

Exfiltration from Pervious Concrete into a Compacted Clay Soil

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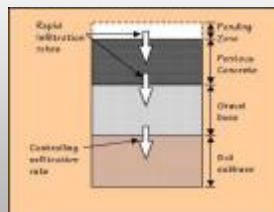
Biosystems Engineering and Soil Science
Department



Objective

- Evaluate methods to increase the subsoil infiltration rate of pervious concrete systems placed over a compacted clay soil.

Pervious Concrete System



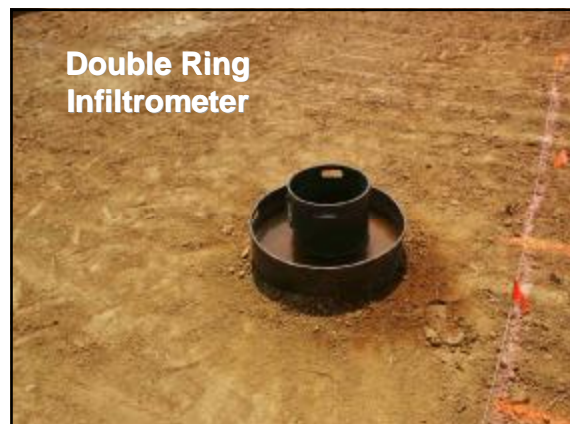
Method

- Grade a level pad large enough for twelve 8' x 10' pervious concrete infiltration plots
- Construct plots with four subsoil infiltration treatments and three repetitions of each
- Monitor water level in the concrete storage
- Determine treatment effect on subsoil infiltration rate

Subsoil Permeability/Infiltration Rate

- The infiltration rate prior to grading was established by conducting perc tests
 - $\frac{1}{4}$ - $\frac{1}{2}$ in / hr
- The infiltration rate of the graded pad was determined with a double ring infiltrometer
 - $<1/16$ in / day

Double Ring Infiltrometer



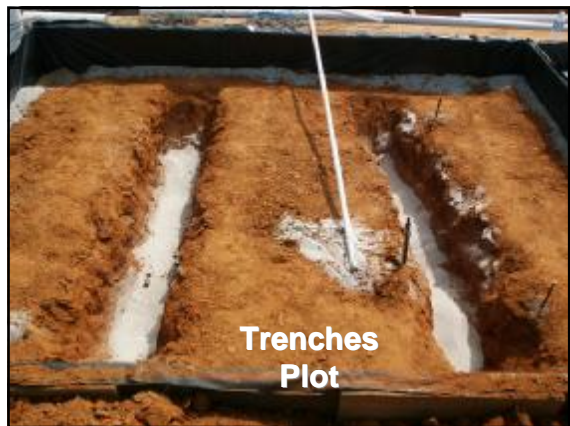
Plot Construction

- The 8' x 10' plots were constructed with pressure treated 2" x 12"s
- 8-mil plastic was trenched 12" into the ground and placed along the inside perimeter of each plot
- The plastic trench was sealed with *Easy Seal Bentonite* clay
- The outside perimeter of the plots was backfilled with soil



Treatments

- Subsoil Rip
- Boreholes
- Trenches
- Control – No Treatment





Stone Base

- Each plot was filled with 6.5" of washed #57 stone
 - Grade steel was driven into the subsoil to set the depth of stone



