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Sewage Works between the Southern Toll-House, Menai Suspension Bridge, and the Antelope Inn

GAT Project No. 1811

Report No 553
October 2004

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust
Craig Beuno, Ffordd y Garth, Bangor, Gwynedd LL57 2RT

Sewage Works between the Southern Toll-House, Menai Suspension Bridge, and the Antelope Inn, Gwynedd

GAT Report No. 486

October 2004

Prepared for Daniel Ltd

by

David Longley

Gwynedd Archaeological Trust were contracted to undertake a watching brief on sewage pipe-work operations between the southern toll house of the Menai Suspension Bridge and the Antelope Inn and on the adjacent shoreline during November 2003.

Thanks are due to the on-site team from Daniel for facilitating this recording during the progress of the works.

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Summary

The Menai Suspension Bridge carries the A5 London-Holyhead road across the Menai Straits at Treborth-Porthaethwy (later to become known as Menai Bridge) some 2.5 km south west of Bangor. The bridge and its surviving toll house on the southern shore were built between 1818 and 1826. The adjacent Antelope Inn was built at about the same time. Gwynedd Archaeological Trust were contracted to undertake a watching brief on sewage pipe-work operations between the toll house and the Antelope Inn and on the adjacent shoreline during November 2003.

The watching brief recorded a previously unknown stone-built culvert, contemporary with the bridge and set beneath the causeway of the A5 as a storm drain. The inclined track bed of a horse-railway, constructed in 1818 to facilitate the movement of building stone from a quay on the shoreline to the higher levels of the bridge building site was also identified and pipe-work in the vicinity was monitored.

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Introduction

The watching brief, methods and techniques
The watching brief conforms to the IFA guidelines as given in Standards and Guidance for an Archaeological Watching Brief (IFA 1994, revised 1999). In the latter a watching brief is defined as " formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area of site ... where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive'.

The objective of this programme of archaeological works was to create a record of any archaeological deposits or structures that may be revealed through on-site works.

Desk-top Study
Archive maps, aerial photographs and other documentary sources were consulted in the Gwynedd Sites and Monuments Record, the Gwynedd Archive Office, Caernarfon, and the library and archives at the University of Wales, Bangor. Listed Buildings Records and Scheduled Ancient Monument Records were checked. Documents and maps used in this report are listed in the bibliography.

I am grateful to the staff of the County and University Archives at Caernarfon and Bangor for access to relevant documents.

Existing statutory protection
The site subject to the current development proposal does not fall within a Conservation Area or other comparable designation.

Scheduled Ancient Monuments and Listed Buildings
There are three Listed Buildings and features within or immediately adjacent to the area of development as follows.

RCN 2185
Cadw Reference 42/A/108(I); 4049
NGR 255500 371600
Menai Suspension Bridge Spanning the Menai Straits (including Toll House). Grade I
Built 1818 to 1826 by Thomas Telford. This bridge completed the London to Holyhead Turnpike Road. The site was chosen because of its steep banks enabling the erection of a high bridge to satisfy the Admiralty's requirements. Opened 30 January 1826 - 100ft high, 28ft wide roadway and with a single suspended span of 579ft. Strengthened 1938-40 by Sir Alexander Gibb. Coursed rubble Penmon masonry with ashlar facings to the tapered suspension towers or 'pyramids' from which the deck is hung on a system of 16 chains (originally iron, now steel) with pins. At the mainland end the suspending members are taken into the former Toll House, a low storey classical ashlar faced building with channelled rustication to ground floor.

Cadw References 42/A/109(I) and 42/A/110(I); 4050 and 4051
NGR 255700 371200
Railings,including the gate at the mainland end of the Menai suspension bridge. Grade 2
Section of railings beginning at the wrought iron gate at right angles to the tapered pier at the end of the bridge parapet on the west side continued along the road as far as the brick garden wall of the Lodge Cottage. Also railings beginning at the wrought iron gate beside the former Toll House and continuing down to the rubble wall opposite the Lodge Cottage. Said to have been originally on the bridge. Characteristic Telford designed gate with radiating metal ribs and trellised gate posts; the railings are also of trellised design. Group value with the Menai Suspension Bridge.

Cadw Reference 42/A/117(I); 4058
NGR 255800 371200
Antelope Inn, Holyhead Road. Grade 2
Immediately at the south end of the Menai Bridge; above the road and set in the slope. Also entered from Treborth road NW side. Possibly built shortly after the bridge was opened in 1826 with latter additions. Group value with Menai Suspension Bridge and attached railings.

