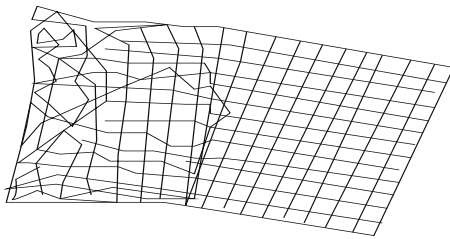


FLUX101

Introduction

The main key concept would be flux, which means movement. Main intention was to create a transition according to the site context. The final form derives from the site response that we have gathered through thorough analysis.

Strategies

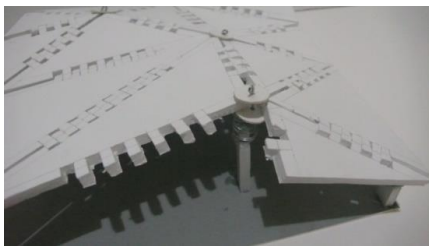


The transition of the form changes from an orderly manner to a disorderly manner as it gets closer to the harbour. This would be due to the amount of movement created by the land and the water. There are more movement generated by the water than the flat land thus, the form changes accordingly. Such dissolution of grid is also the the main

intention of our design: re-establish the linkage between our site and the little mermaid statue.

In addition, people's safety for public viewing of education purposes was taken into consideration. The main idea was of course to integrate renewable energy technology. There are three energy generating device that we focuses on; wave energy, wind energy as well as human interactions.

Wave Energy



Taking advantage of the site surroundings, we are incorporating wave generating device that collects energy through human movement. The panel would move up and down according to human movement as well as wave movement. There would be an interlocking connection between two panels that allow movement. At each main

intersection of triangles, there would be a circular point that keeps the connection together. This would then allow a connection from the walking panel to the sea bed. Spring would be integrated in the design to allow an up and down movement. The bottom portion of the panel has a tiny slit that allows wave to flow through it according to the human movement. As the water flow through the slit, energy would then be generated and collected.

Wind Energy

There are certain parts of the site that has tremendous amount of wind. Wind travels from the South-West to the North-East direction which has a great advantage to place a wind tunnel in the form which allows wind to travel faster in a more tight space. At the end of the wind tunnel, there are wind generating elements for energy collection.

Human Interaction

It is important to incorporate human interaction to the designed form as involvement of public is also a focus of sustainability. It is rather important to allow connection between the two; in this case, the structure was designed in such a way that allows users to stand on top of the structure to maximise their views on the mermaid on the opposite side. This touches on the educational

experience given to students. The wave interactive panel also allow a lot of interaction with users and educational experience on the energy saving devices.

Materials

Timber material will be used in the final structure form as it is natural. It is safe to handle and touch, it does not break down into environmentally damaging materials. Timber is made from carbon to convert the wood into trees which then reduce the amount of greenhouse effect in the structure. It is a natural insulator and can reduce energy needs. Timber is versatile and can be used in a wide variety of ways. Being light, it is easily installed and can be worked with simple equipment.

As the material for the wind panel, steel our finalised material choice. Steel is inorganic whereby it will not rot, split or crack. This is a good quality as the wind turbine is going to be moving most of the time. Durability is key. Apart from that, it is easily disassembled for repairs, alterations or relocation. This is also a good advantage point, should there be a need to change if it is broken. Steel is also 100% recyclable to touch on sustainability in the building. Steel also slows down the aging process with less maintenance.

Estimation of Energy Generation

Wave:

$$\begin{aligned}P &= 0.57 \times (H_s)^2 \times T_p \\&= 0.57 \times 1 \times 2 \times 5 \\&= 5.7 \text{ kW/m}\end{aligned}$$

Link to calculate wave energy:

<<http://www.dexawave.com/energy-content.html>>

Wind :

$$\begin{aligned}P_{\text{avail}} &= \frac{1}{2} \times \rho \times A \times v^3 \times C_p \\&= \frac{1}{2} \times 1.23 \times 0.9 \times 19.68^3 \times 0.5 \\&= 5.44 \text{ MW}\end{aligned}$$

Link to calculate wind energy:

<http://www.raeng.org.uk/education/diploma/maths/pdf/exemplars_advanced/23_wind_turbine.pdf>

Human activated energy :

The energy generated is yet to be studied but this proposal can acted as a ground for future research.

Environmental Impact Statement

Purpose and Need of the Proposed Action

The installation is designed for the purpose of generating renewable energy through interactive panels floating on top of the water and the wind energy devices installed. It also created a recreational space for the visitors as well as indoor waiting area for water taxi. The paragraph below would illustrate and analyze how the surrounding environment and cultural sites is affected.

Affected Environment

The impact to threatened or endangered species and air and water quality would be taken into consideration. Also, the impact to historic and cultural sites as well as the social and economic impact to local communities, aesthetic and noise impact would be considered.

Analysis of environmental impact

•Air and water quality impact

There are green vegetation planted on top of the installation. With the aid of plants, the process of phytoremediation helps remove environmental airborne toxins. The quality of water in front of the site could possibly be managed and improved due to the interactive panels installed. The waterfront area becomes a managed and controlled area. The paved surface will be kept clean.

•Social and economic impact to local communities

The installation could form a gathering place for people. The plants and seating form an outdoor garden and the shaded area becomes a place for community purpose. A place is also reserved as water taxi waiting area. It could be a first stop for tourists and local visitors.

•Impact to aesthetic and noise

Although the installation formed a kind of big structure, the height of the installation is kept below the height of surrounding buildings to avoid adverse visual impact on environment. Timber is used as the materials of panels which could avoid the reflection of sunlight on surrounding buildings. However, there may be noise produced by visitors and the wind turbines.