



**DURA VERMEER**

Waarmaken van ambities



## **DuPont Industrial Biosciences New Building:**

*A BREEAM Excellent case study*

### **Project description**

A new laboratory and office building are being developed for DuPont Industrial Biosciences in Oegstgeest, in the vicinity of Leiden University. The laboratory will be the main location for R&D activities in Europe, The NME and Africa. Already the leading location in the Netherlands for cutting edge research in the field of biotechnology, the Bio Science Park Leiden is expanding rapidly. The new office and laboratory building take full advantage of its prime location. A minimal number of large spaces and flexible layout are raised over an efficient car park, presenting a welcoming atrium to visitors and passers-by along the Willem Einthovenstraat. Here, the building connects subtly but effectively with its neighbours, most notably the Hilton Hotel and the well-known Corpus Leiden Museum. Expedition and other amenities are discretely located at the building's west facade. DuPont will be fully immersed in this unique science landscape. Housing knowledge communities is more than just accommodating a working process. The aim of the design is to create the conditions in which a community can develop and flourish, where people are invited to challenge and inspire each

other. That is why space for interaction, chance encounters and relaxation is an essential ingredient of a successful knowledge landscape. This, of course, is what the 'Great Place to Work' philosophy is all about. For that reason, the atrium plays a very important role in our design as the welcoming central space that allows users and visitors to become visible to each other. This is where everybody enters the building, and where all comes together. This is where you sit down for a brief meeting or where you get a great cup of coffee or light meal. The atrium is also the place where results, challenges and successes are shared through lectures, exhibitions and product presentations. A walk around the atrium and on the bridges going through it even allows visitors to see what happens inside the laboratories. This is how architecture contributes to the 'Can Do' mentality that DuPont embodies.

### **BREEAM Excellent**

DuPont has expressed the wish to have a BREEAM – Building Research Establishment Environmental Assessment Method – certified building. A BREEAM assessment measures the sustainability ambitions of a project. Because its



main function – laboratories for research & development – is not part of the standard BREEAM assessment guidelines, a custom process will lead to obtain the BREEAM certification. The ambition is to achieve a BREEAM-NL Excellent certificate.

## Technical solutions

The most important sustainable and technical solutions applied to this design are:

- Cold-heat storage with heat pumps for a sustainable energy source
- Solar panels on the roof for generating electricity
- LED lighting for all laboratories and offices to significantly reduce the energy-use of lighting
- High comfort level in all working areas, like good air quality, comfortable temperatures, good acoustic level
- High flexibility with column-free floors and modular partition walls so the offices and laboratories can be exchanged easily
- Use of responsible materials like FSC wood
- Submeters to be able to monitor the energy- and water use
- Further ecological measures to create an environmentally friendly surrounding

## Functions and plans

### Building concept

Connectivity and flexibility are the main aspects of the design, resulting in an efficient overall solution. The desired total floor space is situated on just three v-shaped floors, minimizing vertical transportation. All floors are large, continuous and free of obstacles. Fire compartments match the functional building compartments seamlessly. Partitions walls can be installed every 1.8 m and there is no present location for circulation space. Technical risers are optimally placed. Storage, goods elevator, passenger elevator and other facilities have a central location, allowing for a virtually limitless number of possible layouts. At the heart of the building the atrium serves as showcase, connector and event space for both occupants and visitors.

Gross floor area 9.075 sqm  
Total terrain area 0.44 hectares

- Offices approx. 1.187 sqm
- Laboratories approx. 2.591 sqm
- Meeting function approx. 465 sqm
- Corridors approx. 961 sqm
- Storages / other approx. 321 sqm

### Expected energy and water consumption

- Expected energy use: 56,3 KWh/m<sup>2</sup> BVO
- Expected consumption of fossil fuels: none
- Expected consumption of renewable energy sources: 21,4 KWh/m<sup>2</sup> BVO
- Expected water consumption: 1.095 m<sup>3</sup>/-year
- Expected reuse of water for toilet rinse: none



## Innovative sustainability

Flexibility is a key concept in the project, to the point that offices and labs can be switched and exchanged. This will give the building a much longer lifespan than a normal office or laboratory, allowing for adjustments over the years. The combination of daylight and artificial light is, among others, a key factor in bringing to a



minimum the energy consumption: the height of the rooms is used to allow in as much daylight as possible through the facade and from the atrium.

During the construction process the following steps will help reduce the environmental impact:

The production of waste on the construction site is limited by the application of prefab parts. The waste produced on the construction site is processed by a certified waste treatment. The construction site staff is instructed on waste reduction and recycling. The contractor has an obligation to implement a building waste management plan to minimize the amount of waste and reuse it as much as possible. The contractor has the obligation to monitor and analyze the energy and water consumption on the construction site.

