

## **Verifying Automated Prestressed Concrete Design Software for Mdot Bridge Design Standards**

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### **Abstract**

The Design and of bridges is a very critical and time consuming process. The automation of bridges design can save us time and effort, but the designer must have enough background with structural design of bridges in order to be able to analyze and understand the output of the automated design. This research shows the design and analysis of the superstructure of the US-27 Interchange Bridge at M-57 in Gratiot County of Washington Township, Michigan. The main purpose of this research is to establish a comprehensive design example following AAHTO LRFD Bridge Design Specifications and Michigan Bridge Design Manual. There was another goal for this research which is verification of the hand calculated design with the automated design through PGSuper Bridge design software. It was determined that both designs were generally correct. However, it appears that there were some differences in the calculated final values of girder prestress and final girder service stresses between the hand calculated design and the automated one. Slight differences were also noticed in some of the live load distribution factors and moment and shear envelopes for the prestressed girders when the PGSuper design was compared to the hand calculated one.