

## 2008 Tanaka Award

### Excellence in Bridge Design and Construction:

the award is made to recognize a constructed, or reconstructed bridge, or related structures which possess excellent quality in planning, design, construction, maintenance and management and exhibit technical and aesthetic excellence. The award is made not to individuals who were involved in construction of bridge, but rather to the work produced based on those individuals' superb collaboration and performance under the supervision and management of an organization, or organizations during the entire construction process.

### Toyoshima Bridge

Hiroshima Prefecture, Hiroshima Pref Road Public Corp., CHODAI Co., Ltd., Wesco Co., Ltd., FUKKEN Co., Ltd., Mitsubishi Heavy Industries Bridge & Steel Structures Engineering Co., Ltd., IHI Corp., JFE Engineering Corp., Nippon Steel Engineering Co., Ltd., SHINKO WIRE Co., Ltd., MIYAJI IRON WORKS Co., Ltd., Yokogawa Bridge Corp., OKUMURA Corp., HIRAMOTO Corp., TOYO CONSTRUCTION Co., Ltd., DAIDO Corp., KAJIMA Corp., OKAMOTOGUMI Co., Ltd.

### Summary

The Akinada Islands Bridges Project is a plan for connecting the islands with 8 bridges. These islands are located on the Inland Sea in the southern part of Hiroshima Prefecture. The Toyoshima Bridge is a single-span suspension bridge. The bridge length is 903m and that is located thirdly from Honshu. New technologies were used for construction to meet the social demand for cost reduction. The main technologies are as follows, adoption of the rock anchorage method, adoption of 7-mm-diameter wire for suspension bridge cables, and Large-block erection method of main towers. The technology that uses it for the purpose of the maintenance of the bridge is dehumidification system for the main towers and stiffening girders and suspension bridge cables. Adoption of site welding to outside connection of construction blocks of stiffening girders supplements the dehumidification system.



## Sannai Maruyama Bridge

(独) 鉄道・運輸機構鉄道建設本部 東北新幹線建設局、(株)千代田コンサルタント、  
銭高・浅沼・志田特定建設工事共同企業体

### Summary

Sannai Maruyama Bridge is a concrete extra doped bridge built for Tohoku Shinkansen Line. The main span of the bridge is 150m long, which is the longest span of railway bridges in Japan. Even though the bridge has long spans, the deflection of the girder is controlled within very limited range in order to enable high speed crossing of super express trains by applying several new technologies.

Seasonal temperature effect is eliminated by adopting sliding support system. The influence from temperature change of the stay cables is minimized by limiting pylon height. Further the temperature change of the cables is reduced by encasing them into the thick cement grouting. The deflection by train loads is also reduced by employing 2-line bearing system.



## Yabegawa Bridge

Ministry of Land Infrastructure and Transport/ Kyushu Regional Development Bureau/ CHODAI Co., Ltd.  
Sumitomo Mitsui Construction Co., Ltd./ P.S.Mitsubishi Construction Co.,Ltd./ SHIMIZU Corp./  
KAWADA CONSTRUCTION Co., Ltd./ Tobishima Corp./ Nishimatsu Construction Co.,Ltd/ DAIHO  
Corp./ Seiohkensetsu Co., Ltd./ Co.,Ltd. Kawaken

### Summary

Yabegawa Bridge is a concrete cable-stayed bridge built as a part of Ariake Coastal Highway. The central span of the bridge is 261m long, which is the longest span of the concrete cable-stayed bridge in Japan. State-of-the-Art bridge technologies are integrated in order to complete the bridge.

The 3-cell trapezoidal box girder makes the superstructure lighter, because the rational girder shape does not require diaphragms at the anchorages of stay cables. Horizontal component from the stay cables to the pylons is reduced by inclining the pylons corresponding to the horizontal curvature of the girder. A newly developed stopper is applied in order to secure dumping function of the rubber bearings. The stopper resists horizontal load during general service stage while the resistance disappears at large scale earthquakes.



## The Tokyo International Airport international airline district GSE bridge

国土交通省関東地方整備局東京空港整備事務所、羽田空港国際線エプロンPFI(株)、大成・鹿島・五洋・東亜・鹿島道路・大成ロテック異工種建設工事共同企業体

### Summary

The Tokyo International Airport international airline district GSE bridge is a 48m PC box UFC (Ultra-high strength Fiber reinforced Concrete) girder bridge for GSE (Ground Support Equipment) vehicles.

UFC girder realized a high durability bridge while 1.86m height of the girder about 80% of the conventional PC bridges, reduced the scale of the approach embankment and the superstructure weight.

In addition, the twin perfobond rib shear connector for the girder-slab connection, and the UFC wet joint having the large-scale shear key for the precast segment joint were developed with element experiments of the original size.



## New Metropolitan Bridge

East Japan Railway Company Tokyo Construction Office/ JR East Consultants Company/  
Maeda Corporation/ Totetsu Kogyo Co., Ltd

### Summary

The highway bridge named 'New Metropolitan Bridge' over eleven tracks of JR lines such as Keihin-Tohoku line, Tohoku line and others is the 73 m Lohse bridge with single rib, which is located between Yono station and Saitama-Shintoshin station.

This bridge is the first Lohse bridge with single rib among highway bridges over railway in Japan taking into account the structural constriction and the landscape. Pushing-out method was adopted as the erection method for the first time in Japan in order to reduce the work above the railway.

The constructor took care of the erection by doing the detailed structural analysis in each pushing-out step and the trial in real bridge, finally the construction was safely finished without influencing train service.

The bridge contributes to the development of this area as the significant highway and the safe daily road.

