

Standardized structures for rapid bridge construction

Autor(en): **Vorsa, Vladimir**

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Standardized Structures for Rapid Bridge Construction

Éléments standardisés pour une construction rapide des ponts

Standardisierte Elemente für schnellen Brückenbau

Vladimir VORSA

Chief of Dep.
Bridge Design Institute
Leningrad, USSR

The principal task the bridge designers and bridge builders have to solve is to improve the quality of the work to be done, to reduce specific consumption of materials and labour expenditure, and to shorten the bridge construction period.

These tasks which seem to contain mutually exclusive conditions - e.g. provision of quality alongside with shortening the construction period - may be accomplished by further industrialization of construction technology, the latter being gradually transformed into a unitary industrial-constructional process for the bridge erection using prefabricated unified elements.

To achieve these goals, a project has been implemented to develop unified elements and blocks employed for construction of motor-road and town bridges using a universal technology.

This project included a broad unification of elements and blocks of span structures used for construction of 2, 4 or 6-lane motorways (with common and separate span structures). The spans were from 42 to 147 m long, the main beams being of flange and box section types.

Application of unified elements and blocks used in span structures results in the increase of labour productivity and the improvement of products quality manufactured at metalworks factories. We may as well relate this to the erection stage of the bridge when the positive effect is achieved owing to similarity in repeatedly performed operations.

The next constructive measure directed to the accomplishment of the task stated is to increase the degree of readiness for use of

factory-made structures upon their delivery to the erecting site. The above is achieved by using the main beams which are seen as factory-made box blocks capable of being transported (by railway or motor road) as one-piece units.

Application of these structures results in redistribution of the labour expenditure between the factory and the construction site, to the builders' advantage. The work at factories is characterized by a higher labour productivity and a greater possibility of accomplishing the work with higher quality. This results in decrease of general labour expenditure and, eventually, in shortening the construction period.

Introduction of the factory-made box beams which replaced the traditional box beams assembled at a construction site, made it possible to reduce considerably the volume of erection weldings and to lower sharply the labour expenditure during the assembly period.

The experience acquired during the erection of four bridges shows that the use of metal span structures made of unified elements and one-piece box blocks as main beams, is found to reduce the labour expenditure and shorten the bridge construction period.

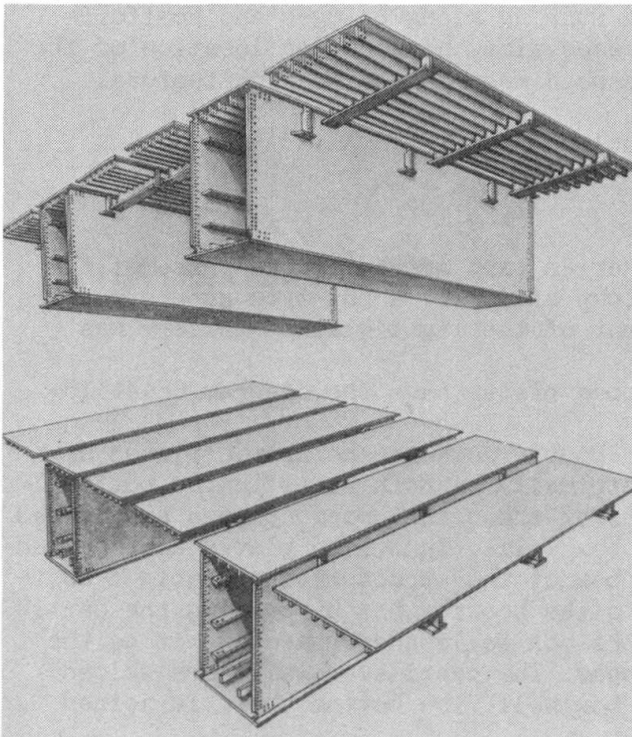


Fig. Formation of cross section of span structure using box blocks