

TAMAR CANAL, GUNNISLAKE, CORNWALL

(NGR SX 43592 70974)

Results of archaeological monitoring and recording

Scheduled Monument: Canal lock, island and salmon keeping pond known collectively as the Tamar Canal (National Heritage List no 1007302)

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On behalf of:
South West Water Ltd

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AC archaeology

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The project was commissioned South West Water Ltd and managed for them by James Field, and for Historic England by Nick Russell. The project was managed by and carried out for AC archaeology by Andrew Passmore. The illustration for this report were prepared by Leon Cauchois.

The views and recommendations expressed in this report are those of AC archaeology and are presented in good faith on the basis of professional judgement and on information currently available.

Summary

Archaeological recording and monitoring was carried out by AC archaeology in September 2016 during repairs to the northern lock on the Tamar Canal. The canal is a Scheduled Monument. It was opened in 1801 as the Tamar Manure Navigation, and closed in the 1940s.

The repairs comprised drilling holes into the masonry to inject resin behind and into the bonding of the lock walls. This caused minimal damage to the monument and has left no visible evidence of the repairs. The lock walls contain rebates for stop planks, but unusually are also partially recessed between these rebates creating a wider waterway. The function of this space is unknown, but it could represent a winding hole or turning space for vessels.

1. INTRODUCTION (Fig. 1)

1.1 This report presents the results of archaeological monitoring and recording carried out by AC archaeology on 22 September 2016 at the Tamar Canal, Gunnislake, Cornwall (SX 43592 70974; Fig. 1). The watching brief was commissioned by South West Water Ltd, and was required under a condition of Scheduled Monument Consent for repairs to the northern lock on the canal.

1.2 The Tamar Canal is located to the south of Gunnislake on the floodplain of the River Tamar, and is situated at a height of around 5m aOD. It falls within area A10 of the Cornwall and West Devon Mining Landscape World Heritage Site. The underlying geology of the area comprises Devonian slate of the Tavy formation overlain by Quaternary alluvium of clay, silt, sand and gravel (British Geological Survey online viewer).

1.3 The Scheduled Monument description (National Heritage List (NHL) no. 1007302) under the name *Canal, lock, island and salmon keeping pond known collectively as the Tamar Canal* describes the canal as follows:

"The monument includes a canal basin, lock, island and salmon-keeping pond associated with a weir on the River Tamar at Gunnislake. The island survives as a low lying area between the canal basin and the River Tamar which contains the salmon-keeping pond and was produced by the construction of a canal to allow navigation upstream beyond the weir. The canal has a relatively wide stone-built basin of about 25m long with narrow lock and partially surviving gates and winding gear to the south. The northern end has granite-built walls but no surviving gates. The salmon-keeping pond was built to provide an extra income from management of the salmon stocks in the river which might otherwise have been disrupted by the weir and canal.

Built by the Tamar Coal Manure and General Mercantile Company the canal was designed to carry agricultural fertilizers, in this case lime, inland. The River Tamar had been navigable since the 12th century as far as Morwellham but there were proposals in 1796 to build a public Devonshire Canal to provide a tub boat canal which would link with the Bude Canal in north Cornwall and Devon, incorporating both navigable river stretches and canals. This was never completed and the Tamar river section was only improved for a distance of 2.75 miles. The canal did support major industries including the Bone Manure works, Bealswood Brickworks and Gunnislake Gasworks up until 1914. According to the 1881 census six or more sea going vessels were tied up at the quays upstream. These quays supported two lime kilns, a large mine, two quarries and other industrial features and linked them to the sea enabling export. The company owning the canal was liquidated in 1942. The canal is known locally as the 'Tamar Manure Navigation'. It closed for commercial traffic in around 1929.

- 1.4 The southern lock is Listed Grade II (NHL no. 1329331) and the lock keeper's cottage (excluded from the Scheduling) is also Listed Grade II (NHL no. 1158203). The northern lock is briefly mentioned within the List description of the former, and the Cornwall Council online mapping marks the southern edge of the current bridge over the canal below this lock as forming part of the Listed structure.
- 1.5 The repairs took place in three nearby locations – the inside of the east face of the lock, the inside of the west face of the lock, and the wall at the head of the overflow channel. This comprised the drilling of injection ports to insert resin to plug water leaks, and involved drilling down through the historic stone walls from within the canal (but above water level), and in the mid 20th-century masonry of the overflow channel to the east. Works also took place to the nearby mid 20th-century penstocks, but did not impact on any historic masonry or architectural features.

