Reference Details

Owner UNY Co. Ltd., Yokohama-shi, Kanagawa Prefecture, Japan +++ **General Contractor** Chotetsu Kogyo Co., Ltd., Nagaoka-shi, Niigata Prefecture, Japan +++ **Contractor** Kajima Corporation, Japan +++ **Consulting** Engineers Kajima Corporation, Minato-ku, Tokyo, Japan +++ **Subcontractor** Sumitomo Mitsui Construction Co., Ltd., Nakano-ku, Tokyo, Japan

DSI Unit Sumitomo Electric Industries Ltd., Tokyo, Japan
DSI Scope Supply of type MA 19x0.6" DYWIDAG Tendons

DYWIDAG Post Tensioning Systems Used for Extra Thin Main Girder

Riverside Senshu Overpass, Senshu, Nagaoka-shi, Niigata Prefecture, Japan

With its length of 367km, the Shinano River is the longest river in Japan. On its way through Niigata Prefecture, the Shinano runs through the city of Nagaoka. The city council of Nagaoka has hosted a number of development projects in recent years: most notably new large-scale commercial facilities in Senshugahara District. Part of this pro ject was the construction of a shopping center with a cinema complex divided into two buildings on both sides of a highly frequented road that is several lanes wide.

A pedestrian overpass was constructed in order to link these two buildings. The provisionallynamed Riverside Senshu Overpass is a threespan continuous prestressed concrete (PC) structure with a length of 30.5m and a width of 3.5m. The fact that the bridge had to cross a highly frequented road and the need for earthquake- proof anchorages of the bridge at both buildings called for a special technical design.

Consequently, external prestressing and the application of SUQCEM, an ultra-high-strength fiber-reinforced concrete characterized by compressive strength five times that of regular concrete, made it possible to minimize the depth of the main girder. The shallow depth was also made possible by the use of steel fiber instead of steel bars for reinforcement. For the external prestressing, Sumitomo (SEI) Steel Wire Corp., DSI's licencee in Japan, supplied high quality type MA 19x0.6'' DYWIDAG Tendons.

Another special solution was the use of HiFleD (i.e. high flexibility and damping) piers, the sheet metal dampers of which increase resistance against seismic motion, simplify the sub - structure and facilitate recovery work in the event of seismic damage.

The SM (Sumitomo Monostrand) method was used for vertical PC steel members to ensure rigid frame construction. In this method, each steel element extends from the top of the bridge pier down through a support cross girder to the top of the floor slab for anchorage.

As a last step, the bridge was fitted with a membrane structure roof to protect pedestrians from rain and snow. Since August 2007, the bridge allows visitors to the shopping center and cinema complex a safe crossing between the two buildings. With its decorative nighttime lighting, the bridge may soon become a popular landmark of Nagaoka.

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