SMR search
There are no archaeological sites on the Regional Sites and Monuments Record which extend into the area of the development proposal other than the Listed Buildings referred to above.

Fieldwork
This was undertaken during November 2003. Four new sites or features, contemporary with the building of the suspension bridge between 1818 and 1826, were identified and have been allocated Primary Record Numbers as follows:

PRN 18381 *Site of horse tramway* (255751 371288)
PRN 18382 *Site of stables* (255795 371320)
PRN 18383 *Site of quay* (255810 371370)
PRN 18384 *Culvert under A5 embankment* (255820 371260)

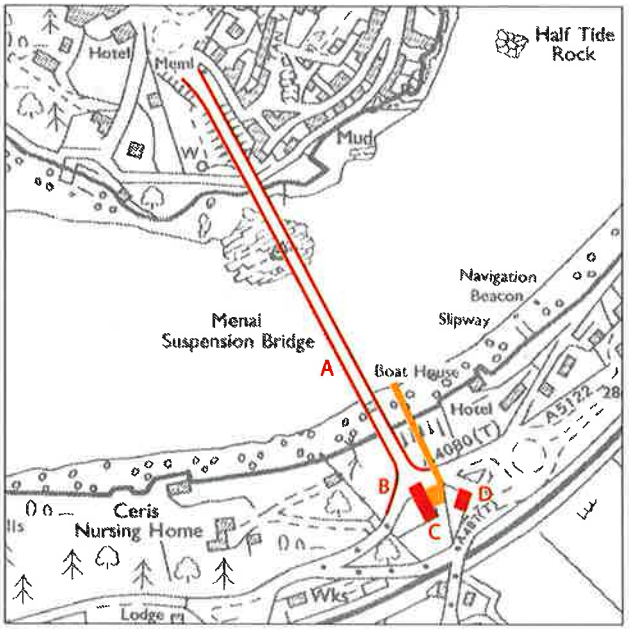

Fig 1. The local context of the watching brief

The listed buildings - the Menai Suspension Bridge and the bridge railings (A and B), The Bridge Toll House (C) and the Antelope Inn (D) are highlighted in red. The area of the watching brief is shown orange

Fig 2. The aerial photograph clearly shows the route of the old road from Penrhos Garnedd to the Porthaethwy Ferry, running obliquely from the southern edge to the north-eastern corner of the frame. (©Getmapping)

Archaeological and historical background
Menai Bridge

For centuries, travellers between Anglesey and the mainland crossed the Menai Straits by ferry. At Treborth – Porthaethwy (later to become Menai Bridge) there existed an important crossing place served, during the 18th and 19th centuries, by no less than four ferry routes. During the 18th century an improvement in roads, both on Anglesey and along the north Wales coast, contributed to an increase in wheeled traffic and the ferries began to experience their busiest period. It would appear, however, that the operators were not up to the challenge and several complaints of delay and overcharging were raised. In January 1801 the Act of Union with Ireland was passed, increasing the pressure for good communications between London and the port of Holyhead. Designs for an alternative to the ferries were submitted by the engineers, Rennie in 1802, and Telford in 1811. However, it was not until 1817, at which time Telford was actively at work on the London – Holyhead post road, that Telford's adventurous and innovative design for a suspension bridge over the straits was approved. An important consideration in the design at, the requirement of the Admiralty, was that the bridge should not impede navigation of the straits by tall ships. The bridge, in consequence, was built with a clearance of 100ft above high water.

Work began in 1818. Workshops were established, building stone was sourced (Penmon limestone), foundations were levelled and quays were established and cranes erected.

The first stone was laid on the Anglesey side in August and work began on the large pier on the Caernarfon side in October. Coffer dams were employed to allow good rock to be found for the foundations, 6ft below low water.

Boats brought stone from the quarries to the quays at the construction site and a horse-railway brought stone from the quays to the arches, the trackway rising higher as the height of the arches increased.

The bridge was opened on 30th January 1826. Toll houses were placed at each end of the bridge. That on the Caernarfonshire side extended south to accommodate the suspension chains as they passed from the main pier on the Caernarfonshire side to their anchor points in tunnels cut into the solid rock.

