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**WBS ELEMENT :** 34209.1.1 (I-4025A)

**FEDERAL PROJECT:** IMS-77-1(141)83

**COUNTY:** Yadkin-Surry

**DESCRIPTION:** Bridge No. 13 on I-77 SBL over the Yadkin River, Yadkin Valley Railroad, and NC 268

**SUBJECT:** Geotechnical Report of Structure Subsurface Investigation

Trigon Engineering Consultants, Inc. has completed the authorized geotechnical investigation for the above referenced project in Yadkin and Surry County, North Carolina. The purpose of this exploration was to investigate the subsurface conditions at the proposed bridge bent locations and to provide general construction considerations based on the subsurface conditions.

## 1.0 SITE DESCRIPTION

The project site is located in the northwestern corner of Yadkin County and the southwestern corner of Surry County, at the approximate location shown on the Project Vicinity Map (Drawing No. 1) attached to this report. The site and project description of the proposed project is "Bridge No. 13 on I-77 SBL over the Yadkin River, Yadkin Valley Railroad, and NC 268." Topographically, the site slopes relatively steeply down towards the Yadkin River floodplain from both ends of the structure. The floodplain at the location of the existing bridge

appears to be approximately 550 feet wide. The topography of the general site vicinity consists of gently to relatively steeply rolling hills.

At the time of this exploration, a twelve-span bridge (existing Bridge No. 13) was present at the location of the proposed bridge. The existing bridge consists of a reinforced concrete deck on prestressed concrete girders. The existing end bents consist of reinforced concrete caps on steel piles, while the existing interior bents consist of reinforced concrete dual columns with reinforced concrete cross-supports. It appears from the as-built plans that all of the interior bents, with the exception of Bent -2, bear on spread footings, and that the Bent-2 columns rest on a pile cap supported by steel piles. The existing bridge is approximately 766 feet in length and approximately 32 feet in width.

The river water surface elevation surveyed by Trigon on April 29, 2004 was  $\pm 865$  feet. According to the Bridge Survey and Hydraulic Report, the normal river water surface elevation is 866.3 feet, the 10-year floodwater surface elevation is 881.4 feet, the 50-year floodwater surface elevation is 883.8 feet, the 100-year flood elevation is 884.7 feet, and the 500-year flood elevation is 886.4 feet. A debris pile, including trees and limbs was present during this exploration under the existing bridge against the upstream side of the existing Bent-4 column.

## 2.0 PROJECT DESCRIPTION

Proposed for construction is a new, four-span steel span structure or seven-span prestressed concrete span structure to replace the existing Bridge No. 13 on I-77 over the Yadkin River, Yadkin Valley Railroad, and NC 268. Information for the proposed bridge structure was obtained from the Bridge Survey & Hydraulic Design Report and the preliminary general drawings provided to Trigon by the NCDOT. The proposed bridge will be 760 feet in length and approximately 72 feet in width (clear roadway). A skew angle of  $90^{\circ}00'00''$  is proposed for each bent. The proposed grade along the -SBL- centerline of the new bridge will be approximately the same as the existing grade. New embankment fill will be required above the existing ground surface on the left side of the existing embankment fills at the end bents to accommodate the proposed wider roadway. Slopes on the order of 1.5(H):1(V) maximum are proposed for the new embankment slopes.