

Welcome to the Dumfries Bridges civil engineering trail

Being so close to the border, Dumfries has had a history of conflict but the bridges of the town tell a different story, one of uniting communities old and new.

Rising in the Carsphairn Hills in East Ayrshire, the River Nith flows south-easterly through Dumfries and Galloway for 70 miles and then into the Solway Firth. The section that flows through Dumfries features several bridges that not only span across the river but also across several centuries.

The bridges also reflect the story of transport; from the pedestrian and horse traffic of the Middle Ages, through the growth of cars in the 20th century, to today's need to reduce pollution and reliance on fossil fuels and focus on more active ways of travelling.

On this walk through the town centre bridges you'll learn about the engineering behind them and see things you may never have noticed before.

THE TRAIL

This trail follows the River Nith through Dumfries town centre, starting from the east side of the river at Greensands to the Kirkpatrick Macmillan Bridge at Castledykes Park. It can be walked in either direction, taking approximately thirty minutes in each direction, or a one hour round trip. The trail follows pavements and paths and is easily accessible, although there are stairs to access Devorgilla Bridge.

There are regular buses to and from the Whitesands and cycleway links to access the starting point of the trail.

This leaflet has been produced by the Institution of Civil Engineers in partnership with Dumfries & Galloway Council. An engineer led guided walk is available for groups on request.

Find out more:

ice.org.uk/what-is-civil-engineering

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 @ICEScotland

 ICE Scotland

 scotland@ice.org.uk

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INSTITUTION OF CIVIL ENGINEERS



Dumfries
Bridges Trail

GLOSSARY

Abutment – the element that supports the end of a bridge

Cantilever – a beam supported only at one end

Cutwater – diamond-shaped extensions to bridge supports which offer less resistance to the flow of water.

Deck – the traffic carrying surface of a bridge

Facing/façade – an outer layer covering the surface of a wall or other construction

Parapet – a low protective wall along the edge of a roof, bridge, or balcony.

Pier – intermediate vertical support for a bridge superstructure.

Span – the distance between the supports for a structure

Spandrel – the space between two arches or between an arch and a rectangular enclosure

Superstructure – the part of a structure that is above ground. That below ground is known as sub-structure

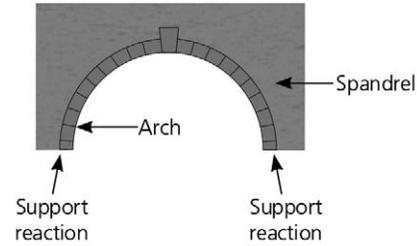
Weir – a barrier or dam across a river that alters the flow of water raising the upstream water level

Types of bridge design

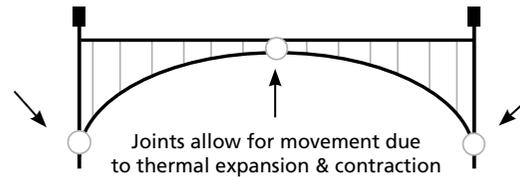
BEAM AND SLAB



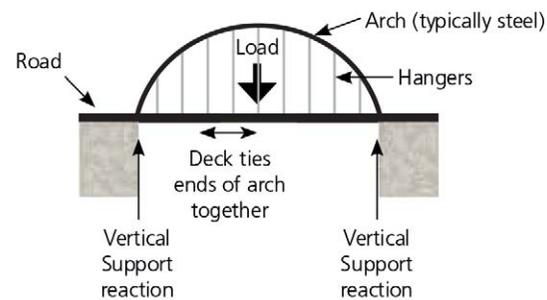
ARCH



3 PINNED ARCH



TIED (BOWSTRING) ARCH

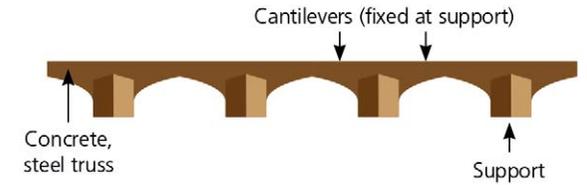


TRUSS

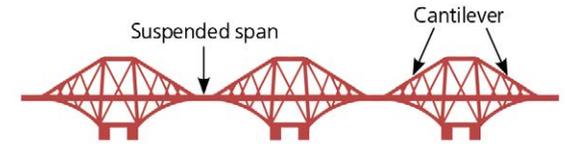


Main support beam (can be rolled steel section, plate girder (welded together from flat plates) or box girder)

