



The Experience
The prevailing south westerly wind blows off the bay, past Melbournians enjoying the beach, through the Catani Gardens, and across Jacka Boulevard on its way to Rotor. A visitor to the installation lies in the grass and watches as the wind drives the turbines, ripples the foliage around her, and causes the branches of the eucalyptuses to sway before it disappears past the turbines on the far side.

Rotor is an immersive artwork that operates simultaneously at human and urban scales. The phenomena of wind and the renewable energy derived from it, the experience of feeling it on your skin and of seeing its effect on the immediate environment around you are the central themes of this installation.

Rotor has the capacity to communicate the science and poetry of wind and to engage with the widest possible public in ways that large wind turbines simply can't due to either a combination of their size and or their placement (out at sea, or in a remote location). It seeks to harness the innate beauty of this invisible phenomena and to render it visible.

The Proposal
Rotor is a circular array of adapted proprietary 1.5kw Savonius type vertical axis wind turbines (VAWT's). Where as, Darrieus turbines rotate at high speeds, and are subject to low torque and generate power through lift, Savonius turbines rotate slower and generate power through drag and are subject larger amounts of torque. We propose a custom rotor which will be made from stainless steel, polished to produce a highly reflective surface. The post of the VAWT will have a cylindrical 'sheath' of stainless steel wrapped around it so that it too functions as a mirror. Rotor comprises of three horizontal layers. The upper and middle layers of the structure are made up of VAWT's offset so that the post of the uppermost turbines has an unobstructed connection to the ground. There are no VAWT's on the lower layer due to the obvious safety implications, instead there are fixed stainless steel panels that define entry points and conceal the posts from the middle layer of turbines. We were keen that 'structure' or at least its visibility, should be kept to a minimum so that the primary sense one got from the artwork was of its dynamism and lightness.

The turbine rotors measure 2m wide by 3.5m high, the posts that they sit upon are either 3.5m or 7m depending on whether they are on the middle or upper layers. There are 30 panels or turbines per layer, which results in a structure that has a diameter of 30 m and height of 10.5 m. The 'plant' (including the control units and the inverters) for the installation will be located at the foot of the slope on which it sits, facing on to 'Jacka Plaza' for easy access.

We have spoken to producers of VAWT's in order to gauge the feasibility of our proposal and to assess issues relating to their adaptation. We are

reassured that there are no significant hurdles to overcome. VAWT's where chosen for several reasons; They are a mass produced proprietary technology that's widely available.

Their ability to work well in urban contexts

Their ability to still work efficiently even when closely packed, unlike horizontal turbines, the performance of which is compromised by turbulent air.

They are omni directional, and therefore don't need to pivot like horizontal turbines.

They are quieter and less dangerous to bird life than horizontal turbines

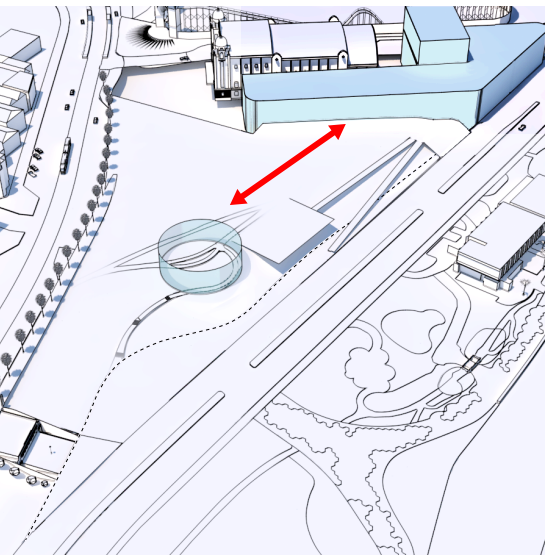
Our proposal was inspired by and is tightly integrated with the St Kilda Triangle Master Plan. We have chosen to locate it upon 'The Slopes', in between the 'Jacka Plaza' and 'Lawn' areas indicated in the masterplan. The 'Promenade' that snakes through the site intersects with our proposal. We have 'sculpted' the gradient of the 'Slopes' in the immediate vicinity of the artwork to provide a larger amount of flat ground to situate the installation. Our proposal also redirects one of the radial staircases that are indicated in the masterplan through our proposal so as to have a direct connection from the Jacka Plaza. The coastal planting and Australian natives that are specified in the masterplan are a key feature of our proposal, our desire is for the visitors to be immersed in the spectacle of the swaying grasses and the gentle rocking of the eucalypts as they move with the wind. The circular plan of Rotor was chosen for a number of reasons, externally, both up close and from far away, it is a clearly understood form, and its placement on a promontory on the triangle site means it will appear as beacon at night and a shimmering ethereal presence during the day. However, when the visitor walks inside the structure the primary effect of the cylindrical form in conjunction with the reflective, rotating turbines will be one of immersion, the horizon will be obscured and the world outside of the 30m diameter structure will only be fleetingly present in the reflections of the panels.

