PROLOGIS Tilburg DC5 Unit CD

BREEAM CASE STUDY

18.12.2018

BREEAM NL
CODE FOR A SUSTAINABLE BUILT ENVIRONMENT
DGBC

PROLOGIS®

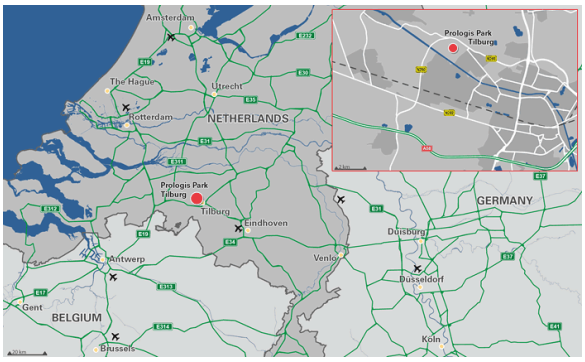
Introduction

Sustainability has been integrated into the design, implementation and operation of the building. As a world leader in the development of industrial and logistics real estate, Prologis has a special social and economic responsibility. Therefore Prologis is a participant of the Dutch Green Building Council. Please read all relevant information in Prologis' latest Sustainability Report (http://www.prologis.com/en/sustainability.html). To measure and certify the sustainability performance of the building, Prologis will apply the Breeam-NL assessment method. Prologis aims to qualify the building at least with the BREEAM 'VERY GOOD' rating BREEAM BRL 2014 v2.0. This case study outlines our approach to the sustainable development of this unique project.

About the building

Prologis Park Tilburg is located in the large scale Industrial Park Vossenberg West II and encloses 13 ha of land with a possibility to build out approximately 80,000 m² state-of-the-art and sustainable distribution center. This distribution center can easily be divided into units of approximately 11.700 m² and 14.500 m² with a clear height of 12.2 m and a mezzanine above the loading area. The size and location of the offices are flexible and can be determined in consultation with the needs of the customer. The second phase consists of the units C&D a total floor area of approx.30.170 m²

Tilburg is one of the Netherlands' logistics hot spots due to its strategic location close to the north-south and the east-west corridor. The city has excellent transport links by land, freight and waterways. It can be easily accessed from all directions and is complemented by an excellent road system including the peripheral road A261; the A27 motorway, which connects the north and south, and the A58 motorway, a major arterial route connecting Rotterdam Harbour and the Belgian Port of Antwerp with the Ruhr Valley region in Germany. Additionally, Tilburg is served by rail and barge terminals.



Within the design of Prologis Tilburg DC5 phase 2, the concepts of well-being, health, durability, quality, flexibility and appearance all play a decisive role.

Area overview:

Total site phase 2	30.176 sqm
User area	30,176 sqm
Warehouse	26,270 sqm
Mezzanine	3,589 sqm
Office	317 sqm

Project team

To achieve the Breeam Very Good rating, Tilburg DC5 unit CD will be carried out in conjunction with the following partners:

Developer:	Prologis
Architect:	Johan de Vries Architect
General contractor:	Sprangers Bouwbedrijf
BREEAM & WELL Building expert:	M3E
Ecologist:	AquaTerra-KuiperBurger (ATKB)
Interior architect:	Doepelstrijkers
Electrical installation:	Hoppenbrouwers
Mechanical installation:	Hoppenbrouwers
Sprinkler installation:	Altebra
Customer:	Pantos
Landscape architect	Plein06

Approach

The dedicated Project Team has the ambition and drive to outperform the set level of sustainability. The Project Team recognizes creating a sustainable building being a joint-effort. The Project Team culture encourages to share new ideas and offers a platform to stimulate innovation.

Prologis has in-house Breeam Experts what allows us to consider the Breeam aspects in the preliminary stage of the project. The global expertise of Prologis with sustainability, is implemented in each stage of the project. This unique approach helps to reach high levels of sustainable performance from an idea to its exploitation. Sustainability will be a recurring topic on the agenda of customer, construction, site and toolbox meetings to involve all stakeholders through-out the project.

Special attention will be given to guide and support the customer with Breeam aspects that are subject to the tenant specific fit-out and future operation in order to secure the Breeam certification at project completion.

This will help the customer to integrate the Breeam requirements in the most efficient way.

To maintain the Breaam rating and optimize the efficient operation of the building a handover is scheduled at completion in which the customer Facility Manager, Service Companies and the Prologis Property Manager are closely involved.