## Social and economic sustainability

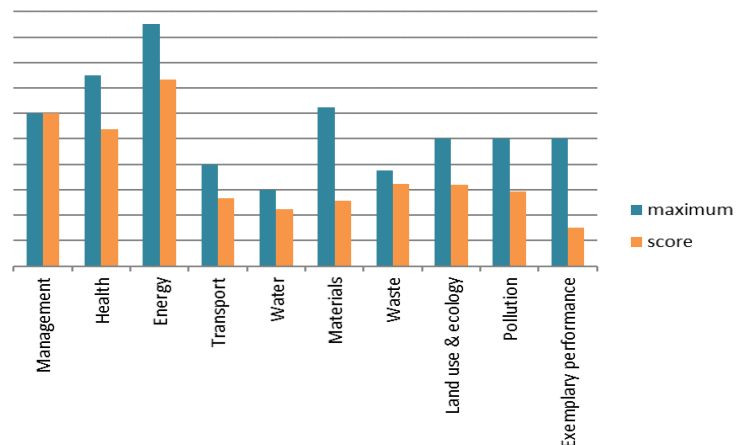
DuPont set a new standard for sustainability on a newly developed area where more high-end facilities will be built. By introducing one of the highest sustainable labels for a sophisticated building DuPont shows that even for these developments it is possible to obtain a BREEAM excellent certificate. DuPont shows that it pays to innovate, not only with products and research but also with a new building that is flexible and ready for the future.

DuPont brings a highly trained group into the area that stands for sustainability. This will interact with students and scholars that visit the opposing museum Corpus. They will see and feel that large global enterprises also stimulate and endorse sustainability.

## BREEAM process & credits

The DuPont design team consists of **Dura Vermeer, Ector Hoogstad architects, ABT and L3Q**. The BREEAM process to obtain their certificate is led by **Build2Live** on behalf of ABT. All parties involved will hold monthly meetings to discuss the progress and safeguard the ambition to obtain the BREEAM Excellent certification.

Subjects are included in each BREEAM category to achieve the ambition level. The management, energy and waste categories in particular score high. Due to the close collaboration between the various design disciplines, sustainability measures could be integrated into the design early on. The score in each BREEAM category is showed in the graphic. The list of BREEAM credits is shown in the appendix.



## Costs and benefits

The (process) costs for elaborating the BREEAM requirements are relatively high. Various parties must be involved for the preparation of documents that investigate or prove that certain requirements are met. Technical solutions for BREEAM also sometimes cost more than the usual solutions. These costs are invested because Dura Vastgoed believes that an energy-efficient building with high quality will be more beneficial in management and maintenance in the longer term and provides a better working environment.

## Evaluation and learning

BREEAM was already taken into the design from the start of the tender. This is essential for a building that is not only specific in its use but more importantly given the tight construction timeline. Dividing the project in blocks and integrating BREEAM in the design and





construction process will allow the team to meet the deadlines. This means that fit-out and interior design need to be developed simultaneously. The result is a truly integrated team where the BREEAM Expert is one of the team members that will assist the team from the start.

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## Appendix: BREEAM credits

List of BREEAM credits incorporated into the design

### Management

MAN 1 Commissioning  
MAN 2 Considerate constructors  
MAN 3 Construction site impacts  
MAN 4 Building user guide  
MAN 6 Consultation  
MAN 8 Security  
MAN 9 The development as a learning resource  
MAN 11 Ease of maintenance  
MAN 12 Life cycle costing

### Health

HEA 3 Glare control  
HEA 4 High frequency lighting  
HEA 5 Internal and external lighting levels  
HEA 6 Lighting zones & controls  
HEA 9 Volatile organic compounds  
HEA 10 Thermal comfort  
HEA 11 Thermal zoning  
HEA 13 Acoustic performance  
HEA 17 Specifications fume cupboards in laboratories  
HEA 18 Best practices laboratories

### Energy

ENE 1 Energy efficiency  
ENE 2 Sub-metering of Energy Uses  
ENE 4 Energy-efficient external lighting  
ENE 5 Use of Renewable Energy  
ENE 6 Avoidance of air infiltration  
ENE 7 Energy-efficient refrigerated and frozen storage  
ENE 8 Energy-efficient lifts  
ENE 26 Assurance of thermal quality of building shell  
ENE 19 Energie efficient laboratories

### Transport

TRA 1 Provision of public transport  
TRA 3 Alternative modes of transport  
TRA 4 Pedestrian and cyclist safety  
TRA 5 Travel Plan and Parking Policy  
TRA 7 Travel information point  
TRA 8 Deliveries and manoeuvring

### Water

WAT 1 Water consumption  
WAT 2 Watermeter  
WAT 3 Major leak detection  
WAT 4 Sanitary supply shut off  
WAT 6 Irrigation systems  
MAT 1 Materials specification  
MAT 5 Responsible sourcing of materials  
MAT 7 Designing for robustness  
MAT 8 Flexibility

### Waste

WST 1 Waste management on the construction site  
WST 3 Recyclable waste storage  
WST 5 Compost  
WST 6 Finishing elements

### Land use & ecology

LE 1 Re use of land  
LE 3 Existing Wildlife at the Construction Site  
LE 4 Plants and Animals as Co-users of the Plan Area  
LE 6 Long-term Sustainable Co-use by Plants and Animals

### Pollution

POL 2 Preventing refrigerant leaks  
POL 3 Refrigerant GWP - Cold storage  
POL 4 NOx Emissions from Heating Sources  
POL 7 Reduction of night time light pollution  
POL 8 Noise attenuation