# Permeable Pavement

Just as drinking water can be filtered to remove impurities, the soil particles filters rainwater percolating through soil on its way to surface waters and to groundwater aquifers, This important step in the natural process of water purification is bypassed when rainwater falls on impermeable pavement surfaces or roofs and is carried directly through storm drainage systems into waterways. Since engineered curb and gutter storm drainage systems are costly to design and build, use of permeable pavement systems can also result in a reduction of construction costs for developers or municipalities. Pervious pavements are also denoted as porous or open-graded pavement.

Pollution carried in rainwater runoff is another concern, especially in urban areas. Storm water flowing across streets and sidewalks picks up contaminants associated with air pollution particles, spilled oil, detergents, solvents, de-icing salts during freezing conditions , dead leaves, pesticides, fertilizer, and bacteria from pet waste. Natural filtration of water through soil is the simplest way to control these pollutants, and is a direct advantage of permeable pavement.

**There are many options for permeable pavement materials:**

**Porous Asphalt:** A great advantage to porous asphalt is that the same mixing and application equipment is used as for impervious asphalt. Only the formula for the paving material changes with porous bituminous pavement. For more details on the various layers of materials see, the Pennsylvania Stormwater Management Manual Porous pavement specification used by the City of Seattle Washington Park Department. The amount of asphalt binder required is about 6% by weight which is somewhat higher than required for standard impermeable asphalt mixes.

Bituminous permeable paving is appropriate for pedestrian-only areas and for very low-volume, low-speed areas such as overflow parking areas, residential driveways, alleys, and parking stalls. Permeable paving is an excellent technique for dense urban areas because it does not require any additional land. With proper design, cold climates are not a major limitation.

Permeable paving is not ideal for high traffic/high speed areas because it has lower load-bearing capacity than conventional pavement. Nor should it be used on stormwater “hotspots” with high pollutant loads because stormwater cannot be pretreated prior to infiltration. Perkiomen Watershed Conservancy has an on line video presentation on Porous Pavement which requires the “Real Player” Media Player, to view.

**Porous Concrete:** Again, the same equipment may be used as for standard concrete. Larger pea gravel and a lower water-to-cement ratio is used to achieve a pebbled, open surface that is roller compacted. This material was recently used in a parking area in Fair oaks, California as a way to reduce solar heat-gain solar from absorption. Project costs were reduced because no retention pond or connection to the municipal storm drain system was required.

**Plastic Grid Systems:** High strength plastic grids (often made from recycled materials) are placed in roadway areas. Some are designed to be filled with gravel on top of an engineered aggregate material, while others are filled with a sand/soil mixture on top of an aggregate/topsoil mix that allow grass to be planted on the surface. The grids provide a support structure for heavy vehicles, and prevent erosion. After heavy rains, the grids act as mini holding-ponds, and allow water to gradually absorb into the soil below.

**Block Pavers:** This material can be used to create a porous surface with the aesthetic appeal of brick, stone, or other interlocking paving materials. They are most often used for driveways, entryways, walkways, or terraces to achieve a more traditional, formal appearance.

(http://www.toolbase.org/Technology-Inventory/Sitework/permeable-pavement#summary)