

# Shepperton 'B' weir River Thames Surrey



## Historic Building Investigation



**Oxford Archaeology**

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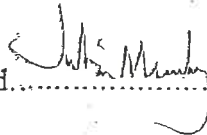
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Date: 30th November 2004

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Date: 30th November 2004

Signed.....

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# SHEPPERTON 'B' WEIR

## HISTORIC BUILDING INVESTIGATION

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# SHEPPERTON 'B' WEIR

RIVER THAMES, SURREY

## HISTORIC BUILDING INVESTIGATION

### SUMMARY

*Oxford Archaeology (OA) carried out archaeological and historical analysis of Shepperton 'B' weir, Surrey for Atkins (on behalf of the Environment Agency). The weir is a steel and timber framed construction and comprises a covered walkway over the central buck gate weir with paddle and rymer and overfall weirs to the east and west. Archaeologically, the paddle and rymer bays are the most important aspect and date from the original construction in 1887. The overfall weir is of the same date and both have been subject to later modifications. The seven buck gates were added in 1924 and the weir was further altered, most substantially in 1955 and 1981. This work is required prior to further modernisation of the structure as new radial gates are to be installed. This will result in the loss of the paddle and rymer bays as well as the buck gate weir and canopy, and as such will have a significant impact on the overall appearance of the weir.*

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## 1 INTRODUCTION

### 1.1 LOCATION AND SCOPE OF WORK

- 1.1.1 Oxford Archaeology (OA) has been commissioned by the Environment Agency, with Atkins acting as their consultants, to record and investigate Shepperton 'B' Weir, on the River Thames in Surrey. The weir dates to 1887 (with later alterations) and now requires a substantial programme of modernisation. The Environment Agency's archaeological specialists have requested that a programme of recording is undertaken prior to the start of works.
- 1.1.2 The structure covered by the current works is located within the county of Surrey and fifteen miles south-west of central London (Fig. 1). Shepperton lies between Sunbury and Weybridge with the weir located on the south side of the river, between Weybridge (south bank of Thames) and Hamhaugh Island. The Shepperton lock landscape consists of the lock to the north-east, weir 'A' to the south and weir 'B' to the south-west as well as a lock house and office (Fig. 2). 'B' weir is a steel and timber framed construction with a covered walkway and a central concrete and wooden gangway. The central part of the weir consists of seven buck gates with paddle and rymer bays to either side and overfall weirs to each side of this.
- 1.1.3 Archaeologically, the most significant impact of the proposed works will be the loss of the paddle and rymer bays (1887) and as such these features will form the main focus on this study. The buck gates (1924) as well as the existing canopy of the weir will also be removed and new concrete piers constructed to support the new gates. These structures form a secondary focus



on the archaeological recording and more recent features such as the extant 1987 Denil fish pass (to be replaced by a Larinier pass) will be form a final consideration.

## 1.2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

- 1.2.1 The landscape of Shepperton lock is historically significant and was originally a City of London lock dating from 1813. The first timber pound lock at Shepperton was infilled in 1899, and following this a new lock was constructed immediately to the south of the old lock (as shown on Fig. 2). The original lock house was built in 1812 (lock house 1), but was later demolished for the construction of the new lock. In 1900 a second lock house was built near the head of the lock (lock house 2). Following bomb damage in 1940 this was demolished and the Forman's house of 1883 became the present lock house (lock house 3) (Fig.2) (Thames Heritage Audit 2004).
- 1.2.2 In 1887 a new weir channel was constructed and the original 1813 weir was removed (Fig 3). Within the new channel weir 'A' was built and this has since been subject to rebuild (1935), modernisation (1973) and refurbishment (1991). Weir 'B' was constructed to the south of the original weir including the paddle and rymer bays and two fixed overfalls (1887). In 1924 a central buck weir with seven gates was added and the gangway rebuilt (Fig. 4). The gates were again replaced in 1955 and the winch for operating the gates was modified in 1959. This was originally a hand operated system that was thought to have been first powered by electricity in 1959. The gangway was again rebuilt in 1981 (Thames Heritage Audit 2004).
- 1.2.3 Archaeologically the most important aspect of 'B' weir are the paddle and rymer bays. It is estimated that there are only thirteen such weirs extant on the Thames (Rickard et al). These weirs are made of vertical timbers called rymers against which rested wooden paddles with long handles. At Shepperton, these were removed one by one to control the flow of water.
- 1.2.4 Historically, millers used weirs to provide a sufficient head of water to turn the mill wheels. Although, the level of water was raised they also obstructed the boat traffic from travelling freely. The solution was the use of paddle and rymers which were removable to allow the water to pass through. These were called 'flash locks' as when a boat was to pass, water which previously had been dammed behind the weir poured through in a torrent or 'flash'(River Thames website). Flash locks were gradually replaced from the 18th century by pound locks and only fragmented remains survive today. They share the same technology as the paddle and rymer at Shepperton although this structure did not act as a flash lock.

## 1.3 ACKNOWLEDGEMENTS

- 1.3.1 The Environment Agency had previously commissioned a major 'Thames Heritage Audit' of structures along the Thanos and this consisted of a desk-based assessment of the Shepperton lock landscape. Information gained as a result of this report has been used in the investigation of Shepperton 'B' weir. Most importantly, Thames Conservancy drawings were used in the archaeological recording of the weir and some of these are included within the figures of this report.



## 2 AIMS AND OBJECTIVES

- 2.1.1 The general aim of the investigation was to create for posterity a record of the weir prior its modernisation concentrating on the structure, construction, history and use.
- 2.1.2 More specific objectives were to:
- Investigate the paddle and rymer bays as these are archaeologically of most significance. The overfall weir is of the same date (1887) and will also form a main focus of the report
  - Investigate the buck gates and covered walkway, as these are to be removed in accordance with the programme of modernisation. More modern features, such as the Denil fish pass will form a final area of recording
  - To determine the phasing of the structure to appreciate the development of the site within its historical context
  - Overall, to gain an understanding of the operation of the weir through the recording of the extant features
  - To gain an overall understanding of the significance of the weir within the history of the subject
  - To create an ordered archive of the work to be housed in the public depository.

## 3 METHODOLOGY

### 3.1 SCOPE OF ANALYSIS

- 3.1.1 The building recording was undertaken at Level II as defined in the Royal Commission on the Historical Monuments of England (RCHME 1996). The structure was recorded in its current form before the start of works and this consisted of three principal methods: a drawn record, a photographic record and a written record. The site visit for the recording was completed on the 25th October 2004 by Jon Gill and Jane Phimester.

### 3.2 FIELDWORK METHODS AND RECORDING

#### 3.2.1 The Drawn Record

- 3.2.2 Existing elevations and plans were provided by Atkins Consultants Ltd.. Main drawings depicting the general arrangement and super-structure (1:100) (1:20) were traced onto archivally stable permatrace. Descriptive annotation was added to indicate construction, structural breaks, evidence relating to the structure's use and other features of historical interest. The recording followed IFA Standards and Guidelines using conventions outlined in *Recording Historic Buildings: a Descriptive Specification* (RCHME 1996).

- 3.2.3 Further drawings including historical plans, elevations and sections were provided from the Environment Agency archives, and these were analysed on site and compared to the existing structure. These date from 1887 and were also accessed and annotated on site to indicate construction, structural breaks and use.

#### 3.2.4 The Photographic Record

- 3.2.5 Photographs were taken using 35mm film (black and white prints, colour slides) and include general shots of structures (external and internal) and specific details. Flash lighting was used to illuminate dark interiors and a scale



used where appropriate. All films included a chalkboard indicating the film number and site code. Photographic record sheets were used to indicate the location and direction of each shot and any further detail

3.2.6 Digital pictures were also taken including general shots of structures (external and internal) and specific details. Automatic flash lighting was used to illuminate dark interiors. Digital photographic record sheets were used to indicate the location and direction of each shot and any further detail.

### 3.2.7 **The Written Record**

3.2.8 Written descriptions of the structures were made as part of the annotated drawings. Additional analytical and descriptive notes were taken as appropriate to compliment elements of the record.

## 4 **DESCRIPTION**

4.1.1 A weir is a barrier across a waterway, intended to divert a flow into an alternative channel, or to maintain a particular level along a given stretch (Trinder 1992). The Thames weirs reduce the risk of widespread flooding to properties along the river by regulating the flow of water. At each weir, gates are used to optimise available storage, thus reducing the risk of downstream flooding. It is estimated that more than 740 properties are at least partially protected via the operation of the gates at Shepperton 'B' weir during flood events (Atkins 2004).

### 4.2 **GENERAL FORM**

4.2.1 The weir is a steel and timber framed construction with a covered walkway and central gangway. In total it measures c. 50 m in length. The central part of the weir consists of seven buck gates and paddle and rymer bays to either side and overfall weirs to each side of this (Plate 1). The overfall bays are simple stepped constructions used to control water turbulence from undermining the foundations of the weir. The paddle and rymer bays consist of a series of upright posts and paddles that are used to control the flow of water. Both these sections date to the original construction of the weir in 1887 with later modifications. In 1924 a central buck gate weir was inserted with a timber gallery with hipped roof and gablet. This weir contains seven gates and has been subject to modifications, most predominately in 1955 and 1959. Presently, the gates are operated by an electric motor although a hand-winch system was previously used. A gangway runs along the centre of the structure finishing at the west end of the paddle and rymer bay and thus does not extend over the west overfall weir. The gangway was rebuilt in 1924 and 1981 and now has 'Kee-Klamp' railings surrounding its parameters. It is largely concrete (with wood planking across the buck gate section) and supported on cast iron frames. The frames are thought to date to 1887 and are shown in Figs. 5 & 6 (section CD).

