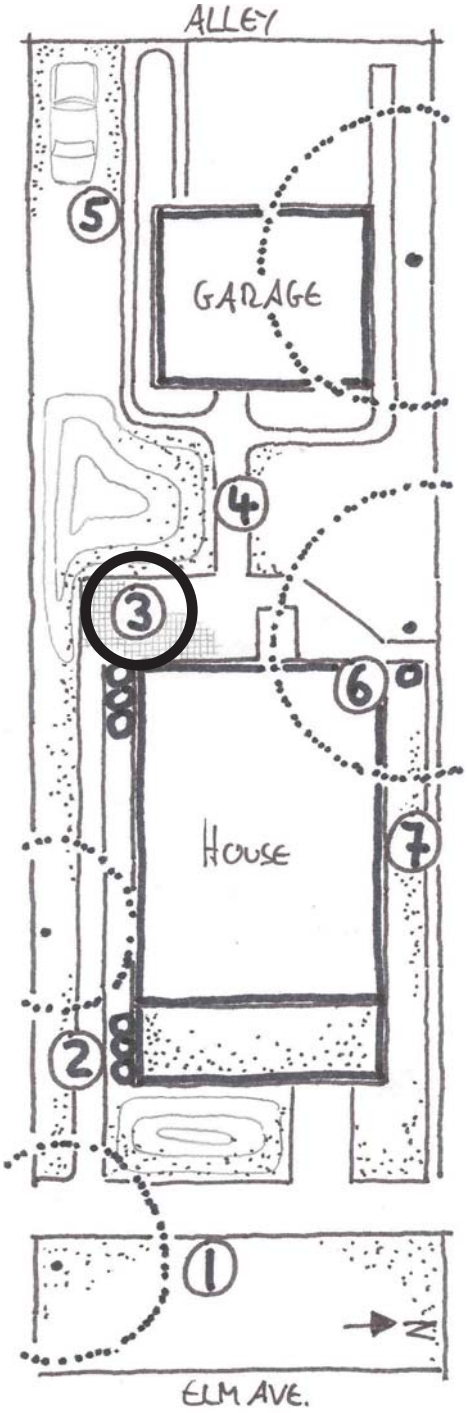

Station 3 - Porous pavement

What is porous pavement?

It generally consists of concrete block pavers (brick pavers) that have built-in gaps or openings through which rain water can infiltrate. The purpose and concept behind porous pavement is to provide stormwater retention (soaking runoff back into the ground). Depending on the subgrade infiltration capacity, use of porous pavement can help to maintain the natural water cycle, recharging local aquifers and supporting groundwater-driven base flow (subsurface water movement) that feeds into streams, ponds, and wetlands. Porous pavement systems can also improve water quality through filtration and a reduction in runoff temperatures (thermal loading).

Porous pavement 101

Typical block pavements, such as cobble stones and brick pavers, have been used for many centuries. The use of cobble stones dates back as far as the Roman empire when they were used to construct roads. Early block pavements had varying degrees of permeability. The modern concrete block paver, which constitutes a relatively impervious surface, was developed in Europe in the 1950s and became widely available in the U.S. in the 1970s. At that time German engineers started to develop the first true porous pavement block pavers to address the increased disruption of the natural water cycle by urban and suburban development.

Porous pavement blocks are available in different types and configurations. (See also samples overleaf). The precast units have openings or gaps (expanded joints) formed into them. The gaps (or expanded joints) are created through tabs or spacers that are cast onto each paver unit. The cast-on tabs or spacers lock into each other to create a flexible pavement system. The width and size of the gaps or openings in the pavers vary by product, and yield different ratios of openings per square foot.

Porous pavements for pedestrian applications on the residential scale are relatively easy to engineer and design. Porous pavements for vehicular traffic (such as a driveway) require greater involvement of a design professional.

What makes it work?

All materials in a porous pavement must be coarse and without any finer particles

Station 1 - Green roof
Station 2 - Rain barrels
Station 3 - Porous pavement
Station 4 - Rain garden
Station 5 - Gravel grass
Station 6 - Cistern
Station 7 - Bioswale