Before the route of Telford's London to Holyhead road, the present A5, had been surveyed and before the suspension bridge was built, the main roads which traversed the Caernarfonshire shore of the Menai Straits in this area were those which converged on the ferries. The principal route south-west from Bangor, in the direction of Caernarfon, rose up from the valley of the Adda and along the ridge of Penrhos Garnedd towards the Vaynol Estate.

A spur from this road turned northward crossing Ffriddoedd down to Bangor Ferry and the George Hotel, a coaching inn built in the late 18th century. Before reaching the George, this road forked west to the shoreline and the Porthaethwy Ferry, which crossed to the Cambria Inn on the Anglesey shore. From the south-west, the Caernarfon – Bangor road took a spur northward to the shoreline at the same location, some 400m north-east of the suspension bridge.

The only structure of note recorded on the Caernarfonshire shore in the near vicinity of the bridge construction site in the late 18th century are those concerned with the operation of the ferries, at the George Inn and Porthaethwy Ferry and Treborth Mill, immediately west of the bridge site. The Antelope Inn appears to have been built at about the time the bridge was under construction. It is marked on W.A. Provis' survey of around 1820, published in 1826. The Inn sits at the junction of the old road from Penrhos Garnedd and Telford's new road from Bangor to the bridge.

The Penrhos Garnedd road ran obliquely across the slope to the shoreline. The new Bangor road met the bridge at right angles, parallel with the contour, cutting the Penrhos Garnedd road. In consequence the Bangor road required to be terraced out and revetted on the downslope (seaward) side to a height of up to 9 m of made up ground. During the course of the present pipework operations and archaeological watching brief, a stone built culvert was identified, running under the terraced road and emerging at the base of the revetment. It is probable that this culvert was built at the time of the road and bridge construction as a storm drain.

The ferries ceased to operate after the opening of the bridge in 1826 and the road down to the Porthaethwy Ferry from the point where it is crossed by the A5 now serves, for a short distance, as access to private housing and for the remainder of its length as a little used, overgrown, unmade track.

Archaeological Watching Brief

Gwynedd Archaeological Trust were contracted to undertake a watching brief on excavations for pipework in connection with sewage pumping works and storm water overflow in the area between the Antelope Inn and the Menai Suspension Bridge toll house on the Caernarfonshire side of the Menai Straits.

The suspension bridge, toll house and associated ironwork, and the Antelope Inn are all Listed Buildings, having the benefit of statutory protection.

The works involved included:

- Large excavations made within the curtilage of the toll house on its eastern side, to house two circular concrete connection/pumping chambers (Area A).
- Trenches for pipework to be dug in the pavement and access road between the Antelope Inn and the toll house (Area B). An exploratory excavation had encountered a stone built culvert under the pavement here.
- A storm water overflow pipe to be laid from the connection chamber to the shore of the Menai Strait, across the A55 road 19 m east of that road's junction with the bridge carriageway (Area C).

The excavations were made by machine (JCB) and cleaned or finished by hand with shovels. The excavations were observed and exposures were recorded by measured sketch section and/or digital photograph as appropriate.

Fig 3. The work site, showing work in progress, looking north towards the Menai Straits

Fig 4. The work site, on completion showing trench locations, looking north towards the Menai Straits