### 4.3 **THE OVERFALL WEIR**

4.3.1 The overfall weir dates to 1887, the gangway was rebuilt in 1924 (at the same time as the paddle and rymer bays) (Plate 2). In 1981 galvanised steel 'Kee-Klamp' railings were added and an access gate at the east river bank.





- 4.3.2 The overfall weir flanks the paddle and rymer bays and measures c. 18.5 m in length to the east and west. The weir is stepped to prevent water turbulence from undermining the foundation of the weir by reducing the impact of the fall. Historical plans of the weir are provided in figures 5 & 6, and these illustrate the original construction of the weir. The original timber piles, sheeting and walling are extant beneath the steps and to the east of the weir as it meets the river bank. The steps are of rough concrete with concrete rubble towards the base. Four cast iron frames extend from the steps (as illustrated in Fig. 7) in a 'V' formation that appear to have been extended downstream, most probably in 1924.
- 4.3.3 The **gangway** has a concrete base with a steel frame (as shown in plate 7). A gangway has been in place since 1887 although it was rebuilt in 1924 and 1981. 'Kee-Klamp' railings surround the parameters and are bolted onto the steel frame, it is probable that these were added in 1981.
- 4.3.4 The **access** to the weir is provided at the east end of the overfall weir, through a large steel bar gate (height 8.7 m, width 4.2 m) (Plate 3). This is locked to prevent public access and was probably added in 1981 at the same time as the 'Kee-Klamp' railings. The gate is in two sections and there are three bars to each side of the centre of the gate. To the north and south there is a steel fence (to the same height) running a short distance along the riverbank. This has shorter spiked bars between the more lengthy ones to further prevent access to the river.
- 4.3.5 Two sets of steps provide further access to the weir at the south elevation. Masonry piers project to the south that have five brick steps leading up from the water and a steel ladder above on the sheer face providing access to the gangway. The weir gangway rests on these piers, that have more recently been rendered with cement above the steps. As with the remaining structure, 'Kee-Klamp' railings surround these features. The western steps are at the end of the gangway, although the overfall weir continues to the west river bank (without access).

#### 4.4 PADDLE AND RYMER BAYS

- 4.4.1 At Shepperton, the basic structure of the paddle and rymer bays dates to 1887 and are located at either side of the central buck gate weir (Plate 4). The gangway was rebuilt in 1924 and in 1981 when the 'Kee-Klamp' railings were added.
- 4.4.2 Paddle and rymer weirs (as describe in 1.2.3) are constructed from vertical timbers called rymers, against which rest wooden paddles with long handles. Historically, a wooden beam was laid on the riverbed (sometimes encased in a masonry sill) with slots 0.10 m<sup>2</sup> square and 0.60 m apart. A similar beam was then positioned over it above the water level. This beam, which was fixed to the bank or part of the weir, was removable in some way. Squared vertical timbers (0.10 m<sup>2</sup>) were then fixed into the slots in the lower beam with their tops resting on the upper beam. A series of boards 0.60 m wide and 0.90 m deep, attached to long poles were then placed against the rymers to hold back the water, these were called 'paddles' The paddles would be removed one by one over a width of about 6 m, there would usually be about ten sets of paddles (River Thames website).



- 4.4.3 At Shepperton, the length of the east and west paddle and rymer bays are c. 8 m (Plate 5). The east bay contains twelve sets of paddle and rymers, with only ten extant to the west. The rymers are square in section and timber, measuring 0.9 m<sup>2</sup> and 3.04 m in length. These are spaced at 0.57 m intervals and pulled vertically upright by iron bars on each side of the timber post (Plate 6). They are reinserted by placing the post at a roughly 45 degree angle and then pulling it towards the body to fit into the shoe. At the western bay there are only ten such posts, presumably due to the removal of two posts in 1987 to allow for the Denil fish pass. Paddles are extant at each side of the rymers, these have smaller hexagonal handles (0.05 m in diameter). They are operated by wriggling the handle upwards so that it could be removed.
- 4.4.4 A horizontal timber is extant along the length of the bays at the height of the gangway. Smaller sets of timber are attached to this thus creating trenches into which the rymers are placed (as shown in plate 6). The paddles rest against these lengths of timber. The paddle and rymers are further held in place by a timber locking bar that is rotten. These are in turn held by open steel brackets so that the locking bar can be lifted as necessary.
- 4.4.5 The **gangway** is of the same construction as the overflow weir and also dates to 1887. It was rebuilt in 1924 and 1981 (Plate 7) and has a concrete base encased in a steel frame to which the sections of wood holding the rymers are directly attached (as described in 4.4.4). It is thought that originally the gangway was wooden. 'Kee-Klamp' railings surround the gangway and are bolted onto the frame. It is probable that these were added in 1981. The gangway is held by two cast iron frames extending in a 'V' as illustrated in Fig. 7. The frames have been extended downstream and it is thought that the gangway was also extended at this time. The exact date of this extension is not certain, although they are first shown on drawings dating to 1981 (Fig. 7). It is therefore probable that the alteration occurred at this time. These sit on four concrete steps also extending downstream. Contemporary plans show that there is a rough bed and universal piles lying beneath the steps (Fig. 4).
- 4.4.6 The **storage areas** for the paddles and rymers extend unsupported from the weir gangway and consist of a square platform (Plate 8). Two such platforms are evident, one at the beginning of the east section of paddle and rymer bay and one at the end of the west section. The floor is a metal grill overlying a galvanised steel base, and 'Kee-Klamp' railings also surround the area. Lamp posts (presumably installed in 1959, at the same time as the electric buck gate motor) are situated in the corner of each of the platforms. A former paddle rack was also evident at the east of the weir, lying beyond the entrance gate (Plate 9).

#### 4.5 BUCK GATE WEIR

- 4.5.1 In 1924, a central buck weir with seven gates was constructed and these were replaced in 1955 with new buck gates. The gates were originally operated by a hand-winch which was replaced with an electric motor (probably in 1959).
- 4.5.2 A **gallery** extends the length of the buck gate weir (c. 13 m) (Fig. 8). The roof (hipped with gablet) is clad in oak shingles, and was originally supported on scissors braces that were nailed to the principle rafters (Plate 11). A faint trace of the braces survives to the east of each principal and there is one small extant truncated stump visible. It is possible that these were removed in the 1950s when new gates were installed and the winch was changed and operated



by electricity. At this time the current steel frame and rail were inserted (see 4.5.4). The gallery has common rafters (0.10 m by 0.50 m) and the timber canopy frame has a simple tenoned construction. The posts meet the wall plate and the brace to the post. At the south elevation, wooden balustrading runs the length of the gallery with five bars spaced between eight posts.

- 4.5.3 The **gangway** of the buck weir has wood board flooring that sits on timbers orientated north/ south. These sit on galvanised steel girders and below this the eight weir supports are triangular frames and extend down to the concrete weir steps below (as illustrated in Fig. 9).
- 4.5.4 These seven buck weir **gates** are wood and iron and situated on the north elevation measuring 1.63 m in width (it was not possible to measure the length of the gates) (Plate 12). The gates sit in a steel frame with guide slots and are lowered with the use of chains. There are eight steel posts projecting from the horizontal plate running at the top of the gate frames (Plate 13). The posts are later in date (presumably added in the 1950s) and bolted to the earlier gate frame (thought to date to 1924). The posts project diagonally to the south and then vertically towards the gallery roof. A horizontal post projects to the north from the top of the post and this is bolted to the rail (running east/ west) that carries the electric motor (Plate 14). Large chains and a hook hang from the motor and attach to similar chains and hooks on the gates (Plate 15). At the south of the rail are two smaller rails that sit just below the peak of the roof. These carry the electric wires for the motor as it moves between the gates (also visible on plate 14).
- 4.5.5 An additional winch system is extant at the west of the overhead rail (Plate 16). This is a system of two pulley wheels holding a series of chains and a large hook that would be used to operate the weir gate. This is later in date (probably 1959) and is attached to the same rail as the motorised system. The exact purpose of this secondary winch system is unclear, although it is probable that this is used to operate the gates in the case of a power cut.
- 4.5.6 A handwinch previously operated the gates (prior to the introduction of electricity at the weir) (Fig. 10). There remain extant grooves in the weir floor in which the winch handle and mechanism would have moved along the gangway (Plate 17). The horizontal platform of the gate frame has fifteen imprints from former vertical bearers which can be divided into two sets. The first set corresponds to each vertical post, and there are two holes on each side of the posts (Plate 18). The second set is situated between the vertical posts and directly overlie the buck gates. The imprint is 0.32 m in length and the full width of the platform (0.20 m) and grey paint is extant to the east and west of this area. At the north there are four bolt holes; the inner two contain sawn off bolts. The outer two have been reused and contain a nut and bolt holding a chain. The chain is further held by a hook just to the west and this in turn holds the weir gate in position. It is thought that this area once housed the pulley wheel used in conjunction with the hand operated winch system (Plate 19).
- 4.5.7 The hand-winch mechanism is illustrated in Thames Conservancy drawings dating from 1924 as shown in Fig 11/ section A-B. The winch mechanism moved along the gangway on two wheels, as each gate required lowering or heightening. A wheel would have been situated above each gate into which a winch handle would be keyed. A chain would be attached to the hook on the weir gate and through the pulley wheel. A second handle (pointing downstream) would then be rotated thus allowing the gate to be heightened and lowered.



