

# 2007 SEAUPG CONFERENCE – SAN ANTONIO, TEXAS

## Investigations in the use of Porous Pavements for Storm Water quality

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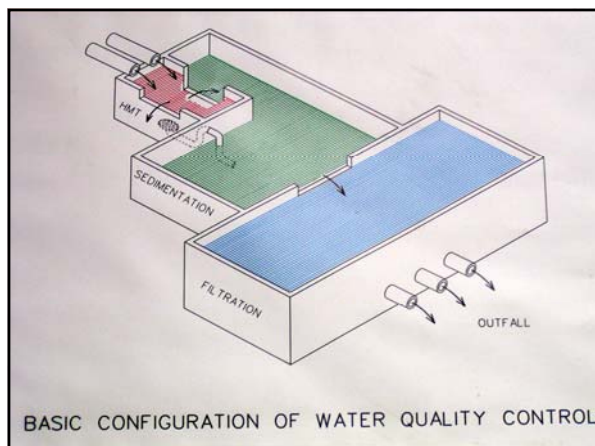
## Urban Growth and Development in karst environments

- Impervious surfaces
- Rainfall Runoff relationship
- Offices
- Malls
- Transportation
- Parking
- Runoff **Quality**
  - chemical, metal, particulates.
- Runoff **Quantity**
  - outfalls, stream flow



## Past and Present water quality controls

- History Austin District – Recharge Zone, Aquifer mitigation controls.
- Mandate: **80%** Removal of Total Suspended Solids (TSS)
- Best Mgt. Practices (BMPs) – Ponds, Basins, Traps, Filters
- Maintenance requirements.



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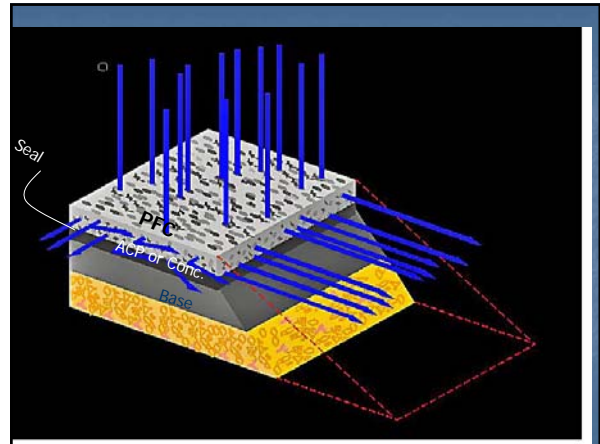
## The potential attributes of Porous Friction Course (PFC) as a water quality control.

- Alternative to existing BMPs – Slow flow and “filtration” for removing TSS.
- Less Maintenance
- No additional ROW.
- Avoid, or reduce complicated hydraulic structures.
- Reduced project cost (since funding is becoming problematic).

Lab core of PFC



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Preliminary evidence

- Project 0-4605 Storm water quality of roadside shoulders borrow ditches.
- Evaluating the benefit of grassy shoulders and swale.



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Comparison of Average Edge of Pavement Concentrations

Constituent	Conventional Asphalt	Porous Asphalt
TSS (mg/L)	117.8	8
TKN (mg/L)	1.13	0.54
NO3/NO2-N (mg/L)	0.43	0.40
Total P (mg/L)	0.13	0.23
Dissolved P (mg/L)	0.036	0.077
Total Cu (µg/L)	26.8	5.7
Total Pb (µg/L)	12.6	0.7
Total Zn (µg/L)	167	45
Dissolved Cu (µg/L)	5.9	3.9
Dissolved Pb (µg/L)	0	0
Dissolved Zn (µg/L)	47	34
COD (mg/L)	64	30

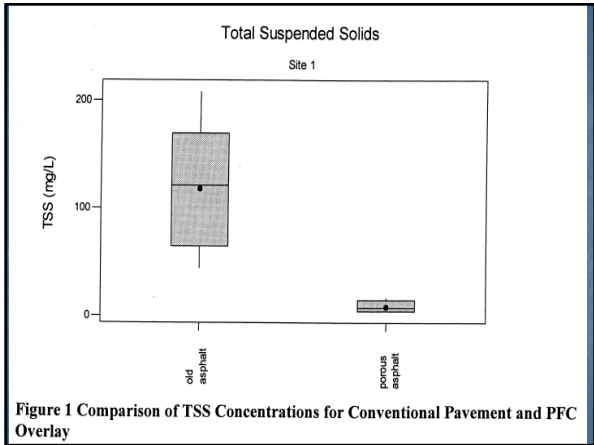


Figure 1 Comparison of TSS Concentrations for Conventional Pavement and PFC Overlay

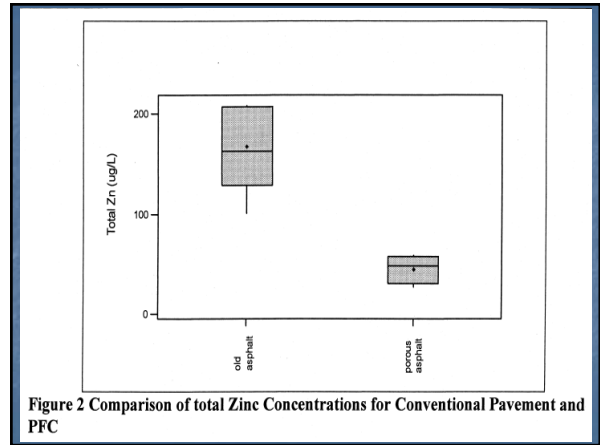
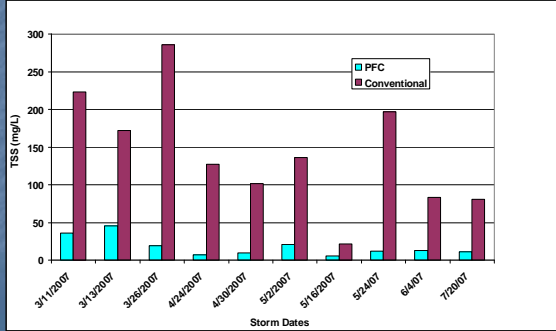


