Dörken - leading through competence. For more than 120 years.

Horizontal surface drainage in the field: in this reference brochure, architects, owners, and users will find tailored and cost-efficient solutions for all applications in planted and paved flat roofs involving drainage sheets of the DELTA® brand. Developed on the basis of innovative ideas and manufactured in modern production facilities, the top-quality surface drainage products made by Dörken GmbH & Co. KG set standards for reliability, durability, and energy conservation. Domiciled in the Westphalian town of Herdecke, the company is committed to providing its customers with products of outstanding quality and personalised solutions. Having lived up to

this ambition for more than 120 years, Dörken is in every respect an efficient partner for planners, dealers, and craftsmen.





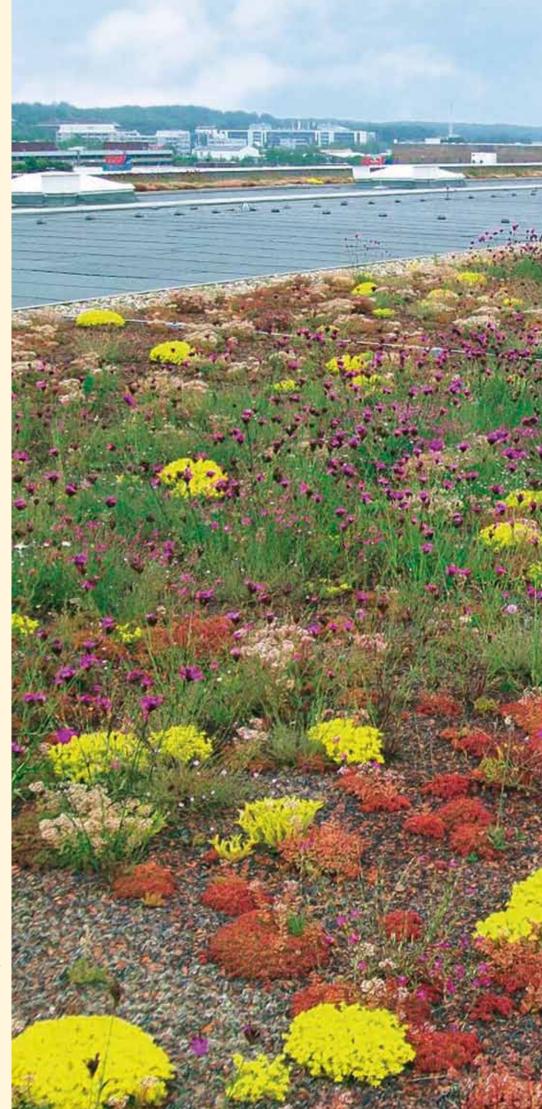
Greenery as far as the eye can see: we call it building with a vision.

Today, green roofs are part of a sustainable building philosophy in modern urban architecture. For green roofs not only look good, they offer numerous advantages. Thus, large flat roofs and ceilings can be used in many ways: your every wish can be realised, be it a biotope, additional parking space, or areas to be used for leisure and sports. Given the limited space available in urban areas, flat roofs have a special contribution to make towards increasing the quality and comfort of life.

In addition, there are a number of essential technical advantages in favour of green roofs: they protect the roof structure from extreme temperatures and wind suction, besides improving noise attenuation and heat insulation. Small wonder, then, that green roofs are growing more and more popular among architects, planners, and owners.

However, this will work only if rain water as well as any run-off from outer walls can be safely and reliably drained away at the surface and the waterproofing level. Mineral drainage layers of gravel or chippings do not really comply well with these requirements: not only is there a constant risk of silting up with the attendant negative effect on drainage performance, their requisite minimum thickness constitutes a planning problem, frequently causing considerable additional costs.

Dörken offers no fewer three sheet types that are tailor-made for the conversion of flat roofs: DELTA®-TERRAXX, DELTA®-FLORAXX TOP, and DELTA®-FLORAXX. These top-quality sheets are distinguished not only by their high protective effect and large drainage capacity but also by their permanent filtration capability, high compressive strength, outstanding longevity, and low add-on height. Once again, users benefit here from the proven knowhow of Europe's number one manufacturer of dimpled and drainage sheets.







