

LAGI 2016

Project: Seascape

Energy Technologies: Solar, Vapor Compression Distillation

Annual Solar Energy Capacity: 18,615 kWh

Annual Potable Water Capacity: 13,687,500 Gallons

Description

Inspired by sacred geometry, these structures standing tall in the midst of an ever-expanding ocean portray the dualities of humans and nature. Can the two coexist? Does proliferation of one necessarily threaten the other? Used as a decorative motif since ancient times, the flower of life's universal patterns serve as the foundation for the design of the Seascape. The same patterns are also believed to be the foundation of design from which the universe, including both man and nature, are contrived. The flower of life pattern and its intricately interwoven parts suggest to onlookers that the built environment and nature may not be as separate as we have made them out to be.

Within the petals of each tower sits the technology used by Dean Kamen in his 'SlingShot' water-purifying device. The 'SlingShot' uses vapor compression distillation to turn grey water and black water into potable water. Grey water and black water from the pier (restrooms, restaurants, showers, drinking fountains etc.) will be diverted to the towers where it will be cleaned and purified, then sent back to the pier as potable water. The sludge that remains after purification will be sent to the Santa Monica Water Treatment Facility for proper disposal. About 10 times the size of Kamen's 'SlingShot' that produces approximately 1000 liters (250 gallons) of pure water every day, vapor compression distillation machines in the Seascape will produce a total 13,687,500 gallons of potable water per year. Vapor compression distillation technology can also be used to desalinate water, however, desalination has environmental impacts that are extremely difficult and costly to mitigate.

The glass orbs resting atop each of the towers is solar technology as developed by Rawlemon for their "Beta.ray 1.00" generator. Each globe has a capacity of 3.4 kWh per day. With a total of 15 globes atop the 3 towers, the Seascape produces 18,615 kWh in the course of a year; just enough to power the vapor compression distillation devices making the towers carbon neutral. Rawlemon's design uses a spherical lens that concentrates sunlight onto a small photovoltaic panel. The design is also equipped with a dual-axis pivoting support structure that allows it to track the movement of the sun, maximizing the amount of energy collected throughout the day. Additionally, the support frames for the solar globes are equipped with all plugs needed to connect to the grid, sending any potential excess energy collected back into the system. As night falls and the sun's beams disappear below the horizon, the globes are transformed into high-powered lamps as LED lighting is magnified inside them.

The dimensions of the towers will be roughly 71 meters tall and 19 meters wide. The structures themselves are built out of primarily recycled materials including steel, glass and concrete.

Environmental Impact & Mitigation

Because it does not take in water from or release any water into its surroundings, the effects of the Seascape's water purifying process on the environment after construction are little to none. Because the area is already heavily developed, replace the breakwater with this structure will not adversely effect the location. Additionally, all water-purifying technologies are powered by solar energy that is harvested through the structures' solar globes and photovoltaic panels. In sum, the effects of this structure on its surrounding environment are negligible.