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SOUTH BRIDGE over DAUGAVA RIVER in RIGA

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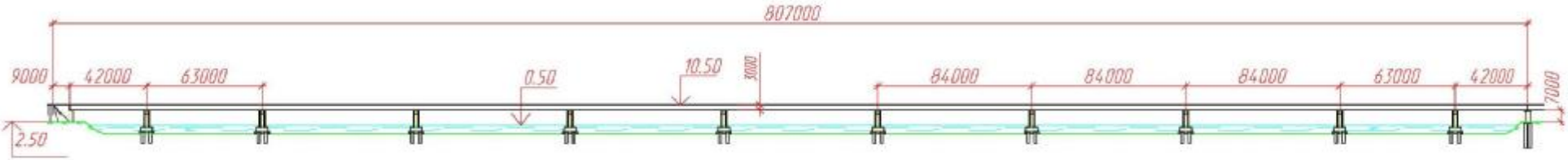
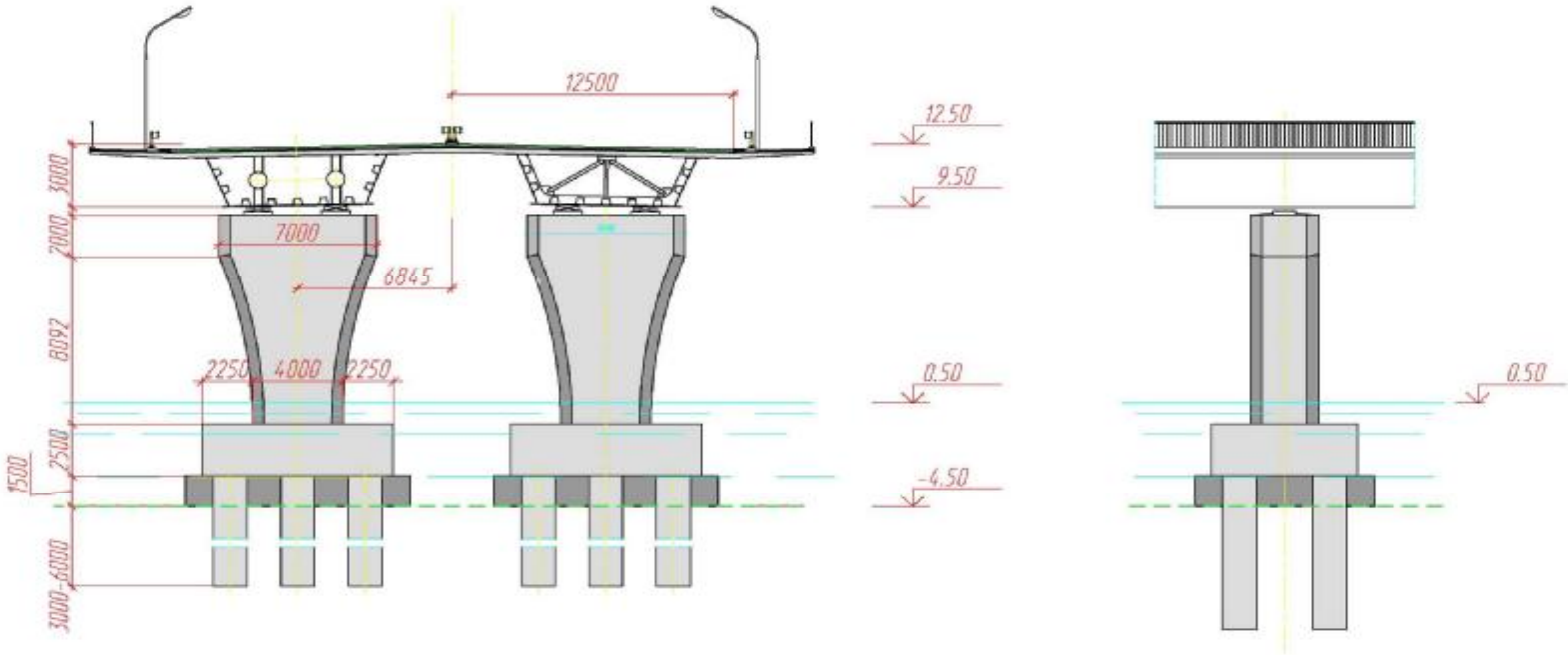
CONTINUOUS GIRDER PROPOSAL





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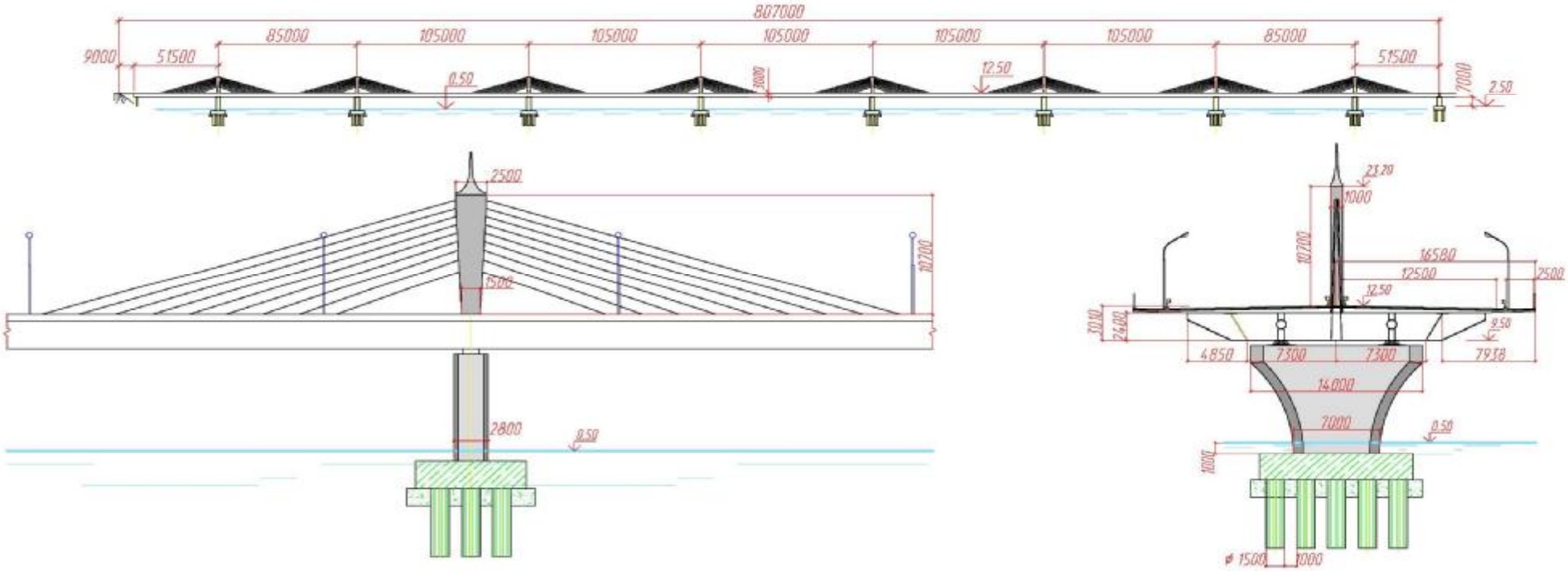
EXTRADOSED PROPOSAL ONE LINE STAYS



