



# WARREN COMMONS

New for this year is our first stormwater management site for the Conservation Tour. The Warren Commons site was very controversial with local residents due to the already problematic lower Jackson Run watershed.

The Warren Commons site consisted of 79.8 total acres with approximately 69.6 acres being disturbed during excavation and construction. As many of you know most of this site was existing agricultural land that was being farmed by a local farmer. The soil conditions resulting from farming were a lot more favorable for stormwater infiltration and runoff control. A lot of the area had low lying pockets in the fields where stormwater runoff could pond and slowly infiltrate back into the soil. Also there were a few isolated wetlands within the site that helped filter the stormwater and control runoff rates.

Due to the previous factors local residents and business owners were very concerned that when the site was disturbed, compacted, and covered with asphalt in many places that it would result in more flooding and stormwater issues in the immediate area of the site. The pre-construction impervious area was around 2.6 acres on the site. The post-construction impervious area was estimated to be 39.7 acres.

That is a 37 acre change in impervious area that will not let water infiltrate back into the soil in those areas. So we went from around 77 acres of open green space that would let at least some water infiltrate to only 40 acres of open green space.



To combat the obvious increase of post-construction stormwater that would leave the site the engineering company had to take steps to use innovative techniques. Also due to newer more stringent regulations water quality and infiltration must also be a factor of the post-construction stormwater management plan. As you can imagine every drop of oil, antifreeze, and whatever else is leaking from our vehicles would also end up in the stormwater system and ultimately in our local streams and groundwater.

All of the above factors led to the most intricate and advanced stormwater system in Warren County to date. Also it is the biggest site that has ever been developed in the county.

The completed site has many post-construction best management practices (BMP) that you see and some that you would never know are there. The most obvious BMP is the large detention basin located directly behind Walmart. Stormwater that reaches this basin's outlet eventually leaves the site via an underground 36" storm sewer that goes under Route 62 across the State Hospital property and discharges into the Conewango Creek. This basin basically serves the site from the main entrance road to the north. One unique characteristic of the basin is that it contains a water quality forebay that actually serves as a basin within another basin. The forebay basically adds another filter to the system.



*Picture showing forebay*

Working south from the large basin also directly behind Walmart is a Cultec underground infiltration system that consists of plastic underground structures that interlock and provide an area



for stormwater to infiltrate back into the groundwater rather than running off directly into the basin. The structures are bedded in gravel and the soil in each location was specifically tested to make sure it was suitable for infiltration. The current regulations require the 2-year 24/hour storm to be infiltrated or recycled onsite.



*Stacked Cultec infiltration chambers*

This system allows the first part of large storms to go into the underground chambers and slowly infiltrate. Once the void space within these chambers is taken up the water passes through an overflow pipe which leads to the large basin to the north. Also behind the Walmart building are the truck unloading areas. The drains that lead from this area have an emergency shut-off valve that can be turned off to prevent a chemical spill from discharging to the detention basin.

There are many catch basins that are located within the Walmart parking lot that look like a normal catch basin to the untrained eye, but a large portion of them have what is called a Snout. This is a plastic structure that is installed on



the outlet of the basin to prevent trash and oil products from leaving the catch basin and going into the larger retention basin or into the underground infiltration chambers and causing problems. Basically anything that floats will be separated out so it doesn't end up in our waterways at the end of the system. There are many other brands of products that have the same purpose as the Snouts.

Moving further south beside the existing power substation there are two more underground infiltration areas that use the same Cultec structures as the ones behind Walmart. These catch most of the Walmart customer parking lot runoff. Once these are full the water passes through an overflow and ends up in the large detention basin to the north.

Located directly in front of Lowes between the end of the parking and Route 62 is an infiltration basin. Basically this is an aboveground system similar to the Cultec systems that allow the stormwater to infiltrate as much as possible before being routed to a detention basin. The infiltration basin has a drainage system beneath it that aids in infiltrating the water back into the ground. It consists of a series of 4" pipes that are bedded in washed gravel that are buried in the existing soil that showed suitable infiltration rates following onsite specific tests. The infiltration basin will hold around 3' of water before it will flow out through an

overflow outlet that allows the water to travel to a basin that is located along Jackson Run Road and then discharge to the stream. The site was visited after the large storm event in August and no water was seen leaving the infiltration basin.



*Picture showing infiltration basin*

And finally the last post-construction stormwater BMP is the small basin located directly beside Lowes along Jackson Run. This basin serves as the overflow for the infiltration basin in front of Lowes and also the overflow for the wetland area that is located behind Lowes. This basin has two 30" pipes that discharge to Jackson Run. This basin is relatively small because of the large capacity of the infiltration basin before it enters the drainage system.

The last unique characteristic about the site is the constructed wetlands located behind Lowes. During construction on other parts of the site, wetlands were filled in. By regulation those wetlands must be replaced or mitigated onsite. The mitigation area was a very suitable location because the new wetlands could be tied into an existing wetland already at the site.