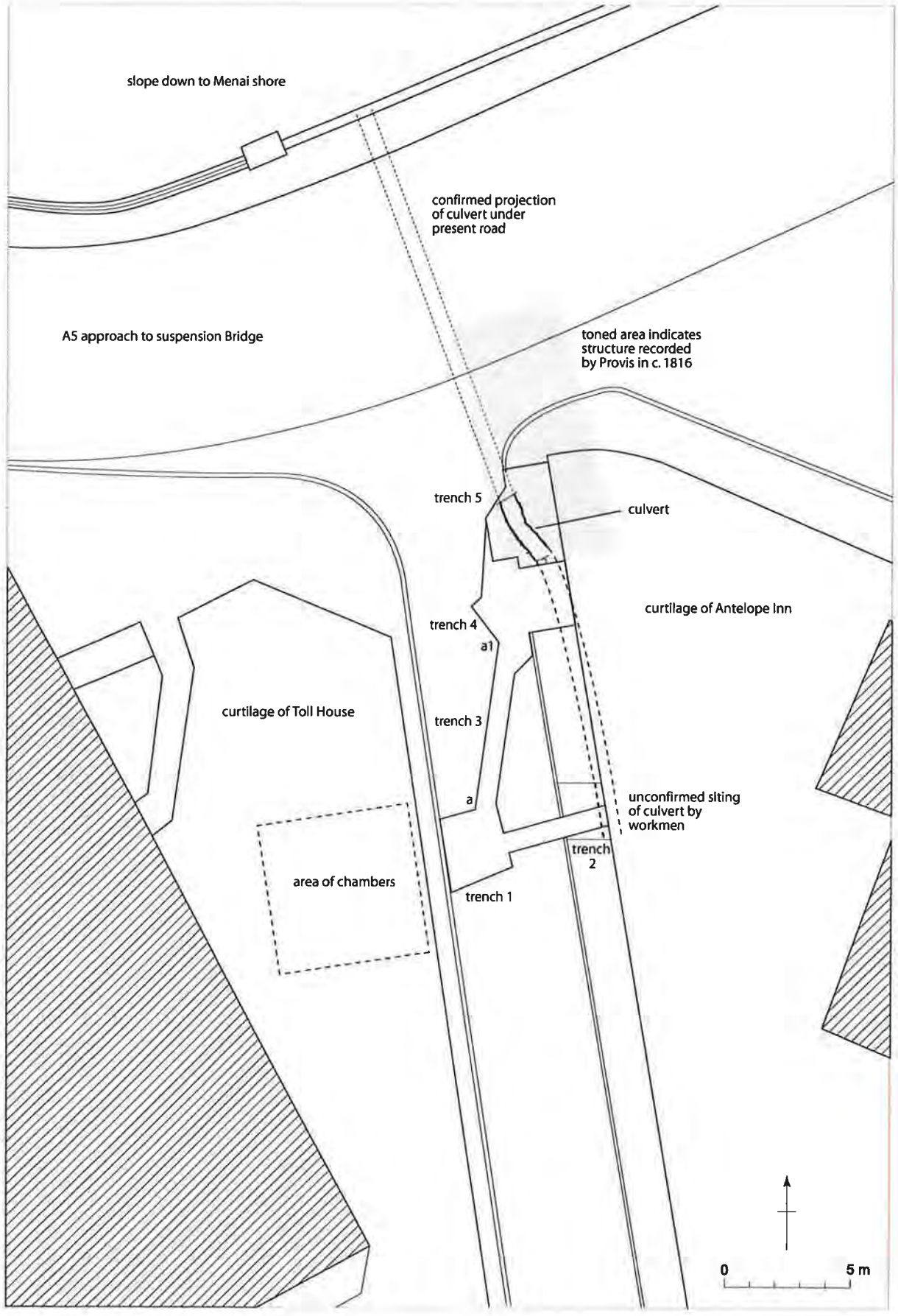

Fig 5. The work site in plan view

Area A
Exposures in the excavated areas for the concrete chambers and pipework within the curtilage of the bridge house revealed no features of archaeological significance. The subsoil was a light, relatively uniform, orange-grey soil.

Area B
Trenches 1 and 2
A machine excavation was made to a depth of c.1.5m across the road giving access to the Antelope Inn back carpark to link sewage outflow from the Antelope to a connection chamber on the west side of the road. No features of archaeological significance were visible. Subsoil was encountered below the road metalling at c. 0.5m.

Trenches 3 and 4
A machine excavation was made to carry a pipe from the connection chamber to a point on the pavement at the north end of the access road where preliminary excavations had revealed a stone culvert carrying sewage from the Antelope Inn. It was intended that the Antelope Inn sewage be redirected to the pumping chamber within the toll-house curtilage and that the culvert be re-used to carry storm water from the connection chamber via pipework in trenches 3 and 4 down to the Menai Straits.

The upper levels in excavated trenches 3 and 4 comprised a thick deposit of grey and pink gravel beneath the tarmac surface of the road to a depth of around 0.5m. Below this there occurred a horizon of mixed soil and smaller gravel overlying clay and clay with soil mixed. These deposits overlay a more restricted area of disturbance extending downwards to a depth of c. 1.5m, cutting obliquely across the excavated trench and parallel to the A5 road. This feature (or features) probably represents a drain or pipe trench and cuts a dark soil containing pottery of 19th century date.

A sketch section is reproduced below.