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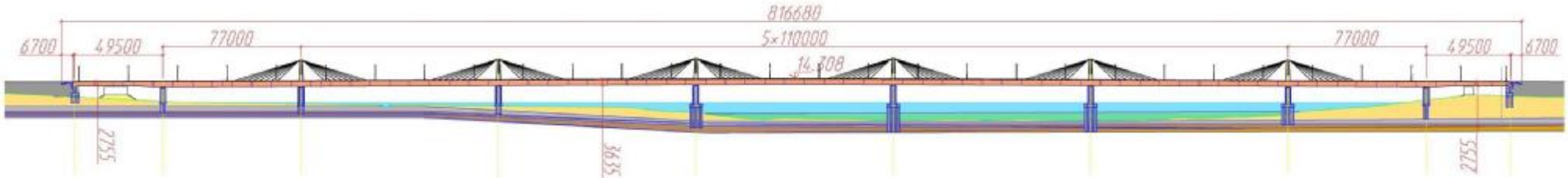
ADOPTED PROPOSAL



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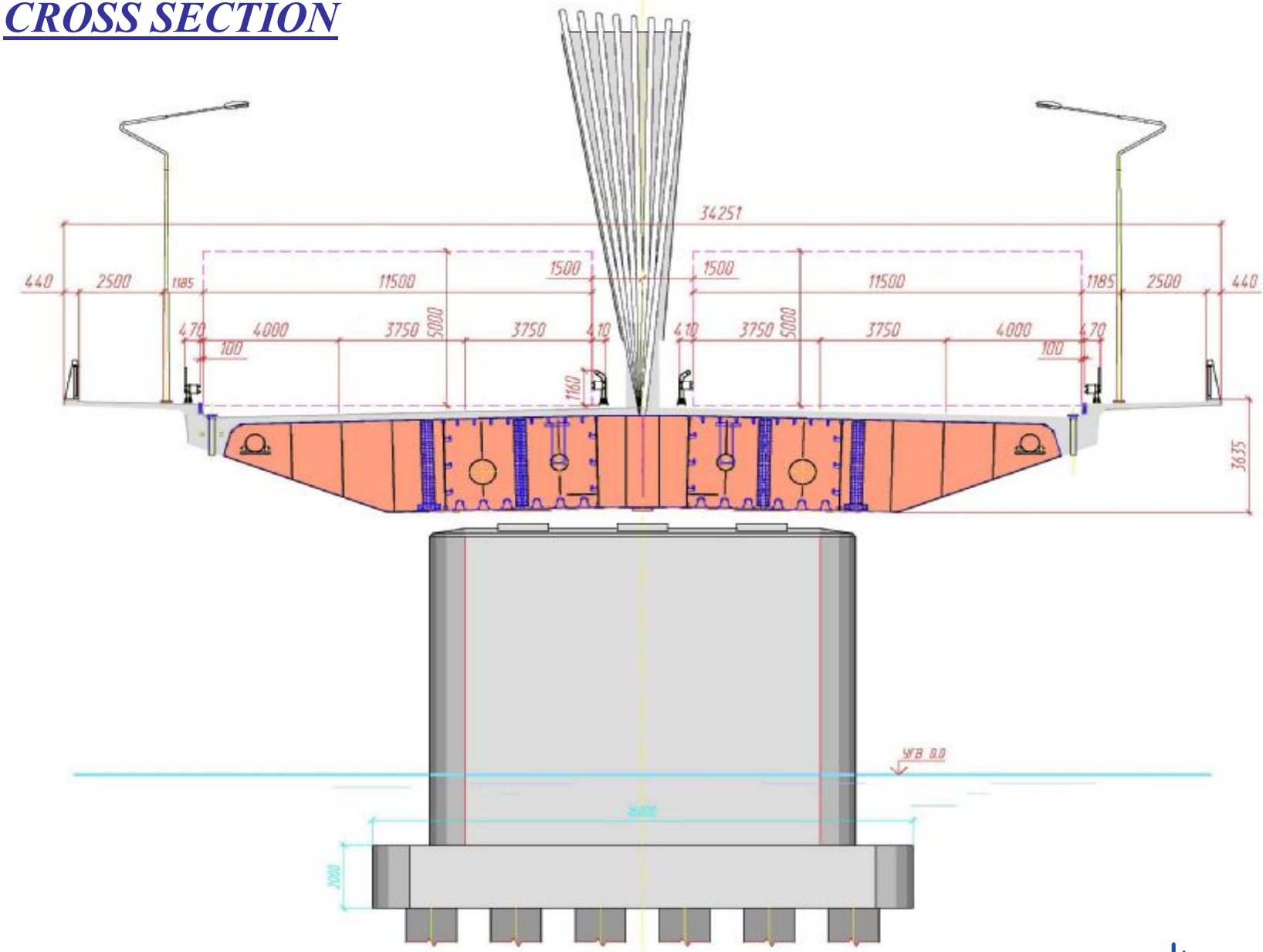
CROSS SECTION



