

# The Legacy of IKB

*'Brunel built modern Britain and Britain built the world, which means Brunel built the world'.*

*'Darwin told us where we came from but it was Brunel who took us where we wanted to go'.*

These words were used by Jeremy Clarkson arguing the case for Brunel being the greatest Briton in the 'Great Britons' poll run by the BBC. In the end, Brunel finished a creditable second to Sir Winston Churchill.

Isambard Kingdom Brunel was buried in Kensal Green Cemetery, London, in 1859 at the age of just fifty-three. This was the year before the launch of *HMS Warrior*. Although he did not live to see the age of the modern iron warship, he, more than any other person, had been the driving force at the heart of the Age of Steam.

Brunel was a truly incredible individual. During his professional life he dominated not only the building of railways, but also shipbuilding and major civil engineering projects such as bridges and tunnels.

Brunel pioneered the transatlantic liner. His wooden-hulled *SS Great Western* made regular crossings between Bristol, later Liverpool, and New York from 1838 to 1846. He then invented the cellular hull, establishing a principle which is still of the utmost importance to naval architects.

In his grand schemes for later projects, the iron-hulled *SS Great Britain* and *SS Great Eastern*, he made requirements of marine engine designers and toolmakers which forced them to the limits of their capacities. Brunel's iron hulled *SS Great Britain*, designed to carry 250 passengers, 130 crew and 1200 tonnes of cargo, made its maiden voyage from Liverpool to New York in 1845. The *SS Great Eastern*, started in 1852, was designed to carry an unprecedented 4000 passengers. It remained the largest ship built for forty years.



Bronze statue of IKB, The Temple, London

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# The Legacy of IKB



Clifton Suspension Bridge  
Adrian Pingstone 2003

As a tribute to Brunel's achievements, his colleagues in the Institute of Civil Engineers in 1860 set about building a bridge across the Avon gorge at Clifton in Bristol according to his designs. The bridge, completed in 1864, although not quite as grandiose as Brunel had envisaged made an appropriate tribute to this extraordinary man.

The legacy of Isambard Kingdom Brunel is still visible today in the railway routes, tunnels, bridges and docks that are still in use nearly 150 years after his death. However, perhaps the most important aspect of his legacy is the example he sets for not just today's engineers but for us all

in terms of what we can achieve if we try. Perhaps this is the true legacy of a man who throughout his working life lived by the motto on his signet ring, '*En Avant*' - ahead.



# Spanning the Gap

Suspension bridges are all well and good, but what are all those cables about?

Why not try building your own suspension bridge to find out?

This is what you will need:

7 or 8 plastic drinking straws (try to find ones without the bendy bit)

Electrical tape (you can use masking tape or ordinary sticky tape, but electrical tape works best)

Strong cotton

A pair of scissors

4 or 5 large paper clips

A paper cup

A ruler

Lots of 1p or 2p coins

Now this is what you do:

## Step 1

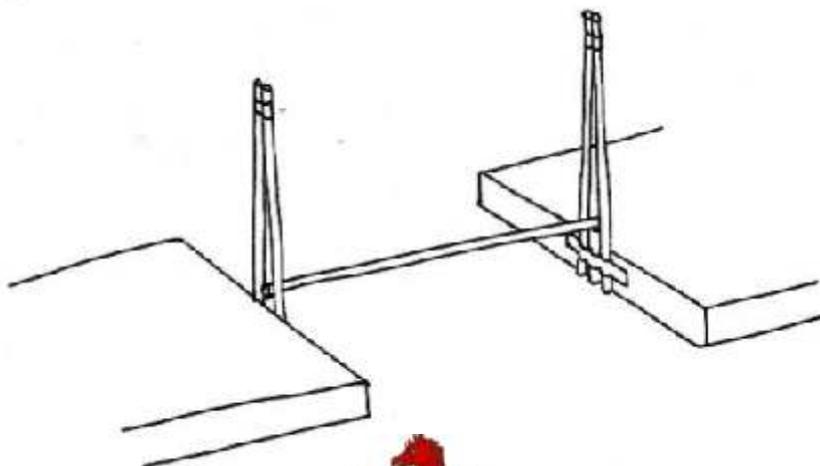
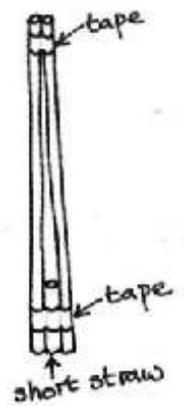
Cut two pieces of straw about 3 cm long. Tape a full length straw to either side of each of the short pieces as in the diagram below. Tape the full length straws together at the top as well. These will be your bridge towers.

