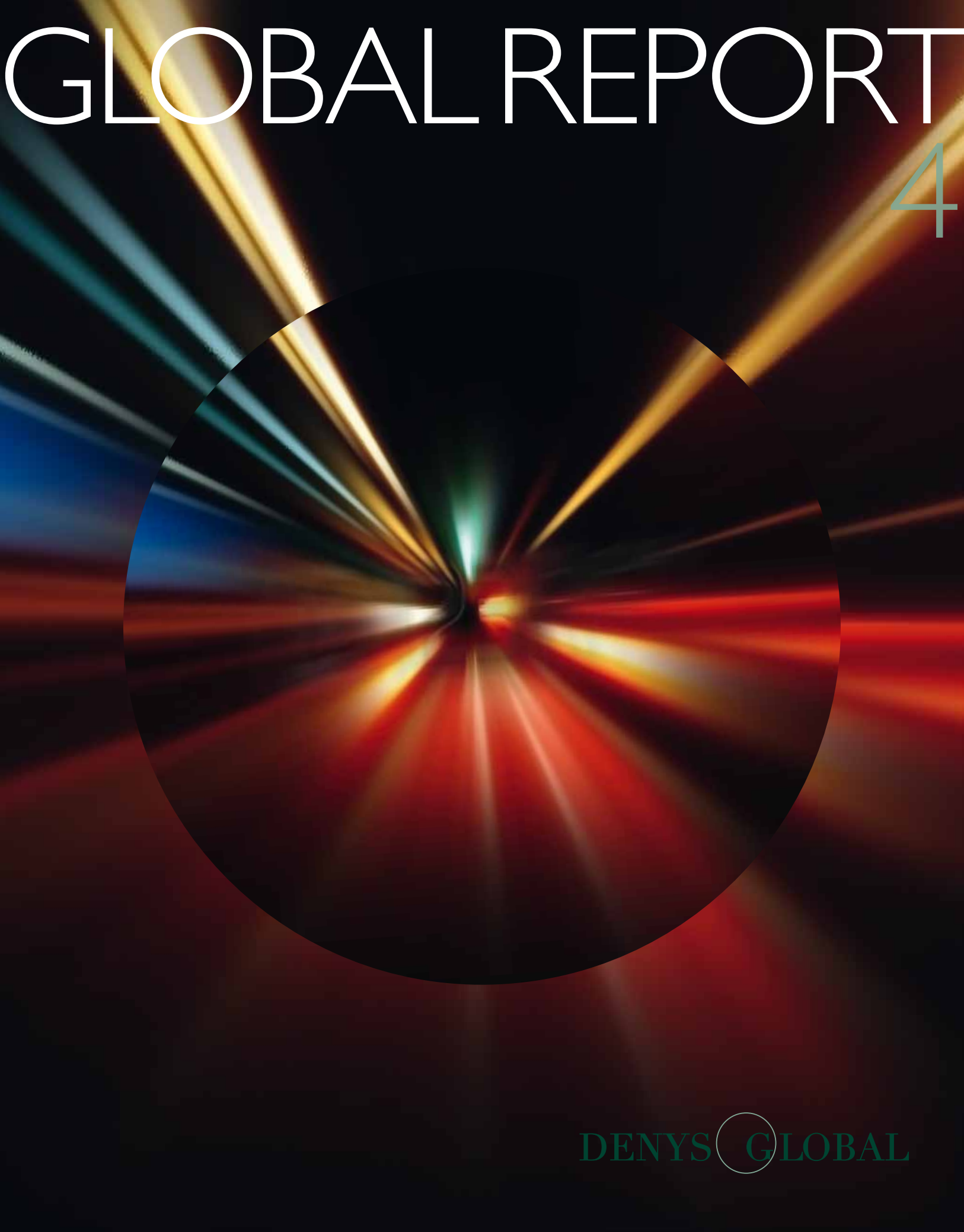
GLOBAL REPORT 4



DENYS GLOBAL

Thinking out of the box

Johan Van Wassenhove
CEO Denys Group

Speed and flexibility

Do we really have any time to waste? Humankind faces enormous challenges in securing and spreading prosperity and at the same time preserving the earth's resources. Strategic programmes have to be developed to tackle interconnected problems such as inadequate transport systems and energy demand outstripping supply. Unfortunately, crucial political decisions are postponed all too frequently. It feels at times as if we've accepted the status-quo. Resigning ourselves to daily traffic congestion is just one example. But we shouldn't take this situation lying down! We should be developing new solutions. We should be working creatively and thinking out of the box. Let's find and embrace the entrepreneurial spirit we know we have. The slow pace of political decision-making contrasts sharply with the increased speed and flexibility demanded from contractors. Some of the projects discussed in this Global Report illustrate that. A new prison in Haren/Brussels of unprecedented size: ready in just 32 months. A complex 13-kilometre pre-metro line and a new Forensic Psychiatric Centre in Antwerp: each one in 24 months. Projects have to be completed faster and faster these days. Yet we're not complaining. Part of Denys' success is our ability to adapt to and stay ahead of the ever-changing market. Check out our Dr Shelter programme, which enables us to build hospitals in 4 months time. Read up on RescCrew, our 24/7 pipeline emergency repair and protection service. These kinds of innovative methods and services allow us to grow at a steady pace without losing control.

BELGIUM / ROYAL MUSEUM FOR CENTRAL AFRICA, TERVUREN

The elephant's retreat

"I'll be back," says the poster, depicting a departing elephant. That elephant is the famous stuffed animal that visitors would encounter at the entrance to the Royal Museum for Central Africa in Tervuren, Belgium. It was the undisputed star of the museum, but it's been forced into retreat for the next few years. The museum closed its doors in December 2013 to be completely renovated and brought up to current energy efficiency and comfort standards. When the museum reopens in 2017, the elephant will return to a light and airy building, restored to its old splendour.

The elephant will return in 2017

BELGIUM / ROYAL MUSEUM FOR CENTRAL AFRICA, TERVUREN

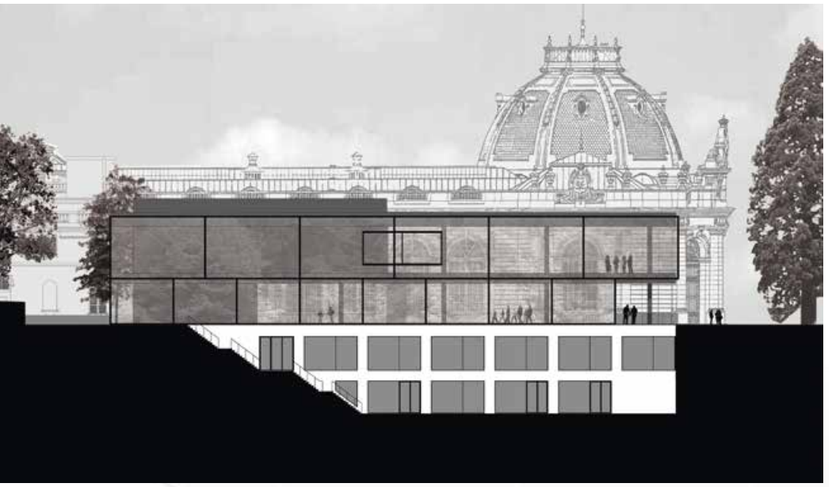
The entrance pavilion is a remarkable new landmark in the old park.

BELGIUM / ROYAL MUSEUM FOR CENTRAL AFRICA, TERVUREN

A glass-in-steel landmark

We're pretty sure the elephant will be pleased with his new surroundings. Likewise, visitors will find much to enjoy in the renewed museum. The renovation project is being carried out by a large multidisciplinary team which includes Stéphane Beel Architects and Origin Architecture and Engineering. They have designed a number of exciting architectural elements, including a brand new entrance pavilion 100 metres away from the old building, which will house 'parasitical' functions such as the museum shop and restaurant.

The glass-in-steel pavilion will provide a splendid, modern landmark in the old Warandepark garden. This beautiful royal park was converted into a museum site at the time of the 1897 Brussels World Expo to celebrate the richness of the Congo, then a colony of Belgium. The pavilion will give access to a large tunnel, taking visitors to the museum's exceptional vaults, never before seen by the public. The museum building itself is a 1910 gem of French architect Charles Giraud, who wanted to more or less replicate his own design for Le Petit Palais in Paris.



Extensive granito floor and large curtain walls require great care in detailing joints and junctions.

The mahogany display cases will be preserved but upgraded with modern climate control technology.

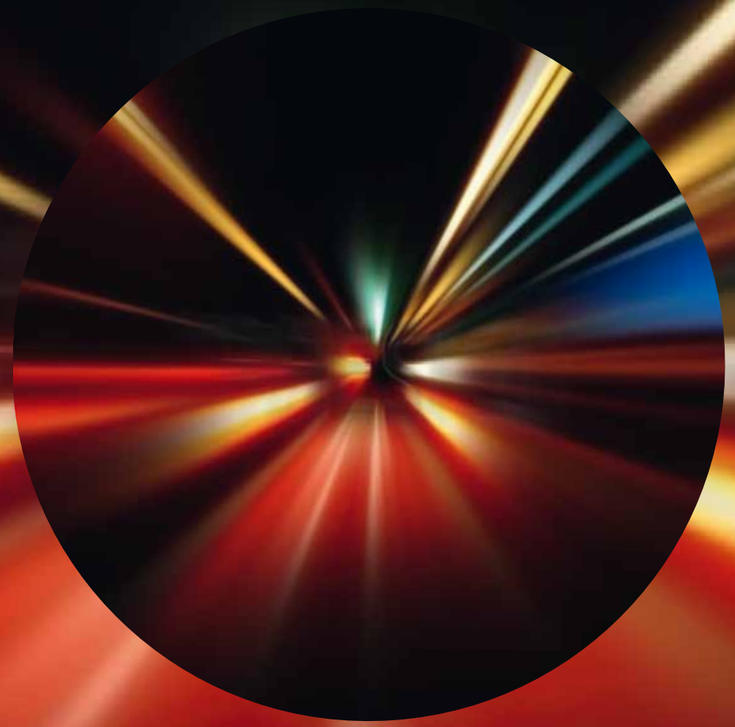
A multitude of disciplines

Denys will be leading the construction and renovation works, drawing on its vast expertise across the diversity of disciplines required for this type of project. Our first challenge is to dig the tunnel between the pavilion and the museum vaults, a task that demands patience and prudence. Then there's the pavilion with its extensive granito floor and large curtain wall. This will require great care when detailing joints and junctions.

Finally, the Giraud building must not only be restored to all its authentic glory but also be adapted to meet 21st century conservation requirements. We'll be taking care of everything, including repairing the stucco, restoring the zinc, marble and stone, and upgrading the mahogany display cases with climate control technology. And, of course, we'll be making sure the elephant feels at home again.

BELGIUM / LIVAN TRAMWAY EXTENSION, ANTWERP

Spooky underground comes alive



A ghosty existence

More than forty years ago, the city of Antwerp started building an ambitious network of underground tramways. The hope was to eventually convert this pre-metro system into a full-blown metro network, similar to the one in Brussels. However, that plan never materialised. What's more, only part of the 13.5 km tunnel network was taken into service. The remaining tunnels and the underground stations have been unused ever since, leaving a ghostly, subterranean labyrinth under a bustling city.

BELGIUM / LIVAN TRAMWAY EXTENSION, ANTWERP

The Giant Pipe comes to life

The good news is that this spooky network of tunnels and stations is going to be brought back to life: Denys is currently fitting out the longest of these tunnels (known as the Giant Pipe) for a new tramway line that will link the Antwerp city centre with a park-and-ride facility in Wommelgem, approximately 13 km east. The existing Astrid station is being entirely renovated and extended and one of the ghost stations (Zegel) is being fully equipped.

Fire safety is a key aspect of the project. Computational models have been used to simulate a fire ignition in the tunnel or one of the stations and to determine underground smoke and heat propagation as well as people evacuation scenarios. As a result, it was decided that the remaining ghost stations along the trajectory will act as emergency evacuation sites.

A series of Antwerp underground tunnels and stations were left unused for decades.

BELGIUM / LIVAN TRAMWAY EXTENSION, ANTWERP

Drainage

The Giant Pipe and eight stations were built using the then state-of-the-art techniques of the late sixties and seventies. The sections constructed using tunnel-boring machines proved virtually watertight. However, other sections were constructed using techniques that were not leakage-free. As a result, groundwater seeped into some sections. To remedy this situation, specifically engineered polyurethane foam was injected into each of these leaks using the latest injection techniques. That proved a success, as demonstrated by the rising groundwater level around the Giant Pipe. Indeed, some private property owners suddenly found water in their cellar...

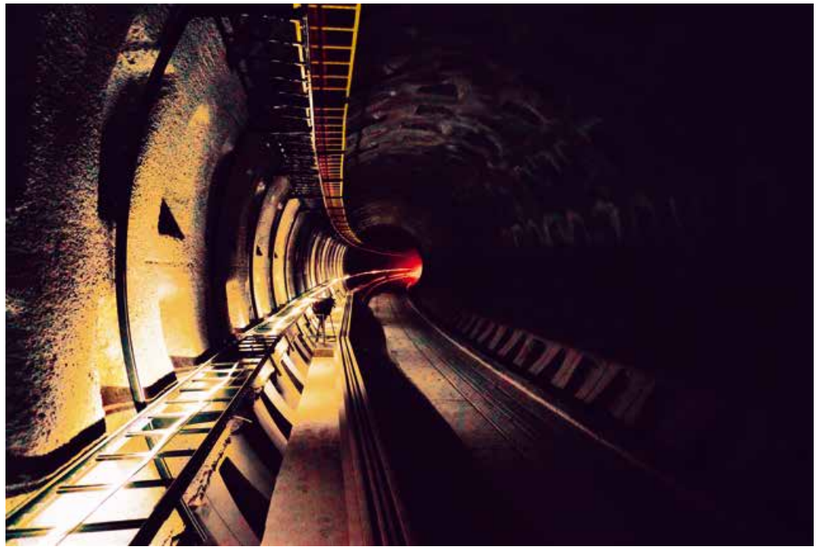
Following the foam injection, we applied a 3-centimetre fire resistant coating. We would normally do this manually but, given the size of the job, we automated the process using a shotcrete robot. The machine proved its worth; it speeded up the process significantly.

