Verdant Apartments green walls

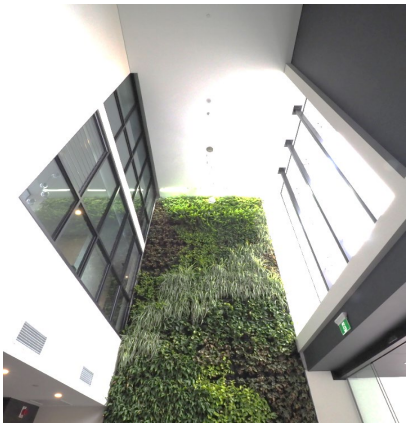
Land use / development type	Scale
Residential and commercial development	Lot

Efficient use of water	Scale
Green wall	Building

Other benefits	Scale
Amenity Air quality Mental wellbeing	Building

Local government	Location
City of Perth	Stirling St, Perth

Verdant is a 21-storey residential development on Stirling Street, Perth, with 137 one and two bedroom apartments. Verdant has a strong focus on energy efficiency and its design maximises the use of natural light and ventilation and incorporates a unique 6-story green wall on the external façade of the building, as well as 3-story green wall in the foyer.



A green wall is a vertical structure planted with vegetation that contains a growing medium and a built-in irrigation system.

The use of green walls is increasing in popularity in our urban areas, both inside and on the external facades of our buildings. There are many benefits of green walls which include reductions in ambient air temperatures and absorbing noise, pollution and dust, as well as increasing biodiversity in our cities. In addition to these benefits, green walls improve amenity through enhanced visual appeal and help to connect our communities to nature.

Key Design Features

Key design features, developed by Deep Green Landscaping for the internal 10metre green wall include:

- lightweight modular vertical garden system made from recycled plastic
- water retention mat that reduces loss of irrigation water from gravity effects
- moisture sensors at various heights in the wall
- remotely controlled drip irrigation system with four stations
- vegetation established off site, with roots growing directly into the water retention mat
- hydroponic system to manage fertigation
- variety of plant species chosen for colour and texture as well as their fibrous root system and slow growth rates to reduce maintenance requirements
- specially designed and regular maintenance regime
- low rates of irrigation ensured by watering with frequent small volumes to a maximum of 20mm/m2/day.

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Issues

Deep Green landscaping note that water and nutrient management are critical in ensuring a successful and cost-effective vertical greening system. Water management is one of the biggest challenges in vertical greening, especially in Western Australia's harsh climate. The water requirements of each wall will be influenced by a number of factors. Internal walls are most affected by exposure to air-conditioning, which can vary across the wall, as well as heat reflection from neighbouring buildings or windows. External walls are affected by a larger number of variables including aspect, daily/annual temperatures, daily/annual movement of sun/shade, exposure to prevailing winds, evaporation rates, rainfall, runoff onto the structure and drainage.

The irrigation systems in each green wall required a period of adjustment to refine the application times and volumes required. This included adjusting the position and number of stations to cater for variations in air-conditioning and shade from nearby buildings. Optimal performance of the irrigation system can only be achieved where the system is monitored in real-time and can be operated remotely.

The health of the vegetation is influenced by the quality of the cultivars used in the wall. Diversity is important, not only for aesthetics, but also to increase the overall resilience of the wall to pests and diseases.

Consideration was given to collecting unused water from the bottom of the system and using this for irrigation; however, it was found that constant recycling resulted in salts building up in the dripper systems. It was more effective to operate live soil moisture sensors which triggered the irrigation scheme as this reduced the amount of water discharged from the system and the need for recycling.

Other considerations for green wall design include the load-bearing capacity of the location and access for installation and maintenance. Regular, scheduled maintenance is a critical success factor for healthy green walls. This includes fertilisation of the plants and Deep Green recommends application via the reticulation system to provide appropriate nutrients directly into the plants root zone.

Outcomes

This green wall demonstrated the importance of the water retention properties of the media and modular system, noting the critical need for balance, as a high-retentive media is often too heavy while a less-retentive media is too dry. The final root mat media and irrigation system was four times as efficient as when it was first installed.

The green walls in this apartment complex are now a key sales feature recognised by the property industry for their visual appeal and contribution to improved amenity resulting from cooling and microclimate creation, occupants' connection to nature, and other human health and wellbeing benefits.

Contact details for further information

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