AMBITIONS

A dive into Sika's world

© Marc Goodwin: Archimospheres

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A BUILDING SHAPED LIKE A "Y"

When design makes most out of the scenery and rooms follow the rotation of the sun.

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AMBITIONS ISSUE #31

BUILDING TRUST

NEAR-NATURAL CONSTRUCTION

ASTRID SCHNEIDER

Marketing & Communications Manager, Sika Services

Prior to the late 19th century, architecture changed in response to the new industrial landscape. The weight of a multistory building had to be supported principally by the strength of its walls. The higher and bigger, the better. In America, the development of cheap, versatile steel in the second half of the 19th century helped change the urban landscape. A much more urbanized society was forming and society called for new, larger buildings. Though there are fabulous architectural designs from then which we can still admire today, we now have different needs in the 21st century. While back then it was about creating a new space for a new industrial society, now we are conscious about what we have to keep and take care of: nature and its resources.

In terms of architecture and construction, it is now time to create smarter buildings. One excellent example is House Y in Finland (p.4). The project represents a generational shift in design ideology and ecology. It has an intelligent approach to energy consumption, as it is heated with geothermal energy. Furthermore, the sun brings natural light and thermal energy to the interior at the right time, as the rooms have been arranged so that they follow the rotation of the sun. The morning sun shines onto the terrace and sweeps round to light up the kitchen and living room by noon.

Creating near-natural designs is not only about construction above ground, but also underground: Wastewater can be hazardous to the environment, which is why raw sewage should not be allowed to get into groundwater. That is why having a functioning tunnel system to a treatment plant is a must in an urban environment (p.26) such as in Buenos Aires, Argentina. Having a sustainable mindset is not a given, but providing young people with insights into chemistry and fully educating them for their future is a good start (p.42).

Yours sincerely,

ASTRID SCHNEIDER

CONTRIBUTORS

CARSTEN RIEGER

Market Development, Manager Concrete, Sika Services

The product range of SikaFiber® is used in many different concrete applications like shotcrete for tunneling and mining or slabs on ground and concrete precast element. It is a great experience to see all the applications and getting in contact with many customers and applicators.

SIMONA ROSU

Marketing & Office Manager, Sika Ethiopia

Working for Sika in Ethiopia as an emerging country is a real challenge for me. At the same time it is the ideal place to learn how to implement marketing campaigns which are tailored and adapted to the local culture and needs, which are so different from the ones I know.

FRED GLOUDIE

Account Manager Sika Netherlands

The Lammermarkt car park is unlikely to other car parks an architectural delight. The spiral shape ensures that drivers find a free parking space without any effort. The light finishing of the floors and ceilings creates a really spacious look and feel as well as protecting the construction itself. Although a carpark is never a destination on its own, this one will definitely leave a unique impression.

SIRPA LUND

Marketing Specialist Sika Finland

More and more people want the nature to be part of their life at home. Luckily I work at Sika which offers stable and sustainable solutions for exactly this kind of construction I believe in. I am sure near-natural architecture will become more common in the future.

SALIM ISSA

R&D Assistant Sika Tanzania

As a chemistry enthusiast, working at Sika has given me the chance to grow personally and think out of the box to have a look at what construction industry looks like from a chemical viewpoint. By interacting with the youth via *ProjeKt Inspire* I hope to spread this enthusiasm and knowledge to the chemists and engineers of tomorrow.

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Editors' address: Sika Services AG, Corporate Marketing, Tüffenwies 16, CH-8048 Zurich, Switzerland, e-mail: ambitions.magazine@ch.sika.com
Layout and Design: Sika Services AG, Corporate Marketing, Marketing Services
Visit us on the Internet: www.sika.com

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The external walls are clad with untreated Siberian larch, the idea being that the building will age gracefully, creating a beautiful patina.

