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Bridge Superstructure with Environmental Protection

Structure de pont en vue d'une protection contre les agressions du climat

U-Bahn-Brücke mit Schutz gegen klimatische Einflüsse

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1. INTRODUCTION

Under the USSR climatic conditions for reliable operation of the underground railway the trains leaving the tunnel and running along bridges and scaffolds require environmental protection. At the same time, considering location of the metro bridges under the city conditions should meet increased architectural requirements.
The specified work seeks to solve the problem.

2. SUPERSTRUCTURE

For the bridge passage across the Oka river as part of the second phase of the underground railway construction in the town of Gorky, a box-type superstructure allowing cantilever traffic and arrangement of the light glassed gallery was suggested.
The bearing box with a top and bottom ribbed plates have the diagram 66+4*115+ 2*135+99 m.
Steel cantilever-cross beams bearing the "Double-deck" orthothropic plates of the underground trains are attached symmetrically on both sides to the bottom chord and box walls. The horizontal sheets of the orthothropic plates are joined with longitudinal horizontal ribs of the box walls. Thus, the plates are engaged in a combined operation with the bearing box of the structure.The double T-section cantilever cross beams are attached to the bearing box by passing the cantilever top chord through special cuts in the box walls and connecting it to the chord of the lower rid plate transverse beam. The cantilever walls are welded (or fixed by high strength bolts) to the box wall. The bottom chord is joined with the box lower plate (Fig.1) .
The closed glassed galleries have the Γ-form frames and light-weight fencing structures (roof and wall with windows). The bearing frames of welded I-beams are hinged on the top chord of the cantilever transverse beam and on the box walls. The above fixing of frames increases reliability of the gallery operation at dynamic loads. The longitudinal ties interconnect the frames.
The galleries are erected in 10 m sections, fully shore assembled and delivered to the installation site on flat cars equipped with special girders. The intersection joints are done from especially manufactured scaffold girders travelling along the chord of the superstructure box.

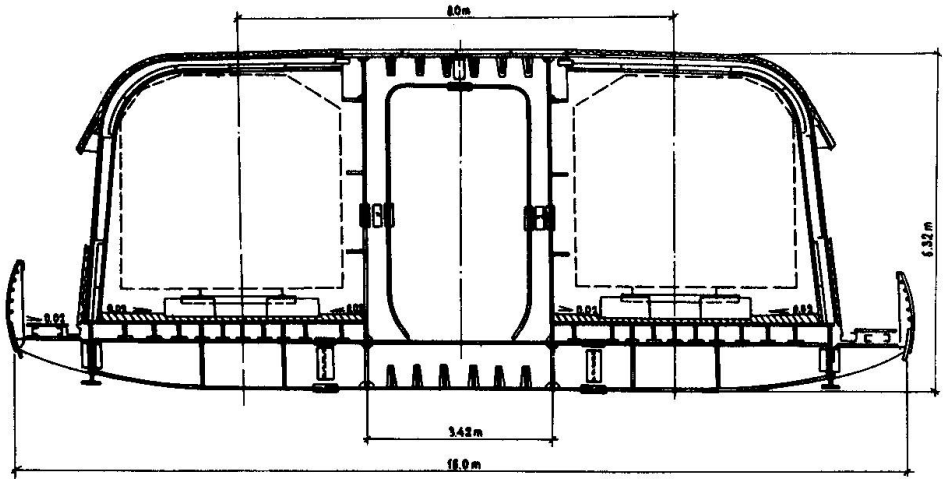

Fig. 1 Superstructure cross-section

The specified design of the superstructure has great potentialities in designing the structure architectural appearance and may be recommended for applicaton on other objects.

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