Serenade Court, Limburg

Most guided tours of Limburg on the river Lahn start off at one of the town's landmarks, the 'Blowball'. Consisting of a metal column with a sphere of 127 nozzles around its top, the fountain in the Serenade Court resembles a dandelion clock in shape. The space around the fountain is ideal for lounging, and it is also a popular attraction, particularly in the summer months. In this case, DELTA®-TERRAXX was installed as an efficient structural drainage system underneath the paved and planted areas.

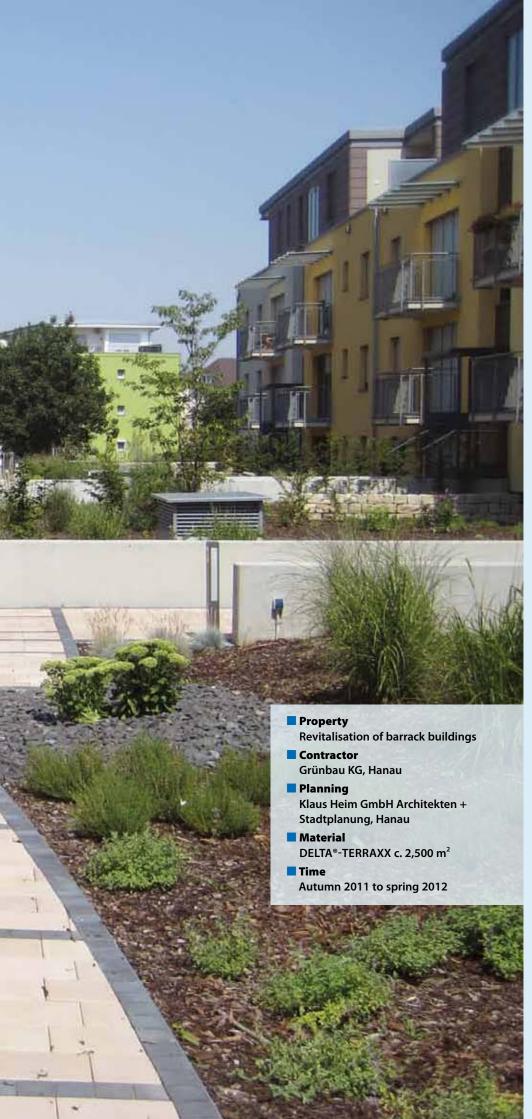














Argonne Park, Hanau

Modern living close to nature: Argonne Park is not a classical development but a symbiosis of old and new, forming part of a master concept that is in touch with nature. The most impressive features of the property include its spaciousness and its large parks containing numerous children's playgrounds and old trees. The drainage system laid out under the herbaceous covers of the underground garage ceilings is DELTA®-TERRAXX.



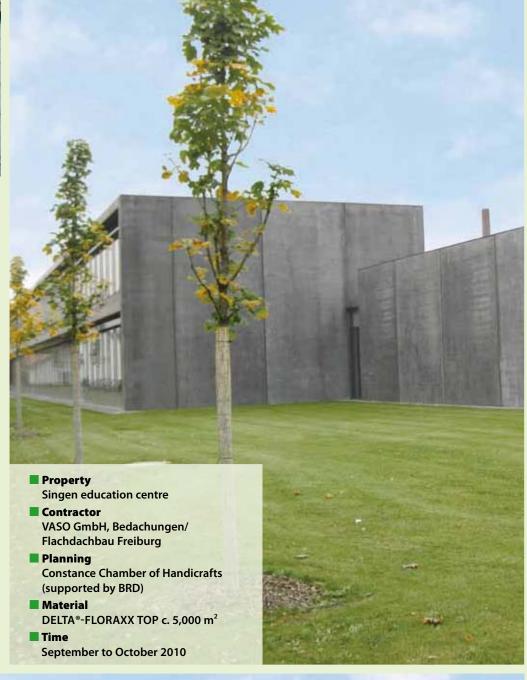




Education centre, Singen

Belonging to the Freiburg archdiocese, the Singen education centre is an adult education institution recognised by the state of Baden-Württemberg.

The building is situated in a quiet location directly at the foot of the Hohentwiel range on the outskirts of Singen. Under the extensive herbaceous cover of its flat roofs, DELTA®-FLORAXX TOP was laid out for water storage and drainage.







