

Houston School's Limited Acreage Requires

# Underground Stormwater Solution



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The Houston Independent School District (HISD) is the largest public school system in Texas and the seventh largest in the United States. Anticipating the need to hire more than 80 new bus drivers for over 120 bus routes, the parking facility at their bus operations center needed to be expanded. The added capacity required several acres of land to be paved with concrete, creating several acres of impervious cover. This would greatly increase the amount of stormwater generated on site, and necessitate a comprehensive treatment and detention solution.

#### Challenging Space Limitations

Limited land was available for the development. In fact, most of the 10-acre site would be needed to fulfill the parking requirements. That didn't leave enough space to utilize a typical runoff storage solution, an above-ground pond.

“We needed to meet new, higher detention quantities from Harris County and did not have a lot of land,” says Paul Nicosia of Lockwood, Andrews & Newnam, engineer on the project. “In addition, the city of Houston required that the design storm be treated to the maximum extent practical under the NPDES Phase II Permit requirements.”

As a result, design engineers met with CONTECH representative Jeff Smallwood early on in the design phase to discuss the most economical solution that would allow them to meet their requirements.

#### Large-Volume Storage and Treatment

Flows generated by the design storm on this site would be so large that more than 4 acre-feet of storage would be needed. As a result, design engineers chose a corrugated metal pipe (CMP) detention system for storage.

“We designed not only a great alternative, it was the only alternative,” explains Smallwood. “Because of the large volume, all other underground options were much too expensive. With the limited budget of the school district, higher-priced alternatives might have delayed the project.”

The CMP underground detention system's variable sizing, quick installation and durability made it a practical and economical choice for the HISD Bus Operations site.

Two CMP systems were installed on site. A 60-inch-diameter system was designed to hold approximately 135,000 cubic feet (3.1 acre-feet), and the 108-inch system approximately 57,000 cubic feet (1.3 acre-feet).

At the outfall of each system, a Vortechs hydrodynamic separator was installed to

treat runoff prior to discharge from the site. The Vortechs system removes finer sediment, particles, free oil and debris from urban runoff. The high-performance system uses an effective combination of swirl-concentrator and flow-control technologies to maximize treatment. The shallow system profile and unique horizontal design allow for easy installation and maintenance.

#### Working against a Demanding Timeline

The need to meet project deadlines was important to the HISD Bus Operations Center. Time was tight, and because of the large size of the CMP systems, Grant Gilbert from Sendero Industries, the project manager, needed the pipe delivered as soon as possible.

The necessary header pieces for the system arrived on site in less than four weeks, even though the original timeline had been quoted at up to six weeks.

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The complete detention and treatment solution was successfully installed by April 2007. ■ 102

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