

Lady Landfill Skyscraper



PRIX 2012 « ARCHITECTURE, TECHNOLOGIE ET DESIGN DE LA MER »

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Great Pacific Garbage Patch is a pile of plastic floating in the northern part of the Pacific Ocean. This region of the floating garbage is located approximately between 135° and 155° west longitude and 35° and 42° north longitude. “The San Francisco Chronicle” claims that the “patch” now weights more than 3.5 million tones, 80% of which is plastic waste that reaches more that 30 meters in depth. Great Pacific Garbage Patch began to be created in the 1950s, and its removal would cost billions of dollars.

Center of the Great Pacific Patch is a relatively calm region of the Pacific Ocean, and sea currents that circle around it bring the trash. This causes the accumulation of floating garbage in big piles. While, during course of history, this garbage used to be biodegradable, today in the Great Pacific Patch of Garbage, plastic and other non-degradable materials are piling up. These materials can only be split up but their particles still remain in the water.

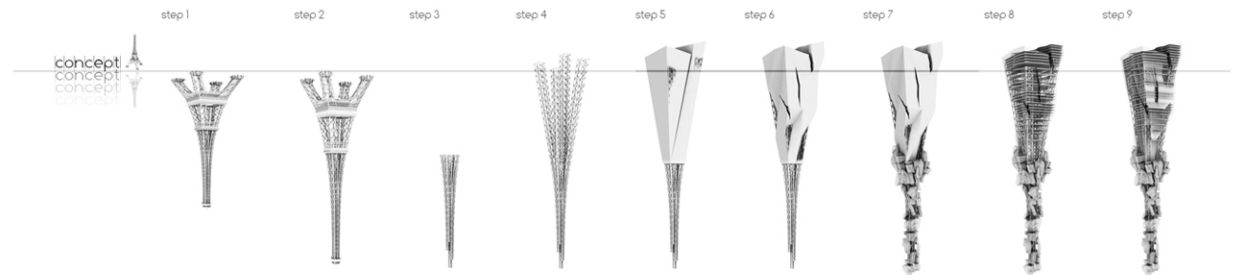


Lady Landfill Skyscraper

concept

The industrial Revolution brought us progress, scientific conquest, modern construction, more leisure and comfort. As everything comes with a price, this was no exception. The industrial Revolution brought more waste!

Eiffel Tower, built between 1887 and 1889, is one of the most typical and exquisite symbols of Industrial Revolution. Hence the idea of the inverted Eiffel is the next step from the process of industrialization towards progress. This step involves raising awareness about the caused harm, and the effort to begin the reversible process (the inverted Eiffel) in order to create a synergy between the nature and the modern society.



Living area
recreation ▼

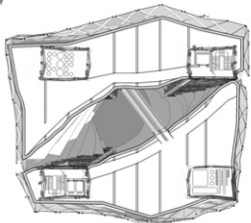
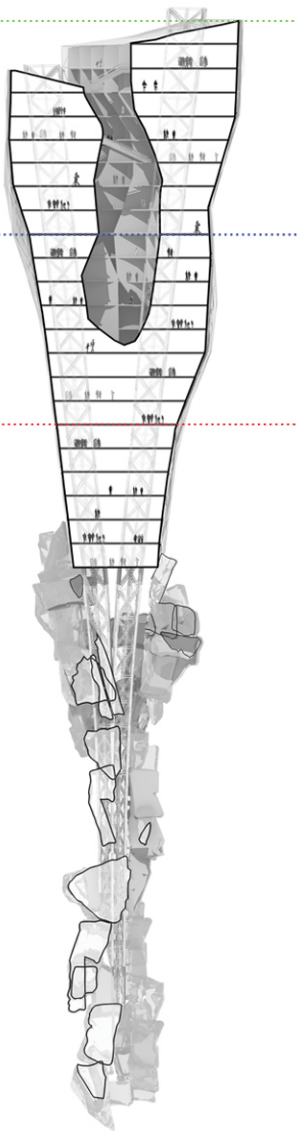
Factory
area ▼