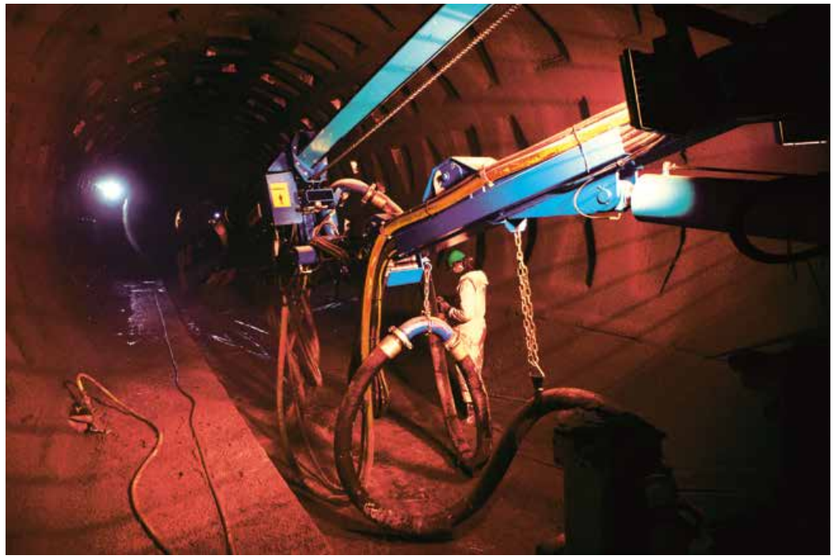
Work smart to deliver fast

We have to work fast here. The entire construction and renovation project must be delivered turnkey in 24 months, and that includes laying tramways and power supply in the tunnel and along the trajectory to Wommelgem, finishing the stations, and facilitating a three-month test period.

So smart planning was and is crucial. Logistics are a particular challenge, given the limited accessibility of the tunnel, especially during the busy weekdays. We are working seven days a week, using the weekends and nights mainly for supplying material and removing waste. We're perfectly on schedule and will be able to deliver on time in March 2015.

We carefully filled the holes one by one, injecting them with water-reactive polyurethane foam.

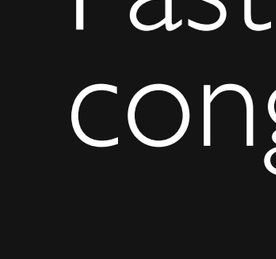




The entire construction and renovation project must be delivered turnkey in 24 months.

BELGIUM / TRAMWAYS, GHENT AND DE HAAN-WENDUINE

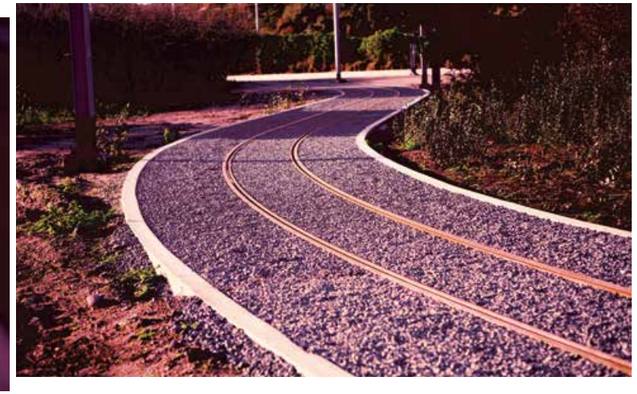
Fast, safe and congestion-free



Today, it's hard to believe that tramways used to be everywhere. In 1925, the entire Belgian tramway network was 5,200 km long. Today, only 200 km of tramways are left, found in the larger cities of Brussels, Antwerp, Ghent and Charleroi as well as along the coastline between De Panne and Knokke. Around the country, trams were replaced by bus services on a massive scale.

However, trams are reasserting their popularity these days. For example, the cities of Ghent and Antwerp are expanding their tramway networks to encourage commuters and visitors to leave their car at the city outskirts and continue their journey with fast, safe and congestion-free public transport. One such project is the extension of the southern Ghent tramway line to Zwijnaarde, currently being carried out by Denys.

Authorities are also considering various extensions to the 63 km coast tramway, already the longest tram trajectory in the world. While the decision to extend hasn't been made yet, the existing line is being renewed step by step. Denys is currently replacing the 9 km segment in De Haan-Wenduine. As this part runs through a beautiful chain of dunes, the project involves extensive consultation with nature conservation authorities.



The southern Ghent tramway line is being expanded to Zwijnaarde.

Renewing a tramway that runs through a chain of dunes involves extensive consultation with nature conservation authorities.

BELGIUM / HIGHWAY TUNNEL TEST PROJECT, ANTWERP

Bad, bad, bad... bad vibrations

BELGIUM / HIGHWAY TUNNEL TEST PROJECT, ANTWERP

A subject of controversy

The closing of the highway perimeter around Antwerp is a crucial project for the future of Belgium's second largest city. However, it's been the subject of controversy for over a decade now. Long and short tracks have been proposed to close the northwest side perimeter, either running through the port of Antwerp or just south of it. Bridges and/or tunnels have been planned to cross the Schelde River, the Albert Canal and the surrounding industrial and residential areas. All of these proposals have been advocated fanatically by some stakeholders and rejected furiously by others. It's fair to say this issue has produced some bad vibrations in Antwerp.

We tested various piling procedures, sinking sheet piles to a depth of up to 30 metres.

The subsoil consists of a clay type containing elements that may obstruct piling activities and/ or influence the propagation of vibrations.

Will geological behaviour frustrate tunnel plans?

Despite the war of words, one particular proposal is now being elaborated and checked for feasibility: to dig a new tunnel, running from the 16th century harbour (het Eilandje) to the current perimeter in Deurne, near the Sportpaleis concert hall. The plan is to build the tunnel using the cut-and-cover technique, requiring the sinking of sheet piles and the construction of slurry walls to excavate the trench for the tunnel. However, one important issue has to be settled first: little is known about the geological behaviour of the ground beneath Antwerp.
This information is crucial when applying sheet piling and excavating deep trenches. The subsoil consists of Boomse Klei, a clay type containing silt, glauconite and septarian nodules (rock solid spherical concretions of carbonates). These elements may obstruct piling activities and/or influence the propagation of (bad) vibrations around the construction site.

Testing the trench excavation

Denys was asked to perform a series of tests in order to check feasibility, monitor the geological behaviour of the clay and assess the related impact on surrounding buildings and local residents. First, we tested various piling procedures by sinking sheet piles to a depth of up to 30 metres and measuring the geological behaviour of the clay around the site. Based on these findings, we developed an appropriate trench excavation procedure and excavated an entire test trench 30 metres down, using custom-made shore constructions. Throughout the procedure, we measured the vibrations in and around the trench. The results are now being analysed.

BELGIUM / NEW PRISON, HAREN

A village for detainees and convicts

Prisoners will be given the opportunity to learn a craft and work in teams

The Belgian federal authorities are planning to build a new prison in Haren, Brussels. Accommodating 1,190 inmates, it will be the largest Belgian prison by far. It will also be the first Belgian prison to follow a new architectural concept. It's rejecting the star-shaped blocks that have dominated penitentiary architecture since the mid-19th century. Instead, it's embracing **a prison-village model,** where various groups of detainees co-exist in such a way to promote reintegration into society.

The Panopticon consigned to history?

Buildings constructed purely for imprisoning people are a relatively recent development, even though visionary architects such as Alberti, Piranesi and Jeremy Bentham were proposing them long before the 1800s.
In the 19th and 20th centuries, most prisons were built according to Bentham's ideas on panopticism: a rigid organisation of individual cells that allows prison staff to keep inmates under effective surveillance. Large star-shaped prison blocks surrounded by huge perimeter walls are still the norm around the world.
In recent years, however, this familiar prison concept is being increasingly criticised as ineffective, even inhumane, because it doesn't allow inmates to prepare for **reintegration into society.** Surely, that is the ultimate goal of most prisoners and the general public.

BELGIUM / NEW PRISON, HAREN

Promoting reintegration into society

The increased focus on reintegration issues has led to new prison concepts. The prison in the small Austrian town of Leoben, designed by Josef Hohensinn and completed in November 2004, is the paragon project in Europe. Likewise, the design of the Haren prison, created by the Cafasso Consortium spearheaded by Denys and including architects Buro II & Archi+i, is based on a pleasant village rather than a tenement building. Prisoners, while still deprived of their freedom, will be given the opportunity to learn a craft, work in teams and practice sports. The idea behind it is to socialise convicts by fostering group awareness and promoting a sense of responsibility, not just towards fellow prisoners but also the entire community.

Outstanding quality and proven track record

The Cafasso architectural team has designed a village covering more than 100,000 m² and including five houses for charged and convicted people (two for women and three for men), a forensic psychiatric centre and a youth detention centre. It will also include a visitor centre, a training centre for warders, a logistics centre and a sports hall. The outstanding architectural quality of the proposed design was crucial in the Cafasso Consortium winning the project. Equally important was Denys' track record with similar large and complex projects, such as the Forensic Psychiatric Centres in Ghent and Antwerp, as well as its ability to deliver on time, even when confronted with difficult circumstances.

As it is a DBFM project, Denys and its partners have agreed to assume service responsibilities for 25 years after completion of the site, planned for 2016. Services will include building maintenance, waste treatment, catering and laundry services.

Priest of the Gallows

Giuseppe Cafasso (1811-1860) was a priest and social reformer living in 19th century Italy. He was a small man with a deformed spine, a disability that he successfully offset against a remarkable talent for the rhetoric. As a priest, he was assigned to a seminary in Turin, where he championed the marginalised, even criminal, elements of the city that were being industrialised with alacrity.
He provided religious support for convicts, especially those condemned to death, hence the nickname 'Priest of the Gallows'. Cafasso was canonised in 1946 by Pope Pius XII and is now the **patron saint of prisoners and prisons.**

Treating prisoners more humanely

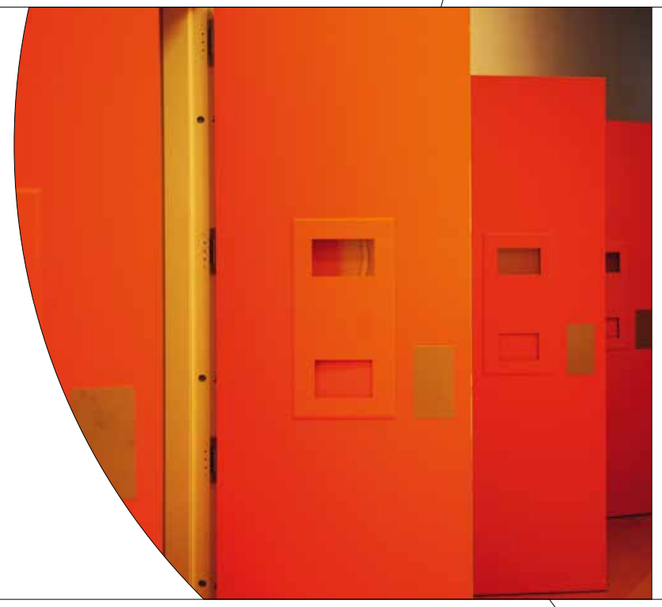
It is no coincidence that the consortium selected to develop the new prison in Haren is named after Giuseppe Cafasso. Indeed, our project is clearly in line with Cafasso's struggle for the more humane treatment of prisoners for the benefit of society as a whole. The **Cafasso Consortium** is directed by Denys.

BELGIUM / FORENSIC PSYCHIATRIC HOSPITAL, GHENT AND ANTWERP

Gaining confidence

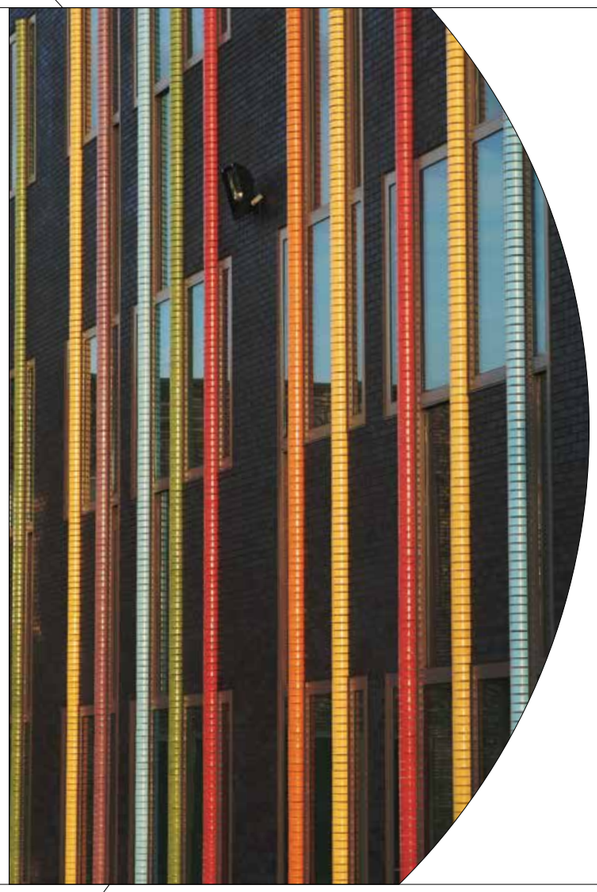
BELGIUM / FORENSIC PSYCHIATRIC HOSPITAL, GHENT AND ANTWERP

Gaining confidence



Denys may have just finished the new Forensic Psychiatric Hospital in Ghent, but we've already started building another one in Antwerp. The technical requirements are the same as in Ghent and include the use of unbreakable glass, rock-solid wall finishing and sanitary blocks that cannot be removed without special equipment. But the centre in Antwerp is a little smaller, designed for 180 detainees, and the architectural layout is completely different. It is based on the treatment process that mental patients must go through, starting in a closed Crisis Stabilisation Unit (CSU) and moving gradually to more open units as and when their mental health allows. Over time, this should give patients the encouragement and confidence to reassume their roles in society. The architects also gave considerable thought to the visual impact on the scenic area behind the hospital site: the perimeter wall will be built in a ditch, so that it is less visible from outside while still being effective.

