Glossary – Bridges Terminology

Abutments – the support at the ends of a bridge.

Arches

> **Brickwork arches** – early forms of bridges where longer roads and railways were able to be carried over streams and rivers. To construct a brick arch a temporary falsework is built, usually from timber, to the arch shape and individual bricks are then built up in layers over the top. Once the brickwork has cured the falsework is removed and the arch becomes self-supporting. Brickwork arches were often used to build approach embankments to raise a road or railway over the obstacle and typically give sufficient headroom for vessels to pass below. In towns the brickwork arches themselves provided space for small businesses to develop.
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> **Vaulted arch** – in bridge building terms this describes secondary arches which span at right angles and between the main arches, so forming a wider space.
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> **Two-pinned arch** – this describes a bridge form where the ends of a bridge are free to rotate at its abutments, thus reducing the loads and costs of supporting foundations.

Ashlar – this is finely dressed (cut, chiselled or sawn) stone built up into masonry walls. The stone is usually hard like granite or sandstone.

Bailey bridges – are temporary bridges named after their inventor Sir Donald Bailey. They were developed in 1940 as a method of bridging obstacles in war and could be rapidly constructed, manually if necessary, to carry heavy machinery such as tanks. Forms of them are still in use today.

Bridge length – the total distance of a bridge from end to end.

Cast iron – molten iron poured into a mould to form structural members used in early building works. Cast iron is very stable (it does not rust much) but is brittle and does not carry bending loads very effectively.

Culvert – typically a pipe or brick-built tunnel which takes a stream or ditch under or around an obstacle.

Engaged balusters – balusters are the vertical members of a parapet or balustrade – typically in older bridges they would be stone circular pillars overlaid with some form of capping such as capping stones. The term *engaged* probably describes how the balusters are socketed into the capping.

Lattice strengthening – typically this describes diagonal steel members attached to the sides of bridges to distribute forces through the bridge and hence reduce main member sizes and costs.

Plate girders – before steel section rolling mills were invented, beam or column sections were built up from flat plates, riveted together.

Raft foundation – a large underground slab which spreads loads from a superstructure over a large area, typically used when the subsoil is soft.

Reinforced concrete (sometimes pre-stressed) – an economic material for building bridges. The reinforcement is usually steel which is embedded in the concrete. The steel typically carries

the tensile and bending loads, while the concrete resists compressive loads and provides a protective coating to the steel. Pre-stressing is where the steel (usually in the form of cables) is tensioned before the member is loaded to ensure that the concrete always remains in compression and so does not crack and bend.

Skewed bridge – where the bridge does not cross the obstacle at right angles. This allows approach ramps to be straighter, at the expense of a longer span to the bridge.

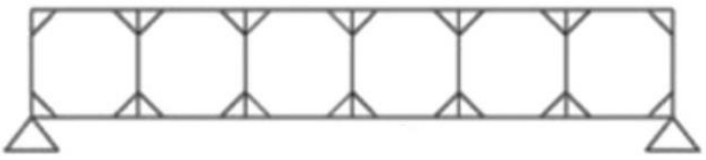
Span – the distance between supports of a bridge (or sections of a bridge), usually taken from the centre line of any supports.

Spandrel panels – typically these are located on the visible sides of bridges and fill in the gaps between the main structural members and the deck structure. In older brick-arched bridges they are often constructed from brick. For newer iron or steel structures, spandrel panels may be cast-iron plates.

