

Pre-construction Site Specific Infiltration Testing and Soil Sampling at the Pennypack
Ecological Restoration Trusts BMPs

Prepared by Derron LeBrake, Emeraldcreek Ltd. (10/27/2006)

Under Parking Lot Infiltration Gallery

The location selected to install the Under Parking Lot Infiltration Gallery at Pennypack Ecological Restoration Trust (PERT) was chosen because it is at the low point of the PERT parking lot where it will receive the largest stormwater flows. Approximately 4.5 acres drain to the Infiltration Gallery. Of those 4.5 acres, approximately 30% are impervious and the remainder is either forest or mowed grass lawn.

During the spring of 2006 and before installing the Infiltration Gallery, T-VSSI researchers conducted infiltration testing and collected soil samples for grain size analysis. The infiltration testing was performed at a depth of about 4.5 feet below the ground surface, approximately 30 feet north of where the Infiltration Gallery was installed. The two tests had an average infiltration rate of 17.1 inches per hour. The grain size results indicate that the soils where the infiltration tests were conducted are loam and sandy loam soils. The soils are generally 56% sand, 37% silt and 7% clay.

Infiltration Trenches

The location selected to install the Infiltration Trenches at PERT was chosen because it is at a low point near PERT's visitor center, below most of the impervious surfaces (parking lot, driveway and buildings). At this location it will receive most of the stormwater runoff that is not intercepted by the Infiltration Gallery. Approximately 8.5 acres drain to the Infiltration Trenches. Of those 8.5 acres, approximately 50% are impervious and the remainder is either forest or mowed grass lawn.

During the spring of 2006 and before installing the Infiltration Trenches, the T-VSSI researchers conducted infiltration testing and collected soil samples for grain size analysis. The infiltration testing was performed at a depth of about 4 feet below the ground surface at the location where the Infiltration Trenches were installed. The four tests had an average infiltration rate of 21.6 inches per hour. The grain size results indicate that the soils where the infiltration tests were conducted are loam and sandy loam soils. The soils are generally 54% sand, 37% silt and 9% clay.

Upland Stormwater Wet-Ponds

The location selected to install the Upland Stormwater Wet Ponds at PERT was chosen because it is at a topographic low point receiving stormwater runoff from an area of approximately 54 acres. Of those 54 acres, less than 5% are impervious and the remainder is either forest or mowed grass pasture (most of it is pasture).

During the spring of 2006 and before installing the Wet Ponds, the soil was probed with a backhoe to determine the depth to the seasonal high water table. The depth to the seasonal high water table was used to design the depth of the Ponds, as we were seeking to maintain at least 3 feet of standing water year round in the Ponds.

Soil conditions at the site prior to construction were sampled for pH, EC, textural class, color, and accuracy with the Montgomery County soil survey published data. Soil testing was conducted randomly across the areas for construction.

Riparian Stormwater Wetland and Buffer

The location selected to install the Riparian Stormwater Wetland and Buffer at PERT was chosen because it is at a topographic low point, receiving stormwater runoff from an area of approximately 34.5 acres. In addition, it lies within the floodplain of Terwood Run and the depth to shallow groundwater was near enough to the surface to support wetland vegetation. The areas selected for planting Riparian Buffer were in close proximity to the location selected for the wetland and were selected because they lacked Riparian Buffer vegetation. One of the areas selected for Buffer planting was upstream from the site selected for the Wetland and the other was adjacent to the Wetland. Of the 32.5 acres that lie upgradient from the wetland, about 30% are impervious and the remainder is either forest or mowed grass lawn (about a 50:50 mix of each).

During the spring of 2006 and before constructing the Wetland at the selected location, the soil was probed with a backhoe to determine the depth to the seasonal high water table. The depth to the seasonal high water table was used to design the depth of excavation depth for the Wetland because we were seeking the proper hydrology. We were seeking hydrology that would maintain year-round saturated soils to support the selected wetland vegetation. The soils that were going to be used as topsoil for the wetland were sampled and tested for fertility to determine whether soil amendments would need to be added to support the vegetation. The soils had enough natural fertility present to support the wetland vegetation without being amended with nutrients.