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2. Bridge over the Oka River in Ryazan

Designer: Design Institute Giprotransmost
Contractor: A constructional organization of Glavmostostroi
Sphere of application: the bridge is meant to have 4 lanes for vehicular traffic and pedestrians
Bridge full width: 18.0 m including 15-m-wide roadway
Static system: the river-bed part (58.2 + 2 x 84.0 + 58.2 m) is spanned by a frame-suspension superstructure. The bank parts (viaducts) have spans 32 and 64 m long.

Materials used per m2 of the bridge:

Materials	*Left-bank viaduct*	*Right-bank viaduct*	*River part of the bridge*	*Average amount*
Concrete for superstructure (m3/m2)	*0.33*	*0.33*	*0.51*	*0.38*
Concrete for piers (m3/m2)	*0.44*	*1.184*	*1.33*	*0.87*
Metal total (kg/m2)	*111*	*163*	*169*	*140*
including high-strength wire (kg/m2)	*18.7*	*17.1*	*23.7*	*19.6*

Traffic opened: in 1972

The bridge is erected of precast prestressed concrete units. The transporting of 32 and 64 m long precast T-beams widely used by the contractor increased the erection rate. The prefabrication of the beams and other elements was well developed by concrete plants.

The mentioned T-beams (fig. 2) were used for suspended spans in the bridge river part having a frame suspension superstructure (fig. 1). The frame cantilevers were assembled of box-section elements (fig. 2) 3 and 5 m long, manufactured on the site near the bridge.
Epoxy adhesive joints were used between the adjacent elements.

High-strength tendons consisting of 48 d = 5 mm wires located in closed ducts were used for the preliminary squeezing of the cantilevers, a considerable number of inclined tendons being threaded into the box webs. The ducts were arranged with the help of duct-formers pulled out afterwards. 32 m and 64 m long T-beams were used for viaduct spans.
To improve maintenance conditions and to make the traffic more comfortable, each 7 - 8 spans are united into a continuous structure with expansion joints arranged only at the ends of the unit. The viaduct roadway made of concrete having hydrophobic additives without using a hydro-isolation layer.
The 2-pillar viaduct piers are precast and cast-in-place, with a cap.
The river piers are solid, with massive section, but above the water level they are hollow, with box section.
The river piers and part of right-bank piers have massive reinforced concrete well foundations. The foundations of the left-bank viaduct piers and the abutments are mounted on reinforced concrete piles (section 40 x 40).
The erection of precast units on the viaducts was carried out by gantry cranes K-451M, the erection of river spans, by cranes СП К–65 (fig. 3).

