# Two special chinese timber bridges

# TWO SPECIAL CHINESE TIMBER BRIDGES

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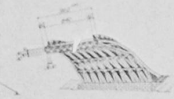
## Rainbow Bridge

This is a Chinese national art treasure, the Sung painting "River Side Scenes at the Qing Ming Festival." The bridge was constructed in year 1032, and was first noticed and analyzed by author in year 1953.

Dimensions of the bridge, as estimated from sketches of writings by different authors in Sung dynasty are shown as pictured. Calculated by electronic computer. The timber truss segment is about 30 cm in diameter. The total material required is 0.423 million cubic long kind rock and deck planks.

## Combined Beam-Arch Construction



The bridge structure consists of two basic systems, system A and B. Both systems are unstable structures as they are tied together by flat, crossbeam with bamboo strips.

The structure is designed as two hinged arch, but each segment is acted as a fixed-end beam. It is neither a "Combined Beam And Cantilever" or other names.

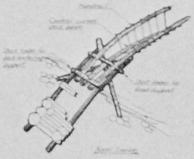
## Bow-Bow Bridge

In the Northwest of the Chekiang province, China, crossing the mountain river gorges, there are some interesting timber bridges constructed by natives in the woods. The peasants have their friendly nickname called them "Bow-Bow" bridge.

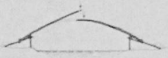
Span length 12 - 20 M

The bridge was naturally constructed with three curved beams connected with V-shaped and members. The whole bridge looks like a new moon in the front view, and triangular shape in the side section.

Bow-Bow bridge is a spaced structure.



The construction of the bridge is shown on the picture. Longitudinal beams are used first in the riverside on each bank, and cantilevered out to the river. The gap between two cantilevers is then connected by another beam. Bending the cantilever beam downward connecting their ends firmly with bamboo strips, the Bow-Bow bridge is finally completed.



The Bow-Bow bridge, though in arch form, not to arch action. It is a flat-stressed flexural beam construction.

## Conclusion

These two interesting special Chinese timber bridges are structurally remarkable, economical in term, simple economical, and easy to erect. Their structural principles may be useful in new bridge design with new material and technique for new functional purposes.