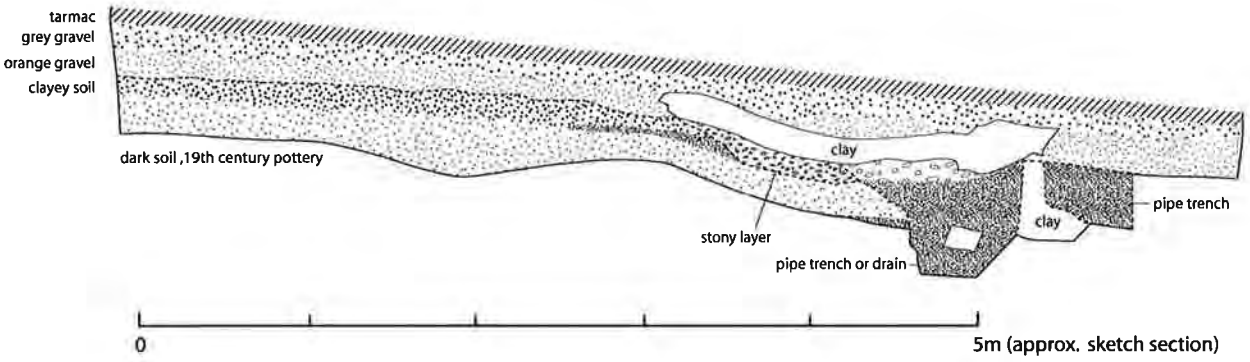

Fig 6. Sketch section, trench 3, a-a1

Trench 5
An area approximately 4m north-south by 2.80 west-east was excavated in the area of the pavement and adjacent access road immediately south of the junction with the A5 to a maximum depth of c.3m. The top 300mm comprised modern soil and rubble, including some large squared blocks immediately below the tarmac. A pipe trench was observed running down the centre of the pavement at between 300mm and 600mm depth, with dark soil and stone mixed either side of the trench. The remnants of a brick wall running west-east with a damp-proof course of thin slates and rudimentary floor slate slabs was observed at c.600mm. These structural features may relate to a small rectangular building, mapped in this location by Provis c. 1820-28. They overlay a dark sticky soil with mortar flecks which in turn overlay a brown clay-like soil at c. 1m below the pavement level.

The top of the culvert, previously referred to, was revealed at around 2.15m. The culvert is c. 0.75m square with walls of dry-stone, capped with large stone slabs except in the central area of the excavation where the culvert was capped with re-used rectangular iron plates of varying sizes, the largest being 640mm x 140mm, the smallest being half that size. The culvert slopes in a generally south-north direction. Curving along its course.

Fig 7. The culvert revealed (looking north).

Fig 8. Detail of the culvert (looking south).

Area C

The culvert described in Trench 5, above, was probably laid on the former ground surface at the time that the embanked and revetted A5 was constructed at the approach to the suspension bridge. An outlet is visible at the base of the stone revetment on the north side of the A5 road. Storm water would have been allowed to debouch onto the sloping bank of the Menai.

However, at some time after the construction of the Antelope Inn (already built by 1828), sewage from the inn was diverted into the culvert for emptying into the Straits. Twentieth century pipework accessed by a series of manholes, carried the effluent from the culvert outlet down onto the Straits shore, below low water mark. This pipework was re-used during the present operations as a conduit for the storm water overflow from the connection/pumping chambers. Some work was required in reaming out choked deposits in the pipes and as the line of pipework crossed the route of both the 1818 horse railway and stable block described below, these operations were monitored.

During the bridge construction, between 1818 and 1826, a quay was established 80m east of the bridge centreline and a crane was placed on the quay. Stables were erected on what would appear to have been an extension of the quay on its western side. A horse railway was laid to haul masonry blocks up the steep bank of the Menai Straits from the quay, onto the upper construction levels of the arches and carriageway of the bridge.

The quay is now occupied by a later house and garden on the shoreline. No trace of the structure of the stable block survives above ground, although its former presence is indicated by a differential build in the sea wall fronting the straits at this location. The bed of the horse railway can be traced, to the rear of the former stable block and immediately either side of the suspension bridge, as an inclined terrace crossing the contour obliquely from east to west. The railway is not traceable for its full length but was mapped by Provis over a distance of 275m from the Straits-side quay to a location close to the present Ceris Nursing Home before doubling back to continue upslope to approach the bridge entrance from the south-west.

