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Nature/Building

ACROS Fukuoka's Step Garden

ACROS – Why a green roof?

ACROS (Asian Crossroads Over the Sea) is a mixed commercial-public building located in Fukuoka, Japan. Opened in 1995, it serves as a prefectural international hall, and hosts an exhibition hall, a museum, a 2000-seat proscenium theater, conference facilities, 600,000 square feet of government and private offices, as well as a large underground parking and retail spaces.[1]

In 1993, the city of Fukuoka needed a new government office building, but the only available site in the center of the city was also the only green space in the area. To offset the impact of depriving the residents of half of the five-acre Tenjin Central Park[2], the architect (Emilio Ambasz & Associates) decided to include a green roof in the design of the new 15-story building – an original move at the time. The goal was "to create new public land equal to that lost to the development"[3].

As a result, ACROS has two distinct sides: its north face presents a traditional urban facade on the most prestigious street in Fukuoka's financial district. On the other hand, the south side of the Hall is reminiscent of a green hill which connects to the existing park.

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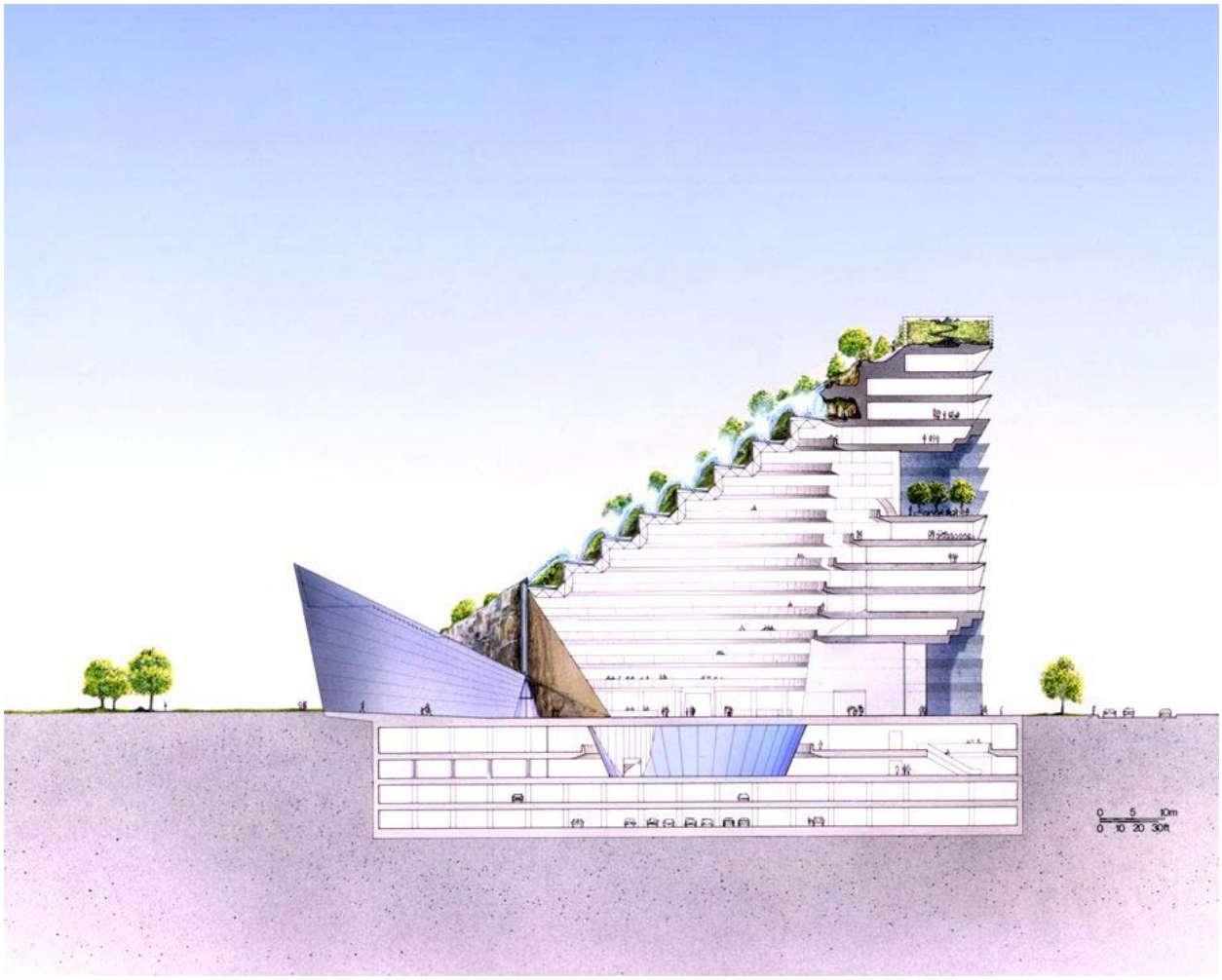
[1] Emilio Ambasz & Associates, Fukuoka Prefectural International Hall
http://www.emilioambaszandassociates.com/portfolio/portfolio.cfm?Pid=7
[2] Tower in a wild kingdom, BusinessWeek; 11/06/2000, Issue 3706, p140-140
[3] Green Roofs: Ecological Design & Construction, Earth Pledge Foundation, 2005

