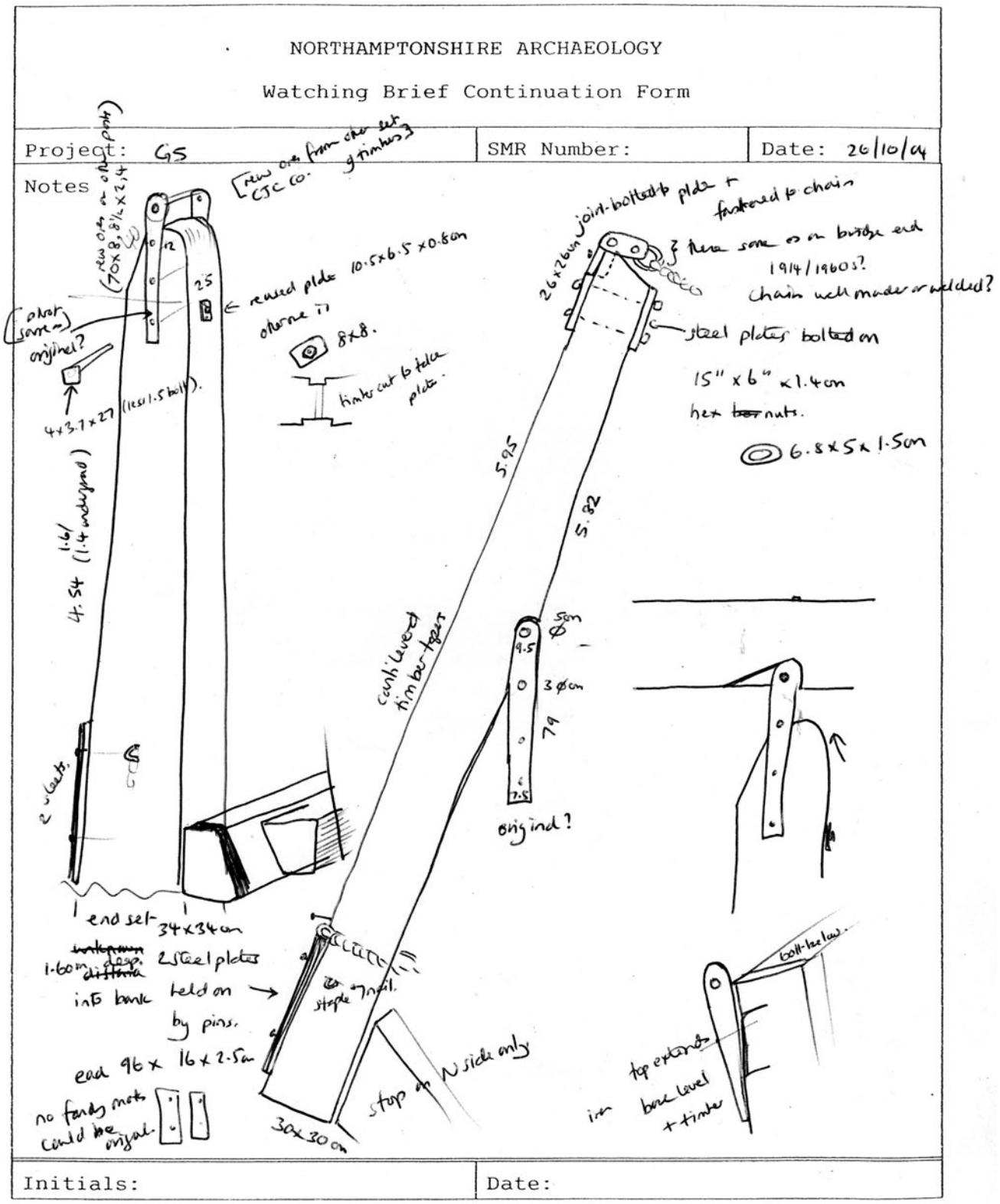

Fig 17 Working sketch showing details of the counterbalancing beam and upright post