

Bridges carry people and vehicles over natural obstacles such as rivers, gorges and depressions and are vital components in any communications network. They are built in a variety of forms, listed and illustrated in this feature with examples from aerial photography held at NCAP.

Bridge Forms

Arch

An **arch** bridge is held in place by the abutments at either end, which support the weight of the bridge and its load. Arch bridges were common constructions until the invention of new forms during the industrial revolution, when new materials became available.



Bascule

The **bascule**, or drawbridge, is hinged at one end and a counterweight is used to aid in lifting the deck. This type of bridge is commonly seen along canals and navigable rivers where the deck of a fixed bridge would normally be too low for large boats to pass under.



Beam and Deck

A simple design, the **beam and deck** bridge consists of two or more parallel beams placed over the gap to be spanned, and some form of decking placed on top. The road bridge in the background of this image is a typical example of this type.



Bowstring

Also known as the tied-arch bridge, **bowstring** bridges can be built on areas of unstable soil since the bottom chord ties the tips of the arch together, like the string of a bow. The arch itself is often formed by a steel truss.



Cable-Stayed

The deck of a **cable-stayed** bridge is supported by individual cables extending from the bridge towers.



Cantilever

In its simplest form, a **cantilever** is a beam extending out over a gap. Two such beams, from either side of the gap, form a pair of cantilevers.



Composite

A composite bridge uses more than one type of form to span an obstacle. This example features multiple beam and deck spans and three individual bowstrings followed by further beam and deck spans to carry a road between the Danish islands of Falster and Zealand.



Girder

A development of the beam and deck bridge, the strength of steel **girders** allow wider gaps to be bridged than by using materials such as wood or concrete.



Lattice

The use of diagonally-crossing steel members bolted together results in a steel bridge which is lighter than a girder bridge. In this example, the bridge in the foreground comprises individual **lattice** spans, each with a curved top chord.



Lift

In a vertical **lift bridge**, the deck is kept horizontal and is lifted between two towers. These bridges are often employed along navigable rivers and canals, where the span is lifted to allow boats to pass.



Pontoon

Using floats or shallow-draft barges to support the deck, pontoon bridges are predominantly employed by the military and, since they block the water channel, normally temporary in nature. They can be used to supplement an existing bridge or to facilitate crossing where a bridge has been destroyed, as in this example.



Portal

The **portal** frame bridge is a modification of the beam and deck type bridge, where the supports are inclined inward. This form of bridge is commonly employed to carry roads over motorways, or is chosen for aesthetic reasons



Suspension

Cables suspended from tall towers, and anchored to the abutments, secure the deck of a **suspension** bridge. Bridges of this type can cross wide gaps in a single span and have a degree of flexibility in poor weather conditions.



Swing

Swing bridges horizontally pivot the bridge deck to allow water traffic to pass. The pivot will be positioned within the river channel, either centrally or to one side, and a rest pier may be employed to support the weight of the bridge when open.



Truss

Featuring a framework of individual members, a truss is a strong, lightweight construction used as the beam in a beam-and-deck bridge, or in through-type truss bridges commonly seen as footbridges or railway bridges. The deck of the rail bridge in the background of this image is formed by a [steel truss](#).



Bridge Types

Deck type - the deck is the highest part of the bridge and the deck itself may be the superstructure of the bridge.



Semi-Through type - the deck of the bridge passes through the superstructure, which is partly above and partly below the deck.



Through type - the superstructure of the bridge is entirely above the deck.



Bridges can be supported by abutments, piers, columns, bents and trestles. When describing a bridge, it is useful to detail the bridge type, its form and its supports, as well as any pedestrian features such as recesses and parapets that may be present. Some typical bridge descriptions appear below.

A serviceable, single-span, through-type steel bowstring with upper lateral bracing, two-lane road over river bridge with concrete abutments. The bridge is unoccupied, with one lane closed for deck maintenance and access controlled by traffic lights.



A serviceable, five-span, deck-type, segmental masonry arch, two-lane road over river bridge with masonry abutments, cutwater piers, parapets and pedestrian recesses with lighting. The bridge is occupied by one car, leaving the bridge at photo south-west.

