



FAST FACTS:

Carbon Fiber Reinforced Polymer Strands

PROJECT LOCATION:	Virginia Beach, Virginia
AGENCY	Virginia Department of Transportation
URL:	virginiadot.org/projects/hamptonroads/laskin_road aai.transportation.org (select Carbon Fiber Reinforced Polymer Strands)
PROJECT NAME:	Laskin Road Bridge Replacement and Widening Project
PROJECT DESCRIPTION:	The Laskin Road Bridge Replacement & Widening Project encompasses roadway improvements along the heavily traveled Hilltop business corridor of Virginia Beach, starting at Republic Road, through the First Colonial Road intersection, ending with the bridge replacement at Red Robin Road. The primary purpose of this project is to improve capacity and enhance safety through the widening and improvements of Laskin Road and First Colonial Road, as well as replacing the bridge over Linkhorn Bay in the City of Virginia Beach.
STATUS: IN PROGRESS:	The project has been under construction for approximately six months. Work has been broken up into four segments and is currently proceeding at night and on weekends on various segments of the roadways and bridges.

PROJECT PURPOSE AND NEED:	The primary purpose of this project is to improve capacity and enhance safety through the widening and improvements of Laskin Road and First Colonial Road, as well as replacing the bridge over Linkhorn Bay in the City of Virginia Beach.
OVERALL BUDGET / COST ESTIMATE:	\$141.7 million
WHAT WAS UNIQUE ABOUT THIS PROJECT?	This project provided VDOT with a pile design that is more than just corrosion resistant, it is corrosion free.
DESCRIBE TRADITIONAL APPROACH:	Concrete with traditional steel materials, which mainly follow the ASTM A 416, grade 270 low relaxation strand designation, are uncoated, and subject to corrosion, section loss, and eventually loss of prestressing force. This becomes an even greater issue with piles in certain geographic locations since a pile can be placed in a splash zone of a saltwater environment resulting in the pile being exposed to salt with daily wetting and drying cycles. This aggressive environment can reduce the service life of these elements, leading to costly repairs.
DESCRIBE NEW APPROACH:	<p>A corrosion free option is available for prestressed piles that requires special handling during production but once cast performs like conventional piles.</p> <p>During casting, CFRP strands are handled with care and ends prepared with protective material to prevent damage since they are brittle especially in the direction perpendicular to the fibers. During placement and while in service, CFRP strands behave similarly to steel strands at service loads. Concrete handles compression whereas the CFRP strands handle tension in piles. The main difference between the two options is at ultimate load. The CFRP used in the project has higher ultimate strength compared to the steel strands. However, the more brittle nature of CFRP strands when compared to conventional steel strands and the limited experience of fabricators with this material has capped the prestressing load to 65% of the ultimate strength at this time.</p>
TOP INNOVATIONS EMPLOYED:	Piles will be corrosion free.
PRIMARY BENEFITS REALIZED TO DATE:	Project is currently in the early stages of construction.
OTHER BENEFITS REALIZED / EXPECTED:	This location is near a popular beach area with high tourism density, so corrosion free prestress piles will minimize maintenance and traffic disruptions.
PROJECT START DATE / SUBSTANTIAL COMPLETION DATE:	Fall 2019 through Spring 2023
AFFILIATIONS:	Allan Myers
PROJECT CONTACT:	Hampton Roads Public Affairs hamptonroadspublicinfo@vdot.virginia.gov 757-956-3028
REFERENCES:	Project Website: http://www.virginiadot.org/projects/hamptonroads/laskin_road.asp



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▶ This photograph shows construction work starting on the Laskin Road Bridge Replacement & Widening Project as this project was awarded in Fall 2019.



▶ This photograph shows as example from an earlier VDOT project of what the preformed CFRP spiral looked like before it was untied and the spirals properly spaced out along the length of a precast concrete CFRP reinforced pile. These piles are corrosion free.