Dump ▼

10m

Cross section ▲

Floor plan ▼



Lady Landfill Skyscraper

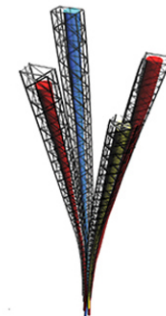
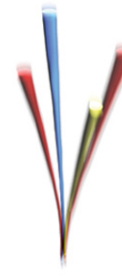
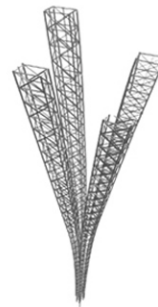
vertical program

Lady Landfill skyscraper is thought of as a floating island, whose main goal is removing the non-degradable materials from the water. Unfortunately, collecting and disposing garbage elsewhere does not solve the problem, but creates another. The potential solution is to accumulate and recycle the waste or to use it as an energy source.

This skyscraper is a self-sustained structure organized by the functional hierarchy. The vertical program connects all processes that are happening inside the skyscraper. Four cores of communication connect three organizational parts, where the landfill is at the bottom, recycling plant in the middle, and housing at the top.

The first thing to do is to collect the garbage. Collected waste is being vacuumed, the volume is decreasing and the weight is increasing, which makes it easier to be de-positied it in the lower part of the skyscraper. Then comes the recycling of the waste. Upper parts of the skyscraper are intended for housing, recreation and other activities that would provide a comfortable stay.

Vertical communication



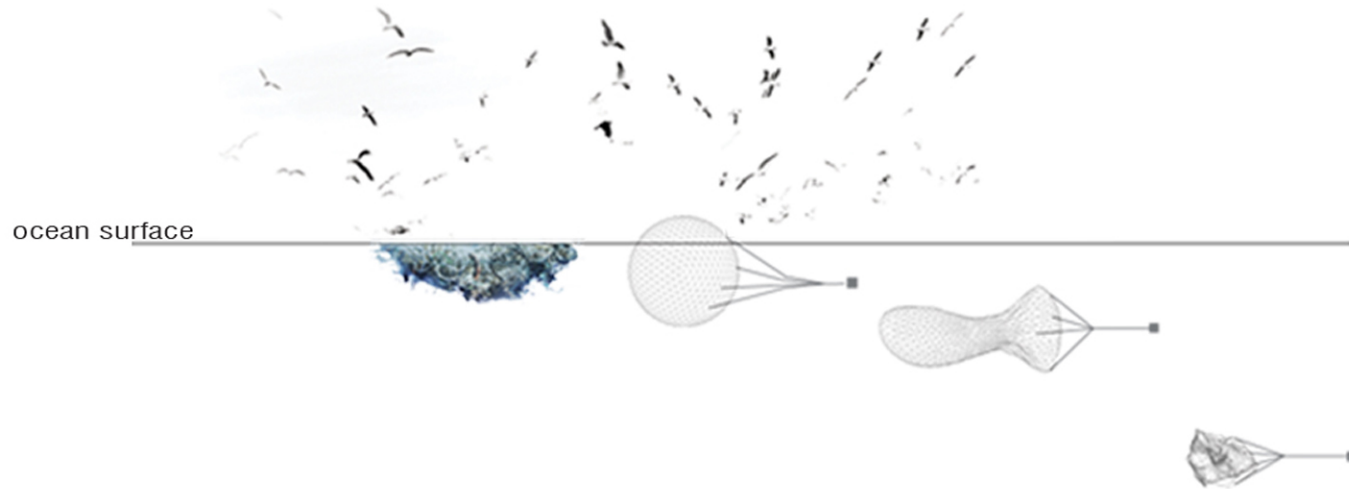
eiffel construction -four cores

communication pipes

— litter transport
— supply of the cold water
— communication for residents

Lady Landfill Skyscraper

garbage collecting units



There are units for collecting garbage within the skyscraper. They are made of membrane structures that allow them to shrink and expand. Garbage transportation involves several stages:

