FLOOD ALLEVIATION WORKS AT MONKTON BRIDGE, PEMBROKE A WATCHING BRIEF

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CONTENTS

ILLUSTRATIONS

FLOOD ALLEVIATION WORKS AT MONKTON BRIDGE, PEMBROKE A WATCHING BRIEF

SUMMARY

An archaeological watching brief was commissioned by Pembrokeshire County Council and undertaken by Cambria Archaeology during engineering and construction works undertaken on Monkton Bridge, Pembroke, as part of a flood alleviation scheme on the Pembroke Commons. It was anticipated that the cutting of a trench across the existing bridge might reveal evidence for an earlier bridge, or causeway, linking Pembroke to Monkton during the medieval period.

Evidence of the construction of the existing bridge was recorded, but no evidence to suggest the character or location of an earlier crossing structure was revealed during the excavation. If an earlier structure had existed in this location, it is assumed that all evidence of it was removed when the existing structure was built.

INTRODUCTION

Site location, historical background and archaeological potential

Monkton Bridge is located at the western end of Pembroke town, at the foot of a hill leading up to Pembroke Castle. The bridge is a solid dam structure through which a small stream flows, from an area of former marsh to the east known as 'The Commons', into Monkton Pill, an inlet of the Pembroke River, to the west. It supports a road linking Pembroke with Monkton.

Pembroke Castle was established by the Norman adventurer Roger de Montgomery in 1093. His possessions were seized by Henry 1 in 1100. The charter for the foundation of the town was issued some time between 1100 and 1135. The Benedictine Priory at Monkton was founded in 1098. A path that can still be traced up from the present bridge to the inner gatehouse, may suggest this was the original route up to the castle and that the original settlement was confined to the inner ward. The outer ward and the surviving medieval layout of the town may therefore be a later phase of development (Ludlow 1991, 25-30).

Given the location of the western gate in the medieval town walls and the close connections between the town, Castle and Monkton Priory (to the west) it seems likely that there was a bridge or causeway structure of some description in the same location as the present bridge, from the earliest origins of the Priory and Pembroke Castle.

The exact date of construction of the present bridge structure is unknown. However there is known to have been a mill on the north side of the bridge from at least 1331 (Owen 1918, 123-4), and a building here is possibly depicted on John Speed's map of Pembroke, drawn in 1611 - the earliest known depiction of Pembroke. Because of its location it is assumed to have been a tidal mill. Such a mill would require the construction of a more permanent structure, and the Speed map appears to show a solid, earthen dam, with sloping sides and a ?timber parapet, on the line of the present bridge.

Other depictions of the bridge are limited. Its north end is shown on a plan of the estates of Edward Lovedon of 1787 (National Library of Wales, Map Book 39, 93-4), but this map does not depict any structural detail of the bridge. An Ordnance Survey map of 1837 apparently exists, but has not been seen (it is not housed in any known depositories and is only known from an advert on eBay). The earliest Ordnance Survey map that has been seen dates from 1861. It does not suggest that the bridge structure has changed from 1861 to the present.

It appears that the bridge also functioned as a dam from at least 1331. The dam apparently retained tidal water to the east – as a millpond - when the tide was out, egress of water being controlled by a sluice. An open sluice, in its present location, appears to be shown on the Speed map. Whether or not the same sluice fed the mill wheel is debatable – the mill may have been operated from a separate sluice independent of the main sluice, which would also have regulated the flow of tidal water from west to east, when the tide was in.

Project scope, proposals and commission

The flood alleviation scheme at the Pembroke Commons generally consisted of an upgrading of the existing watercourse which flows along 'The Common' and through the bridge. As part of this upgrade, a new outflow pipe was constructed through the bridge, to the south of the existing sluice. To achieve this it was necessary to machine excavate an open cut trench, roughly 4.0m deep across the entire width of Monkton Bridge and the road it carries.

This work offered the opportunity to record the manner in which the bridge was constructed, and the nature of any alterations to the structure. In addition, it offered the opportunity to record the construction method for the existing bridge and to ascertain the presence, nature and degree of survival of any earlier bridge, causeway or dam structures that might survive within, below or as part of the fabric of the existing bridge. Such information would provide insight into the early history and subsequent development of the castle and town, and provide answers to how water levels in this area have been managed in the past.

As a consequence of this potential for archaeologically significant deposits to be exposed during the project, Cambria Archaeology was commissioned by Pembrokeshire County Council to undertake a watching brief during the construction works to record any significant deposits, features or finds that might be encountered.

