

Suspended pavement: The best system for urban development

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Suspended pavement over noncompacted soil is a construction technique that has been recommended worldwide for urban development projects.

According to Dr E. Thomas Smiley, an arboriculture researcher at Bartlett Tree Experts, in an article in March 2006 "Growing Trees Downtown", "suspended pavement over noncompacted soils provided the best tree growth" for the experiment they conducted.

In 2004, three trenches were excavated at the Bartlett Tree Research Laboratories and Experimental Grounds in Charlotte, North Carolina. To contain root growth, the trenches were lined with a thick geotextile provided by BBA FirewebAmericas.

The research at the urban plaza experimental plot at Bartlett laboratories in America compared soil treatments under pavement to determine which one provided a suitable rooting environment for urban tree plantings.

Suspended pavement over noncompacted soils is a "treatment that often is overlooked by landscape architects when designing urban tree sites". "The trees in this treatment were larger and faster-growing, had better colour and more root growth than most of the other treatments," Smiley said in his findings.

"The most limiting factor in the growth of urban trees is the lack of usable soil for root growth," he said.

Smiley added that with the suspended pavement over noncompacted soil technique, "nearly all of the soil under the pavement is usable for root growth".

The CityGreen® modular [StrataCell system®](#) is fast becoming the favoured suspended pavement system for tree pits in urban development projects around the world.

The StrataCells are structural soil cells that come in modular units, which can then be assembled to form a skeletal matrix that supports pavement and traffic loads. This structural cell system features almost five times more available growing media compared to the traditional rock/soil method, therefore facilitating healthy root growth.

The study said that "structural soil only contains approximately 20 percent soil by volume, which may affect water and nutrient availability over the lifetime of the tree." Compare that to the StrataCell's interconnected skeletal matrix which provides over 94 per cent void space for filling with soil media, or storing/detaining storm water.

The study also found that the noncompacted soil with suspended concrete treatment was easy to install – a fact not uncommon with using StrataCells. Previous users of the system have often expressed their surprise at how easy it is to use the StrataCells even for first time users.

After the first year of the experiment, trunk caliper, twig growth and foliar colour were all checked. Root growth was monitored by "installing Lexan windows called rhizotrons, in a trench that ran between the treatments".

According to the results, the noncompacted soil with suspended pavement treatment had the longest twig growth after approximately a year of planting.

There were also distinct differences in tree growth, foliage color, root growth and crown dieback. The ornamental cherry trees had more trunk diameter and twig growth, as well as better foliage in the noncompacted soil with suspended pavement.



"With the elms, there also was more trunk diameter growth in the noncompacted soil with suspended pavement treatment. Twig growth rates and root lengths were significantly higher. Visually, the foliar rating of the noncompacted soil with suspended pavement was better than the Stalite treatment."

The study also suggested that "if suspended pavement is to be used, it will need to be engineered to take expected loads without breaking. This may require thicker or reinforced concrete and the installation of footers."

[Citygreen StrataCells](#) provide the perfect answer to this requirement as the pavement load is evenly supported over the structural matrix.

Numerous laboratory tests have proven that the StrataCell system's structural integrity is without equal. Recently, the CityGreen Edmonton office demonstrated that [this system can sustain the weight of an ASV PT-50 multi terrain loader](#). An assembled StrataCell matrix has been FEA tested to 550kPa vertical load.

The modules feature extremely high compressive strength and the unique, globally patented, interlocking feature provides correct dispersion of wheel loads throughout the matrix. Due to the high structural integrity of the modules, these matrices can even be used beneath trafficked areas.

In an updated research by Smiley last year entitled "Growing Trees Near Concrete", it says suspended pavement is still associated with healthier tree growth, and pavement damage doesn't happen with this treatment. "Suspended pavement over noncompacted soil provides a good, long lasting alternative for growing large trees in urban plaza areas."



CityGreen Systems are also advocates of environmentally friendly solutions. Aside from having a very high strength capacity, the StrataCell modules are also recyclable and are manufactured from 100 per cent recycled polymer. As there are no steel components, the modules are corrosion free.