Sustainability aspects

Although the building will be constructed as a 'built-to-suit' concept, for its first customer, the design of the building complies with the uniform European Prologis Specification. The generic set-up of the building can accommodate a wide variety of tenant-specific fit-outs with a normal and/or narrow-aisle racking configuration and multiple storage mezzanine floors. The possibility of installing a tailor-made-fit-out without needing significant adjustments to the building shell ensures future-proofing as the ultimate sustainability aspect. Furthermore, the following technical features will be implemented in the building design:

- High-grade insulated wall panels and a high-grade insulated roof system.
- Interior coating in bright white on the visible side of the roof and façade cladding to improve light reflection and with an easy-to-clean surface.
- Guaranteed air leakage rate of max. 2.5 m³/(m²h) in the warehouse, proved by door blower test and thermographic survey.
- Steel roof structure prepared for the installation of solar panels on the entire roof surface.
- High-quality (above standard) running plate of dock levellers; 8/10 mm thick with insulation.
- Dock levellers with gap sealing to prevent drafts as well as the escape of warm air.
- Dock shelters with bottom cushion for optimized energy efficiency.
- Dock envelop with flexible rubber sealing.
- Energy-saving mode for dock equipment control.
- High-grade insulated dock doors with a thickness of 67 mm, equipped with a thermoframe for a thermal break between frame and façade. Lip seals on both sides of the door and a double seal in the lintel area prevent heat and cold loss, with a thermal value of U=0.6 W/(m²K). Two sight windows per door with Duratec triple glazing with a pane thickness of 51 mm, 40% improved thermal insulation compared to 16 mm thick glazing.
- Energy-efficient LED lighting in the warehouse with dynamic DIM function via DALI intelligent lighting management system.
- Innovative control of LED lighting in the warehouse with lifetime lumen management via constant light output for up to 15% energy savings over the life-time of the installation, extended lifetime and uniform light level between maintenance cycles.
- Energy-efficient LED lights in offices with dynamic DIM function via daylight reflection control.
- Energy-efficient LED lights in sanitary and technical rooms with motion control for energy savings.
- Energy-saving LED emergency lighting pictograms.
- Energy-saving outdoor LED lighting.

- Daylight intrusion via rooflights in the warehouse for energy savings and well-being; system with three layers of polycarbonate.
- Daylight intrusion via window strip with HR++ insulating glass at the mezzanine level.
- Insulating glass in offices with a special solar control coating which also has heat-insulating properties, with an outstanding thermal value of approx. U=1.00 W/(m²K). The application of this coating enables ample daylight to enter and the majority of heat to be kept out at the same time.
- Energy-saving radiant ceiling panels in the warehouse. The panels are heated indirectly via a heat pump.
- Highly efficient floor heating along windows in the offices.
- Heat pump VRF cooling system and ventilation system with efficient energy recovery in the offices.
- Building management system for installations.
- Smart energy meters for monitoring and managing energy consumption.
- Leak detection of water connections.
- Sprinkler system equipped with additional cut-off valves for water savings during test runs.
- Low-maintenance concrete paving in the loading/ unloading zone.
- Oil–water separator for rain water of truck court.
- Water-saving measures in sanitary rooms.
- Encouraging carpooling.
- Charging stations on-site for electric cars and bicycles.
- Ecological survey of location.
- Solar panels to supply the electric cars with 100% sustainable energy.

During the construction process, various measures will be taken to reduce the impact on the environment, such as:

- The registration and reduction of the consumption of water and electricity.
- Waste management to reduce waste and to enhance recycling by a certified waste treatment facility.
- The commissioning of an ecologist to assess the environmental impact of the construction and to minimize it.

Quality control

Along with the Breeam certification, the other measures that are used to control quality and assure sustainability are:

- Quality control of design and construction of floor slab by specialized slab consultant.
- Plan review and construction management of roofing system by Roof Management and the Roof Manager Web-based tool.
- Environmental management system in line with ISO14001.
- Environmental site assessment survey ‘zero base line soil and groundwater investigation’ at commencement of lease.
- External Breeam expert and assessor.
- Air-tight construction with blower test to guarantee air leakage rate of max 2.5 $m^3/(m^2h)$.
- Thermographic survey to ensure building shell insulation.
- GPR certification method.
- WELL Building Standard to assure a healthy, safe and pleasant working environment.
- FSC-wood certified project.