Recording methodology

The depth of the excavation (4.0m below the road surface) meant that steel sheet shoring was needed to support the trench sides. The construction method also meant that the trench was dug in sections, with the pipe being laid and the trench section backfilled before the next section was excavated. As a result, the entire section was not visible at any one time. The presence of several live and obsolete services made the machine excavation process difficult and slow.

These factors limited the 'window of opportunity' for archaeological recording by the attending archaeologist, to the gaps between the shoring where service pipes crossed the trench. Health and safety factors meant that detailed archaeological recording was not advisable until shoring had taken place. Despite these restrictions it was possible to compile a measured sketch section as the works proceeded and field notes were made on the character of the various deposits exposed in the trench sides. A photographic record was made of various stages in the operation.

Although most of the excavation work was observed by an attending archaeologist, the final stages of the excavation (where the eastern wall of the bridge was breached) were not observed, until the trench had been mostly backfilled.

This report presents the findings of the watching brief. The only other records relating to the project are those contained in the computer based project archive of Cambria Archaeology.

RESULTS

For ease of understanding it is recommended that this section is read with reference to Figure 1. The lettered references to the features and deposits discussed in this text are represented on the schematic section drawing.

The construction trench for the new pipe was cut to a depth of approximately 4.0m below the present road surface. This coincided with the base of the bridge walls (O and N). The cross section across the bridge demonstrated that the bridge walls did not have individual construction cuts. Instead there was a single cut for the whole width of the bridge. The walls were constructed as free-standing structures, with only the lower portions of the exterior wall-faces built against the construction cut (I). As a result, the base of the bridge walls and the base of the construction cut are below the upper level of the surrounding natural deposits (H, and J). The interior area between the two bridge walls was then backfilled with a series of laminated clay and silt deposits up to the same level as the surrounding natural deposits. The water-lain deposits (H) continued below the depth of the machine-excavated trench to an unknown depth.

To the west of bridge wall (O), the exposed deposits consisted of modern made-ground overlying water-lain silty and gravely deposits (Q and P). These layers were deposited against the west wall of the bridge by tidal deposition (after the construction of the bridge, but before the water levels in Monkton Pill were artificially controlled to their current level well below the high tide).

On the eastern side of the bridge, immediately above the natural silt and clay deposits (H and J) was a layer of crushed slate (K), roughly 0.15m thick. This is assumed to be demolition debris from buildings associated with a timber (later coal) yard represented on the first and second edition Ordnance Survey maps. This was in turn overlain by a dark-grey silty topsoil deposit (L) that was mixed with modern debris (including car tyres) in its upper parts (M).

The lowest backfill deposit between the two bridge walls was a mixture of stone, sand, silt and grey clay (A) which lay against the inside face of the west wall. This was more clearly demonstrated by an isolated deposit of stone rubble in the southern side of the construction trench (see photo 6). A similar relationship is assumed for the east side of the bridge although the opportunity to record this during the trench excavation was missed.

Above the stoney layer was a deposit of grey silty clay (B) containing occasional stones and fragments of waterlogged wood. This layer was a maximum of 1.30m thick, and towards its upper limit was mixed with several laminations of material from the layer above (see photo 5). The grey deposits have been interpreted as re-deposited natural silts and clays. No dating evidence was recovered from any of these deposits.

Deposit (B) is overlain by a markedly different deposit (C), which is generally orange in colour, up to 0.70m thick and contains several laminations (see photo 4). Although different in colour, and more mixed, this deposit may in fact be similar material to the grey silty clay but in an oxidised, ferrous-rich form. It is assumed that both these backfill deposits are derived from the material removed from the construction cut for the bridge.

Above the backfill deposits (A, B, and C) are a series of road make-up layers consisting of laminations of stone and chippings in a different soil matrices (D) topped by a surface of highly compacted road-stone (E). This group of deposits

was up to 0.50m thick and covered the entire span between the walls of the bridge. It was truncated in several places by later services (R).

The earlier road surface was overlain by another deposit of road make-up (F) up to 0.40m thick, upon which was constructed the modern tarmac road surface (G), up to 0.25m thick. These deposits were also truncated by numerous service trenches (R).

The west wall of the bridge was cut through and revealed in section (photo 2). Above ground the wall was 1.0m high and 0.70m wide at ground level. Below the ground surface, the wall was found to be of good stone rubble construction, roughly faced on its western side and almost vertical except for a step out at the level of the construction cut, to a total depth of 4.0m from the current pavement level. The east side of the wall was un-faced and stepped out at two points as it descended. The first step at the level of the earlier road surface (E), the second at the base of the road make-up deposits (D). At its base, the wall was 1.6m thick.

