

POLITECNICO DI TORINO  
SECOND SCHOOL OF ARCHITECTURE  
Master of Science in Sustainable Architecture  
***Honors theses***

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**Vertical farm and botanical garden Seoul The rising rice tower**

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The thesis stems from the desire to develop the project that I purposed at the skyscrapers contest directed by Superskyscrapers([www.superskyscrapers.com](http://www.superskyscrapers.com)). I developed the project from a compositional point of view, structural and technological.

The theme concerns the design of a vertical farm in the economic heart of Seoul (S-Korea), the demands of the jury were: engineering design, creating a place of soul's peace, add fruit and vegetable production and sale space miles<sup>0</sup>, using environmentally sustainable solutions.

The analysis of historical, cultural, climatic and economic conditions of the city of Seoul have been instrumental to contextualize the project.

The lot is located in the district of Samil Daero and in front of the Cheonggyecheon, stream rediscovered in 2005 and turned into a green promenade that runs through the heart of the city.

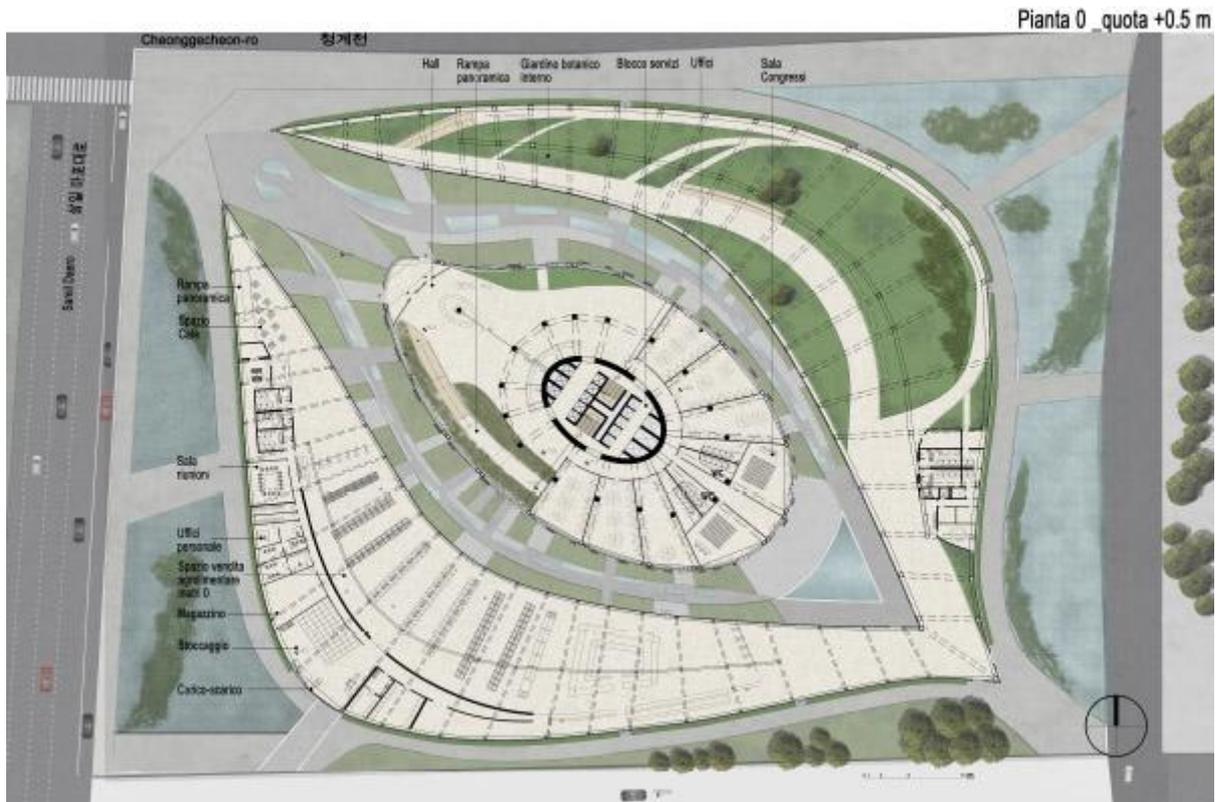
The concept was born from the desire to maintain the relationship with the green and the river, recalling a fundamental element for the agricultural economy of the country: the rice, and following the design principles of an ancient discipline: the feng shui.

The lot quadrilateral faces an important crossroads in the center is placed the vertical farm that becomes a landmark in the business district; a second building consists of two wings that surround the tower, opening towards the intersection, house commercial spaces and a botanical garden.

The vertical farm resumes in plant and in front the shape of a grain of rice that grows leaves lay on the ground the two leaves that protect it (commercial building).

In order to create a green oasis which bodes the inner function, it has been built a macro paddy around the lower building with elevations in structural glazing, mirrors of water enriched by reeds and bamboo.

The vertical farm is surrounded by green promenades, is geared taking into account sun exposure, and climate agents following the precepts of feng shui.

