

Zeitschrift: IABSE reports = Rapports AIPC = IVBH Berichte
Band: 64 (1991)

Artikel: Large mobile scaffolding system for Tsukiyogawa bridge
Autor: Ooyama, Shinji / Yagi, Sadatoshi / Uehira, Kenji
DOI: <https://doi.org/10.5169/seals-49318>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 10.08.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>



Large Mobile Scaffolding System for Tsukiyogawa Bridge

Echafaudage mobile de grande dimension pour le pont de Tsukiyogawa

Bau der Tsukiyogawa-Brücke mit grosser Vorbaurüstung

Shinji Ooyama

Nihon Doro Kodan
Sendai, Japan

Sadatoshi Yagi

Mgr
Oriental Constr. Co. Ltd.
Tokyo, Japan

Kenji Uehira

Chief Researcher
DPS Bridge Works Co. Ltd.
Tokyo, Japan

1. Introduction

TSUKIYOGAWA Bridge locates between Sekizawa I.C. and Yamagata-Zaoh I.C. on Sakata Line of Tohoku-Ohdan Motorway. This bridge was constructed along the western ridge (approximately 600m above sea level) of Ohu Mountains, and then down towards Yamagata Basin (approximately 200m above sea level). The total bridge length was approximately 1km long with 5% gradient and the S-Shape plane view with minimum radius of 540m (see Photo-1).

The economical feasibility study had been made comparing steel bridges with concrete bridges. Consequently, Prestressed Concrete (PSC) bridge was chosen. The bridge span vary from 35.3m to 38.0m. The Bridges consist of two separate lanes because of the adjacent tunnel. Because of the geographical feature, the pier heights vary from 13.5m to 37.9m. Consequently, the large moving scaffold system was chosen considering geographical feature, constructability, construction management, economy, and so on even though that system was not common in the mountainous area.

Scaffold of TSUKIYOGAWA Bridge with the maximum gradient and the minimum plane radius in Japan are presented.

2. Design and Construction

Basic matters for design and construction are as follows.

- 1) Three span continuous PC box frame type bridge (37.05m + 38.00m + 37.05m) as the basic structure was adopted considering reduction of the bearings, and the structure of main girder cross section is box type with 2-cell as shown in Figure-1.
- 2) Because of the divided construction system, the cantilever length from each piers was selected 7.5m ($0.2 \times L$, L: Span Length) in consideration of inflection point for bending moment.
- 3) As prestressing tendon, tendons made of twelve 12.4mm-diameter prestressing steel strands (SBPR 7A) were used, and prestress was introduced in the main girder every construction spans.
- 4) The adopted moving scaffold is shown in Figure-2, and this bridge was erected by the construction procedure as shown in Figure-3.

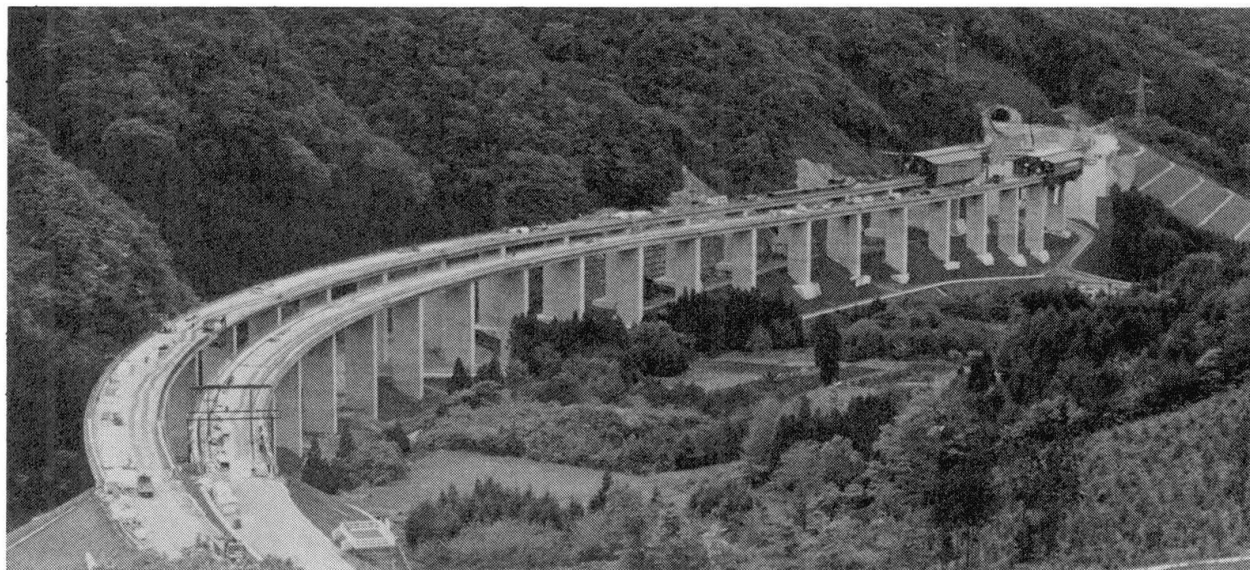


Photo-1 General view

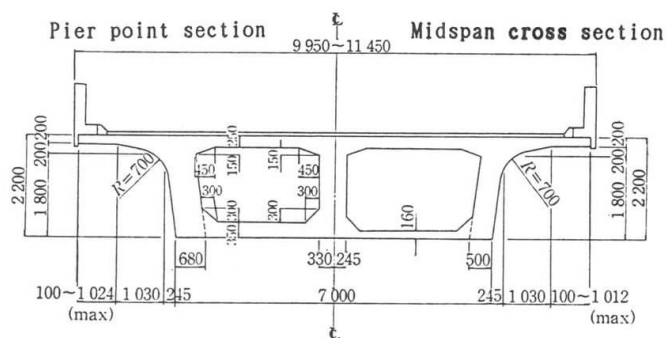


Figure-1 Typical box girder cross section

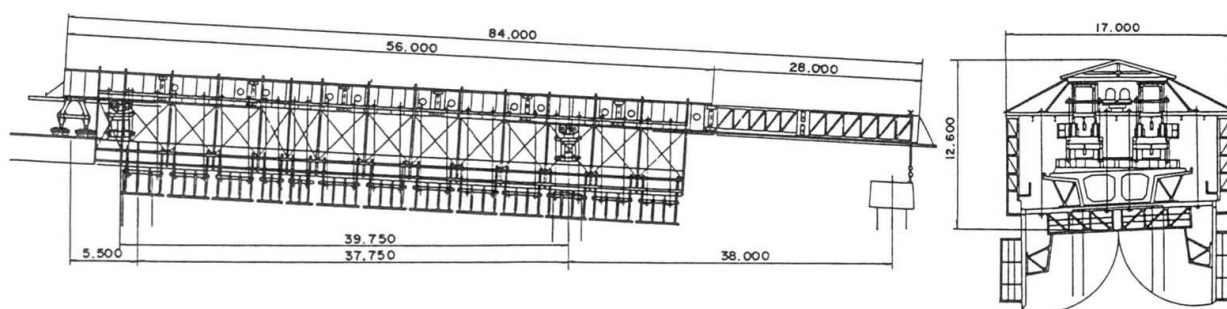
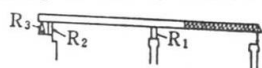


Figure-2 General view of large moving scaffold

① Placing concrete of pier head block



② Assembling of moving scaffold



③ Placing concrete of first construction section



④ Placing concrete of second construction section



⑤ Placing concrete of third construction section



⑥ Moving to next 3-span continuous girder



Figure-3 Construction procedure by moving scaffold