

NC 540 from South of Rock Quarry to I-87 / US 64 / US 264 (STIP No. R-2829B)
Wake County, North Carolina

Updated Project Description for NC 540 Bridge Crossings over the Neuse River

Subsequent to the issuance of the consultation letter response from the National Marine Fisheries Service (NMFS) dated May 21, 2018 pursuant to Section 7 of the Endangered Species Act (ESA) for the subject project, a Design-Build Team was awarded a contract to design and construct on September 1, 2023. Since the date of award of the contract, the Design-Build Team has been advancing the final design of the project, resulting in changes to the Project Description included in the May 21, 2018 letter from NMFS. A summary of these changes is listed below with additional detail provided in the following paragraphs:

- Reduced the number of bridge piers directly in the Neuse River from four to two.
- Eliminated the need for the temporary causeway on the south bank of the Neuse River resulting in only one temporary causeway on the north bank of the River (approximately 15,000 square feet of temporary impact).
- Reduced the number of drilled shafts directly in the Neuse River from 16 to 9.
- Reduced the diameter of the drilled shafts directly in the Neuse River from sixty inches in diameter to fifty four inches in diameter, resulting in a decrease in river bottom impact from 320 square feet to 144 square feet.
- Geotechnical borings in the Neuse River have been reduced from 24 to four and will be performed from the single temporary causeway on the north bank of the River.

Below is a the more detailed revision to the Project Description provided in the May 21, 2018 letter from NMFS for use by NCTA in determining if additional consultation with NMFS is required.

Project Location

Address	Latitude/Longitude	Water body
Neuse River, Wake and Johnston Counties, North Carolina	35.725632°N, 78.506774°W (North American Datum 1983), bridge point at Neuse River crossing	Neuse River

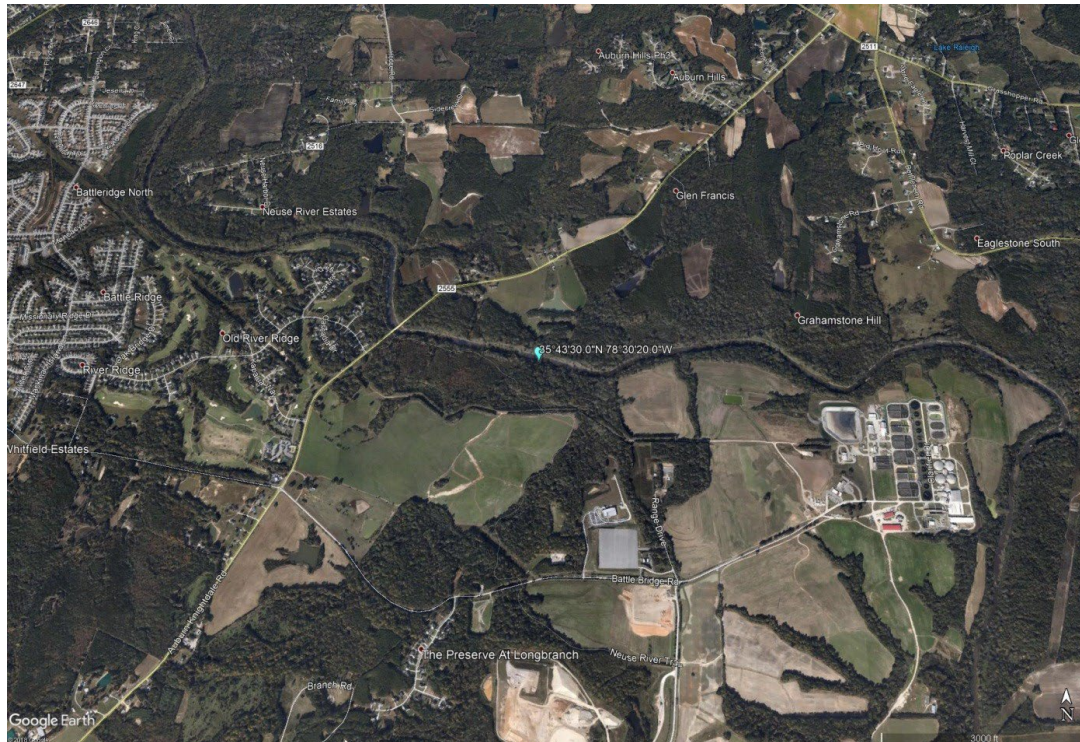


Image of project location at Neuse River crossing (©2018 Google)

Existing Site Conditions

The proposed project crosses at the Neuse River (approximately RKM 338) and is approximately 185 miles (mi) from Pamlico Sound. The width at the deeper thalweg areas are narrow (approximately 25 feet (ft)), and the width at the proposed crossing is approximately 80 ft. Water depth in most of the crossing location is six inches (in) or less, and ranges in the action area from 0 to 3 ft. The action area is located in freshwater (above the saltwater wedge). The substrate in the Johnston County and eastern Wake County section of the Neuse River is dominated by shifting sand and soft clay banks, with sporadic pockets of gravel, cobble, and boulder and bedrock. Other than a minor small gravel component in limited areas, there was no concentration of any hard substrate found at the proposed crossing location. The substrate at which the bridge will cross is mainly muddy clay and coarse/fine sand. The project location is located in Atlantic sturgeon critical habitat Carolina Unit 3.

