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False Work for
Stage
Span-by-Span
Construction of
A Dual Twin Rib Bridge
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1. INTRODUCTION

Span-by-span construction of continuous prestressed concrete bridges is one of the most effective cast-in-situ techniques in the case of medium span bridges. Using a repeated construction cycle enables economic gains at site.

Different types of falsework and construction technologies are used depending on the existing constraints and construction potentiality.

The falsework and formwork
2. THE BY-PASS PROJECT AND THE ECOLOGICAL VIA DUCT

Localization:
Stargard Szczeciński

Legend:
- Interchanges:
  1 - West
  2 - Centre
  3 - East
- Viaduct E1
- Expressway
- National Road
- Railways
- River
THE BY-PASS PROJECT AND THE ECOLOGICAL VIADUCT

The main bridge structure on the bypass is the ecological multi-span viaduct marked as E1. It is located over the Ina river valley.

The structure is for ecological purposes and allows the movement of wild animals under the expressway along the river valley plain. The structure carries two carriageways of the trunk road also over the Small Ina river, an drainage channel and some lanes through the fields.
2. The By-Pass Project and the Ecological Viaduct

Ecological viaduct - cross section

Szczecin

Bydgoszcz

12.20

25.20 m

0.8

12.20
The decks have ribs of depth 1.70 - 2.50 m. The width of the decks is 11.5 m.

Structural concrete of grade C35/45 was used in the decks.

The ecological viaduct is a 10-span structure with span length 30.0 + 45.0 + 6×34.0 + 45.0 + 30.0 m. The total length of the structure is 356.2 m.

The decks were designed to be continuous over the whole length of the bridge. Expansion joints are
2. THE BY-PASS PROJECT AND THE ECOLOGICAL VIA DUCT

Ecological via duct - longitudinal scheme
The soil conditions are typical for West Pomeranian river valleys.

The bridge is located in post-glacial terrain filled with glacial sands covered by peat and organic soils of different depth between 0.4 m and 2.8 m.

This caused problems both in the falsework foundation works and in the transportation of materials and equipment.
The design assumed that the bridge decks would be built in stages; this was followed in construction.

The decks were built in eight stages connected with concrete placement and prestressing. Each deck has seven construction joints (CJ) positioned in areas where the minimum moments and shears occur.
Cross sections of the decks:

- At midspan

- Supports № 1, 4-8 & 11

- Supports № 2-3 & 9-10
In the first stage of construction, the casting segment consisted of the third span plus two short cantilevers of the adjoining spans.

In the second stage, the casting segment consisted of the first span and the remaining section of the second spans. In the second span, the first construction joint is located.

The next spans were built span by span; in one stage a segment of span length was cast and prestressed.
3. V I A D U C T

C O N S T R U C T I O N

T E C H N O L O G Y

Arrangement of stages for the viaduct deck construction

Stages: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

1..2 - Support number
The location of parallel decks next to each other allowed the adoption of a simple falsework system with repeatable structure for the construction in stages of succeeding segments in both decks. The falsework and formwork members were used repeatedly.

The falsework supports were located on the viaduct pier footings and on temporary foundation pads from precast slabs supported on improved soils (at midspan). Soil improvement...
4. FALSE WORK AND FORMWORK

The deck form work for spans of constant depth 1.70m
4. FALSE WORK AND FORMWORK

The deck form work for span with variable depth between 1.70 ÷ 2.50m
4. Falsework

Scheme of transversal movement and relocation of falsework for stages 1 and 2 of parallel construction of the two bridge
4. FALSE WORK AND FORMWORK

Scheme of falsework for span-by-span construction: stages 3÷7
Falsework cross sections for the deck with variable depth: a) at via duct mid span, b) near via duct piers.
4. FALSEWORK AND FORMWORK

Falsework support at midspan
4. FALSE WORK AND FORMWORK

False work support near bridge pier
4. Falsework and Formwork

Formwork frames
4. False Work and Formwork

Formwork panels
4. False Work and Formwork
4.FALSE WORK AND FORMWORK

False work for the next stages
4. FALSEWORK AND FORMWORK
4. FALSE WORK AND FORMWORK
4. FALSE WORK AND FORMWORK
4. Falsework and Formwork

Transverse Movement
4. False Work and Formwork

Timber pilling
Dual twin rib viaduct
CONCLUSIONS

- The technical design for the falsework construction included designs for ground improvement, falsework and formwork.
- The falsework supports and decks featured simplicity and great adaptability for different construction conditions.
- The designed and
THANK YOU FOR YOUR ATTENTION