- 4.5.8 Modern strip lights are housed within the gallery and these are situated on the south side of the roof.
- 4.5.9 The Denil **fish pass** dates from 1987 and is located at the west end of the west paddle and rymer bay. An open ended concrete passage projects south from the south elevation, which slopes down from the face of the weir. The pass has wooden baffles equally spaced along the slope. The fish pass has a steel gate that is operated by an electric actuator above the pass. As this structure is so modern, archaeologically it is of less importance and its relevance is in its impact to the west paddle and rymer bay. This now houses 10 rymers and it is thought that it previously contained twelve. It would therefore have been equal to the east paddle and rymer bay.

## 5 DISCUSSION AND INTERPRETATION

- 5.1.1 Weirs have formed an integral part of British's waterways and are often part of a larger historic river landscape including locks and auxiliary buildings (as at Shepperton). They have not only formed a functional purpose in controlling rivers but are able to give an insight into the wider archaeology of an area. Weirs, for example, are often found at the site of textile or paper mills and as such provide an indication of the localities industrial heritage. Paddle and rymer weirs date from the 13th century and there are now thought to be only thirteen remaining on the River Thames.
- 5.1.2 The relatively rarity of paddle and rymer weirs means that Shepperton 'B' weir is of significant interest. The weir did not operate as a flash lock but was used solely to control the flow of water. It has been subject to later modifications but the main features of the site remain extant. The overfall weir is of the same date although such structures are more common and as such are archaeologically of less importance. The buck gate weir has also been subject to much later modification. The gates and hand winch were removed and replaced in the 1950s, and although evidence survives relating to the former operation, these are archaeologically of less interest.
- 5.1.3 The advent of alternative modes of transport as well as the reduced reliance of water as a source of power has gradually decreased the importance of weirs. The exception is the large number of weirs that form an integral part of Britain's waterways. Shepperton 'B' weir provides flow and level control, both for navigation and flood defence purposes. As such, while the weir is of significant archaeological interest, its modernisation is fundamental to the operation of a navigable river system.



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**Websites**

River Thames website <http://www.the-river-thames.co.uk/locks.htm>

**Unpublished references**

- Atkins (2004) Shepperton 'B' Weir - Archaeological Recording
- Oxford Archaeology (2004) Shepperton 'B' Weir - Written Scheme of Investigation



## 7 SUMMARY OF SITE DETAILS

**Site name:** Shepperton 'B' Weir, Surrey

**Site code:** SHEWBS

**Type of evaluation:** Building Investigation

**Date and duration of project:** October -November 2004

**Location of archive:** The archive is currently held at OA,  
Janus House, Osney Mead, Oxford, OX2 0ES.

### **List of Archived Items:**

Two films of 35mm photographic negatives (black and white prints)

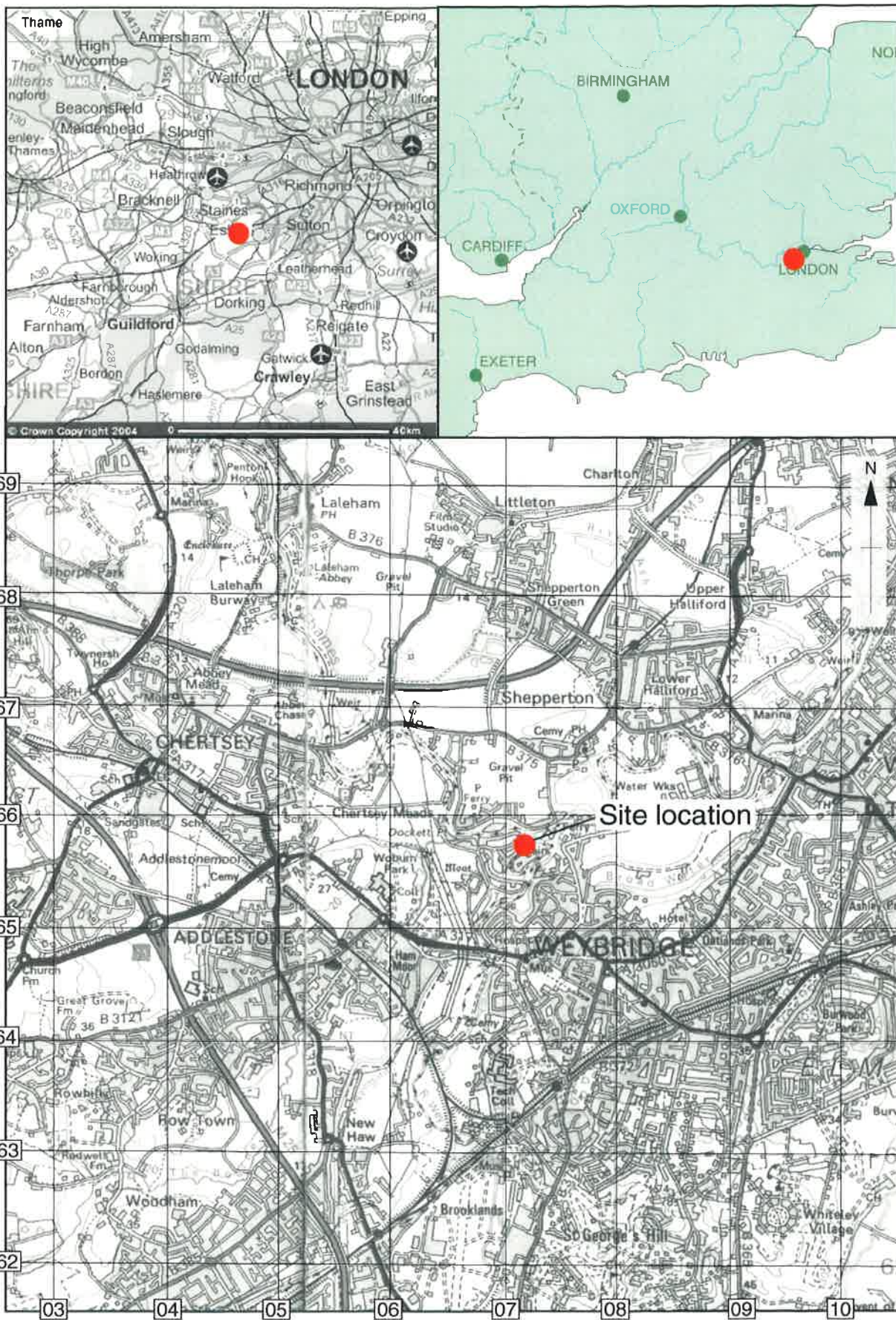
Two sets of black and white photographic prints (contact sheets)

Two films of 35mm colour slides

A copy of the current report

Original site drawings to permatrace

Descriptive notes



Scale 1:25,000

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Figure 1: Site location



Figure 2: Site plan (reproduced from Thames Heritage Audit)



