Operating Costs and Considerations for a Nedlaw Living Wall Biofilter

A White Paper by Dr. Alan Darlington

NEDLAW LIVING WALLS

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Issue

The Nedlaw Living Wall Biofilter is major feature commitment to the environment and to providing the building occupants an ideal indoor space.

The Biofilter will provide many years of service but it is a combination of mechanical and biological components that must be properly maintained and as such requires a continued commitment by the owner to the biofilters.

Although provided manuals will provide specific details on the maintenance of the system, this is a brief review of the issues associated with the ongoing operation of the wall.

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Warranty Period

During the first year, Nedlaw provides completed coverage of all maintenance related issues through our warranty Program. The Warranty coverage includes plants and all components supplied by Nedlaw. This warranty functions is a built-in one year service contract for the system. Longer Warranty periods can be arranged.

Nedlaw and Ongoing Maintenance

At the end of the Warranty period the owner may decide to either:

- Enter into an on-going service contract with Nedlaw
- Take over the maintenance directly
- Bring a third party to carried out the maintenance

If the owner remains with Nedlaw a typical annual service is between 10 and 15% of the capital cost of the system per year. The owner decides not to remain with Nedlaw, we shall take every reasonable step ensure an easy transition from our control to the new maintenance providers.

Nedlaw can provide site specific training for the new maintenance provider to ensure that they are well versed in the uniqueness of our systems. Owners may retain Nedlaw as consultants to give quarterly or semi annual appraisals of the system.

Ongoing Maintenance of the Plants

Plant Life Expectancy

Once the plants are established, one can anticipate roughly 10% of the plants to fail each year. This is an average number and is dependent on the plant selection and growing conditions. Hardy (more utilitarian) plants can be selected if survival is a concern.

Poor light conditions are the most frequent factor associated with poor plant survival. The cost of routine plant replacement can usually be included as part of the plant maintenance contract.

It typically requires one hour to maintain 10 m^2 of living wall biofilters.

Consumables for the Plants

Plants food and other consumables such as required for pest control are a minor expense (less than $5 per square metre per year) and are usually included as part of the plant maintenance contract.

Growth media

The TBS growth media was selected for its long life. Current life expectancy for TBS is over 10 years. We currently believe that TBS can be replaced with approximately 75% retention of the plants. We estimate approximately one man hour of labour and $60 for material and plants per square metre of material being replaced. TBS is available from Nedlaw to our past client, if the client choices to do the replacement themselves.

Labour

It typically requires one hour to maintain 10 m^2 of living wall biofilters. Maintenance of the system requires understanding of plants and associated mechanical systems. This could be in one individual such as a plant person experienced with water features (ponds) which share many similar components.

Alternatively, the expertise could be supplied through different departments (horticultural/grounds and the building mechanics).

Irrespective, the owner should be aware persons working on system may require specialized training for working at heights and using the various lift systems that are employed.

Although, nothing other than natural or 'organic' means of pest control should be used, some jurisdictions require accreditation (pesticide licenses) for applications of even these materials.

Access Systems

Biofilters higher than 3 m may require a system to access the plants for routine maintenance. These can include library ladder, bosun chairs or mechanical swing stages, scissor or boom lifts. For most installations of medium size, we recommend a bosun chair.

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In selecting a lift, cost, availability on site, certification and inspections of the system and the operator should all be considered. Availability of boom and scissor lifts may be difficult to coordinate when unscheduled repairs are required and mechanical swing stages may require annual inspection and certification.

Lighting Systems

Lights frequently are the largest utility expense for the system. This can minimized by proper design by taking advantage of natural light and if required, proper design of lights. If supplemental lighting is required operating expense can be minimizes by careful control of when the lights are *on*. Several of our systems use sophisticated control protocols to minimize electrical expenses.

The light output from some light lamp decreases substantially with time. Depending on hours of operation, the halide lamps may need to be replaced in as little as two or three years. Although more expensive initially, LED lamps require far less frequent replacement.

Other Mechanical Components

Pumps and fans are the other major mechanical component to consider. The life expectancy of these components is typically in the order of three to seven years under normal operating conditions.