The attending archaeologist was not present when the east wall of the bridge was breached, but the wall was reportedly of the same depth as the west wall, and of similar thickness. Only its known thickness is represented on the schematic section.

The construction, mortar type and general appearance of the west wall of the bridge did not suggest that it contained more than one phase of construction. No repairs were apparent and in this location at least, there was no evidence to suggest that the wall had medieval origins. Although the east wall was not observed in section, it is assumed to be contemporary with the west wall and not to be of medieval origin.

CONCLUSIONS

No dating evidence was recovered during the flood alleviation project, and no documentary evidence referring to the construction of the existing structure has yet been identified. However, based the mortar used and the style of construction, it is suggested that the present bridge or causeway probably dates from the late medieval or post-medieval period. No evidence for an earlier bridge or causeway structure was revealed by the current project. There are several possible explanations for this.

The construction cut for the existing bridge most probably destroyed the remains of any earlier structure in this location. Alternatively, although a bridge was present in its current location by 1611, it is possible that the earliest crossing point may have been elsewhere. It is also possible that evidence of an earlier bridge or causeway may still survive elsewhere within, or as part of, the existing bridge, especially at either end of the present structure.

It is interesting to note that the existing sluice is located next to the site of the former mill on the northern side of the pill. After the mill went out of use (probably during the early post-medieval period), the bridge and sluice may have been used to control water levels in order to manage the former millpond as salt marsh (or perhaps water meadow) for common grazing, hence the name 'The Commons'. The Speed map appears to show the area east of the bridge as being well drained, perhaps suggesting that the mill, although it appears to be shown as a standing building, was not in active use by 1611.

Because of the location of the sluice, the watercourse across 'The Common' developed a meander over to the north bank in order to drain through the sluice. It is assumed that the present bridge structure was constructed after the mill went out of use, but for ease of construction the location of the sluice on the north bank was preserved. The present flood alleviation scheme has now bypassed the original sluice reverting the waterway to its natural course down the middle of the former pill.

The later Ordnance Survey maps mark the area as salt marsh and liable to tidal flooding. Several drainage channels are also shown leading to the main watercourse. This suggests that tidal waters were not excluded from the area. The water level in Monkton Pill is now regulated by a dam further downstream. It is much lower than it was in earlier times, which is why water-lain deposits are now exposed above the present water level; there is reportedly a difference of up to 8m between high tides and the present water level in the pill (Emyr Williams, PCC engineer, *pers. comm*.).

The construction of Monkton Bridge has obviously had a profound effect on the water management and exploitation of the Commons, which was previously referred to as the Common Lake (Ordnance Survey First Edition, 1861). There is clearly scope for more research into the past management of water in this area of Pembroke.

Unfortunately, the opportunity to undertake archaeological recording as part of the flood alleviation scheme has not provided any new information to clarify how water management in the Commons area has evolved since the foundations of the town.

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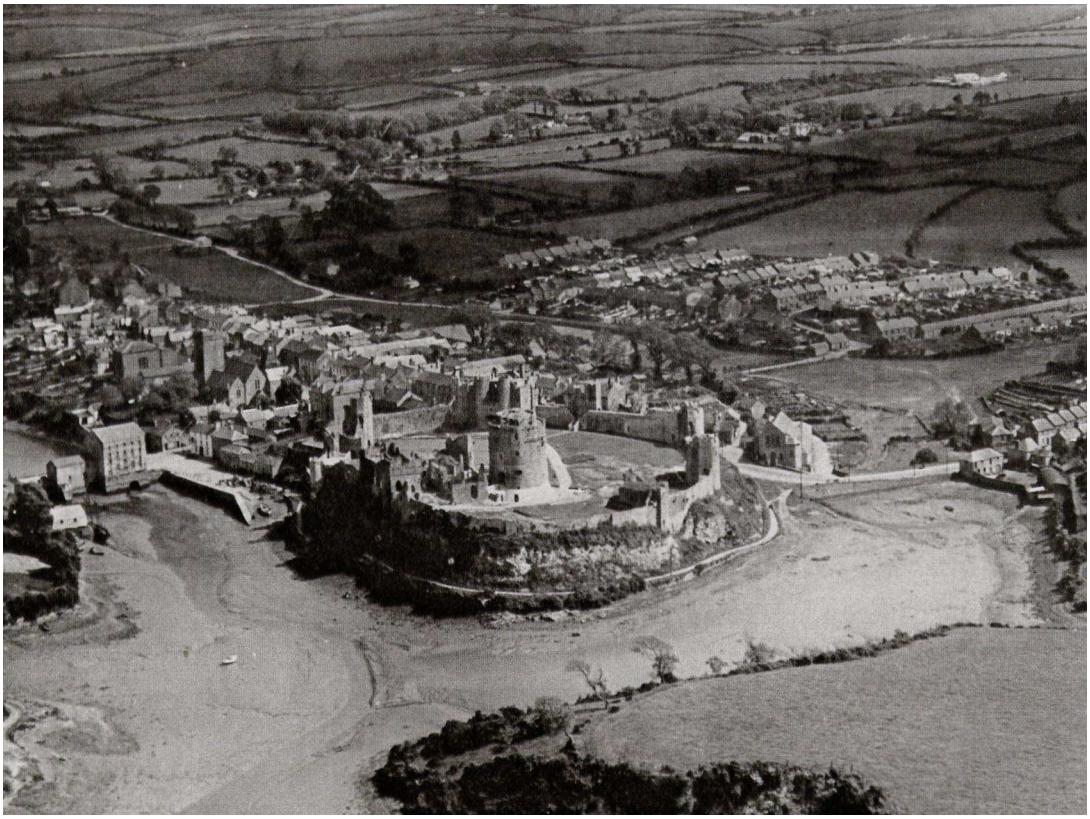


