

Schulich School of Engineering, University of Calgary

Project Background

- Value engineer the Macleod Trail and 194 Avenue bridge design made by ISL Engineering .
- Develop an alternative solution using steel girders as opposed to concrete girders.
- Existing 4-way traffic light intersection is unable to efficiently circulate traffic volumes with fast-growing neighbouring communities.



Figure 1: Google Maps Intersection Plan View

Deck Design

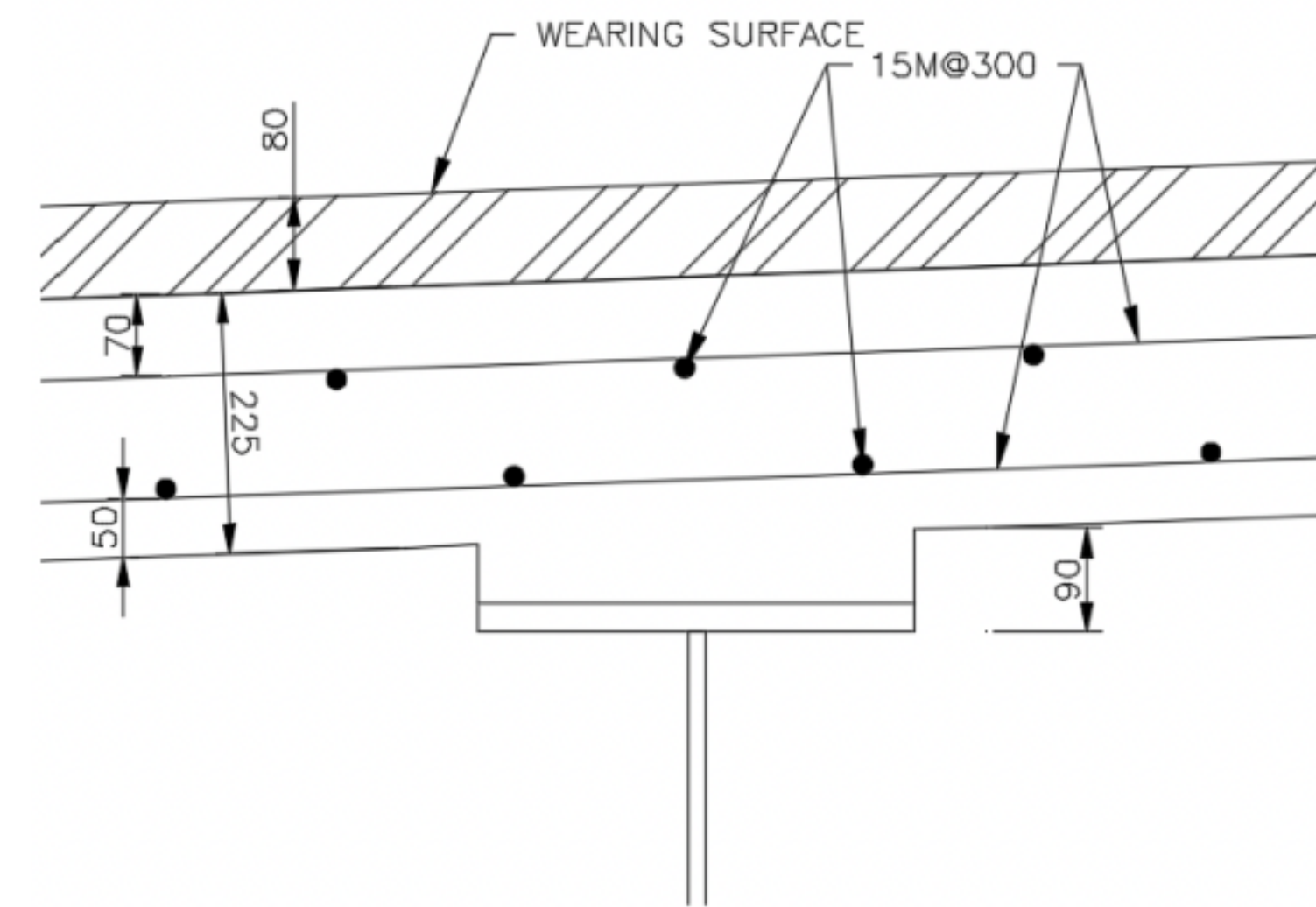


Figure 4: Deck Reinforcement at Positive Moment Regions

