Construction of the Kurushima bridge

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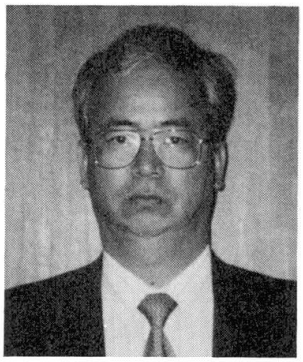

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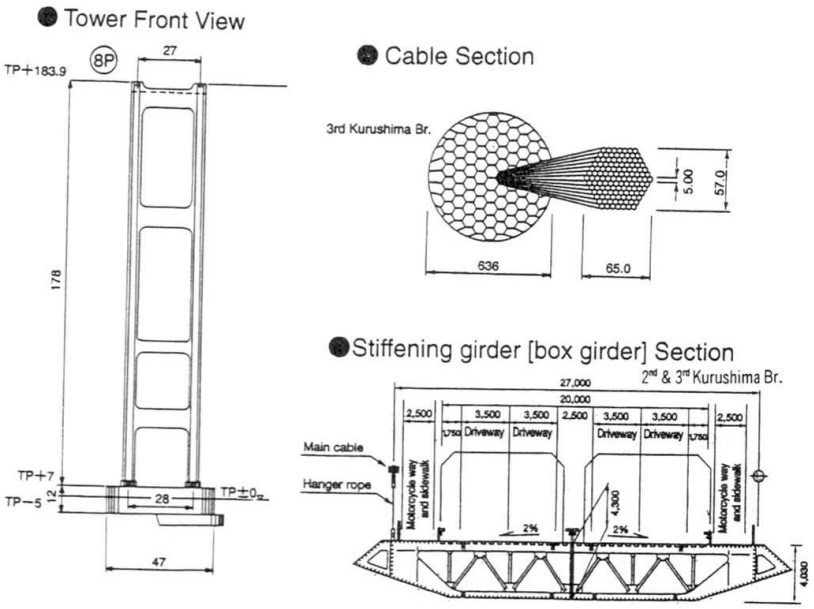
1. Outline

The Kurushima Bridge, located on the Onomichi-Imabari Route of the Honshu-Shikoku Bridges, is the three connecting suspension bridges across the Kurushima Strait. The Kurushima Strait with its beautiful scenery is designated as one of Japan's national parks. The strait is approx. 4 km wide and divided into three marine traffic routes by the two small islands. Compounding the heavy shipping traffic, the strait is hazardous for its geographical conditions characterized by numerous



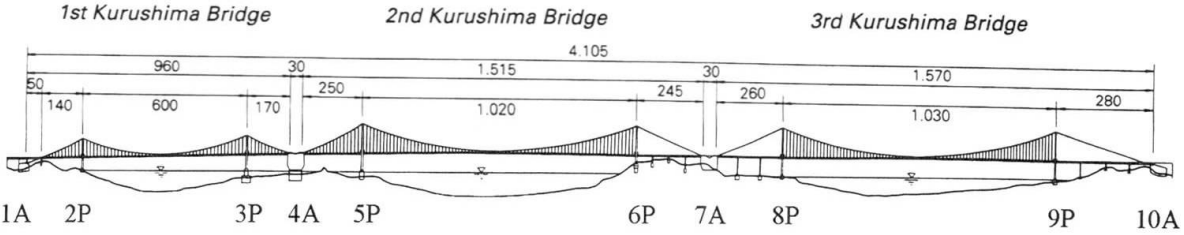


Fig. 1 General view of the Kurushima Bridge

islets and swift tidal current with a maximum velocity of 10 knots. The construction work started in September of 1990 and will be finished in 1999.

2. Towers

The tower height is generally determined so that the sag ratio may become optimum in dynamics and economy and the line linking the tower tops may become parallel to the vertical alignment of the girder. However, in the case of this bridges, this manner brings about the discontinuity of the towers' height, because the center span length of 1st bridge is shorter than that of 2nd and 3rd bridge. Therefore, the special consideration was paid for aesthetics and the towers' heights were determined in the manner of continuous variation through the comparative study.

