Demonstration Project #4: Permeable Pavement

In a forested landscape, rainfall is filtered by plants and slowly absorbed into the ground, where it replenishes groundwater that keeps rivers and streams flowing even during droughts. In a developed landscape, rain runs off impervious surfaces, gathering pollutants before being quickly channeled into storm drains and discharged without treatment into rivers and streams.

The amount of impervious area, like paving or rooftops, is an important factor in river protection. As development of a watershed occurs, impervious area increases. Impervious areas of 10% or more are associated with impaired water quality, degraded habitat, and loss of biodiversity. Increased imperviousness is also the main reason why floods become increasingly severe in urbanizing areas, at the same time that low-flow conditions get worse too.

Permeable paving is a key tool in the low impact development toolbox, because reducing “effective impervious area” is one of the most important strategies in restoring the Ipswich and other rivers. Runoff would have been a larger factor at Riverbend, except for the use of permeable paving that allows water to soak into the ground instead of flowing off the surface.

At Riverbend, we chose a permeable concrete paver called SF RIMA™. The parking area is prepared in the same way that it would be for other paving approaches: by excavating the area and then installing a layer of crushed stone or sand. Then, the pavers are laid; in this case the spacing between pavers is adjustable, allowing for different rates of infiltration of rainwater underground. The use of permeable paving retains the site’s natural drainage features where water can soak into the ground, rather than running off. The SF RIMA™ pavers are quite easy to install, and do not require specialized expertise for the installation pattern that we chose. The pavers are available in a range of colors, and the cost per square foot is (currently) about $3.80 per square foot retail for the pavers, plus the site preparation and installation costs. See http://www.sfconcrete.com/products/sfrima/brochure.html for more information about this product.

Other types of permeable paving are also available, and may be suitable for particular applications. These include permeable asphalt, which looks very similar to regular asphalt; other types of pavers; and several other proprietary materials, such as Flexipave™ or PermaPave™. If you would like to see other options for yourself, several permeable paving approaches have been used on a parking area at Silver Lake in Wilmington; see http://www.mass.gov/dcr/waterSupply/ipswichRiver/demo3-paving.htm for more information. The costs and other characteristics vary considerably, so it is important to consider all the options available.