Plate 1: Aerial photograph from 1931 including Monkton Bridge

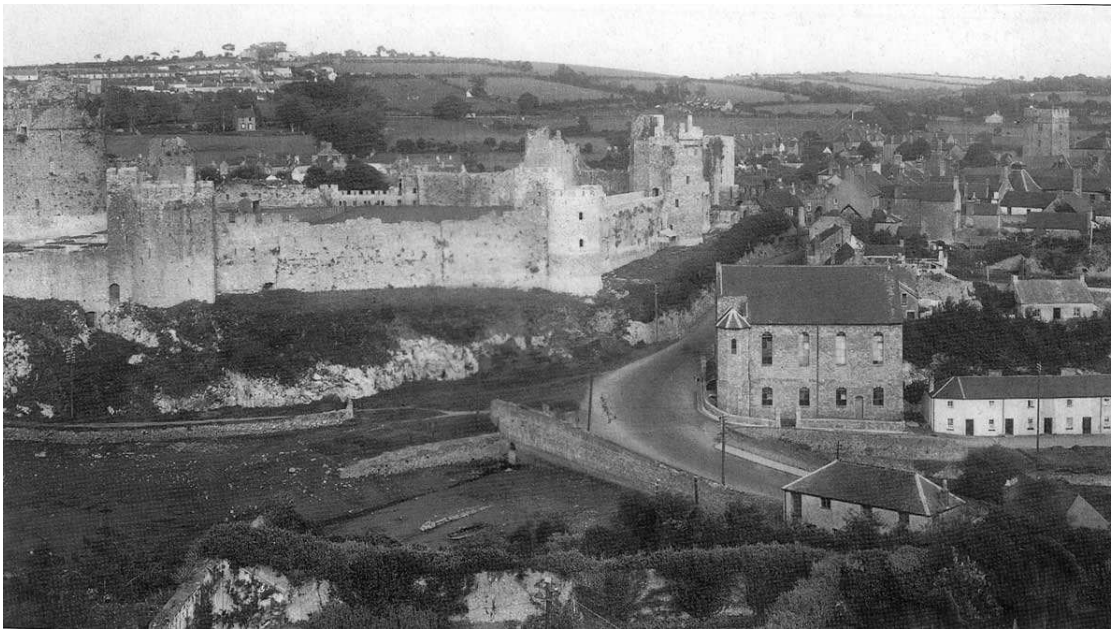


Plate 2: Photograph (by Arthur Squibbs) showing Monkton Bridge in 1938

Photo 1: Deposits to west of the bridge

