
Juuougawa Bridge

The rigid frame bridge built out of concrete with its iconic V-shaped pier is surrounded by green lush, allowing all passer-by to behold the spectacular sceneries



Client	: Japan Highway Public Corporation
Project Site	: Juuou Town, Taga District, Ibaraki Prefecture
Completion Year	: 1987
Bridge Length	: 250m (The V-shaped rigid frame section)
Bridge Type	: 5 span continuous PC V-shaped rigid frame bridge
Width	: 10.9m
Span Length	: 70m (central span), 45m (The V span section)
Girder Height	: 4m (max), 2.5m (central section)
Construction Method	: Girder lift up method (for the V pier section) and cantilever method (for the superstructure)
References	: Journal of Prestressed Concrete No.3 1985

The pier layout option for this bridge was limited because the surrounding terrain on the site was steep and situated above the Juuou River and the prefectural road. The structure, which has two V-shaped substructures, was selected because of its ergonomic shape that allows efficient use of foundation space and because of its intrinsic shape that blends well with the surrounding landscape. Such large-scale V-legged concrete road bridge is the first of its kind in Japan. The span length on its foundation is $70\text{m} + 45\text{m} = 115\text{m}$. By adopting V-shaped design, the girder height of the superstructure can be minimized to 4.5m. The angle of the V-leg was set to 40 degrees to suit the local topographical conditions. Meanwhile, the superstructure is constructed out of pre-stressed concrete and has a hollow girder cross section with 3m height. As for the V-shaped pier construction, the "Girder Lift-up method" was adopted, on which the girders itself were placed on both sides of the pier. While temporary support was constructed, the girders were gradually pulled up for installation. A temporary strut was set in the middle section to resist the outward force due to the V-shaped design. The strut was removed after the superstructure was completed. After the triangular structure of the V-leg part was completed, the superstructure was constructed through the cantilever method by using the conventional form traveller.

橋長上り線526000 (下り線491200)

5 径間連続 PCV 脚箱桁250000

3 径間連続 PC 箱桁120600

4 径間 (3 径間) 連続 PC 箱桁155400 (120600)

45000 45000 70000 45000 45000 40200 40200 40200 40200 40200 40200 34800 (0)

十王川 県道十王里美線

十王里美線 (付着)

A₁ M P₁ P₂ P₃ P₄ P₅ M M M M P₆ P₇ P₈ P₉ F A₂

橋長 下り線491200

5 径間連続 PCV 脚箱桁250000

3 径間連続 PC 箱桁120600

3 径間連続 PC 箱桁120600

2500 9250 700 2450 5800 2450

主桁断面図

橋長—上り線526000

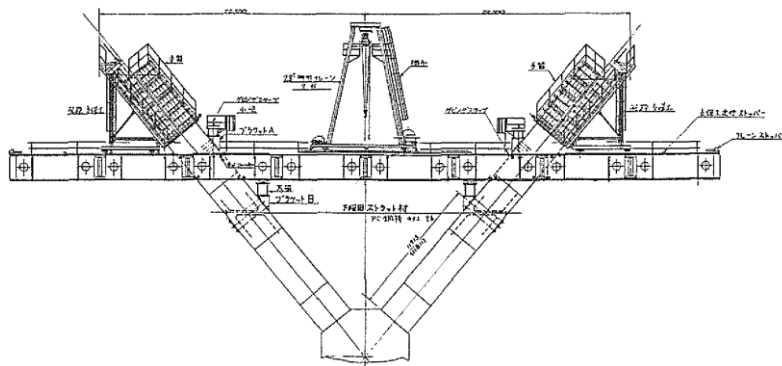
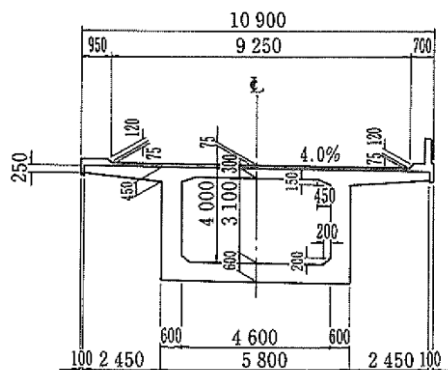
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3 径間連続 PC 箱桁120600

4 径間連続 PC 箱桁155400

十王トンネル

Girder Lift Up Process Arrangement



Construction Via Protrusion Method

