



The 3rd Agatsuma River Bridge

Owner: East Japan Railway Company

Design: JR East Consultants Company

Construction: Taisei Corporation, Totetsu-Kogyo Corporation and
Sato-kogyo Corporation Joint Venture

(Steel fabrication: Kawada-kogyo Corporation)

Location: Naganohara-cho, Agatsuma-gun, Gunma Prefecture

Structural Type: Three-span continuous concrete-steel composite arch bridge

Bridge Length: 203 m

Outline

The 3rd Agatsuma River Bridge is a 203m long single arch bridge that crosses the Agatsuma River near Naganohara Kusatsuguchi Station. It is located near a termination of the Agatsuma line modification work associated with the construction of the Yanba Dam by the Ministry of Land, Infrastructure, Transport and Tourism. The bridge type is a 3-span continuous girder bridge with a basket-handle type half-through arch construction.

After constructing temporary works in the river, the arch ribs and the temporary steel stiffeners (arch ties) to maintain the shape of the arch ribs were assembled on the temporary works in parallel with the construction of the abutments and arch base. The arch ribs and the arch ties that were assembled on the ground were lifted up to the specified height using lifting equipment, connected to the base of the arch, and then the insides of the arch ribs were filled with concrete to form the arch.

Applying the cantilever method, the stiffened girder of the central span was constructed from the center of the span using a traveling work vehicle. The stiffened beams of the side spans were constructed by installing falsework on a part of the temporary works on the riverbank. After removing the temporary stiffeners (arch ties) used for lifting the arch and moving the traveling work vehicle, the steel members were given corrosion protection treatment, and the bridge was completed.

Characteristics

1. Long-span bridge structure that harmonizes with the surroundings

As there is a new urban development planned for the area around the bridge, the structure was chosen to be an arch in order to be a landmark for the area, taking into account its excellent appearance, and harmonization with the local environment and the national road which runs alongside it.

2. Design and construction work aspects

(1) Structural shape for stiffness and reduced dead load

This is a steel-concrete composite arch structure consisting of reinforced concrete (RC) arch base, and concrete filled tube (CFT) arch ribs.

(2) Bridge with a slim appearance

Vertical and inclined members in the central span of the arch were provided to reduce the number of suspension cables, and to attain a slim appearance. The vertical and inclined members are wide steel box members 1.4m×0.45m, and a feeling of unity was created in the arch by providing vertical support members at the ends of the arch.

(3) Selection of suspension method for arch construction

The method of lifting up the arch as a whole after assembling the arch on the temporary works during the dry season was selected as a method of reducing the risk due to flooding of the river.

(4) Construction of the stiffened beams using the traveling work vehicle

A monorail beam was installed using temporary stiffeners that maintain the shape of the arch, and the stiffened beam (PC through girder) was constructed using the traveling work vehicle.