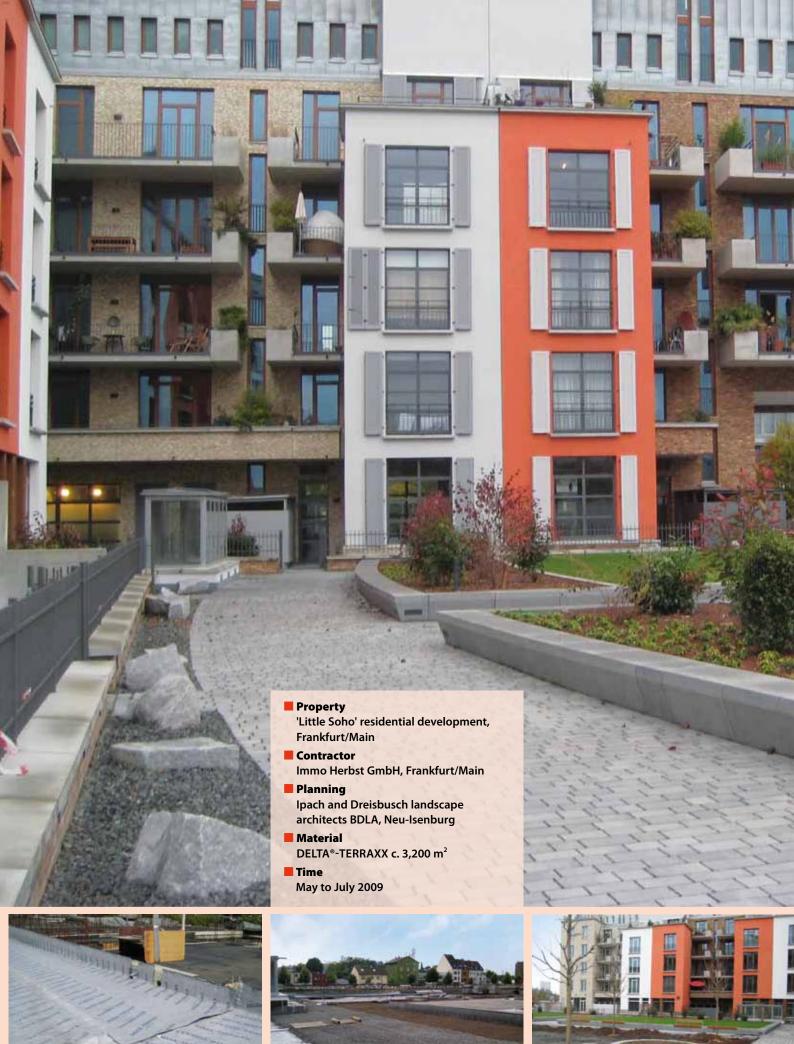






Berliner Allee 8 residential development, Darmstadt

The development is situated in the well-known publishing quarter of Darmstadt, immediately adjacent to the central station and the downtown area. Its elegant and comfortably spaced townhouses blend harmoniously with generous parks. Some of its balconies and terraces open on the quiet planted inner courtyard which sits on top of a 148-unit underground car park. The ceiling of the underground car park was covered with DELTA®-TERRAXX to provide structural drainage under the intensive herbaceous cover.















'Little Soho', Frankfurt/ Main

The 'Little Soho' project is situated in the Deutschherren quarter of the Frankfurt borough of Sachsenhausen. Inspired by Soho, the famous artists' quarter in New York, the residential development 'Little Soho' manages to combine living, working, culture, and shopping. Generously laid-out squares and parks serve as a place of rest. DELTA®-TERRAXX was used for surface drainage on the intensive green roof of the underground car park.





















Oberursel grammar school

The schoolyard, the new centre of the Oberursel grammar school, has direct access to the classroom buildings, the lobby of the assembly hall, the sports hall, and the science classrooms. Walkable skylights fitted with frosted non-slip glass admit daylight into the subterranean sports hall. Conversely, the hall lights shining through the skylights create a poetic atmosphere in the schoolyard in the evening hours. DELTA®-TERRAXX forms a drainage layer underneath the flagstones of the inner courtyard which doubles as the roof of the school's 3-field sports hall. The upper roofs of the adjacent school buildings were covered with 5,000 m² of DELTA®-FLORAXX TOP underneath the extensive green roof.



