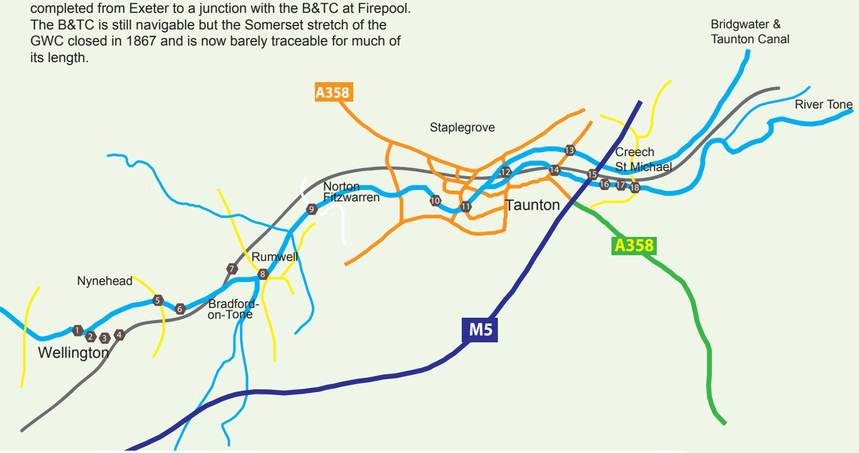
Bridges along the River Tone

The river Tone rises near Huish Champflower in the Brendon Hills, and flows generally southwards and eastwards for 32 miles to a confluence with the river Parrett at Stanmoor Bridge near Othery. By 1717 it had been made navigable up to Taunton by means of locks and half-locks, but the opening of the Bridgwater & Taunton Canal (B&TC) in 1827 signalled the demise of the Tone navigation. The B&TC joins the Tone at a lock alongside Firepool Weir. Canal navigation above Taunton was achieved in 1838 when the Grand Western Canal was completed from Exeter to a junction with the B&TC at Firepool. The B&TC is still navigable but the Somerset stretch of the GWC closed in 1867 and is now barely traceable for much of its length.



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1 Tone Bridge, Nynehead

In 1817 William Ayshford Sanford of Nynehead Court built a bridge to carry a new entrance drive over a stretch of the Tone that he had recently transformed into an ornamental lake, as part of a scheme to improve his parkland and provide work for local men. This elegant classical masonry arch bridge of three 12.2m spans (pictured on cover, lower) was designed by a 24 year-old Barnstaple architect, Thomas Lee. The low-profile arches are built of brick but, like all the elevations, they are faced with a greyish building stone known as North Curry Sandstone that was probably quarried from an outcrop at nearby Hele. A plaque under the centre arch is inscribed “W A Sanford 1817”.

2 Canal Aqueduct, Nynehead

Further along the Nynehead Court drive is this imposing sandstone aqueduct dating from the early 1830s. Its designer, James Green, was County Surveyor of Devon from 1808 until 1841, where he designed more than 100 large bridges. He was Engineer to several canal companies, including the stretch of the GWC from Taunton to the Devon boundary, where he used cast iron extensively in the bridges and aqueducts, writing “its cheapness, its convenience in fixing, and its durability render it for those purposes most desirable”. The canal waterway over the Nynehead Court drive was conveyed through a trough consisting of cast-iron plates bolted together. The side plates have splayed joints analogous to stone arch voussoirs, and the arched bottom plates harmonise with the masonry arch into which the trough is built.

3 Dismantled GWC Bridge

After the GWC closed in 1867, the cast-iron ribs and deck plates of a redundant bridge (most likely under Staplegrove Road in Taunton) were re-used in a bridge near Trull Mill. This bridge was itself replaced in 2012, and the dismantled cast-iron components are now stored near the Nynehead aqueduct until they can be re-assembled as a static museum display. Close to the storage area there are the remains of a GWC “lift” and a restored section of waterway.

