

Restoration of Historic Stone Arch Bridge

Repairs are now completed on Delaware State Bridge Number 1A in Wilmington.

Wilmington, DE — Vacuum technicians have now completed historic restoration of a 19th century stone arch bridge located on Rising Sun Lane. The earth filled structure, built in 1883, serves as the south approach for a larger steel truss bridge and carries about 30 feet of roadway some 25 feet above the overflow channel for the river flood plain.



During inspection of the bridge arch in early 1993, large voids with multiple missing stones were found to be common. Voids exposed by the missing stones were found to be vast, some as large as 2 square feet with penetrations up to 22 inches into the arch fill. Furthering the apparent seriousness of the existing condition were mortar losses and openings between the stones up to 4 inches, which caused many areas where the stones had slipped down in the arch but not yet fallen. Subsequent load rating analysis determined the structural capacity of the bridge over stressed due to its own dead load.

It was further determined that restoring the structure to its original condition would not be adequate to restore structural capacity for the existing dead load. Because the historic two lane structure was situated on a main thoroughfare serving thousands of commuters per day, and because of the delicate repairs required, a rehabilitation process which could provide a higher strength mortar to fill all existing voids in the structure was required. Short of tearing down and rebuilding the structure, vacuum processes were the only alternative method of repair. It was believed that conventional methods of pressure grouting of the structure would apply unwanted stresses to the structure, causing further damages and catastrophic displacement.

From its offices near Washington, DC, TECVAC, Inc. performs its' vacuum repair processes around the world and is a regular contributor to the advancement of leading edge technologies in the investigation and repair of concrete, masonry and stone structures. ##

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