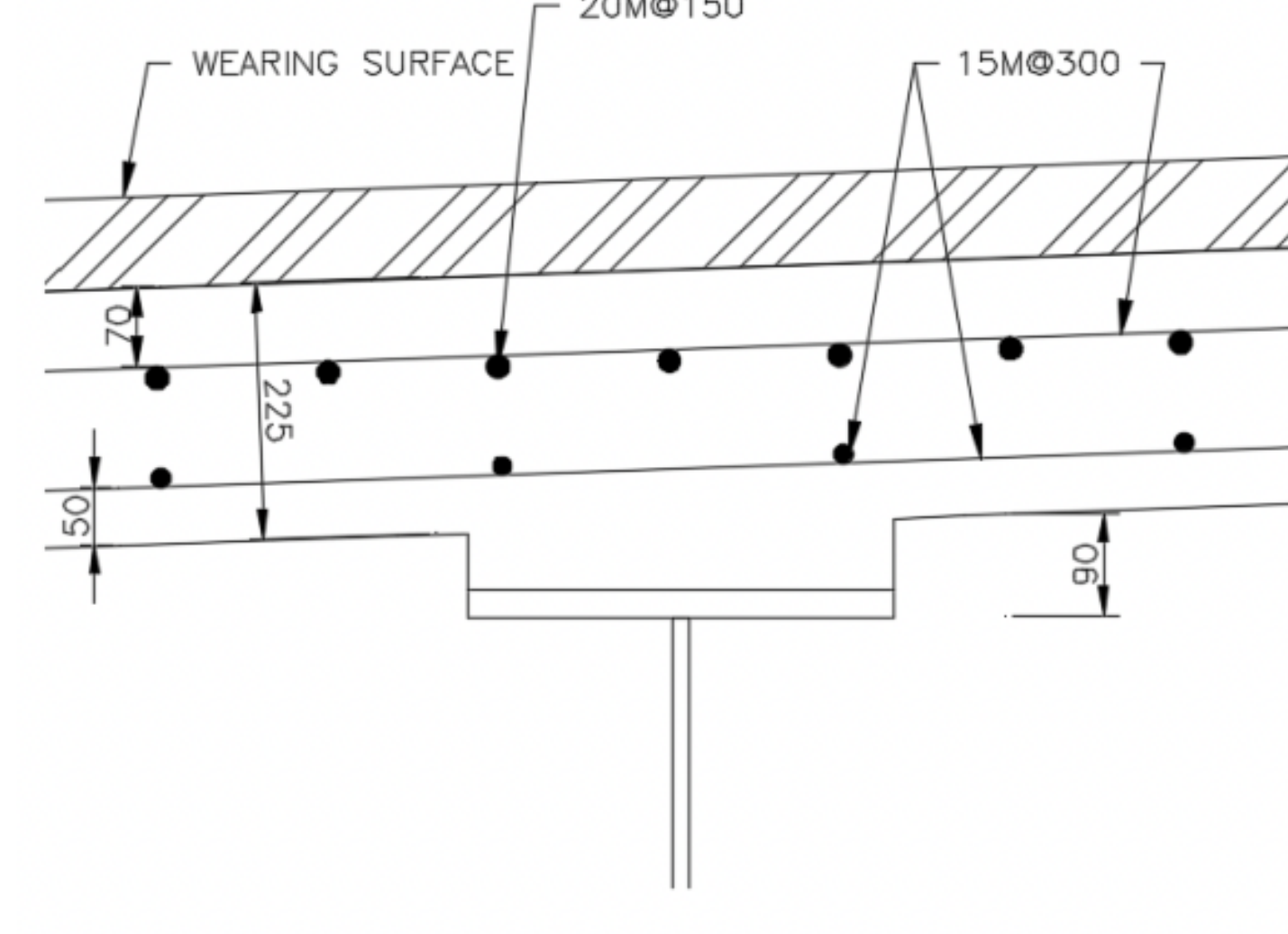


Figure 5: Deck Reinforcement at Negative Moment Regions

Connection Details

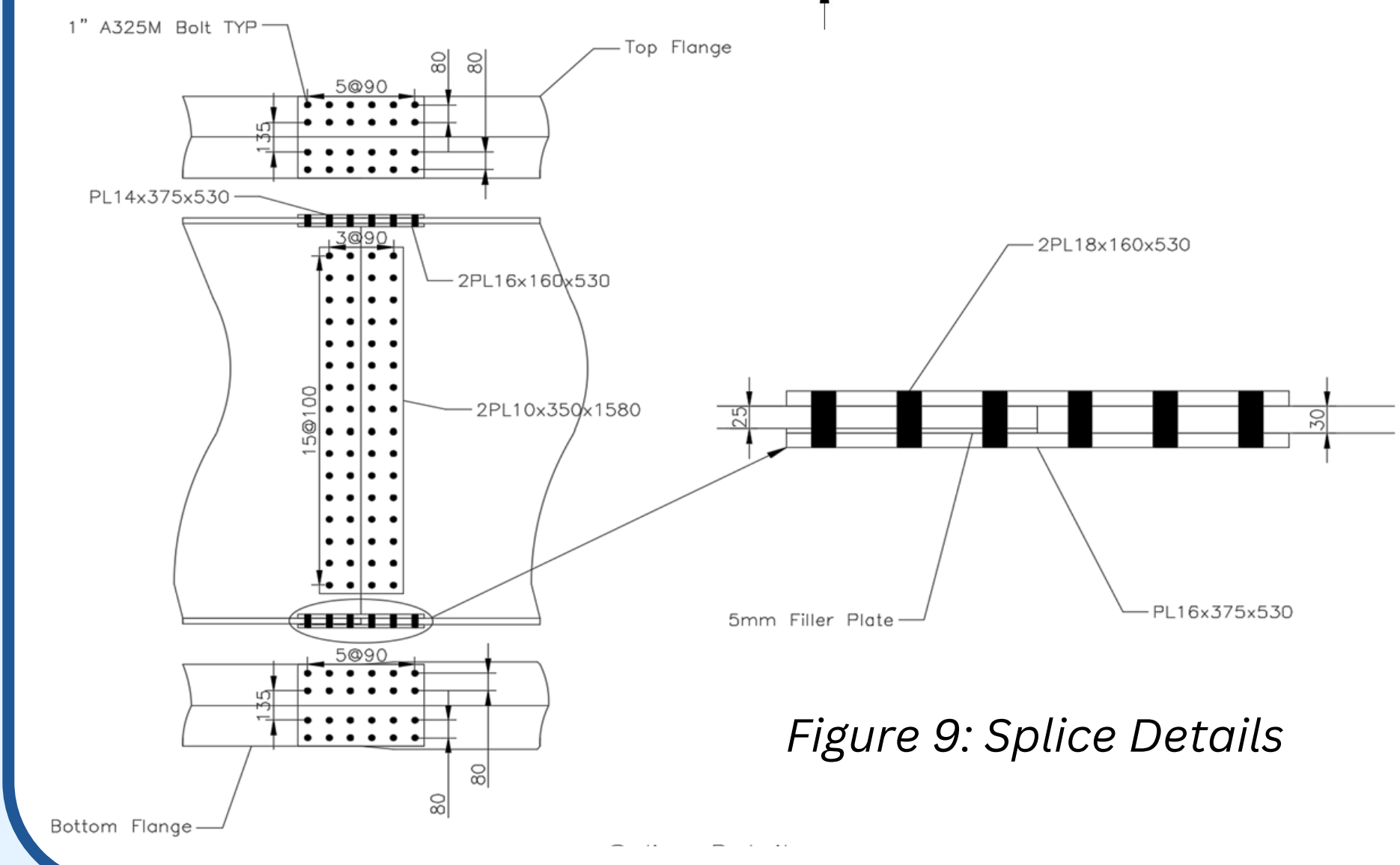
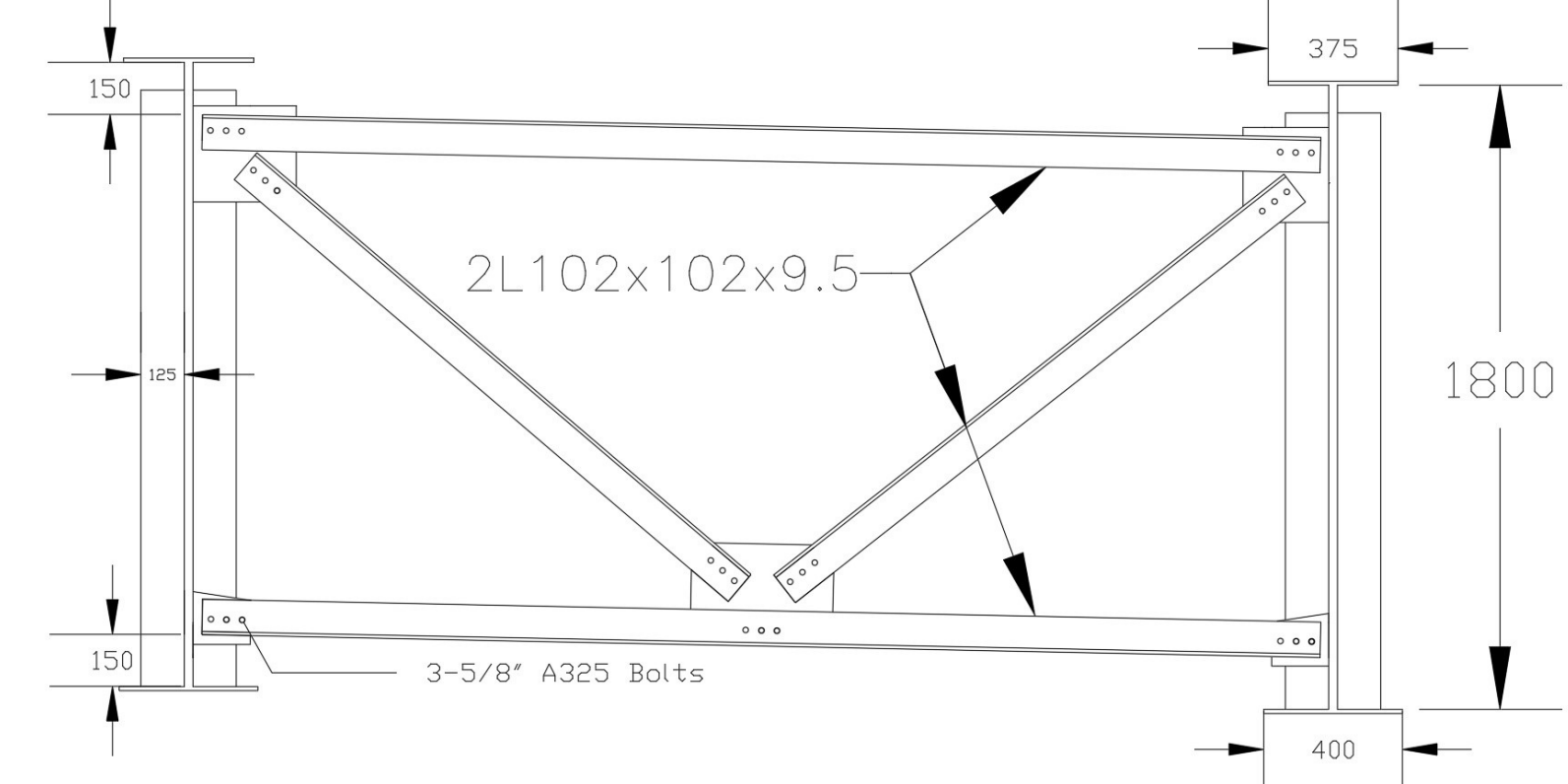