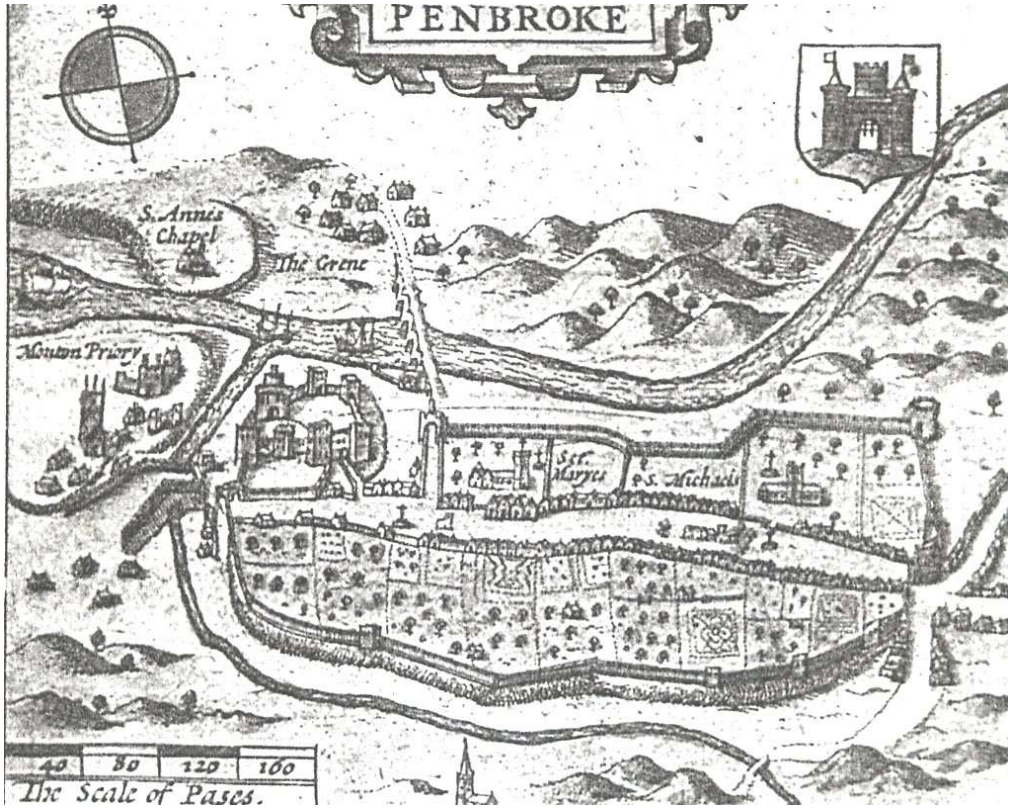
Photo 2: Section through wall, road and backfill deposits

Photo 3: Detail of road deposits

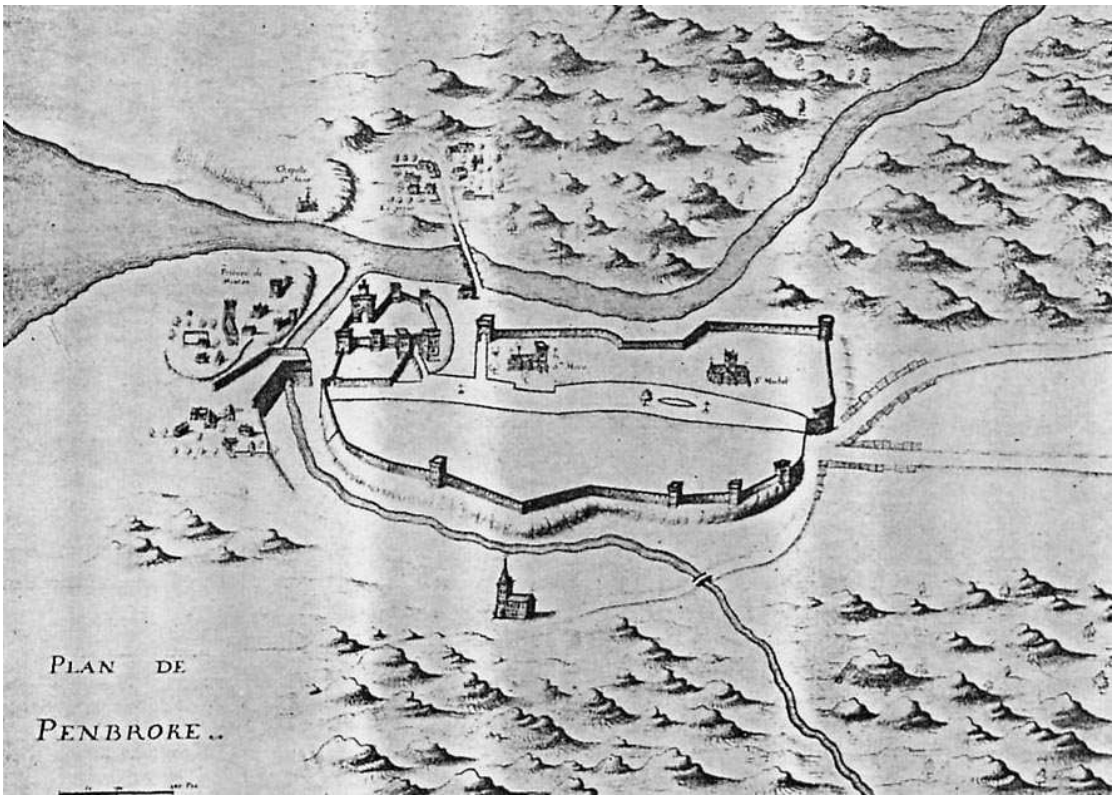
Photo 4: Detail of redeposited orange silty cay deposits

