

Welcome to the Union Canal civil engineering trail

Firstly, a little bit of history...

To give the canal its original full title, the Edinburgh and Glasgow Union Canal was completed in 1822, but why was it needed? It was all about the price of coal. The people of Edinburgh relied on coal coming through the Port of Leith which was expensive, whereas the West of Scotland had cheaper supplies from coalfields of their own. So, in 1793 planning began for a canal to transport coal from West to East. As with all big infrastructure projects, cost was a critical factor and the project was delayed by the Napoleonic Wars, so construction didn't actually start until 1818. Scottish canal engineer Hugh Baird was appointed as chief engineer and designer of the project.

When the canal opened, supplies flooded into Edinburgh – coal, building materials and farm produce. And what went back out again? Horse manure! It was used in the fields along the route of the canal. There were also people travelling to Glasgow or taking day trips out of Edinburgh.

As with all canals in Scotland, the Union Canal had a relatively short life before the newer, faster railways arrived. The Edinburgh to Glasgow railway line opened in 1842. Passenger services on the canal stopped six years later though commercial traffic continued to use it until the 1930s. In 1965, the Union Canal formally closed.

Thankfully, the canal was reopened in 2001 as part of the Millennium Link restoration and reunited with the Forth & Clyde Canal in 2002 with the opening of the Falkirk Wheel allowing us to enjoy it once more.

THE TRAIL

Start the trail at Lochrin Basin off Fountainbridge, which is a 10 to 15 minute walk from Haymarket train station or on several bus routes. The trail follows the towpath along the Union Canal which is flat and level, though narrow in some places. There are various other access/egress points along the route. Walking the trail from Lochrin Basin to Slateford Aqueduct takes approximately 1 hour (in one direction).

This trail ends at the Slateford Aqueduct where you can retrace your steps back along the canal, use the stairs down to the Water of Leith to access the A70, Lanark Road and catch a bus back to the city centre or continue your walk along the Water of Leith Walkway.

If you're keen (or maybe on a bike) you could continue along the Union Canal on to the Almond Aqueduct beyond Ratho (approx. 9 miles) or go further on to the Avon Aqueduct near Linlithgow or even all the way to the Falkirk Tunnel and Wheel, the subject of another of our civil engineering trails.

This leaflet has been produced by the Institution of Civil Engineers in partnership with Scottish Canals.

An engineer led guided walk is available for groups on request.

Find out more:

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Scottish
Canals



Union Canal Trail



GLOSSARY

Aqueduct – an aqueduct can be a pipe, ditch, tunnel or supporting structure used to carry water. On the canals, it generally refers to a bridge carrying the waterway over an obstacle.

Canal basin – An open area of water, usually artificial, and often enclosed by dock gates or locks where barges, narrow boats and other canal vessels can load and unload goods and supplies.

Contour line – a contour line is a line drawn on a map connecting points of equal elevation.

Keystone – the central stone at the summit of an arch, locking the whole together.

Penstock or sluice gate – A penstock or sluice gate is a type of valve for controlling water. It acts like a sliding door lifting to let water out and closing to stop the flow. These can be operated by hand or automated.

Pound Lock – canal locks (or pound locks to give them their proper name) are a way of moving boats uphill or downhill. A lock is a chamber with gates at both ends that can be filled or drained to lift or lower a boat.

Puddle Clay – puddle clay is the natural material used to provide a waterproof lining to the canal.

Rack & Pinion – the rack is a straight bar with teeth, the pinion is a cogged wheel which runs along it. This converts movement from linear to rotational (and vice versa).

Stop Lock – a stop lock completely stops the flow of water from one part of a canal to the next.

Viaduct – A viaduct usually carries a path, road or railway over an obstacle like a valley. It is generally a larger structure than a bridge (in length, height or width).

