Engineering Structures for Life

BUILDINGS - SPECIAL STRUCTURES

Port of Maputo Control Tower

ABOUT

The project of the Port of Maputo Control Tower arises from a competition launched by Maputo Port Development Company. GEG integrated the design team and was responsible for the design of all engineering disciplines.

The Tower will be a building that constitutes an important port infrastructure, and which will allow the best performance in the control and planning of the maritime traffic, comparable to the best infrastructures of this kind on an international level.

From a structural point of view, the tower consists of two lateral concrete cores interconnected by a series of reinforced concrete beams, at the roof slab level. The main objective is to ensure the mobilization of the two cores.

The three elevated floors will consist on a composite structure composed of 3 main beams, simply supported on the 2 concrete cores, which support secondary cantilever beams. The slabs are materialized through composite slabs. This solution allows the prefabrication of the steel structure at ground level and its simple lateral fixation to the cores after its erection. This solution also avoids the use of scaffolding systems for the concrete formwork at these levels.

FACTS

Year: 2017-2018
Client: Secon
Services: Detailed design, Foundations design, Structural Engineering, Mechanical, Electrical and Plumbing design, Lighting design, Acoustics, noise & vibration design, Telecommunications & Security

TEAM

LOCATION

Maputo, Mozambique

The structural stability of the system is guaranteed by the large inertia of the cores in both directions. Thus, due to the great structural stiffness, the global second-order effects can be disregarded, and the overall stability is assured.

The conclusions of the site investigation carried out referred the need for deep foundations which were considered in the definition of the tower foundations. Each core is based on a pile cap, and each pile cap will comprise 11 cast-in-place piles with 1.0 meter in diameter and an average depth of 35 meters.

The tower is designed to allow a maximum lifetime of use even if it is felt that it needs to be functional refurbished in the medium/long term. For this, it was considered an architectural layout independent from the structure, such as the possibility of ensuring an easy access to networks and equipment located in technical areas and infrastructure channels.

The Control Tower can be more than a building with port control functions. Being a remarkable point of observation is surely also a remarkable point to be observed and with this in mind the Port of Maputo can take advantage of it to point out the tower as an element of positive affirmation of the importance of its activity.

Interpreted as a reference site, the project of the tower will have simultaneously the mission of port control and planning, as well as being considered as a spatial and territorial landmark.

Due to the specificity and complexity of some areas, we decided to use effective design tools such as BIM (Building Information Modeling). These tools allowed an accurate coordination anticipating several problems that would arise only in the construction phase. The entire project was modelled using REVIT software, which made it possible to reconcile and coordinate the solutions of all disciplines in order to ensure perfect compatibility between structures, equipment, infrastructures and architecture.

On the north-facing façade of the Tower will be installed photovoltaic panels throughout the height of the building lateral cores. By producing its own energy through a self-consumption production unit, in the hours of photovoltaic energy production, this will reduce the energy consumption of the public network and thus allows to benefit from a reduction in the value of the monthly invoice.

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