AN ECOLOGICAL APPROACH TO BUILDING DESIGN
SOLARIS

Text by Ken Yeang and Mitch Gelber
Images courtesy of T.R. Hamzah & Yeang Sdn Bhd

“Saving our environment is the most vital issue that humankind must address today; thus designing ecologically is crucial. Within this context it is clear that the building of green and ecological buildings is just one part of the entire environmental equation that we must address. We must ultimately change our cities into green ecologies in entirety as well as change all of our industries and manufacturing, all of our forms of transportation and all of the myriad human activities. In making these green we must integrate them seamlessly with the natural environment.

Addressing the current state of environmental impairment has to be carried out at all levels of our human world—globally, regionally, locally and individually. We need new social, economic and political models with non-polluting manufacturing and industrial production processes, using green systems and materials, that are carbon neutral and with zero-waste, as is the case with ecosystems in nature.” (Yeang, 2007)

Projects such as Solaris, now under construction in Singapore, and the DiGi Technical Operations Centre, recently completed just outside of Kuala Lumpur, are typical of T.R. Hamzah & Yeang’s innovative approach to skyscraper greenery. Both projects feature extensive vertical eco-infrastructure in the forms of roof gardens, vegetated ramps and large-scale green walls.

In Solaris, a 1.5-kilometre long landscaped ramp runs continuously along the perimeter. This uninterrupted ecological armature connects the adjacent park at ground level with a cascading sequence of roof gardens at the building’s highest levels. Similarly, continuous strips of vegetated green walls adorn the DiGi Technical Operation Centre’s facades, covering a total area in excess of 1460 square-metres. This constitutes 32% of the total surface area of the building envelope. The continuity of these landscaped features represent a key component of these projects’ ecological design concepts, allowing for fluid movement of organisms and plant species between all vegetated areas within the buildings, enhancing biodiversity and contributing to the overall health of these ecosystems. These building-integrated landscape systems provide ecological benefits to projects on multiple levels. They act as living filtration systems, improving the building’s ambient air quality, reducing carbon dioxide levels, regulating local humidity, trapping dust and reducing noise. Extensive skyscraper greenery also contributes directly to building performance by reducing solar gain (the transfer of heat by passive solar gain across the building envelope) and, by extension, building energy costs. It provides protection from the effects of UV radiation and acid rain, and helps lessen the building’s contribution to the heat island effect, whereby forests replaced by concrete and asphalt cause urban centres to become warmer than natural areas. Finally, these systems promote biodiversity by fostering bird...