Concept

Santa Monica, California offers golden beaches and year round warm weather. This proposal aims to create a sculptured island, with an independent roof structure formed after a spiral shell. The roof will be covered in OPV (Organic photovoltaic) solar panels that will provide clean renewable solar energy back to the grid.

The Spiral Shell shape is based on a Fibonacci Spiral sequence, using the top halve for art exhibitions and the bottom for fish conservation.

The structure will act as an extension of the current embankment, giving a larger area of beach with reduced wave intensity and protection against beach erosion.

The Sun Shell is to promote use of sustainable energy and to teach about conservation.

Program

Once arriving at the Sun shell by ferry the visitors are greeted by an open entertainment space with a stage and seating. By walking up the ramp the visitors will see that are walking under a great arch made of steel and high tensile solar cloth. Colourful light emitting from the stained glass will form patterns on the timber decking and the wavy water below. As the visitors continue their journey on the timber landscape they will come to a large exhibition hall that can be used to exhibit some of the area’s most influential artist.

As the visitor make their way around or even over the exhibition hall they can see how the columns of the Sun Shell frame the city of Santa Monica. By looking down to the water the visitors see that they are walking over the fish hatchery which is used to spawn species of fish caught by the fishing industry. This is to promote conservation of the various species. The fish hatchery can also be used to help breed endangered species and release them back into to the ocean.

Continuing with the journey the visitors come to an added extension of the local flora of Santa Monica. The raised area is covered with Coastal sage scrubs. A ramp takes the visitors down to a sea pool looking back at Santa Monica. A ramp further on takes the visitors over the aquarium. The visitors can decide to enter the aquarium or walk over it to the departing area where a ferry will take them back to the Santa Monica pier.

Dimensions

Height - 44,363 m

Width - 96,135m

Length - 400,272 m

Energy

The energy type used in this design is solar energy. Making use of new technology CIGS (Copper Indium Gallium Selenide) This technology is incorporated into an ultra-thin, flexible and light weight material which makes it easy to apply it to flexible or tensile roof structures.

This project makes use of CIGS (Copper Indium Gallium Selenide) thin-film technology as the basis for our solar PV systems. CIGS has a more extensive absorption spectrum than silicon (Si) panels. CIGS has a much better spectral response that is closely aligned with the entire spectrum of light. This means that CIGS absorbs light for longer throughout daylight hours. Silicon is very sensitive to small amounts of shading, CIGS on the other hand is much more tolerant to higher levels of shading. When shaded, CIGS technology will continue to produce efficient amounts of electricity, whereas Si will not.

The solar panels will be installed on to the tensile roof structure that face south, of which there is 13 sections. That gives as the energy generation as show in the table below

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| --- |
| Solar Energy Generation |
| Average W/h per m2 | 5260 W/h |
| m2 | 1120 m2 |
| Total Area in m2 | 14560 m2 |
| Total MW/h per Day | 76.58 MW/h |
| Annual MW/h | 27953.74 MW/h |

Materials

The materials chosen is reinforced concrete, treated steel, timber that’s found in the region and stained glass. The concrete which the structure will rest on is to add structural stability against wave impact and add to longevity of the Sun Shell.

Artist

In this project the stained glass is inspired by the artist Adamm Gridlefeld. Gridlefeld’s stained glass studio and art gallery is located in Santa Monica which specialises in the restoration of stained glass windows from the historical buildings within Santa Monica and around the world.

The use of the stained glass is to inspire regionalism. This effect will make the Sun Shell apart of Santa Monica’s culture by using an artist or artist trade that is found in the city. The many different colours is symbolise diversity which Santa Monica is known for.