Monitoring Equipment

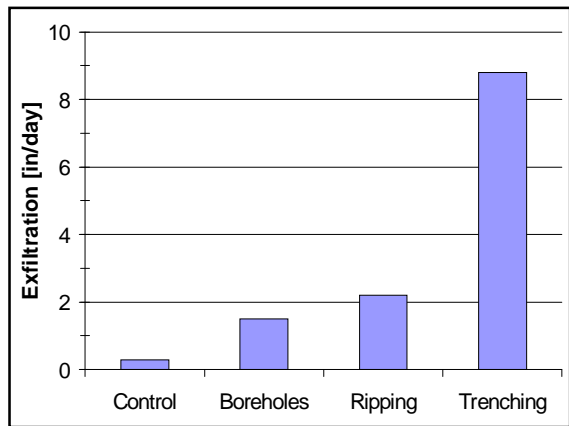
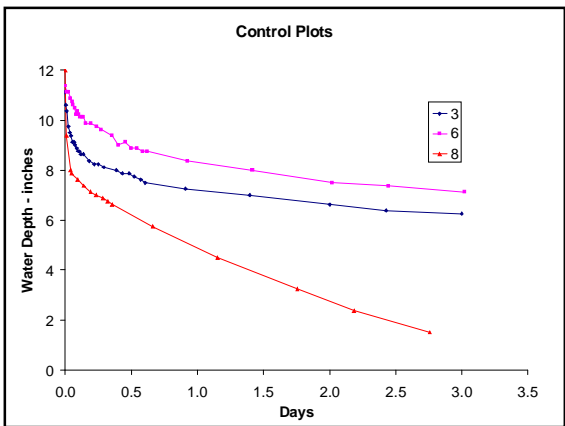
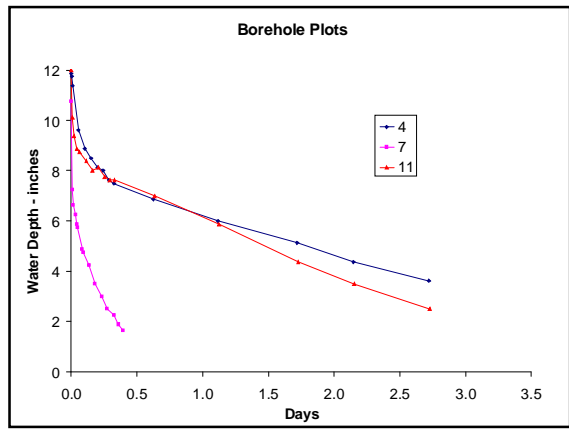
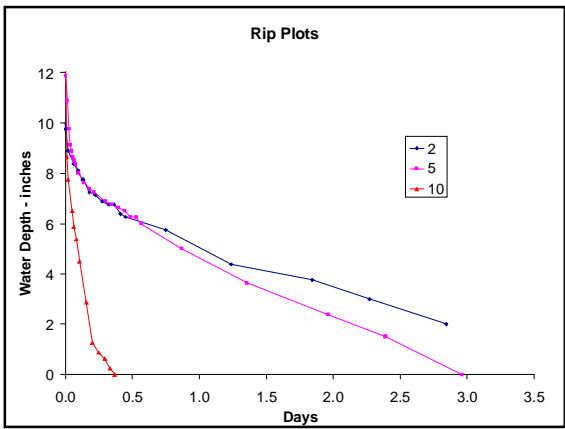
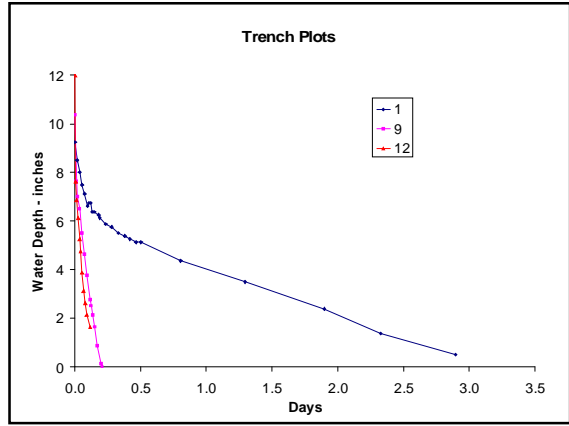
- Soil Moisture Tension — Watermark sensors placed at 1 and 3 feet in the subsoil of each plot
- Storage Water Level - A 1 psi pressure sensor monitors water level in a stilling well in each plot
- Rain Gage



Pouring Pervious Concrete

- Pervious concrete was placed by *Tennessee Concrete Assoc.*
 - Plastic was placed over the concrete for 7 days
- *Ready Mix Conc. Co.* and *Rinker Materials* donated the concrete for this project





Preliminary Conclusions

- Exfiltration time of a pervious concrete system on a compacted clay soil will generally exceed 3 days
- Treating the subsoil with trenches, rips, or boreholes is affective
 - The fraction of treatment area required is soil and compaction dependent

Questions?