Patients enter a closed Crisis Stabilization Unit and move gradually to more open units as and when mental health progress allows.



A very tight schedule

Denys started construction work on 6 January 2014 and must deliver by the end of March 2016. This gives us just 430 working days, a very tight schedule compared to the Ghent project.

But we can draw on the expertise gained in Ghent and we're working with seven to eight concrete formwork teams. Have no doubt: we'll be ready. Come and check in two years' time.

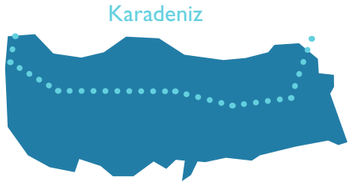
SOUTH-EAST EUROPE

Feeding natural gas to Europe

The 2,000-kilometre TANAP and TAP pipeline is planned to run from Georgia through Turkey to Greece.

Three gas corridors to Europe

The security of natural gas supply has been a major concern of the European Union for many years now, especially since the Russia-Ukraine gas disputes between 2005 and 2010. Since then, several initiatives have been launched. Russia has been developing two alternative pipeline routes for feeding Gazprom's natural gas to the European Union. The North Stream route through the Baltic Sea was the first to materialise, supplying 55 billion cubic metres (bcm) of natural gas per year as of 2012. The South Stream route below Ukraine is under development and is planned to supply 63 bcm per year at its peak. Meanwhile, the Azerbaijan-Turkey TANAP project is developing a third large diameter pipeline, meant to supply at least 16 bcm per year of natural gas coming from Azerbaijan's Shaz Deniz II gas field in the Caspian Sea.



Running thousands of kilometres across Europe

The South Stream pipeline will run offshore from Russkaya (Russia) through the Black Sea and then 900 kilometres onshore through Bulgaria, Serbia, Hungary and Slovenia to arrive in the north of Italy. The Trans-Anatolian Natural Gas Pipeline (TANAP) is a 2,000-kilometre extension of the 400-kilometre South Caucasus Pipeline Expansion (SPCX) from Azerbaijan and Georgia through Turkey to Greece. It will be extended further west by another planned 800-kilometre corridor (called Trans-Adriatic Pipeline or TAP) running through Greece, Albania and the Adriatic Sea to connect with the Italian natural gas transport system near San Foca.

Selection of pipeline contractors

Both the South Stream and the TAP developments are achieving cruising speed in 2014. This means that around 4,000 kilometres of onshore 48 or 56-inch pipelines will be constructed in the upcoming years. Procedures for selecting potential pipeline contractors are ongoing and Denys is participating in all of them, mostly in joint venture with solid local partners. We are sure we will be selected to participate in the construction of these major arteries, given our experience and our capacity and ability to build such large pipelines.

SOUTH-EAST EUROPE

Feeding natural gas to Europe

Denys is participating in all of the procedures for selecting potential pipeline contractors.

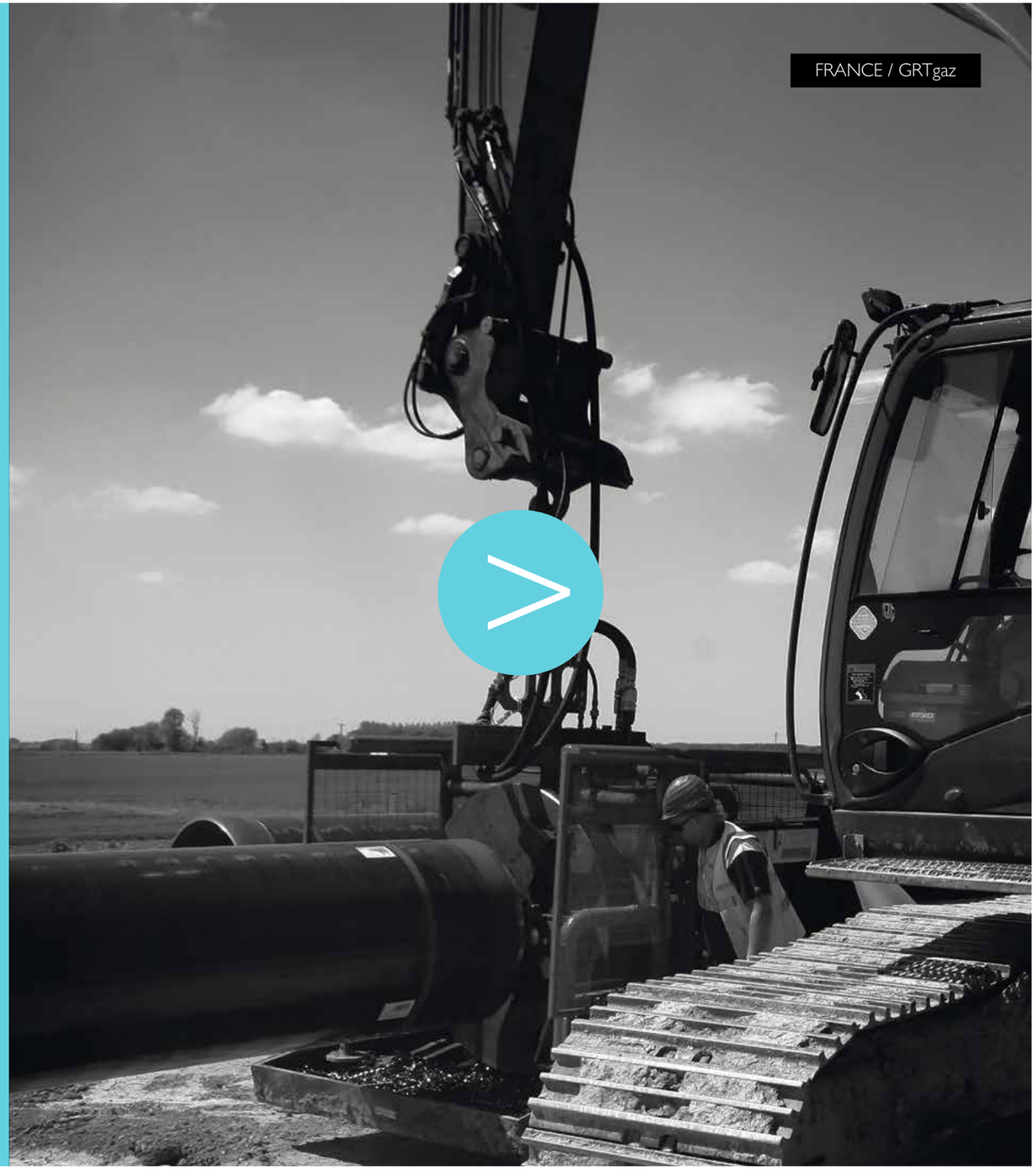
Journey to the south

Last year, Denys completed on schedule the construction of two sections of the Hauts de France II gas pipeline project for GRTgaz in the north of France. This project involved laying a total of 91 kilometres pipelines and crossing numerous obstacles. Five of these obstacles, including a high-speed rail and the A16 highway, were crossed using the micro-tunnelling technique. We achieved everything within the tight timeframe of seven months.

We're now continuing this journey to the south, with two sections of approximately 60 kilometres each of the Arc de Dierrey project between Cuvilly and Voisines, east of Paris. It's a similar challenge, and taken up with the same level of enthusiasm.

We used micro-tunnelling to cross the high-speed rail and the A16 highway.

Feeding natural gas to Europe



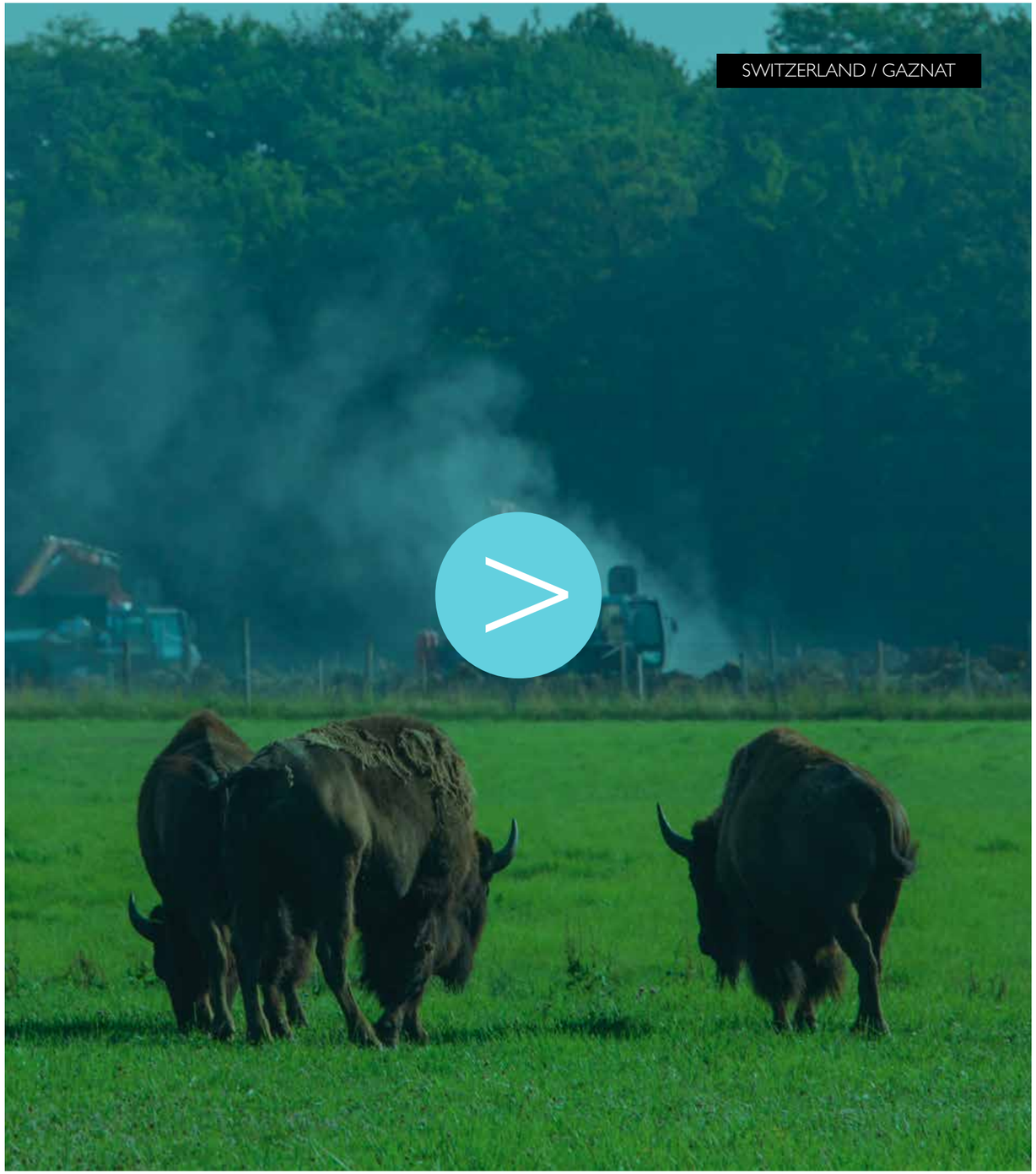
For the love of nature

In the beginning of 2014, we successfully completed the GAZNAT pipeline between Trélex and Colovrex, parallel to Lake Geneva in Switzerland. The project was heavily characterised by the stringency of the environmental regulations prevailing in the region. Greenhouse gas emissions had to be kept extremely low, and ground pressure caused by equipment had to be continuously monitored. Virtually every activity was meticulously checked against its impact on the environment, leading to frustrating standstills at times.

Over the top? We don't think so.

We found this stringency a little over top at first, but eventually learned to appreciate this nature-loving approach to construction. We enjoyed helping cane toads cross the street. We loved digging trenches and building fences to keep wild animals secure, and we were happy that we could protect trees. We even learned how to replace an ants' nest. In fact, we're convinced this is the future of carrying out infrastructure projects in Europe and, in the mid to long term, in the rest of the world. That's why we've recently engaged a full-time ecologist at Denys, an expert in nature preservation techniques and environment protection. We'll certainly be calling on her expertise whenever we prepare for a new project.