North side: modern office building

South side: small mountain of lush greenery

A stepped-terrace garden

Unlike conventional green roofs, ACROS's is actually a staircase-shaped rooftop garden which climbs the entire height of the building, reaching 60 meters above ground[4].



Source: Greenroofs.com, ACROS Fukuoka Prefectural International Hall

35,000 plants representing 76 species populate the fifteen terraces, adding 100,000 sq. ft. to the greenery of Tenjin Central Park[5]. The Takenaka Corporation, who participated in the construction of ACROS, wanted the building to be seen as a mountain[6], and thus opted for an intensive green roof[7].

[4] ACROS Fukuoka: The serene green roof of Japan!, Sameer Kumar, Jul 23 2008 http://www.ecofriend.org/entry/acros-fukuoka-the-serene-green-roof-of-japan/

[5] Green Roofs: Ecological Design & Construction, Earth Pledge Foundation, 2005

[6] Takenaka Corporation, ACROS Fukuoka Prefectural International Hall, http://www.takenaka.co.jp/takenaka_e/env_pro_e/09_across/01.htm

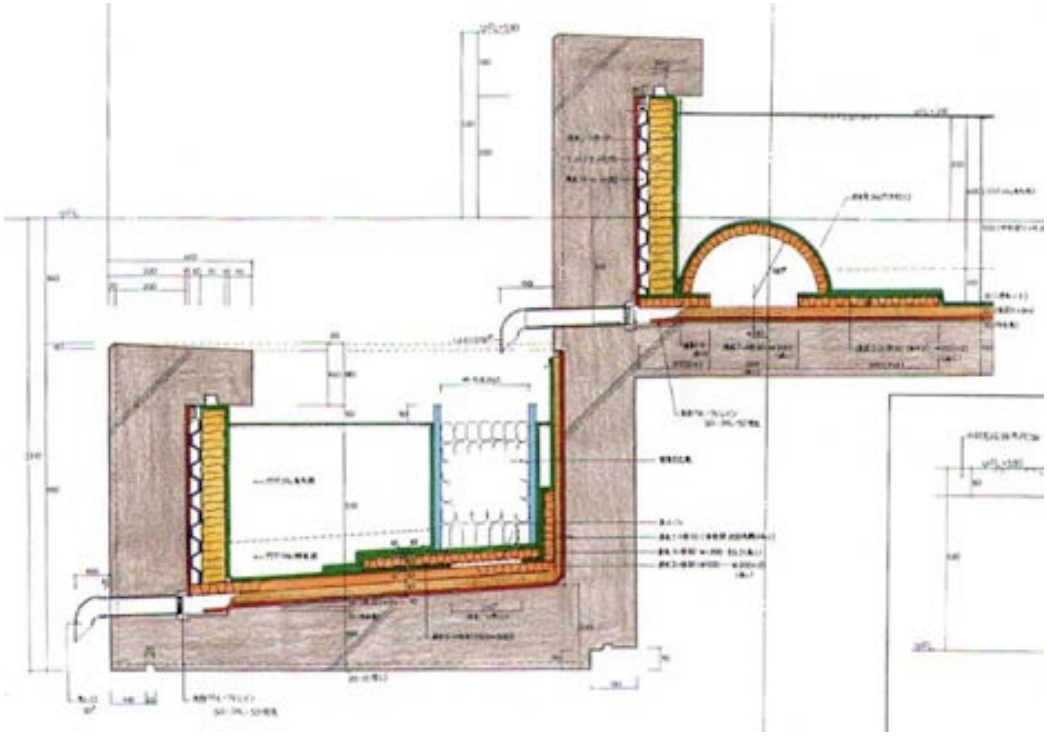
Source: www.metaefficient.com Amazing Green Building: The ACROS Fukuoka

