



TVH EQUIPMENT

Waregem

New construction with workshop, storage space, offices, showroom and underground parking



Status

2019 - 2024



Services:

Building Services, Structural



Sectors:

Industry: Logistics



Client:

NV FREMATO GROUP



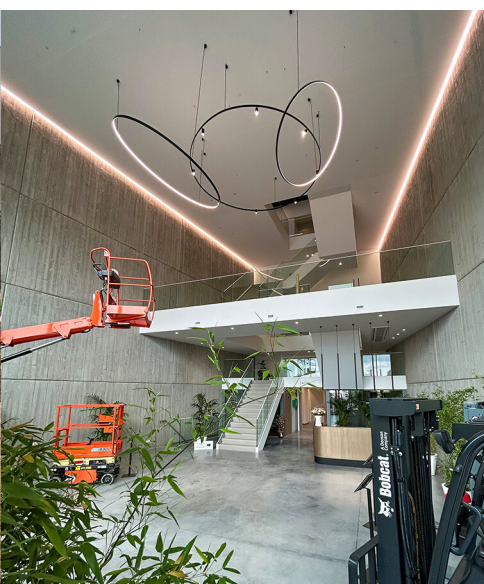
Architect:

BV ARCHITECTEN DERYCKERE,
MOERMAN & PARTNERS



Area:

6358 m²



General

TVH Equipment centralized all its Waregem activities in a new building along the E17 highway in the autumn of 2023. The fully circular shape – with a diameter of 90 meters – will undoubtedly become an architectural eye-catcher. In terms of structural stability, building services, and BIM, this did require extra thought and calculation.

This project is a new episode in a long series of collaborations between TVH and BM Engineering. The 'donut shape' of the building naturally adds extra color this time. TVH Equipment will soon bring together the employees who are currently working at two locations and in different buildings in Waregem.

The compact and circular design by DEMO+ Architects has several advantages. On the outside, the surface area of the building envelope is reduced, which is an advantage for construction costs. On the inside, it ensures that walking distances are shortened, making the workplace considerably more pleasant and efficient. The plan includes an underground parking garage. On the ground floor, the outer ring of the building houses the workshops for maintenance and repairs of forklifts. Around 40 doors allow smooth entry and exit. In the center of the ground floor, there is space for changing rooms, sanitary facilities, and the warehouse. On the first and second floors, there are offices for administration and sales and a multipurpose cafeteria. External staircases provide access from the second floor to the central inner garden on the first floor, which will also serve for informal meetings. Around the second floor, striking sun shading in the form of a lattice structure is provided on the outside of the building. This is connected to the columns via a steel structure.

Combining precast and cast-in-place concrete

The spacious site is a bonus for the earthworks. It was possible to work with an open excavation pit – without a retaining wall. Piles were used for the foundation because the large spans in the workshops and offices – up to 20 meters – and the surcharges from the machines brought inside create very large downward forces. The inspection pits on the ground floor in the workshops are not supported from the basement but are suspended from the thick floor slab that covers the basement.

To allow both the workshops and offices to be arranged as flexibly as possible, TT slabs are used for the spans. However, their rectangular shape is not fully compatible with the circular shape of the building. To fill the remaining 'wedges,' precast planks are used that are attached to the TT slabs, after which the concrete can be poured. This allowed the use of standard elements instead of having to provide custom pieces everywhere, and it was not necessary to provide formwork at 11 meters height. This solution was therefore much more efficient and also cheaper. Above the workshops, the floor slab was made extra thick – 17 cm – to transmit as little noise and vibration as possible to the offices.

The structural design is made 'for future growth.' There is a possibility that a third floor will be added to the building in the future. The dimensioning of the foundations and columns already accounts for this, and the necessary starter bars are already installed in the columns.

Focusing on comfort and safety

TVH Equipment aims for energy efficiency and fossil-free energy generation for the new building. For this reason, a BEO field (borehole energy storage) was chosen, among other things, to provide the base temperature for heating and cooling. However, due to the very specific activity in the workshops, much higher heating capacities are needed than normal. While awaiting their maintenance or repair, the machines are stored outside. Especially in winter, their large mass absorbs a lot of cold. Once inside, they quickly extract a lot of heat from the workshop. These temporary peaks in heat demand are then handled by gas boilers. Radiant panels provide very precise heating – directed at the technician and the machine, but not the ambient air in the rest of the warehouse – which results in a much more comfortable working environment than if air heating were

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chosen. Comfort is also prioritized in the offices, with active chilled beams providing heating and cooling.

In the workshops, a lot of exhaust gases are released from moving machines and diesel testing. Because some pollutants are heavier than air and others lighter, ventilation is provided both at low and high levels. We previously applied this technique in vehicle inspection centers. The air is extracted via the basement and blown out into the surroundings.

Adapting building services to the circular shape

Various overhead cranes are provided in the workshops, following the circular shape of the building. To prevent the overhead cranes from conflicting with vertical pipes, the latter are routed through the sufficiently high basement to a vertical shaft to reach the floors above.

Due to the suspended inspection pits in the basement, the clear height there is more than 4 meters. Combined with the circular shape of the building, it was complex to apply smoke and heat exhaust ventilation (SHEV). Therefore, the basement was divided into two sub-compartments and only a sprinkler system is provided. The rest of the building is also equipped with sprinklers. Because the central part of the building is essentially 'milled out,' it was not possible to design the piping in a star configuration; instead, curved piping had to be routed around the perimeter.

The possible future addition of a third floor also meant that no technical installations could be placed on the roof of level +2. The central inner garden is used as a central air intake plenum, and the technical rooms are carefully integrated into it.

BIM coordination

In this project as well, the client engaged our sister company Onebim for BIM coordination. They brought together the virtual models of the architect and the various contractors into one central BIM model. Clash detection was performed, and bottlenecks were identified and resolved. This allows for more efficient and faster work in both the design and construction phases.

The design and construction of this 360° building may be complex, but it will soon deliver an efficient architectural gem. The video above provides a virtual tour.

Construction partners:

- TVH Equipment (Waregem) – client
- Delta Sierra (Roosdaal) – project management
- DEMO+ Architects (Izegem) – architect
- Willy Naessens Group (Wortegem-Petegem) – structural contractor (precast)
- Stadsbader (Harelbeke) – structural contractor (cast-in-place concrete) + site development
- Deman (Ledegem) – overhead crane contractor
- Onebim (Kortrijk) – BIM coordination
- BM Engineering (Kortrijk) – building services and structural engineering