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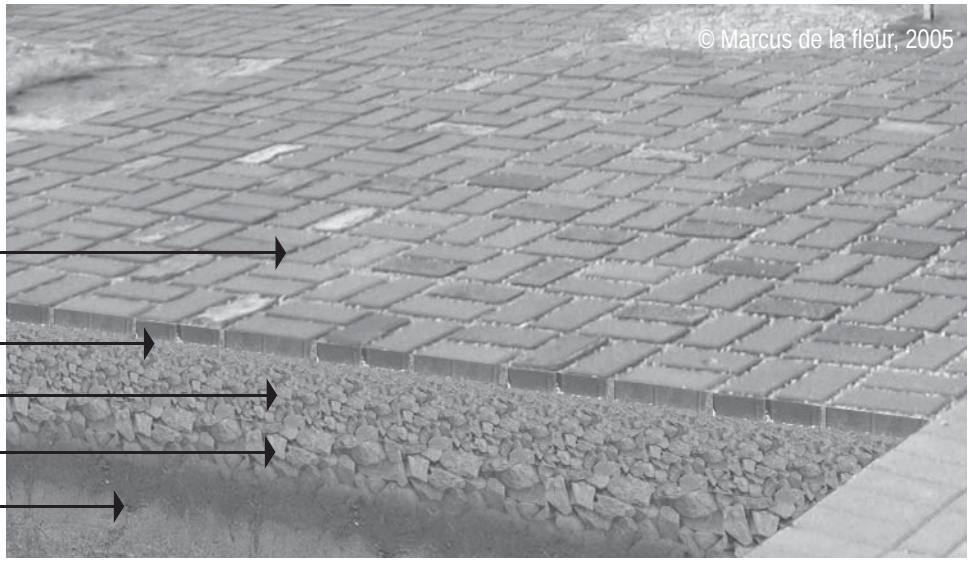


to allow for effective infiltration: The gaps or openings must be filled with stone chips (never sand). Stone chips must also be used for the setting layer. The permeability of the stone chips will ultimately determine the rate at which water can infiltrate through the surface. Clean, coarse materials, such as stone chips, further ensure a good infiltration rate over many years. It is absolutely imperative that any porous pavement is designed and installed in a way that protects it from sedimentation. Any soil that may wash onto the porous pavement will clog the openings and prevent further infiltration.

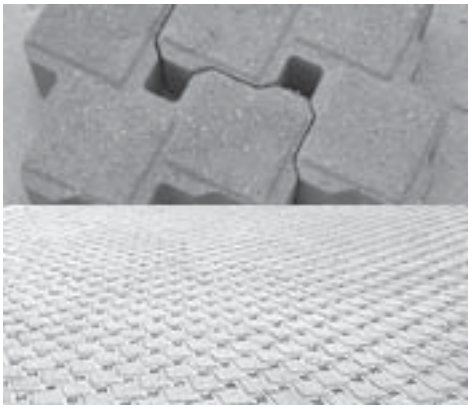
The porous pavement at Elm Ave.

The area of the current porous pavement was previously covered with an impervious concrete pavement. That concrete pavement was demolished and broken down into approximately 2-3" pieces. The newly created "gravel" was then re-used (recycled) as the base for the new porous pavement. The pavement surface consists of a wide variety of brick pavers, some concrete and some clay, which were all salvaged from various locations where they were headed for the landfill. The pavers were placed with gaps between them on a carefully screened bed of stone chips. The gaps, the stone chips, and the recycled concrete allow rainwater to infiltrate through the pavement and eventually soak into the underlying soil

What about snow and ice on the Elm Ave. porous pavement?

Snow removal in the winter has not been a problem. The porous pavement surface is very even and allows to clear snow with a typical snow shovel. No de-icing salts or agent are needed: Melt water on the porous pavement drains immediately through the gaps between pavers, which prevents the water from ponding and freezing over, a characteristic of conventional concrete and asphalt pavements.

Many folks believe that porous pavements may be damaged by frequent freeze-thaw cycles in cold climates. In fact, porous pavements hold up better than conventional pavements under these conditions. This is largely due to the superior base (gravel) construction under the pavement and the interlocking nature of porous pavement. The block paver surface can absorb some vertical movement that may occur (such as frost heave) and eventually settle back into position. Asphalt or concrete pavements, on the other hand, are likely to crack under such conditions.



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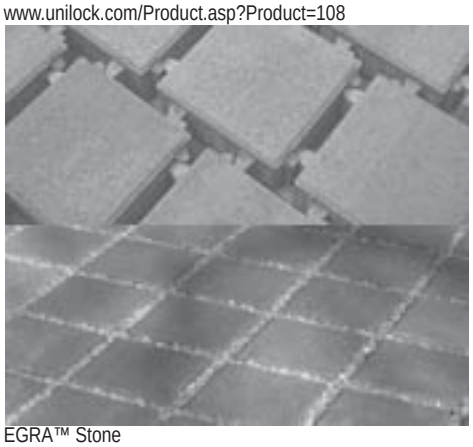

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