Rebstock Park, Frankfurt/Main

A quarter where work and private life merge: designed by renowned American star architect Peter Eisenmann, the new Rebstock Park quarter offers attractive residences for 4,500 and jobs for 5,500 people. What is impressive is the high proportion of green space: 75,000 m² of landscaped parks and 20,000 m² of forest create room for leisure. All streets are planted like avenues. Fruit groves, playing fields, and lawns invite people to sunbathe and relax. DELTA®-TERRAXX was laid out as surface drainage on the intensive green and paved roof of the underground garage.











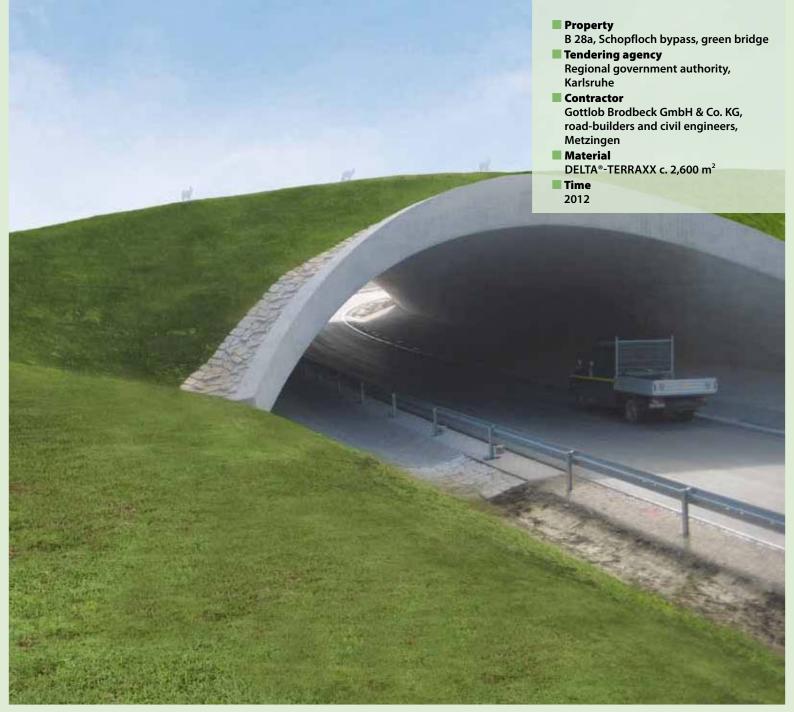
'Treasure Island' municipal day-care centre, Oberursel

In co-operation with the Thomas Cook company, the municipality of Oberursel has built a new day-care centre for children which it is sponsoring. Operating since May 2011, the centre is designed to care for around 100 children aged 18 months to six years, divided into six groups. DELTA®-FLORAXX TOP was laid out under the extensive herbaceous cover of the flat roofs to store and drain off water.















Green bridge, Schopfloch

Green bridges actively protect biodiversity by re-connecting previously severed habitats and migration corridors of wild animals while enhancing road traffic safety at the same time. 80 metres in length, the green bridge is a part of the Schopfloch bypass that was built to avoid sustained interference with game paths. From now on, woodcock and smooth snakes as well as ground beetles and migratory butterflies will be able to cross the road in perfect safety. DELTA®-TERRAXX was installed on the green bridge as a high-performance drainage layer to protect the waterproofing.



Unter den Linden, Berlin

The world cultural heritage in Berlin is protected by DELTA®-TERRAXX, a high-performance surface drainage sheet. At the foot of the monumental glass cube that houses the reading room of the Berlin National Library, an open square covered with flagstones was built on top of two subterranean high-security floors where the library's most precious treasures are kept on around 3,000 m²: preserved manuscripts by Johann Sebastian Bach, autographs by Goethe and letters by Albert Einstein. DELTA®-TERRAXX was installed underneath the flagstones to prevent waterlogging in the pavement.