Fig 9. A5 embankment

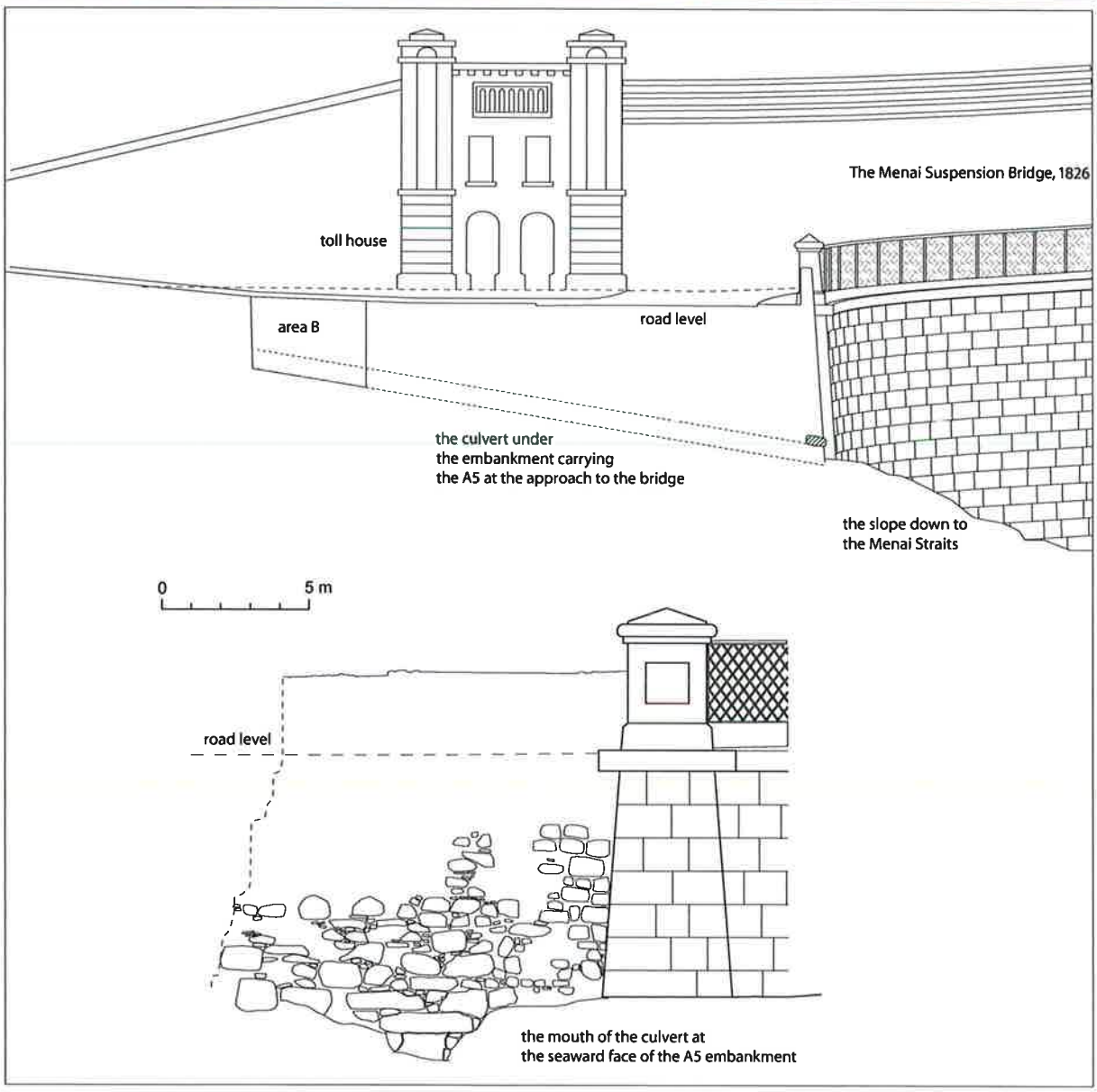

Fig 10. Profile and elevation of the A5 embakment and culvert

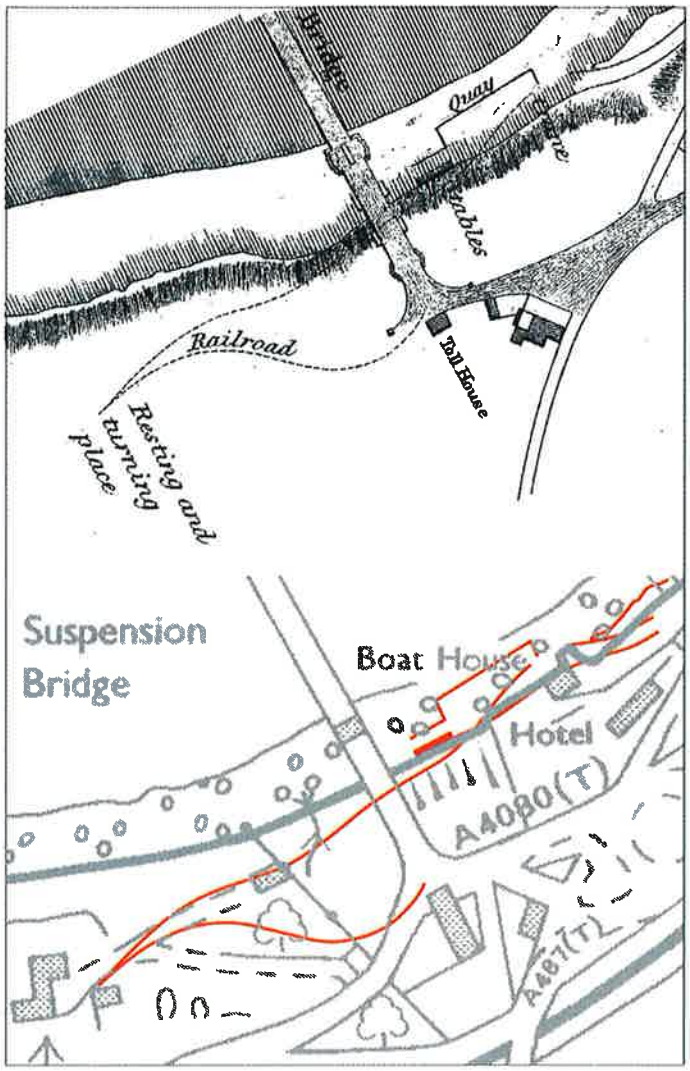

Fig 11. The location of the horse-railway, planned by WA Provis between 1881 and 1826, and the route superimposed on a modern OS 1:10,000 map (Crown copyright, reproduced under licence)

Fig 12. The shoreline in the vicinity of the quay, stables and the origin of the horse-railway, 2003.

Fig 13 and Fig 14. The shoreline and shoreline wall in the vicinity of the 1818-26 quay and stables, showing the pipework formerly carrying sewage from the Antelope Inn to the Straits. The lower photograph shows the deterioration of the shoreline wall adjacent to the manhole cover.

