

What a Craftsman Needs to Know About Pervious Concrete

Chapter 1



Working Safely With Concrete

- Fresh concrete can cause severe chemical burns to skin and eyes.
- Keep fresh concrete off your skin.
- Promptly rinse out wet concrete from clothing.
- Wash your skin promptly after contact with fresh concrete.
- If fresh concrete gets into your eyes, flush repeatedly with water.
- Consult a doctor immediately.
- Use proper lifting techniques to prevent injuries.

Disclaimer

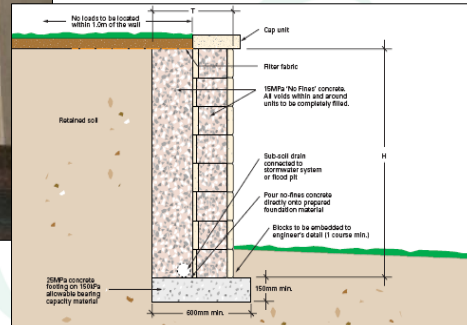
- Some of the images used in this presentation shows worker that are not using the proper safety equipment or clothing.

What is Pervious Concrete?



- 15-25% Void Space
- Also Called No-fines Concrete

History – No Fines Concrete



Other Uses



Japanese Uses



Reef Blocks



Pervious Concrete Pavement



Texture Comparison



Fresh Concrete Surface



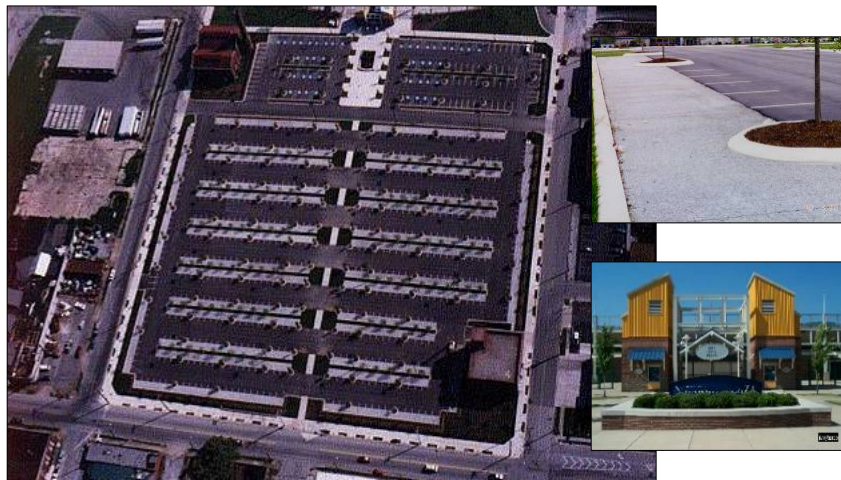
Hardened Concrete Surface



Applications for Pervious Concrete

YES	NO
<ul style="list-style-type: none">■ Parking Lots■ Driveways■ Residential Streets■ Roadway Base	<ul style="list-style-type: none">■ Airports■ Basketball Courts■ Truck Areas■ Industrial Facilities

Parking Lots



Tree Wells



Driveways



Sidewalks



Nature Paths



Streets and Roadways



Why use Pervious Pavement?



EPA Stormwater Regulations

- EPA Stormwater Phase II Regulations
- Cities greater than 50,000 must manage stormwater
- Limits amount of stormwater that can leave a building site
- Pervious pavement is a Best Management Practice (BMP)



Stormwater is Polluted

- Oils and Greases
- Metals
- Sediments
- Fertilizers



Stormwater Pollution



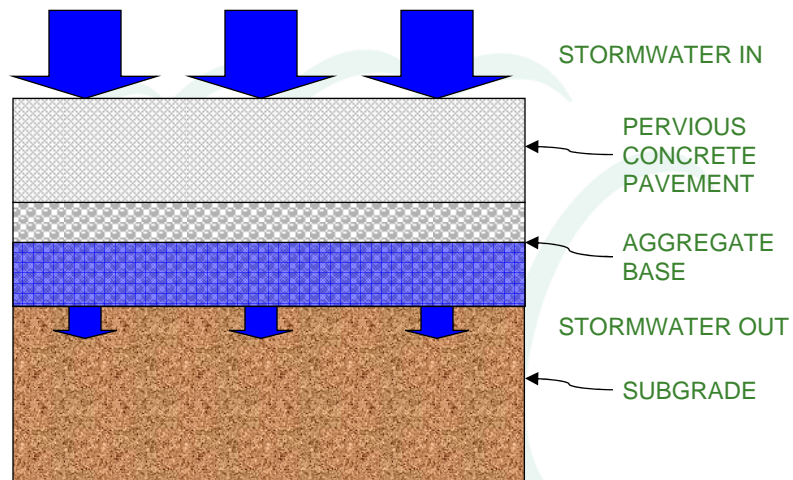
Detention Pond (Dry Pond)