Aesthetics played an important part in the design of the roof, whose "space configuration and vegetation configuration was adopted to represent the changes of the four seasons[8]."

[7] Greenroofs.com, ACROS Fukuoka Prefectural International Hall, http://www.greenroofs.com/projects/pview.php?id=476

[8] Takenaka Corporation, ACROS Fukuoka Prefectural International Hall, http://www.takenaka.co.jp/takenaka_e/env_pro_e/09_across/01.htm

Besides enhancing its appearance, the design of the garden simulates the drainage system of a natural mountain, where rainwater permeates into the soil of the tops floors and follows water paths, runs through hanging planters before permeating through the lower floors and reaching ground level.[9] As a consequence, water runoff volume is reduced and partially treated (for nitrate nitrogen)[10].



Source: Greenroofs.com, ACROS Fukuoka Prefectural International Hall

The leave trees and bushes on ACROS's green roof also participate in reducing the heat island effect, as studies have shown that the plants created a microclimate around the building which cooled the area[11]. In the summer, temperature on ACROS's roof is about 15°C lower than that of an exposed concrete roof, staying at about 38°C (100°F) [12].

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[9] Takenaka Corporation, ACROS Fukuoka Prefectural International Hall, http://www.takenaka.co.jp/takenaka_e/env_pro_e/09_across/01.htm

[10] Runoff water quality from intensive and extensive vegetated roofs, Justyna Czemiel Berndtsson, Lars Bengtsson and Kenji Jinno, Ecological Engineering, Volume 35, Issue 3, 4 March 2009, Pages 369-380

[11] Field measurement on the micro climate around the building with the large stepped roof garden, Hagishima et al., 2003, http://ktlabo.cm.kyushu-u.ac.jp/j/archive/pdf/acros2003_low.pdf.

[12] Daily Yomiuri, Green data from Fukuoka, By Asami Nagai, 29 November 2003

ACROS and nature in the city

The architect Emilio Ambasz and Associates succeeded in preserving the public space that was lost in building ACROS: the green roof transitions seamlessly into Tenjin Central Park, and is open to the public except on rainy days[13]. The terraces provide space for meditation and relaxation, as well as a view of the bay of Fukuoka and the surrounding mountains. Pools were included in the design as well, along with jets simulating a waterfall[14] isolating dwellers from the noise of the city.

ACROS enjoyed worldwide recognition for its original design and won several awards such as the First Prize of the 2001 Japan Institute of Architects Certificate of Environmental Architecture[15]. The building was also chosen to be on the cover of the book *Green Roofs – Ecological Design and Construction* by the Earth Pledge Foundation. Indeed, ACROS combines the developer's desire for profitable site use with the public need for open space[16]. The building and its neighboring park coexist in perfect harmony.

Source: Green Roofs – Ecological Design and Construction by the Earth Pledge, 2005

[13] Exploring Tenjin's Attractions, Fukuoka Tenjin Style, http://style.welovetenjin.com/about/attraction/nature_01.html

[14] Greenroofs.com, ACROS Fukuoka Prefectural International Hall, http://www.greenroofs.com/projects/pview.php?id=476

[15] Tower in a wild kingdom, BusinessWeek; 11/06/2000, Issue 3706, p140-140

[16] Green Roofs – Ecological Design and Construction by the Earth Pledge, 2005