LEAKAGE

California, amongst many other places in the world, is experiencing unprecedented drought conditions. According to the statistics provided by EPA, up to 60% of water is lost due to leaky pipes, which accounts for approximately 14 billion USD annually. The other majority of water waste is caused by our excessive water consumption through faucets. These significant numbers show how necessary it is for us to be aware of the way we are using and wasting water.

The art installation, designed for the Santa Monica site in specific, aims at shaping a statement to raise awareness concerning the current water issues we are facing. Since this site specifically shouts out ‘water’ and separates us from the notion of water scarcity, it is interesting to integrate an art installation that would draw the attention to our daily “hidden” water waste.

The installation is an abstraction of the intertwined pipes we find in our homes and within the city infrastructure. These pipe-like structures stand between the pier and the completely open view of the ocean. They go up to 80 meters high and cover almost the entirety of the site horizontally. The abstracted pipes are built with truss structures on the inside creating a space frame on which solar panels are mounted on all sides exposed to the sun. Northern faces and bottom faces are covered with black reflective glass to give the same effect through the installation while minimizing the cost.

The pipeline structure is sitting on concrete columns that will be embedded within the ocean bottom. The concrete columns form a clear grid and are all covered with reflective stainless steel sheets to create the illusion of flying pipes while distorting the rigidity of the concrete columns. These stainless steel sheets reflect solar panels in some areas, the seawater in others and reflect also on each other sometimes, which adds an interesting dimension to the installation and the space surrounding it.

Throughout the installation, several leak points are apparent from the main façade facing the pier. The leakage is highlighted through several perforations in the bottom face of the pipes, and in specific areas where it is safe to have water jets without affecting the installed solar panels, in order to avoid any damage to installed solar panels. These perforations are connected to several seawater pumps that are installed above water level, within the truss structure of the installation, and that pump the water up to the desired level and discharges the water through the existing perforations. The pumps use some of the energy generated by the panels. ­

The ‘pipelines’ end up in one outlet that discharges water from a faucet. The designed faucet is also covered in solar panels and has a helix-shaped stainless steel structure that looks like running water, with wind turbines attached to its nodes.

These wind turbines will give the effect of running water and will also help generate power from the installation.

During the night, the installation lights up in a linear manner to highlight the installation when it is dark. The Tetra Contour lights by General Electric are also linked to the solar panels and use some of the power generated by the solar panels to light up during the night.

It is important to mention that the bulkiness of the installation and the size of the ‘pipelines’ reflect the way we are building our cities. Reflective glass skyscrapers are more often than not present in our city centers and business districts. The abstraction of the pipes was inspired by these current construction trends.

Environmental impact:

Since the installation is mainly overwater, the environmental impact on marine biology is minimal. Light is not directed towards the surface of the water, which minimizes the impact on marine life. The structural columns are mainly embedded in the sea bottom, which will disturb the natural habitat of marine fauna and flora and will probably destroy some existing coral reefs. The seawater pump should necessarily have a filter to minimize suction of ocean fauna and flora.

The installation is comprised of approx. 110,000 sqm of SunPower solar panels exposed to solar rays throughout the majority of the year in Santa Monica, as per the data provided. The panels used are 22% efficient. They panels can generate 214,802,500 KWh of electricity per year.

The 50 installed wind turbines used are Eddy GT and they can produce a minimum of 62,500 KWh/year. Their advantage is that they do have a low starting wind speed to start the turbines and their shape allows the wind coming from any direction to penetrate the turbine.

In total, the entirety of the installation can generate enough energy to power approx. 19,500 household in Los Angeles.