

CASE STUDY

Manchester Field Winchester, Massachusetts



Phase I

Storage Provided: 496,584 cu. ft.
Area: 36,000 SF
Models: Recharger® 150 HD
Number of Units: 1,356
Installed: June 2011

Phase II

Storage Provided: 527,076 cu. ft.
Area: 22,000 SF
Models: Recharger® V8™
Number of Units: 556
Installed: August 2011

Project Engineer: AECOM Environment,
Westford, MA
Contractor: Green Acres Landscape
& Construction Co.,
Lakeville, MA

For years, residents of Winchester, Mass., have enjoyed the use of the town's main athletic ground, Manchester Field. When they noticed that flooding occurred in the area of Manchester Field and the adjacent neighborhoods, engineering firm AECOM Environment came on board to find a solution.

After looking into the existing stormwater conditions, the engineers concluded that the system was under-sized and could not collect and discharge even small-scale storm events. AECOM recommended to upgrade the system for storms less than and including the 25-year, 24-hour storm.

The \$1.2 million, two-phase project proposed the construction of an innovative, integrated stormwater management system, which incorporated underground detention chambers provided by CULTEC, Inc. According to Jacob San Antonio, P.E., Water Resource Engineer at AECOM who worked on the project, underground detention was the only suitable best management practice for this four-acre site.

"The site did not have enough space for an above-ground detention solution, so we went underground," said San Antonio. "We designed CULTEC systems as detention galleys to attenuate peak discharge rates to prevent the existing system's surcharges and increase storage when the Aberjona River level rises above the low ground areas."

Before installing CULTEC's detention system in the basketball courts area during Phase I, the engineers had to solve a significant challenge. The existing drainage system flowed through a siphon that crossed the 48-inch diameter Mass. Water Resources Authority sewer main. The siphon had to be replaced to connect the drainage from the neighborhood streets into the CULTEC system. The new siphon was installed

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Manchester Field Winchester, Massachusetts *(continued)*

approximately 10-feet into groundwater using pipe-jacking techniques, which required a significant amount of dewatering.

With the new siphon in place, contractor Green Acres Landscape & Construction began installing 1,356 CULTEC Recharger® 150 HD chambers in three beds fed by two header lines. The system occupies 36,000 square feet and provides 496,584 cubic feet of storage.

“CULTEC was instrumental in helping us launch this project smoothly,” said Anthony Amaral, Jr., Assistant Project Manager with Green Acres Landscape & Construction. “A representative helped us every step of the way, clarifying details and specifications, and answering questions about the system’s installation. He has also been on site during the installation to assist in any way he can.”

The engineers selected the Recharger 150 HD, a lower profile, 18.5-inch-tall unit, for Phase I to accommodate the high groundwater level. Additionally, the footings for the basketball hoops extended four feet into the ground right above the chambers, limiting the available space for installation of the subsurface chambers.

The second-phase location has a greater separation to the groundwater, and the engineers selected the Recharger® V8™, a high-capacity, 32-inch-tall chamber. Its parameters allow fewer units to be used to achieve the desired storage volume.

The second CULTEC system will be installed in the summer of 2011. It will offer 527,076 cubic feet of storage and will be located under the teacher’s parking lot behind McCall Middle School. The design calls for 556 Recharger V8 units arranged in two beds and fed by one header line.

The stormwater system upgrade is designed to reduce the surcharge of catch basins and manholes and the ensuing flooding of the Manchester Field area. CULTEC’s detention systems play a key role by offering the necessary runoff storage and allowing the aboveground land to be used for the school’s athletic facilities.



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