Analysis of Prestressed Concrete Girder

Analyze an interior prestressed concrete BT 72 girder on a 90-foot span of the Vest Creek Bridge.

Specifications in the ALDOT Structures Design Detail Manual supersede specifications in AASHTO.

Assignment 6a, Due 3/29:

1. Calculate the tension in the prestressing tendons at transfer ($f_{pt}$) and the effective tension in the prestressing tendons after all losses ($f_{pe}$).

2. Check that the stresses in the concrete girder at transfer are within the allowable limits at two locations:
   a) midspan
   b) near the end of the girder at the location the prestress in the bonded strands is fully transferred to the concrete.

3. Check that the stresses in the concrete girder under service conditions are within the allowable limits for the same two locations indicated in Problem 1.

Assignment 6b, Due 4/3:

4. Check the flexure strength of the girder at midspan.

5. Calculate the camber of the girder at midspan just before and after the deck is placed. Assume the prestress force is transferred to the girder when the girder concrete it 1 day old. Lookup the age of the girder concrete when the deck is placed on the girders in the ALDOT Structures Design and Detailing Manual, pg 26.

Assignment 6c, Due 4/3:

6. Design the shear reinforcement for the girder.