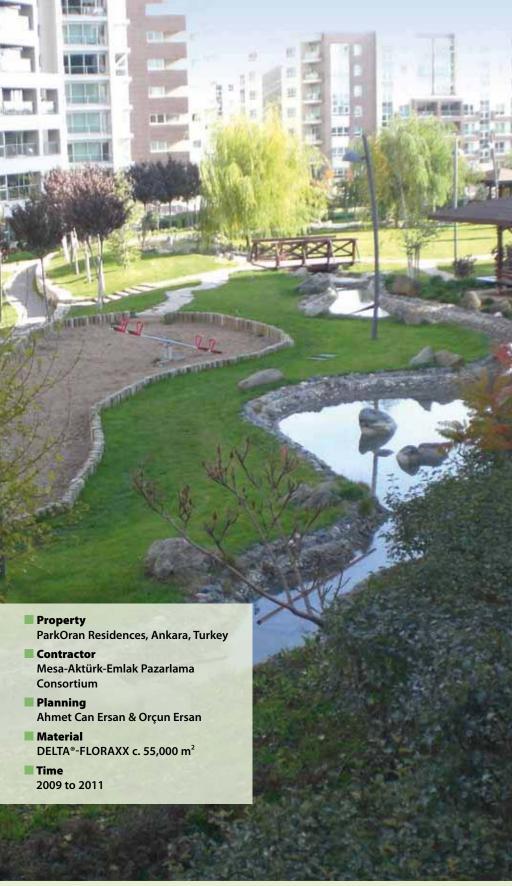






ParkOran Residences, Ankara, Turkey

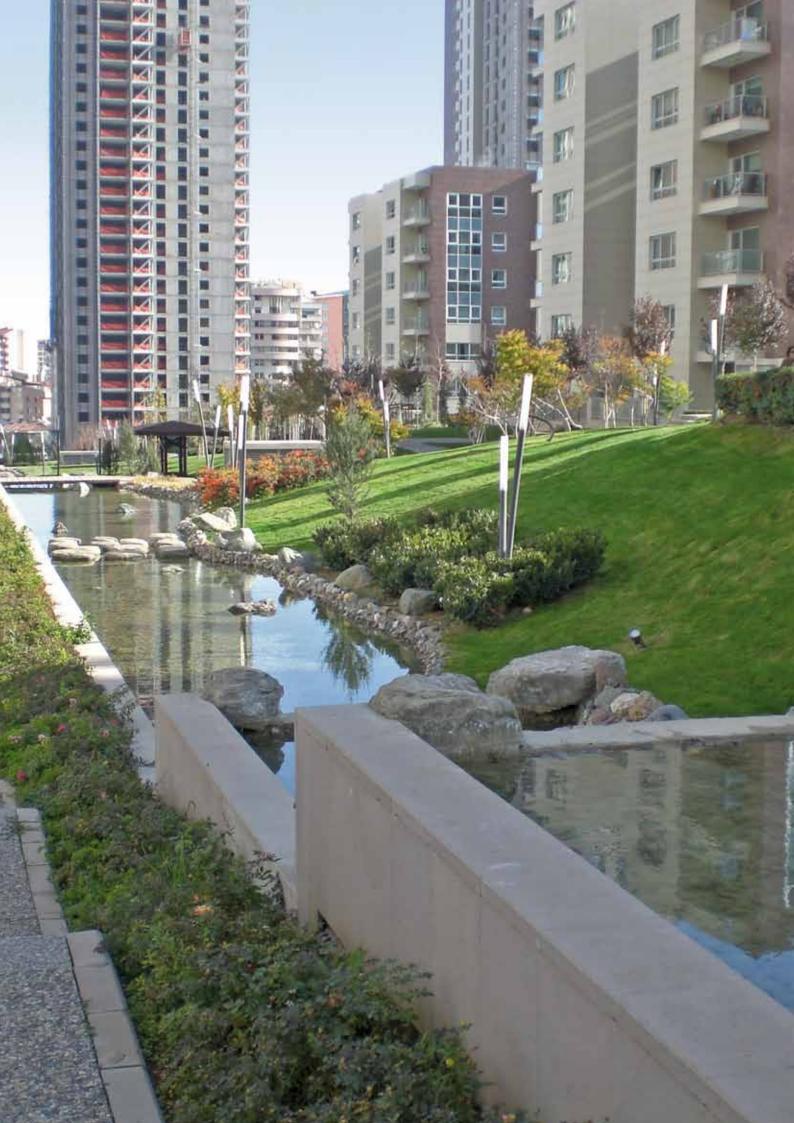
Park-like green spaces to play and relax in: the ParkOran development in Ankara covers a total of 517,253 m². It consists of twelve 32-story high rises and five 7-story buildings. The project encompasses 1,832 flats, 72 offices, 12 shops and several social facilities. Moreover, all buildings offer views of the lakes of Morgan and the adjoining forest. DELTA®-FLORAXX was laid out on the large intensively planted and paved ceilings of the underground car parks to store and drain off water.















