

PROJECT OVERVIEW REPORT

1. UTC Identifying Number
DTRT13-G-UTC28
2. Center Identifying Number
CAIT-UTC-NC2
3. Project Title
Carbon Fiber Shear Reinforcement for Prestressed Bridge Girders
4. Principal Investigator & Contact Information
Carin Roberts-Wollmann, Professor
Center for Advanced Infrastructure and Transportation (CAIT) National UTC
Virginia Tech
200 Patton Hall
Blacksburg, VA 24061
5. Rutgers/CAIT Project Manager
Patrick Szary, Ph.D.
6. Customer Principal
Mike Brown
VCTIR
530 Edgemont
Charlottesville, VA 22903
7. Project Description
This research will determine the relative merits and design philosophy of several carbon fiber shear reinforcement schemes for pretensioned, prestressed concrete girders. The primary use of carbon fiber shear reinforcement would be in bridge girders prestressed with carbon fiber prestressing strands. This is done to provide a completely non-metallic reinforcement system, and , therefore, to provide for a longer girder life. The project will begin with a thorough literature and state-of-the-practice review. Based on this review, the three most promising reinforcement methods will be selected for further study. In addition, a design methodology for each reinforcement scheme will be developed. Square, reinforced concrete panels (mimicking the web area near the end of a full sized prestressed girder) will be fabricated with each of the three reinforcement methods so that a direct comparison of construction and design issues can be made. The panels will be tested in direct shear with load, deflections, and strains at critical locations continuously recorded. The behavior of the panels at both service load and strength will be observed and recorded. The project will conclude with developing fabrication and design recommendations for use by the VDOT and other state agencies.
8. Implementation of Research Outcomes (or why not implemented)
State DOTs are very interested in the use of longer lasting materials in new bridge construction. At the conclusion of this project, at least one technology demonstration for

field implementation of carbon fiber shear reinforcement will be selected by the VDOT.

9. Impacts/Benefits of Implementation (actual, not anticipated)
To Be Determined
10. Dates and Budget
Start date: 6/1/2014
End date: 1/31/2016
UTC (CAIT) Dollars: \$59,106
Cost Sharing: \$59,106
Total Dollars: \$118,212
11. Keywords
Prestressed concrete, Shear Strength, Carbon Fiber Reinforcement
12. Web Links (Reports and Project Website)
<https://cait.rutgers.edu/cait/research/carbon-fiber-shear-reinforcement-prestressed-b-ridge-girders>