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Prestigious property in Duesseldorf

The green side of Koe-Bogen

Koe-Bogen, the luxury shopping and office mile in the heart of Duesseldorf, the capital of North Rhine-Westphalia, Germany, is shaping the cityscape. It is not only the innovative design of this six-storey complex created by Daniel Libeskind that is extraordinary but also the fact that it has been awarded LEED Platinum Certification for sustainable building. The green design plan includes about 4000 m² of extensive green roof at a height of 26 m, about 1500 m² of roof garden for each of the green courtyards on the third and fourth storeys and 1200 m² of paving for the forecourt at ground level, above the underground garage. Greenery has also claimed its place in the bizarre incisions in the façade, enabling these “permeated green cuts” to bring the adjacent green courtyard into the building. The concepts have all been a huge success thanks to the use of the appropriate ZinCo green roof technology.

In assuming Koe-Bogen from the project developer “the developer” Projektentwicklung GmbH, Cologne/Duesseldorf, the current owner, Art-Invest Real Estate, has acquired a prestigious property. This contemporary and highly-functional building complex consists of a shopping area and



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restaurants across three levels, three levels with office space and an underground garage also over three levels.

The name *Koe-Bogen* is taken from the arc (Bogen) that is drawn by the street on the boundary of the Hofgarten park towards Koenigsallee (Koe) street. The two buildings connected by a bridge take up the contour of the Hofgarten to the North and follow the building line to the West of the Koenigsallee. To the South and East, the building complex discloses an undulating curved silhouette. The passageway between the buildings allows direct access to the quiet zones of the Hofgarten and the Landskrone lake.

The architecture of Daniel Libeskind

In addition to the very special shape of the building, the façade made of glass, white stone and greened diagonal “cuts” speaks its very own language. It is joined by contemporary roof gardens with plant beds set among the patterns made by paving stones, and expansive green roof areas.

“Buildings – contrary to popular belief – are not inanimate objects. They live and breathe and, just like us people, they have an inner and an outer self and a body and a soul”, according to the philosophy of the architect, Daniel Libeskind. The work of the New Yorker can be seen worldwide and ranges from museum buildings, convention centres, universities, hotels and shopping malls to residential projects. What sets his designs apart is that



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the buildings are represented as having their own identity within their given cultural context.

Precision tailoring

Usable open space for the building of Koe-Bogen became available once parts of the infrastructure for trams and cars were relocated below ground. The contractors were faced with a considerable challenge regarding the logistics of the project, due to the fact that the first stages of the civil engineering projects, i.e. tunnel construction, the reinstatement of the former elevated road and the creation of a pedestrian promenade, coincided with the timing of the structural engineering project, the building of Koe-Bogen.

The foundation for all the roof areas of the Koe-Bogen complex is a root-resistant, bituminous roof waterproofing membrane, regardless of whether it's for the "warm" roofs of the buildings and the inner courtyards or on the "inverted" roof of the underground garage, where the waterproofing is protected beneath the thermal insulation layer. ZinCo provided tailor-made solutions, from extensive to intensive green roof to forecourt surfaces for pathways and driveways, to suit each individual building in the Koe-Bogen complex for each type of individual use.



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Extensive green areas

The drainage and water storage element Floraset FS 50 is the core element of the build-up used for the approx. 4000 m² of extensive green roof in the building complex. The Floraset[®] FS 50 elements made from expanded polystyrene (EPS) are particularly suited for such large roof areas with minimum pitch and lengthy drainage routes, where puddles can be expected to form. The installation of 50 mm high elements with their underlying, continuous channel system, ensures the required elevation over the standing water. On the upper side, water retention cells provide for a supply of water suited to the given plants and the openings ensure diffusion and aeration. Transport and handling on the building site is not a problem given the light weight of the Floraset[®] FS 50 elements. The system filter SF is installed over the drainage layer and this is followed by 8–10 cm of substrate. Pre-cultivated vegetation mats were installed around the areas at the roof edge due to the wind suction at an altitude of 26 m, and Sedum cuttings were sown in the other areas. Just one year after sowing, full coverage has been achieved, as can be seen in the recent photos.