Project Description

The North Carolina Department of Transportation (NCDOT) and the Federal Highway Administration (FHWA) propose to build the Complete 540 project, which will be a controlled access toll road extending the existing Triangle Expressway from NC 55 Bypass in Apex to the US 64/264 (I-495/Future I-87) in Knightdale, a distance of approximately 27 miles.

The project includes the construction of two bridges (one northbound and one southbound) over the Neuse River in conjunction with a six-lane expressway. A temporary work causeway will be placed between the two highway bridges for construction. The highway bridges will be concrete decks supported by concrete beams. The concrete decks are anticipated to be approximately 107,020 square feet (ft²) (1422 ft long and 75.25 ft wide) for the southbound bridge and 89,929 ft² (1422 ft long and 63.25 ft wide) for the northbound bridge. The bottom of the bridge beams would be approximately 40 ft above mean daily flow of the non-tidally influenced Neuse River.

Fifty-four-in concrete drilled shafts/concrete columns will be used to support a single bridge pier for each of the new highway bridges. Five drilled shafts/columns will be constructed for the southbound bridge pier and four drilled shafts/columns will be constructed for the northbound bridge pier (for a total of 9 concrete piers), which will be aligned parallel to stream flow. Holes will be augured and lined with steel liners. Material removed from the holes will be deposited in an approved off-site upland location. Each shaft will have an approximate permanent impact of 16 ft², and the 2 piers will permanently impact approximately 144 ft².

Each pier and the erection of girders will take place from one temporary causeway between the bridges, and also from the river banks via cranes. The causeways will be made from cleaned large grade rip rap. There will be a causeway on the north side of the river and will temporarily impact approximately 15,000 ft². The temporary causeway will always leave more than 50% of the river free flowing with no obstructions. It is estimated that approximately 8 prefabricated concrete cross pipes will also be installed under the causeway to maintain river flow. The exact size and number of cross pipes will be determined closer to the time of construction.

Geotechnical drilling may be performed at the project site and may require boring through the substrate. There would be 2 borings of 3-in diameter per bent, for a total of 4 borings. Borings will be performed by advancing a casing to the rock. Split spoon samples will pull material, after which the rock will be cored. Work will be performed from the same temporary causeway as is used for the bridge construction with no additional impact area required.

Each pier is expected to take 2 weeks to install and an additional 4 weeks to erect the girders. Total in-water work time is expected to take 25 weeks to complete. In-water work will be done during daylight hours, however if daytime temperatures are too high, pouring of concrete may be done at night. While not anticipated, some shaft auguring may be done at night.

Pile Installation

Pile type(s)	Number of Piles	Installation Method	Confined Space or Open Water
Concrete	9	Auguring	Confined

Construction Conditions

The contractor will comply with NCDOT's Best Management Practices. The NCDOT has agreed to provide an additional measure of protection by requiring in-water construction activities to stop if a sturgeon is spotted within 50 ft of operations. No in-water work will occur from February 15 – October 31. Causeways and temporary work

bridges will be installed/removed outside the moratorium and construction will not block more than 50% of the stream. Any blasting, if necessary, associated with the project will not occur within 50 ft of the river. In addition, NCDOT has agreed to abide by the PDCs for temporary structures (Attachment 1) for the proposed actions associated with this project. Project specific PDCs that will be part of this project at the Neuse River crossing are listed below:

- 1) New Bridges
 - Shoreline stabilization for new bridges (approaches/causeway/embankment) will adhere to Shoreline Stabilization PDCs stated below.
- 2) New Piers
 - New piers will not be installed where swimming sturgeon are known to occur.
 - New piers within 0.5 mile of areas where sturgeon are known to occur, or where Atlantic sturgeon critical habitat is present, will adhere to the following:
 - Take-off/causeway fill for piers will not be placed below the OHWM or MHWL of the waterbody or impede or restrict normal flows.
 - Shoreline stabilization activities for new or replacement piers (approaches/causeway/embankment) will adhere to Shoreline Stabilization PDCs stated below.
- 3) Installation, Maintenance, and Removal of Shoreline Stabilization
 - Installation of new shorelinestabilization
 - Bank stabilization will not exceed 500 feet in length (for any type: e.g., seawalls, riprap, revetments)
 - Riprap/Revetments
 - Shoreline stabilization materials will be free of debris and are limited to sand cement, concrete, and quarry stone. No slope paving, poured concrete, or reinforced concrete will be utilized.