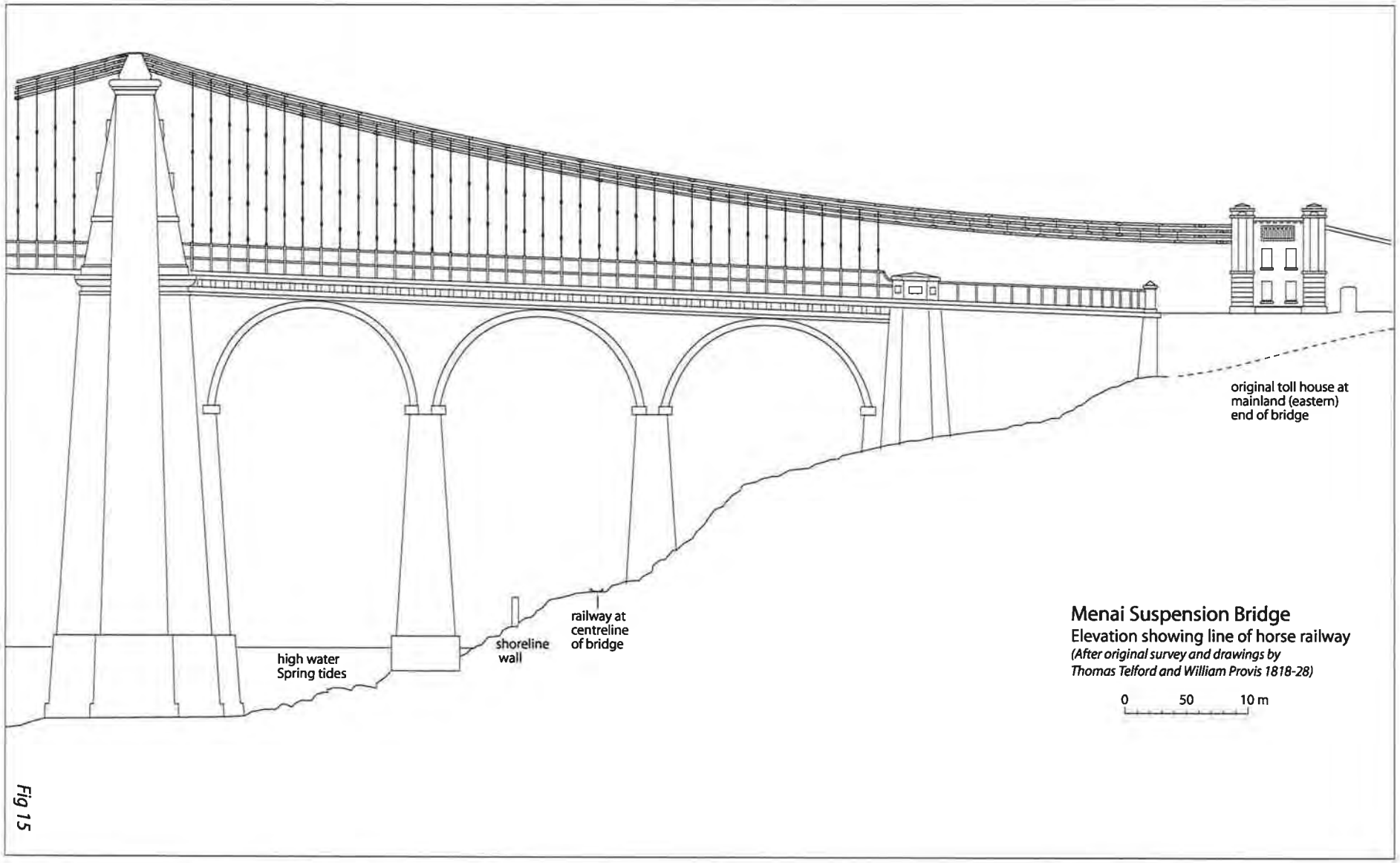
original toll house at
mainland (eastern)
end of bridge
high water
Spring tides
shoreline
wall
railway at
centreline
of bridge
Menai Suspension Bridge
Elevation showing line of horse railway
(After original survey and drawings by
Thomas Telford and William Provis 1818-28)
0
50
10 m

Fig 15

Conclusion

The surviving features, the quay, the horse railway and the location of the stable block are important ancillary components of the bridge, associated with its construction. The drainage culvert is an interesting and previously unrecorded additional component of the A55 road and embankment construction at its point of junction with the bridge.

The culvert had previously been broken into to accommodate the outflow of effluent from the Antelope Inn. No damage was done to these features during the present works although capstones were removed over a limited length of the culvert in order to gain access to the culvert to unblock it and make the new connection for storm water overflow.

The pipework, which still continues to carry drainwater from the culvert outflow, must, at some point in the past, have been trenched through the foundation on which the stable block stood and through the sea-wall at this point. There is a manhole immediately to seaward of this wall. The sea-wall at this location is in poor condition.

Bibliography

Davies, H R 1942. The Conway and Menai Ferries, Cardiff
Provis, W.A. 1828 'An Historical and Descriptive account of the Suspension Bridge constructed over the Menai Strait in North Wales, from Designs by and under the Direction of Thomas Telford FRSL and E.'

Maps
Ordnance Survey maps
OS 1:2500, 1889, 1910, 1914
OS surveyors drawings 2" mile scale Caernarvonshire and Anglesey 1822
Telford, T. 1811, Mail Road from Shrewsbury to Holyhead, Report to House of Commons.
Evans, J 1795. Map of the counties of North Wales.

In 1818 Thomas Telford began work on the Menai Suspension Bridge. The Straits were surveyed at this time and the survey was published in detail by Telford's Resident Engineer, William Alexander Provis, in 1828.

Project Brief

This watching brief was initiated at extremely short notice following discussion between Emily Bateman, the Development Control Archaeologist within Gwynedd Archaeological Planning Service and Daniel Ltd, when the possibility of impact on archaeological features in the immediate vicinity of Listed Buildings was realised. In consequence the project brief constituted a verbal instruction to monitor the works and observe and record any archaeology present.

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