4 Railway Bridge, Nynehead

In 1835 IK Brunel visited WA Sanford’s son and heir, Edward, to explain how the Bristol & Exeter railway line would be built through his park and cross over the drive just 100yds away from the canal aqueduct. Brunel promised Sanford that the B&ER Company would build a bridge similar in architectural style to the aqueduct, “but superior in every respect, and it shall if desired include a lodge in the abutments.” From the aqueduct there is a fine view of the sandstone railway bridge and the brick walls that line the drive, all completed in 1839. True to Brunel’s word, a lodge was built into the further end of the bridge, with a mock lodge at the nearer end.

5 Hornshay Bridge, Nynehead

In 1594 an old stone bridge that carried the West Buckland to Nynehead road over the Tone was known as Langhams or Longham Bridge, and later as Hornes Hay Bridge. An ancient legal responsibility made Nynehead parish liable to repair the northern half of the bridge, Wellington parish two-thirds of the southern half of the bridge, and West Buckland parish the remainder. The liabilities were in force until the 1860s, when responsibility passed to the Milverton Highway Board and then to the County of Somerset. It was rebuilt in 1912 as a reinforced concrete arch bridge, and was one of the earliest of over 60 concrete bridges that were constructed in Somerset between 1909 and 1930 to the design of Edward Stead, who retired as County Surveyor in 1946.

6 Tone Aqueduct, Nynehead

Within half a mile of the Nynehead drive aqueduct the GWC crossed over the Tone on another of James Green’s cast-iron troughed aqueducts. Although the side plates are similarly splayed, in this case the bottom plates are flat. The towpath on one side and a track on the other were carried by very flat masonry arches. The whole structure was built on a skew to prevent the river scouring the foundations.

7 Trefusis Canal Bridge, Bradford-on-Tone

This is the only cast-iron GWC bridge left standing in its original position, and the components are identical in most respects to those that are now stored at Nynehead (see Dismantled GWC bridge). Four slightly arched iron ribs, spanning 4m between masonry abutments, carry iron deck plates on which the road construction was originally laid. Very flat and narrow masonry arches support the stone parapets. In 1997 a reinforced concrete strengthening slab was cast over the iron plates; the slab was “debonded” from the plates so that it could be removed if necessary.

8 Bradford Bridge

In 1617 the inhabitants of Bradford parish were liable to repair at least seven timber bridges and five stone bridges, including two major bridges over the Tone – one near the village and another 3 miles away at Hele, both of which were probably built in the 15th century. Bradford Bridge became a County Bridge before 1667. The Justices of the Peace also took responsibility for repairing 100 yards of each approach road, as was stipulated in the Bridges Act of 1530. On each approach to every Somerset County Bridge there was set up a stone inscribed “CBB”, which marked the “County Bridge Boundary”. By 1860 there were over 150 County Bridges, but only a handful of the boundary stones still survive, one of which stands on the west side of the entrance to the White Horse Inn car park at Bradford (pictured on cover, upper left).

9 Hele Bridge

In 1617 the Bradford parishioners pleaded at the Quarter Sessions that they should be freed from paying the enormous costs of repairing Hele Bridge on the grounds that it lay “in the uttermost boundes of our parishe and none of us have occasion to travell to the markett that way”. The Justices of the Peace for Somerset subsequently enrolled it as a County Bridge. It was badly damaged when Taunton was besieged in 1645 during the Civil War; several years later the Justices were still trying to raise funds to repair this and many other war-damaged bridges. Early in the 20th century the bridge was widened on both sides by the addition of steel beams supporting concrete extensions with brick parapet walls; these were replaced by reinforced concrete and masonry in 2002.

10 Tone Bridge, Tangier Way, Taunton

Tone Bridge spans 36m and carries Tangier Way over the River Tone in the centre of Taunton. It forms part of the Taunton Third Way road scheme which was built by Somerset County Council to relieve traffic from the town centre and provide access for the regeneration of the Tangier area. Principal contractor Galliford Try was on site between 2010 and 2011.