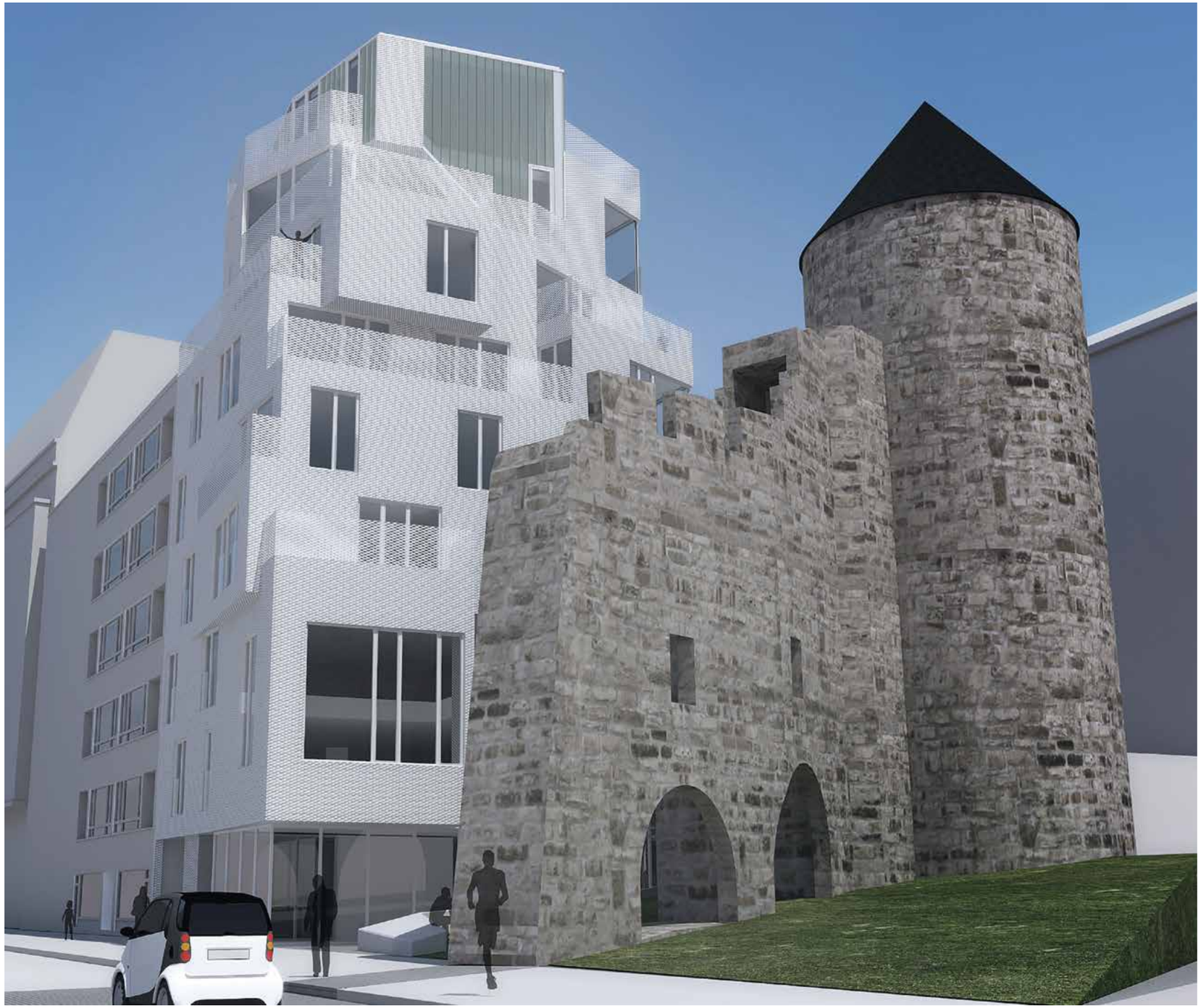
Today, digging trenches and building fences to protect animals is part of the game.



BELGIUM / EMPEROR BOULEVARD BUILDING, BRUSSELS

For tower's sake

Leaning on a shabby neighbour



Leaning on a shabby neighbour

Halfway down Emperor Boulevard in Brussels you can find the remnants of Anneessens Tower, a key element in the city's medieval ramparts. Despite the historic importance of the building, it's barely noticed by passers-by. No wonder. Just check the location in Google Street-view: the monument seems to have been stashed away between an old bowling palace and a shabby four-storey apartment block. Take a closer look and you'll see that the short town wall east of the tower is actually leaning against the apartment block. Take away the block of flats and the tower would collapse!

Keeping it straight

Now imagine having to demolish this apartment block and construct a new one without damaging the historic monument. Well, that's exactly what we did between December 2012 and June 2014. It was a genuine tour de force. We needed to build against the town wall an auxiliary construction, anchored more than six metres below the foundations of the tower. This counterbalance would keep the tower in position. However, as we progressed through the various stages of demolition and construction, we had to keep adjusting the anchorage. We also had to work inside the existing apartment block to construct the new first floor before we could start tearing down anything.

As if that wasn't challenging enough, we had to do most of the manipulations by hand because there wasn't enough manoeuvring space for heavy equipment.

Well within the limits

But we did it. And we monitored the setting of the tower throughout. It was well within the limits defined by monument preservation authorities.

We needed to build against the curtain wall an auxiliary construction, anchored more than six metres below the tower's foundations.

BELGIUM / REDEVCO RETAIL CENTRE, GHENT

In the heart of the city

The Redevco project in Ghent was an extremely complex job.

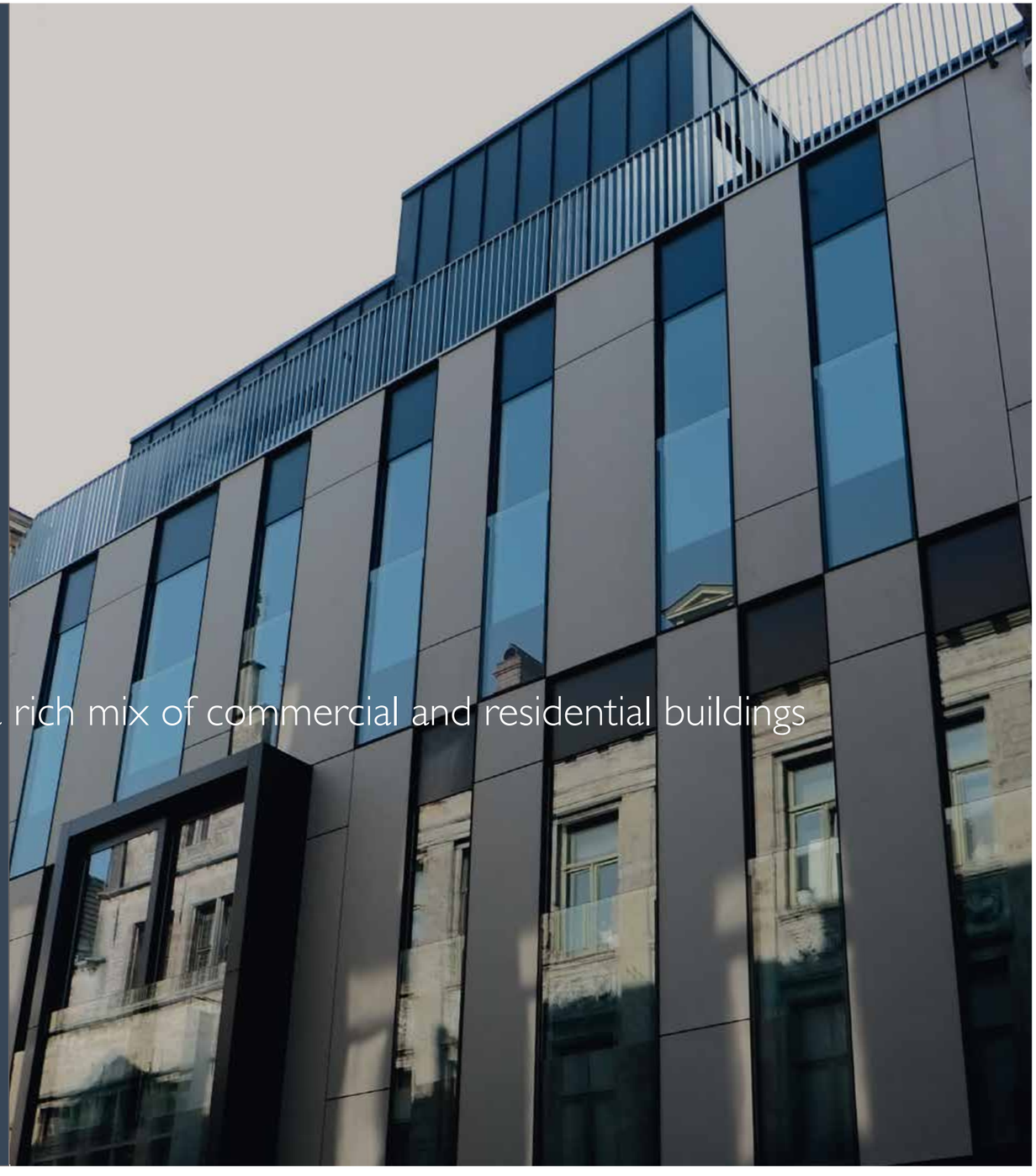
Exercising great care

At the end of March 2014, Denys completed the two-year retail centre redevelopment project for Redevco in Ghent. It was an extremely complex project. Consider the location: a 3,500-m² site right in the heart of the city, with a rich mix of commercial and residential buildings and with trams rattling past. As a result, organising the logistics came close to being a nightmare because it was impossible for trucks to reach the building site. And, of course, we had to reduce the inconvenience for residents as much as possible and prevent damage to surrounding buildings. In short, we had to be extremely careful.

Welcoming special requests

In addition to the challenges posed by the site's location, Real Estate developer Redevco had negotiated some demanding pre-conditions. For example, we had to make sure a couple of retailers and a fitness centre could continue their activities during construction. What's more, we had to deliver parts of the project one month earlier than planned at the request of a particular retailer.
Once again, we demonstrated our flexibility by rising to the challenge. Despite all these hurdles and the harsh winter of 2012-2013, we still delivered on time.

The site is surrounded by a rich mix of commercial and residential buildings



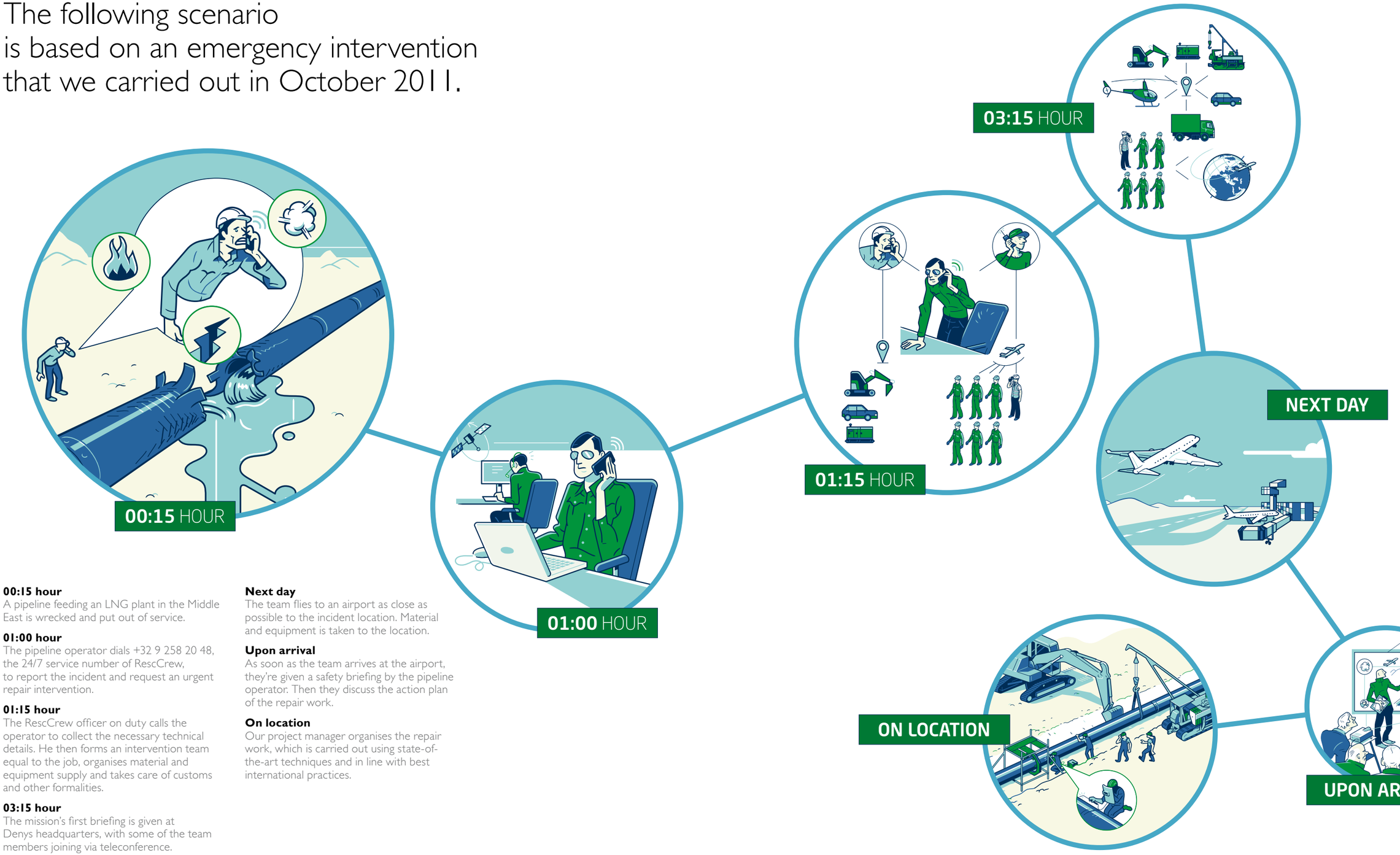
RESCCREW / PIPELINE EMERGENCY SERVICE

Under control within 10 days

A wrecked gas, oil or water pipeline spells disaster for businesses and communities alike. To avoid severe disruptions and prevent huge financial losses, such incidents need to be tackled promptly. Broken pipelines have to be repaired. Pipelines exposed to natural hazards or other sudden dangers must be protected. There's no time to lose; every hour of every day counts.

That is why Denys has created RescCrew. Our emergency pipeline protection and repair service sends a highly skilled team to the site in the shortest delay possible. The team includes a project manager, a number of pipe fitters and welders, a welding engineer, and other specialists with the right expertise. RescCrew has entered into intervention agreements with various companies in Europe and the rest of the world, including Total, Air Liquide and Fluxys.

The following scenario is based on an emergency intervention that we carried out in October 2011.



00:15 hour
A pipeline feeding an LNG plant in the Middle East is wrecked and put out of service.

01:00 hour
The pipeline operator dials +32 9 258 20 48, the 24/7 service number of RescCrew, to report the incident and request an urgent repair intervention.

01:15 hour
The RescCrew officer on duty calls the operator to collect the necessary technical details. He then forms an intervention team equal to the job, organises material and equipment supply and takes care of customs and other formalities.

03:15 hour
The mission's first briefing is given at Denys headquarters, with some of the team members joining via teleconference.

Next day
The team flies to an airport as close as possible to the incident location. Material and equipment is taken to the location.

Upon arrival
As soon as the team arrives at the airport, they're given a safety briefing by the pipeline operator. Then they discuss the action plan of the repair work.

On location
Our project manager organises the repair work, which is carried out using state-of-the-art techniques and in line with best international practices.

