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## Hitsuishijima and Iwakurojima Bridges

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## 1. THE OUTLINE OF THE PROJECT

The Hitsuishijima and Iwakurojima Bridges with four-tracks railway (on lower deck) and four-lanes highway (on upper deck) are situated more or less midway along the Kojima-Sakaide route which forms the main project of the bridge activities between Honshu and Shikoku.

In early stage of the designing of these bridges, several bridge-types such as gerber truss (Fig. 1), cable-stayed bridge (Fig. 2) were considered. And cable-stayed bridges of Fig. 3 and Photo. 1 were finally chosen by considering the navigative, constructional and economical requirements and also from aesthetical points of view.

Work on this project was started in Oct. 1978 with the substructures. Construction of the bridges are scheduled to be complete in March 1988.

## 2. DESIGN CONDITION

Highway (upper deck) :	Four lane	Design speed: 100Km/h
Railroad (lower deck):	Two ordinary lines	Design speed: 120Km/h
	Two Shinkansen lines	Design speed: 160Km/h

## 3. SUMMARY OF THE SUPERSTRUCTURE

(1) Span length: 185+420+185m, (2) Main truss: Warren truss with vertical members (high 13.9m, width 27.5m), (3) Cable: Multi-stay cable system (parallel wire strand using 7mm $\phi$  steel wire) anchoring to HiAm sockets, (4) Tower: Rigid steel frame type (height 136m), which has image of Japanese traditional form such as Japanese Helmet, (5) Shoe: Spring shoes (Fig. 6) with corned disc springs (Photo. 2) (700mm O.D., 350mm I.D., 32mm T) are installed at the truss ends to control the longitudinal deformation response due to earthquake, (6) Shock absorber: Solid rubbers are also installed on the both end piers to control the extreme seismic amplitudes of the truss and to protect the expansion joints of tracks, (7) Joint: Friction type joints using high strength bolts are used to connect the truss panel points and the pylon.

# HITSUISHIJIMA AND IWAKUROJIMA BRIDGES



Fig. 1 Gerber Truss Type



Fig. 2 Cable-Stayed Type

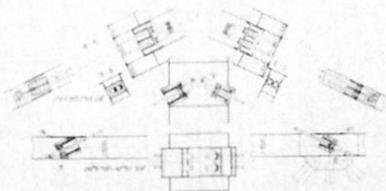


Fig. 4 Cable Connections

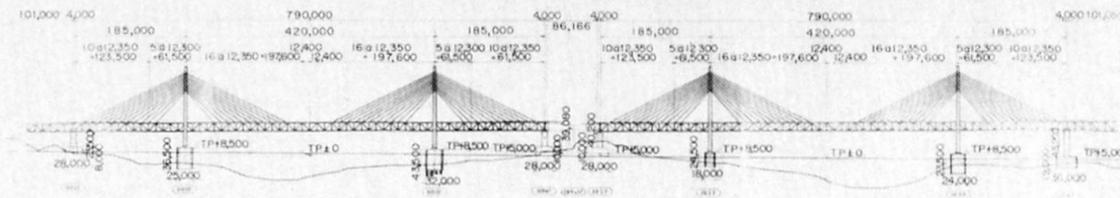


Fig. 3 General Profile

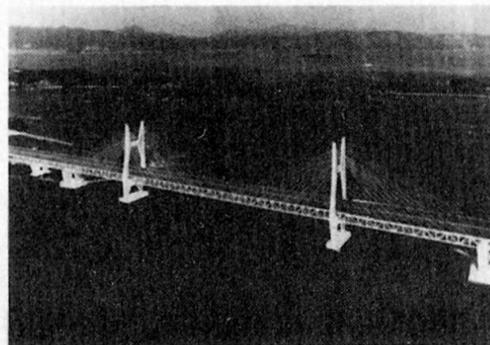


Photo. 1 Aerial View of Hitsuishijima Bridge (photo-montage)

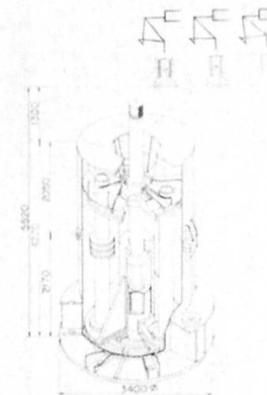


Fig. 6 Spring Shoe

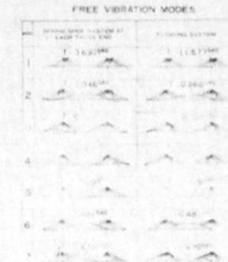


Fig. 5 Results of Dynamic Analysis

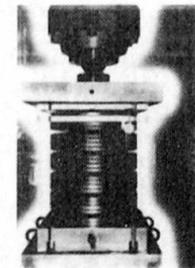


Photo. 2 Coned Disc Springs for Static and Dynamic Loading Experiments