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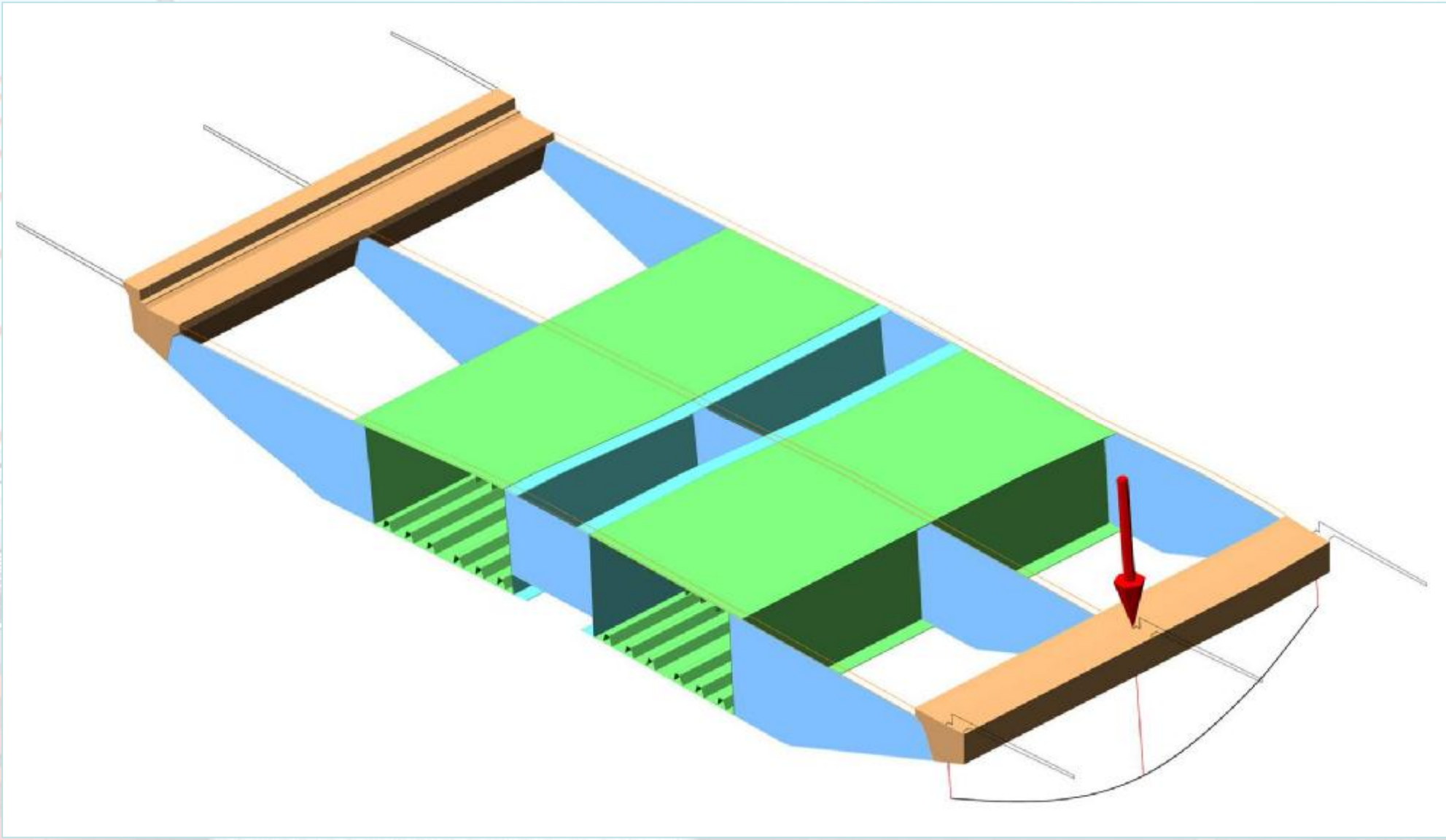

INFLUENCE OF EDGE BEAM ON STRESS LAYOUT

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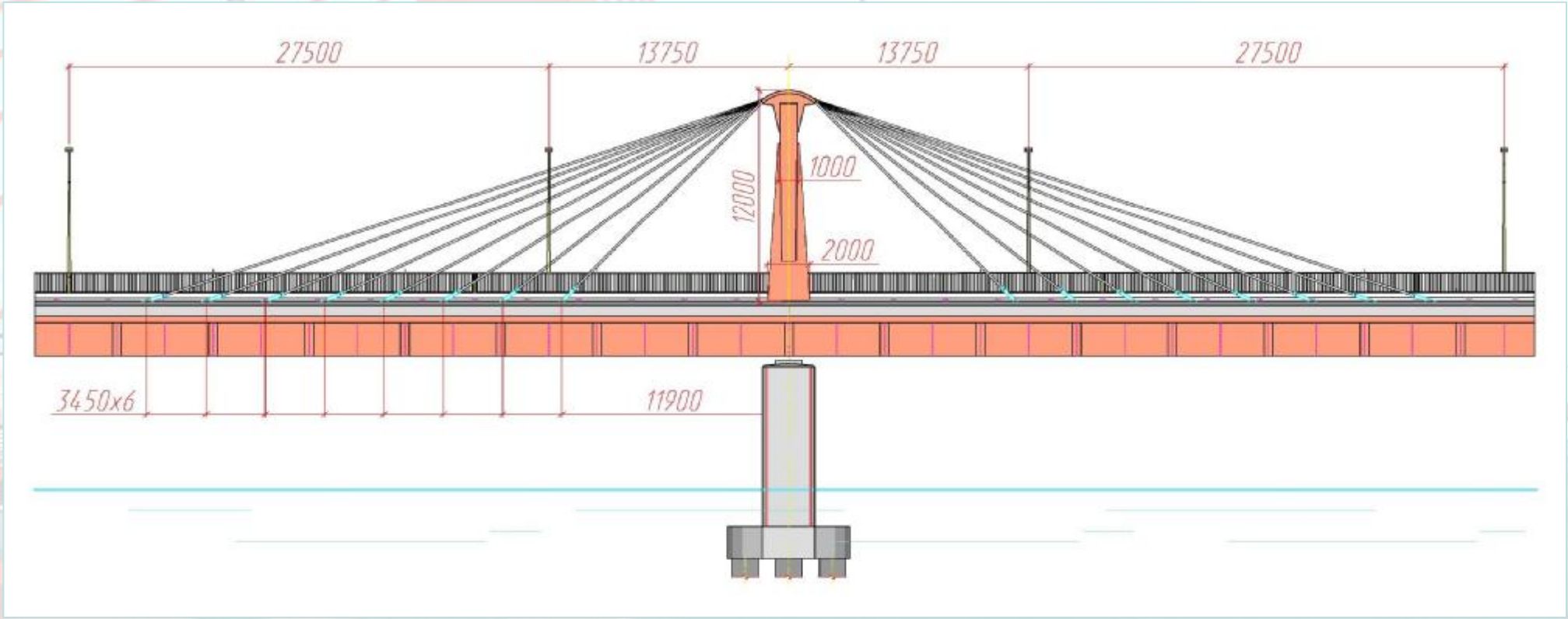
STAYS ARRANGEMENT



