

ALEXANDRA ARCH AND FOREST WALK

SOUTHERN RIDGES

Text by Elaine Lee
Photography by Jeremy San

From time to time, strategies shift. More than four decades ago, a strong political will, with Minister Mentor (then Prime Minister) Lee Kuan Yew at its helm, was the driving force behind Singapore's development into a Garden City. The visionaries were convinced that a greening programme would offer the competitive edge that would attract foreign investments to Singapore, on top of softening the harshness of urban living. Four decades of sustainable development involving strategic cultivation, infrastructural provisions, urban lungs, and a lot of preening and pruning later, the Garden City is phased out, or rather enters its next phase. Prime Minister Lee Hsien Loong's speech in 2008, at the opening of the pedestrian bridges and HortPark gardening hub at the Southern Ridges, heralded a shift. Not a paradigm shift, but the beginning of a new era in greening programme—a City of Gardens and Water. It has grown into an exercise that works on the adjectives. The City of Gardens and Water is a sustainable development promoting strategic "skyrise" cultivation, "seamless" infrastructural provisions, "recreational" urban lungs, and perhaps more preening and pruning.

The seamless recreational infrastructure started with the vision of the Urban Redevelopment Authority (URA) to link up the nine-kilometre rolling expanse of the Southern Ridges—consisting of the chain of hills including Mount Faber, Telok Blangah Hill and Kent Ridge. The aim was to form an uninterrupted network of linkages for the public to enjoy convenient access to nature. Today, that seamless connection enables an undisrupted stroll from HarbourFront MRT station all the way to Kent

Ridge Park. The formidable feat started in July 2002, when URA first announced its plans to link the Southern Ridges as part of the Master Plan 2003 Review. At that time, the popular hill parks at Mount Faber, Telok Blangah Hill and Kent Ridge were separated by either major roads or wooded vegetation.

In 2003, URA, in collaboration with the National Parks Board (NParks) and the Singapore Institute of Architects (SIA), organised an international design competition to select outstanding design concepts for the connections that were to be built. By 2004, the concept by LOOK Architects (Singapore) was selected for Alexandra Arch, a bridge that spans Alexandra Road, and Forest Walk, the adjacent elevated walkway. The design by IJP Corporation Ltd (UK) and RSP Architects Planners & Engineers (Pte) Ltd (Singapore) was selected for Henderson Waves, which spans Henderson Road. These two bridges form the main connectors to link up the hill parks.

Consultancy works for the connectors started as early as 2005, when a series of monthly Design Review meetings were organised with the consultants to keep the design development in check. Although there was a need to ensure that the new structures complemented the rustic character of the natural landscape unique to the Ridges and respected the terrain of the surroundings, the completed connectors were nowhere near rustic in expression. In fact both bridges and their corresponding park connectors are bold gestures that certainly complemented and are more often than not, customised to the terrain.



“WINNER OF THE 2009 CHICAGO ATHENAEUM—INTERNATIONAL ARCHITECTURE AWARD, THE TILTED ARCH BRIDGE RESEMBLES AN OPENED LEAF, WITH ITS FOUR-METRE-WIDE CURVED DECK INTERSECTING AN ARCH THAT IS TILTED AT A 70-DEGREE ANGLE.”



ALEXANDRA ARCH

Construction works for the Alexandra Arch and Forest Walk connectors commenced in the middle of 2006 and was finally completed in mid-2008. Spanning 80 metres across the busy six-lane Alexandra Road, Alexandra Arch is flanked by the two hilly areas of Telok Blangah Hill and Kent Ridge. Tracing westwards from the bridge leads to the Horticulture Park (HortPark) at Hyderabad Road and the park land at Gillman Village and eastwards leads to Forest Walk, an elevated walkway that skirts around the reservoir and eventually links to Telok Blangah Hill Park.

Winner of the 2009 Chicago Athenaeum—International Architecture Award, the tilted arch bridge resembles an opened leaf, with its four-metre-wide curved deck intersecting an arch that is tilted at a 70-degree angle. The pedestrian and cycle bridge is an asymmetric structure, comprising a single leaning arch supported by means of hanger fins. The imposing feature, an arching steel rib armature, rises 17 metres above ground level with 60 metres between springing points.


The four-metre-wide granite-surfaced deck, profiled in cross section and curved in plan, is designed by the engineers to act as a torsion box. The bridge's arch, deck and fins are all fabricated from steel and the whole assembly is supported by raking concrete piers which in turn are supported on piled foundations. To add to the challenge, the footings of the bridge and ramp were sited in between 230 KV High Tension cables and sewer mains. The deck is paved with 40-millimetre trapezoidal-shaped granite pavers, each weighing approximately 90 kilograms and supported on telescopic pedestals, which eliminates the need for heavy sand and mortar beds. Lifting the pavers also reduces problems associated with drainage, efflorescence and differential expansion between the steel bridge and pavers. It also conceals electrical services, which is essential as lighting forms part of the appeal of the Alexandra Arch. The pyrotechnic display of LED lighting changes colour at intervals from evening till midnight daily, displaying varying shades from the colour spectrum of dusk.