Figure 2 Comparison of total Zinc Concentrations for Conventional Pavement and PFC

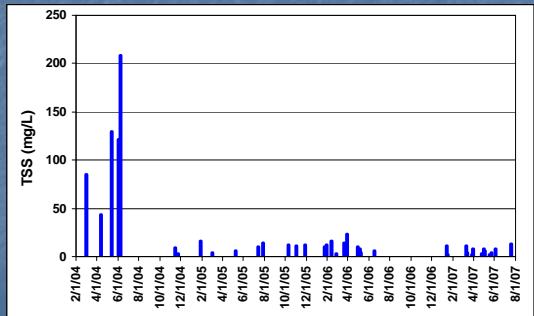


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## Paired Samples – New Site



## TSS Concentrations vs. Time



With **effective permeability** ...  
there's no "film" of surface water.

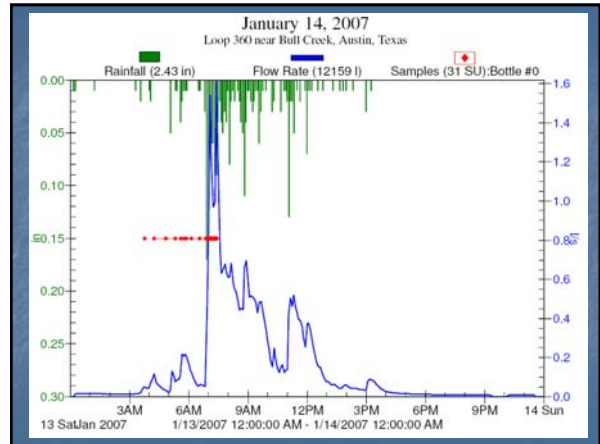
This eliminates:

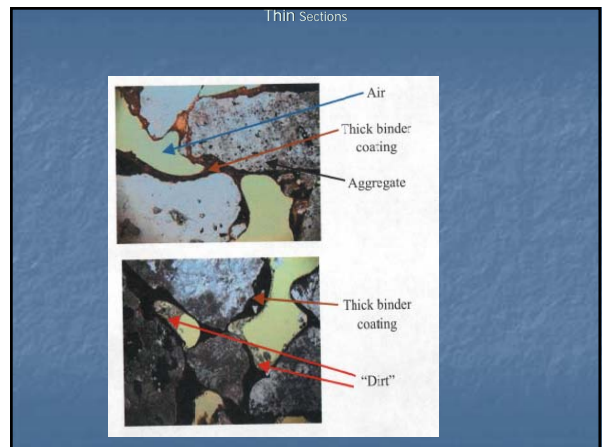
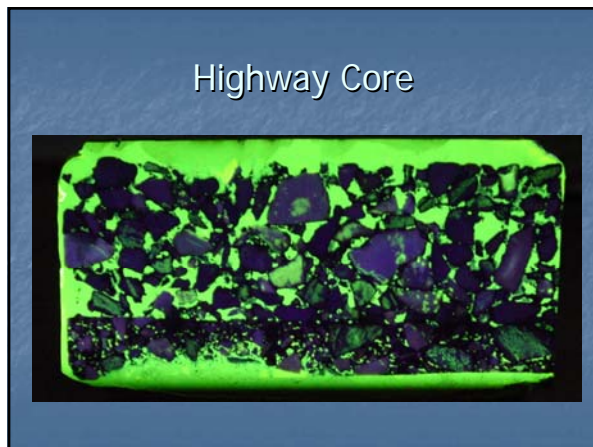
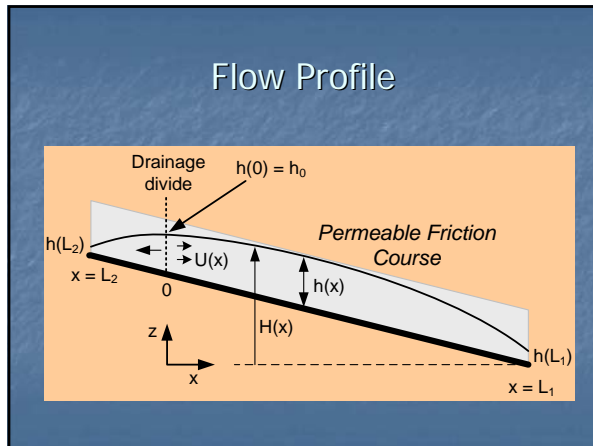
- Hydroplaning
- Undercarriage spray
- Particulate migration

## New Collection System



## Flume and Flow Meter





- ### Summary of Findings of Porous Pavements
- Goal (for water quality) Contaminant removal
  - Water Quality Cost improvement
  - Performance
  - Longevity

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The outlook is promising for PFC's attributes

- TSS removal
- Metals
- Spills
- Maintenance
- Eliminates the need for additional ROW or hydraulic design structure.

### Acknowledgements

- University of Texas
- Center of Research for Water Resources (TxDOT Project 0-5220).
- Research Supervisor: Michael Barrett Ph.D., P.E.
- and Randall Charbeneau Ph.D.