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No.27
FUJI P.S TECHNICAL REPORT

TOKAI-HOKURIKU EXPWY
Sounori Bridge and Kurotani Bridge

Bridge Overview

Owner : Central Nippon Expressway Company Limited
Construction Period : June 2015 - December 2018
Location : Gifu Prefecture
Structure : [Sounori Bridge] PRC 5-span continuous box girder bridge
Structure : [Kurotani Bridge] PRC 3-span continuous corrugated steel web rigid frame box girder bridge
Length : [Sounori Bridge] 360.0m (Max span: 98.5m)　[Kurotani Bridge] 295.5m (Max span: 140m)
Width : [Sounori Bridge] 9.81m　[Kurotani Bridge] 9.11m

Project Overview

This project is one of the lane expansion projects on the Tokai-Hokuriku Expressway. There are two bridges, the Sounori Bridge and the Kurotani Bridge, and both bridges were erected using the balanced cantilever method. Because the bridges were located in an area with heavy snowfall, construction was temporarily suspended from December to March. In addition, the site was easily affected by adjacent construction projects (of different types), so it was necessary to coordinate the construction process taking into account those construction projects. Therefore, measures were taken to ensure construction quality and to improve work efficiency during the winter construction period.

Figure-1 Sounori Bridge

Figure-2 Kurotani Bridge

Figure-3 Sounori Bridge construction progress

Figure-4 Kurotani Bridge construction progress

Approaches to Ensure Construction Quality

Countermeasures against deflection during winter downtime in balanced cantilever erection (Sounori Bridge)

Because pier No. 3 is high and the overhang length is long, the overhang length was changed to be symmetrical (Figer-1), and the movable hanging scaffolding system was moved back to the pierhead side during the winter temporarily suspended period (Figer-2). As a result, the amount of creep deformation of the piers and main girder was almost equal on both sides, and the overhang deflection was managed as planned. Furthermore no harmful cracks were observed.

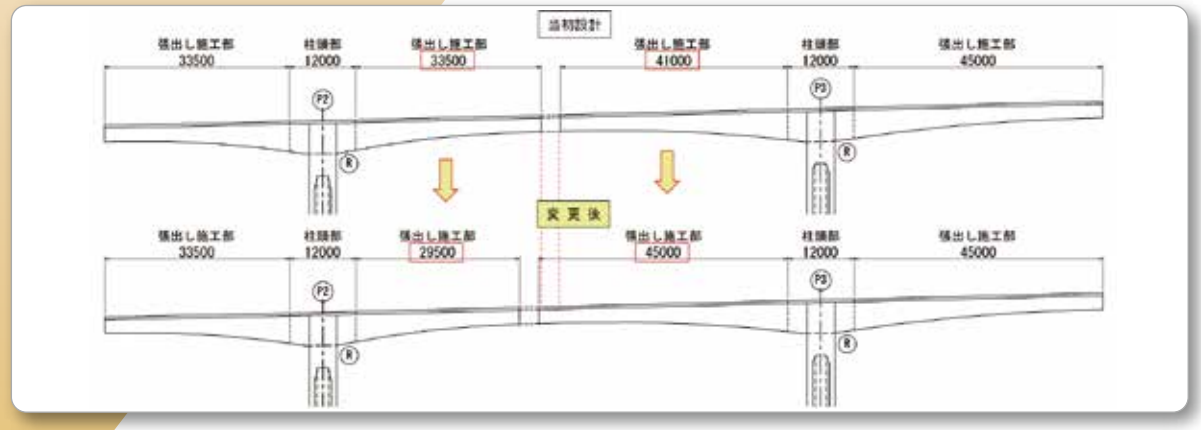


Figure-1 Overview of overhang length change

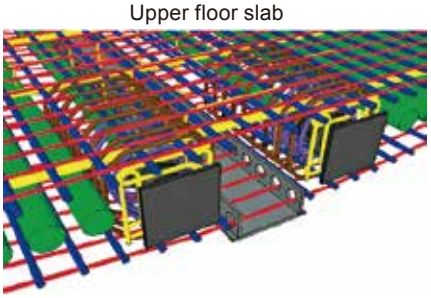
Approaches to Construction Efficiency

Improving construction efficiency through the use of ICT

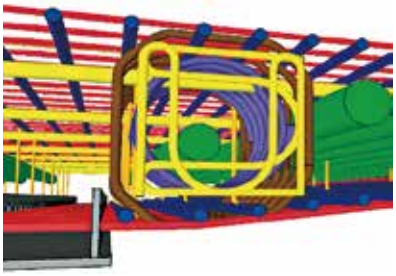
Three-dimensional drawings were used for the construction of sections with complex reinforcement arrangements and large amounts of rebar such as around PC anchorage part and pierhead, joint of corrugated steel web, and upper and lower floor slab. This enabled efficient assembly procedures to be formulated in advance, preventing rework and other problems during construction.

Figure-2 Arrangement of the movable hanging scaffolding system during the winter temporarily suspended period

Upper floor slab



Prestressing strands anchor part



Pierhead (Inner part)

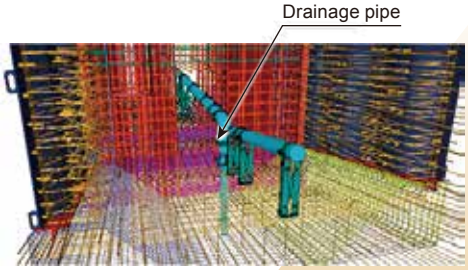


Figure-3 Example of three-dimensional drawings