Step 1: Collection - on sea or land

Step 2: Transport - floating on the surface of the ocean (which enables the appropriate volume to weight ratio)

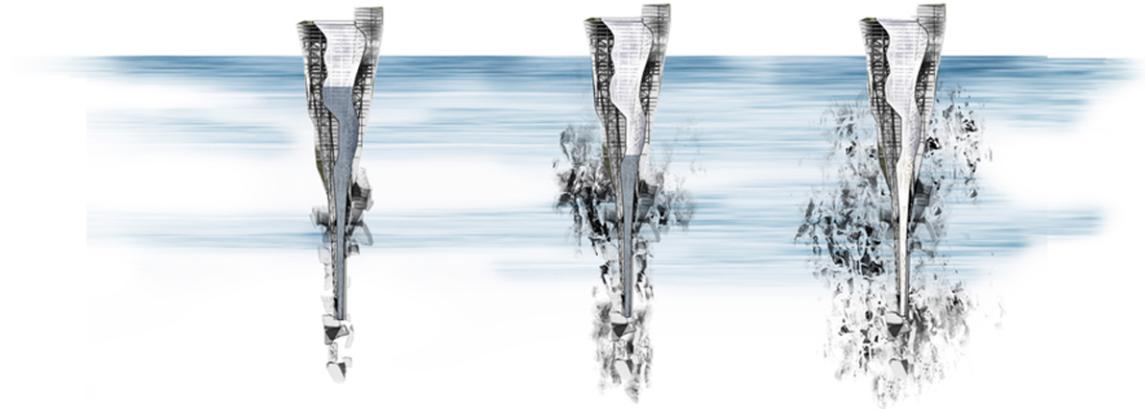
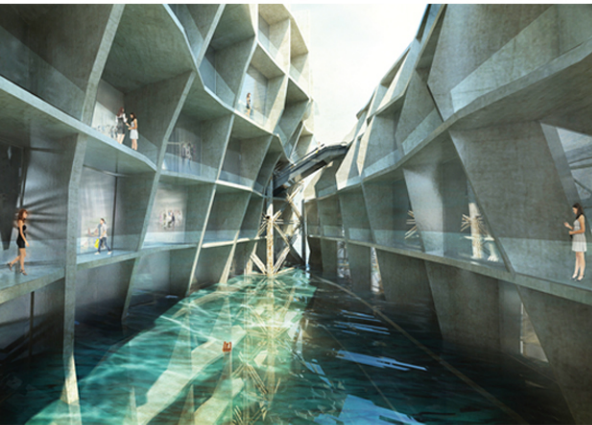
Step 3: Dipping - shrinking of the membranes leads to compression of trash(vacuuming), which enables faster shrinking