Ruit health centre

The first multi-functional hospital project nationwide, the Ruit health centre was awarded the innovation prize in the 'Health' category by the Federal Public Private Partnership (PPP) organisation in 2011. The prize is awarded to projects in which public and private partners have been particularly successful in jointly realising a plan on behalf of the state. Under the intensive herbaceous cover of the ceiling of an underground car park, DELTA®-FLORAXX TOP was laid out to store and drain off water.









Arnulf Park M13, Munich

Surrounded by a great deal of greenery, the Arnulf Park was created on the site of a former railway container station only a few minutes away from downtown Munich. Today, it is a first-rate location for companies and high-quality living. Modern architecture, ecological construction and a communication-friendly infrastructure afford feel-good space for all those who live and work in Arnulf Park. On the extensively planted and paved roofs, DELTA®-TERRAXX was used for surface drainage.









Bilgili Holding's BodrumBodrum

A residential paradise on the Turkish Aegean sea, BodrumBodrum is a unique building project featuring an authentic architecture that reflects the natural beauty of the landscape. On a piece of land 25,789 m² in size, 98 luxury residences are being built at Yalikavak, Bodrum. The project is distinguished by its splendid situation on slopes directly above the sea. From their roof terraces all houses enjoy a wonderful view of the crystal-clear sea and beaches of finest sand. On the intensively planted flat roofs of the villas, DELTA®-FLORAXX was laid out to store and drain off water.

















Situated in the midst of the metropolis of Haifa, the hanging gardens of the Bahai are regarded as a symbol of peace and a place of quiet. They are among the most visited tourist attractions of Israel. Bridging a 250-metre slope, its terraces are one kilometre in length and 400 metres wide. The 250-million-dollar project was completed after 15 years in 2001. Since then, the gardens have been open to visitors, offering an opportunity to stroll around the Bahai world. DELTA®-TERRAXX was employed for horizontal surface drainage in the construction of the terraces.















Property

Residential development,

Brickworks Court, Oberwil/Basle, Switzerland

Urban living on the boundaries of a nature preserve: situated on the site of a former brickworks between Oberwil and Allschwil, modern residential buildings form a pattern that is all their own. Light materials and large windows provide residents with good views and a great deal of light. With its generously laid out park-like free spaces, the location appears very spacious. On the intensively planted and paved ceilings of its underground car park, DELTA®-TERRAXX was installed as surface drainage.







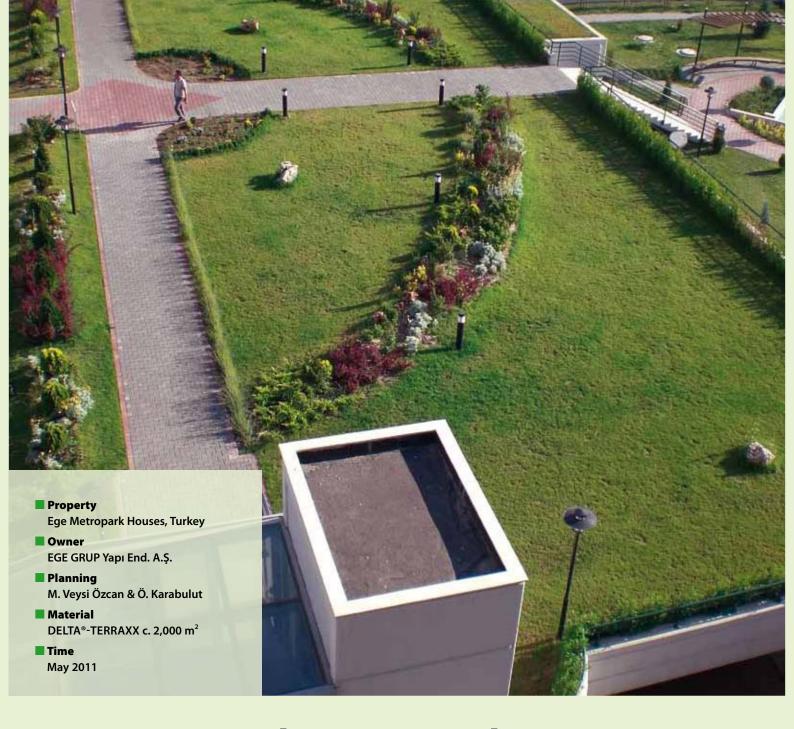




Patio Ząbki, Poland

Well connected to downtown Warsaw and surrounded by generous green spaces, Patio Ząbki offers a great deal of space for self-fulfilment to young families. With their large balconies and open ground-floor flats, these multi-family buildings provide enjoyable views of the planted and stone-paved inner courtyard. DELTA®-FLORAXX TOP was laid out under the intensive herbaceous cover of the underground car-park ceiling.