2. SCOPE OF WORKS, AIMS AND METHODOLOGY

- 2.1 The aims of the archaeological monitoring and recording were twofold. Firstly, to prepare a before and after photographic record of the walls of the canal where the repairs took place. Secondly, to monitor the programme of repairs to provide a fuller understanding of the canal at this location, specifically to provide a more in-depth record of the walls of the canal once the water level had been reduced following the installation of temporary stop planks.
- 2.2 The works were undertaken in accordance with the Written Scheme of Investigation (Passmore 2016) and the Chartered Institute for Archaeologists *Standard and Guidance for the archaeological investigation and recording of standing buildings or structures* (revised 2014). Works commenced prior to the initial photographic survey being carried out but the archaeological record prepared was sufficient to understand the development of the lock, and to assess and record any impact of the repairs on the lock. It took place following the draining of most of the water from within the former lock. Internal recording was carried out from a floating pontoon situated adjacent to the east face of the lock.

3. HISTORICAL BACKGROUND

- 3.1 Historically the River Tamar was an important means of transport in the Tamar Valley. It is tidal up to Weir Head just north of Morwellham Quay. The Tamar Manure Navigation Canal was completed by 1801 to bypass the weir, and was part of a larger scheme devised in 1794 to build a canal from North Tamerton Bridge (not far from the source of the Tamar) to Morwellham, a distance of *circa* 48km. It was also planned to link the canal with the proposed Bude Canal, although the latter was not completed until after the Tamar Canal. When the Gunnislake gasworks opened, coal was brought up through the canal, and by 1905 a third of the canal traffic was coal, the rest was granite and bricks – the Bailswood brick works was located on the west side of the River Tamar adjacent to the north end of the canal. The canal closed in the 1940s.
- 3.2 The Gunnislake tithe map of 1840 depicts the canal as a linear feature with the southern lock and adjacent wharf clearly identifiable. At the north end the other lock is represented by a pair of opposing cut-outs in the canal sides and a slightly wider section to the southwest. The 1st edition 25-inch Ordnance Survey map of 1883 depicts northern lock as a wider section with shallow V-shaped sides (of differing angles). Later Ordnance Survey maps record no change until the publication of the

1953 1:2500 map when the canal had become discussed. The present bridge over the canal to the south of the lock had been constructed, as had the penstocks and the overflow channel to the east.

4. RESULTS (Fig. 2; Plates 1-12)

Description of the lock

4.1 The lock is constructed into and onto bedrock which at the time of the survey was visible in the west face below the masonry (Plate 1). The main walls of the lock are constructed of tooled/dressed granite blocks measuring up to 0.7m long by up to 0.40m high and at least 0.35m deep extending back beyond the face, as well as smaller rectangular blocks of slate of varying size.

4.2 At the north end of the structure the granite masonry projects into the lock and incorporates rebates into which stop planks were inserted during the repairs (Plates 2 and 3); these are constructed onto slightly projecting footings on the west side visible that are only visible when the water within the lock is drained. To the south are recesses – one with a broad curve (Plate 4) and one with an angled straight side (Plate 1) using mainly coursed blocks of slate to within 0.20-0.35m of the present ground level. The north and south edges of this masonry incorporate granite quoins tying it into the adjacent granite walls. On the west side of the lock, to the south of the curved recess is a length of granite wall laid onto bedrock (Plate 5). Two-thirds of the way along this wall the masonry incorporates a vertical rebate, filled with concrete. This extends down to the bedrock, but it is capped with masonry, overgrown with vegetation that was not removed, that may represent a mid 20th-century repair. Beyond the end of the granite wall bedrock is visible in the side of canal overlain by soil covered with vegetation (Plate 6).

4.3 On the east side of the lock the opposing granite was only extends a short distance before it is truncated by the mid 20th-century insertion of steel penstocks (Plate 7). Beyond the penstocks the granite masonry continues giving way to a contemporary slate wall to the point where the canal has been infilled (Plate 8).