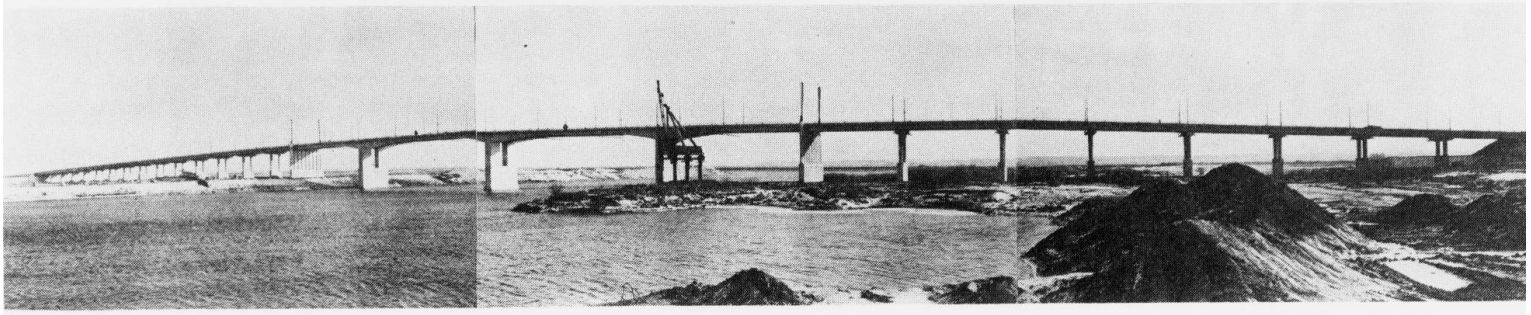

Fig. 1 The bridge scheme

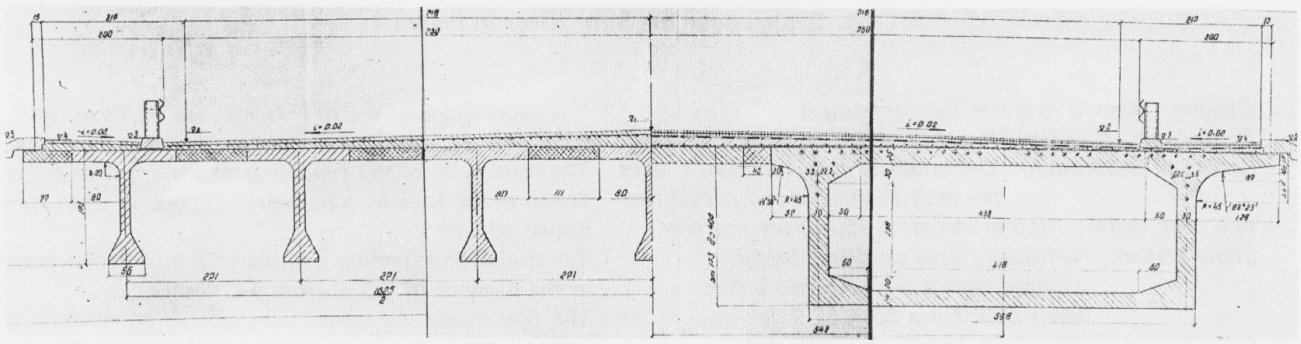

Fig. 2 Cross-sections

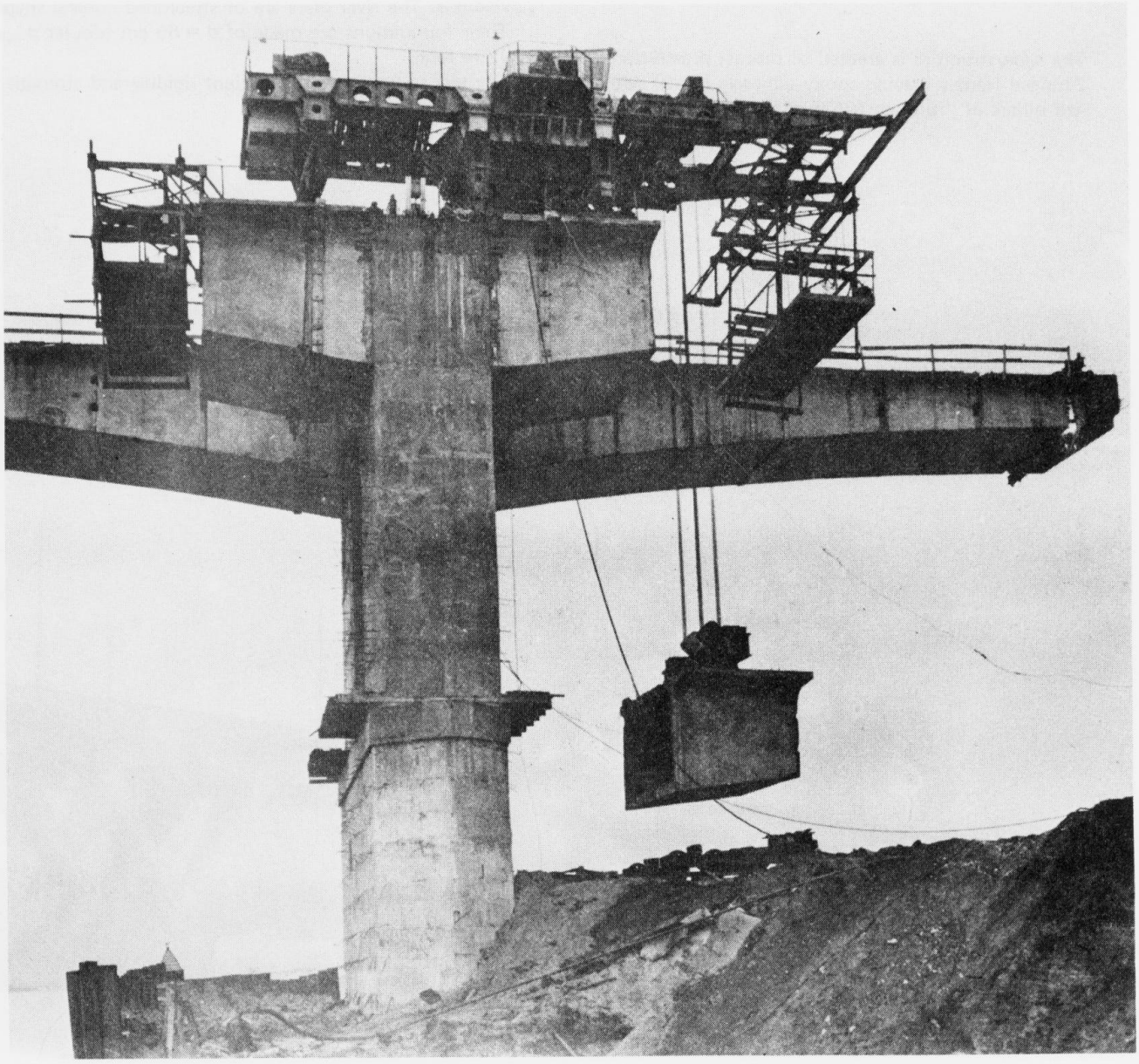

Fig. 3 The box elements erection by СПК–65 crane.