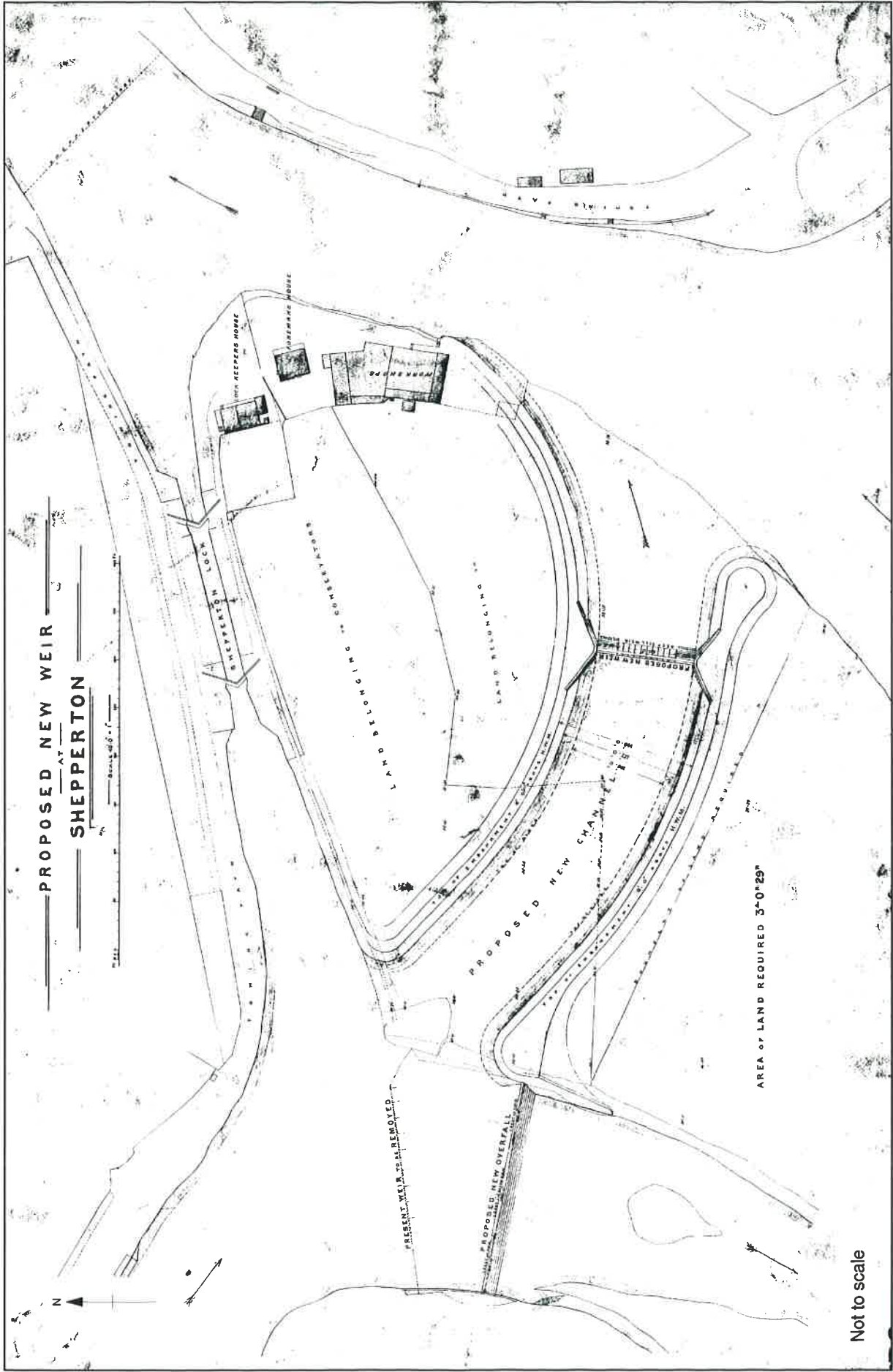


Figure 3: Plan showing proposed location for new 'B' weir and channel (Environment Agency 1887 EHG02732/01)

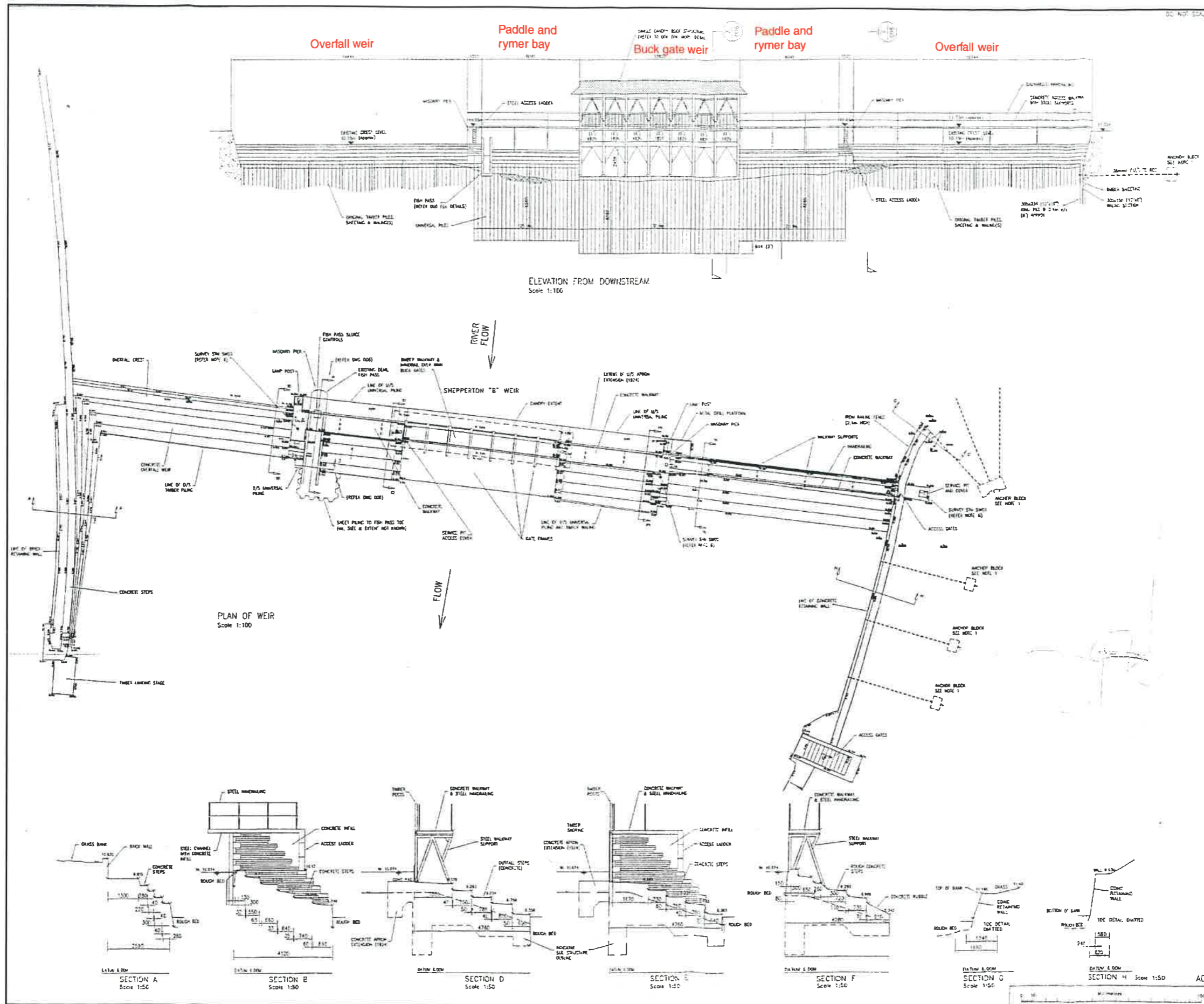


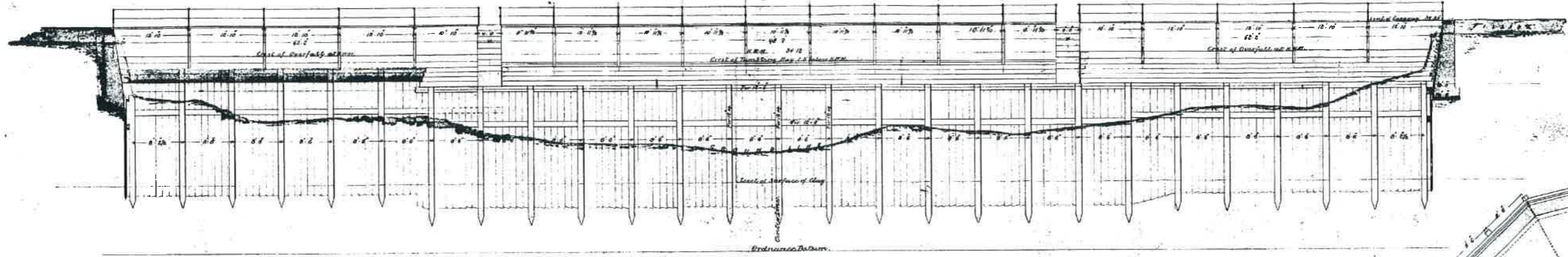
Figure 4: General arrangement of existing structure (supplied by Atkins)

