

Project Dossier



PROJECT DOSSIER

BR 1-159 BRIDGE PROJECT IN DELAWARE

PROJECT OVERVIEW

BR 1-159 bridge project includes bridge replacement works that entails construction of a new 393'-11 7/8", 5-span bridge on James Street over Christina River in New Castle County, Delaware.

The existing bridge BR 1-159 is structurally deficient, with its movable portion inoperable. Its steel superstructure exhibits heavy corrosion and section loss.

The new bridge structure is being constructed just east of the existing bridge alignment. It is 393'-11 7/8" long with 5 spans. The span lengths vary from 55'-5 1/2" (Span 5) to 88'-1 1/8" (Span 2). The structure has a curb-to-curb width of 28 feet and a 10-foot wide bike and pedestrian way. The out-to-out width of 42'- 5 1/2" consists of two 12-foot lanes,

Project	BR 1-159 BRIDGE ON JAMES STREET OVER CHRISTINA RIVER
Location	New Castle County, Delaware, USA
Client	Delaware Department of Transport
Contractor	Wang Tech
Duration	2020- ongoing

two 2-foot shoulders, two 1'-8 1/4" parapets and 1'-1" for a handrail. The deck elevation at the centerline is 12.76 feet at Abutment A and 12.5 feet at Abutment B. The maximum embankment height is approximately 9 feet at Abutment A and 5.5 feet at Abutment B.



WHY MONITORING ?

The instrumentation monitoring plan included installation of geotechnical instrumentation to monitor subsurface soil conditions around the existing seventy-two (72) inch Christina River Force Main (CRFM) concrete sewer pipe. The Christina River Force Main, constructed in 1974, is a 72" Prestressed Concrete Cylinder Pipe (PCCP) with Flow Rates of 50 Mgalpd (dry) to 200 Mgalpd (wet), serving the entire New Castle County, and has little to no system redundancy. As such, protecting the utility against adverse impacts associated with equipment loads, ground settle-

ment and vibrations as a result of the planned construction activities, including, but not limited to, the construction of any temporary works over and/or adjacent to the CRFM, is of paramount importance at this project.

MONITORING SOLUTION

Rite Geosystems Inc., our USA Company was entrusted to supply complete geotechnical instrumentation for the project.

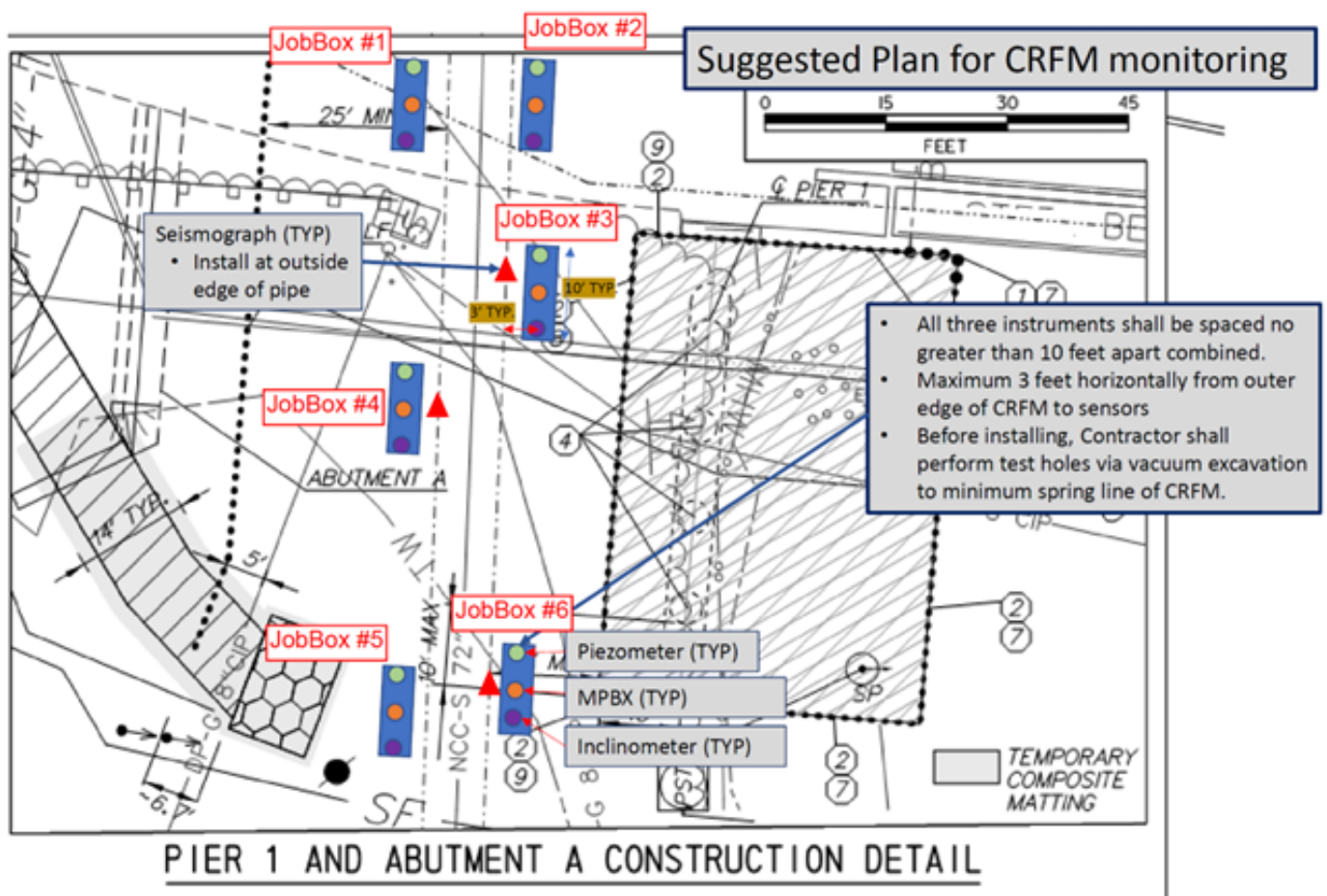


Figure 1: Instrumentation schematic



INSTRUMENT USED

In-place inclinometers	Used to monitor the biaxial lateral soil movement to verify that movements are within design tolerances
Piezometers	Used to monitor the pore water pressure

RESULTS

Monitoring of the above mentioned instruments has been executed successfully, giving the client necessary information required for smooth progress of the project. The project had very rigorous triggering limits to closely monitor the impact of construction activities on the Christina River Force Main (CRFM) concrete sewer pipe.



Figure 2 Instrumentation layout at the site