Energy Generated
We will be using sixty 1.5kw VAWT's in Rotor (thirty per layer). For this estimate we have assumed a figure of 5.7 m/s for annual wind speed (this is the average from the data from St Kilda Harbour wind data supplied by LAGI). We have been informed by a manufacturer that typically this will result in 80 RPM, which in turn corresponds to 200W of power, please see below for further workings:
200w x 24hours = 4800 watt hours/day or 4.8kWh/day

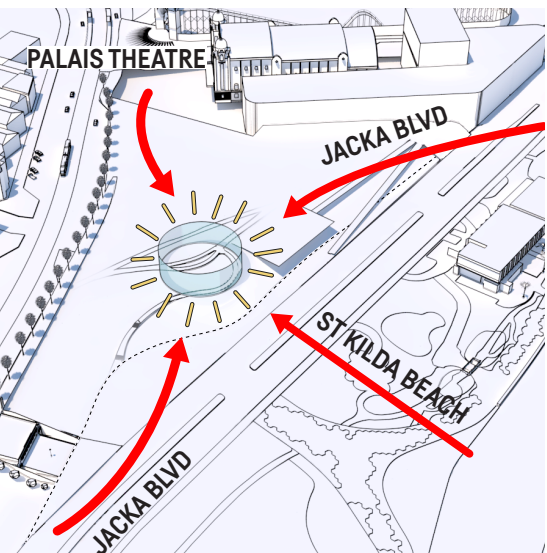
4.8kwh day x 365 days = 1752 kWh/year

1752 kWh x 60 [no. of turbines] = 105.120 kwh per annum or 105.12 MWh per annum

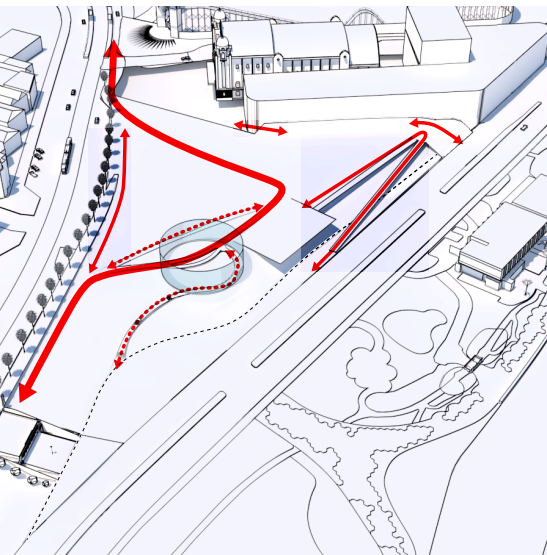
Environmental Impact Summary
Rotor seeks to have minimal environmental impact. It uses a modified VAWT, which pose less of a threat to birdlife than traditional horizontal turbines. By using an 'off the shelf' product it will be relatively easily to calculate the cost of the artwork in relation to the amount of energy generated. Our proposal is a simple one that will be straightforward to build and maintain. The turbine's components would still be covered by warranties which will insulate the client from running costs. The anticipated long lifespan of the artwork (and the ability for it to be broken down to it's constituent parts and then re-used) should mean that embodied energy in the turbines and in the artwork's construction in general, can easily be offset by the amount of energy it will generate. We acknowledge that the design of the rotor is sub-optimal, we have sacrificed mechanical efficiency in order to create an immersive and beautiful artwork that will engage with the public and that has the potential change peoples' perceptions of wind turbines and wind energy.



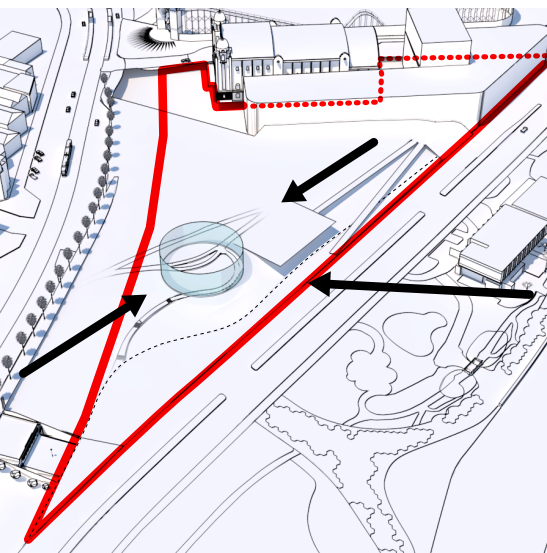
01. Cultural Attractor
Rotor compliments the provision for a cultural precinct on the site and acts as a centrepiece in the park.



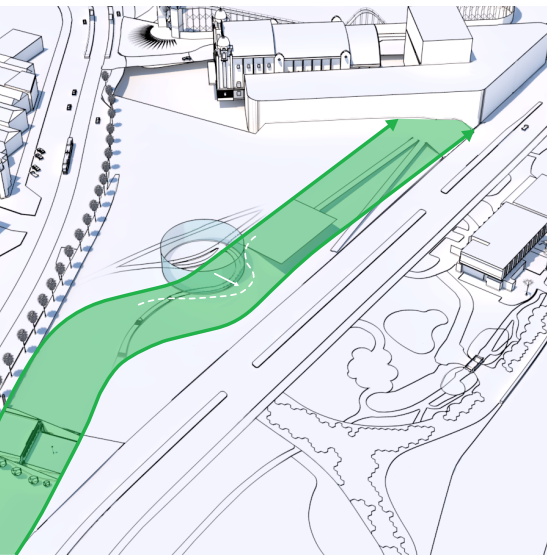
02. Beacon
The artwork is positioned to capitalise on experiential sight lines from the Palais Theatre, Luna Park, Jacka Boulevard and St Kilda Beach Foreshore.



03. Masterplan Connections
The scheme integrates with the proposed St Kilda Masterplan and largely builds upon proposed connections.



04. Orientation
The work is sited to maximise access to the prevailing south westerly wind and to wind from the north and south.



05. Masterplan Slopes
Rotor is situated upon the 'Slopes' which are a key feature of the St Kilda Triangle masterplan.

