▲ FIGURE 1: ARCHITECTURAL RENDERING OF SAWA BUILDING

Wooden residential building, SAWA

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SAWA is a 50m high,one-of-a-kind, circular wooden residential building which will add aesthetical value to the neighbourhood of Lloydkwartier and the city of Rotterdam. It will be the first fully wooden residential building in Rotterdam. Its unique feature is that it will be entirely constructed of cross-laminated timber (CLT) hence the use of concrete and/or steel is kept to the bare minimum. The environmentally friendly design and the creation of affordable housing led both the client and the engineers to realize this innovative project.

Location

SAWA will be constructed at Lloydkwartier. This neighbourhood in Rotterdam has a maritime past which goes back to the 1900s and is one of the most water-rich districts in the centre of Rotterdam. The architecture in this area is diverse from new and industrial buildings to old harbour monuments. Thanks to its diverse nature the Lloydkwartier area has transformed from an industrial harbour into a popular residential area.

Concept

The name of the building was inspired by its stepped shape with green roofs which imitate the Eastern rice fields. Regarding the design, the building volume of the structure was consciously reduced, and a stepped volume was introduced. The new volume improves the relation between SAWA and the surroundings of the area by softening the living block. An open square space will be created in the west side of the structure leading to air and light being preserved in the streets as well as an uninterrupted view of the harbour. SAWA will house approximately 100 apartments. Due to the columns' structure and placement, the space is versatile and flexible resulting in the ability to freely arrange the apartments.

▲ FIGURE 2: ARCHITECTURAL RENDERING OF SAWA BUILDING

Innovation and timber architecture

The client and architect mutually decided to construct the building, including the main supporting structure, almost exclusively of CLT (90,97%) and reduce the amount of concrete and steel to the minimum. That decision was made based on the UN Sustainable Development Goals and objectives of the municipality of Rotterdam to reduce CO2 emissions. In that respect, CLT is a great material both aesthetically but also environmentally and became the perfect candidate for the project. In addition to its eco-friendly properties, the construction time of the project will be much

▲ FIGURE 3: CONCEPT PRESENTATION MODEL OF SAWA BUILDING

shorter compared to a conventional concrete construction. Architecturally speaking, in order for the building to please the eye the walls were left without applying plaster so that wood is as visible as possible in all parts of the building (apartments, galleries, balconies). Even though the design solutions are not innovative if taken into account individually, the combination of all the things that led to the construction and future realization of this project make it unique and one of a kind.

Circularity

The main advantage of SAWA is that the building materials used for its construction will be reusable in the future. For that to be possible, SAWA will be built using a modular construction system using dry and separable solutions (no cast construction). The building is designed to be future-proof as well. This means that the structure's supporting system, consisting of floors, beams and columns, creates a great degree of freedom and flexibility in layout. Regarding the materials used, timber for the construction comes from sustainable production forests in West Germany while other materials used are bio-based, wherever possible. SAWA's indoor climate was designed to be healthy and residentially friendly. The apartments have cross ventilation while the facades are equipped with CO2-controlled ventilation valves. As far as energy is concerned, there will be photovoltaic panels on the roofs which will fuel the batteries of the residents' cars, scooters and bicycles. When construction is complete, SAWA will be able to generate the energy it needs for the communal facilities. The combination of the above makes SAWA energy-neutral (Energy Performance Coefficient of 0) both during the construction process but also after the realization of the project.

▲ FIGURE 4: ARCHITECTURAL RENDERING OF SAWA BUILDING

SAWA under construction

The launch idea for the SAWA residential building was first created in November 2019 while the building permit was granted in June 2022. In August 2022 the construction phase initiated starting with excavations to make space for the foundation. Even during this construction stage, SAWA remained environmentally friendly and energy-neutral. The excavated soil was stored and will be used for SAWA's green roofs and terraces enhancing the biodiversity of the area. The completion of the building is planned for spring 2024.

Conclusions

SAWA, also known as the "healthiest building in the Netherlands", is a fully sustainable, energy neutral project made of more than 90% timber. The realization of the project is an important step towards sustainability and proof that things can be done differently while answering to many social issues including not only architectural and civil engineering aspects but also issues that consider society as a whole.

SOURCES

https://www.mei-arch.eu/en/projects/sawa/

https://www.pietersbouwtechniek.nl/projecten/sawa

https://www.issuu.com/meiarch/docs/sawa_gidsje_en_20210714_issuu