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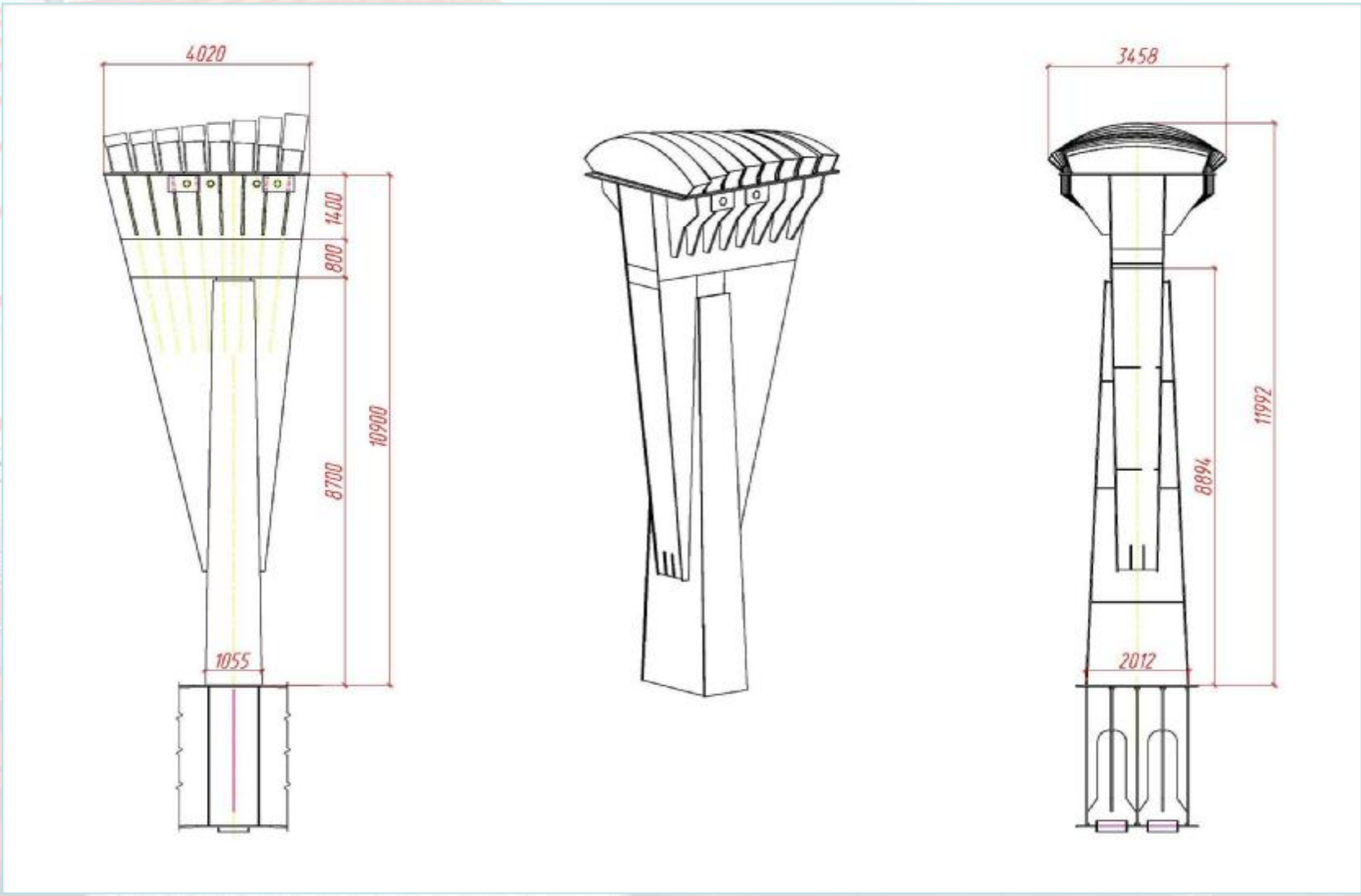
PILON



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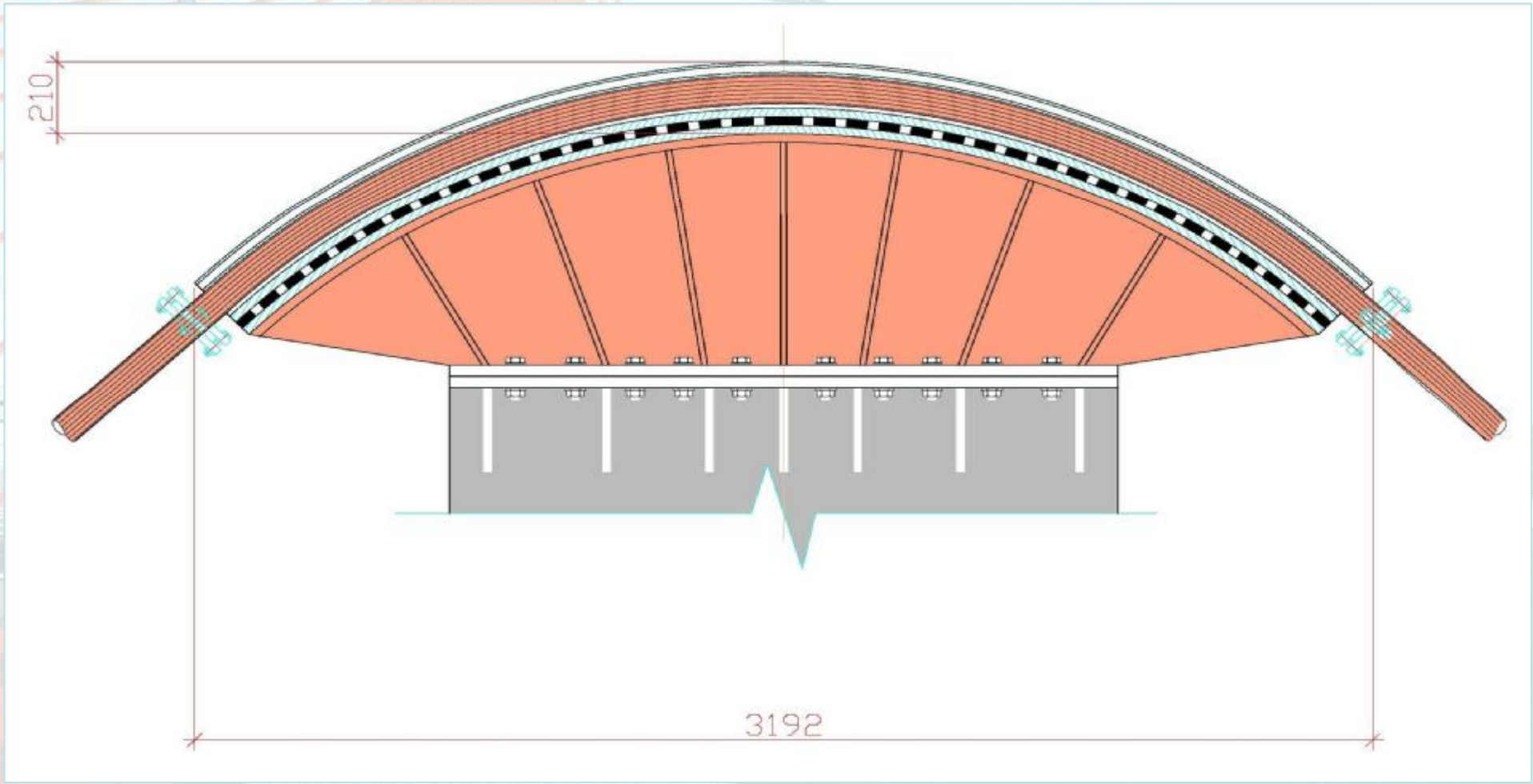
SADDLE