Figure 9: Splice Details

Figure 8: Bracing and Stiffener Details



Bridge Detailed Drawings

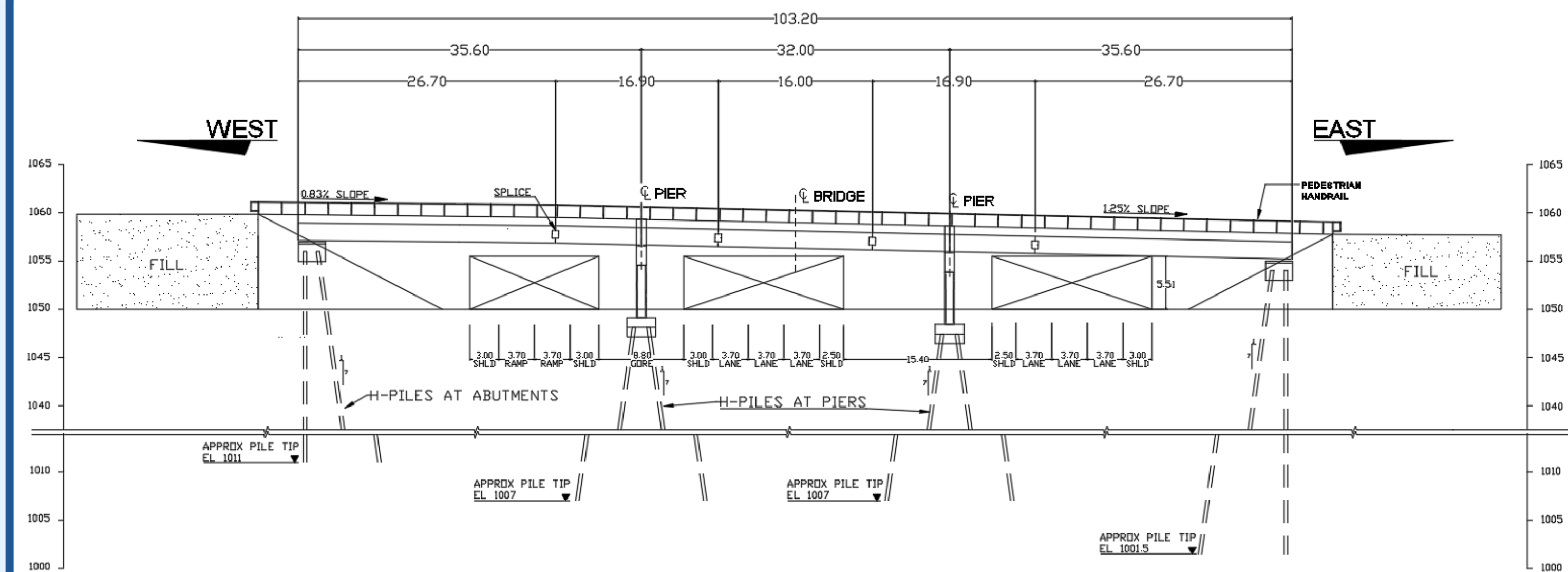


Figure 2: Elevation View

