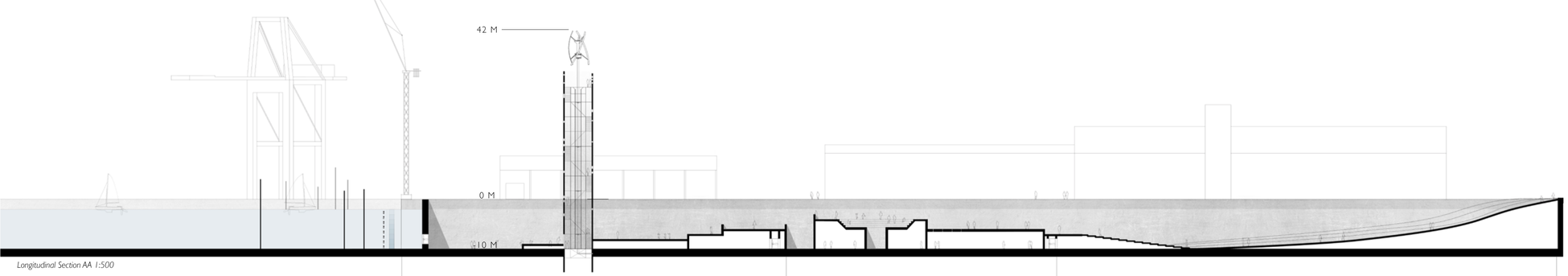
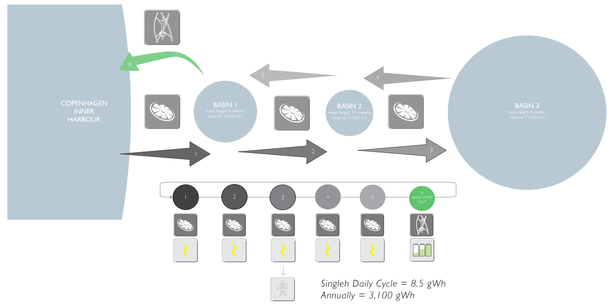
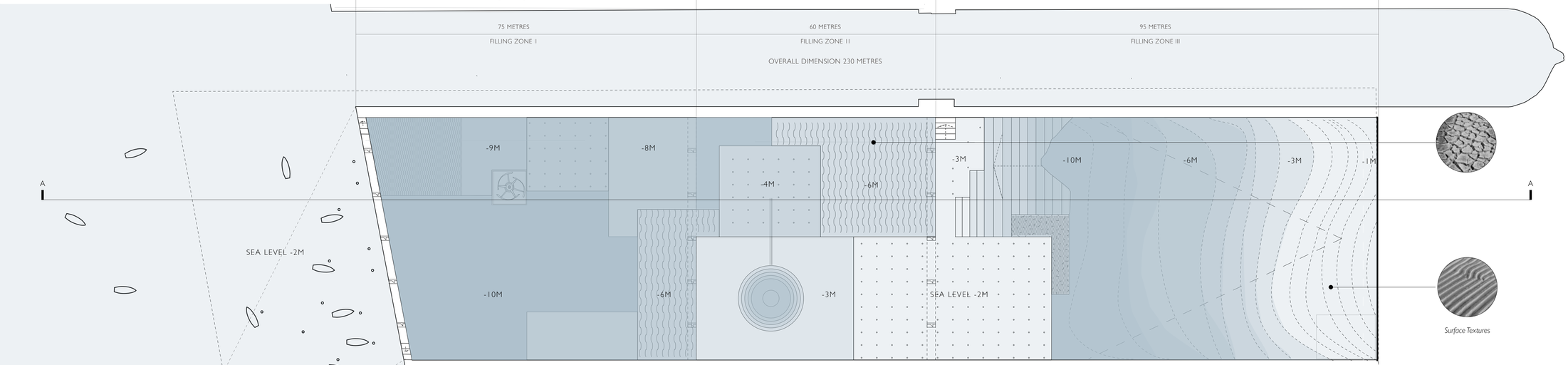


