

Route 340 Bridge: Virginia's First Stainless Steel Bridge

PROJECT TITLE

Route 340 Bridge: Virginia's First Stainless Steel Bridge

STUDY TIMELINE

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INVESTIGATORS

Stephen R. Sharp, Ph.D., P.E., Virginia Transportation Research Council, Co-PI

Jason T. Provines, P.E., Virginia Transportation Research Council, Co-PI

Audrey K. Moruza, Virginia Transportation Research Council, Co-PI

William F. Via, Jr., VDOT Materials Division, Co-PI

Keith N. Harrop, P.E., VDOT Staunton District, Co-PI

VDOT CONTACTS/CHAMPIONS

Kendal R. Walus, P.E., State Structure and Bridge Engineer, VDOT

Andrew M. Zickler, P.E., Complex Bridge and ABC Support Program Manager, VDOT

For more information, please contact Jason Provines, jason.provines@vdot.virginia.gov or Stephen Sharp, Stephen.sharp@vdot.virginia.gov

FURTHER RESOURCES

[Final Report](#)
[Project Web Page](#)
[TRR Journal Paper](#)
[World Steel Bridge Symposium 2018 Journal Paper](#)
[AISC/NSBA Prize Bridge Award](#)

Problem Statement

The original Route 340 Bridge in Waynesboro, Virginia, was constructed in 1934. By 2012, the bridge had significant corrosion and needed to be replaced. FHWA guidance recommended that uncoated weathering steel, which is commonly used for inland bridges, should not be used for this bridge for two reasons: the bridge was located downstream of a chemical plant that produced corrosive chemicals and the bridge's minimal clearance from the river below caused water to reach it during 10-year storm events. Therefore, a more corrosion-resistant steel was necessary to provide a durable, long-lasting structure.



Action Taken

The Virginia Department of Transportation (VDOT) elected to build the Route 340 Bridge superstructure with ASTM A1010 steel, a cost-effective stainless steel. In doing so, VDOT constructed the first highway bridge in the United States made completely of stainless steel. First of their kind innovations for the bridge included using A1010 steel cross frames and stainless steel fastener assemblies on bolted splices and identifying a new welding consumable used with A1010 steel. By using stainless steel, the bridge will be low maintenance throughout its service life, translating into significant cost savings for VDOT.

Next Steps

Based on the success of the Route 340 Bridge and its expected 100-year service life, VDOT is currently conducting research on how to reduce further the initial cost of using A1010 steel, including examining design modifications, new types of corrosion-resistant fastener assemblies, more efficient welding parameters, and dissimilar metal connections.

Potential Impacts and Benefits

VDOT has developed design guidance and a special provision for using A1010 steel, now referred to as ASTM A709 Grade 50CR steel. Both specifications identify changes to VDOT's current design, fabrication, and construction practices that allow corrosion-resistant steel to be used safely and effectively, leading to more durable new designs and repairs.