

**Design and Construction Guidelines For Strengthening Bridges Using Fiber Reinforced
Polymers (FRP)-OR10-039 QA1
3/1/2012**

Q: Under Consultant Responsibilities (pdf sheet 3 of 7):

Are the requested design and implementation guidelines for use of FRP intended to follow published national guidelines such as ACI 440 *Guide for the Design and Construction of Externally Bonded FRP Systems* and NCHRP 655 *Recommended Guide Specification for the Design of Externally Bonded FRP Systems for Repair and Strengthening of Concrete Bridge Elements, and others*? If not, are new or modified design guidelines expected as part of this project or can some parts of these publications be incorporated into the future MDOT Guidelines for using FRP?

A: it is expected that the design guidelines would reference published national standards, incorporating ACI/NCHRP guidelines for design to AASHTO LRFD requirements.

Q: Is the requested FE analysis intended to serve as a verification of a strengthened structural element or strictly for design?

A: FE analysis intended to verify the proposed design of strengthened member and identify the anticipated failure modes and limitations of strengthening.

Q: Is developing a procedure for bridge rating of strengthened members part of this project? Does MDOT accept the results of strengthened members in terms of postings?

A: No, the scope does not include developing a procedure for load rating of FRP strengthened bridges. However, the design guidelines would be used to determine the strengthened bridge factored resistance against AASHTO LRFD strength I and service III requirements.

Q: Should the guidelines consider negative moment strengthening of continuous concrete beams (e.g., near surface mounted bars or strips)?

A: yes the guidelines may consider negative moment strengthening of structural members, which could include NSM bars.

Q: Should the guidelines include strengthening structures with externally prestressed FRP tendons or cables? Or is strengthening restricted to non-prestressed wet lay-up fabrics and/or bars?

A: the guidelines are not intended to restrict the type of FRP system used for structural component strengthening. Externally mounted systems can be included.