Green Roofs proposed New York City tax abatement bill

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Green roofs are making headlines as a result of tax abatement legislation. City Council Intro No. 630, insures that New York City will follow through with regards to its environmental directive and develop a Sustainable Stormwater Management Plan as outlined in Mayor Bloomberg's PlaNYC 20301.

Under the existing outdated design, storm water flows into our sewage system. Consequently, even rainfall as light as 1/10" can overload the system causing raw sewage to overflow into the harbor.

In supporting plant life, Green Roofs reduce the quantity of rain water entering the sewage system. According to a recent study by Riverkeeper, a small, 40 s/f green roof could result in 810 gallons of storm water captured per roof per year2.

To foster the implementation of Green Roofs throughout the City's office buildings, two bills have been introduced to the NYS Assembly, each calling for 35% tax abatement on the cost of a Green Roof, although they differ on the assumed cost basis by author. Assemblyman Rubin Diaz (Assembly Introduction A 10234) proposes that the cost be based on a $19.00 per s/f cost, yielding a $6.75 per s/f tax abatement3. Senator Lanza (Assembly Introduction 7553) recommends using $13.00 per s/f, providing for a $4.54 per s/f abatement4. Each of the bills has a $100,000 tax abatement limitation.

However, a Green Roof is not the same - and does not provide the benefits of - a newly evolving phenomenon called a "green roof garden."

A green roof garden can be like an "ecological prism," and differs considerably from a green roof in that sustainability, beauty, encouraging biodiversity and utilizing "found" materials to avoid land filling are equally important factors to storm water management.

The following are a few assumptions about how green roofs are currently implemented so that I can illustrate the advantages of the more sustainable, more beautiful, "eco-prismatic" approach of a green roof garden.

Assumption #1: A typical commercial roof is an Inverted Roof Membrane Assembly (IRMA roof), and uses insulation on top of a waterproof membrane with stones and pavers as ballast.

Assumption #2: Many green roof components are imported into the local area - a less than desirable practice from an energy efficiency perspective.

Assumption #3: In a typical green roof, material such as expanded shale, a common growing medium, requires a great deal of energy to produce it, and it does not support bio-diversity or retain as much water as real soil. In fact, the energy to process one cubic yard of expanded shale is 1,340,000 BTUs or 392,620 watts/hr (this would be the equivalent of lighting 3,926 100 watt light bulbs for one hour) or 1300 cubic feet of natural gas!

Assumption #4: Sedum is exemplary of the type of plant used in a standard green roof, which utilizes CAM (Crassulacean Acid Metabolism), in which the stomas close during day to prevent

water loss and open at night when less cooling is necessary. In that they don't "evapo-transpire," sedums don't cool the roof down, and a hotter roof is less thermally efficient compared to a cooler one. Â

Gail Swithenbank, an architect specializing in penthouse extensions, thinks that giving up the most valuable real estate for the sole purpose of rainwater capture and roof cooling, albeit a noble concept, falls short of what's possible. She felt compelled to develop a green roof garden specifically for IRMA roofs and has been rewarded with initial success, implementing the following innovations:

Innovation #1: Soil is mixed with olefin yarn pulled from carpet that would otherwise become landfill (carpet creates 5 billion pounds of waste a year). The hydrophobic nature of olefin yarn maximizes transportation of moisture to plants, since it absorbs no moisture itself - critical in preserving all available rainfall for plants. Padding is used as a water retention mat under the soil.

Innovation #2: Creating a natural bio-diverse habitat by fertilizing with "vermi-compost" (worm manure) and using native plants that attract birds and butterflies. Native plants mitigate the heat island effect by cooling thru plant evapo-transpiration. Although not necessarily for this application, the LEED rating system acknowledges the value of native plants, and gives points for using native plants that "evapo-transpire," thus cooling, and oxygenating the air, as well as creating bio-diversity. Birds and butterflies are not merely pretty, but are recognized as being essential to the ecology.

Innovation #3: Creating portable green islands that can be repositioned when desirable, so that soil and plant material is effectively kept away from rooftop edges and flashing. Swithenbank's inspiration flows from Japanese garden design which use pebbles with islands of green to create beautiful spaces. The "islands" are a cost effective approach to maintenance issues, and are similar in concept to modular tile systems that allow easy removal for roof repairs.

Innovation #4: Pertains to HR issues - such as feeling uplifted by the beauty of nature in its simplicity.

Swithenbank's work is paying pay off by providing less costly green roof garden implementation methodology that utilizes materials from the waste stream and other materials which are available locally. Swithenbank is working with CarpetCycle.com a local carpet recycling facility that collects commercial and residential carpet.

Tax incentives and the work of Swithenbank and other green roof garden pioneers are leading the way towards a movement that will bring us sustainable clean water coupled with lower cost and increased beauty.

Footnotes:

1) www.nrdc.org/media/2008/080130.asp

2) www.nyc.gov/html/planyc2030/html/plan/water_quality-green-roofs.shtml Incentive9: Provide incentives for green roofs-p.61

3) www.assembly.state.ny.us/leg/?bn=A10234

4) www.assembly.state.ny.us/leg/?bn=S07553&sh=t

Nadine Cino, an environmental "thought leader," is a co-founder and co-inventor of the Tyga-Box Systems, Inc., New York, N.Y.