Retention Pond (Wet Pond)



Solution to Stormwater Management

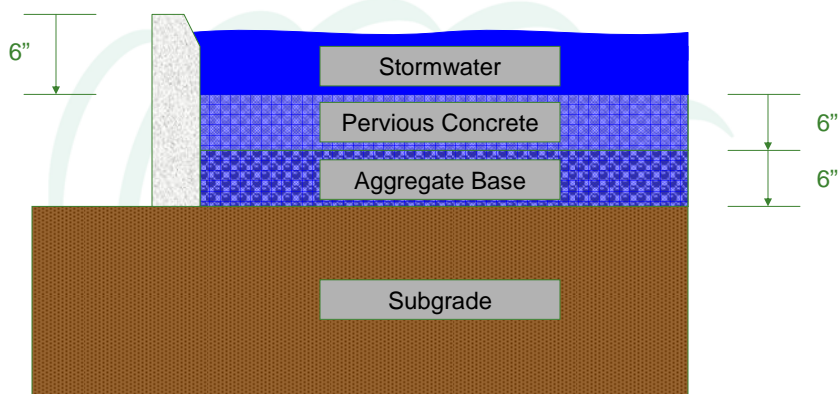


Benefits of Pervious Concrete

- Reduces or eliminates detention/retention ponds
- Removes pollutants
- Recharges ground water



Pervious Pavement is Dry Detention Pond



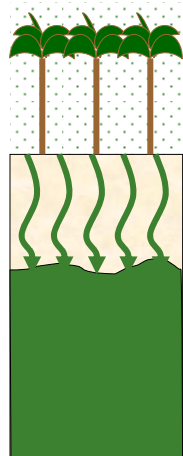
Subgrade permeability should be 0.5 inches per hour minimum

Sustainability

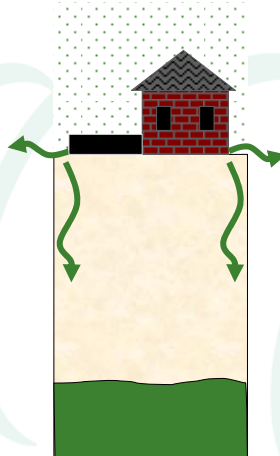
- Low-Impact Development
- Pollution Treatment
- Recharging Groundwater
- Tree Protection
- LEED Requirements
- Cool Communities



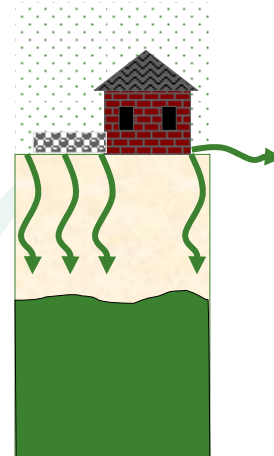
Low Impact Development



Pre-Development



Post-Development



Low-Impact
Development

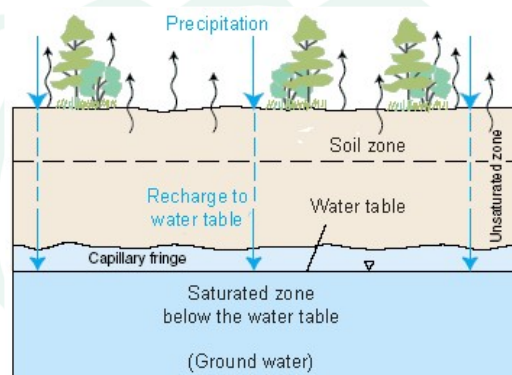
Pollution Treatment

- About 90% of the surface pollutants are carried off by the first ½-inch to 1-inch of rainfall (first flush)
- First flush passes through pavement into soil
- Soil filters and treats rainfall
- Rainfall is spread over entire parking area (instead of detention pond)