Ege Metropark Houses, Turkey

The Ege Group Metropark project demonstrates how to make the best of building land in urban areas: the planted flat roof of the underground car park keeps vehicles out of sight and forms a direct link with the community garden. Additional space for cars is provided by a drivable parking lot. Walkways and green spaces develop into new areas for children to play in and zones of rest for the community. DELTA®-TERRAXX was installed as surface drainage under the drivable as well as the planted part of the underground car-park roof.





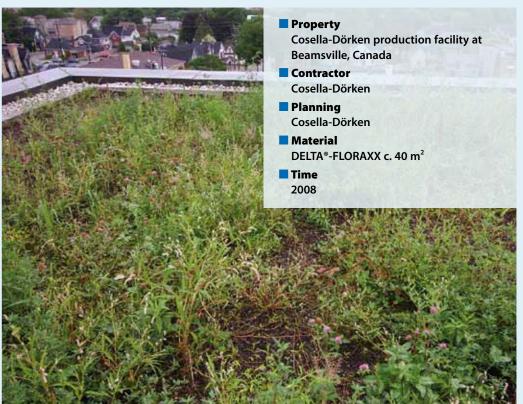






Production facility in Beamsville, Canada

Constituting important oases in the jungle of concrete and asphalt, green roofs offer living space to a variety of animal species, from insects to birds. That green roofs may also serve as undisturbed resting places for birds and occasionally even for ground-breeding birds to build their nests is evidenced by the planted canopy roof of the Cosella-Dörken production facility at Beamsville, Canada. Canadian wild geese have been nesting here each spring Since 2010. The extensively planted canopy of the production hall was equipped with DELTA®-FLORAXX to store and drain off water.













Some other reference properties

Property	Country	Contractor	Quantity [m²]	Time	Product
Arzignano, Vicenza	I	Marcigaglia Construction Spa	1.200	2011	DELTA®-TERRAXX
Adalbert Stifter school, Wiesbaden	D	Immo Herbst, Frankfurt	1.200	2010	DELTA®-FLORAXX TOP
Ant Yapı Antriva Villa Project, Istanbul	TR	Kortek Construction	3.000	2011	DELTA®-FLORAXX TOP
Bodrum Buyukhanli, Fuga Hotel	TR	Büyükhanlı Group	3.800	2011	DELTA®-FLORAXX TOP
Boss, Metzingen	D	Seidenspinner, Stuttgart	1.000	2009	DELTA®-TERRAXX
Breuninger, Stuttgart	D	Seidenspinner, Stuttgart	1.500	2009	DELTA®-TERRAXX
BV Denzlingen	D	UMV, Lahr	1.500	2012	DELTA®-FLORAXX TOP
Dornier museum, Friedrichshafen	D	Seidenspinner, Stuttgart	650	2009	DELTA®-TERRAXX
EON administrative building, Essen	D	GDT Gründachtech. Unterensingen	6.000	2010	DELTA®-FLORAXX TOP
ECB, Frankfurt	D	August Fichter GmbH & Co. KG, Dreieich	3.500	2012/2013	DELTA®-TERRAXX
Family home, Chomutov	cz	Greenville Brün	200	2012	DELTA®-FLORAXX TOP
Munich Airport, terminal 2	D	Fa. Schweiger, Gräfeling	20.000	2011	DELTA®-TERRAXX
Friedensschule, Ulm	D	Kießling-Bedachungen, Ulm	1.500	2009	DELTA®-TERRAXX
Gebze town square, Kocaeli	TR	Suka Engineering	2.500	2011	DELTA®-FLORAXX TOP
Gerneral State Archive, Karlsruhe	D	GDT, Unterensingen	1.000	2010	DELTA®-FLORAXX TOP
Garages, Haguenau	F	R DU JARDIN	460	2011	DELTA®-FLORAXX TOP
Gök and Menekşe Residences, Konya	TR	Seha Construction	1.500/1.100	2011	DELTA®-FLORAXX/ DELTA®-TERRAXX
Grand Tarabya Hotel, Istanbul	TR	Aden Construction/Nanotek	2.000	2011	DELTA®-FLORAXX
College, Esslingen	D	GDT, Unterensingen	1.300	2009	DELTA®-FLORAXX TOP
Hotel, Lidzbark	PL	FALBUD – Olsztyn	3.800	2011	DELTA®-TERRAXX
Innovia 2 Project, Istanbul	D	Yeşil Construction/Işık Landscaping	28.000	2011	DELTA®-FLORAXX
Jagsttal school, Westhausen	D	Kratky-Bedachungen, Aalen	2.500	2009	DELTA®-TERRAXX
Kayseri Forum Shopping Mall, Kayseri	TR	YDA Construction	9.500	2011	DELTA®-FLORAXX
Gartenstraße day-care centre, Neu-Isenburg	D	GDT Gründachtech. Unterensingen	3.500	2008	DELTA®-TERRAXX
District authority, Aalen	D	Michel, Wilburgstetten	1.000	2009	DELTA®-TERRAXX
Lidl enlargement, Kirchheim/Teck	D	GDT Gründachtech. Unterensingen	2.500	2010	DELTA®-TERRAXX