67

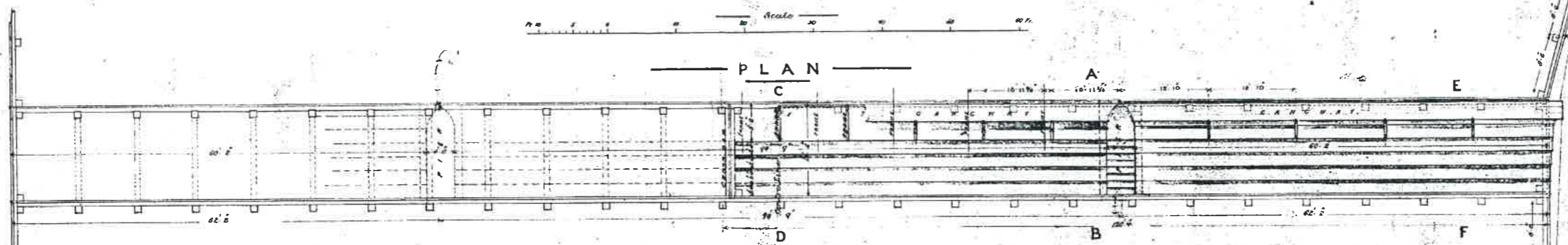
# SHEPPERTON WEIR

## TUMBLING BAY

### ELEVATION



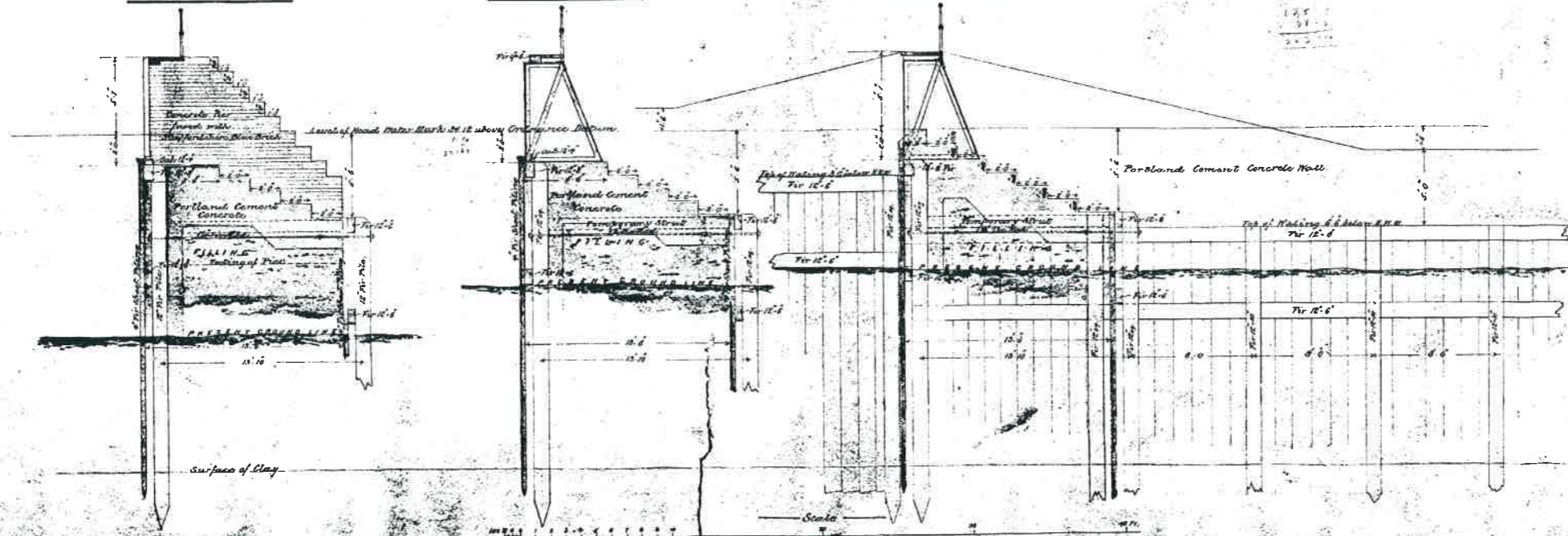
### PLAN



### SECTION AT AB

### SECTION AT CD

### SECTION AT EF



732 /s

9

Copy to Kinton 1-8-87

Figure 5: Tumbling bay elevations and plan (1887)

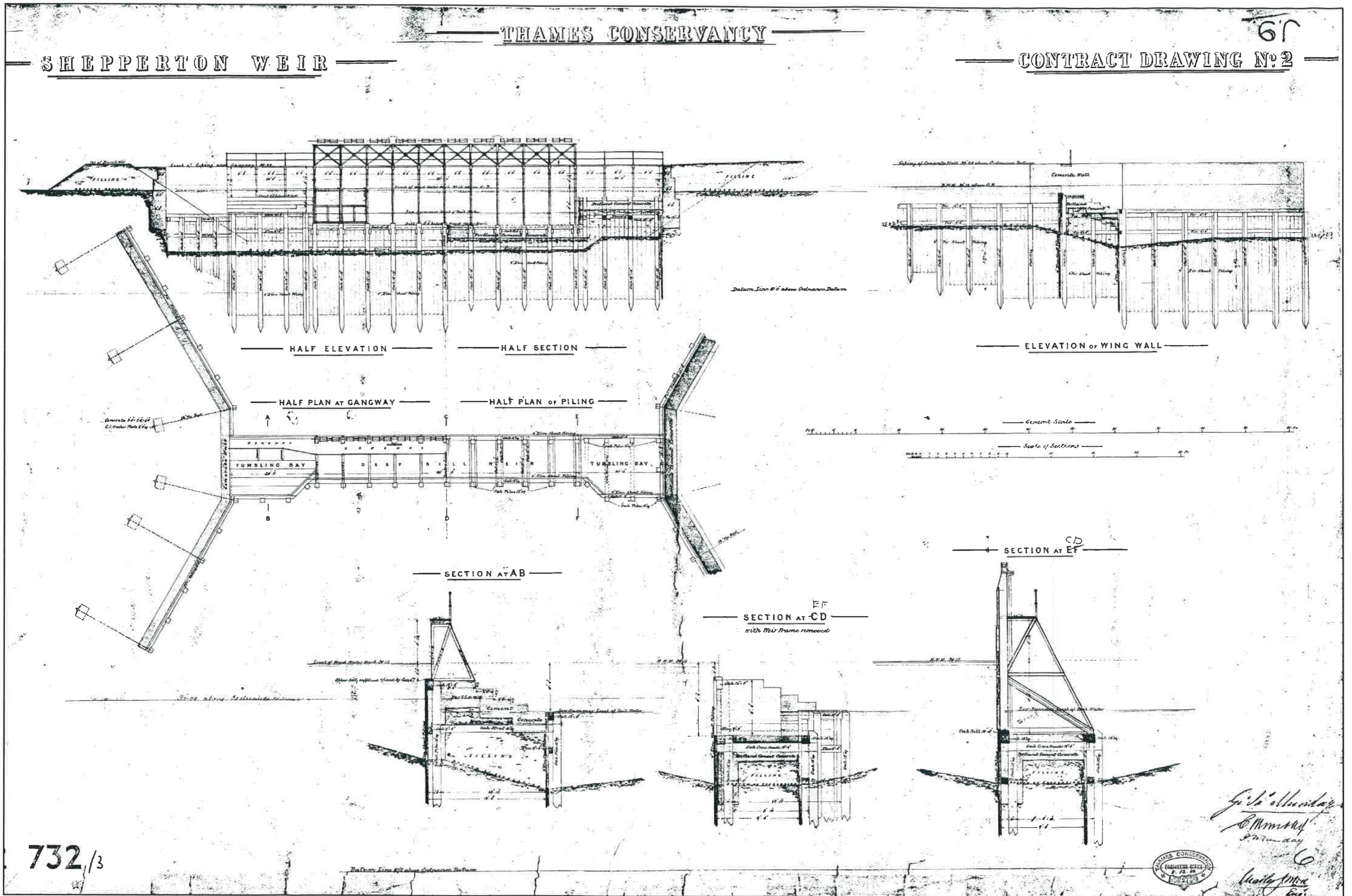
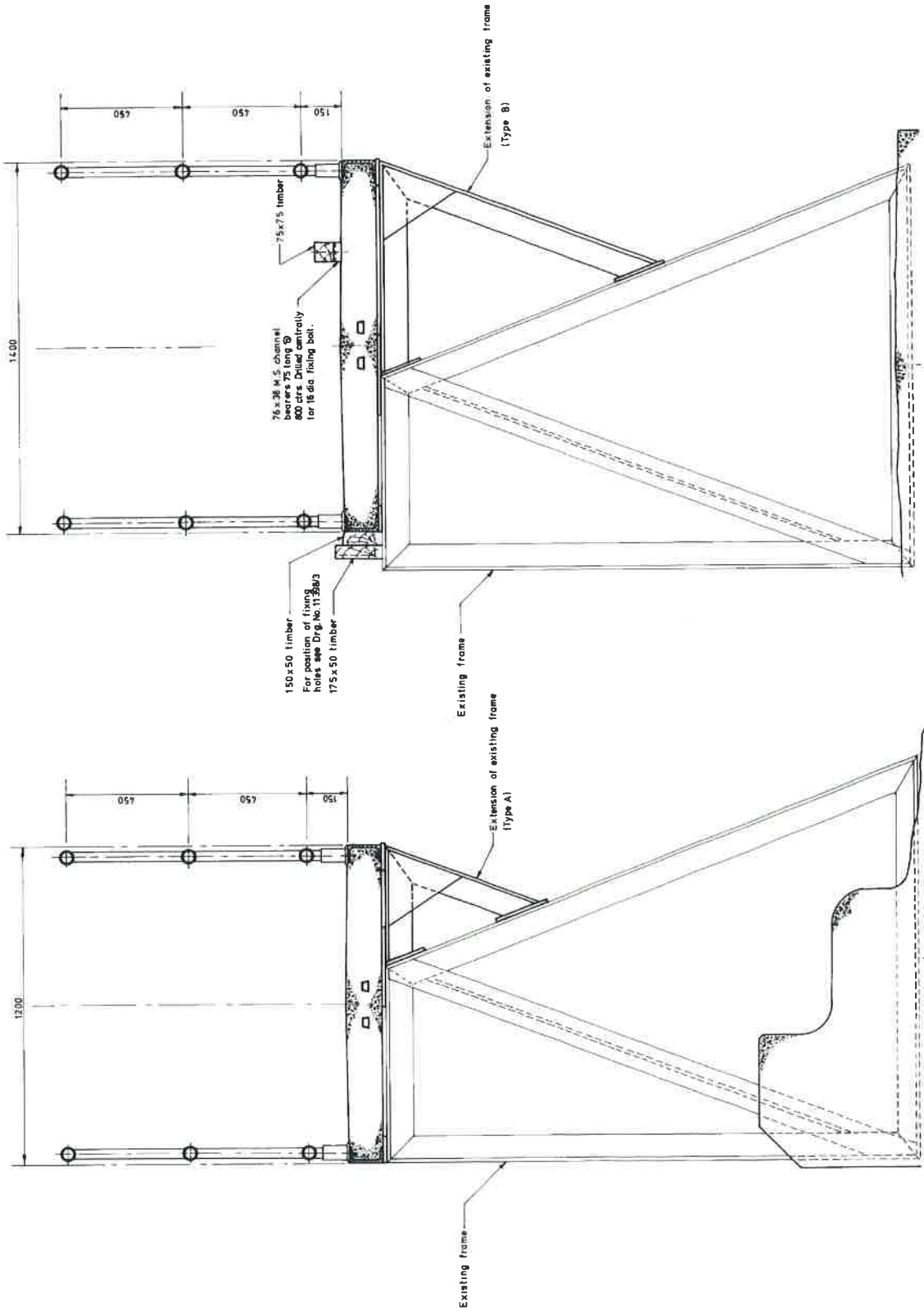


