

PERFORMANCE OF A HISTORIC PRESTRESSED CONCRETE BLOCK BRIDGE

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ABSTRACT

A historic prestressed concrete block bridge in Wilson County, N. C. was recently replaced due to deterioration of its timber pile foundation. One of a few constructed by the North Carolina Department of Transportation in the early 1950s, the bridge used post-tensioned concrete block beams with cast-in-place topping to form the bridge deck. It had provided excellent service for 50 years, and at the time of replacement, the bridge was believed to be the last one of its type still in service in N. C. During replacement, the bridge deck was preserved for historical documentation. Three prestressed concrete block beam sections were tested to failure to assess their performance. This paper describes the construction details of the bridge deck and presents the results of the performance tests including the beam material properties, the effective prestress, the load-deflection characteristics, and the ultimate strength.

Keywords: Prestressed, Post-tensioned, Concrete, Masonry, Block, Bridge, Historic