Property	Country	Contractor	Quantity [m²]	Time	Product
Astrid Lindgren school, Prüm	D	Pölcher & Kalle, Zelingen-Rachtig	3.000	2010	DELTA®-TERRAXX
Mercatura, Aalen	D	Garten Moser, Reutlingen	1.500	2011	DELTA®-TERRAXX
Multi-family building Hansa-Allee, Frankfurt	D	August Fichter GmbH & Co. KG, Dreieich	2.500	2010	DELTA®-TERRAXX
Misia 15300 Residences, Bursa	TR	Fideldus-Göler GYO/İzo Agra	6.000	2011	DELTA®-FLORAXX TOP
Olivia Park, Gdańsk	PL	Dachland	1.500/4.500	2012	DELTA®-FLORAXX TOP/ DELTA®-TERRAXX
Ostim Tefirom İş Merkezi, Ankara	TR	Tefirom	1.000	2011	DELTA®-FLORAXX
Parco Dorotee, Oderzo, Treviso	I	Impresa Setten Genesio Spa	2.000	2011	DELTA®-TERRAXX
Pegasos Resort Hotel, Antalya	TR	Öztaş Construction	2.500	2011	DELTA®-FLORAXX
Pomorski Park	cz	Codan	13.500	2012	DELTA®-FLORAXX
Castle, Lidzbark Warmiński	PL	IPB	3.200	2011	DELTA®-TERRAXX
Castle, Toruń	PL	EM3Dach	1.500	2011	DELTA®-TERRAXX
Sinpaş Kelebekia, İstanbul	TR	Sinpaş/Surtaş-Hitit Construction	1.500	2011	DELTA®-FLORAXX TOP
Sinpaş Sancaktepe Sales Office, Istanbul	TR	Sinpaş / Bayrak Insulation	2.500	2011	DELTA®-FLORAXX TOP
Soyak Urla Houses, Izmir	TR	Soyak/Doruk Construction/Perspektif Architecture	3.500	2011	DELTA®-FLORAXX TOP
Town residence, Langenau	D	Fröhlich-Bedachg., Beimerstetten	1.000	2009	DELTA®-TERRAXX
South Gate, Stuttgart	D	Seidenspinner, Stuttgart	1.000/1.000	2010	DELTA®-FLORAXX/ DELTA®-FLORAXX TOP
Tepe Prime AVM, Ankara	TR	Tepe Construction	1.500	2011	DELTA®-FLORAXX
Torus, Gdańsk	PL	Torus	3.500	2012	DELTA®-TERRAXX
Frank-Heim-Bau residential develop- ment, Rebstock, Frankfurt/Main	D	August Fichter GmbH & Co. KG, Dreieich	3.200	2010	DELTA®-TERRAXX
'Fine Arts" residential development, Toruń	PL	Marbud	3.500/2.500	2011	DELTA®-FLORAXX/ DELTA®-TERRAXX
Residential development, Gdańsk	PL	Inpro	4.500	2012	DELTA®-FLORAXX