Figure 6: Elevations and plan of 'B' weir (1887)



Gangway frame at paddle and rymmer bays

Gangway frame at overfall weir



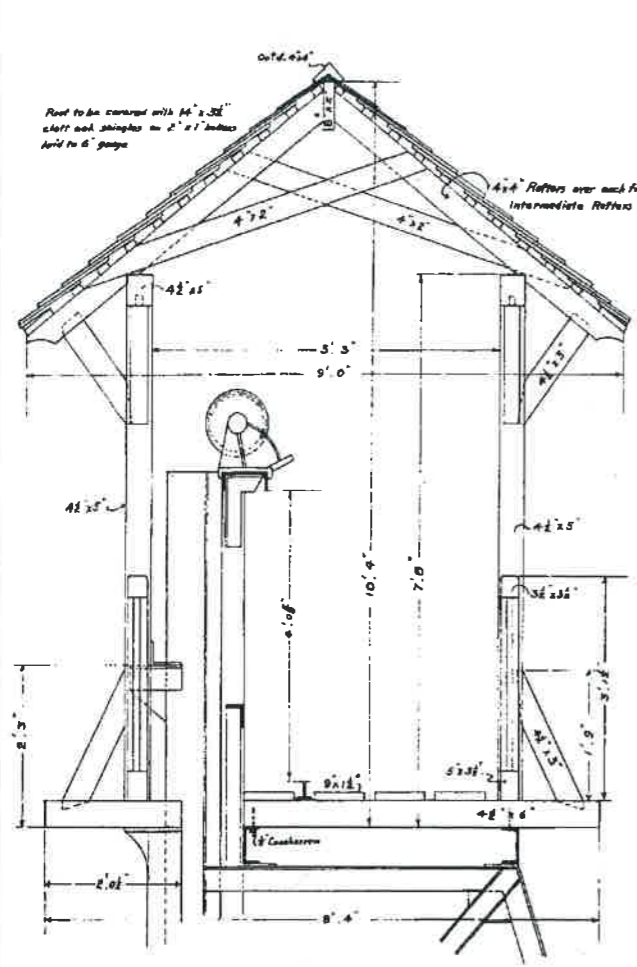
1:10

Figure 7: Detail of gangway frames (overflow weir and paddle and rymmer bays)