Energy consumption	
Expected electricity use by building:	19.1 kWh/m^2 GFA/year
Expected electricity use of fossil fuels:	33.8 kWh/m^2 GFA
Expected use of sustainable resources in the office spaces:	33.2 kWh/m^2 GFA (43%)
Expected water consumption:	10 m^3/person/year
Percentage of ‘grey’ water usage:	0%

Key Breeam facts

The project team expects to achieve the following Breeam credits:

75%	63%	46%
Management	Health	Energy
67%	75%	53%
Transport	Water	Material
83%	55%	73%
Waste	Land use and ecology	Pollution

The project aims to perform well, with credits spread over the assessment criteria, as shown above. The precisely engineered foundation and building structure allow for the effective use of resources. In addition, the flexibility of the design and carefully chosen high-quality materials result in a future-proof building with low operational costs. Further reduction of the running costs may be achieved in adding solar panels in the future. The roof structure will be prepared for solar panels and the project team will explore this possibility.

Breeam credits

credit	onderdeel	Industrie					Kantoor				
		Punten beschikbaar	Minimaal Punten te behalen	Maximaal Punten te behalen	Opp. Gew.	MAXIMAAL	Punten beschikbaar	Minimaal Punten te behalen	Maximaal Punten te behalen	Opp. Gew.	MAXIMAAL
12% Management											
Man 1	Prestatieborging	3	2	2	1,48%		3	2	2	0,02%	
Man 2	Bouwplaats en omgeving	2	2	2	1,48%		2	2	2	0,02%	
Man 3	Milieu-impact bouwplaats	4	4	4	2,97%		4	4	4	0,03%	
	exemplary performance		☐	☐				☐	☐		
Man 4	Gebruikershandleiding	1	1	1	0,74%		1	1	1	0,01%	
Man 6	Consultatie	1	0	0	0,00%		1	0	0	0,00%	
Man 8	Veiligheid	1	1	1	0,74%		1	1	1	0,01%	
Man 9	Kennisoverdracht	1	1	1	0,74%		1	1	1	0,01%	
Man 11	Onderhoudsgemak	1	0	0	0,00%		1	0	0	0,00%	
Man 12	Levenscyclus kostenanalyse	2	0	0	0,00%		2	0	0	0,00%	
	TOTAAL:	16	11	11	8,17%	8,17%	16	11	11	0,08%	0,08%
15% Gezondheid											
Hea 1	Daglichttoetreding	0	0	0	0,00%		1	0	0	0,00%	
	exemplary performance		☐	☐				☐	☐		
Hea 2	Uitzicht	1	0	0	0,00%		1	0	0	0,00%	
Hea 3	Tegengaan lichthinder	0	0	0	0		1	0	0	0,00%	
Hea 4	Hoog frequent verlichting	1	1	1	1,86%		1	1	1	0,01%	
Hea 5	Kunstverlichting binnen- en buiten	1	1	1	1,86%		1	1	1	0,01%	
Hea 6	Lichtregeling	0	0	0	0,00%		1	0	0	0,00%	
Hea 7	Natuurlijke ventilatie	0	0	0	0,00%		1	0	0	0,00%	
Hea 8	Interne luchtkwaliteit	2	2	2	3,71%		2	2	2	0,02%	
Hea 9	Vluchtige organische verbindingen	1	1	1	1,86%		1	1	1	0,01%	
Hea 10	Thermisch comfort	2	1	1	1,86%		2	1	1	0,01%	
Hea 11	Temperatuurregeling	0	0	0	0,00%		1	0	0	0,00%	
Hea 13	Akoestiek	0	0	0	0,00%		1	0	0	0,00%	
Hea 14	Privébuitenruimte	n.v.t.	n.v.t.	0	0,00%		n.v.t.	n.v.t.	0	0,00%	
Hea 15	Toegankelijkheid	n.v.t.	n.v.t.	0	0,00%		n.v.t.	n.v.t.	0	0,00%	
	TOTAAL:	8	6	6	11,14%	11,14%	14	6	6	0,06%	0,06%
19% Energie											
Ene 1	CO_2 emissie- reductie	15	6	6	4,70%		15	6	6	0,05%	
	exemplary performance		☐	☐				☐	☐		
	exemplary performance		☐	☐				☐	☐		
Ene 2a	Sub-metering energieverbruiken overige functies	2	2	2	1,57%		2	2	2	0,02%	
Ene 2b	Sub-metering energieverbruiken woningen	n.v.t.	n.v.t.		0,00%		n.v.t.	n.v.t.	0	0,00%	
Ene 4	Energiezuinige buitenverlichting	1	1	1	0,78%		1	1	1	0,01%	
Ene 5	Toepassing van duurzame energie	3	0	0	0,00%		3	0	0	0,00%	
	exemplary performance		☐	☐				☐	☐		
Ene 6	Minimalisatie infiltratie laad / los	1	0	0	0,00%		1	0	0	0,00%	
Ene 7a	Energiezuinige koel- en vriesopslag overige functies	0	0	0	0,00%		0	0	0	0,00%	
Ene 7b	Energiezuinige koel- en vriesopslag winkel en logies	n.v.t.	n.v.t.	0	0,00%		0	0	0	0,00%	
