



Road Reconstruction Project

The Situation

The City of Maplewood, a metropolitan suburb of the Twin Cities in Minnesota, needed to make some improvements on a key roadway called Castle Avenue. There were several issues at hand, according to Steve Kummer, staff engineer, City of Maplewood, who designed and engineered the project.

"First, the pavement was in very poor shape," he explains. "Second, we are expecting future development in that area that we had to accommodate by widening the road. Lastly, we had to implement some traffic calming measures to increase safety along the roadway, such as adding a curb and gutters and adjusting the existing roadway profile so folks slow down when they go around the curve and downhill."

In addition, the city had to meet a watershed district requirement which called for one inch of infiltration over all new or disturbed pervious surfaces. They also have a city wide requirement to improve storm water runoff to 1988 conditions in terms of the amount of pollutants coming off the street. It was determined that the retrofit of the roadway should include a new storm system.

The Solution

Through its association with Royal Environmental, a Triton Stormwater Solutions infiltration system was selected by the city for its storage volume capacity.

Because of the steep incline of the roadway, one long flat infiltration basin would put too much dependence on one end of the system. Instead, the engineers split the project into three separate infiltration systems.

"Triton's modular design is extremely useful for this purpose as it can be fit into almost any footprint," explains Lance Hoff, water resource engineer, Royal Environmental, part of Royal Enterprises. "It reduced the footprint of each system almost by half."

Another feature that appealed to the city engineers was



Triton's modular design was the perfect solution to handle the tight space requirement of the road widening project.

the easy maintenance obtained through the Triton header row feature. "A system like this is a lot more manageable because you are able to get inside of it with a sewer jetter," explains Kummer. The city originally had a sump manhole, which provided just a bit of extra depth for settling of sediment before it goes into the system.

The Installation

Unlike a typical storm water system installation which often takes place on a parking lot or other large surface, this installation posed some unique constraints. As a residential

road that also serviced a nursing home, the road needed to remain open during construction. In addition, the narrow road provided limited space to store materials and equipment. The storm water system was confined to a deep and narrow trench that was ten feet deep and 12 and a half feet wide.

“The stacking ability of the Triton chambers really came in handy with such a deep and narrow trench,” explains Hoff. “The whole system came on just four pallets that could be set to the side with the materials pulled off as needed. It was very convenient.”

First, the crew dug down to elevation and put down a six inch base layer of stone. Next, the chambers were put in and the walls of the trench were lined with a class 2 non woven geo fabric. The site was backfilled with stone up to six inches past the crown of the chambers and the geo fabric was folded back and backfilled with material to the desired elevation, with Triton needing to be placed under only 10–12' of cover.

The largest of the three systems was 115 feet in length laid out in two rows for a volume capacity of 8,500 cubic feet.

The first installation, including digging the hole, setting up the chamber system, backfilling and getting it back to grade, was completed in one day.

“Even though it was the first of three systems to be installed, it went extremely fast,” says Joe Miskovich, President, Triton Stormwater Solutions, in Brighton, Michigan, who was onsite to help manage the installation. Once the contractor installed the first system, they did not require any further help to install the additional systems, which are now up and running.



The site is backfilled with material to the determined elevation.



The site required three separate filtration systems for a total volume of 8,500 cubic feet.

Summary

The ability to place this product underneath a major roadway is a testament to its strength. In addition, Triton's modular design, ease of maintenance and stackable design played key roles in this storm water redesign.

“I would use the Triton product again, especially from a storm water management standpoint,” says Kummer. “The fact that it can be stored underground and is fairly easy to maintain, unlike a pond where you have to dig it out every ten years, is appealing.”

Working with the City was a great experience for Miskovich, who says that their onsite supervision and knowledge were a big reason the installation went so quickly.

“I am really impressed that the Maplewood municipality is so proactive about storm water runoff,” he says. “They are very forward thinking to solve an issue right up front in the most cost effective and time effective way possible before there becomes a problem down the road.”

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