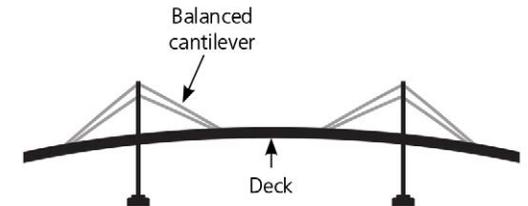
BALANCED CANTILEVER



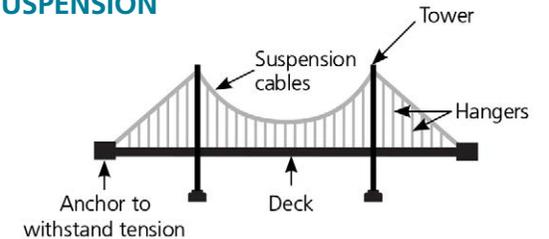
BALANCED CANTILEVER (LIKE FORTH BRIDGE)



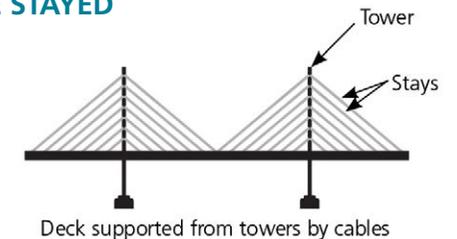
BALANCED CANTILEVER (LIKE ERSKINE BRIDGE)



SUSPENSION



CABLE STAYED





1. LOREBURN CYCLEWAY BRIDGE - 2000

The first bridge on the trail is Loreburn Cycleway Bridge; the northmost of the seven structures on this trail, it connects the Greensands and Nithside areas of Dumfries.

Known locally as Boathouse Bridge due to its position next to the boathouse, this modern steel truss bicycle and pedestrian bridge carries the National Cycle Network route 7 over the River Nith.

Funded and built around the time of the Millennium, Loreburn Cycleway bridge is also sometimes referred to as Millennium Bridge.

From here, stay on the east side of the river and head downstream to find the next bridge.

2. BUCCLEUCH STREET BRIDGE/NEW BRIDGE – 1792

A bridge of many names, Buccleuch Street or Buccleugh Street or the “new bridge”, is a five span, masonry arched structure designed by Thomas Boyd, a local man, and built of dressed sandstone. It has been updated several times over the years to adapt from horses and carts to today’s vehicular traffic.



The original bridge, built in 1793, proved to be too narrow, so was widened in 1893 with the addition of pedestrian footpaths. The work was carried out by James Barbour and Sir William Arrol. By this time, William Arrol had already built the Forth Bridge, Tay Bridge and Tower Bridge in London. The footpaths cantilever out from the original structure. If you look closely, you can see where the cutwaters, the pointed piers that support the bridge, have been extended upwards to support the footpath.

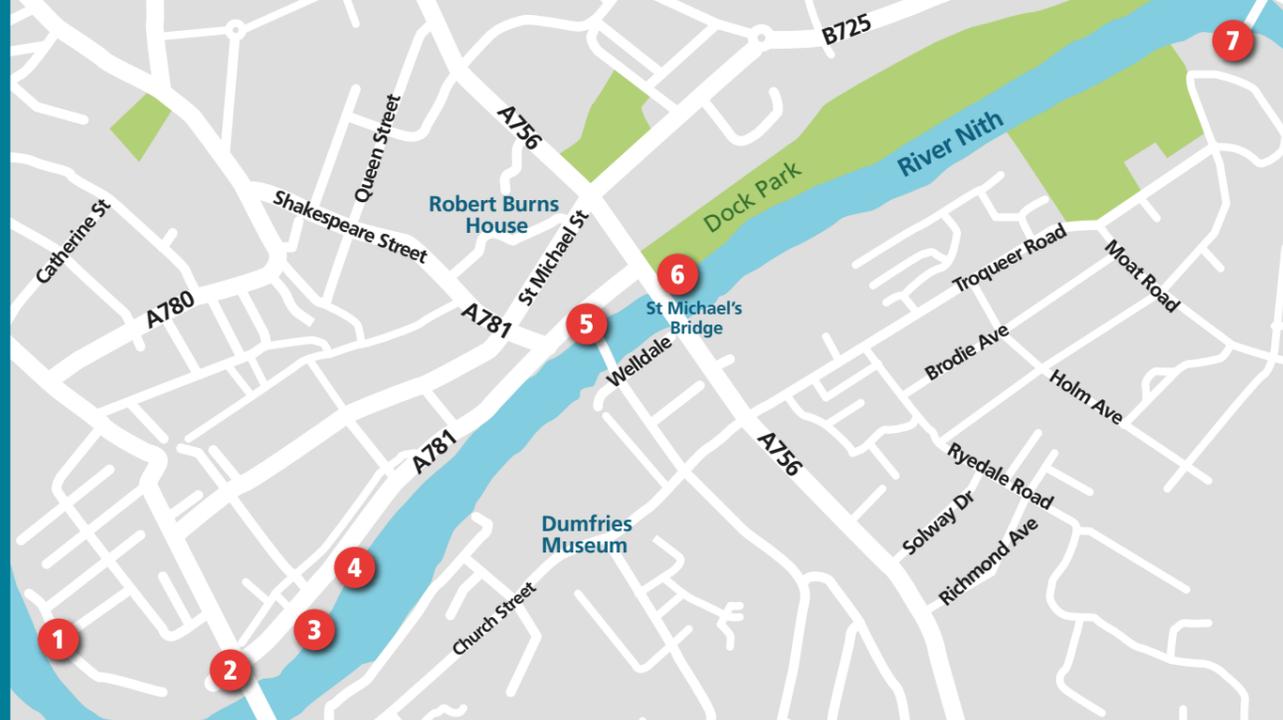
The five arches increase in size towards the centre of the bridge with the smallest of the five being a small underpass connecting the Greensands and Whitesands areas; walk under the smallest arch to head further downstream and continue our journey.