The Mathematical

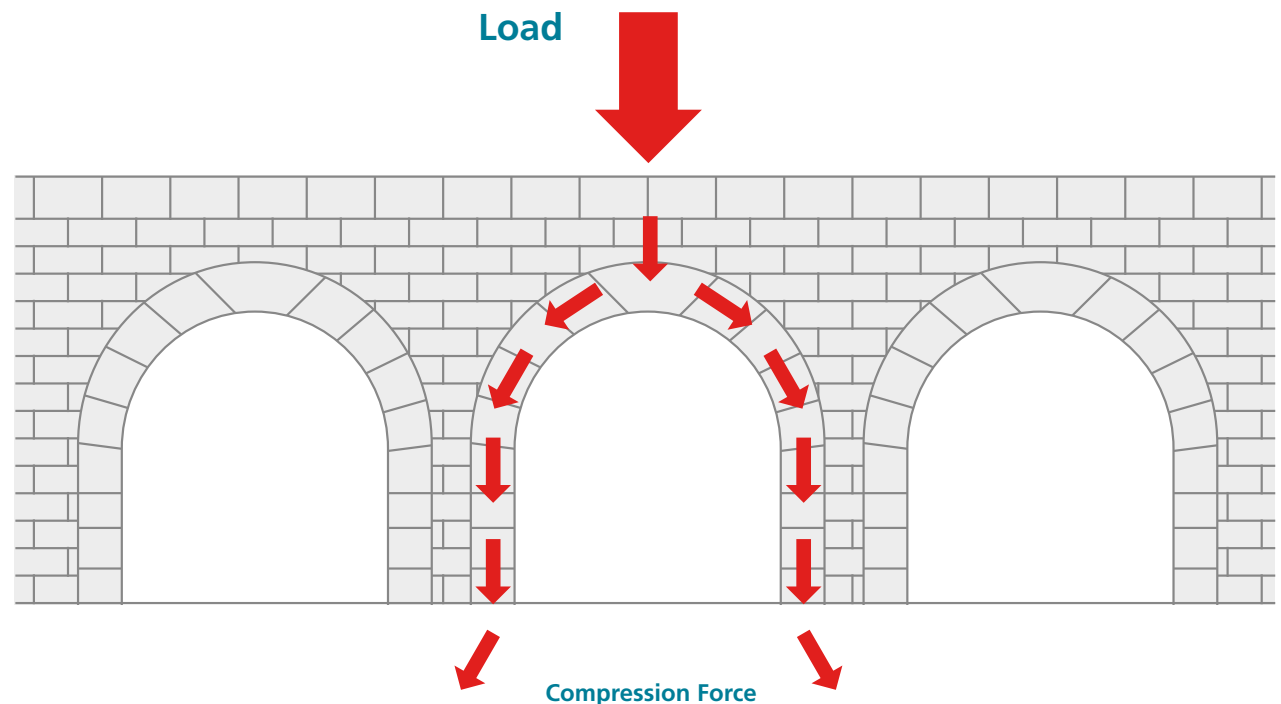
Having already worked on the Forth & Clyde Canal, Hugh Baird designed the Union Canal as a completely level route. His ingenious idea was to reduce costs by following the 240ft contour line, making the Union Canal completely flat and avoiding the need to build locks. Nicknamed “The Mathematical”, this route was cheaper to build and would be faster for canal traffic.

However, that did mean that three major aqueducts had to be constructed; the Slateford, Avon and Almond Aqueducts. Baird was supported throughout by world famous engineer Thomas Telford, using the latest technology of the time. The aqueducts use a cast iron trough rather than stone and puddle clay to hold the canal water, which allows for a lighter structure. The stone piers are also hollow, reducing weight and cost.

How does an aqueduct work?

An aqueduct, which carries water, or a viaduct, which carries traffic of some kind, is really just a long bridge. It's possible to build a bridge structure with just a simple beam but there are limits as to how far it will span before breaking. Arch structures can increase that span. If you can build a series of arches, like in the Slateford Aqueduct or Viaduct, then you can begin to cover much longer spans.

An arch works by transferring the load applied to it as a compression (or pushing) force. This passes from one wedge shaped segment (or voussoir) to the next and through to the ground below. Other types of bridge involve tension (or pulling) forces but an arch only has compression forces, which is why they are so successfully built from masonry.





1. LOCHRIN BASIN

When the Union Canal was shortened in 1921, Lochrin Basin became its eastern terminus. Technically this is the “new” Lochrin Basin, the original one next to Lothian Road in the city centre, was filled in during the 1930s and built over.

2. LEAMINGTON LIFT BRIDGE

Constructed around 1906 where Fountain Bridge crossed the canal (now filled in), the bridge was moved to its current location in 1922 when the canal was shortened. It was refurbished in 2019 and is the only hydraulic bridge on the canal. The bridge lifts the road up by 2.7m to allow boats to pass underneath.



3. VIEWFORTH BRIDGE

This sandstone arch bridge was completed in 1836. If you look at the carvings at the centre span on each side of the bridge, you’ll see the East side has a castle to represent Edinburgh and the West side has an Oak tree to represent Glasgow (as featured on Glasgow’s Coat of Arms).



Confusingly, these first two newer bridges aren’t included in the original numbering, which starts at the next bridge, Yeaman Place (bridge 1) and runs to Walkers Bridge in Falkirk (bridge 62) which is part of our Falkirk Wheel and Tunnel civil engineering trail.