Longitudinal Section AA 1:500



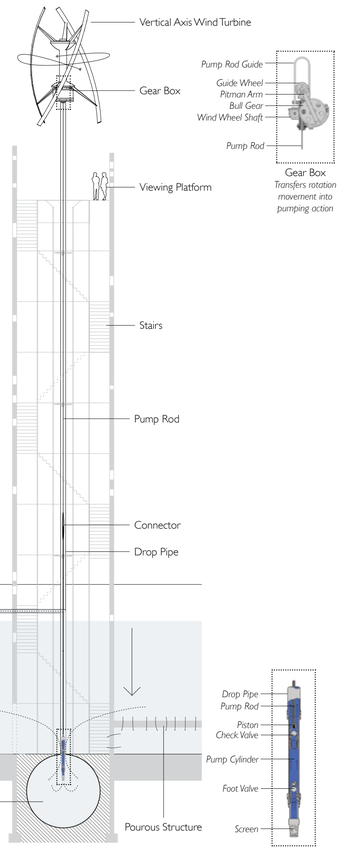
Energy Concept Diagram

Singleh Daily Cycle = 8.5 gWh
Annually = 3,100 gWh

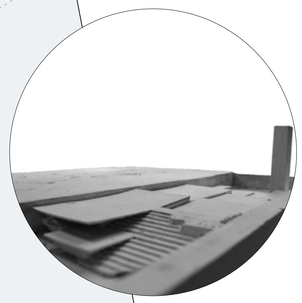


1:500 Site Plan

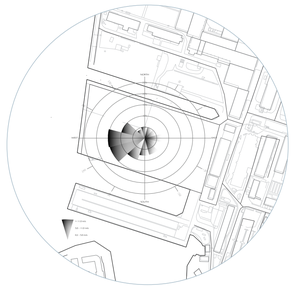
Surface Textures



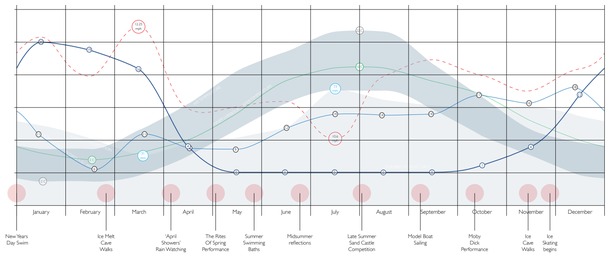
Context Plan 1:2000, increasing the length of the harbour side at Refshaleøen



Physical Model Perspective View looking West towards the harbour

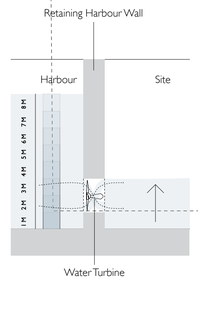


Site Wind Diagram
Conditions suitable for Vertical Axis Wind Pump

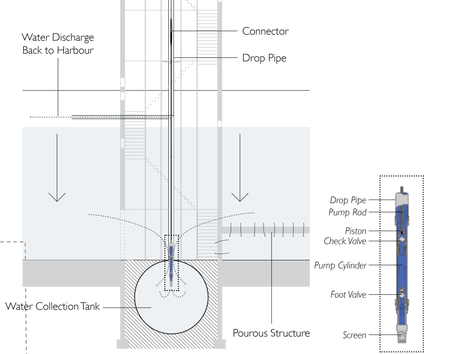


Copenhagen Annual Average Climatic Conditions (Air Temperature, Rainfall, Frost Days, Inner Harbour Water Temperature)

Corresponding Activities on site - placing itself as a landmark and a destination becoming a generator for tourism and future local commerce by celebrating aqua culture.



Low Head Hydro Turbine System



Vertical Axis Wind Pump Tower System

Arrival by boat at night to the site

TIDAL ENERGY

The creation of the tide through the flooding of the site, is created by dividing the dock into three chambers, with each dividing wall holding five water turbines. During the day, water from the harbour is released into the site through the turbines, and at night, with lower energy demands, water is pumped out by the windpump integrated in the tower.

Energy is created by the flow of water between the three chambers making use of both the flooding and the emptying of the site.
Alstom Bulb turbines are proposed for their high level of power capacity ratio for low heads acting as generators in both flow directions for tidal plant applications. The Bulb turbine is designed for a horizontal water passage in the draft tube, improving the hydraulic behaviour of the bulb unit and also results in a lower need for excavation. The turbines are all provided with a security mesh and side flow so to avoid harming the harbours aquatic life.

The energy cycle of the dock stores energy by pumping water out of the lowest place in the dock and allowing it to flow back into the dock turning a turbine to generate electricity. This electricity can then be sent to be part of the city's grid.

The emptying is staged through the windpump tower at night at times of lower demand and higher levels of wind, windpump driven by a vertical axis wind turbine.