Step 4: Fixing

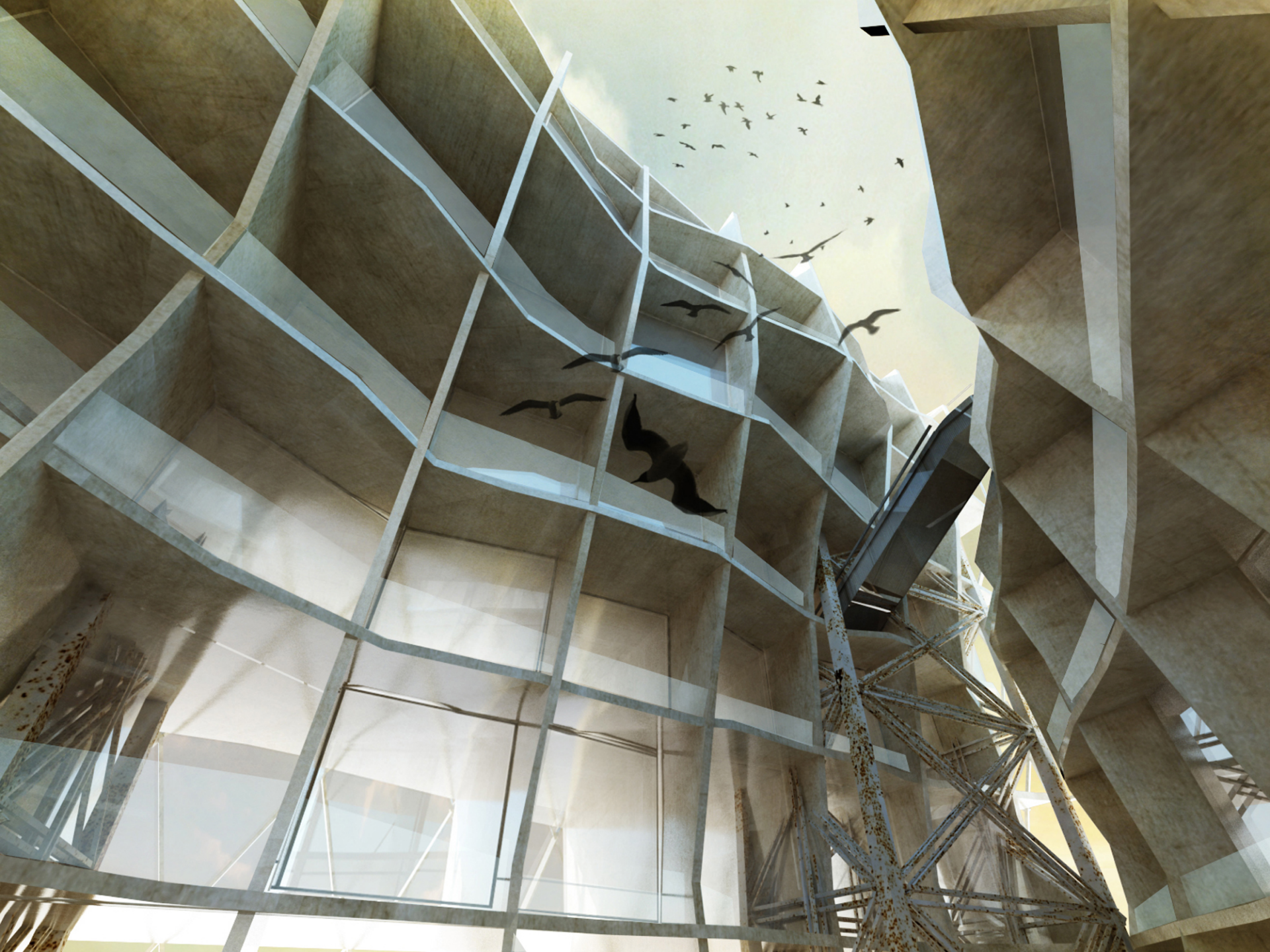


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concept of hole



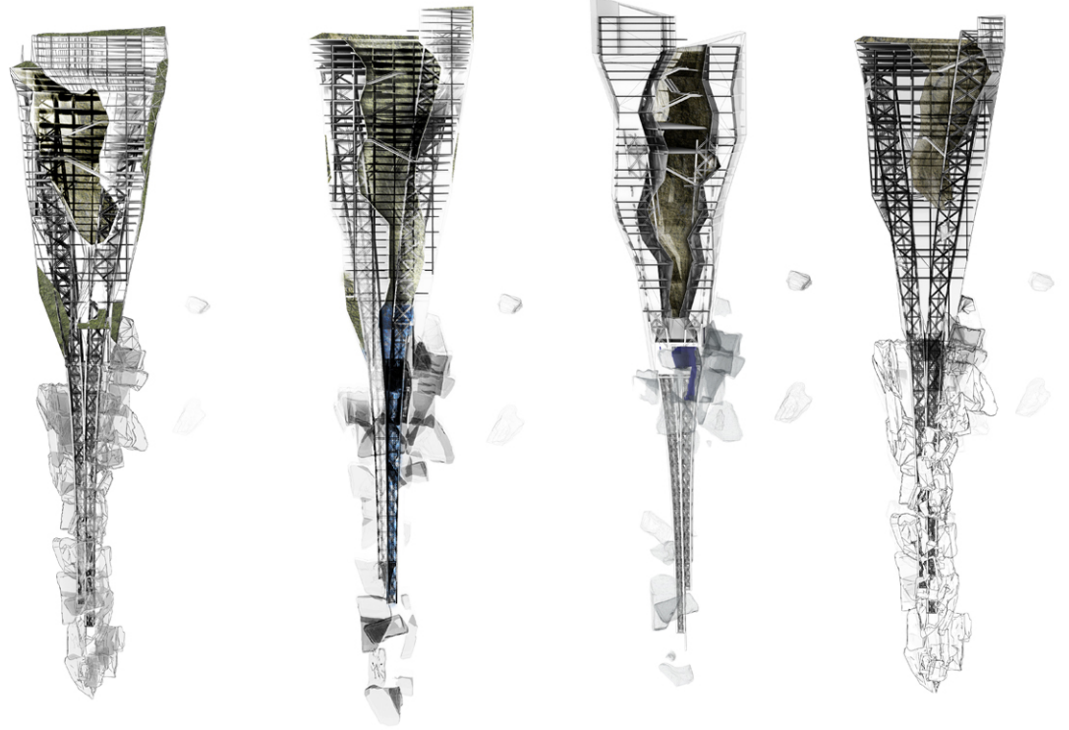
The big shortcoming of the landfills is capacity. Unorganized accumulation and improper classification may be the key aspects that define the shape of the landfill. The project of underwater systems allows us to store large amounts of trash, invisible to the naked eye. The main problem of the floating islands is to achieve balance between weight and volume. System whose capacity is constantly changing, thus the weight varies, has to have a structure that will regulate the necessary balance within it. With controlled filling of the holes with water, the concept of holes provides the necessary porosity of the skyscraper that enables it to float without additional systems.



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cross sektion
cross sektion
cross sektion
cross sektion



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Sustainability of the energy

The floating island represents an enormous energetic potential. The thermal ocean energy, wave energy, power hummer of the ocean provide inexhaustible energy solutions. The garbage itself can be used as an efficient source of energy. The value lies in the molecules found in the each bag of garbage. The molecular recovery process begins by shredding the garbage so that recyclable metals could be removed. The remaining waste is heated and converted into a gas made up of different molecules. The molecules with minimal energy value, remain as solids. Plasma is used to melt these solids into a liquid that once cooled becomes an inert glasslike material. It is non toxic and can be safely used as construction aggregate for adding to cement or asphalt. The molecules with energy value that converted into a gas raise into a refinement chamber where they pass through a cloud of plasma.

Plasma has unique properties that produce an ionic catalyst that helps break apart even the most complex molecules in the gas into basic elements which are building block for new materials. Also in the gas at this stage are contaminants, like sulfur, chlorine and heavy metals that need to be removed before can be used responsibly in engines to generate power. The key ingredients for fuel like natural gas are hydrogen and carbon, both of which are widely found in waste. This technology combines hydrogen and carbon with just the right amount of oxygen into a clean fuel gas that can be used instead of natural gas. Using best available gas cleaning technologies other useful products are recovered, for instance, water for irrigation, commercial salt and sulfur for fertilizer. The clean gas is now sent to engines that make electricity. As an added bonus, heat from the overall process is recovered and used to create additional electricity or to provide district heating. (http://www.youtube.com/watch?v=YIIIj_bzI5A)