4.4 The penstocks are set into entirely concrete walls. On the northside of the outflow channel there is *circa* 5m length of granite wall, and beyond a lower slate wall, both set on a concrete foundation (Plate 9). This masonry is all of mid 20th-century date, and the granite is almost certainly reused from the earlier lock wall where the penstocks have been inserted. There is no historic masonry on the south side of the outflow channel.

4.5 At the time of the survey, upstream of the lock water was ponded at its normal level and only the tops of the walls described below were visible. Beyond the north end of the lock are short lengths of walls constructed of rubble slate with some coursing (Plate 10). These are not tied into the adjacent granite masonry, and are of poorer quality than the slate walls within the lock. Above and beyond the walls the upper sides of the canal are formed by soil.

Works to the lock

4.6 The majority of the injection ports were located within the joints of the walls negating the requirement to drill through and damage the masonry of the lock (Plates 11 and 12). Only a handful of the slate stones were damaged during the repairs, and all damage was confined to the edges of these stones where gaps in the joints was minimal.

5. COMMENTS (Plate 4)

Works to the lock

- 5.1** From a conservation point of view the methodology used to plug the leaks is a sensitive, effective technique. The stone masonry incurred almost no damage, and way the technique plugs the leaks within the masonry leaves no trace on completion (see Plate 4). Thus, the repairs remain hidden and the architectural value remains unchanged with no visible evidence that repairs have taken place.

The use of the lock

- 5.2** The Schedule description (quoted fully above) notes that the lock has "no surviving gates", as does the Listing description for the southern entrance lock, which could be interpreted as implying that it originally was of the same design as the southern lock on the canal, i.e. a standard canal lock between different heights of a watercourse.
- 5.3** However, it is clear from the survey that the northern lock was not a traditional canal lock. The shape of the walls, with only one set of (curved) recesses, does not indicate the presence of two pairs of lock gates, and the rebates within the masonry are not associated with standard lock gates. There is no evidence of other fitments such as sluices in the walls at the upper end of the lock. It is also highlighted that, unlike the southern entrance lock, it is not described and depicted (with gates) as a lock on historic Ordnance Survey maps. Other interpretations must therefore be considered.
- 5.4** Safety gates, often termed Brindley Gates, to stop unexpected water flows through locks were sometimes set within recesses within the canal walls (cf the example recorded at Swing Bridge, Halberton on the Grand Western Canal; Passmore 2014). The curved and angled shapes of the recessed walls on the Tamar Canal indicate that these were not used for safety gates since they would have not provided a flush fit when upright.
- 5.5** The rebates are therefore interpreted as slots for the installation of stop planks. These were manually fitted, and were used to isolate a section of the canal. Denis Dodd (2016, 17) notes they could be "installed at a canal narrowing at either end of embankments, locks, inclined planes, lifts, bridge holes, etc. – anywhere where the engineer would deem them necessary to be useful for maintenance purposes". The recorded rebates are located towards the upper entrance to the canal, a location where maintenance, in the form of dredging, may be necessary due to the entrance of the canal being on the inside – slow flowing – side of a wide curve on the river. The occurrence of pairs of rebates for stop planks is not uncommon – on the Shropshire Canal for example several survive defining short narrower sections of the waterway.
- 5.6** The purpose of the wide recesses remains unknown. A winding hole – turning space has been recorded by Phil Newman at Ventiford Basin on the head of the Stover Canal, and that remains a possibility here, but the depth of the recesses is relatively shallow, and the overall width of the canal here is almost certainly too narrow to allow a boat or barge to be turned around.

6. ARCHIVE AND OASIS ENTRY

- 6.1 Copies of the report have been distributed to South West Water, Historic England, and the Cornwall Council Historic Environment Record. The digital archive for the project will be deposited with Historic England at their regional office in Bristol.
- 6.2 An OASIS entry has been completed under the unique identifier 282027.

