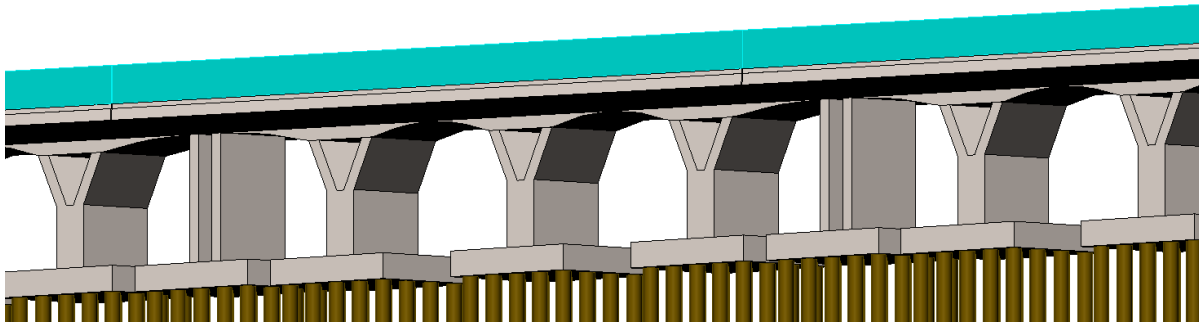


PRELIMINARY DESIGN OF VIADUCTS FOR CONTINUATION OF SOFIA RING ROAD BYPASS – SOUTH-WEST CONNECTION – BOYANA-LYULIN



Improving Sofia infrastructure demand the creation of bypass of the ring road. As part of the project two flyover viaducts are considered in a dense populated area of the existing ring road. Due to the existing infrastructure and surrounding the new viaducts are under heavy restriction.

Objective of the projects

Main objective of the design is prove of concept. Finding suitable design satisfying all restriction. The road profile with total width of 27.5[m]. Along the viaducts the existing road is to be kept below, giving only 7[m] lane for support line.

Scope of project

- Situational placement of the viaducts.
- Foundation placement according to restrictions.
- Design of suitable, elegant and functional superstructure.
- Design of substructure corresponding to the superstructure design.
- Design of foundation corresponding to the structure design
- Analysis and design for prove of concept

Situation and foundation positioning

Due to the significant length of the viaducts, Viaduct 1 – 1360[m] and Viaduct 2 – 200[m] the structure are separate in segments with average length from 100[m] to 160[m]. The average span is aimed at 20[m]. At special position longer spans are considered due to road crossing, with longest span of 55[m].

Superstructure design

Restriction of the design lead to implementation of multiple cross sections with variable parameters following the design. Steel section is used in the major spans. Minor spans are designed with regular reinforcement. Minor section that exceeds the reinforced concrete capacity are prestressed.

Substructure design

Due to the small support are, a full stiff frame connection is considered between the superstructure and the substructure. Substructure is designed to collect all forces from the superstructure and transfer them reliably to the foundation. For the heavy loading the foundation are designed as pile groups.

Viaduct 2 optimization

The restrictive conditions in place for design of Viaduct 1 are not present for Viaduct 2. Therefore optimization is optional, making longer spans with aesthetically similar design. Giving solution with two prestressed concrete box sections, with maximal span spans of 40[m].

EKJ Bulgaria's services:

During design:

EKJ Bulgaria is a contractor in the preparation of project development of the phase "Preliminary design" of:

- Viaduct 1 – length of 1360 m
- Viaduct 2 – length of 200 m

Objectives and features:

- Situational placement of the viaducts.
- Foundation placement according to restrictions.
- Design of suitable, elegant and functional superstructure.
- Analysis and design for prove of concept.

Client: Sofia Municipality

Contractor: EKJ Bulgaria Ltd

Period: 2018

Contract type: Design

Design phase: Preliminary design