Civil engineer Flint & Neill with Moxon Architects won the competition to design Tone Bridge. It is a steel tied arch with a steel orthotropic deck (ie steel plates stiffened by other transverse and longitudinal steel plates and trusses) and stainless steel hangers. The bridge was fabricated off site by Mabey Bridge Ltd and assembled on the adjacent riverbank. The total weight of the superstructure is 247 tonnes and it was lifted in one piece by a 600 tonne crawler crane onto reinforced concrete abutments in an operation lasting less than one hour.

Tone Bridge was the centrepiece of the official opening of Taunton Third Way by Transport Minister Norman Baker MP on 27th September 2011. It won the 2012 British Construction Industry Award for civil engineering projects with a value up to £3,000,000. The judges commented that: “This was a great example of how architects and engineers can work together to design an elegant solution while addressing the buildability and construction issues”.

11 North Town Bridge, Taunton

A bridge at Taunton, probably of timber construction, was first recorded in 1280. By 1570 there was a narrow masonry bridge of six arches, called Tone Bridge. This was replaced in 1810 by a wider bridge of two masonry arches which was renamed North Town Bridge. Plans for a cast-iron bridge in 1828 came to nothing, but six years later an additional, larger, masonry arch was built between the original two, in an attempt to improve the navigation and alleviate flooding. By the 1895 conditions had worsened, and the masonry arches were replaced by a three-span wrought-iron girder bridge supported on cylindrical cast-iron columns. In 1936-8 the girders and deck were replaced by steel, but the cast-iron parapets and lamp standards were re-used as can be seen today.

12 Obridge Viaduct

Obridge Viaduct was constructed as part of Somerset County Council's Taunton Eastern Relief Road. It crosses the River Tone, main line railway and the Bridgwater & Taunton Canal by means of eight spans with a total length of 303m. The viaduct was designed and constructed by Reed & Mallik Ltd and Fairfield Mabey Ltd.

900mm diameter bored piles support reinforced concrete piers and abutments. The site is underlain by stiff red Keuper Marl. The area south of the railway was much disturbed by old river channels and other excavations, some containing domestic refuse which had to be removed and replaced by crushed stone.

The deck consists of two plate girders with a longitudinal stringer on the deck centre-line, supported by transverse frames located every 7m along its length. The steelwork was all fabricated in South Wales. The girders were then brought to site by road in lengths of 24.5 or 17.5m, lifted into place by crane and then welded together to make them continuous over the full length of the viaduct. Weathering steel was used. This is a high-quality structural steel alloyed with chromium, copper and aluminium which has the property of naturally forming a strongly bonded, dark coloured oxide surface layer which virtually eliminates further corrosion after two or three years and requires no painting. The steelwork is topped off with a reinforced concrete deck, spanning between the main girders and cantilevering on either side.

13 Bathpool East and West Bridges

Until 1842 a meander away from its generally eastward course took the Tone at Bathpool northwards nearly to the present Bathpool Inn, where it was crossed by the Taunton to Bridgwater road (now A38). The road also crossed the tailrace of Bathpool Mill, near the western end of the meander. At least one of these crossings was bridged before 1504, and by 1649 there were stone-built County Bridges at both sites. Both were rebuilt as brick arches in the 1790s, after which they became known as Bathpool West Bridge (over the mill race) and Bathpool East Bridge (over the Tone). After the Tone was diverted into the New Cut in 1842 (see below), its old watercourse under the East Bridge served merely as a drain; it was rebuilt as a reinforced concrete slab bridge in 1936. The West Bridge was widened with a reinforced concrete arch in 1926 (pictured).

