Photos: Alex Gallinaro, Oldcastle Precast

Stormwater Detention Facility under NJDOT Roadway Is Largest to Date

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In 2008, New Jersey DOT (NJDOT) specified the largest stormwater detention facility it had ever tendered under a section of 100-year old Rt. 5 that was scheduled for reconstruction. The project included the addition of six feet of drivable highway and eight feet of pedestrian and emergency stopping shoulder in both directions, thereby eliminating traffic congestion in the event of a vehicle breakdown. The stormwater detention facility would mitigate the flooding of houses located in low-lying areas adjacent to the roadway, a result of an antiquated system with insufficient capacity. All of the work was to be completed while maintaining traffic flow and retaining storm water from Rt. 5.

New Prince Concrete Construction, experienced in working in densely populated cities and towns of central and northern New Jersey, was awarded the project. CMX Engineering, a multi-disciplined engineering firm located in Manalapan, New Jersey was retained by NJDOT for design of the road widening, detention facility and removal of an abandoned trolley system.

The multi-channelled 72-inch diameter detention system was needed to retain some 110,000/ft^3 of storm water runoff from Rt.5 and surrounding streets. The system would be situated some 60 feet below the road surface. The system designed by CMX Engineering would be able to retain over two million gallons of run-off from the surrounding streets. Nine ton sections of 72-inch diameter reinforced concrete pipe (RCP) were lowered some 30 feet to the facility's bedding foundation.

Construction of the facility began with a manifold comprised of five 72-inch diameter pipes coming into the structure and a 30-inch diameter pipe exiting to an outlet control structure. The outlet had a 6-inch diameter orifice and a weir approximately 4 feet higher than the invert to slow down the stormwater before it drained into the existing 36-inch diameter pipe, which carries the stormwater from the local road. The manifold was cast-in-place due to its size. Installation began with one row of 72-inch diameter pipes at a time. The detention facility was comprised of five rows of 72-inch diameter RCP at the west end and ten rows at the east end, with custom fabricated Tees and caps.

Storage for materials, heavy traffic, and solid ledge rock were challenges during construction. Limited onsite space required close communication between Oldcastle and the contractor for just-in-time delivery of the large diameter 72-inch diameter Class-4 pipe required for the detention facility. Despite the challenges, the project was completed well ahead of the May 2009 deadline.

Keyword search: detention or retention
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