AFRICA / ENERGY AND WATER WORKS

Notching up more successes in Africa

Africa continues to fascinate us. We love its wide diversity of nature, culture, people and customs. We've been working here for more than ten years and each time we embark on a new project it's a completely different experience.

Last year, we have been working on projects in sub-Saharan countries like Chad, Ghana, Niger and the Democratic Republic of Congo. All our teams are dealing with a variety of persistent problems such as inadequate infrastructure and lack of skilled personnel. Despite the formidable obstacles, we're still notching up successes in Africa, teaming up as much as we can with the local staff we trained.

CHAD / BADILA AND MANGARA FIELDS

Expanding oil fields project

Our experts trained more than 500 local workers and managed construction activities.

The oil fields exploitation project in the south of Chad progresses at an unprecedented speed. The first oil from Badila (Chad) to Kribi (Cameroun) was transported in early 2014. The scope of the project has grown considerably since then. Caracal Energy Inc. has drilled additional oil wells in both the Badila and Mangara fields and asked Denys to assist in constructing part of the Above Ground Facilities and the necessary flow lines between the wells and the treatment facility.

As a result, we had to expand our encampment near Moundou, the place where our experts are located for the construction project's duration. It housed more than 100 expats at peak times. Our experts trained more than 500 local workers and managed the construction activities. The main lines were built, tested at 180 bars and dried, and are now ready for commissioning.

GHANA / KPONG WATER INTAKE STATION

Beyond reproach

The old water intake station at Kpong, Ghana, is being rehabilitated and expanded by Siemens NV so that it can continue to serve the growing city of Accra, about 70 kilometres south-west. However, Ghana Water Company Limited (GWCL) and Ghanaian authorities feared for interruptions to the water supply during these works. They didn't relish the thought of depriving 4 million people of clean water. Incidents such as the Dakar (Senegal) water crisis of October 2013, which triggered pockets of violent protests, demonstrates what can happen if contractors make a seemingly small mistake. The pipe installation activities had to be managed and carried out by a company beyond reproach.

That's why Siemens NV and GWCL called in Denys to construct the main DN1800 pipeline.

We were able to connect it rapidly to the existing pipelines, so the system was shut down for only a very short time. The main challenge was organising the six months job and coordinating the different subcontractors of Siemens and GWCL, including our own teams. All the time, GWCL continued delivering clean water to Accra.

GWCL and Ghanaian authorities feared for interruptions to the water supply during the rehabilitation and expansion works.

DEMOCRATIC REPUBLIC OF CONGO / TSHIKAPA

Crossing rivers

Despite the horrendous logistical situation, the construction and implementation of the Tshikapa drinking-water supply system is reaching completion. Civil works have been completed and the installation of electromechanical equipment has started.

However, the site's poor accessibility and the absence of reliable, basic infrastructure keep on troubling the project. For example, the main lines have to cross two rivers (the Kasai River and the Tshikapa River), but the bridges to which they have to be attached are in terrible condition. Micro-tunnelling would be an option, but it's virtually impossible to bring a tunnel boring machine on site, given the lousy condition of tracks and waterways.

Don't give up easily

But we don't give up easily. Working closely with the client and the engineering firm, we designed a new 75-metre pipe rack bridge over the Tshikapa River. We are now mobilising the necessary supplies and resources to build it. We envisage a similar solution for the Kasai crossing. However, additional funding is required to complete these works.

A new pipe rack bridge will be built over the Tshikapa River and a similar solution is being studied for the Kasai crossing.

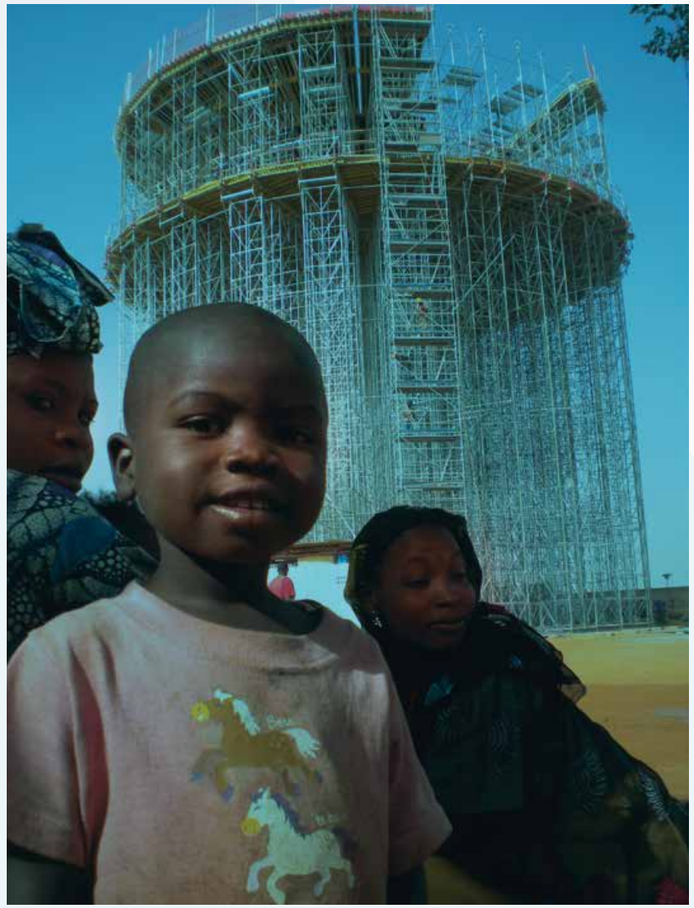
NIGER / NIAMEY WATER SUPPLY

Commitment to the continent

The water supply system of Niger's capital city, Niamey, needs to be improved and expanded continuously. Last year, Denys built a water tower and a distribution network in five peripheral Niamey districts. We did that with the help of the local staff we'd trained for previous projects in Africa, including Ghanaian and Cameroun engineers. The presence of African experts enables us to reduce the number of European expatriates on the project.

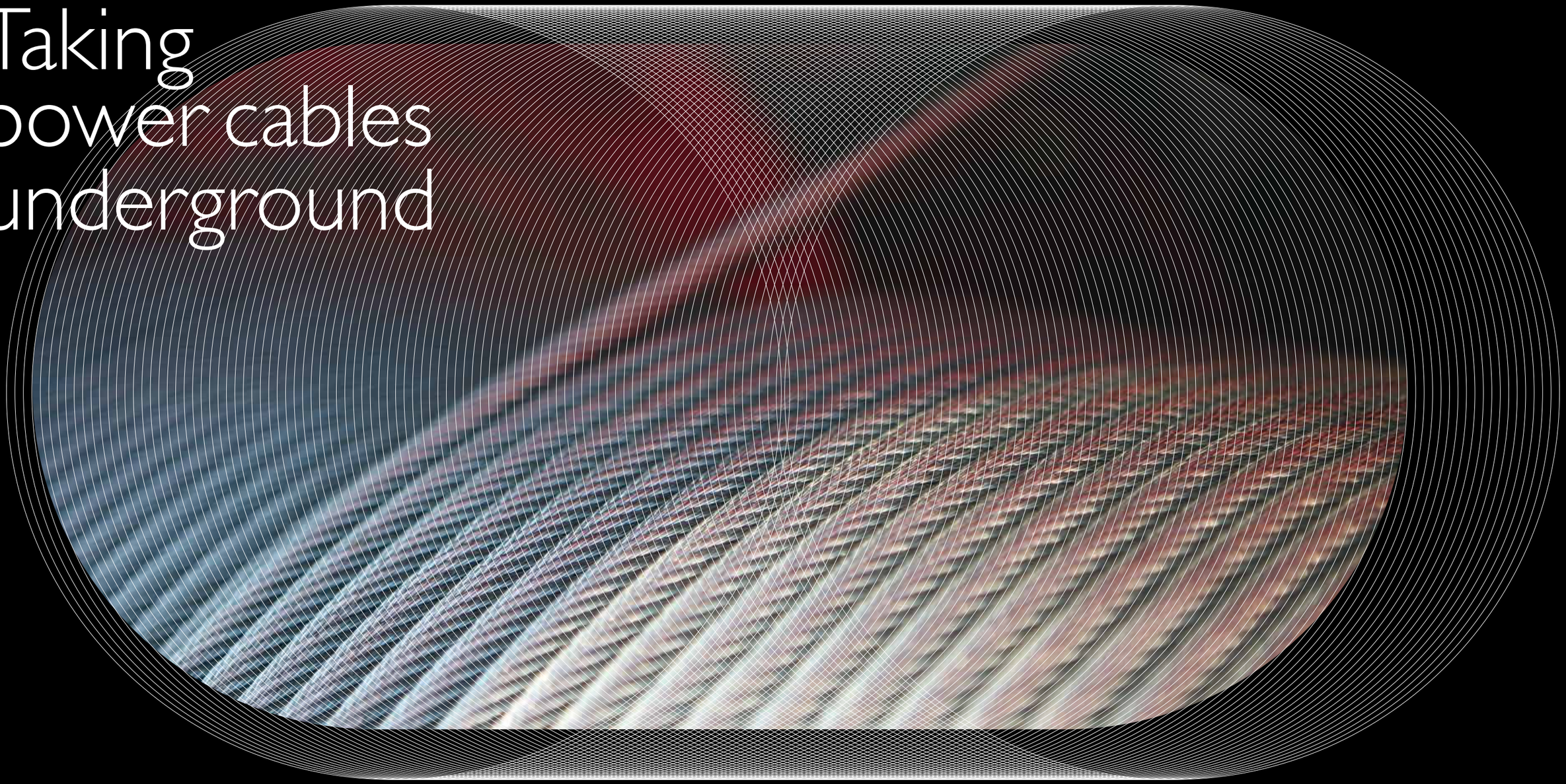
It's a clear win-win situation: we can continue our activities in Niger and the local people keep alive their freshly learned skills while developing their expertise. We're sure they will follow us on other projects in neighbouring countries. And it's a clear demonstration of our commitment to Africa: encourage local people to join us, learn a craft, develop skills and build a future.

We encourage local people to join us, learn a craft and build a future.



THE NETHERLANDS AND BELGIUM / TRANSMISSION GRIDS

Taking power cables underground



High-voltage power transmission lines are increasingly being installed underground. Landscape preservation is the main driver for this. No one likes huge pylons dotted around the country, it seems. A great plus is that underground lines are less affected by bad weather such as lightning or storms.

Complicating design and construction

The cost of installing underground lines is, however, much higher than overhead construction, once you take into consideration cable insulation and excavation costs. What is more, the excess heat produced in underground cables must be continuously evacuated. This complicates design and construction and limits trajectory lengths. For this reason, going underground is not currently an option for 380 kV AC transmission lines over a length of more than 20 km.

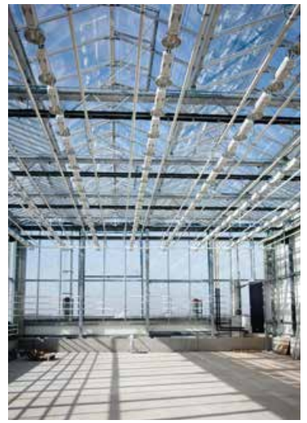
Digging trenches in Holland and Belgium

Denys is currently working on two underground transmission line projects. The Dutch transmission grid operator Tennet has asked us to build a new 150 kV line in the region of Roosendaal. We're taking two circuits underground for a length of 10 kilometres, which involves digging a large open trench. In Belgium, we're laying a new 15-kilometre 36 kV line between Zedelgem and Lichtervelde for grid operator Elia. This project is meant to cope with the growing local energy demand.

Transmission lines are installed between 0.8 and 1.2 metres below surface level using the open trench technique.

BELGIUM / BIO-ACCELERATOR II, GHENT

Happy



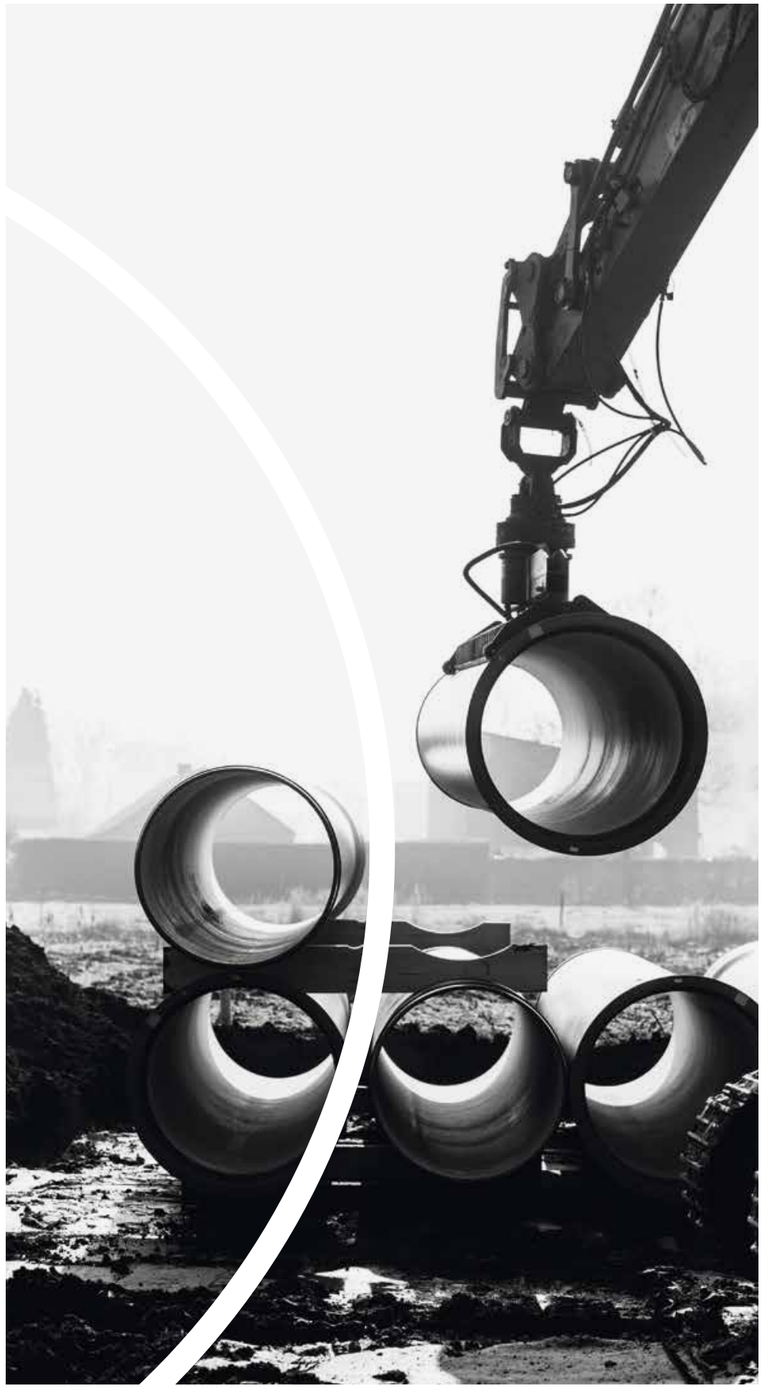
Bio-Accelerator II contains 1,000 m² of office space, 3,000 m² of laboratory space and a huge conservatory on the roof.