14 Bathpool New Cut, Towpath and Railway Bridges

When the B&ER was being built in the early 1840s the meander at Bathpool was bypassed by diverting the Tone into a new channel (the "New Cut") alongside the railway line, thus eliminating the need for two railway bridges over the river. Brunel's assistant, William Gravatt, designed three arches to carry the Bridgwater road on a skew angle over the river , the towpath and the railway. Over the New Cut there was a low-profile 22m span brick arch (24m on the skew) with grey sandstone facings; next there was a 7.6m span brick arch bridge over the towpath, followed by a 9m span brick arch bridge over the railway. New Cut Bridge and the Towpath Bridge were lengthened on the west side when the railway and road were widened in the 1930s, and a steel girder bridge has replaced Gravatt's original Railway Bridge.

15 M5 River Tone & Bathpool Canal

The River Tone Bridge and Bridgwater and Taunton Canal Bridges were part of a 6.5 section of motorway built in one contract between Huntworth interchange (Junction 24) and Blackbrook interchange (Junction 25), thus by-passing North Petherton. The contract was awarded to Arthur Monk Ltd by the Somerset Road Construction Unit for a tender sum of £5.72m and commenced in May 1973; it was opened to traffic in November 1975.

River Tone Bridge is a major three span bridge which carries the M5 motorway over the river. The bridge consists of two separate in-situ post-tensioned concrete box structures (one for each carriageway) with a curved soffit. The abutments are concrete cantilevers built on in-situ concrete piles. The structure was strengthened in 2001 to provide full capacity for 40 tonne lorries. The deck originally had steel roller bearings and these were replaced by more modern types, as well as some works to the abutments and to the piers. The post-tensioning system was checked and found to be in good condition. One interesting fact is that the small footbridge pictured in the foreground above (leading out to Ruishton) is probably one of the smallest post-tensioned structures in the country, only chosen to be this type so that it could be used as a trial for the main bridge.

The Bathpool Canal Bridge is a simply supported prestressed beam structure supported on reinforced concrete abutments. The structure is again made up of two decks, each consisting of 34 No pre-stressed 'inverted T' beams. The canal was not in operation during the construction of the motorway and so was closed off at either end during the scheme, only being flooded again after completion of the training walls and invert.

16 Five Arch Bridge, Ruishton

A branch railway from Taunton to Chard, running parallel with the Chard Canal, opened in 1866. Five Arch Bridge carried the Chard Branch over the Tone 200 yards upstream of the canal aqueduct, until the line closed in 1962. The arches are built on a skew; the stone corbels on which the arch centering was supported can still be seen in each of the piers.

17 Tone Aqueduct, Creech St Michael

The Chard Canal ran from Creech St Michael to Chard, via Ilminster. James Green was appointed Engineer in 1831 but he was replaced by Sydney Hall before any substantial progress had been made. It is not known for certain which of them designed the aqueduct over the Tone near the Chard Canal's junction with the B&TC at Creech St Michael, although the distinctive rounded cutwaters on the piers are similar to those that Green designed for many of his Devon bridges. The aqueduct has two 9m span brick arches and two 3.7m side spans; the piers and abutments are built of lias limestone, which was also used to face the elevations above springing level. Recent archaeological excavations revealed evidence that suggests the canal waterway was conveyed through a masonry trough, unlike the cast-iron troughs of the GWC aqueducts. The Chard Canal was finally opened in 1842, but railway competition soon took away its trade; it closed in 1868.

18 Creech Old Bridge

A medieval County Bridge over the Tone at Creech St Michael was rebuilt as a three span masonry arch bridge in 1700. In 1848 this was widened on both sides by the addition of cast-iron road-plates and parapets supported on brackets built into the masonry spandrels, designed by Richard Carver, the County Surveyor. Edward Murch of Bridgwater supplied all the ironwork; his name is cast into the plates on each side. The two sides of the widening were tied together under the road construction by massive wrought-iron bars which were exposed to view when a reinforced concrete deck slab was installed in 2000.

Glossary

B&TC - Bridgwater and Taunton Canal
B&ER - Bristol and Exeter Railway
GWC - Grand Western Canal

You can visit most of these bridges by public footpaths. Further details of walks around the River Tone are available from Taunton Tourist Information Centre.

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Bridges Along the River Tone

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