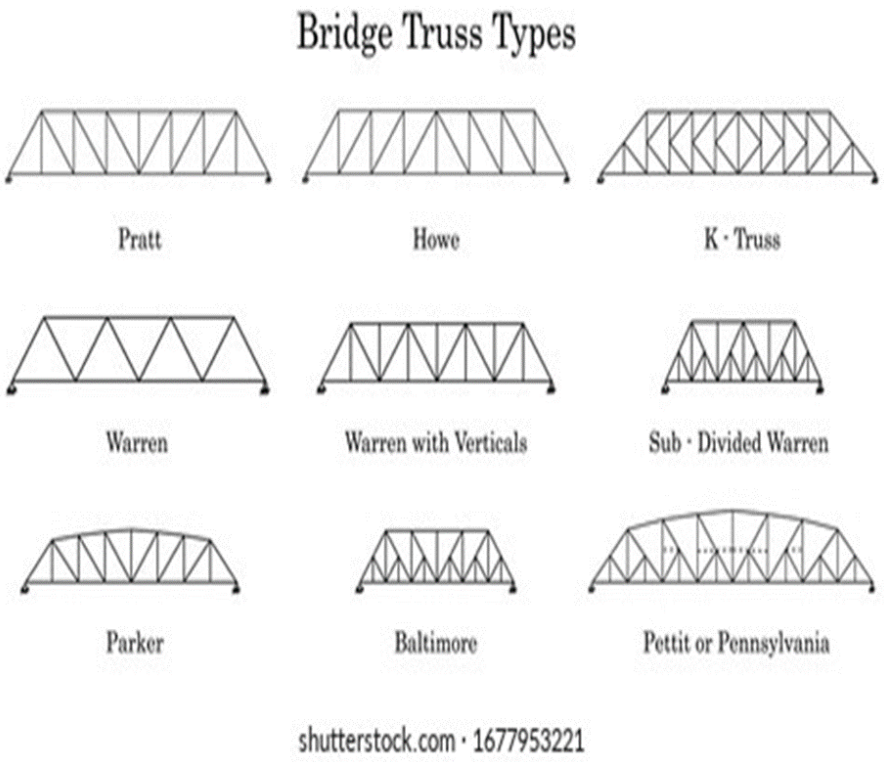
Steel trough – steel sections built up into U-shaped structures, such that the sides of the trough form the sides of the bridge – aqueducts are typically formed this way.

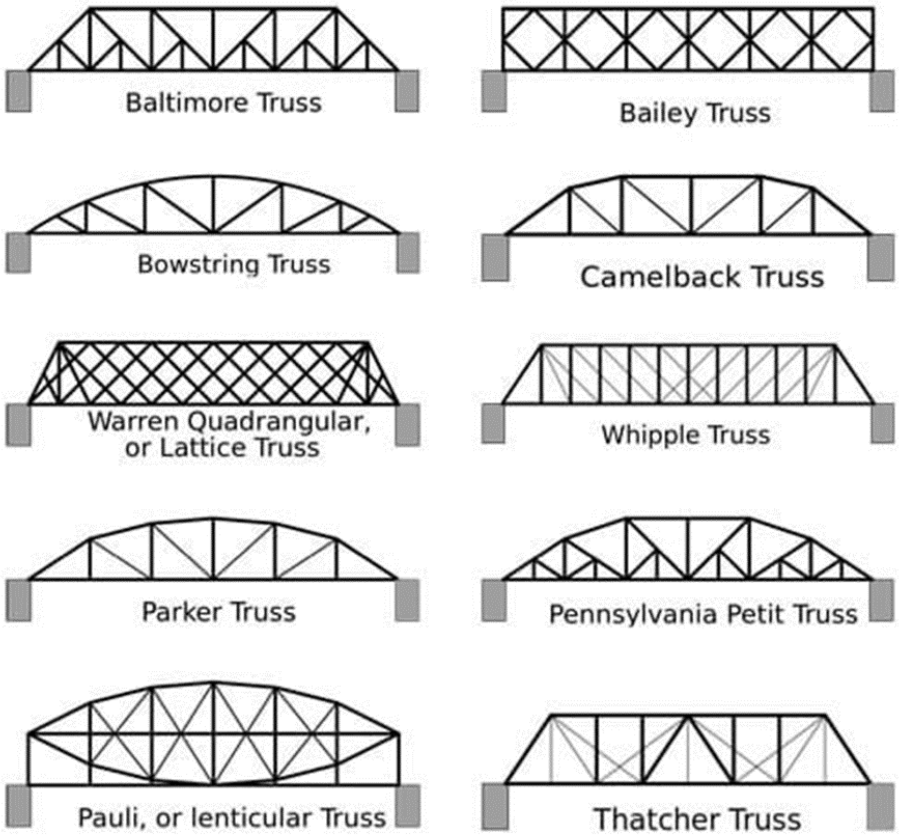
Superstructure – the visible (usually above ground) parts of a bridge.

Truss – an economic method of creating deep beams for spanning long distances. There are numerous types of truss as illustrated below:



Vierendeel truss with rigid joint(stable)





Wrought iron – a development from the Industrial Revolution when cast iron was heated and worked (i.e. wrought or beaten) with tools. It is much stronger than cast iron, especially in bending, and allows bridge spans to increase markedly.