**Interlink + Beacon**

* ***Description\_***

Upon thorough investigation into the history, cultural heritage, topographical conditions, and details of the urban design framework for St. Kilda, Australia, it was deemed necessary that the developing project idea be grounded on generating a design that adheres to the demands of the people of St. Kilda and is considerate to maintaining the values held by the locals. Simultaneously, an additional driving force was the implementation of renewable energy – it was important to recognize that this implementation would not be discreet, but rather would be a celebrated and evident feature of the design proposal, thus soliciting visitors and spectators to acknowledge, investigate, and appreciate the positive impact of utilizing renewable resources for energy generation.

The research into St. Kilda, Australia indicated that beachside suburb offers a place of gathering and community, and that the locals were protective of this defining characteristic. They value the iconic structures that tell the site’s history, such as the Palais theatre and the neighboring Luna Park, as well as the natural topographical features that identify the uniqueness of the site, such as the beach, foreshore, and the Slopes. Additionally, in analyzing the ideas and concepts grounded for future development in the masterplan, there were two key elements which were consistently reiterated throughout, and thus deemed especially valuable to the locals due to their emphasis. The first was the desire for a new iconic structure that enhances and complements the existing iconic features of the site; the second was the emphatic demand of creating stronger connections between the beach and the primary St. Kilda Triangle Site. Drawing from these points – along with the incorporation of sustainable means – the **Interlink + Beacon** responds to such concerns as expressed in the sets of documents put forth by The City of Port Phillip, Australia.

The **Interlink + Beacon** proposes an intervention that consists of two essential components: a “connector” and a “marker”. The connector refers to the interlinking bridge that directly guides the pedestrian circulation from the Triangle to the foreshore. The bridge respects the natural contours of the site, which the locals want protected, in multiple ways. For one, the bridge anchors itself and merges with the Slopes that line the Esplanade, a design decision which offers multiple advantages. Respecting the local activities and events that take place along the Esplanade (specifically the Sunday Esplanade Market), merging onto the slopes offers a significant platform extension – approximately an additional 192,000 m2 – for hosting these activities, thus providing more incentive for extensive hosting and participation of local events. It also leaves room at the heart of the primary site for lawn/ plaza space, open and flexible to any additional activities or performances, as well as a pleasant rest area for visitors to sit, eat, and relax. Finally, it also takes advantage of the significant sectional shift the occurs in the landscape. The slopes are a natural response to the abrupt drop in sea level height change that occurs in the ground moving from the Esplanade to Jacka Boulevard. The bridge proposes an added level to its program that calls for the Slopes to be carved out, and an “underground” condition be created. The circulation that occurs on the lower level of the bridge could then continue and guide visitors to these “underground” spaces. This then transforms the function of the Slopes to that of a green roof over these conditioned spaces underneath, without ever taking away the quality of the Slopes with makes them unique to the people and to the site.

The “marker” is characterized by an energy generating tower that functions as the attracting beacon with the potential of being an added identifying element of the site. The tower is situated on the secondary site, across Jacka Boulevard, nearing the foreshore, yet its 15-meter footprint offers minimal obstruction to the natural conditions to accommodate for its intervention. The tower – which stands at approximately 67 meters in height – harvests energy using wind power, and its construction is designed to both maximize energy capture and facilitate fabrication. Running through the center of the tower is the spine of the tower, the center of its structural integrity around which the other elements are built around, which can be fabricated using recycled steel. The most defined feature of the tower is the skin, whose complex and intricate geometry will hold savonius vertical axis wind turbines. Its design offers the flexibility of placing any number of turbines throughout the structure, though in the diagrams detailing the tower, 43 are used, with each individual turbine generating approximately 1000kW each (43 kW). The turbines are relatively small in scale, the largest reaching approximately 2 meters tall, and are designed to operate with minimal noise in range of wind speed, catch wind coming from any direction, and does not affect bird life. The simplicity of the tower’s fabrication even offers the potential of lining several towers all along the beach, extending even beyond the boundaries of the site, thus offering even more opportunity for energy generation.

* ***Technology Used\_***
* Savonius Vertical Axis Wind Turbine
* ***Energy Generation Estimate\_***

*\*Each turbine varies slightly in size, to accommodate into the asymmetrical and complex geometry of the tower’s skin. These estimates use the average for turbine sizes.*



**Individual Turbine – Approximately 1288 kW**

**Aggregate potential for one tower – 55.4 kW**

* ***Primary Materials\_***

-Concrete

-Recycled Steel

-Architectural Glass

* ***Environmental Impact Summary\_***

The bridge intervention of the proposal will run mainly on passive ventilation, since it does not exhibit any fully enclosed spaces, thus imposing minimal impact on the environment. Additionally, the fact that it is elevated from the ground minimizes the need to make any significant modifications to the inherent environment, thus reducing any negative impact on the surroundings natural ecosystems. The moment the bridge touches ground occurs on secondary site across Jacka Boulevard, neighboring the tower intervention. At this moment, a plaza space holds these two elements, which takes up roughly 7,240 m2 of the foreshore land. Regarding the tower, its design is made to simplify the fabrication and cost in labor, and its pieces can be made using recyclable material. The turbines themselves also impose minimal hazard to the local bird life, since the turbines incorporated spin 90% slower than the average turbine. The only conditioned spaces within the project occur in the “underground” intervention under the Slopes. However, transforming the slopes into an extensive green roof that covers a significant portion of the conditioned spaces offers a solution that responds to the needs of energy conservation.