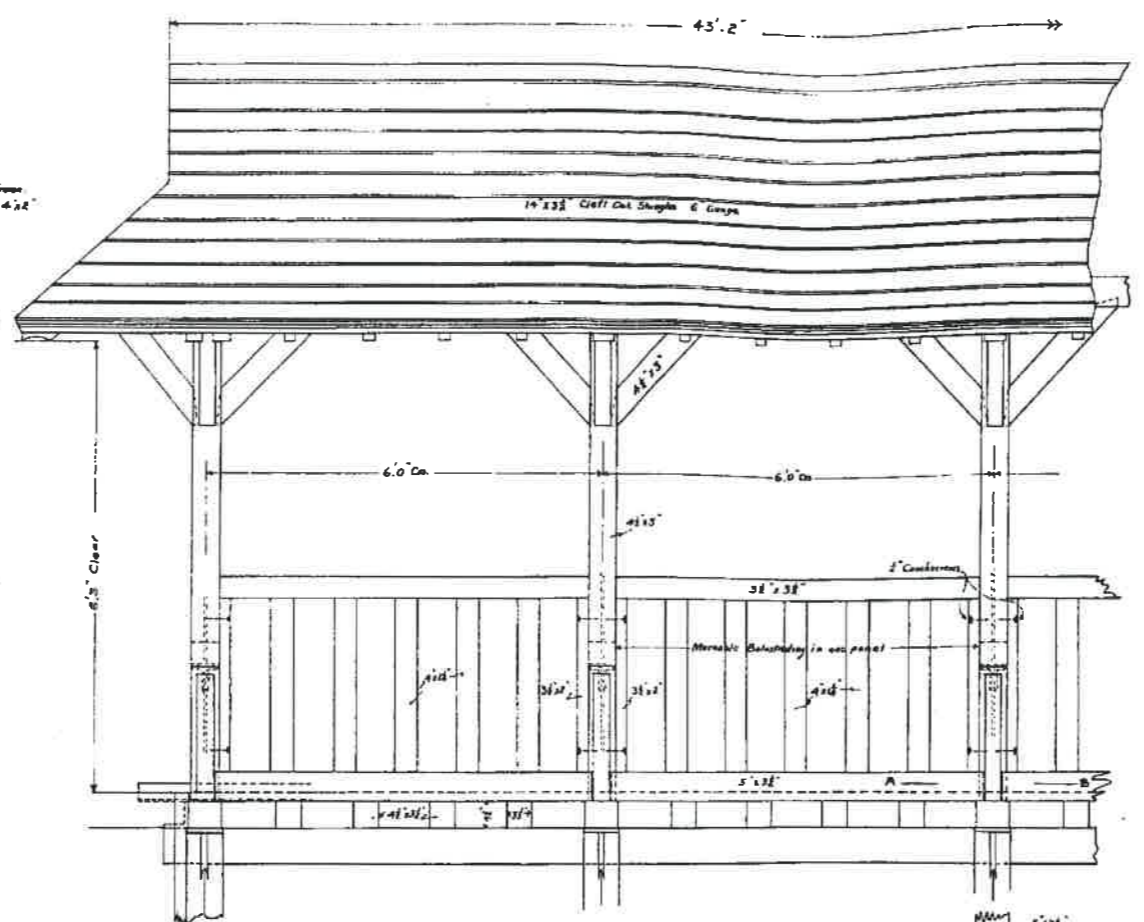
# THAMES CONSERVANCY

# ENLARGEMENT OF SHEPPERTON WEIR DETAILS OF GALLERY

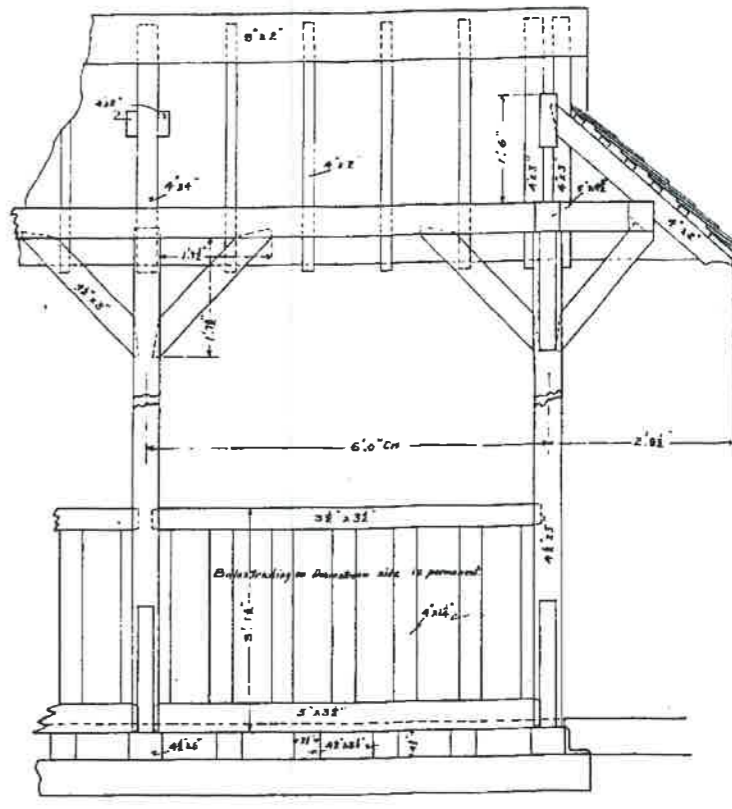
# DRAWING No. 9



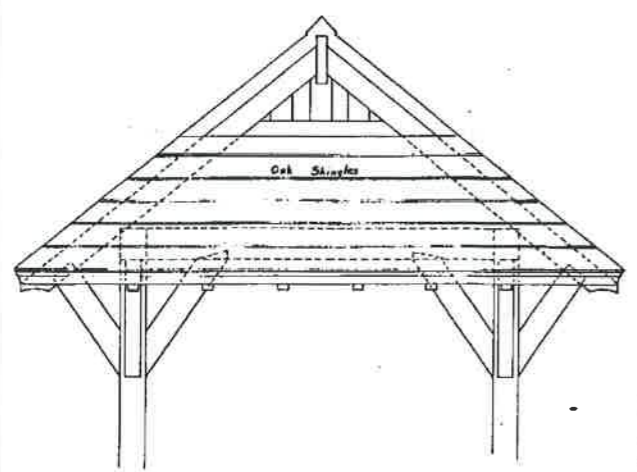
SECTION



ELEVATION LOOKING DOWNSTREAM

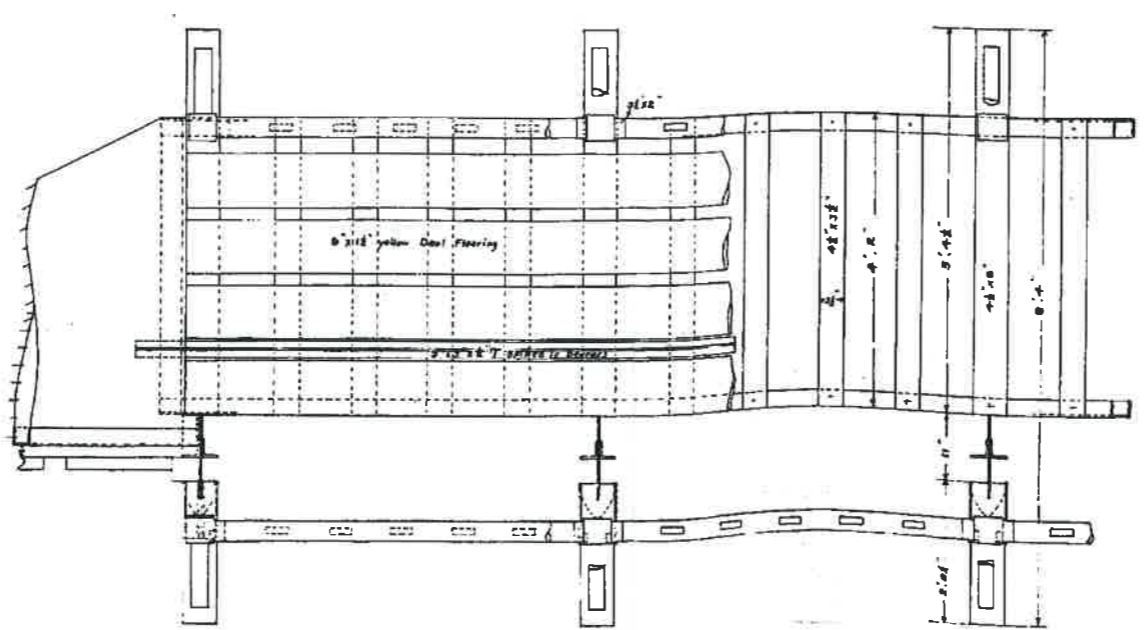


ELEVATION AND ROOF SECTION  
LOOKING UPSTREAM

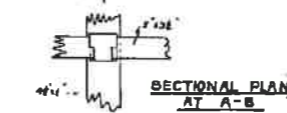


END ELEVATION

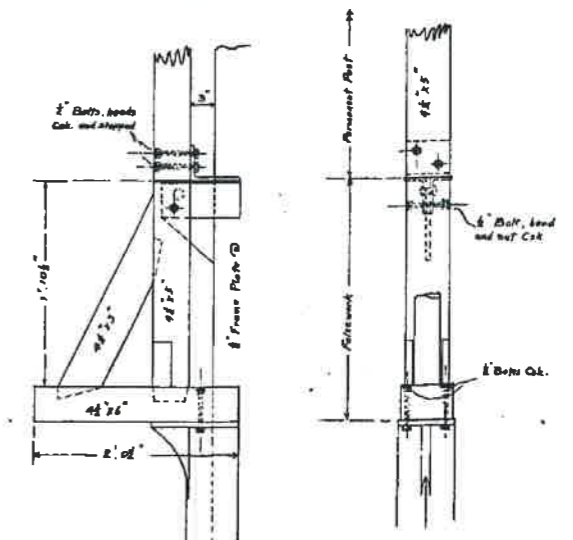
Scale:- 1" = 1' 0"



SECTIONAL PLAN



SECTIONAL PLAN  
AT A-B



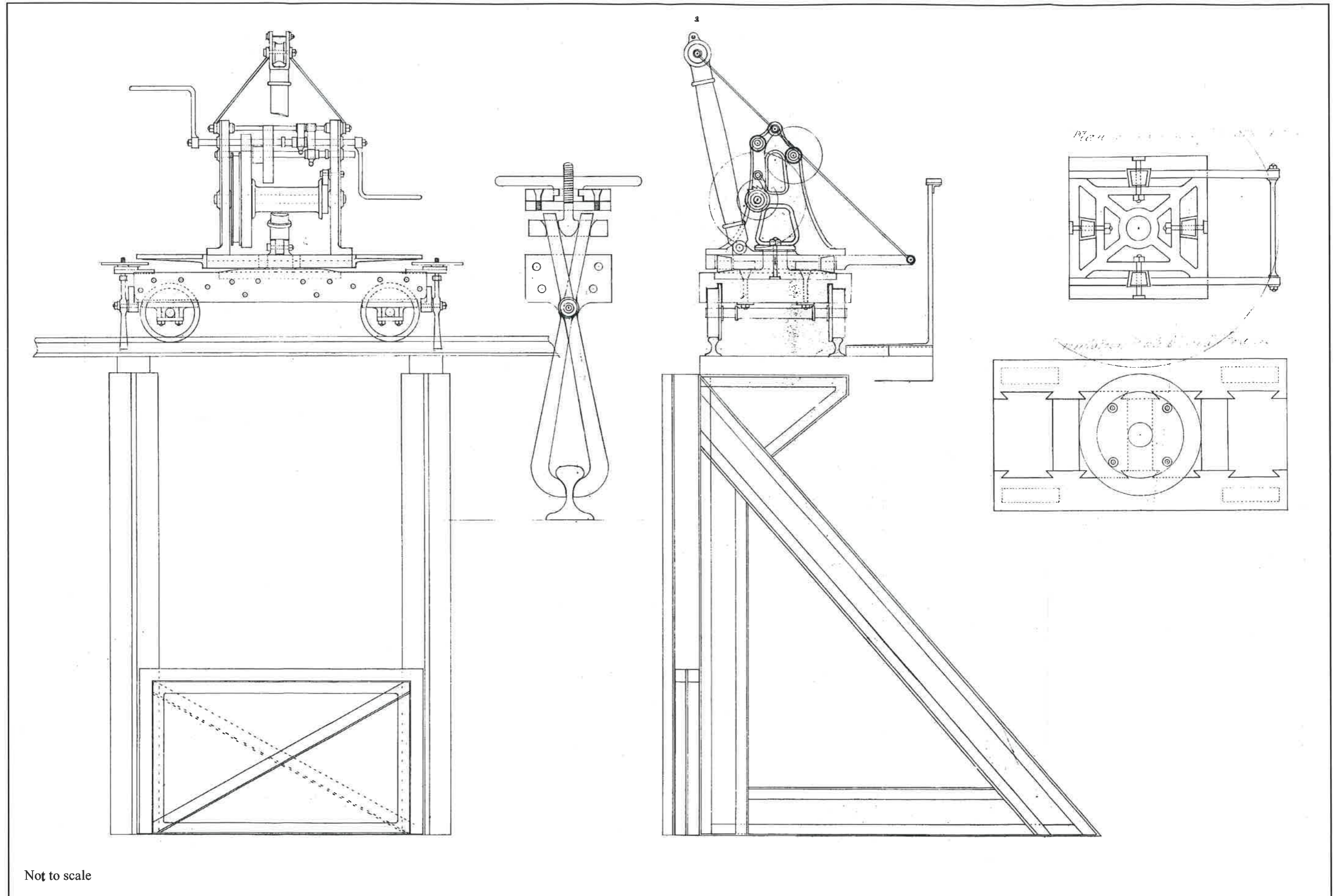
DETAIL OF FALSE BASE OF UPSTREAM POSTS  
Scale:- 1/2" = 1' 0"

Note: On the upstream side, the bulwark and base of posts are movable to allow the gates to be raised and lowered. These movable parts are shown hatched.

2733/8  
JAN. 1924.

