



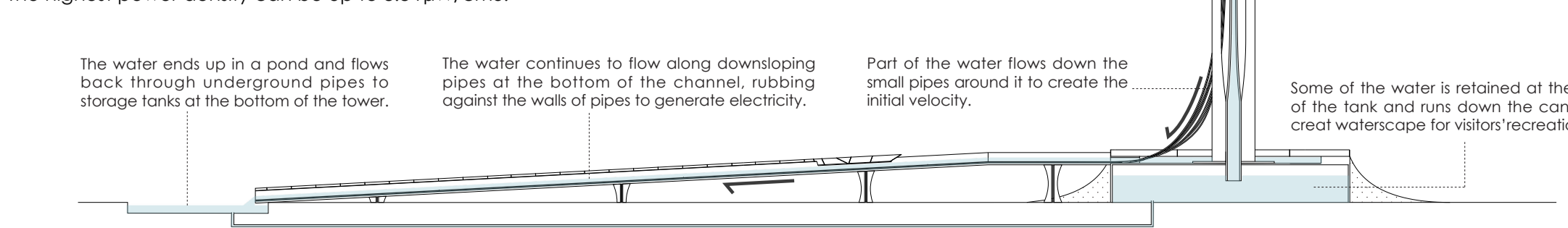
- URBAN BLOCKS
- GREEN BELT
- WATER TOWER
- ECO-AQUEDUCT
- SCHREBERGARTEN
- PLANTING
- PATH
- LANDSCAPE POND
- STREET
- WIND CHIMES
- CYCLE PATH
- SKYWALK
- PRIVATE TENTS
- PUBLIC TENTS
- SPINELLI PARK

**ENERGY RESOURCE FROM NATURE**

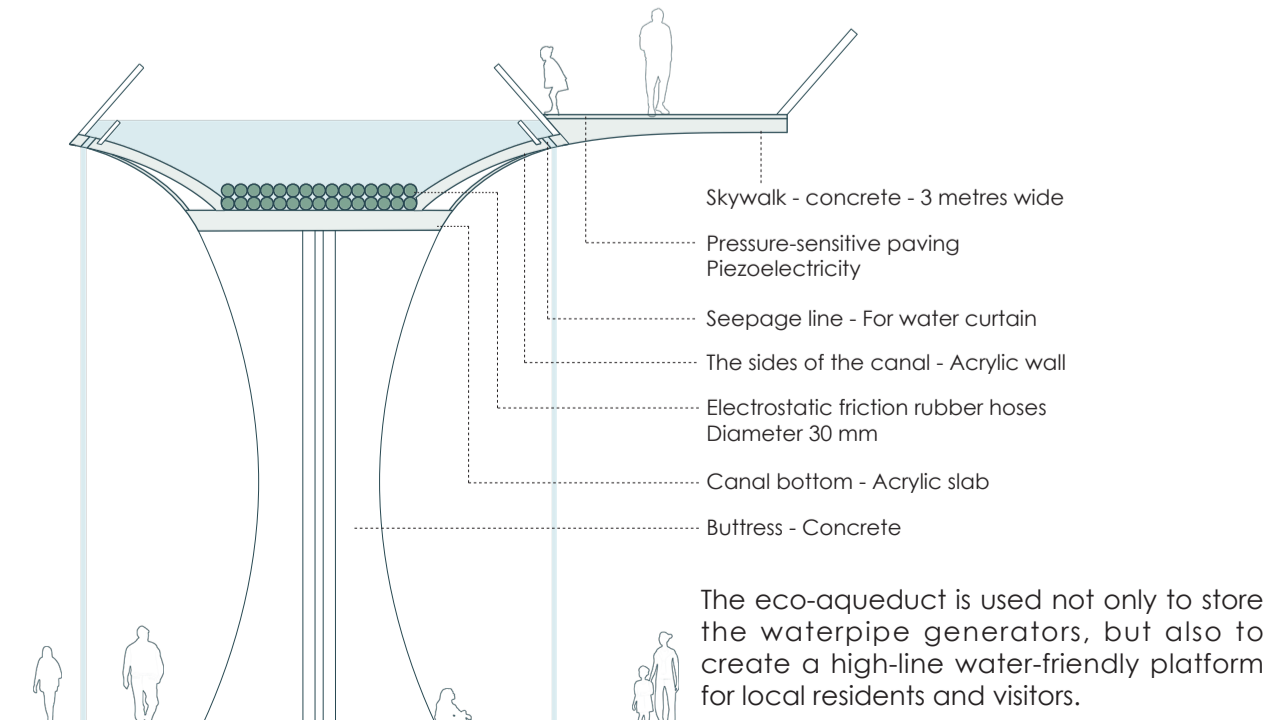
There is a long history in man's utilization of hydraulic power, but Mannheim is not a fitting city for building major hydropower stations. Opposite to that, we propose a new way of generating electric power from water movement - triboelectric charging.

Along the aqueduct system is bundles of airtight pipes released from the sky bowl of the water tower. With the initial velocity generated by gravity, the water inside the pipes flows along the elevated aqueducts. As it flows, the friction between the water and the inner surface of the water pipes is converted into electricity.