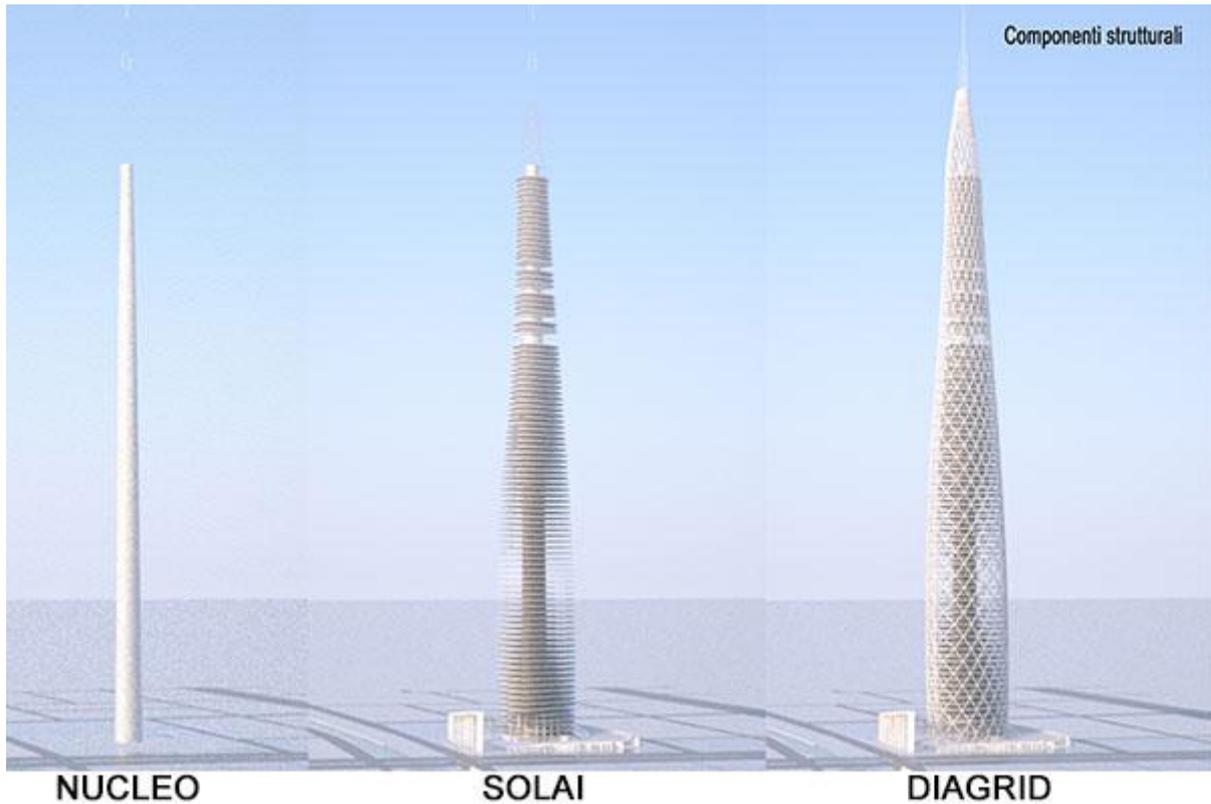


General plan and internal distribution

The architectural design started from a study on the vertical farm, the structural types of skyscrapers and energy saving strategies. The choice of a diagrid structure is dictated by the need to have large arable areas and large open spaces in the plan, have a light structure that allows freedom of expression so the possibility of morphological development aerodynamic, allowing the best use of direct illumination and the greater southern exposure.

The structure is composed of a core of reinforced concrete to which are connected the slabs prestressed lightened, with strands of postensione; the latter come up to the outer structure which has been realized in steel tubulars, these outline the overall shape of the building, connecting between them in lozenges meshes.

The feasibility of this property was verified with the structural modeling software PROSAP.



Structural scheme

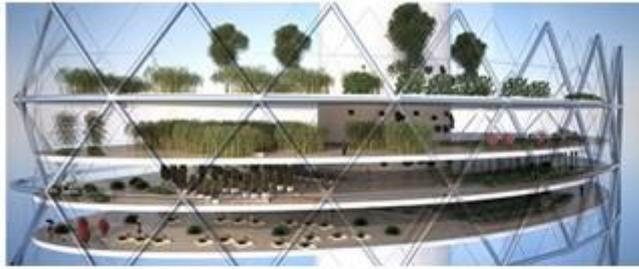
The transparent housing is composed of a single glass exterior and different types of glazing interior.

The internal layout is developed vertically: in the first storey there is a large entrance hall triple-height spaces informative and educational, administrative spaces, a large ramp that runs along the perimeter of the building has a roof top garden.

The next ten floors are used as a farm for public citizens, the next house a vertical farm with controlled hydroponics and aeroponics. The top floor houses a lounge bar, a ramp leads to a lookout point.

The strategies of sustainability solutions provide passive and active: a biomass incinerator in central composting, wind turbines positioned at the top, constructed wetlands and geothermal-powered ventilation system.

The building has low prospects in structural glazing ranging from 4 to 20 m from the sleeve south to the north, they are covered by a green roof practicable, the south wing houses the market km 0 and eateries, the wing north is used as a botanical garden.



Views on the project: floor type vertical farm - view of the entrance - view from the canal

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