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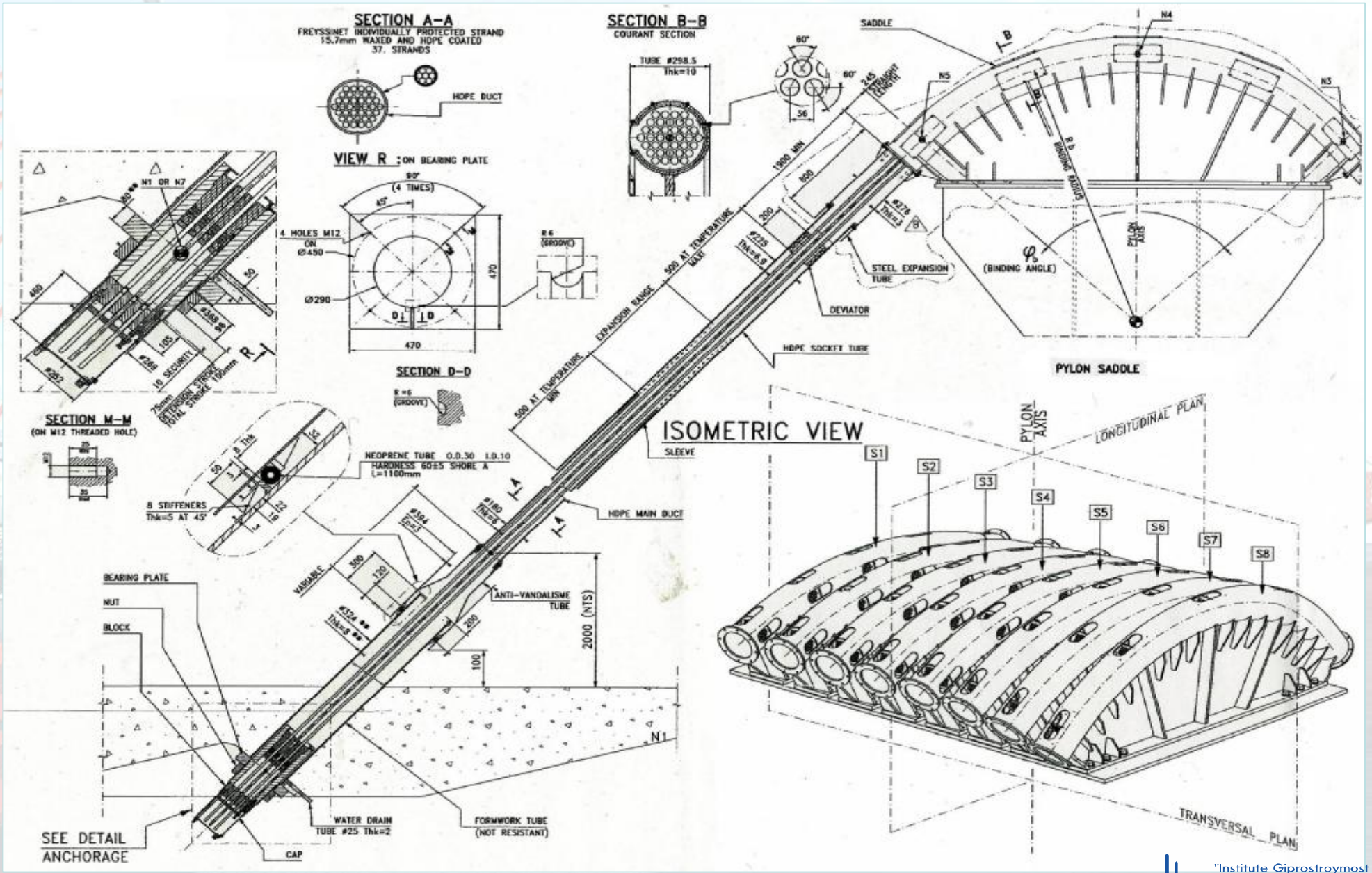

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Analytical model for the bridge

The spatial finite element model was implemented to analyze the bridge. There are 146 parts of the deck in the analytical model, length of every part is 5.5 meters – step of the diaphragms. The boundary surfaces of those parts are analytical cross-sections.

The model consists from several types of Finite Elements, namely:

Spatial frame members and truss members;

Plane stress finite elements;

Finite elements of bending plate;

3D Rigid bodies.

There are 29 nodes in every analytical cross-section. General drawing of cross-section is given at figure 1, while picture of cross-section with nodes of analytical model is represented at figure 2.

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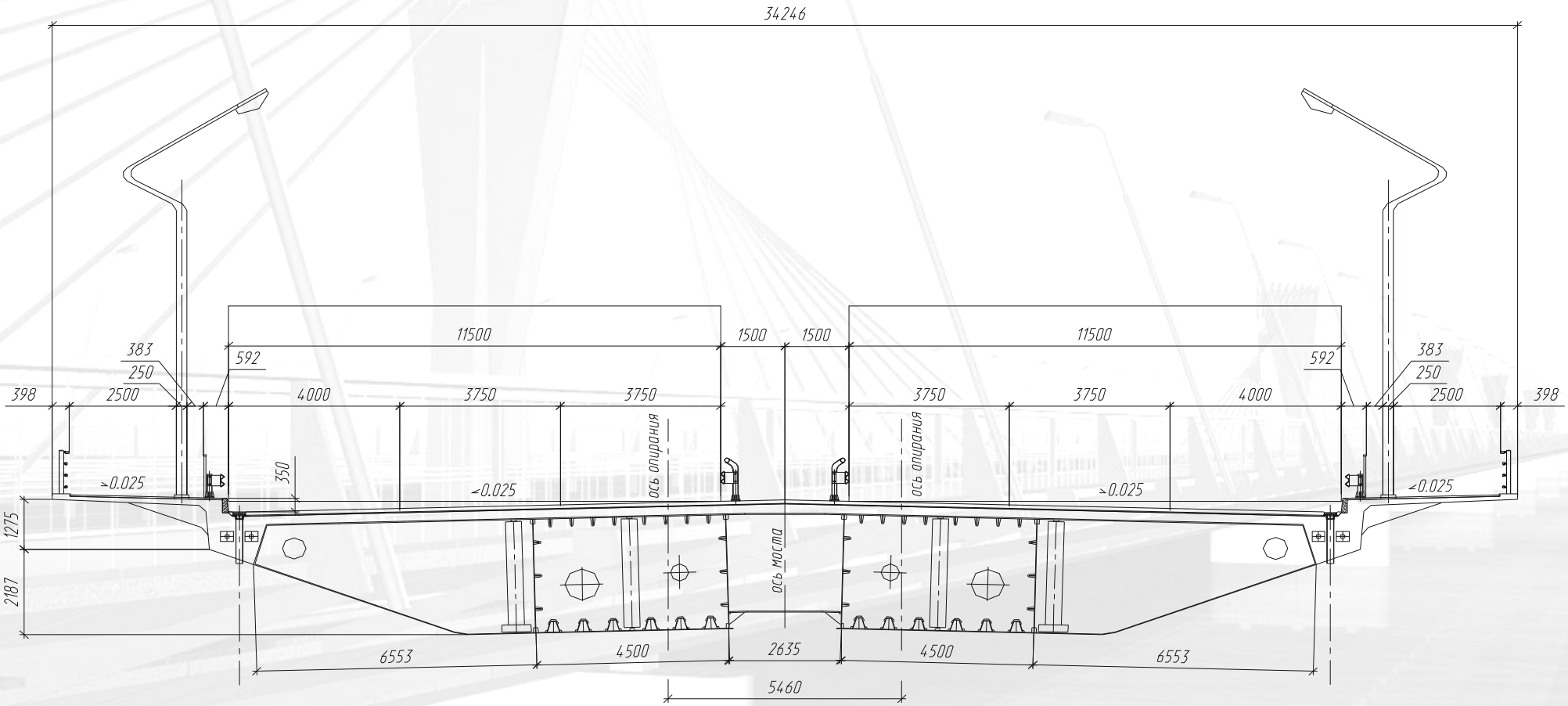
CROSS SECTION