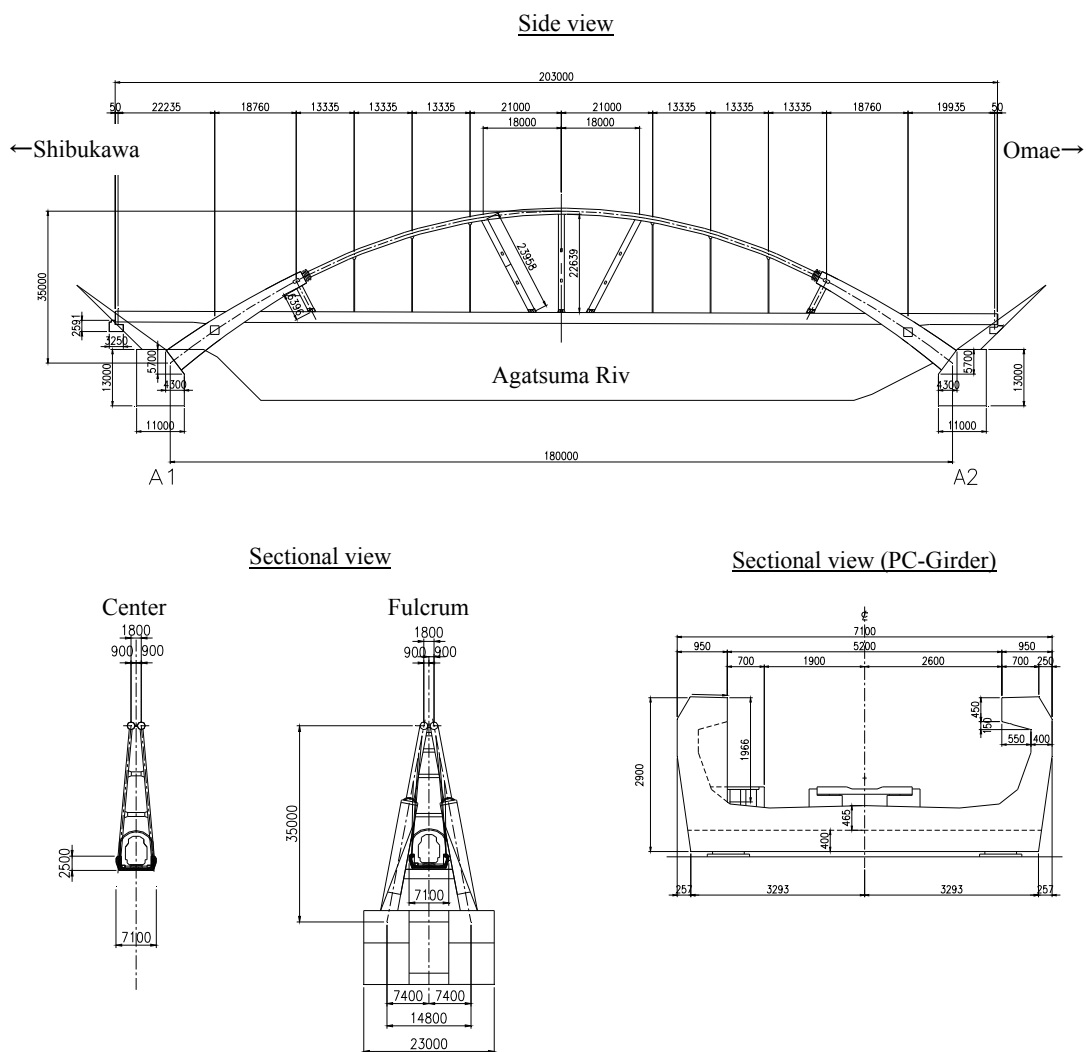


Fig.1 Bridge Structure

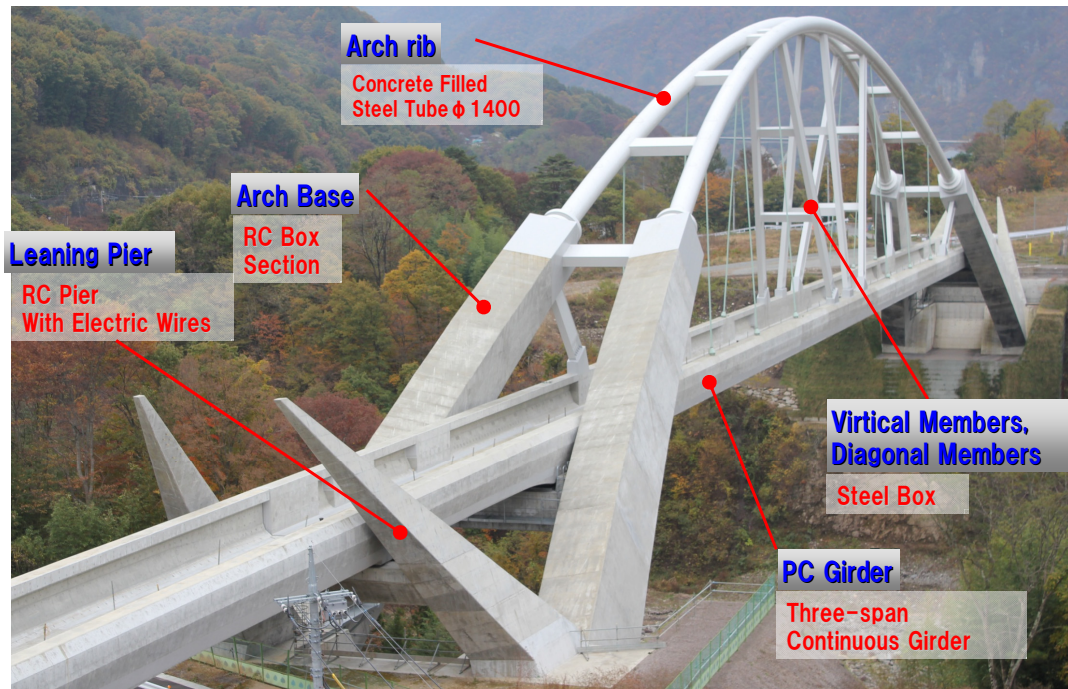


Fig. 2 Features of 3rd Agatsuma River Bridge

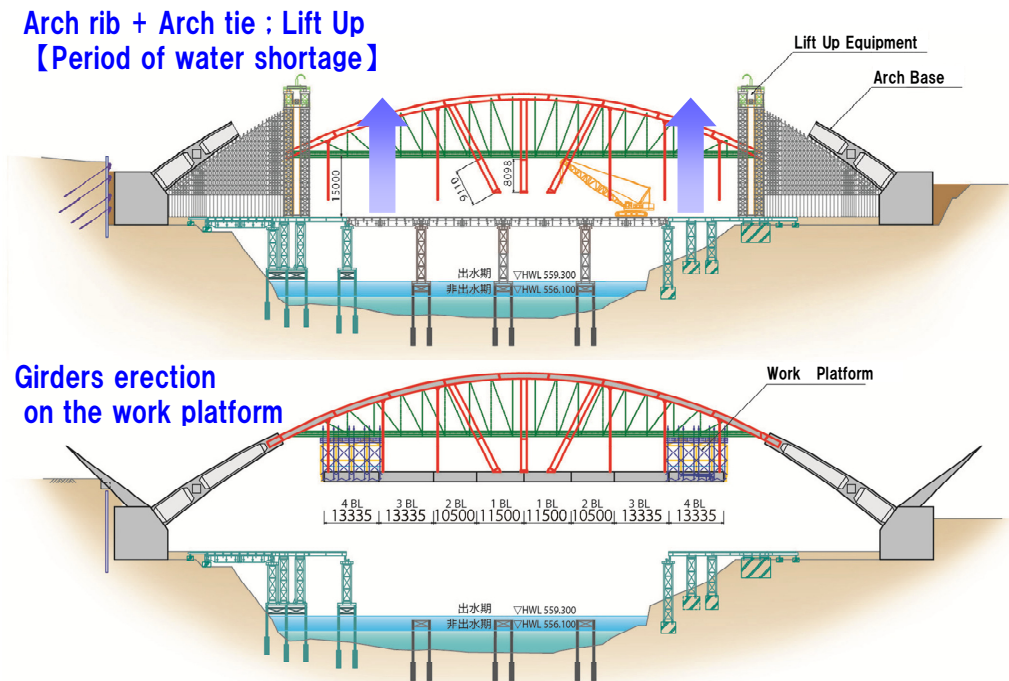


Fig. 3 Lift Up Method