Ene 8	Energiezuinige liften	0	0	0	0,00%		0	0	0	0,00%	
Ene 26	Waarborging thermische kwaliteit gebouwschil	2	2	2	1,57%		2	2	2	0,02%	
	TOTAAL:	24	11	11	8,62%	8,62%	24	11	11	0,09%	0,09%
8% Transport											
Tra 1a	Aanbod van OV kantoren , scholen, industrie	2	0	0	0,00%		2	0	0	0,00%	
Tra 1b	Aanbod van OV winkel, logies, bijeenkomst	0	0	0	0,00%		0	0	0	0,00%	
Tra 1c	Aanbod van OV woonfunctie	n.v.t.	n.v.t.	0	0,00%		n.v.t.	n.v.t.	0	0,00%	
Tra 2	Afstand tot basisvoorzieningen	1	0	0	0,00%		1	0	0	0,00%	
Tra 3a	Alternatief vervoer overige functies	2	2	2	1,32%		2	2	2	0,01%	
	exemplary performance		☐	☐				☐	☐		
Tra 3b	Alternatief vervoer woningen	n.v.t.	n.v.t.	0	0,00%		n.v.t.	n.v.t.	0	0,00%	
Tra 4	Voetgangers- en fietsersveiligheid	2	2	2	1,32%		2	2	2	0,01%	
Tra 5	Vervoersplan en parkeerbeleid	3	3	3	1,98%		3	3	3	0,02%	
Tra 7	Vervoersinformatiepunt	1	1	1	0,66%		1	1	1	0,01%	
Tra 8	Toelevering en manoeuvreren	1	0	0	0,00%		1	0	0	0,00%	
	TOTAAL:	12	8	8	5,28%	5,28%	12	8	8	0,05%	0,05%
6% Water											
Wat 1a	Waterverbruik overige functies	3	2	2	1,48%		3	2	2	0,02%	
Wat 1b	Waterverbruik woningen	n.v.t.	n.v.t.	0,00%	0,00%		n.v.t.	n.v.t.	0,00%	0,00%	
Wat 2	Watermeter	1	1	1	0,74%		1	1	1	0,01%	
Wat 3	Hoofd lekdetectie	1	1	1	0,74%		1	1	1	0,01%	
Wat 4	Zelfsluitende watertoevoer sanitair	1	1	1	0,74%		1	1	1	0,01%	
Wat 5	Recycling van water	1	0	0	0,00%		1	0	0	0,00%	
Wat 6	Irrigatiesystemen	1	1	1	0,00%		1	1	1	0,01%	
	TOTAAL:	8	6	6	4,45%	4,45%	8	6	6	0,05%	0,05%
12,50% Materialen											
Mat 1	Bouwmaterialen	8	5	6	4,76%		8	5	6	0,04%	
	exemplary performance		☐	☐				☐	☐		
Mat 5	Onderbouwde herkomst van materialen	4	1	1	0,95%		4	1	1	0,01%	
	exemplary performance		☐	☐				☐	☐		
Mat 7	Robuust ontwerpen	1	1	1	0,95%		1	1	1	0,01%	
Mat 8	Gebouwflexibiliteit	0	0	0	0,00%		4	0	0	0,00%	
	TOTAAL:	13	7	8	6,66%	7,61%	17	7	8	0,05%	0,06%
7,50% Afval											
Wst 1	Afvalmanagement op de bouwplaats	3	3	3	3,71%		3	3	3	0,04%	
	exemplary performance		☑	☑				☑	☑		
Wst 2	Gebruik van secundair materiaal	1	0	0	0,00%		1	0	0	0,00%	
Wst 3a	Opslagruimte voor herbruikbaar afval overige functies	1	1	1	1,24%		1	1	1	0,01%	
Wst 3b	Opslagruimte voor herbruikbaar afval woningen	n.v.t.	n.v.t.	0,00%	0,00%		n.v.t.	n.v.t.	0	0,00%	
Wst 5	Compost	0	0	0,00%	0,00%		0	0	0	0,00%	
Wst 6	Inrichting	1	1	1	1,24%		1	1	1	0,01%	
	TOTAAL:	6	5	5	6,19%	6,19%	6	5	5	0,06%	0,06%
10% Landgebruik en ecologie											
LE1	Hergebruik van land	5	3	3	2,70%		5	3	3	0,03%	
LE2	Verontreinigde bodem	2	0	0	0,00%		2	0	0	0,00%	
LE3	Aanwezige planten en dieren op de locatie	1	1	1	0,90%		1	1	1	0,01%	
LE4	Planten en dieren als medegebruiker van het planetbied	2	1	1	0,90%		2	1	1	0,01%	
LE6	Duurzaam medegebruik van planten en dieren op de lange termijn	1	1	1	0,90%		1	1	1	0,01%	
LE9	Efficient grondgebruik	n.v.t.	n.v.t.	0	0,00%		n.v.t.	n.v.t.	0	0,00%	
	TOTAAL:	11	6	6	5,40%	5,40%	11	6	6	0,05%	0,05%
10% Vervuiling											
Pol 1	GWP van koudemiddelen voor klimatisering	1	0	0	0,00%		1	0	0	0,00%	
Pol 2	Voorkomen van lekkages van koudemiddelen	2	1	1	0,90%		2	1	1	0,01%	
Pol 3	GWP van koudemiddelen voor warenkoeling	0	0	0	0,00%		0	0	0	0,00%	
Pol 4	Ruimteverwarming gerelateerde NOx emissie	3	0	1	0,00%		3	0	1	0,00%	
	exemplary performance		☐	☐				☐	☐		
Pol 6	Minimalisering van vervuiling van afstromend regenwater	3	1	1	0,90%		3	1	1	0,01%	
Pol 7	Minimalisering lichtvervuiling	1	1	1	0,90%		1	1	1	0,01%	
Pol 8	Geluidsoverlast	1	1	1	0,90%		1	1	1	0,01%	
	TOTAAL:	11	4	5	3,60%	4,50%	11	4	5	0,04%	0,05%
					59,5%	61,4%				0,5%	0,6%

