



MATRIX ONE exterior (Impression: MVRDV)

MATRIX ONE

Spread across six floors, Matrix ONE offers top-quality high-tech offices and laboratories for technology and life sciences businesses. It is an exceptionally sustainable building with extremely low carbon emissions. This is achieved by excellent day lighting, the use of HR++ glass in the facade, heat and cold storage via a closed system, heat pumps, circa 1,000 m² of solar panels, LED lighting and smart building technology. Among other things, the latter allows the building management system to independently control the building's climate, ventilation and lighting depending on the presence of people in the building and their exact location. Residents can control myriad building settings via an app (BGrid technology).

Matrix ONE offers office, laboratory and research space, convention/meeting facilities and a lively ground floor with catering facilities. The various floors can be reached via a large "social stairway." It contains various facilities, such as pantry/lunch areas on every floor, work/meeting spaces and a "roof top" bar. The spacious design of the supporting structure affords great flexibility and variation in the building's layout. Each floor has a surface area of circa 2,000 m² with a large atrium at the center. The natural light that shines down from above gives the whole building a pleasant and open atmosphere. The ground floor features indoor bicycle parking with charging facilities for electric bikes and scooters.

Besides being a sustainable building in and of itself, Matrix ONE will also accommodate students, scientists and research groups from the University of Amsterdam who are working in the field of sustainability.

Sustainable design

The building is certified in accordance with the sustainability methodology BREEAM-NL Nieuwbouw (an assessment method used to determine the sustainability of buildings). BREEAM is an independent organization that issues a certificate for sustainable buildings. In addition to the aspect of Energy, the BREEAM certification process also takes the aspects of Management, Health, Transport, Water, Materials, Waste, Ecology and Pollution into account. The percentage attained in these categories earns a building one of the following scores:

+30% = Pass

+45% = Good

+55% = Very Good

+70% = Excellent

+85% = Outstanding

The design of Matrix ONE earns a BREEAM-NL score of more than 75%, thereby amply realizing the ambition of an Excellent score. Furthermore, an extremely low EPC is attained (<0.15).

The desired BREEAM Excellent score is achieved through a combination of energy demand-reducing measures and the sustainable generation of the energy that the building requires.

The most important sustainable measures incorporated into the design are:

- Compact building with efficient use of the available surface area
- Energy-saving building shell with HR++ glass in the facade
- Efficient use of light: optimal use of the available daylight combined with LED lighting
- Heat and cold generation: Heat and cold storage system
- Heat release and cooling: Climate ceilings
- Low-temperature heating and high-temperature cooling: a small temperature difference results in high efficiency and increased comfort
- Energy recovery from air treatment for heat and cold
- Smart building technology: Effective use of building installations through decentralized control tailored to building usage, e.g. by measuring CO₂, human presence and users' settings in a Smart Building app (BGrid)
- Energy generation with nearly 1,000 m² of PV panels
- Flexible design with demountable and reusable components (Madaster)

- Smart and virtually passive climate control on the social stairway

The building and its installations are flexibly designed to allow for modifications to rooms, room functions and room installations without requiring any major structural or installation-technical overhauls. This means the building can adjust to the developments of its innovative users.

One notable solution that this building offers is the spacious and multifunctional “social stairway” that connects the floors. It invites users to move around and stimulates interaction. To reduce the building's energy needs, this stairway is not actively cooled; instead, a comfortable climate is maintained through various smart means such as natural ventilation, complemented when necessary by adiabatic cooling (with mist) and mechanical ventilation on hot days.

Below is an overview of the various credits incorporated into the building:

- Management: MAN1, MAN2, MAN3, MAN4, MAN9, MAN12
- Health: HEA2, HEA3, HEA4, HEA5, HEA6, HEA8, HEA9, HEA10, HEA11
- Energy: ENE1, ENE2, ENE4, ENE5, ENE7, ENE8, ENE26
- Transport: TRA1, TRA2, TRA3, TRA4, TRA5, TRA7
- Water: WAT1, WAT2, WAT3, WAT4
- Materials: MAT1, MAT5, MAT7, MAT8
- Waste: WST1, WST3, WST5, WST6
- Ecology: LE1, LE3, LE4, LE6
- Pollution: POL2, POL3, POL4, POL6, POL7, POL8

More information about these credits can be found on the DGBC's website.

Sustainable building

During construction, measures were taken to minimize the building's environmental impact. For example, the timber used at the construction site carries a sustainability hallmark and all other materials are responsibly purchased. Construction waste is minimized and collected separately. Furthermore, transport movements to the construction site and the use of water and energy at the construction site are monitored. To properly manage all these aspects, both the contractor and the waste processor use a certified quality and environmental management system.

One unique aspect of this project is the use of demountable and reusable materials. Material passports (Madaster) are used to stimulate their reuse in the future. This marks an important step toward the realization of a circular construction process.

Experiences with BREEAM

A sustainable building initially requires an additional investment. On the other hand, people will feel comfortable in this building and the energy costs will be lower than those of the existing buildings.

Costs/Benefits

The costs and benefits of attaining the BREEAM Excellent certificate are included in the total contract price. As a result of the contract type and because the entire design and realization team is responsible for achieving the desired BREEAM score, the project was realized efficiently and unnecessary additional investment costs for BREEAM measures were kept to a minimum.

Tips

Tips for future projects: It is advisable to integrate the sustainability requirements into the design at an early stage (Preliminary Design). This prevents any surprises at a later stage.



MATRIX ONE social stairway (Impression: MVRDV)

MATRIX ONE facts & figures:

MATRIX ONE has a surface area of ca. 12,900 m² (gross surface area), divided into the following functions:

- ca. 5,140 m² office function
- ca. 2,060 m² light industrial function (laboratories)
- ca. 720 m² gathering function
- ca. 2,210 m² common areas, of which
 - ca. 280 m² sanitary facilities,
 - ca. 1,350 m² passageways
 - ca. 70 m² storage space
- ca. 2,760 miscellaneous use

On average, the building will be used on a daily basis by circa 672 people (maximum occupation is estimated to be 960 people).

The building's expected energy use is circa 190 MWh/year (15 kWh/m² gross surface area/year), of which circa 75% (11.5 kWh/m² gross surface area/year) will come from renewable energy sources. The building does not use any fossil resources (gasless building). The water used for the sanitary facilities is estimated to be 8 m³ per person per year.

The building is situated on public ground with adjacent green areas with grass and water along the north-western facade and grass along the south-eastern facade (circa 1,300 m² in total).

Process and organization

The design was created by an integral design team formed by Stone22 (Project management), MVRDV Architecten (architecture, engineering and interior), Deerns (installation advice, fire safety, building physics and sustainability), IMd (constructions) and IGG (building economics). Various meetings with the entire design team were held. During these meetings, the BREEAM expert played a steering and leading role.

The realization of the building is handled by the contractor De Vries en Verburg in collaboration with Schulte & Lestraden (installations). During the execution phase, monthly BREEAM meetings are held with the executive parties, Stone22 and the BREEAM Expert (Deerns).