Experience

Most people never witness the power of the ocean first hand. The ocean holds the power to sink ships with hundred foot walls-of-water, destroy coastlines with rising waters; but it can also power cities and provide clean drinking water for millions of people. WAVELENGTHS harness the raw power in the ocean to help provide the city of Santa Monica a new option for producing potable water as well as renewable energy, while also allowing visitors of the Santa Monica Pier to inhabit an environment completely powered by incoming waves. Wavelengths stimulates all five senses to create a new way of interacting with the ocean, combining: the smell and taste of salt in the fresh breeze, the sight of light as it passes through the water in the air, the calming sound of water drops and gentle waves crashing on shore, and the cooling feeling of walking through a shaded garden on a hot summer day. The culmination is an educating experience that helps the users understand the raw strength of the ocean and how it can benefit us on land.

Technologies

The main energy generating system is adopted from a wave farm in Portugal; this system uses high pressure oil to spin a generator within the joints of floating buoys. Energy is also generated through the rotation of each module, similar to a water wheel powering a sawmill. The total energy generated is passed through the pumps that run the reverse osmosis process and then onto the Santa Monica Grid, the result is both clean energy and clean drinking water.

Environmental Impact

Producing clean drinking water is an energy intensive process averaging six kilowatts to produce one glass of clean drinking water. Wavelengths uses the embodied energy in the ocean’s waves to overcome the energy intensive process of providing clean drinking water to help alleviate a massive drought that has had California in a strong hold the past five years. The estimated annual production of clean water is around 3.5 million gallons of water a year, at an energy cost of about 4500 kilowatt-hours. On the other side, the estimated annual energy production from the system is estimated around 10,000 kilowatt-hours a year; the net energy production a year after considering the energy needed to clean ocean water is 5500 kilowatt-hours a year, enough energy to power 6,000 homes a year.

Another important environmental impact to consider is the effects on marine life. Wavelengths floats on the ocean surface and is tethered in place by support cables to have the least negative effect of the life fish and plant life below. The tether as well as the main cavity in the module allow for new habitats to form for smaller marine life offering a covered cavity that would protect them from larger predators.