Costs and benefits

Three types of costs – which are related to the Breeam process – can be differentiated in this project:

1. Costs concerning the BREEAM certification process itself
2. Cost of (energy-) reducing measures with a ROI
3. Additional investments in BREEAM credits that don't have a direct ROI

Examples of costs of the BREEAM certification process are the BREEAM expert and assessor, registration fees and the selection of a contractor capable of achieving the BREEAM credits. Examples of energy-reducing measures are radiant ceiling panels, LED lighting and the solar panels.

Additional investments are made in ecological measures, water-loss prevention and energy monitoring of the building.

For Prologis, this translates into a more desirable building. Buildings built to the highest sustainability standards are more efficient to operate, reducing costs for tenants and encouraging extended occupancy. Over time, efficient buildings are better for customers, investors and communities.

Lessons learned and future plans

The building is an excellent reference of Prologis' current specification for all new developments in Benelux. The team has identified the following recommendations for the next project.

1. Some credits can only be achieved by starting early or with the help of the user and/or neighbors. Examples of this are consulting with the local community and future occupants. For future projects, the user should receive an information package to aid them in making choices that also lead to the BREEAM certification.
2. Solar panels are a stand-alone business case. The roof is designed to hold solar panels. At a later time these will be be installed. A subsidy has been granted to install solar panels.
3. The WELL Building Standard offers a framework to consider well-being and health in a consistent way complimentary to the Breeam method. This made it possible to achieve some Breeam credits that were previously not considered. It is useful to use Breeam because it already covers some WELL feature's.

Some final thoughts

For developers, contractors and architects, BREEAM has become the key inspiration to use the available resources in a more innovative, sustainable and efficient manner. Development projects with a BREEAM certification not only improve the quality of the environment for the people that work in them, but also result in more attractive investments for the long-term property owner.

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