A work of art with paving and plants

The two courtyard roofs that make up the 1500 m² of intensive green roof is each a work of art in itself, with a linear paving pattern, created using large-size, light and dark paving stones and a wide variety of plant beds in



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many sizes, heights and shapes, incorporated into the areas between the paved areas.

The ZinCo drainage mat Fixodrive® FX 50 is a permanently reliable basis for the stylish design. As it is supplied as a pre-laminated roll, quick installation is guaranteed. A good, solid bond is made thanks to the interlocking studs along the long side, allowing for drainage across the entire area beneath the green and paved areas. The Duesseldorf landscape architect, Sebastian Fuerst, worked together with Daniel Libeskind on these unique roof gardens with their plants from native grasses, ferns, perennials, bushes and small trees, just as they did for the five diagonal “permeated cuts” in the façade.

Floating garden in the “cuts”

The permeated cuts are on the north and western elevations of the buildings and cut cross a number of storeys. Within the five metre wide and two metre deep “cuts” there are additional sloped levels. The permanent growth of the evergreens and the robust plants that were chosen is ensured thanks to the drainage and protection mat Fixodrain® XD 20, in combination with varying substrate depths, underground anchoring of the bushes as protection against erosion and wind suction, automatic irrigation, fertilisation, heating and lighting.



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Pedestrian area and loading area on the forecourt

An area of about 1200 m² of the forecourt is actually roof area as it is situated directly above the underground garage. Given that not only pedestrians but also vehicles such as delivery vans and emergency service vehicles will be using this area, the paving structure had to be designed to carry the required loads. The extremely pressure-resistant drainage element Stabilodrain[®] SD 30 is ideal for use beneath driveways, particularly on inverted roofs: it is vapour diffusive and therefore allows moisture to diffuse out.

Winner of an MIPIM Award and LEED Platinum-certified

Koe-Bogen was awarded the prestigious MIPIM Award for “Best Urban Regeneration Project” in March 2014, in Cannes. This award is referred to as the “Oscar of the real estate sector”. Six months later, the building was granted certification according to the American system “Leadership in Energy and Environmental Design” (LEED), at the highest classification level: LEED Platinum. This internationally-recognised, sustainable building standard is awarded by the US Green Building Council. The decisive factors in this certification award were, among others, resource-conserving building, the use of renewable energy and heat recovery and also the 47 % proportion of green area of the overall project. The extensive green roof, in particular, provides a large water infiltration area and, therefore, a high level of water retention.

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Koe-Bogen is the first milestone and a prestigious example of the many activities that are required for the creation of a contemporary urban setting in downtown Duesseldorf.

Characters with spaces: 8352

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Site notice

Building project:	Koe-Bogen Einzelhandels und Bueroimmobilie 40212 Duesseldorf
Owner:	Art-Invest Real Estate Funds GmbH, 50670 Cologne
Project developer:	“die developer“ Projektentwicklung GmbH, 40212 Düsseldorf
General contractor:	Zechbau GmbH Niederlassung Duesseldorf, 40699 Erkrath
Architect:	Architect Daniel Libeskind AG, 8006 Zuerich
Landscape architect:	Buero Fuerst Architects GmbH, 40589 Duesseldorf
Construction year:	2011–2013
Roof area:	Building roofs approx. 4000 m ² extensive green roof with Floraset [®] FS 50 Courtyard roofs approx. 1500 m ² intensive green roof with Fixodrive [®] FX 50 Forecourt over underground garage approx. 1200 m ² paving on Stabilodrain [®] SD 30 foundation
Roof contractor:	Friedrich Schmidt Bedachungs GmbH, 28201 Bremen
Green roof contractor:	Balan GmbH Garten- und Landschaftsbau, 45711 Datteln (building roofs) Sieg + Partner GmbH & Co. KG, 42929 Wermelskirchen (courtyard roofs and forecourt)
System supplier:	ZinCo GmbH, 72622 Nuertingen



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Photos

Please quote the relevant source when publishing.



File name: A 1878-17.jpg

Source: "die developer" Projektentwicklung GmbH

Photo caption:

The impressive Koe-Bogen office and retail buildings in Duesseldorf are characterised by their undulating shape.