Photo 5: The complete sequence of backfill deposits

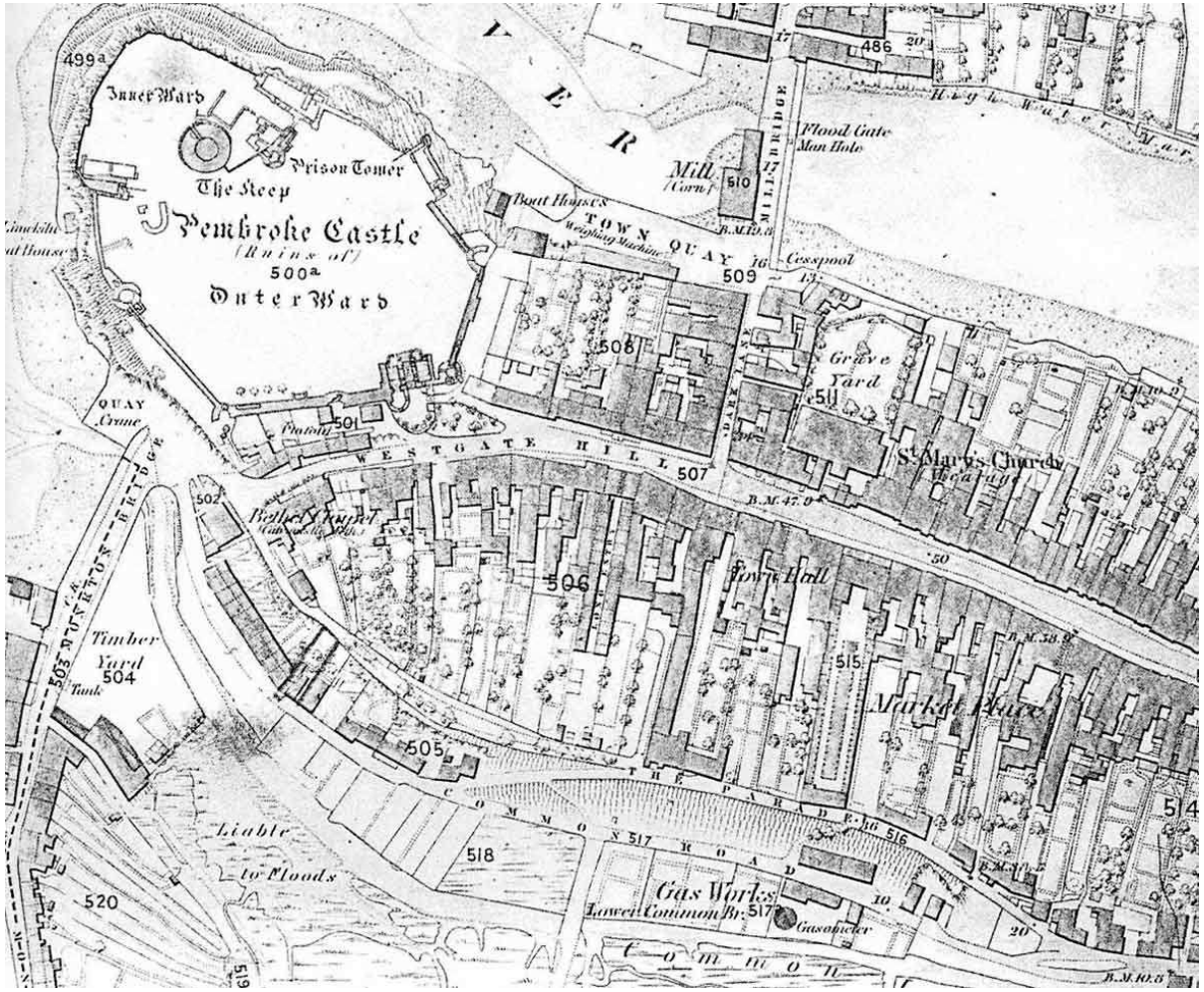
Photo 6: Detail showing rubble at base of wall and Sealed by backfill deposits