OPPOSITE & THIS PAGE The pyrotechnic display of LED lighting changes colour at intervals from evening till midnight daily.



An aerial photograph showing a dense, lush green forest covering a hillside. A network of elevated walkways, constructed from steel, is visible winding through the trees. In the background, a city skyline with various high-rise buildings is visible under a clear sky.

“ PREFABRICATED STEEL COLUMNS, BEAMS, GRATINGS, BALUSTRADES, RAILINGS, AND EVEN RAIN SHELTERS WERE ASSEMBLED ON SITE WITH MINIMUM EQUIPMENT AND SMALL MACHINERY TO MINIMISE DISTURBANCE TO THE SITE. ”



FOREST WALK

Connected to the Alexandra Arch is Forest Walk, which offers a varied range of experiences from raised walkways to earth trails through the secondary rainforest floor of Telok Blangah Hill. The feature of the Forest Walk is a 1.6-kilometre elevated walkway.

According to Mr. Look Boon Gee, Managing Partner of LOOK Architects, the walkway was conceived metaphorically as a vigorous weed, the Mile-a-minute, which attaches itself to the surrounding landscape. Designed to take advantage of the hilly and forested topography, the walkway offers views of lush forest ground and tree canopies, distant harbour views, even colonial houses. It was first conceived on paper with expectations to make adjustments on-site to accommodate rare species of trees or plants, such as the Grasshopper Tree, Squirrel Mango (*Otak Udang*), the Mousedeer Fern (*Paku Pelanduk*). Fortunately, the architect was able to adopt most of the original scheme with a few minor diversions at the dense forested area.

The 1.8-metre-wide elevated walkway, with heights ranging from 3 to 18 metres, is pedestrian-friendly with very negligible incline planes. It mitigates what would have been a climb of 70 metres and meanders in a zigzag fashion to hug the steep slopes. The design strategy of a kit-of-parts concept, worked out to be highly flexible and appropriate in the dense forest context. Prefabricated steel columns, beams, gratings, balustrades, railings, and even rain shelters were assembled on site with minimum equipment and small machinery to minimise disturbance to the site.

Metal decking with fine grating gives a heightened sensation when walking through the forest, such that one is constantly aware of the elevated positions. Again, the decking is of triangulated modules inspired by the geometric leaf shape of the fast-growing Mile-a-minute plant. The hot-dipped galvanised mild steel grating, prefabricated with closer gaps, is wheel-chair and pram safe, so that it can be enjoyed by all.

The completion of the Southern Ridges, demonstrates a new level of sophistication in the local greening programme. In the pipeline, is the completion of a seamless connection between Southern Ridges and the Keppel Waterfront Park. Branching out from Alexandra Arch, a new connector would run along Alexandra Road to convene at Labrador Park, which in turn would link to a mangrove boardwalk at Berlayer Creek. Eventually this leg would connect to a waterfront boardwalk from Bukit Chermin all the way to VivoCity, featuring waterfront views along the Keppel Bay stretch. The City of Gardens and Water offers an unprecedented accessibility to nature where the new recreational playground is a showcase of the distinct biodiversity of nature at its best. What started as an economic strategy and health standard consideration has emerged as one of the most successful branding exercises of this island. The success of the green programmes lies in their transcendence of regulations to define the character and soul of our city—a mean feat achieved through consistency of creating simple joys that is appreciated unanimously.

For more information, visit www.nparks.gov.sg.



OPPOSITE The elevated walkway has a height ranging from 3 to 18 metres.

TOP View of a shelter.

BOTTOM The decking is of triangulated modules inspired by the geometric leaf shape of the Mile-a-minute plant.

**ALEXANDRA ARCH****length** 80m**width** 4m**height** Average height of 6m above Alexandra Road**finishes** Granite slabs on pedestal supports**ELEVATED WALKWAY AT FOREST WALK****length** 1.3km (1.6km inclusive of circular ramps and lookout points)**width** 2m (1.8m clear)**height** 3–18m above the ground**climb** 58m**finishes** Hot dipped galvanised mild steel columns and gratings**project cost** Approx. S\$13 million**year of completion** May 2008**master planner & developer** Urban Redevelopment Authority**owner** National Parks Board**architect** LOOK ARCHITECTS Pte Ltd**project team** Mr Look Boon Gee**civil & structural engineer** Ecas-EJ Consultants Pte Ltd, Buro Happold (Singapore) Pte Ltd**mechanical & electrical Engineer** HY M&E Consultancy Services Pte Ltd**quantity surveyor** JIA Quantity Surveyors & Project Managers Pte Ltd**main contractor** CKT Thomas Pte Ltd**steel specialist** Yong Nam Engineering & Construction Pte Ltd**lighting specialist** Lighting Planners Associates Inc.

TOP, BOTTOM Night view of the Forest Walk.