WSSI CU-Structural Soil® Patio Update

July 1, 2020

WSSI completed installation of a CU-Structural Soil® patio at its Gainesville, Virginia office in November of 2018. In January of 2019 sensors were installed in monitoring wells to record water depths within the structural soil profile and allow us to determine infiltration rates.

Figure 1 shows rainfall events which resulted in a significant accumulation of water in the bottom of the CU-Structural Soil®. Water accumulations higher than rainfall amounts result from the CU-Structural Soil® having limited porosity for water holding. Figure 2 shows the relationship between the peak head height of water in the saturated CU-Structural Soil® and the resulting drainage rates, which had a high correlation value of 0.87.

These data indicate that water does rapidly infiltrate to the bottom of the CU-Structural Soil® in rain events exceeding 10 mm, and that it also quickly drains out of the CU-Structural Soil® into groundwater at a rate which increases with the depth of accumulated water. The CU-Structural Soil® patio at WSSI sits on Triassic siltstone residuum with an extremely low infiltration rate approaching 0 mm/hr. However, it is adjacent to Waxpool silt loam soil down grade which has a high infiltration rate of 33 mm/hr down to a depth of 1.5 meters. Lateral movement of groundwater into this soil type, as well as into the surrounding soils upon which hardscapes are built, may explain its rapid drainage under a variety of rainfall conditions. The drainage pipe having been plugged since construction, the CU-Structural Soil® patio at WSSI has never produced any amount of stormwater. Similar results would be expected wherever CU-Structural Soil® is over or adjacent to permeable soils

This spring marks the beginning of the second growing season for the trees installed in the CU-Structural Soil® patio. The trees, like most other large tree plantings, experience some level of transplant shock and consequently have not shown significant growth to date. However, the Emerald Sunshine Elms have new, healthy leaves and sprouts. WSSI will continue to monitor the installation and hopes to provide updates as new information is gathered! If you would like to know more about our patio or have questions about this alternative soil media for low impact development, please check our October 2018 seminar page, or contact Dillon Conner and Frank Graziano of WSSI, or Chris Fields-Johnson of The Davey Institute.