File name: dkb_aussen_hofgarten_nacht_cam03_view_4_130214.jpg

Source: "die developer" Projektentwicklung GmbH

Photo caption:

In architect Daniel Libeskind's design, Koe-Bogen nestles against the Landskrone lake in the Hofgarten park.



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File name: dkb_aussen_luftbild_montage_final_110520.jpg

Source: "die developer" Projektentwicklung GmbH

Photo caption:

As seen in the model, the green roof areas help to blend Koe-Bogen into the surrounds of the Hofgarten recreation area.



File name: koe-bogen_041.jpg

Source: Michael Jarmusch / ZinCo GmbH

Photo caption:

White stone and glass characterise the complex, linear facade pattern, interrupted by the greened facade incisions, referred to as "cuts".



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File name: koe-bogen_039.jpg
Source: Michael Jarmusch / ZinCo GmbH

Photo caption:

“The cuts allow the Hofgarten park to penetrate into the building, therefore allowing nature to be experienced in a new and unexpected way”, says architect Daniel Libeskind.



File name: koe-bogen_035.jpg
Source: Michael Jarmusch / ZinCo GmbH

Photo caption:

Thanks to ZinCo technology, the forecourt between the buildings can be used for walking and driving.



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File name: koe-bogen_050.jpg

Source: Michael Jarmusch / ZinCo GmbH

Photo caption:

The courtyard on the third floor provides an appealing relaxation area in our day-to-day lives.



File name: koe-bogen_010.jpg

Source: Michael Jarmusch / ZinCo GmbH

Photo caption:

The courtyard on the fourth floor is also a skilfully implemented recreation area.



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File name: koe-bogen_004.jpg

Source: Michael Jarmusch / ZinCo GmbH

Photo caption:

The paving stones continue the linear shape and are punctuated by the green areas.



File name: koe-bogen_031.jpg

Source: Michael Jarmusch / ZinCo GmbH

Photo caption:

Landscape architect Sebastian Furst composed the interplay between green and paved areas on the roof gardens.



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File name: koe-bogen_033.jpg
Source: Michael Jarmusch / ZinCo GmbH

Photo caption:
The planters on the roof gardens have specially chosen sizes and shapes.



File name: koe-bogen_056.jpg
Source: Michael Jarmusch / ZinCo GmbH

Photo caption:
The interweaving of nature and architecture is discovered again and again around the building.



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File name: koe-bogen_011.jpg
Source: Michael Jarmusch / ZinCo GmbH

Photo caption:

A significant part of the greening of Koe-Bogen is the extensive green roof which expands across an area of about 4000 m².



File name: koe-bogen_029.jpg
Source: Michael Jarmusch / ZinCo GmbH

Photo caption:

The roof garden, protected all round by the facade, is appealing no matter what the weather.



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File name: koe-bogen_021.jpg
Source: Michael Jarmusch / ZinCo GmbH

Photo caption:
The Sedum vegetation protects the waterproofing effectively from UV rays, hailstones, heat and cold.



File name: koe-bogen_027.jpg
Source: Michael Jarmusch / ZinCo GmbH

Photo caption:
Water retention is also sizeable with an extensive green roof. Most of it will evaporate, the rest will drain off over time.



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File name: Duesseldorf Koe-Bogen 056.jpg
Source: ZinCo GmbH

Photo caption:
Pre-cultivated vegetation mats are used at the roof edge, which can be exposed to wind suction, while Sedum cuttings are sown in the other areas.



File name: Duesseldorf Koe-Bogen 016.jpg
Source: ZinCo GmbH

Photo caption:
Pressure-resistant even when installed beneath a driveway surface: the drainage element Stabilodrain® SD 30.



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File name: Duesseldorf Koe-Bogen 035.jpg
Source: ZinCo GmbH

Photo caption:

Fixodrive® FX 50 laminated rolls provide the foundation for the green roofs on the courtyards.



File name: Duesseldorf Koe-Bogen 080.jpg
Source: ZinCo GmbH

Photo caption:

Beneath the planters and the paving stones, Fixodrive® FX 50 provides for drainage across the entire area.