

SOLAR CANOPY

The form of our installation is designed to exactly mirror the ecliptic path of the sun with an ideal geometry. A North-facing convex canopy is formed with a precise curvature for maximum solar irradiance and is “shingled” with transparent flexible photovoltaic (PV) sheets. The flexible PV sheets are shingled with overlapping downward facing gaps. The gaps allow the canopy to breathe for comfort below and vent in high wind events. While held in tension, the canopy is designed with an amount of flexibility and movement. Our engineering analysis shows a high amount of solar radiation over the year given the convex North-facing shape of the canopy. With 40% PV coverage, we have estimated an average of 364 kW of PV electricity per day.

Area	m2
Canopy:	1033
Wood Structure:	8
Free Area:	1025
Active Area:	410 (40%)

Radiation	kWh/m2
Average / day	5.5
Maximum / day	8.3

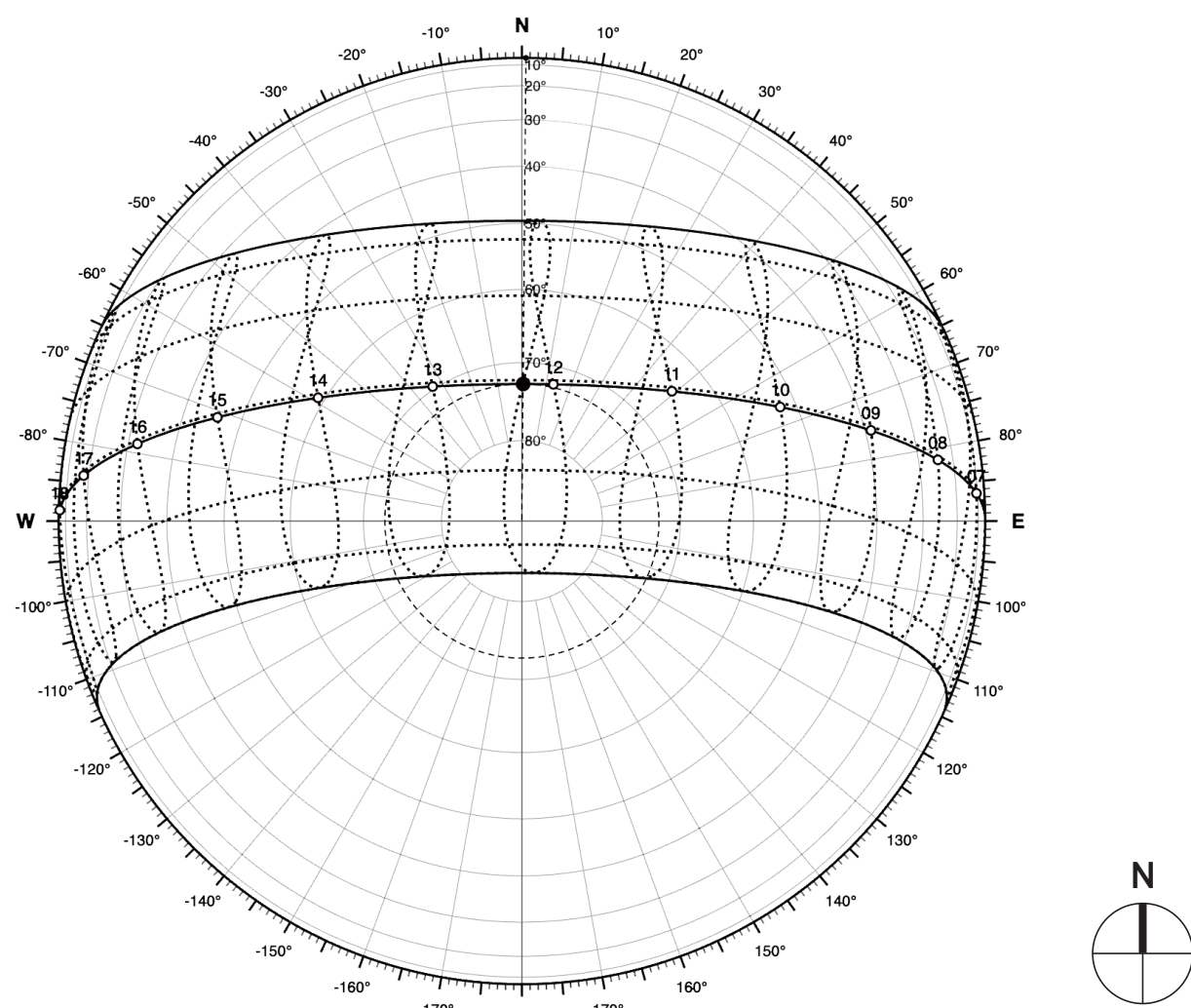
PV Efficiency	-17 %
Connection Losses	-2-5%
PV Electricity / day (avg)	364 kWh

