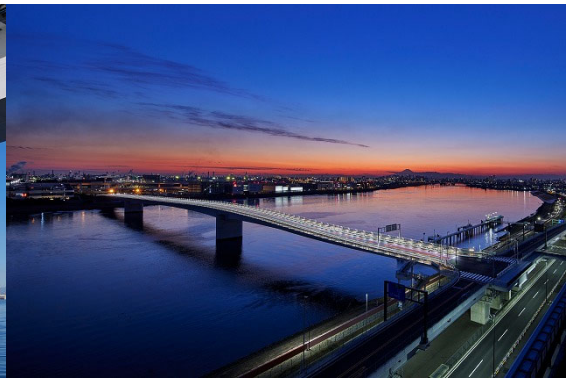
Tanaka Award: Bridge Design and Construction Category

Tama River Sky Bridge



Contractee: Kawasaki City and Tokyo Metropolitan Government

Preliminary Design: Oriental Consultants Co., Ltd.

Structural Verification: Pacific Consultants Co., Ltd.

Detailed Design: Penta-ocean Construction Co., Ltd., Hitachi Zosen Corporation, Fudo Tetra Corporation, Yokokawa Bridge Corporation, Honma Corporation and Takadakiko Co., Ltd. JV

Constructor: Penta-ocean Construction Co., Ltd., Hitachi Zosen Corporation, Fudo Tetra Corporation, Yokokawa Bridge Corporation, Honma Corporation and Takadakiko Co., Ltd. JV

This is a hybrid rigid-frame bridge designed to fit in with the rich natural environment at the mouth of the Tama River. The design achieves good maintainability while at the same time blending in with the landscape. The whole process of construction, from planning through design and construction, was completed in only eight years.

In terms of structural type, this is a three-span continuous steel slab box girder bridge. The design was developed in full consideration of the natural environment, ensuring that it has no impact on this ecological conservation area consisting of valuable tidal flats near the river mouth. The hybrid rigid-frame structure was adopted to cope with the soft ground conditions and the deep bearing layer,

resulting in a slender geometry with a middle span of 240 m (the longest in Japan) and a girder depth of only 7 m. These dimensions harmonize with the horizontal landscape lines of the river mouth.

To avoid impact on the ecological preservation area, girders were installed by a combination of cantilever erection, launching erection, and barge erection.

Maintainability of the bridge is improved through the use of corrosion-resistant steel that allows extension of the painting cycle, while metallic spraying bolts were used for the lower flanges and joints.

To improve the aesthetics of the bridge, the number of runoff drainage pipes was minimized by incorporating steel drains in the raised sidewalks. Additionally, appurtenances on the girder sides were minimized by replacing scaffold hanging rings with eye bolts, resulting better maintainability and aesthetic appearance. Furthermore, splice plates at bolted joints are intentionally cut diagonally to reduce the visual impact of the concave-convex shape.

Roadway lighting is built into the guardrails and bridge railings to reduce light leakage over the water surface considering the river mouth ecology. This design also simplifies lighting replacement and the implementation of inspections by vehicle, resulting in better maintainability.

With the above design and construction characteristics, the bridge is recognized as being a worthy recipient of the Tanaka Award in the Bridge Design and Construction Category.