Last year, Denys finished the second phase of the Bio-Accelerator biotechnology plant project in Ghent, a five-storey building containing 1,000 m² of office space, 3,000 m² of laboratory space and a huge conservatory on the roof. Bio-Accelerator II was tailored to meet the needs of CropDesign, the BASF Plant Science company that moved in at the end of 2013. CropDesign Managing Director Wim Van Camp names it "the best and most beautiful BASF building in the world." Manager Finance & Controlling Marleen Paelinck confirms whole-heartedly how happy they are with the result. "Our people say it's wonderful working here. It's a very pleasant and convenient building with plenty of daylight in each and every corner. We're very satisfied with the work of all parties involved, including the architects, the Bio-Accelerator organisation and the contractors."

TUNNELLING

Drilling and boring

TUNNELLING



Combining several tunnelling techniques

To increase capacity, the Flemish water transport company TMVW commissioned Denys to construct a 10-kilometre 1,000 mm diameter pipeline between Walem and Tisselt, near Mechelen in Belgium. Part of the pipeline runs under a future flood area, which will be formed by building a new embankment along the Rupel River. To construct the pipeline, we have to combine a number of techniques, including horizontal directional drilling (HDD) at three locations and micro-tunnelling at another four. Despite the considerable amount of time that was lost due to archaeological investigations, we're confident we'll be ready by the deadline at the end of 2014.

A combination of techniques is being used, including HDD and micro-tunnelling.

TUNNELLING

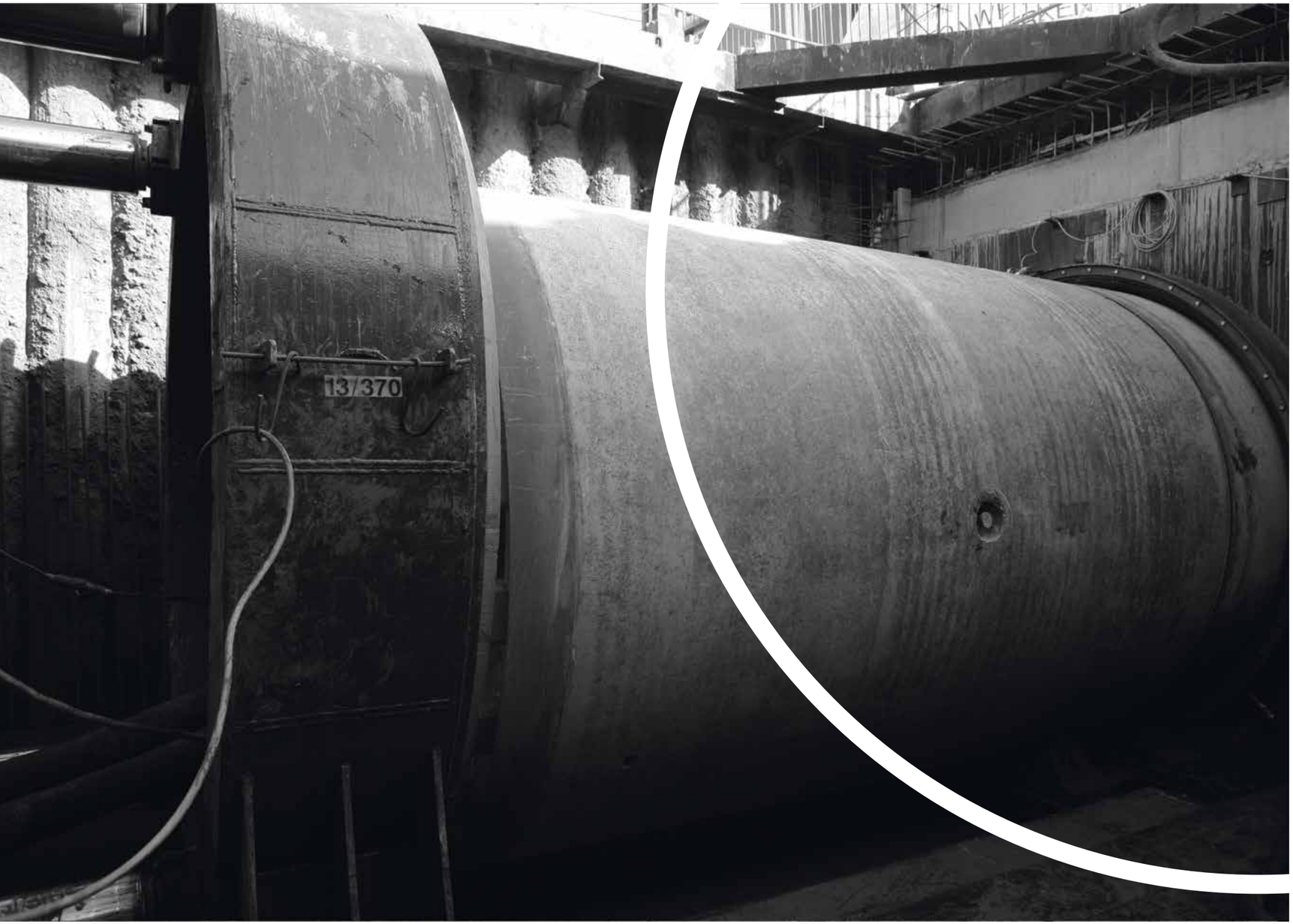
The 150 kV underground transmission line crosses a railway line just north of Roosendaal.

Laying a cable tunnel under the railway

A Denys cables team is currently laying a new 150 kV underground transmission line between Roosendaal and Dinteloord in the Netherlands. The trajectory crosses a railway line just north of Roosendaal, which is why a tunnel had to be built under the railway track to lay the cables. Since we have plenty of expertise in micro-tunnelling, we tendered for this subproject and were granted the commission. The tunnel was bored and completed on schedule in February 2014.

The Roosendaal project also served as a final test case in our four-year procedure to obtain a Prorail licence for drilling activities underneath Dutch railway infrastructure. We're convinced the licence will be granted shortly.

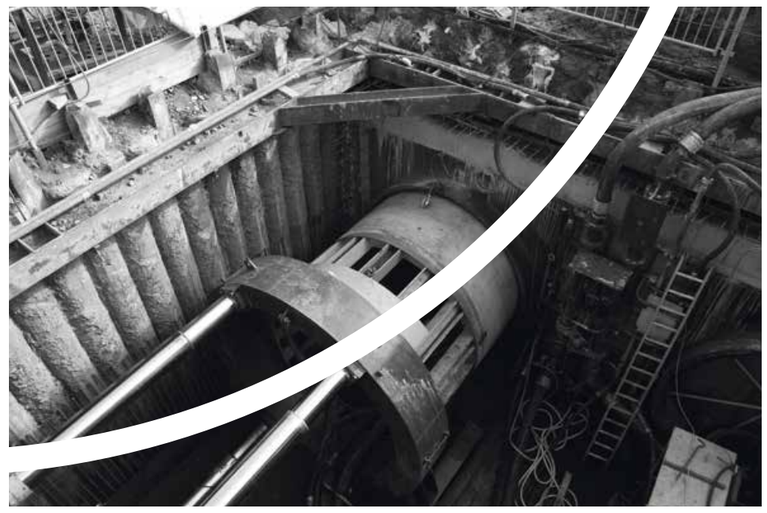
TUNNELLING



The Herrenknecht tunnel boring machine came into play for the most spectacular part of the project.

Called in for the spectacular part

In 2013, the town of Mons, Belgium, had to renew its ancient wastewater pipe.
The Pertuis du Trouillon Vouté had become too small to cope with heavy rainfall. Denys was called in for the most spectacular part of the renewal project: the construction of two parallel 2,500-millimetre diameter micro-tunnels. To do the job, we used our Herrenknecht tunnel boring machine and SOCEA reinforced concrete pipes.



MANIFESTO FOR UNDERGROUND TRANSPORT

Let's be courageous, let's do it

Johan Van Wassenhove
CEO Denys Group

Traffic problems rank high among society's toughest issues. Every day, millions of people waste precious time sitting in traffic jams. This sad reality has a huge, negative impact on our economy, the quality of our lives and the environment. In the most densely populated regions, traffic jams have become 'business as usual'. Belgium is a prime example. The international traffic information platform INRIX lists Belgium as the most congested country in Europe, with Brussels and Antwerp leading the pack of most congested cities in the world.

For those that live and work there, that's hardly surprising. In Antwerp, for instance, authorities have been studying proposals for a complete ring road for more than fifteen years without making a decision. Meanwhile, the situation keeps on getting worse. The many different public bodies involved in the decision-making process means cities are far too slow to cope with the changing reality.

INRIX highlights another interesting fact. In Belgium, the majority of goods are transported by road and not by railway or waterway, leading to a relatively large number of heavy goods vehicles on Belgian highways. A significant reduction in road transport would go a long way to cutting daily traffic jams. What many people don't realise is that there's already a solution for this: transporting goods underground. We're not joking. It's perfectly possible to build underground conveyors or transport pipes. They can be constructed just like pipelines and with minimal disruption.

There are a lot of plusses to underground goods transport. There's no noise pollution and emissions are virtually non-existent. Transport systems occupy only small areas of land, often along or under existing pipes, roads or railway tracks, with minimal environmental impact. And they offer great transport opportunities, not only for small packages but also for entire pallets of goods.

This is not science-fiction. The solutions are already available. Shouldn't we grasp this opportunity? Shouldn't we at least study the economic feasibility and the potential for reducing road transport traffic? Let's be courageous, let's go for it.

RESTORATION AND RENOVATION / PRIVATELY-OWNED BUILDINGS

Recognising an estate's value

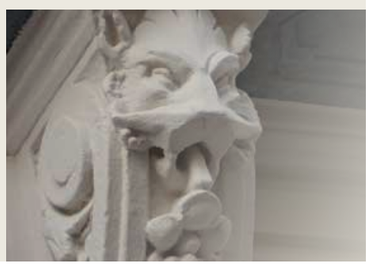
Pre-modern architectural gems seem to be omnipresent in Belgium, not only in major cultural centres such as Ghent and Brussels but also in smaller towns such as Leuven and Kortrijk. A great many of these are privately owned and depend largely on private funding for restoration or renovation.

Luckily, an increasing number of private owners are recognising the value of their estates and are setting about restoring and renovating them, sometimes with support from monument preservation funds. The Denys restoration and renovation team is being called in more frequently for this type of work. Last year, we carried out private initiative restoration and renovation projects in Kortrijk, Ghent, Antwerp and Brussels, to name just a few.

RESTORATION AND RENOVATION / PRIVATELY-OWNED BUILDINGS

Delightfull Ghent

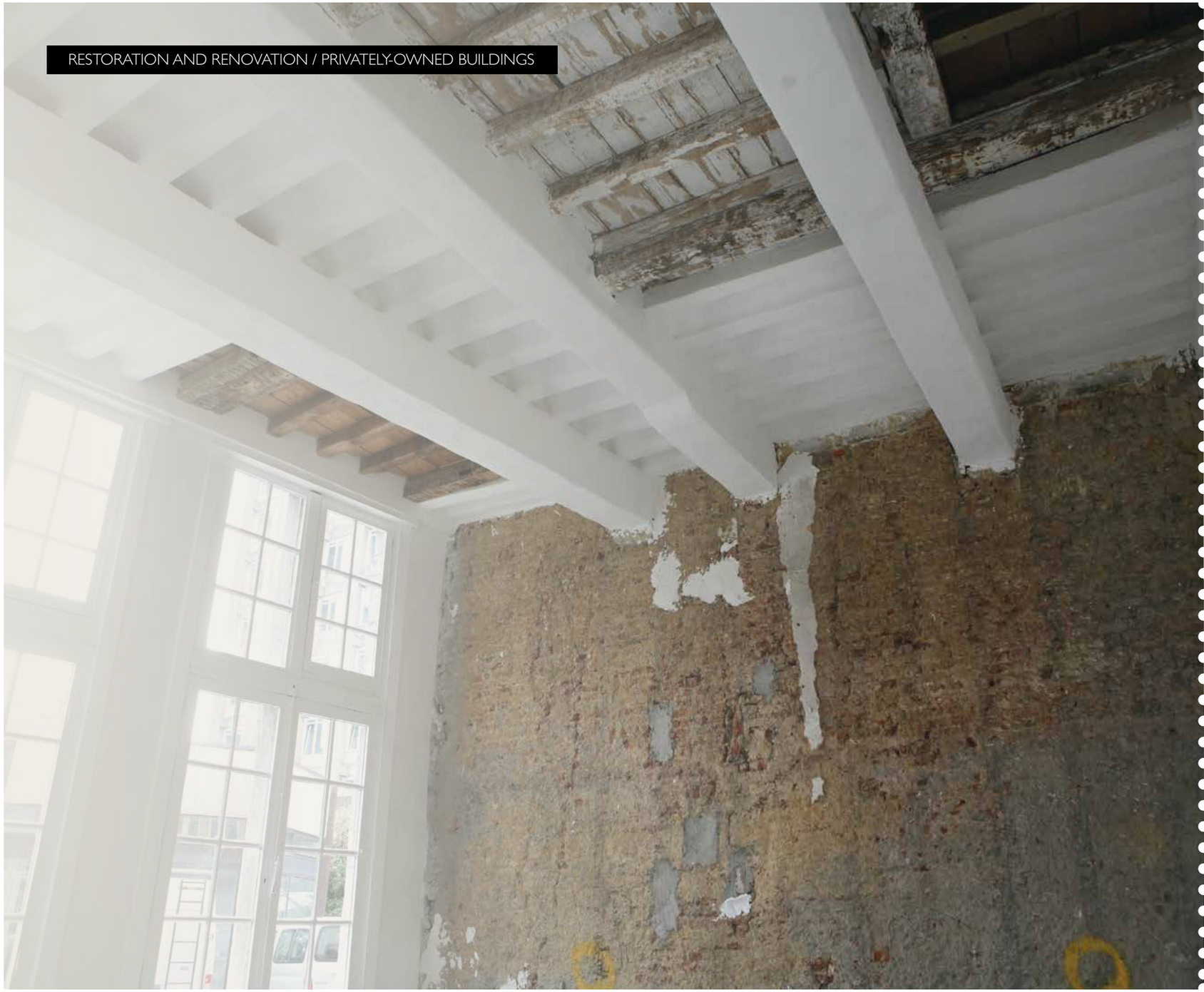
Walk around the centre of Ghent and you'll see plenty of delightful buildings like this. Not all of them are in good shape, but we meticulously restored the façade of this gem in the Jakobijnenstraat.