Estimated System Size:  
0.2 kW peak x 410m2 = **82 kW peak**

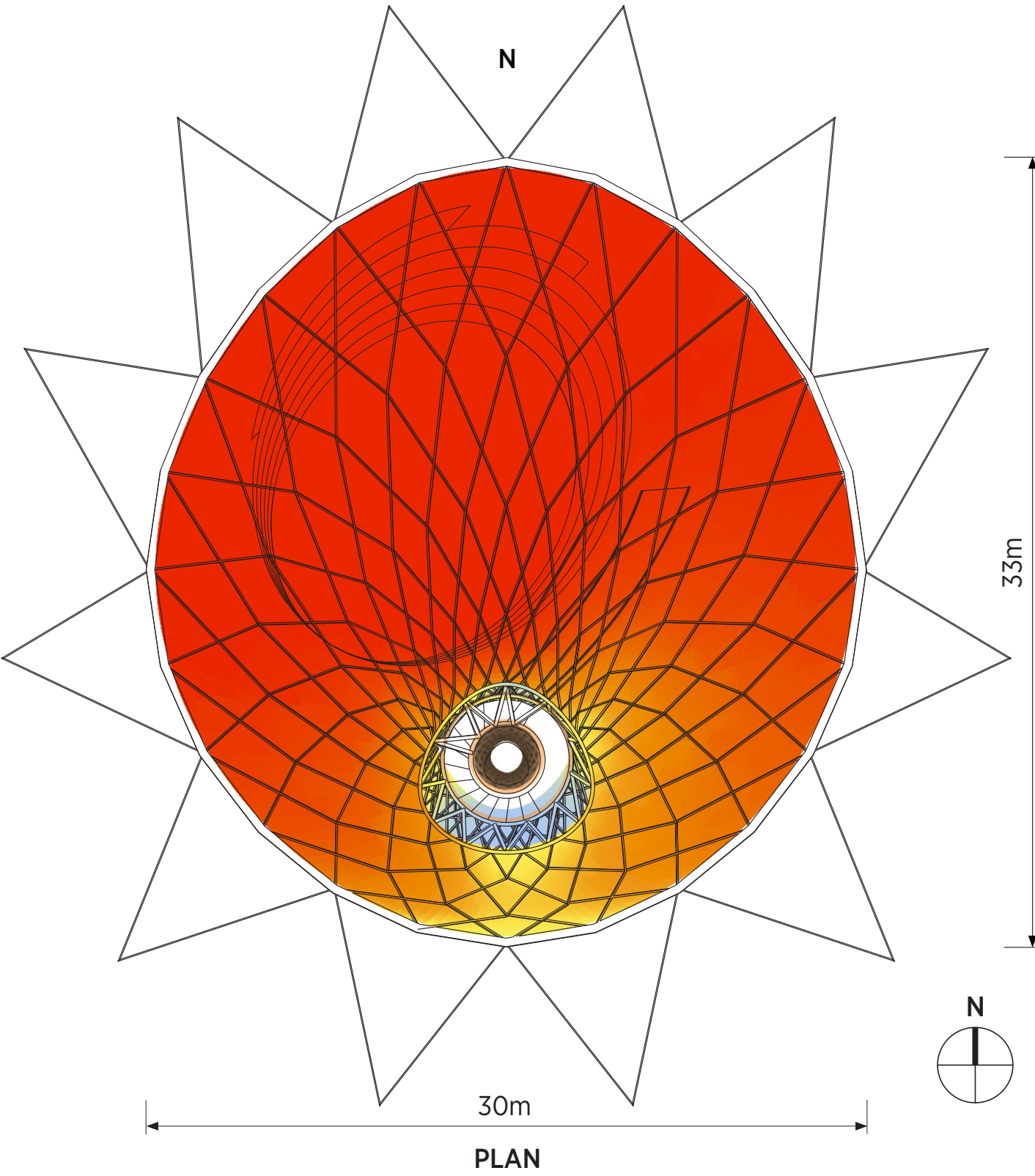
82 kW exceeds the 75 kW system size in the brief. If desired, a greater density of solar cells could be used for higher output.