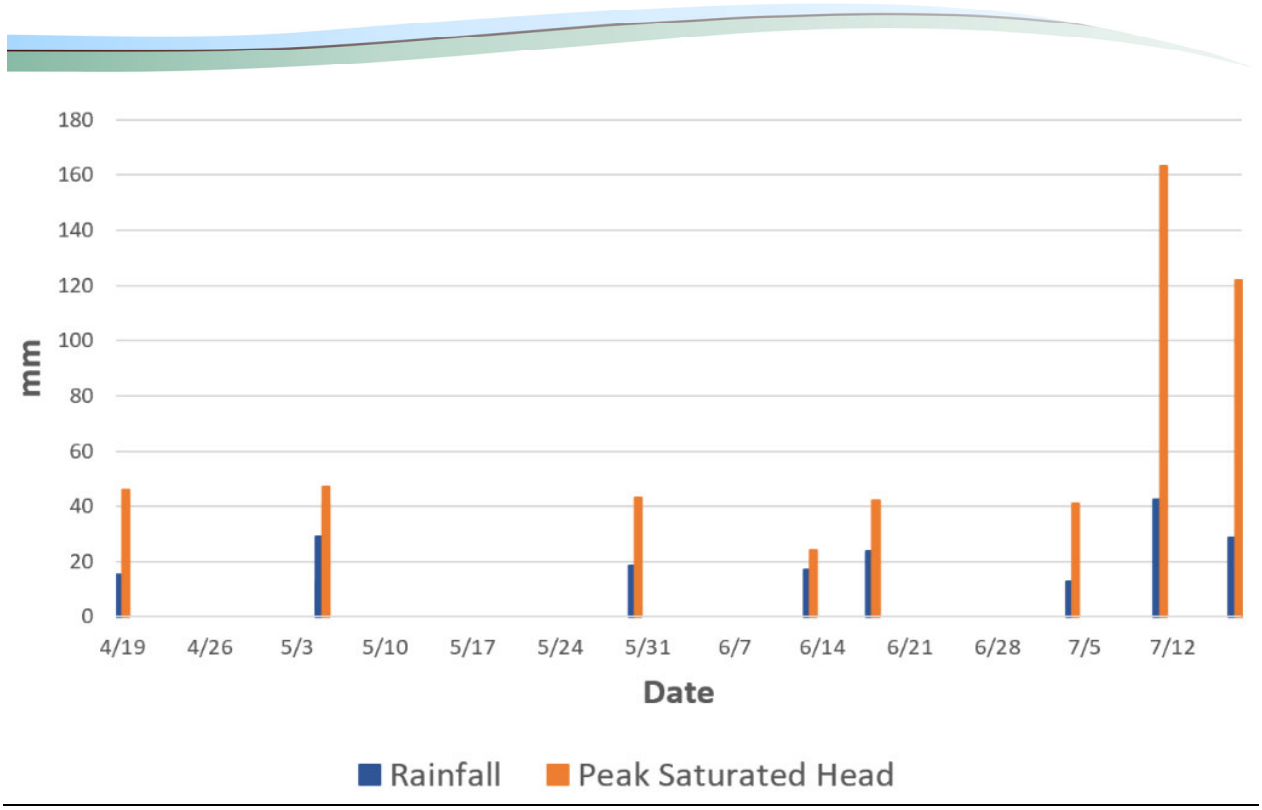

Figure 1. Rainfall events and peak saturated heads for WSSI CU-Structural Soil®.

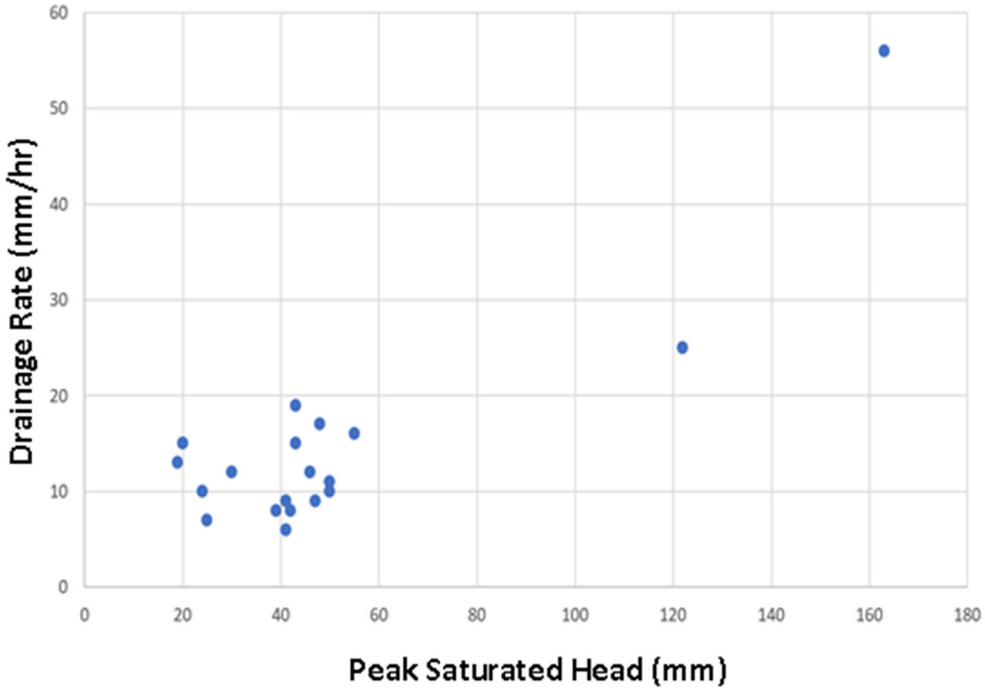

Figure 2. Drainage rates vs. peak saturated heads. Correlation = 0.87