Background:
Strengthening of reinforced concrete members using mechanical fasteners has been developed recently. The strengthening is obtained by attaching FRP strips, having high bearing and longitudinal strengths, to concrete element using many closely spaced steel fasteners. The method is of rapid execution, uses conventional typically hand-tools and unskilled labor. Additionally, the method requires minimal surface preparation, because the mechanism of load transferring concrete-to-composite laminate is done by fasteners not by adhesion.

Bridge Y-0298 is one of five existing RC bridges, located in three districts, which were strengthened using composite materials. Five different strengthening techniques were used in the entire program but only two were used for bridge Y-0298: manual lay-up carbon FRP laminates and mechanically fastened carbon FRP laminates.

Objectives
- Determine feasibility of MF-FRP technology to strengthen bridges where bonded system can be applied only with high cost for concrete repair.
- Monitoring durability on not-repaired concrete surface to determine velocity of deterioration process of pre-existing material on long-term performance.