STRUCTURE

The canopy is structured by a lightweight wood frame hung from the wood framed tower core and anchored to the ground in tension with lightweight steel cables. 75mm square timber members are layered to build up the faceted canopy, 150mm square timber members build up the core, and 300mm square members form the ring beam at the base of the shell. Threaded through-bolts connect the curved timber members at intersection points for simple assembly. 20mm diameter cables are used to stabilize the shell canopy at the outer perimeter, anchoring the outer ring to a rock ballast foundation.

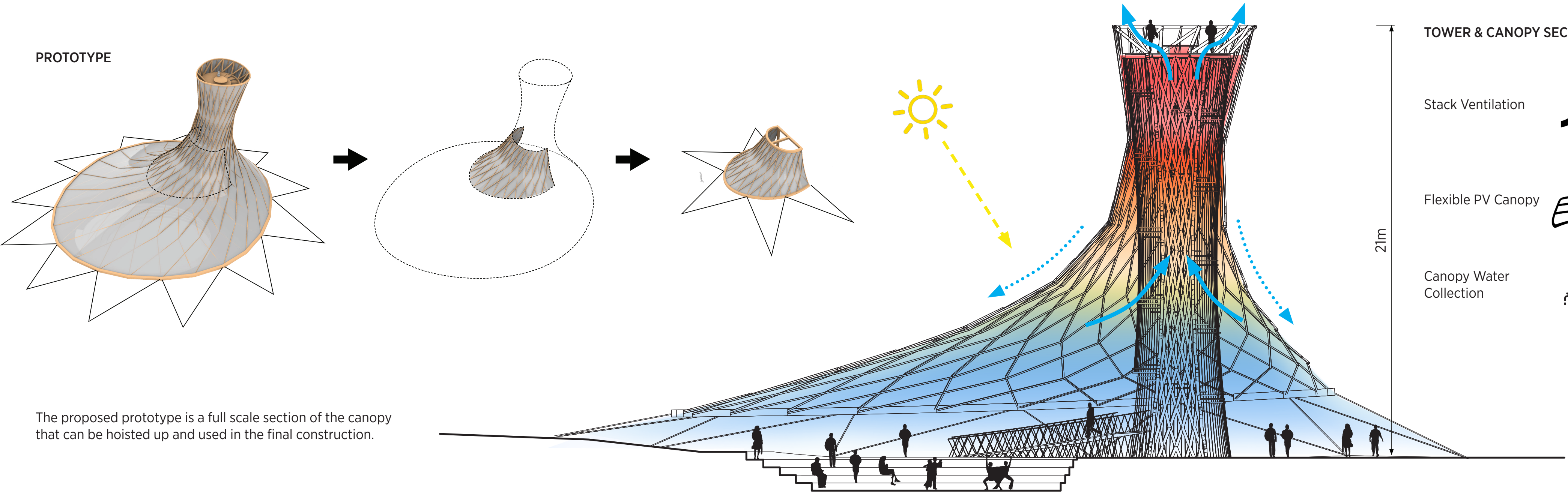


FIJI SUN PATH DIAGRAM



PLAN

PROTOTYPE



The proposed prototype is a full scale section of the canopy that can be hoisted up and used in the final construction.

TOWER & CANOPY SECTION

- Stack Ventilation
- Flexible PV Canopy
- Canopy Water Collection

