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## 9. Standard Overbridges on Expressways in Japan

*Owner and Designer: Japan Highway Public Corporation*

The construction of National Expressways in Japan was started some 20 years ago. Since then, the Japan Highway Public Corporation (Nihon Doro Kodan) has been in charge of the construction. Now, 1,900 km of expressways are completed and more than 3,000 km are under construction. As for bridges crossing over expressways, there are a great number of bridges, that is, one per kilometer of expressway on the average.

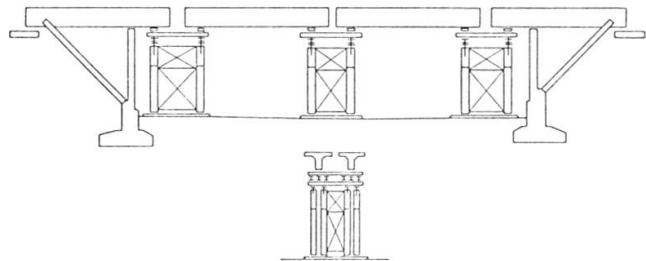
For reasons of economy, aesthetics and maintenance, pre-stressed concrete structures are usually chosen for these bridges.  $\pi$ -shaped rigid frame bridges with diagonal members are mostly adopted as standard type.



$\pi$ -shaped rigid frame bridge with diagonal members  
(constructed by Cast in place method)

These overbridges, however, are generally small and scattered on many spots along the expressway as mentioned above; furthermore, the cast in place concrete method is used for construction. Therefore work and quality control, as well as adjusting time schedule with earthwork has always been a problem. The precast block method is now being used for the construction, in order to solve these difficulties.

Whereas the superstructure is of a hollow slab type with variable depth in case of cast in place concrete method, T-shaped beam with constant depth has been adopted in case of precast block method. The beams are divided into several blocks longitudinally or transversely. Each block has the weight of 20 to 25 tons and is 10 to 12 meters long. The space for joint between each block is fully provided (more than 350 cm). After arranging the total length, it is cast with concrete to make the blocks in a monolith.



*Precast block method*

Even though the aesthetical aspect might slightly be harmed, this type of precast block method has outstanding advantages:

- Improvement of quality
- Shortening of work period
- Rationalization of labor
- Providing clearance during construction

But this method involves other problems, such as costs, carriage road and aesthetics. Nevertheless, the tendency toward precast method will be accentuated in the future.

*(Nihon Doro Kodan)*