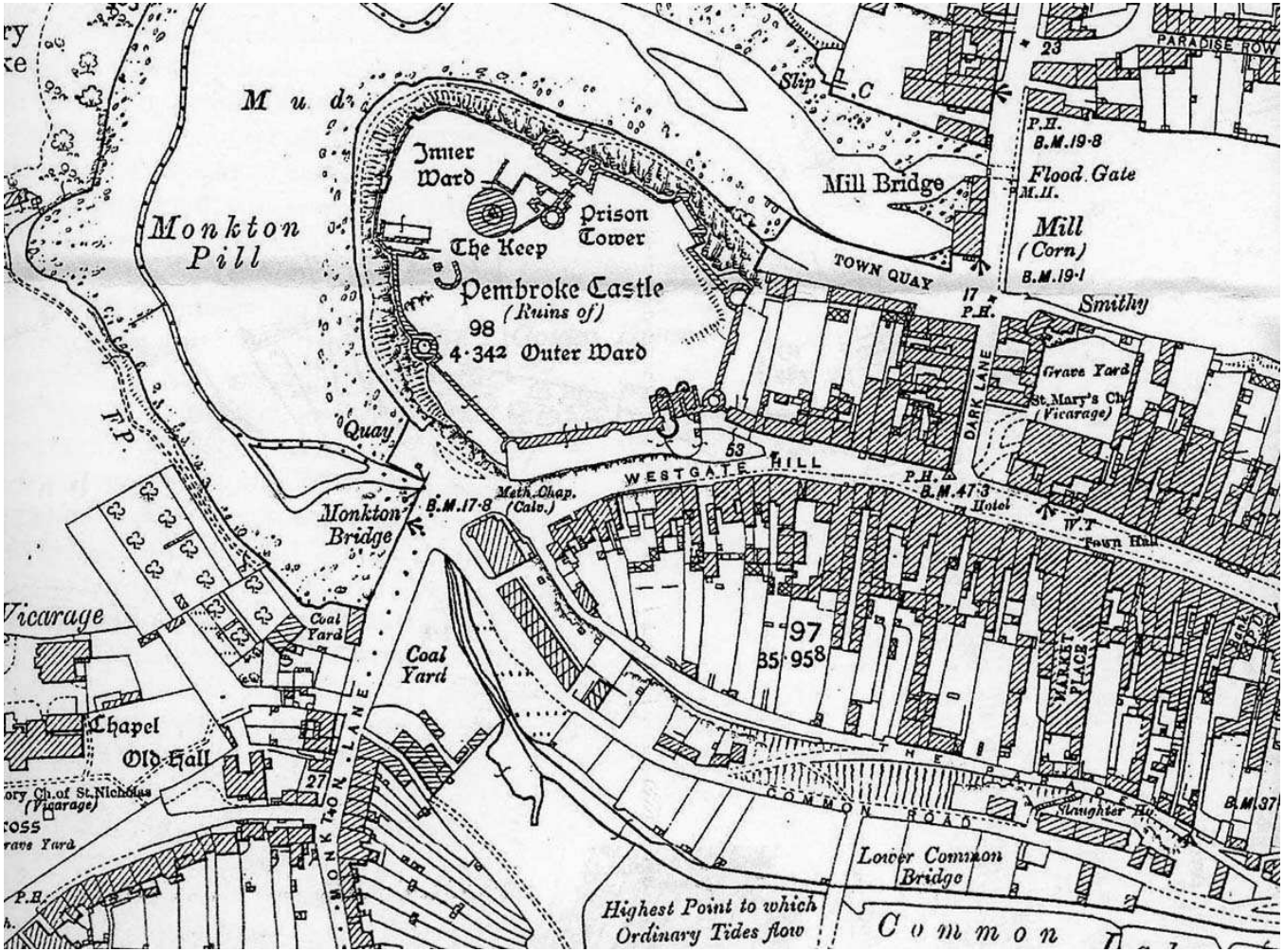
Map 1: Speeds map of Pembroke in 1611



Map 2: French map of Pembroke in c.1650. British Library, additional MS 11546 (reproduced in RCAHMW, 1917 inventory)



Map 3: Extract from 1:2500 Ordnance Survey 1st Edition
1885 Pembrokeshire sheet XL9