Figure 8: Detail of buck gate weir gallery (1924)





Not to scale

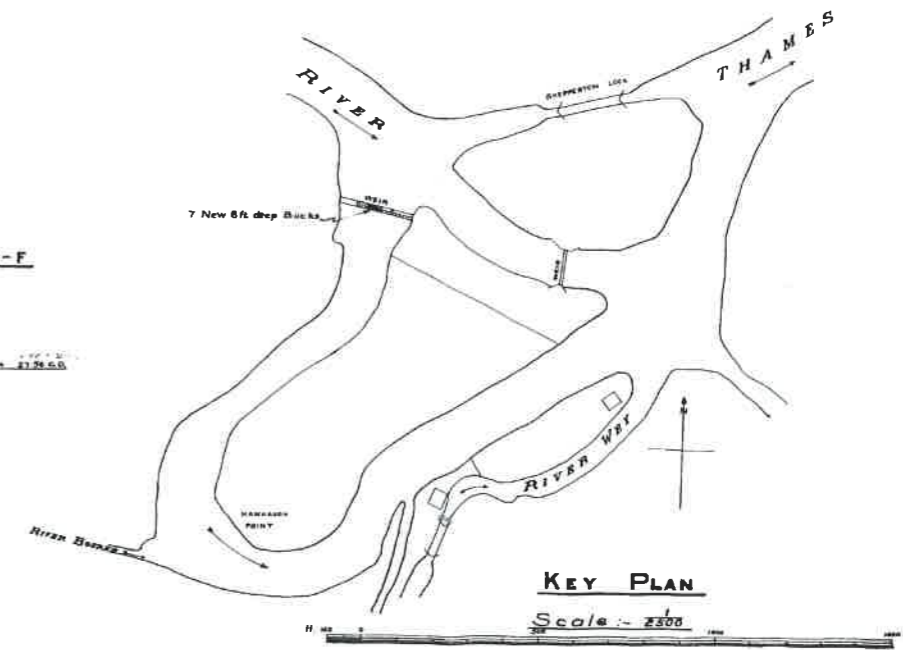
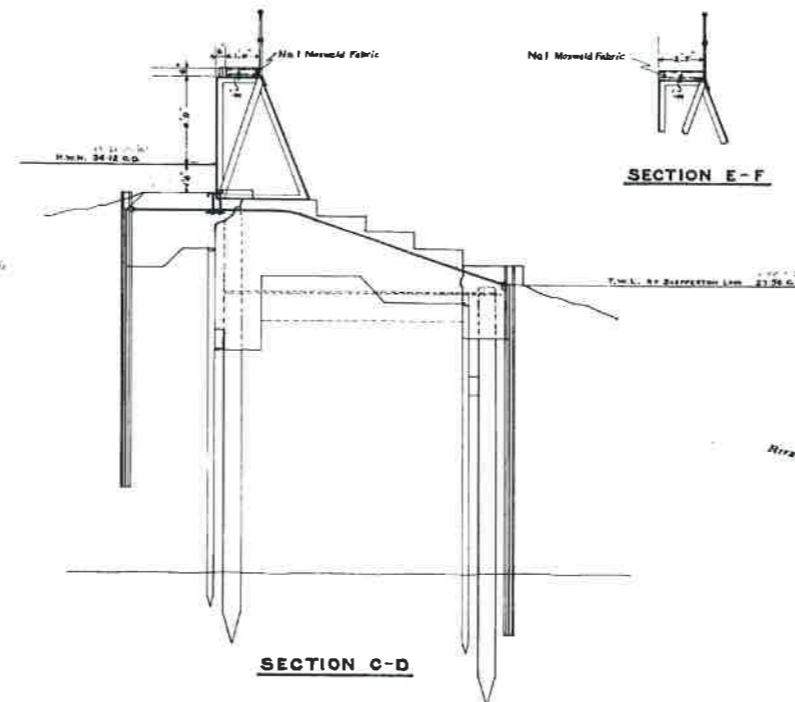
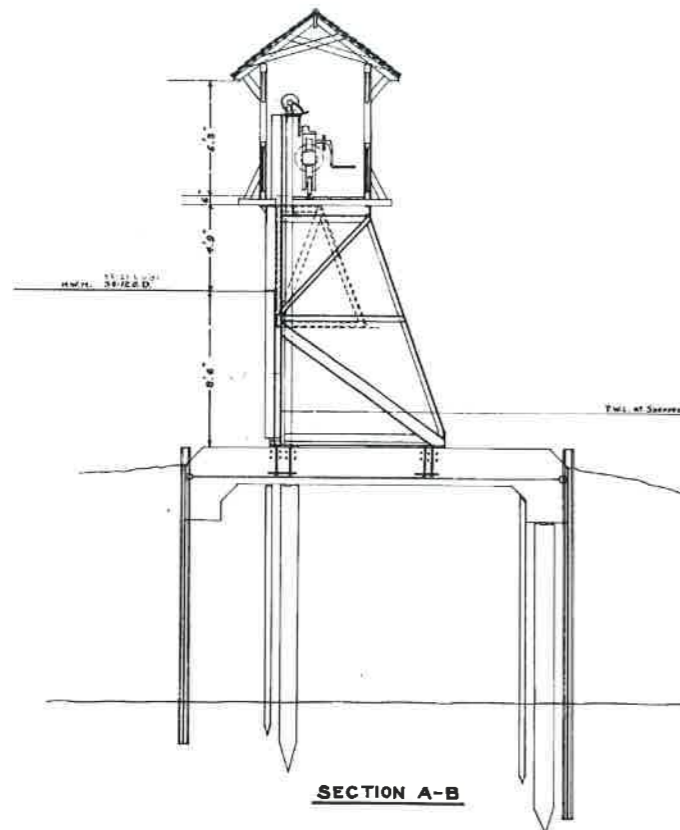
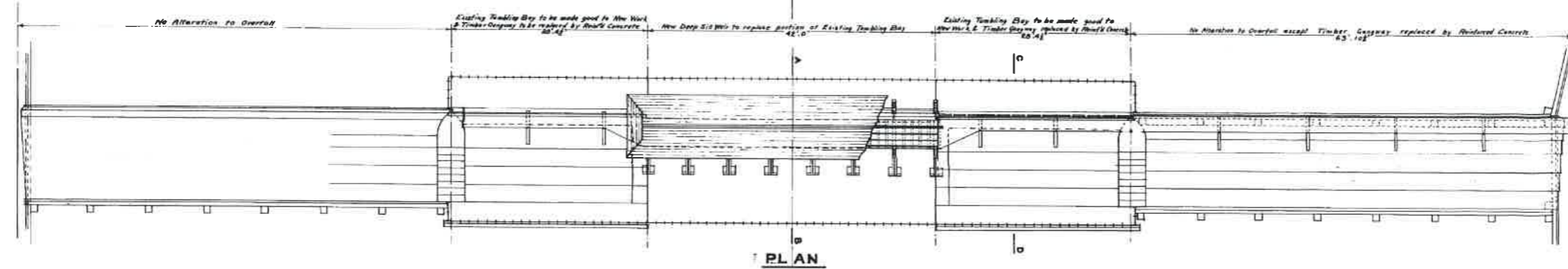
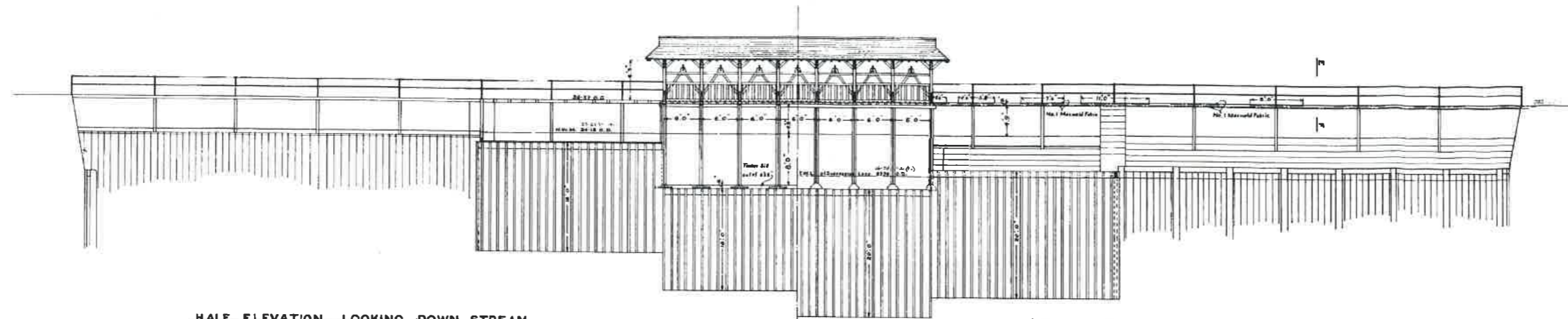
Figure 10: Detail of buck gate weir hand-winch system (date unknown)



THAMES CONSERVANCY

ENLARGEMENT OF SHEPPERTON WEIR  
GENERAL DRAWING

DRAWING No. 1



JAN. 1924.

2733/1

Figure 11: Plan and elevations of 'B' weir (1924)



Plate 1: North-west view of Shepperton 'B' weir



Plate 2: East view of east overflow weir



Plate 3: West view of weir access gate



Plate 4: North-west view of east paddle and rymmer bay



Plate 5: West view of east paddle and rymer bay



Plate 6: South-west view of east paddle and rymer bay



Plate 7: East view of west paddle and rymer bay gangway



Plate 8: South-west view of east paddle rack



Plate 9: Former paddle rack east of 'B' weir



Plate 10: West view of masonry pier



Plate 11: South-west view of the buck gate weir gallery roof



Plate 12: North-east view of buck weir gate



Plate 13: North-east view of buck gate weir gallery



Plate 14: North-east view of buck gate weir electric motor



Plate 15: East view of chains overhanging buck gates



Plate 16: West view of additional buck gate winch



Plate 17: West view showing grooves in gangway floor for operation of hand-winch



Plate18: North-east view showing holes relating to former hand-winch system



Plate 19: North view showing holes relating to former hand-winch system



Plate 20: Aerial view of Larinier fish pass



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