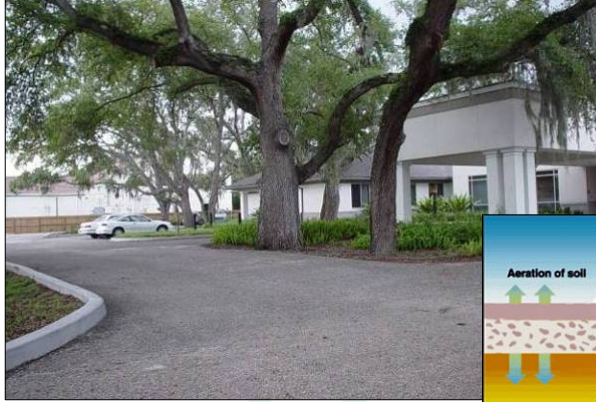


Hydrocarbons treated by filtration and microbial conversion

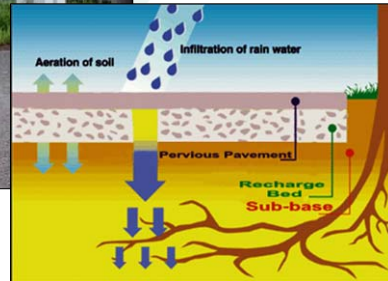
Recharging Groundwater and Aquifer



Protects Trees

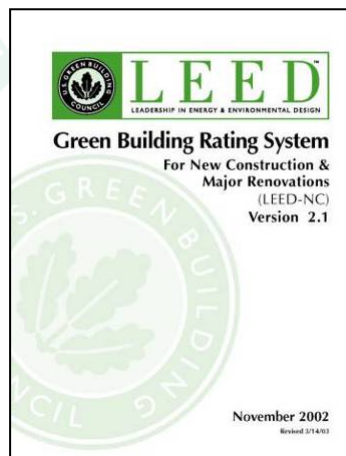


Can pave within the drip line
Water and air filters to roots



Meets LEED Requirements

- Reduce stormwater runoff
- Use Recycled Materials
- Use Regional Materials
- Reduce urban heat islands



Reduces Stormwater Runoff



Uses Recycled Materials

- Cement Production Consumes:
 - Waste Oil
 - Used Tires
 - Contaminated Soil
- Concrete Uses:
 - Coal Fly Ash
 - Blast Furnace Slag

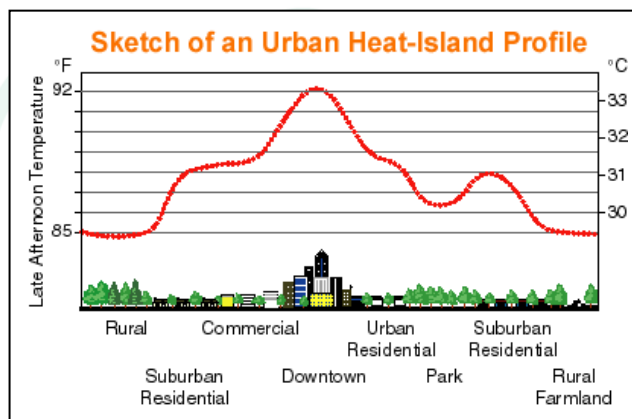


Uses Regional Materials

- Manufacture and extract materials within 500 miles
- supports the regional economy
- reduces impacts of transportation
- Concrete Manufactured within 500 miles
- Concrete materials often extracted within 500 miles



Reduce Urban Heat Islands



Urban Heat Islands

- 6 – 12 °F Hotter
- More Smog Occurrences
- High Level of Ground-Level Ozone
- More Frequent Air Quality Alerts
- Increased Health Problems
- Higher Energy Demand



NASA Thermal Images



NASA Thermal Images



Cool Communities

- Concrete pavement is key element of the “Cool Communities” movement
 - Use light colored roofing and cladding
 - Use light colored pavements
 - Landscape shading
- Reduce air temperatures by 5°
- Reduce air conditioning by 18%
- Reduces ground level ozone, VOC emissions, and the Urban Heat Island Effect

Permitting Rules

City of Stuart (Pervious Concrete Credit):

6.01.02.D. Alternative paving materials. If pervious concrete is proposed for a project, then **50 percent** of the area covered with pervious concrete shall be considered as a pervious surface provided it is installed and maintained in accordance with section 6.03.07 of this Code...