7. SOURCES CONSULTED

Dodds, D., 2016, "Brindley Gates, Safety Gates, Stop Gates and Stop Planks", *Somerset Industrial Archaeology Society Bulletin* **131**, 9-18

Passmore, A., 2014, *Stop Gate at Swing Bridge, Grand Western Canal, Devon, (NGR ST 01148 13121), Results of archaeological recording*, AC archaeology document no. **ACD843/1/0**

Passmore, A. 2016, *Canal, Lock, Island and Salmon Keeping Pond Known Collectively as the Tamar Canal, Written Scheme of Investigation for archaeological monitoring and recording, National Heritage List no. 1007302*, AC archaeology document number **ACD1291/1/0**

Websites

British Geological Survey online viewer

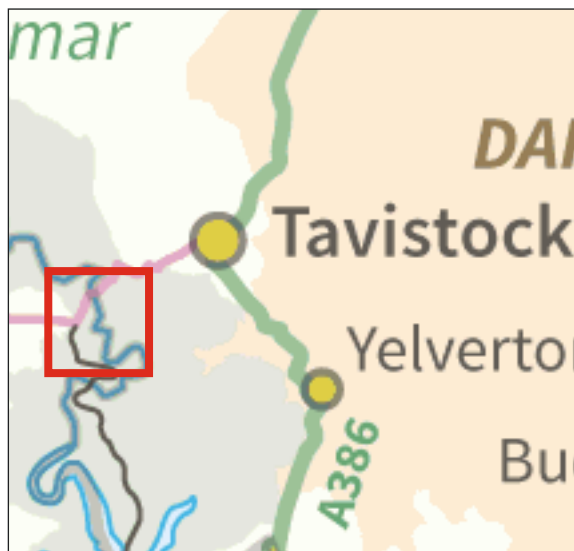
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

National Library of Scotland

<http://maps.nls.uk/geo/explore/#zoom=17&lat=50.5203&lon=-4.2090&layers=176&b=1>

National Heritage List for England

<https://www.historicengland.org.uk/listing/the-list/>



PROJECT

Tamar Canal, Gunnislake, Cornwall

TITLE

Fig. 1: Site location





0 10m
Scale 1:200@A4

- Slate Masonry
- Granite Masonry

PROJECT

Tamar Canal, Gunnislake, Cornwall

TITLE

Fig. 2: Plan of lock showing location of repairs



Plate 1: The recess in the west side of the lock showing the bedrock below, looking west



Plate 2: The granite masonry at the north end of the lock showing rebate, looking north



Plate 3: The granite masonry at the north end of the lock showing rebate, looking northeast



Plate 4: The recess in the east side of the lock, looking southeast



Plate 5: The granite masonry on the west side of the lock showing blocked rebate, looking southwest



Plate 6: The west side of the lock, looking north



Plate 7: The masonry of and penstocks in the east side of the lock, looking southeast



Plate 8: The masonry of and penstocks in the east side of the lock, looking northeast



Plate 9: The reused granite masonry in the outflow channel, looking northeast



Plate 10: The canal above the lock, looking south

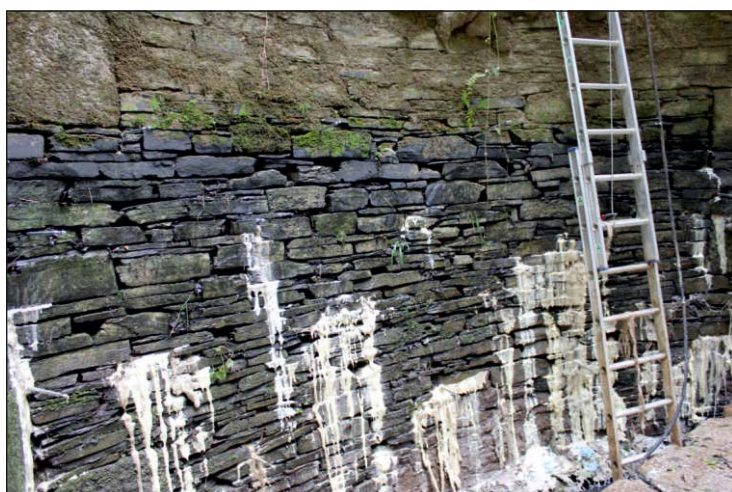


Plate 11: The repairs to the east side of the lock, looking southeast



Plate 12: Close-up view of the repairs to the east side of the lock, looking southeast

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