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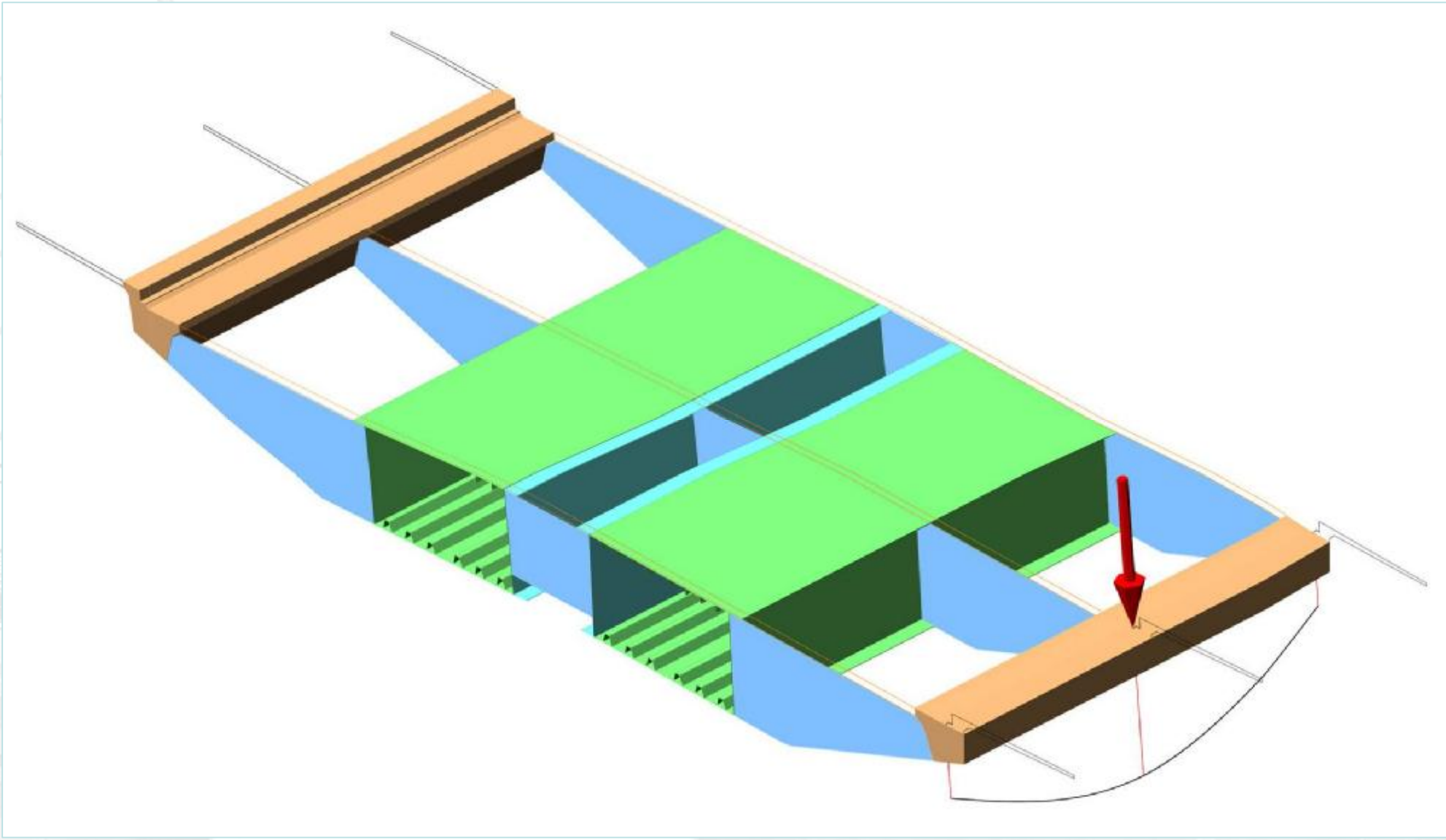

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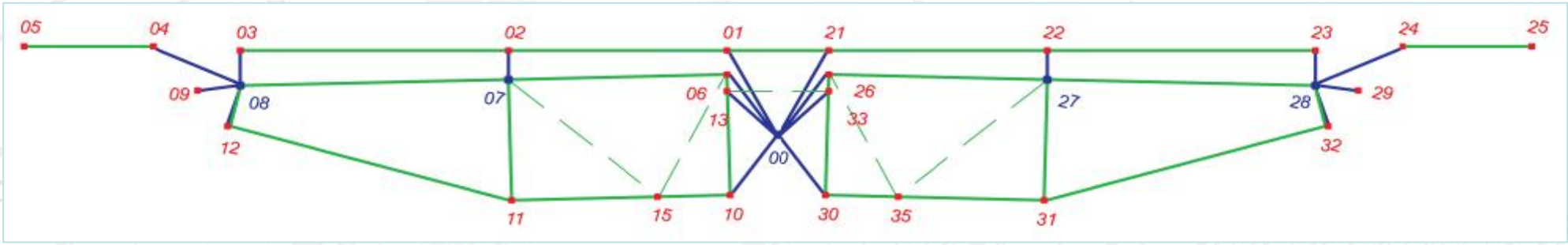
MODELS NODES AND FINITE ELEMENTS