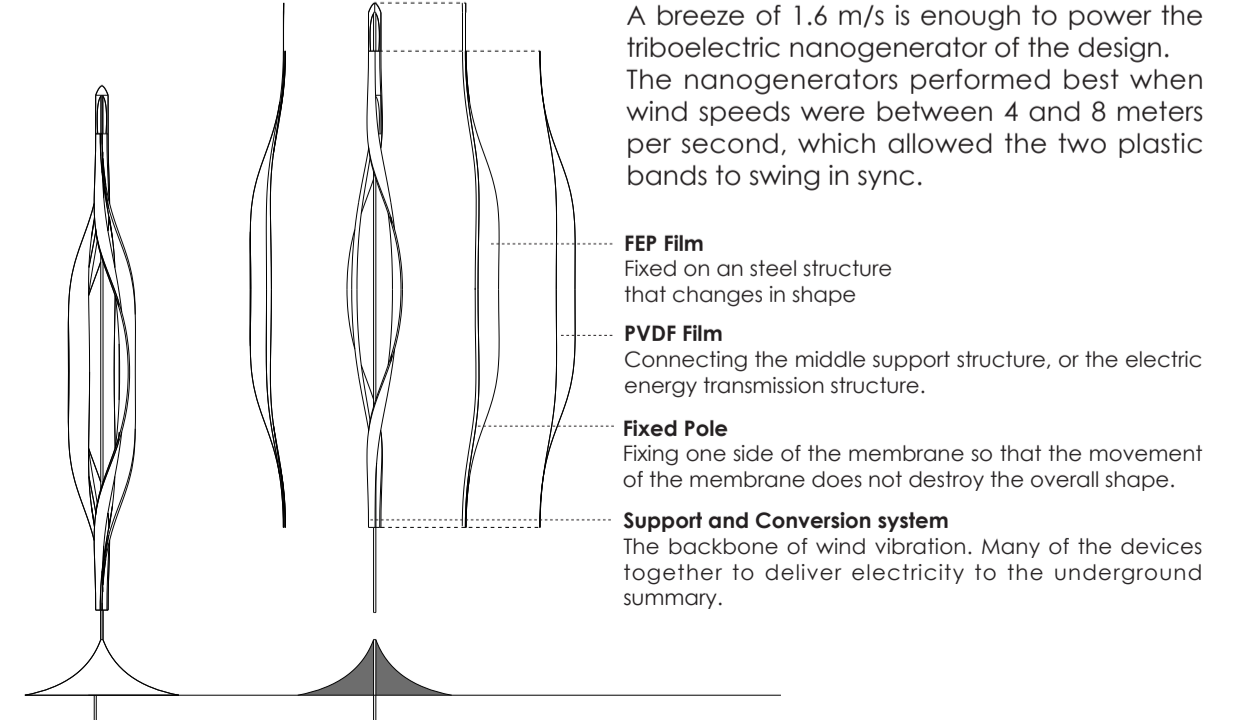
The highest power density can be up to  $8.84 \mu\text{W}/\text{cm}^3$ .



**ECO-AQUEDUCT SECTION**

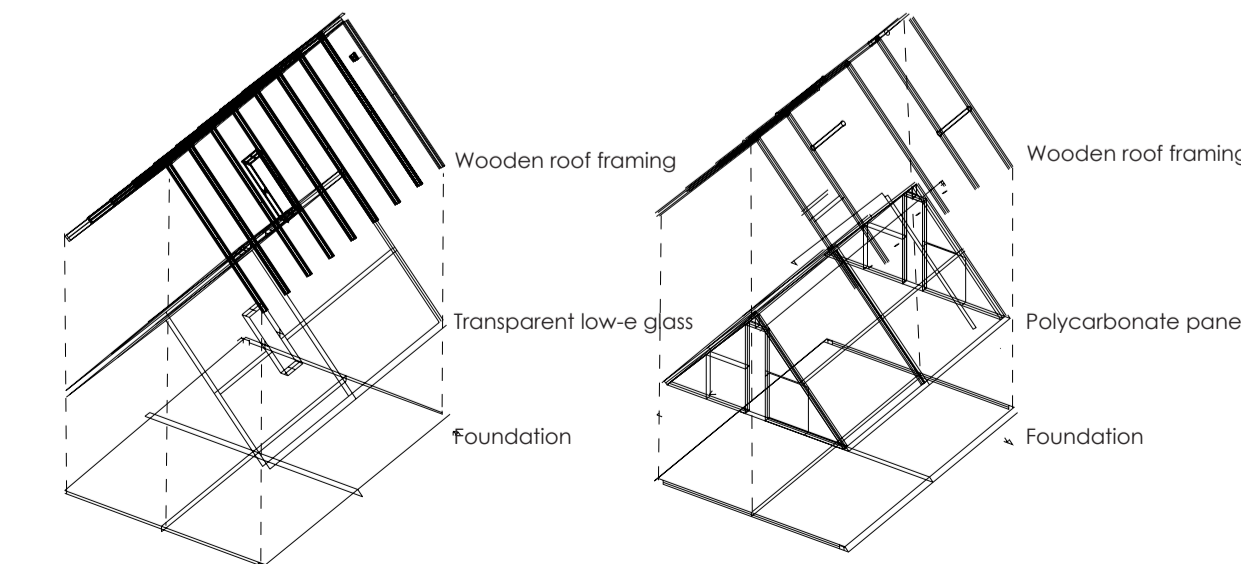


**WIND CHIME**



A breeze of 1.6 m/s is enough to power the triboelectric nanogenerator of the design. The nanogenerators performed best when wind speeds were between 4 and 8 meters per second, which allowed the two plastic bands to swing in sync.

**PUBLIC SCHREBERGARTEN TENT**



Accordingly, two types of small houses have been designed, a translucent 'tent' for exclusive use and a fully transparent 'tent' for public use, to meet the needs of local residents and visitors for indoor rest, recreation and social interaction. Unlike traditional Schrebergarten, electricity can be supplied for the new type of Schrebergarten of the 21st century, but only generated from renewable sources on site in order to achieve zero energy consumption for the FRINGE.