## Step 2

Tape one tower to the edge of a desk or chair and the other tower to the edge of another desk or chair. The distance between the two towers needs to be the same as the length of your straws.

## Step 3

Now lay another full length straw between the towers so that its ends rest on the tops of the short straws. You now have a simple beam bridge.



# Spanning the Gap

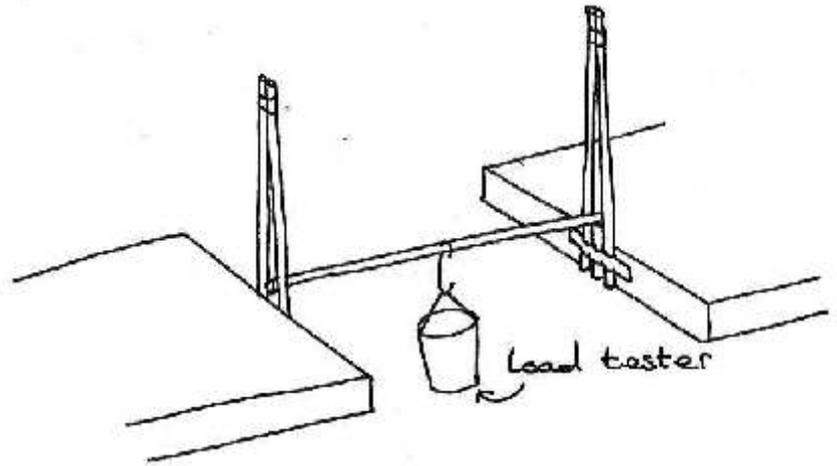
## Step 4

Now make a load tester by carefully making two holes in your paper cup and threading a piece of string through them. Tie knots in the ends so that the string can't slip through the holes. Unbend your large paper clip so that it hooks over the bridge beam and you can hook the cup string on underneath.

Count how many coins the load tester can hold before the bridge breaks.

## Step 5

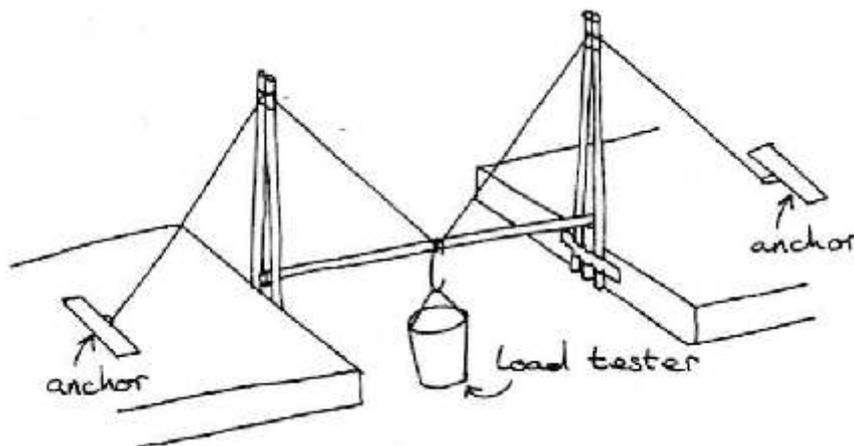
Now see what difference a few cables make. Find a new straw and measure out about a metre of your strong cotton. Tie the middle of the length of cotton around the centre of the straw.



Put the straw in position as the new bridge beam and pass each end of your cotton over a tower and down the other side.

## Step 6

Anchor the bridge by tying each end of the cotton to a paper clip. Slide the paper clips over the desk and away from the tower until the cotton becomes tight. At this point tape them to the desk.



## Step 7

Now test the strength of your new bridge.

How many coins can it hold now, more or less than before?

Does the answer surprise you?

Now put yourself in Brunel's shoes and think about ways in which you might be able to improve this design.

I wonder what Brunel would have done?