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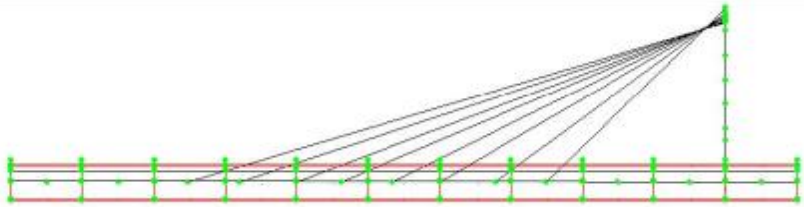
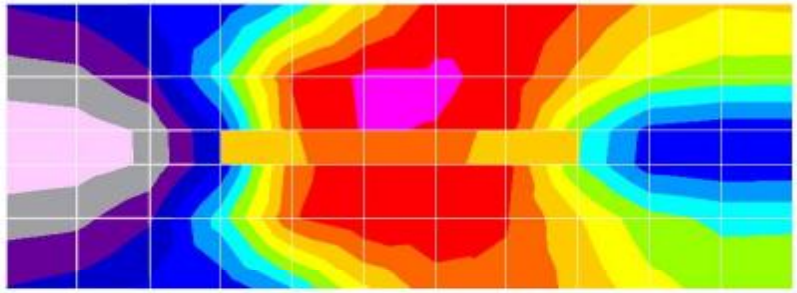
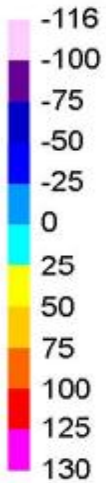
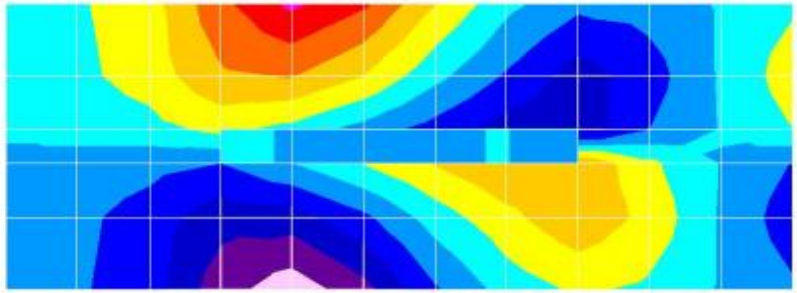


σ_x near a pylon





τ_{xy} near a pylon



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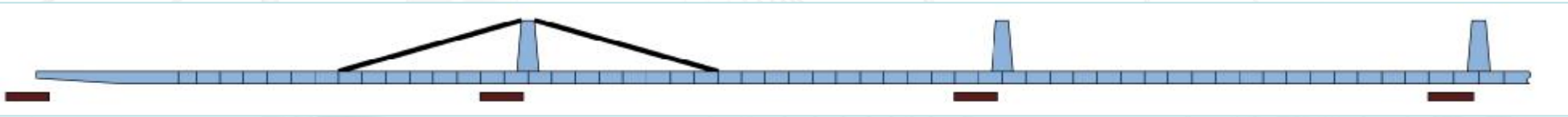
LONGITUDINAL LAUNCHING OF DECK



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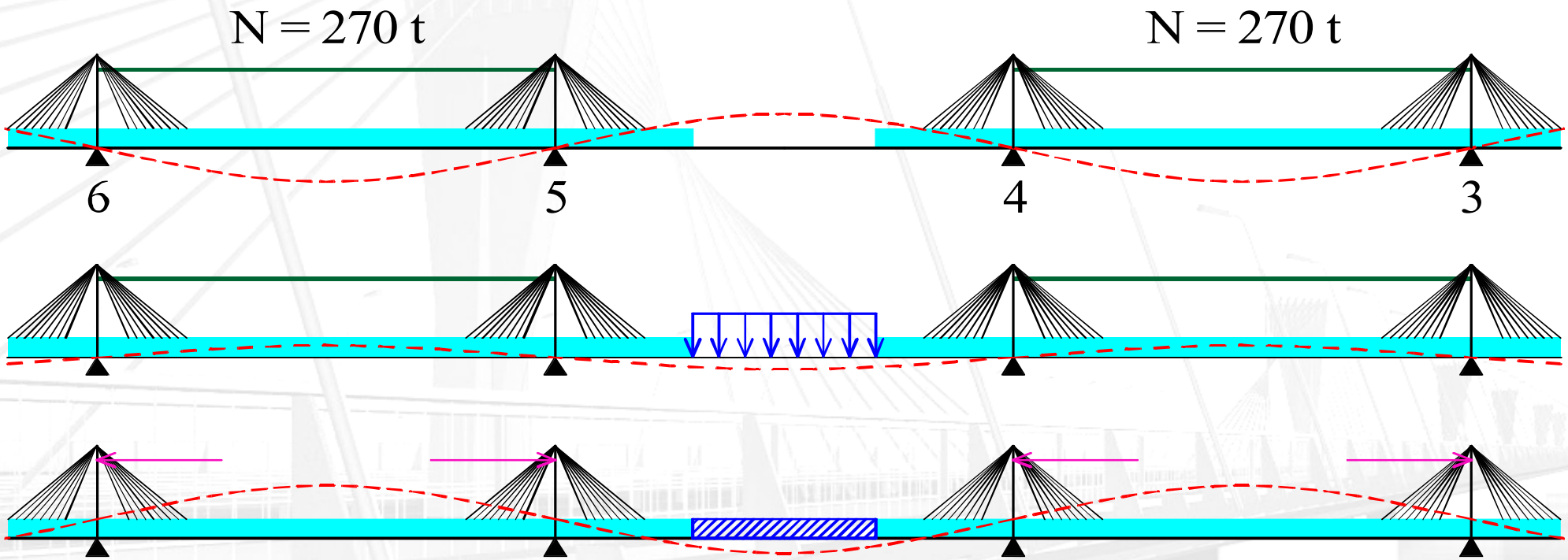