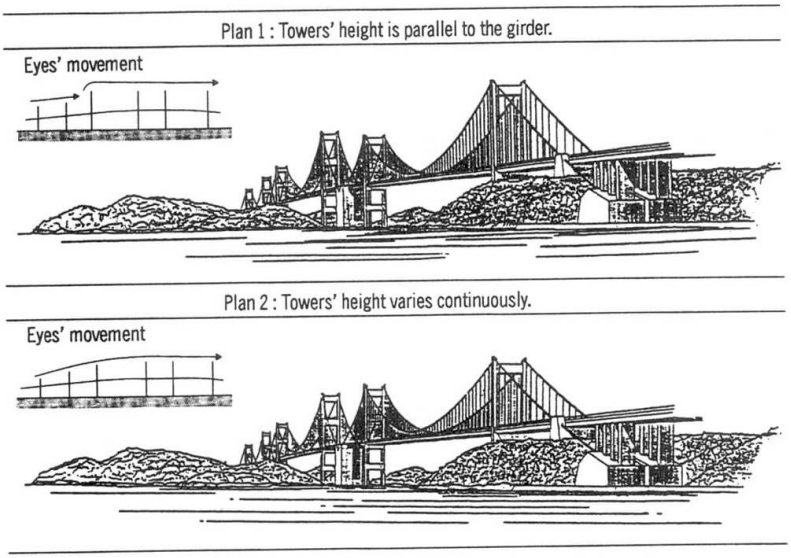


Fig.2 Comparison of looks in different tower heights

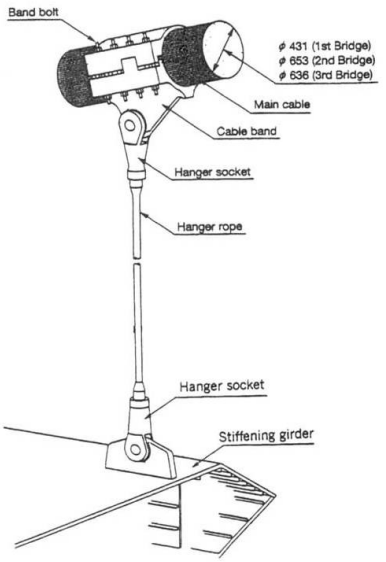


Fig.3 Hanger rope fixing structure

3. Cables

Cables are wired with the prefabricated-strand method. Every strand is comprised of 127 recently developed high-strength steel galvanized wires of 180 kgf/mm2 which were also adopted for the Akashi Kaikyo Bridge. Each hanger rope is a bundle of 5 mm-diameter galvanized steel wires of high-strength grade arranged in parallel. The rope surface is covered with polyethylene for corrosion protection of the hanger rope, to which fluorocarbon resin coating is further applied for coloring. The hanger rope is connected both to the main cable and the girder with pin.

4. Girders

Stiffening girder is erected by the perpendicular hanger method. A prefabricated-at-factory girder blocks on a barge is placed under the perpendicular location of the erection firstly, and it is lifted to fix to the hangers by the lifting machine on the cables. In order to stand the strong tidal current, a sailing barge, was originally developed to secure a certain position without mooring any anchor.

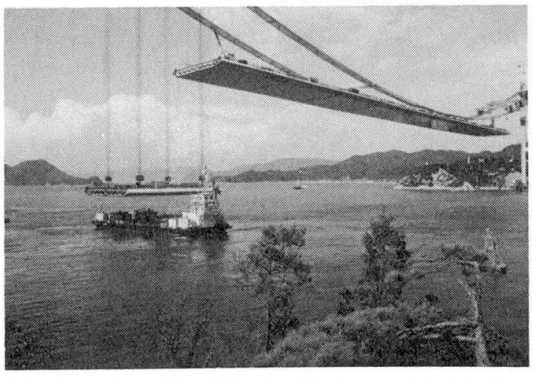


Fig.4 View of the girder erection