# ARTES ROEGIERS

**Kruibeke**

New construction of office

**Status**
2021 - 2022

**Services:**
Building Services

**Sectors:**
Office & Commercial: Office buildings

**Client:**
Artes Roegiers

**Architect:**
Jaspers - Eyers Architects

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When a general contractor with decades of experience builds for itself, decisions are made quickly with a compact building team. Artes Roegiers moved in April to a new headquarters on the Scheldt in Kruibeke. Based on an extensive TCO analysis, supported by dynamic simulations, a good balance was found between user comfort, efficient energy management, a favorable construction cost, and low facility costs.

The new headquarters is raised 2.30 meters above ground level. This ensures that the panoramic view of the Scheldt is preserved in the future, even if the dike were to be raised further. The building is partially basement-level with space for archives, a sanitary block with showers, and a large technical room for the building services. Under the other part, a crawl space allows for easy passage of the building services. A defining feature is the atrium that splits the building into two halves and extends above the roof.

On the ground floor, to the left of the atrium, there are meeting rooms, a cafeteria, and a large multipurpose hall that can be divided with mobile walls. The right half contains open-plan and enclosed offices. In the atrium – which also serves as a central meeting place – there is a reception and administration desk and a central staircase to the upper floor. Here there are more offices, smaller meeting rooms with a view of the atrium, and the boardroom for management. The offices are equipped with raised floors, which make it easy to adapt the building services in case of a possible future reconfiguration. Two walkways crossing through the atrium connect both halves of the first floor.

Sophisticated cooling/heating and ventilation

Under the parking area, a BEO field (Borehole Energy Storage) was installed with 40 boreholes of 100 meters deep that passively cool via the sound-dampening climate ceilings. A heat pump provides heating when needed. The cooling demand is passively met by exchanging cold from the ground. A cooling and heating coil on the ventilation units ensures that the supplied air generates thermal and hygrometric comfort.

For both heating and cooling as well as ventilation, there is a strong focus on efficiency and comfort. The climate ceilings are divided into zones that can each be controlled separately. Rooms with the same function, occupancy, and orientation were intelligently grouped together to limit the cost of controls and piping, without sacrificing comfort. For ventilation in the large halls, variable flow control is provided that measures $CO_2$ via the extraction duct of that space. The actual occupancy thus determines how much air is refreshed. This way, energy consumption is minimized and there is also no risk of overcooling the space when no one is present.

Simulations for the atrium

Because the atrium largely consists of glass, the question arose early in the design phase of how to create and maintain a comfortable temperature in this immense space. In the first design, the roof above the atrium was still entirely made of glass. Therefore, we made dynamic simulations based on various scenarios: an open (glass) roof or a closed roof, using solar-protective glazing, installing screens on the glass, and applying various forms of cooling. Parameters such as outdoor and indoor temperature, humidity, and solar exposure were taken into account over an entire year.

Ultimately, it turned out that a fully glass roof created a climate in which, even with active cooling, it was impossible to maintain comfortable indoor temperatures. Therefore, it was decided to make the roof closed after all, but to provide a vertical light strip protruding above the roof of the two building halves

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for additional light entry. The atrium floor can be cooled and hygienic ventilation is also provided.

From high voltage to BMS

Because the new building is located more than 400 meters from the public road, the existing high-voltage infrastructure was adapted in consultation with Fluvius and privately extended. After a TCO analysis, this proved to be the best optimization. This has the advantage that no particularly heavy, long, and therefore expensive low-voltage cables were needed, and it also makes a future expansion of the installation – with additional charging stations, for example – much easier.

The climate ceilings in the building are multifunctional. They not only provide a comfortable working temperature, but the ventilation grilles, music boxes, and lighting – with presence detection and daylight control – are also invisibly integrated into them.

To be able to monitor the building installations remotely during commissioning and especially during use of the building, and for data logging, a building management system was also installed. In consultation with the building owner, we determined the minimum requirements that the BMS must meet.

BIM collaboration

Although in practice we develop every project in 3D and BIM, the collaboration here was somewhat different due to the composition of the building team. Architect Jaspers-Eyers delivered a design that was fully created in BIM, in which we continued working for the design of the building services. However, coordination was handled by the building owner. The BIM manager of Artes ensured clash detection between building services and structural elements from the design phase onward. Once all contractors were confirmed, the subcontractors for building services refined our model to produce execution drawings and further coordinate the construction site.

Building partners:

Artes Group / Artes Roegiers (Kruibeke) – building owner + contractor + BIM coordination
Jasper-Eyers (Brussels) – architect
Boringen Verheyden (Sint-Katelijne-Waver) – geothermal contractor
Engie (Brussels) – electrical contractor
Van Maele / Artes Group (Varsenare) – HVAC contractor
Dexco (Ghent) – structural engineering firm
BM Engineering (Kortrijk) – special building services

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