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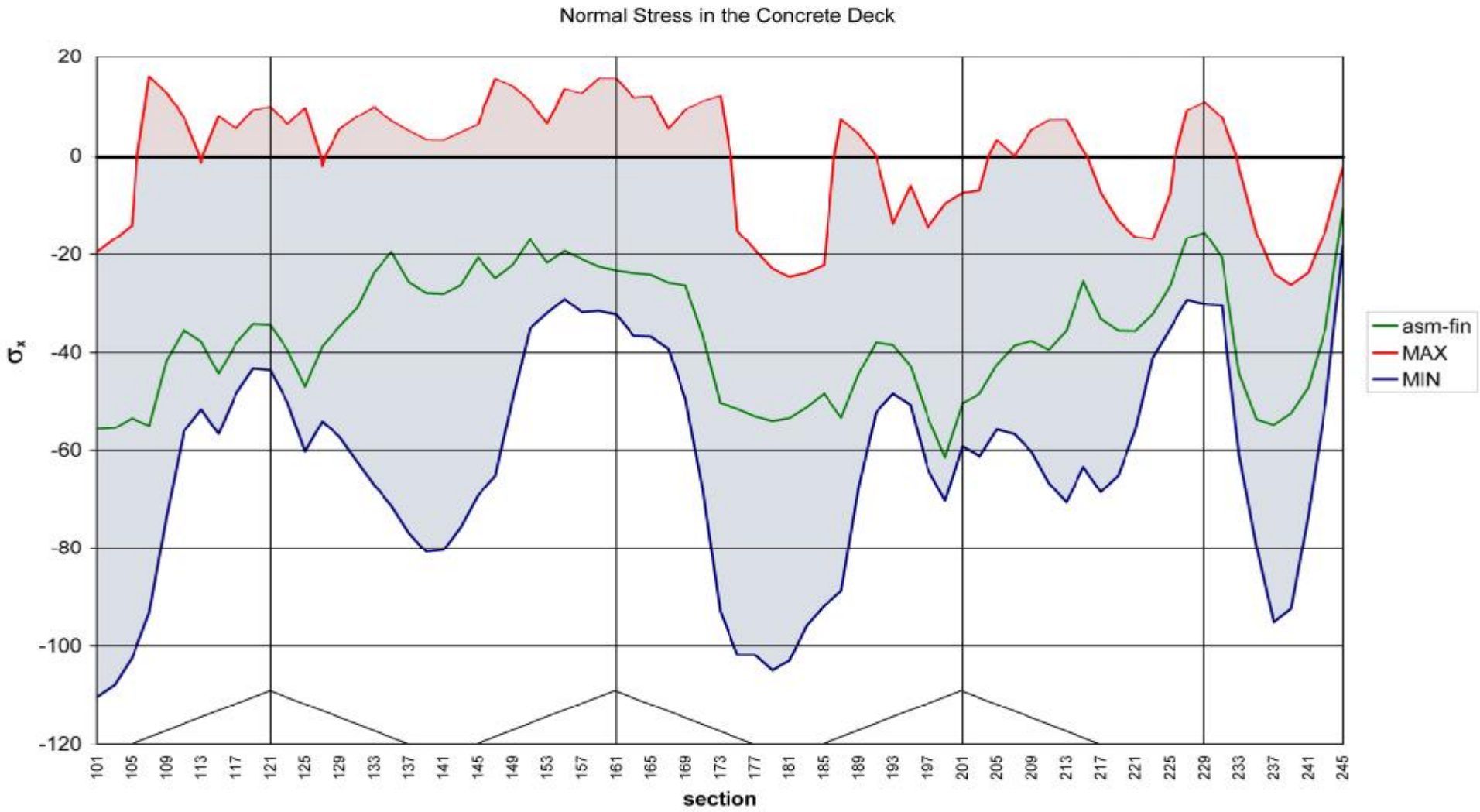

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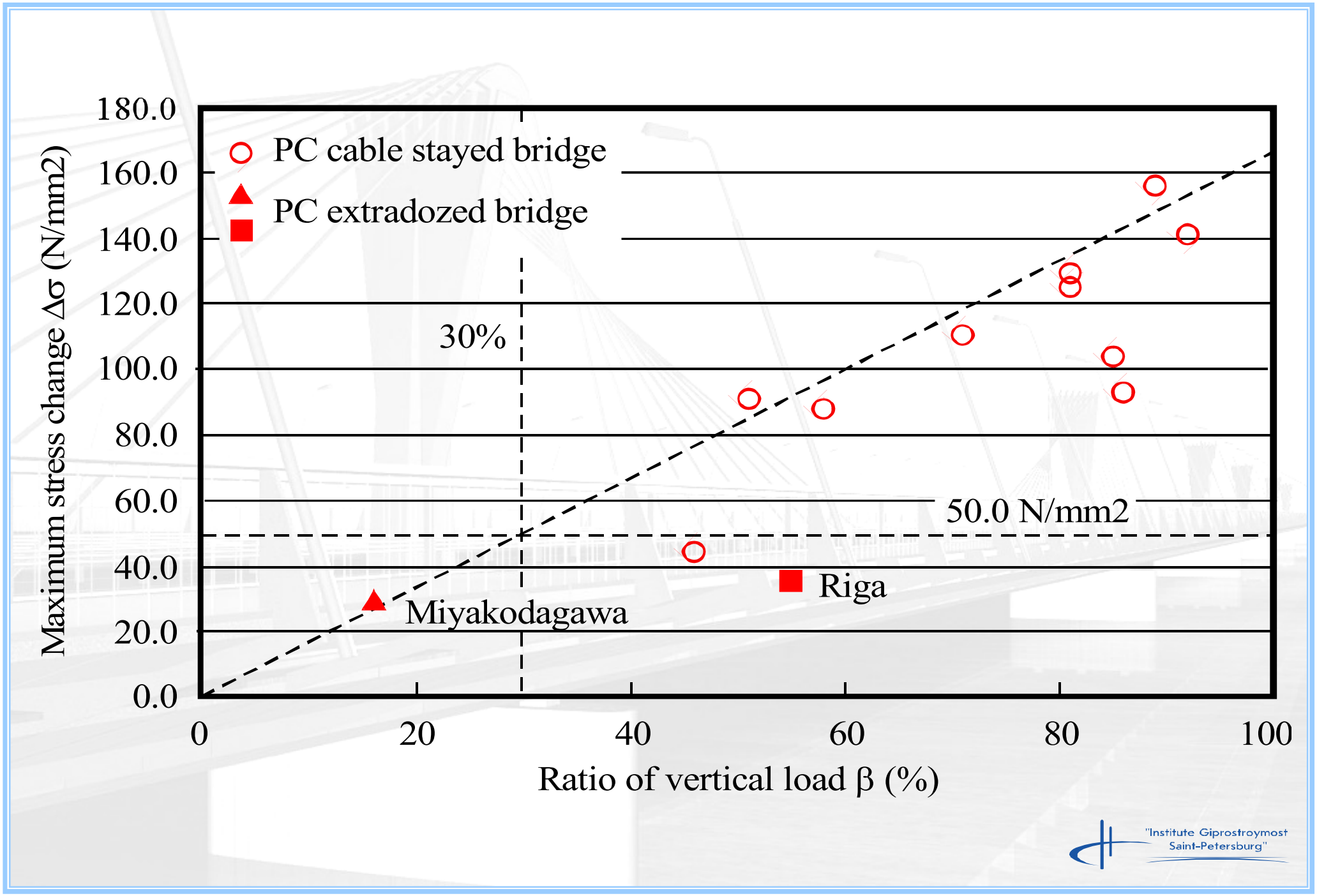
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Maximum stress change Δσ (N/mm2)
PC cable stayed bridge
PC extradozed bridge
30%
50.0 N/mm2
Riga
Miyakodagawa
0
20
40
60
80
100
Ratio of vertical load β (%)
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