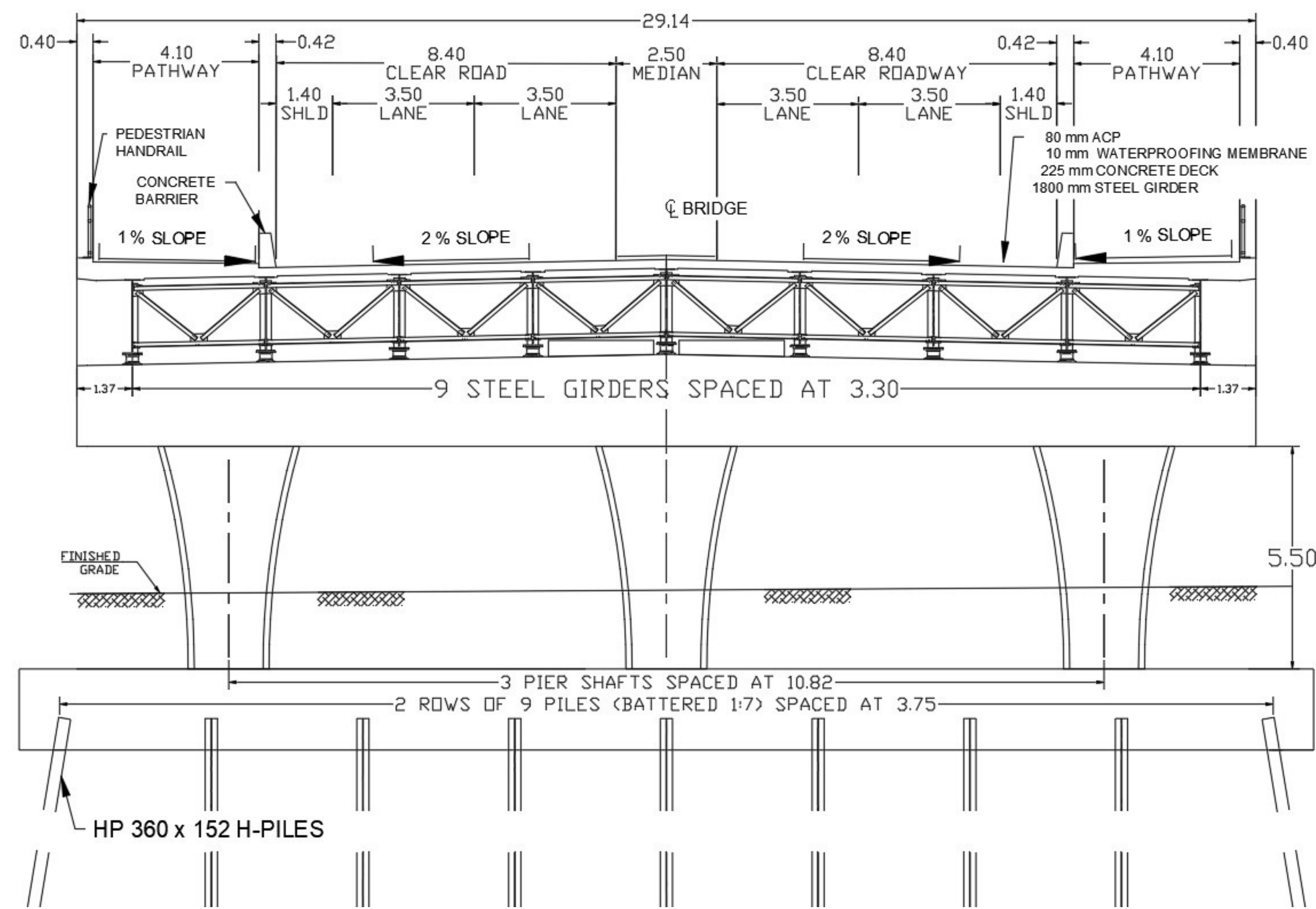


Figure 3: Cross-Section View

Girder Design

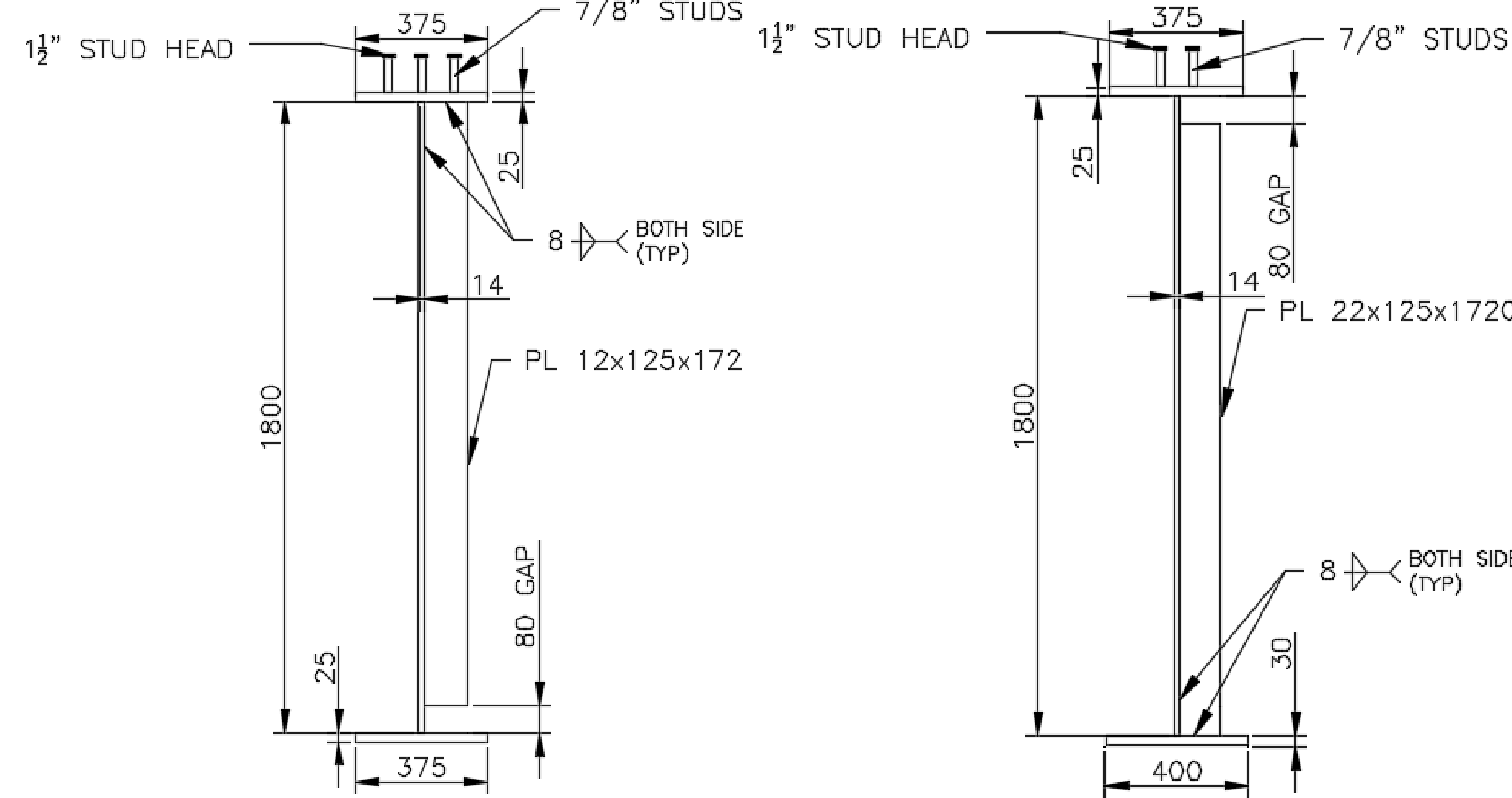


Figure 6: Girders at Positive Moment Regions (Midspan)