Graceful neo-classicism

This 19th century building in the heart of Kortrijk has been converted into a fine clothes shop. We restored the neo-classicist façade to reinstate its original grace.

RESTORATION AND RENOVATION / PRIVATELY-OWNED BUILDINGS



A marriage of old and new

This old school building in Antwerp has been entirely renovated and converted into a residential building with luxury flats and studios. The façade in the Everdijstraat was restored and parts of the old timber structure inside the building were laid bare and renovated. There are also some beautiful traces of 16th century decoration by Cornelis Floris, the original architect of the building and the designer of the Antwerp Town Hall.

BELGIUM / BOZAR, BRUSSELS

Bow Zarr

The Palais des Beaux-Arts in Brussels, now commonly referred to as Bozar (pronounced as 'Bow Zarr'), is an achievement by famous architect Victor Horta (1861-1941). In 1922, Horta had to put together a large array of arts and performance-related functions on a rather small and awkwardly sloped building plot. Nonetheless, he managed to deliver a remarkable hybrid (mainly Art Deco) masterpiece.
The building has played a major role in the artistic and cultural life of Brussels ever since and is maybe best known for the Henry Le Boeuf Concert Hall with its outstanding acoustics. It hosts many events, including the finals of the famous Queen Elisabeth Music Competition.

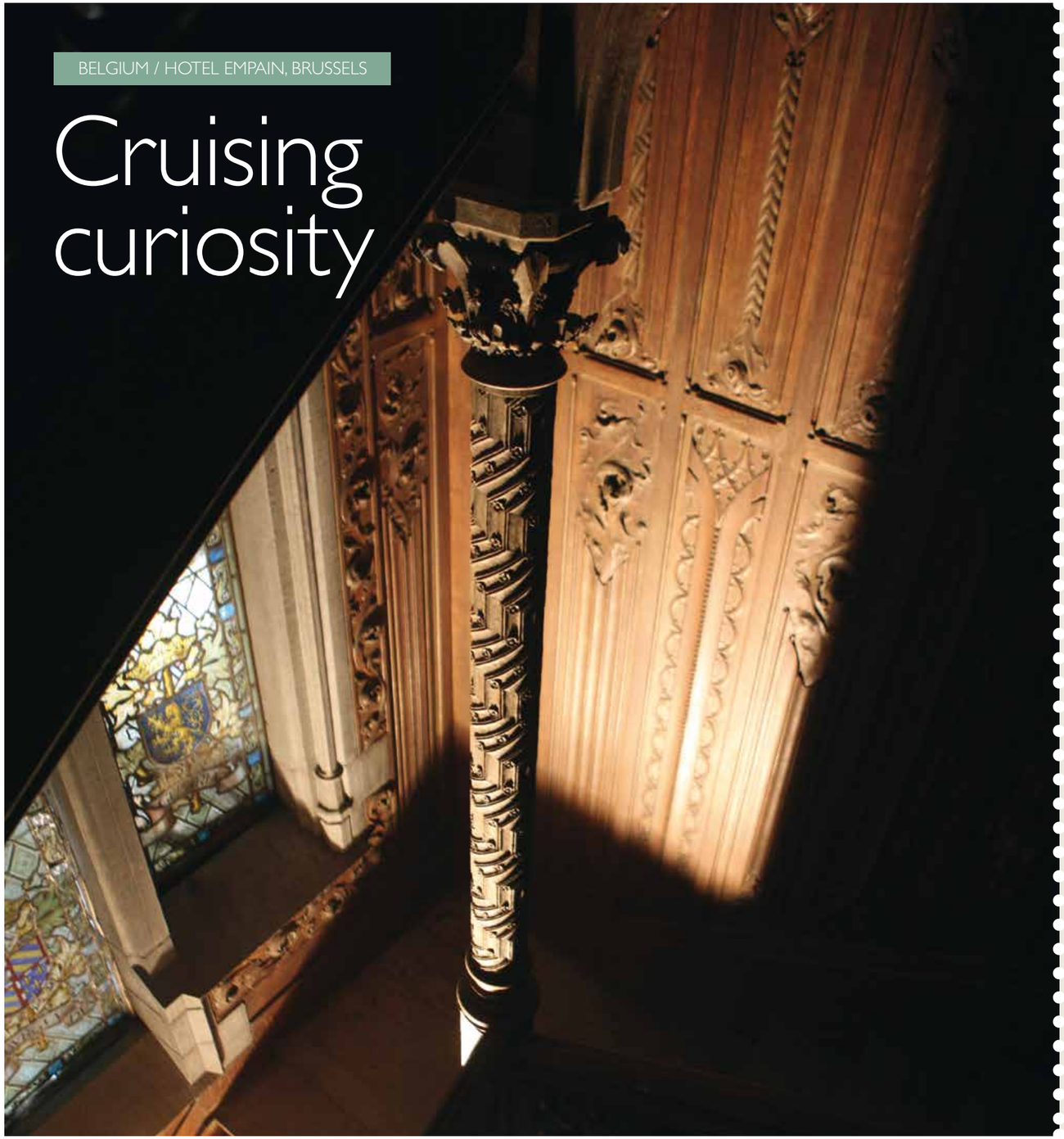
Small things, but oh so important

Despite the building's significance, it has suffered wear and tear and even worse (the concert organ was destroyed by fire a long time ago). The Henry Le Boeuf Hall was renovated in 2000 but still requires a touch up here and there. Several other rooms and halls still need a major upgrade to meet current requirements. That's what is happening now. Denys recently renovated the rehearsal room of the National Orchestra of Belgium, Bozar's resident orchestra. We also renewed some of the rainwater downpipes around the main hall as part of the organ restoration project. Before long, we'll be replacing the terrazzo flooring in the Henry Le Boeuf Hall and we'll be optimising the acoustic quality of its doors. It seems there are still many things to be done in the next few years at Bozar.

Wooden acoustic panels were installed in the rehearsal room of the National Orchestra of Belgium.

BELGIUM / HOTEL EMPAIN, BRUSSELS

Cruising curiosity



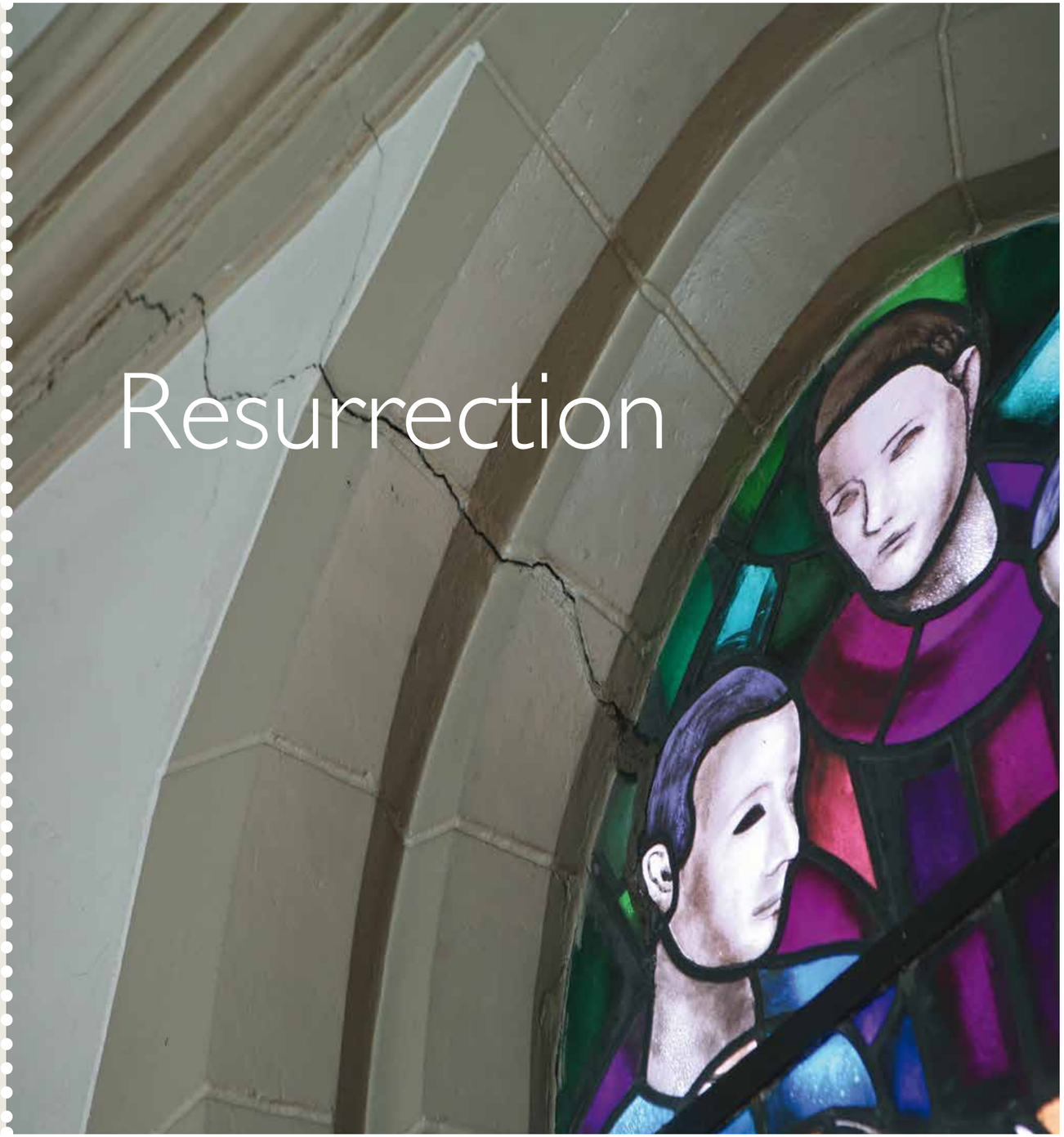
The restoration and renovation of the Hôtel Empain is now definitely at cruising speed. In 2013, we renewed the roofs, reconstructed the main room, which was destroyed by fire, replaced the wainscoting and cleaned up the façade. There's still a lot of work to be carried out but, in 2015, this neo-Renaissance curiosity by Jean-Joseph Naert will have been revived as one of the most prestigious office buildings in Brussels.

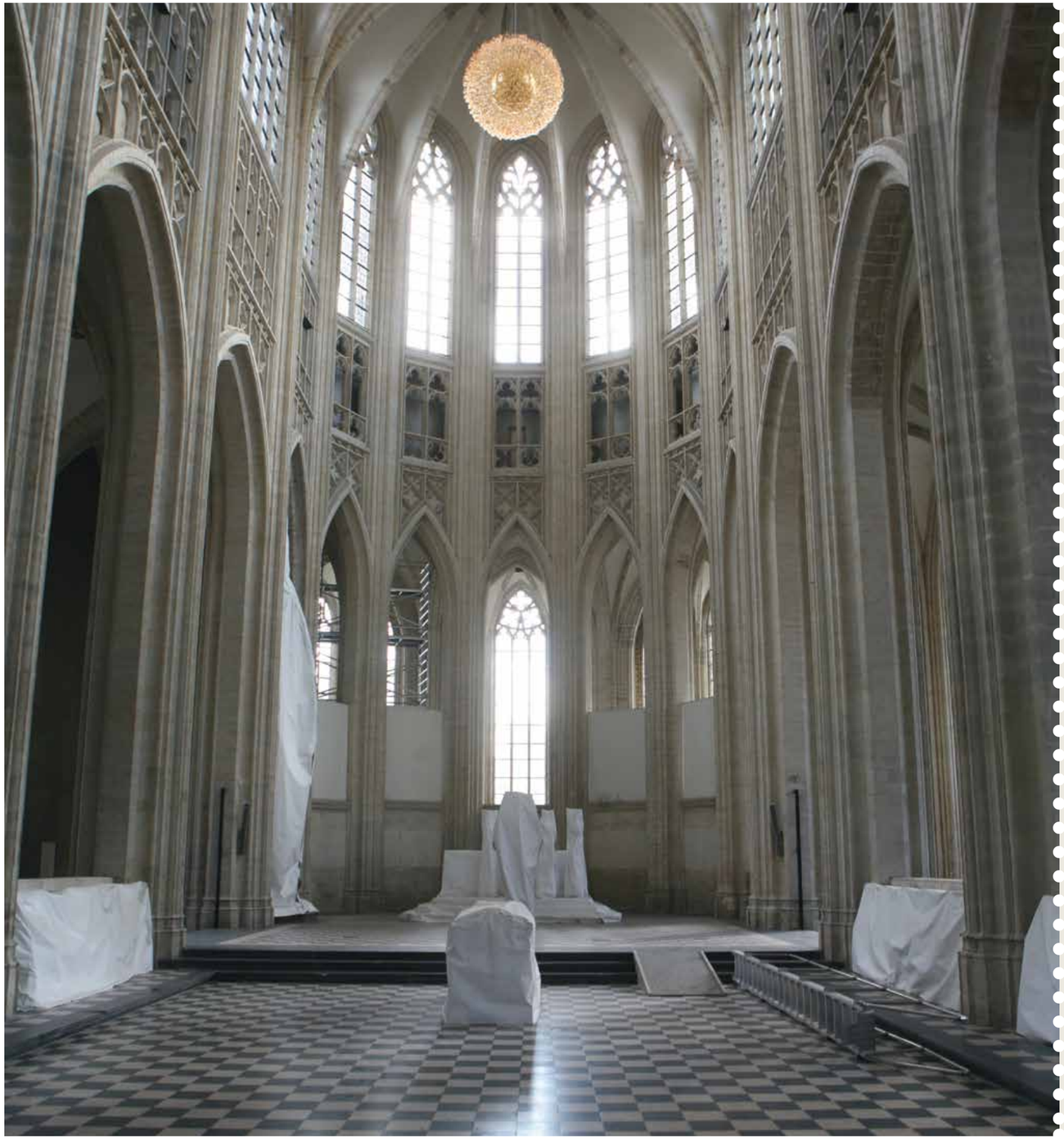
RESTORATION AND RENOVATION / CHURCHES

There are beautiful churches in every region of Belgium, but many of them are in extremely bad shape. We've been carrying out renovation works all over the place, from Appelterre-Eichem to Dilsen-Stokkem, from Eisden coalmine to the town of Leuven.