3. DEVORGILLA BRIDGE – 1432

Devorgilla Bridge, sometimes referred to as the “old bridge”, is the oldest surviving multiple arched masonry bridge in Scotland. Originally constructed around 1432 from local red sandstone, it replaced an earlier timber structure thought to date from 1270.

It was originally constructed with nine arches and named after Devorgilla, the mother of King John Balliol, but was badly damaged



by floods in 1619. A single pointed Gothic arch at the western end remains but the reconstructed arches have a semi-circular shape.

By the end of the 18th century traffic had outgrown the bridge and it was restricted to pedestrians, losing its three easternmost arches to land reclamation, in order to make easier access to the “new bridge”. There is a nod to the former structure in the paving on Whitesands marking the ‘lost’ piers.

You can cross to the west side of the river here at Devorgilla Bridge or continue downstream to the Suspension Bridge and cross there.

4. WHITESANDS CAUL – 1705

Located to immediately downstream of Devorgilla Bridge is the Caul, a sandstone weir built in 1705 to divert water from the River Nith, which was causing erosion of the Whitesands area on the east bank. The diverted water has been used in the past; for a mill in the 18th century and for generating electricity in the early 20th century but currently isn’t used. There are fish ladders on either side of the Caul to allow fish upstream to spawn.



5. SUSPENSION BRIDGE – 1875

This elegant suspension bridge was described at its opening as “an airy graceful thing of beauty that might have been conjured into existence by the wand of an eastern magician”. Built to allow pedestrian access to and from the mills on the west bank of the River Nith, the Suspension Bridge was opened by the Lord Provost T. F. Smith in 1875.

The deck is supported from pairs of wrought iron, chain-link cables suspended from the Doric cast iron columns. The ornamental arches that link the columns feature the Coat of Arms of Dumfries.



If you didn’t cross the river at Devorgilla Bridge, you can cross here and continue downstream on the west side of the river.

6. ST MICHAEL’S BRIDGE – 1929

The original plans for this bridge date to 1913 but construction wasn’t completed until 1929. The multi-span arch bridge is built from reinforced concrete and is faced with sandstone, to blend in with the older bridges. In honour of its linking Dumfries and Maxwelltown, the coat of arms of both burghs is featured on the side of the bridge. The Dumfries coat of arms features the archangel Michael.



If you’re on the west side of the river, walk under the last arch of St Michael’s Bridge and head downstream to find our last bridge.

7. KIRKPATRICK MACMILLAN BRIDGE – 2006

The newest of Dumfries’ bridges, the Kirkpatrick Macmillan Bridge, is actually an arch bridge just like the oldest at Devorgilla. However, unlike Devorgilla Bridge which is a traditional masonry arch bridge, this bridge is a steel bowstring arch bridge. They work in very similar ways except here the arch is above the bridge deck rather than below.

It’s named after Kirkpatrick Macmillan (1813-1878) from Nithsdale, who, in 1839 invented the pedal-driven “velocipede”, the precursor of the modern bicycle. Very fitting for a pedestrian and cycle bridge.

You can cross the Kirkpatrick Macmillan Bridge and walk back upstream through the beautiful Dock Park.

