

Thomas Telford, Civil Engineer

Who was he?

Thomas Telford was a Scottish Civil engineer, he was born in Dumfriesshire in 1757. A civil engineer like Telford is one that works on projects that are for public use, things like roads and railways.

What did he do?

He was a self-taught engineer and worked on projects ranging from roads, to bridges to canals.

Engineering claim to fame?

In his lifetime he was involved in the construction of over 1000 miles of roads in the UK. If you were to lay all those in one long line you would be able to get from London to Seville in the south of Spain!

Back to the drawing board?

Thomas Telford was one of the first large scale engineers who would bother to test materials before he used them in his constructions. This meant that if the material wasn't up to the job he would have to find another one or a different way to use it.

Fascinating Fact?

Telford revolutionised the way roads are designed by making them higher in the middle than they are at the sides (like a little hill) this meant that rain water could run off easily. Have a look next time you are on a path by a road and you might spot Telford's design!

Thomas Telford Bio

Thomas Telford (August 9, 1757 - September 2, 1834) was born in Westerkirk, Scotland. He was a stonemason, architect and civil engineer - a noted road-, bridge- and canal- builder.

Early career

At the age of 14 he was apprenticed to a stonemason, and some of his earliest work can still be seen on the bridge across the River Esk in Langholm in the Scottish borders. He worked for a time in Edinburgh and in 1782 he moved to London where (after meeting architects Robert Adam and Sir William Chambers) he was involved in building additions to Somerset House. Two years later he found work at Portsmouth dockyard and - although still largely self-taught - was extending his talents to the specification, design and management of building projects.

In 1787, through his wealthy patron William Pulteney, he became Surveyor of Public Works for Shropshire, England. At this time, 'civil engineering' was a discipline still in its infancy, so Telford was set on establishing himself as an architect. His projects included renovation of Shrewsbury's Castle, the town's prison (during planning of which he met leading prison reformer John Howard), a church (St Mary Magdalene) in Bridgnorth and another at Madeley.

As county surveyor, Telford was also responsible for bridges. In 1790 he designed a bridge carrying the London-Holyhead road over the Severn river at Montford, the first of some 40 bridges he built in Shropshire, including major crossings of the Severn at Buildwas, Bridgnorth and Bewdley. The Buildwas bridge was Telford's first iron bridge (he was heavily influenced by the famous bridge at Ironbridge), but was 30 ft (10 m) wider in span and half the weight. As his engineering prowess grew, Telford was to return to this material repeatedly.

Ellesmere Canal

Telford's reputation in Shropshire led to his appointment in 1793 to manage the detailed design and construction of the Ellesmere Canal, linking the ironworks and collieries of Wrexham via the north-west Shropshire town of Ellesmere, with Chester (utilising the existing Chester Canal), and then the River Mersey.

Among other structures, this canal involved building an aqueduct over the River Dee in the Vale of Llangollen; for the spectacular Pontcysyllte Aqueduct, Telford used a new method of construction consisting of troughs made from cast iron plates and fixed in masonry.

Eminent canal engineer William Jessop oversaw the project, but he left the detailed execution of the project in Telford's hands.

Engineer in demand

The Ellesmere Canal was finally completed in 1805 but alongside his canal responsibilities, Telford's reputation as a civil engineer meant he was constantly consulted on numerous other projects. These included water supply works for Liverpool, improvements to London's docklands and the rebuilding of London Bridge (c.1800).

Most notably (and, again, William Pulteney was influential in his 1801 appointment), Telford devised a master plan to improve communications in the Highlands of Scotland, a massive project that was to last some 20 years. It included the building of the Caledonian Canal along the Great Glen (and redesign of sections of the Crinan Canal), some 920 miles of new roads, over a thousand new bridges, numerous harbour improvements (including works at Aberdeen, Dundee, Peterhead and Banff, to name but four), and 32 new churches.

Telford also undertook highway works in the Scottish Lowlands, including 184 miles of new roads and numerous bridges, ranging from a 112 ft (34 m) span stone bridge across the Dee at Tongueland in Kirkcudbright (1805-1806) to the 129 ft (39 m) tall Cartland Craggs bridge near Lanark (1822).

Telford was consulted in 1806 by the King of Sweden about the construction of a canal between Gothenburg and Stockholm. His plans were adopted and

construction of the Göta canal began in 1810. Telford travelled to Sweden at that time to oversee some of the more important initial excavations.

The 'Colossus of Roads'

During his later years, Telford was responsible for rebuilding sections of the London to Holyhead road (a task completed by his assistant of ten years, John MacNeill; today, the route is the A5 trunk road). Between London and Shrewsbury, most of the work amounted to improvements (including the Archway cutting in north London and improvements at Barnet and South Mimms). Beyond Shrewsbury, and especially beyond Llangollen, the work often involved building a highway from scratch. Notable features of this section of the route include the iron bridge across the River Conwy at Betws-y-Coed, the ascent from there to Capel Curig and then the descent from the pass of Nant Ffrancon towards Bangor.

On the island of Anglesey a new embankment across the Stanley Sands to Holyhead was constructed, but the crossing of the Menai Strait was the most formidable challenge, finally overcome by the Menai Suspension Bridge (1819-1826).

Telford also worked on the north Wales coast road between Chester and Bangor, including another major suspension bridge at Conwy, opened later the same year as its counterpart at Menai Bridge.

(The punning nickname *Colossus of Roads* was given to Telford by his friend and Poet Laureate Robert Southey.)

Late career

Other works by Telford include the St Katharine Docks (1824-1828) close to Tower Bridge in central London, the Gloucester and Berkeley Ship Canal (today known as the Gloucester and Sharpness Canal), the second Harecastle Tunnel on the Trent and Mersey Canal (1827), and the Birmingham and Liverpool Junction Canal (today part of the Shropshire Union Canal) - started in May 1826 but finished, after Telford's death, in January 1835. At the time of its construction in 1829, Galton Bridge was the longest single span in the world.

In 1820, Telford was appointed the first President of the recently formed Institution of Civil Engineers, a post he held until his death. He was buried in Westminster Abbey.