Figure 7: Girders at Negative Moment Regions (Piers)

Analysis

Figure 10: FEM Moment Analysis - ULS 1

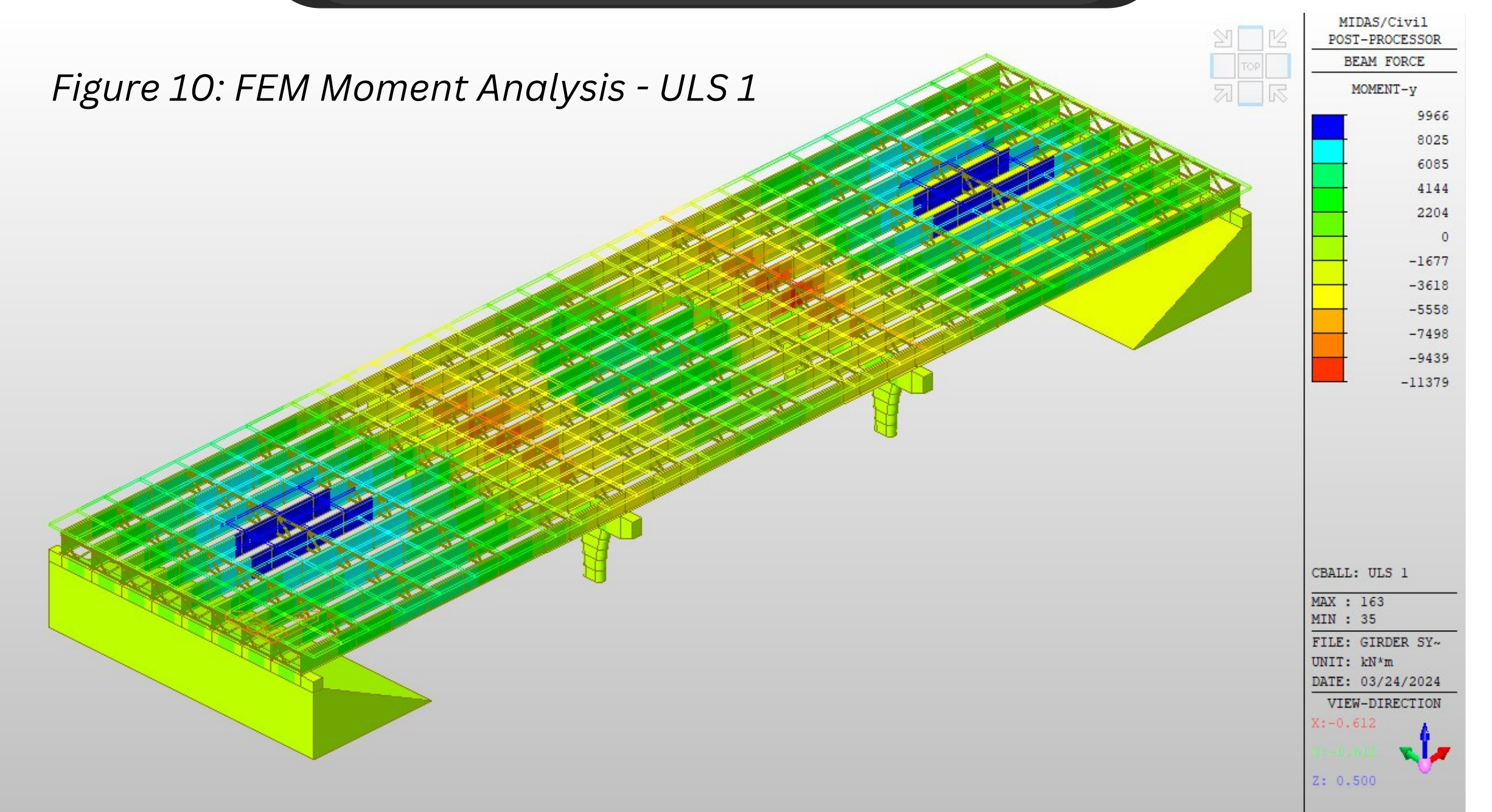
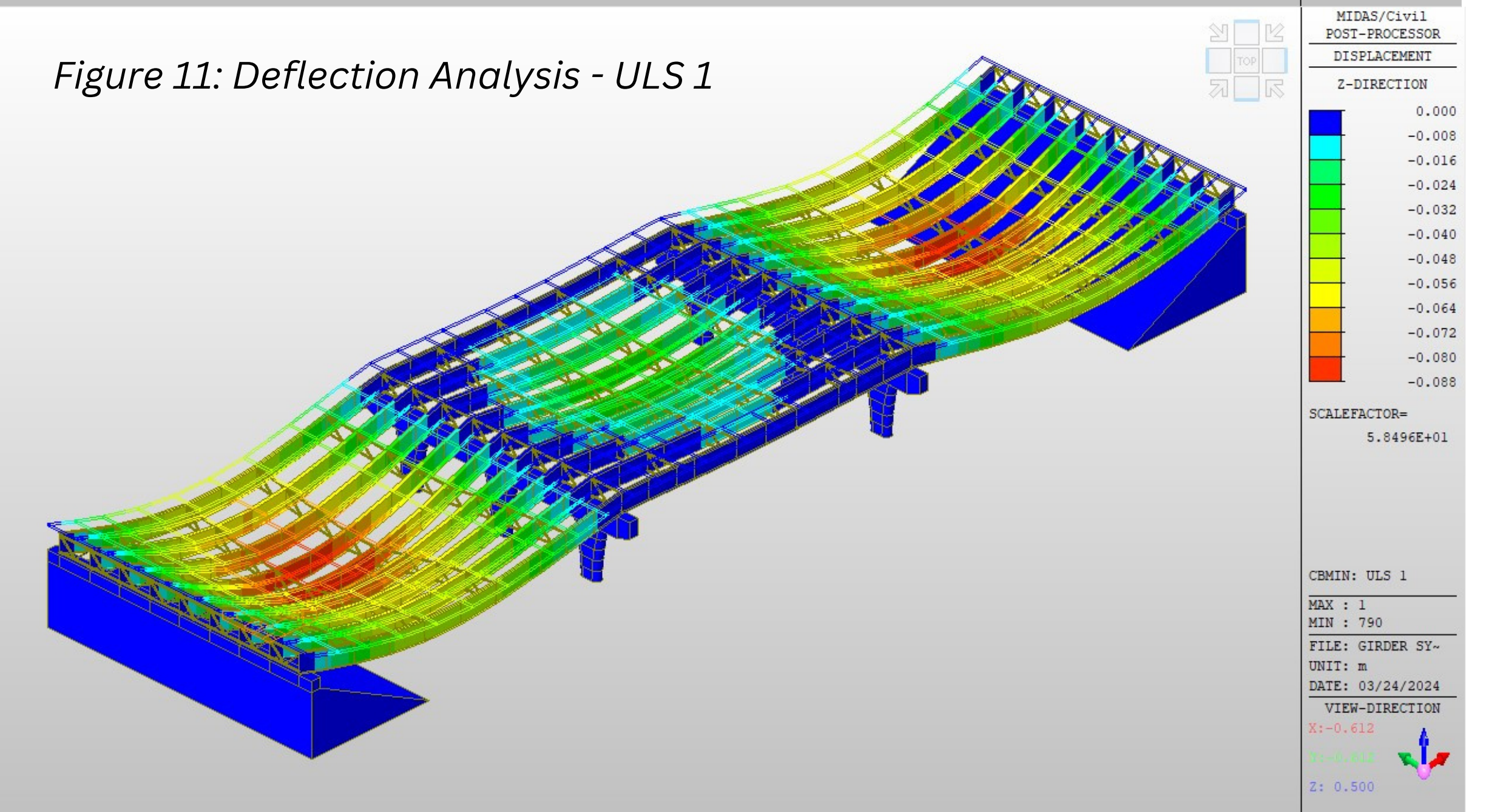


Figure 11: Deflection Analysis - ULS 1



Final Design Advantages

- Reduction in the number of bridges required from two to one.
- Increased accessibility and mobility.
- Elimination of the proposed service road by the Priddis Slough.
- Lower Bridge costs.

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