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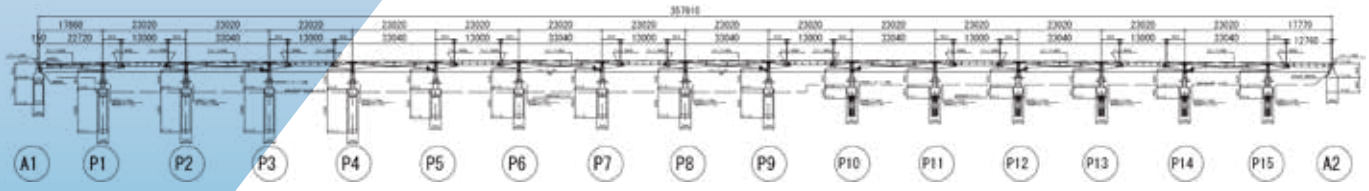
FUJI P.S TECHNICAL REPORT

# Renewal and Reinforcement of Genta Bridge

## Bridge Overview

Bridge Name : Genta Bridge
Location : Tottori
Completion Year : 1951
Structure : RC 16-span Continuous Gerber Girder Bridge
Length : 357.9m
Width : 6.5 m (Before widening 5.5m)




## Project Overview

The Genta Bridge is RC 16-span Continuous Gerber Girder Bridge, and it is completed in 1951. Over 60 years has passed after construction, the number of vehicles has increased, and it was considered, 5.5 m width was dangerous for large vehicles to pass through.
Therefore repairing and reinforcement of the bridge were implemented, and expanding the width of the bridge up to 6.5m has done. Widening the width 1m increases the dead load. In order to reduce the dead load, a steel bridge was erected after removing the concrete Gerber girder. Furthermore, the CFRP rod construction method was adopted for slab reinforcement instead of the overlay method to reduce the dead load.

## Main Construction Process

In the removal works, after removing pavement, slab, wheel guard and railing, the suspended girder was removed.
Major repairs and reinforcement works included cross-sectional restoration of the entire bridge, slab reinforcement with carbon fiber sheets and CFRP rods, girder reinforcement with carbon fiber sheets and external cables, renovation and reinforcement of Gerber hinge, and reinforcement of cross beam.
The steel bridge was erected after the repair and reinforcement of the girder was completed.

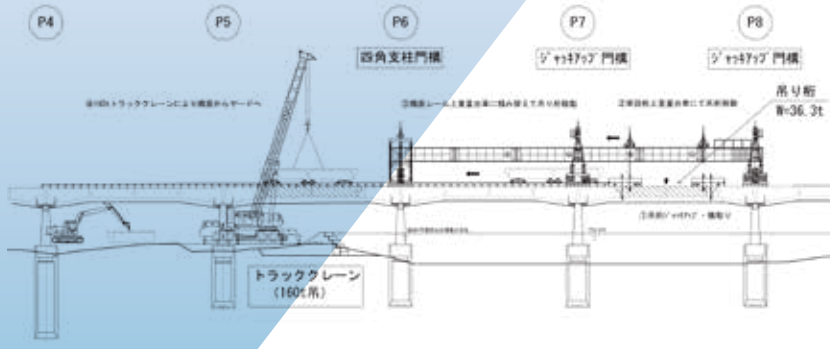
- Removal works
- Reconstruction
- Repair & reinforcement works
- Steel bridge erection
- Bridge surface works

Photo-1 Renewal and reinforcement works completed

# Introduction of Main Construction Method

## 1. Removal of suspended girder by erection girder

For removal of suspended girders, pavement, slabs, horizontal girders, wheel guards were removed in advance and the suspended girders were removed independently. (Photo-2). The crane working radius was insufficient because the suspension girders of P7~P8 spans were located on the river. For this reason, the suspension girders were removed by using erection girder.




Suspended girder removal procedure diagram

Photo-2 Removal of suspended girders using erection girders

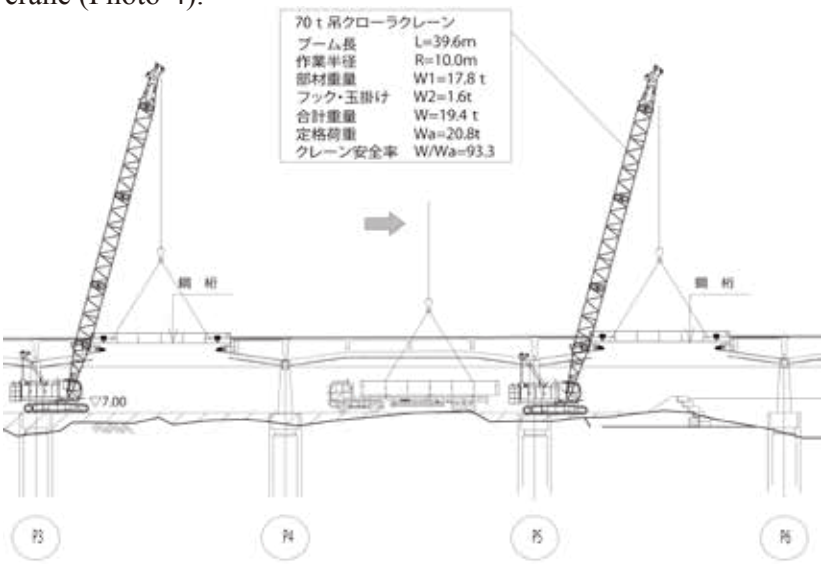
## 2. Slab reinforcement

The reinforcement of upper surface slab includes overlay method using concrete-based materials and adhesive method using the materials such as carbon fiber. When a construction method is selected, the primary requirement was to avoid an increase in the dead load due to reinforcement.Therefore, after comparative study of overlay method and adhesive method, the adhesive method was used (Photo-3).

Photo-3 Erection of resin motor and CFPR rod

## 3. Erection of steel bridge

The erection of steel bridge was performed using the 70t crawler crane (Photo-4).




Steel bridge erection procedure

Photo-4 Steel bridge erection status