Six-storey Living Wall Improves Building Performance at University of Ottawa

A Living Example of Sustainable Design
Located in the heart of University of Ottawa, the 15-storey Vanier Hall functions as the new home of the large Faculty of Social Science and ‘stands tall’ as a living example of sustainable design boasting the intangibles of a rich and inspiring learning atmosphere, plus the measurable returns of energy saving technology.

From an exterior view, the green plant wall provides a striking contrast to the glass and steel structure. Once inside, visitors can fully appreciate a spectacular six-storey-high feature – the largest living wall biofilter in North America at 1,370 square feet. In addition to the aesthetic impact, the biofilter is also part of the building’s sustainable design efforts.

Improves Air Quality and Building Performance
In simple terms, a Nedlaw Living Wall Biofilter is a working machine that harnesses nature’s remarkable ability to ‘eat’ pollutants. Contaminated indoor air is drawn through the biofilter where microorganisms on the root media consume airborne pollutants as food. This removal process cleans 80 – 85% of volatile organic compounds (VOCs) from the air, creating virtual outside air. The cleansed air is then re-circulated through the building’s HVAC system.

The ‘soft’ benefits of the living wall include dust control, sound abatement, white noise in the form of running water, and a noticeable ‘smell’ of fresh air.

In terms of improving building performance, the biofilter at Vanier Hall can provide 75 – 80% of the building’s fresh air intake requirement, which not only enhances air quality but also significantly improves energy performance by reducing the amount of air intake and, consequently, heating and cooling costs. Additionally, the wall provides all of the building’s humidity and no mechanical humidification is needed.

The living wall biofilter at Vanier Hall includes energy smart features designed to address certain energy lapses in traditional building systems. For example, water recycled from storm water runoff and HVAC condensation is used for the hydroponic plant wall. According to Dr. Alan Darlington (founder of Nedlaw Living Walls), “We’ve done a lot of work to streamline and make this as efficient as possible without losing the aesthetics of this system.”
Calculating the ROI of Living Wall Biofilters
In recent years, Nedlaw has completed numerous studies to show the effectiveness of contaminant removal from indoor air and has now quantified the return on investment based on energy savings. By replacing outdoor air that needs to be conditioned, a Nedlaw Living Wall Biofilter reduces a building’s energy needs. In general terms, a fully-integrated biofilter can reduce energy costs by up to 30%, because the biofilters provide clean air at a fraction of the cost of traditional systems.

In a recent study completed for a major international retail chain, it was determined that the proposed living wall biofilter could provide 100 litres per second of outside air – meaning the building needed to take in that much less outside air.

Using the biofilter as a source of clean air would reduce the energy consumption of the HVAC system by 32.5 GJ of energy for square metre of biofilter used. If properly integrated into the building (for example, naturally lit and connected directly to the HVAC), the biofilter would require as little as 0.4 GJ of energy per square metre per year. This gives a total annual energy savings of the system of 32.1 GJ. This is equivalent to roughly 5 barrels of oil or 1.6 tonnes of CO₂ saved per square metre of biofilter.

For this study, it was determined that approximately 400 m² of biofilter would be used. Assuming a combined energy cost for electricity and natural gas of $10 USD per GJ and if the biofilter is used to its maximum potential then the payback period for the capital cost associated with the biofilter could be less than 3 - 5 years.

MEDIA COVERAGE
According to the University of Ottawa, the Nedlaw Living Wall Biofilter was a “cost-neutral initiative”
http://www.cbc.ca/player/News/Canada/Ottawa/ID/2278993415/

University of Ottawa Tower Wins 3 Awards

PROJECT DETAILS
Location
University of Ottawa, Vanier Hall

Architect
Diamond Schmitt Architects, KWC Architects

Award of Excellence / Interior Green Wall - Green Roofs for Healthy Cities
LEED Gold Certified

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ABOUT NEDLAW LIVING WALL BIOFILTERS
INFORMATION VIDEOS
Installation Options and Requirements
Energy Benefits of a Living Wall Biofilter