Map 4: Extract from Ordnance Survey 2nd Edition 1:2500
Pembrokeshire sheet XL9

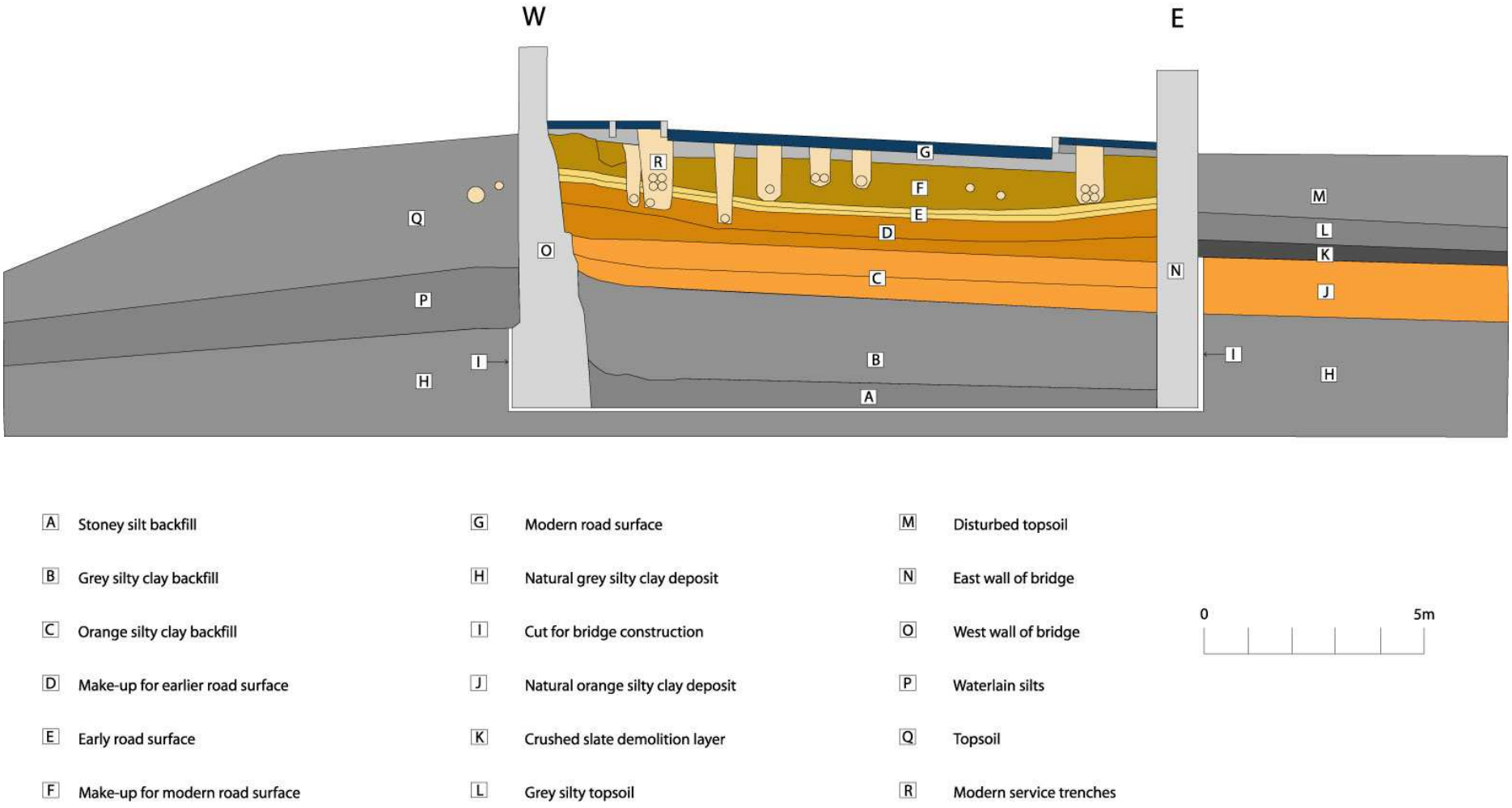


Figure 1: schematic section through Monkton Bridge

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Llofnod / Signature ..... Dyddiad / Date

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ar ran Archaeoleg Cambria, Ymddiriedolaeth Archaeolegol Dyfed Cyf. on behalf of Cambria Archaeology, Dyfed Archaeological Trust Ltd.

Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadausydd gennych ar gynnwys neu strwythur yr adroddiad hwn
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