Saint Martin's Church in Appelterre-Eichem

Resurrection





Saint Peter's Church in Leuven

DR SHELTER / URGENT HOSPITAL BUILDERS

A complete hospital in just 4 months?

A shortage of high quality clinical infrastructure is facing many countries and communities around the world. New hospitals are needed, and they're needed now.

That's why Denys has developed Dr Shelter. This smart construction method, which follows a 7-stage construction plan, lets us build a turnkey clinic in next to no time. It's highly efficient, extremely economical and above all fast. The following scenario shows how we can deliver a three-storey clinic in just four months.

DAY 1 > 8
We prepare the site in just seven working days, grubbing trees and bushes, laying temporary roads and installing equipment.

DAY 9 > 18
In fifteen working days, we apply the necessary soil stabilisation and lay the foundations.

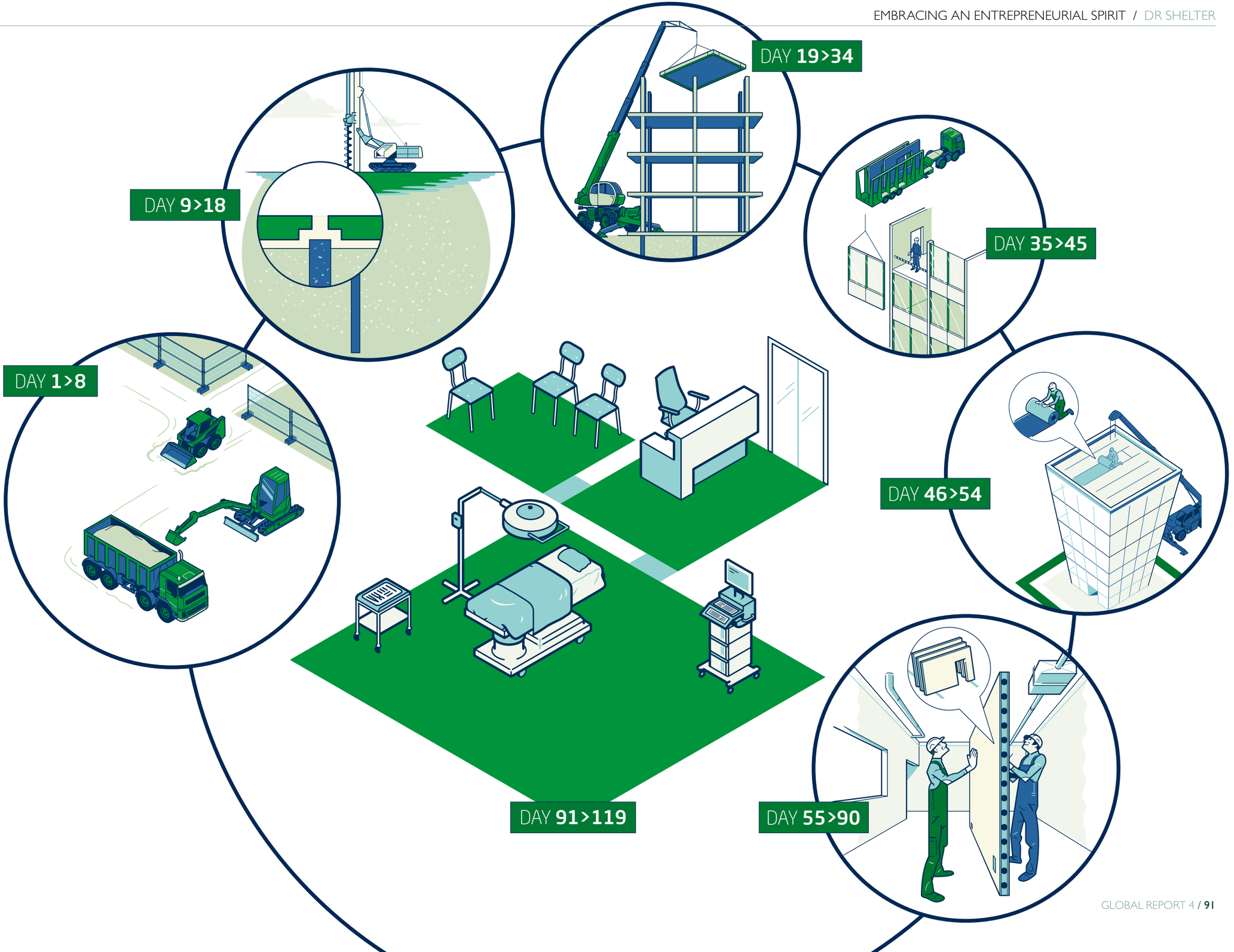
DAY 19 > 34
In twelve working days, we construct the building's skeleton using fully equipped prefab concrete columns and slabs.

DAY 35 > 45
In seven working days, we complete the building exterior by attaching ready-made walls to the skeleton.

DAY 46 > 54
In another seven working days, we seal all joints and cover the roof.

DAY 55 > 90
It takes us just a month to arrange the interior, using fully equipped prefab walls.

DAY 91 > 119
In just another month, we cover the floors, finish walls and ceilings and install door and sanitary equipment.
Then we connect and test all utilities, and we clean the building before delivering.

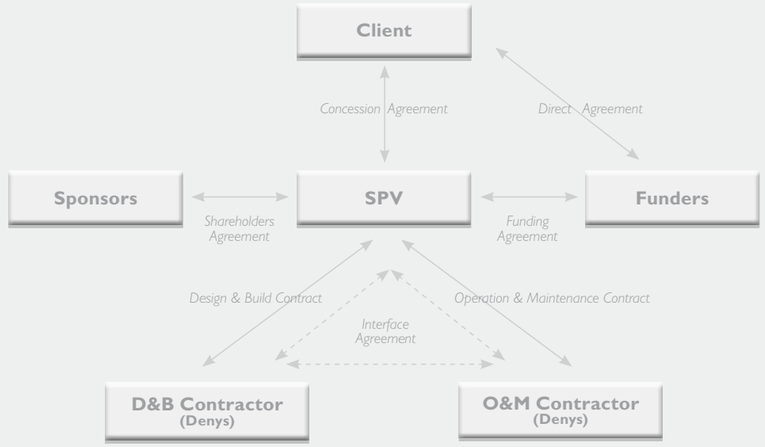


dr.shelter
Urgent hospital builders

PULBLIC-PRIVATE PARTNERSHIPS

OXYGENATING PUBLIC SECTOR PROJECTS

Nowadays, large scope infrastructure projects are being increasingly pursued as a public-private partnership (PPP) rather than a conventional public procurement. Indeed, PPPs allow the public sector to acquire large or complex infrastructure assets.
The synergies resulting from the combined responsibility for design, construction and operation deliver value for money. PPPs also allow these investments to be taken out of annual budget considerations. What's more, PPPs give projects the chance to harness the considerable expertise and efficiency levels characteristic of private enterprise ventures. It's like oxygenating the project. That, and the far-reaching commitment of a solid private partner consortium, can bring the project long-term success.



Engaging in ambitious plans

In Belgium, Denys was an early proponent of PPPs and has participated in a number of them despite the poor financial and economic climate of recent years. Our bus depot project for the Flemish public transport authority De Lijn won the first PPP award from the Flemish Government in 2011.

A Special Project Vehicle (SPV) is developed in each of our PPPs to define the responsibilities for design, construction and operation.

We have been successful in other PPP projects ever since, including the Bio-Accelerator project in collaboration with Ghent University, the construction of nine community sports centres for the Flemish Investment Company PMV, and the Livan tramway project in Antwerp for De Lijn.

Most of these projects are now operational, leaving us responsible for their maintenance for the next 25 or 30 years. In addition, we are co-leading the Cafasso Consortium, which was appointed preferred bidder for the Brussels Prison Project.

We advocate for all these PPP projects a long-term vision on providing public services and demonstrating innovative power, great efficiency and a sound lifecycle approach.

PPP in Africa

We believe the PPP formula could also be applied successfully in developing countries. African countries, for example, have a great need for new and critical infrastructure for drinking water, waste water and energy. Today, most local authorities harbour great ambitions, but public purses are often too small to fund such large-scale projects. What is more, authorities find it difficult to rouse private investors' interest, due partly to investors' fear for political, economic and social instability. At Denys, however, we're convinced Africa is on the brink of a breakthrough. The will to succeed is strong and the money to invest can be found. We're currently helping a number of African countries by giving expert financial advice and carrying out in-depth feasibility studies and risk analyses. We're convinced that PPP projects will shortly follow.

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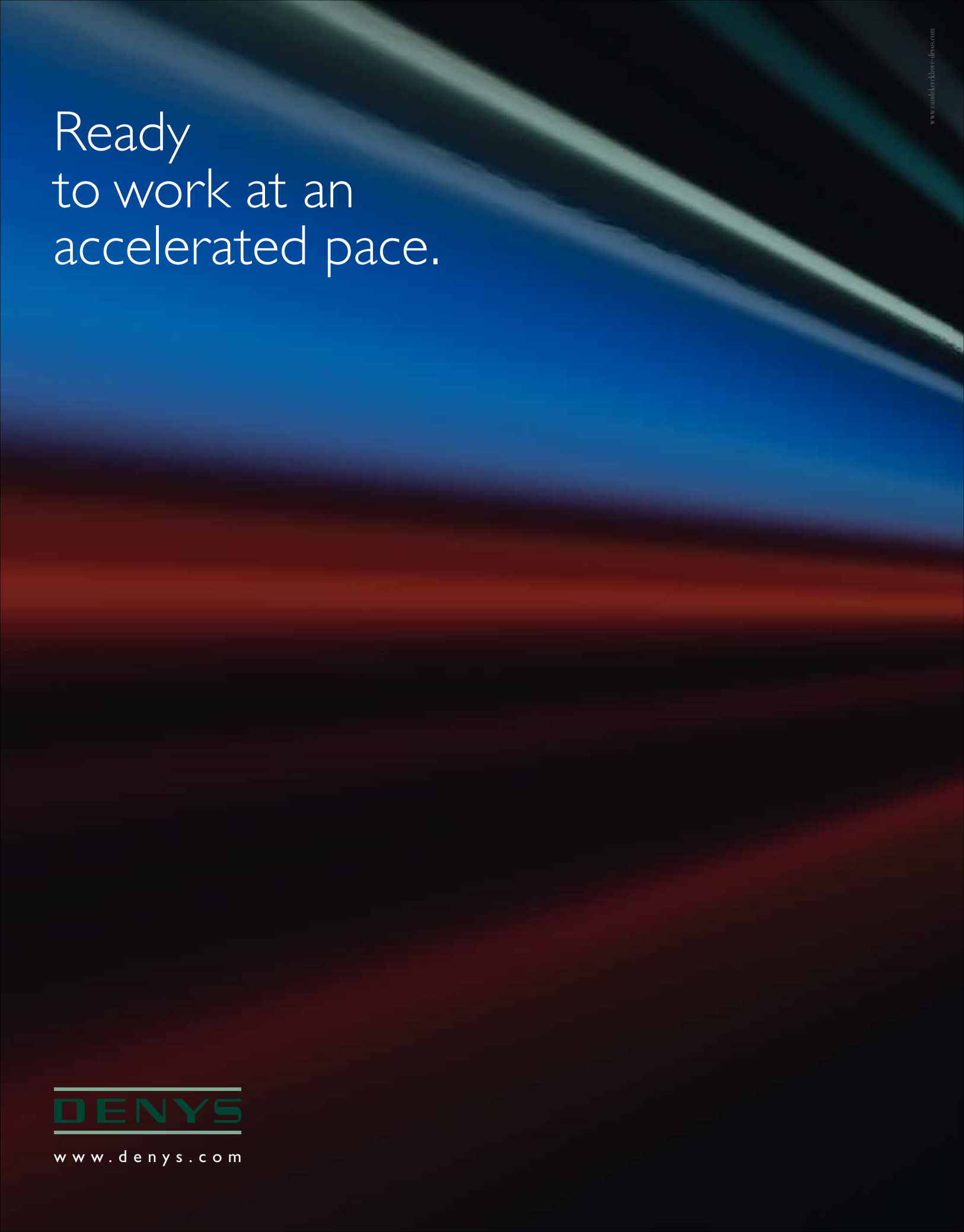
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