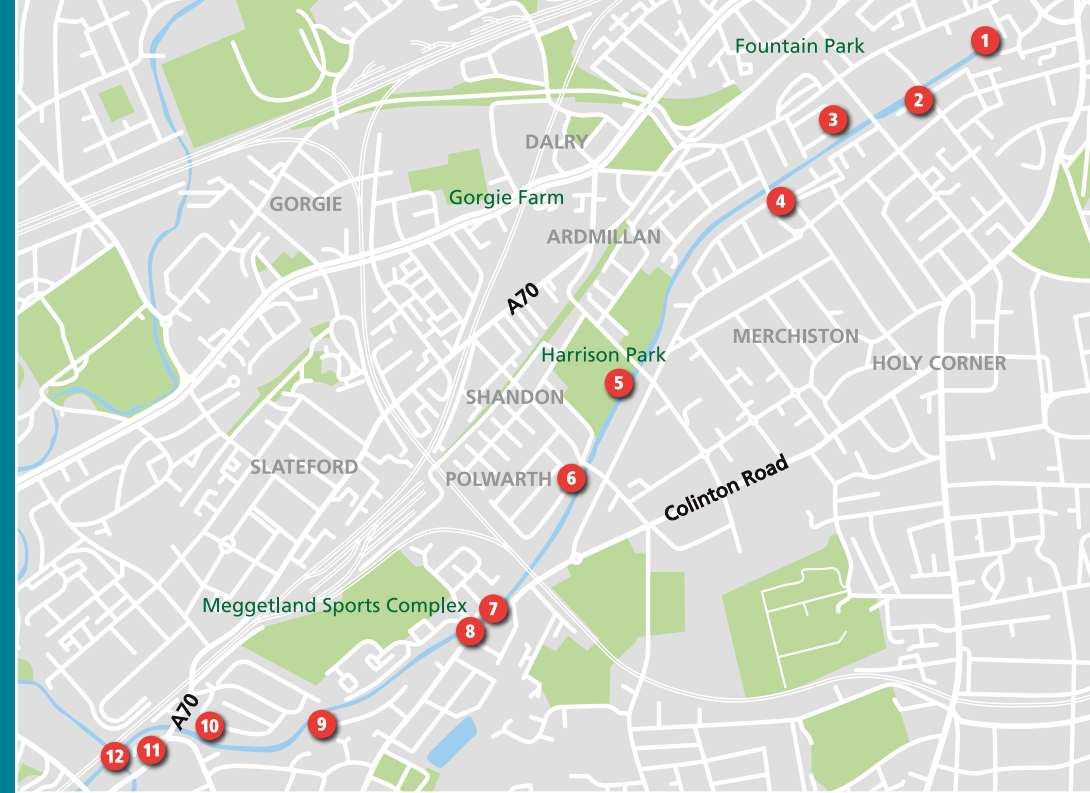
4. YEAMAN PLACE BRIDGE

The original stone bridge was replaced by this one at the end of the nineteenth century.



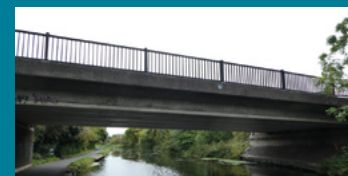
5. HARRISON PARK BRIDGE

The paint colour scheme on this bridge is interesting – gold to represent the merchants funding of the canal, blue for the water of the canal, red for the life blood the canal brought to Edinburgh and black to represent the coal hauled by the barges to the city.



6. ASHLEY TERRACE BRIDGE

Also known as Lockhart Bridge, this cast iron box girder bridge was built in 1904, replacing the original masonry bridge. The iconic boat house next to the bridge is the home of Edinburgh’s Canal Society which was founded in 1986. The boathouse was built in 1987 using recycled parts from one previously at Meggetland.



7. MEGGETLAND NEW BRIDGE

This modern concrete structure was built to remove road traffic from the original bridge which is now listed.

8. MEGGETLAND OLD BRIDGE

One of the original bridges over the canal built 1818-1822, this lovely stone arch bridge is now used as a footbridge with road traffic using the modern replacement next to it. You can see the number 4 carved on the keystone.



9. ALLAN PARK FOOTBRIDGE

This bridge was allegedly meant to carry a tramway to Redford Barracks but the project was never completed. It now carries people and water mains across the canal.

10. PRINCE CHARLIE AQUEDUCT

You might not think much of it from its concrete parapets but this modern replacement has its story to tell. Why Prince Charlie? There’s a plaque under the aqueduct on Slateford Road explaining that Bonnie Prince Charlie set up a camp at Gray’s Mill near here on his way to occupy Edinburgh during his 1745 Jacobite rebellion. The current concrete arch replaced an older stone aqueduct in 1937.



11. SLATEFORD AQUEDUCT

One of three magnificent aqueducts on the Union Canal, Slateford Aqueduct built in 1822 is the second largest aqueduct in Scotland. Its iron trough carries the water channel over eight elegant stone arches, with hollow pillars to reduce weight. Looking along the aqueduct, you can see a pair of penstocks/sluice gates that can be operated manually using a rack

and pinion to drain the canal. It’s visible both from the towpath and from below if you descend the (rather steep) stairs down to the Water of Leith.

12. SLATEFORD VIADUCT

Standing on the Slateford Aqueduct, facing away from Edinburgh, you’ll get a great view to the right of the Slateford Viaduct. This impressive 14 arch masonry structure was built in 1842 to carry the Caledonian Railway into Edinburgh’s Princes Street. Unfortunately, the opening of the Edinburgh to Glasgow railway signalled the end of passenger services on the canal, which lasted only another six years.



Our trail ends here but there are many options to continue your journey on the back page of this leaflet.