LIVING WITH THE ROTATION OF THE SUN

In the days of underwater mortgages and unconventional home financing, inheriting a house can be as much of a curse as it is a blessing. If you're personally attached to the property – say you grew up in it or got married there – it can be difficult to make a logical decision about the best course of action. So what do you do with a house you inherit but don't want to live in? What do you do if the property is too old and in need of renovation in order to rent it out or sell it?

TEXT: SIRPA LUND, ASTRID SCHNEIDER
PHOTO: MARC GODWIN, ARCHMOSPHERES

> The owner who arranged this special project with an architect had inherited a McMansion with a poor spatial layout from his father. The house was designed to meet the tastes of the previous generation. The site also featured a large, ostentatious garden with extensive manicured lawns. In addition, the house was too big and expensive to maintain. The new owner decided to restore the plot to a natural pine forest, and built a small home that fully engages with the surrounding landscape. An added bonus to the restored pine forest is that the client doesn't need to mow any lawns. The new house and garden have now been designed to meet contemporary tastes. This project therefore represents a generational shift in design ideology and ecology.

The new building consists of three wings shaped like a "Y". Each of the three wings is different in volume (width and height). The change in dimensions cre-

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Instead of providing just one main view of the landscape, the architect has utilized all that the building has to offer.

> ates a pleasant atmosphere. Instead of providing just one main view of the landscape, the architect has utilized all that the building has to offer.

The architectural language of the building arose from the desire to make the most of the scenery. Its three wings allow stunning views of the lake from all the rooms in the house without the need to increase its floor area too much.

Instead of providing just one main view of the landscape, the architect has utilized all that the building has to offer. The living spaces open out into 245 degrees of unobstructed lakeside scenery. Only the facade facing the garden now restored to a pine wood is more enclosed. The rooms have been arranged so that they follow the rotation of the sun: the

morning sun shines onto the terrace outside the bedrooms and sweeps round to light up the kitchen and living room by noon. In the evening, the sun casts its beams on the other side of the living room and into the sauna terrace. After the spectacular views, the second most noteworthy element of the house is the convergence of its three wings at the spot where the dining table stands.

The width and height of the wings have been carefully designed according to the importance of the facilities they house. The living room is the highest and widest, while the sauna and bathing facilities are the smallest. The interior is lined with spruce boards that have been UV-protected and treated with a light color. The plot is located in a windy location, >

THE BUILDING'S STRUCTURES ARE DESIGNED TO BREATHE, IN ORDER TO PROVIDE EXCELLENT INDOOR AIR QUALITY

> so the Y-shaped house creates a protected yard on each side of the house. The house and patio are elevated to give a better feel for the landscape, so the landscape looks more powerful and more spectacular than it actually is. By building the living room as a projection towards the lake, from the inside perspective the room seems to float above the water. The beach line cannot be seen from the living room. Every room has outdoor access, so in summer the indoor and outdoor spaces are really one.

The house itself is timber-framed and has a traditional ventilated base floor. Its structural frame is built from sawn timber. The structures at the point where the wings converge have been reinforced with steel beams. The building's structures are designed to breathe, in order to provide excellent indoor air quality. The insulation material used is cellulose insulation.

The external walls are clad with untreated Siberian larch, the idea being that the building will age gracefully, creating a beautiful patina. The building is heated with geothermal energy and a large black fireplace acts as the centerpiece of the interior in the living room. It is graded energy class B, which is excellent considering the volume of its external envelope. For the sealing of the glass facades, Sikasil® WS-605 S was used for its weatherproof nature and non-streaking behavior. Sikasil® IG-25 HM Plus was applied as a secondary sealant in the insulated glass units (IG) because of its very low gas flow rate (EN 1279-3).

In the interior, the bathrooms and bedrooms are presented to the open interior space as boxes made of white plywood. Generally, the interiors are clad with a subtly whitened spruce to enhance the experience of the scenery. The concept of three inter-joined wings and extensive use of glass create a spatial flow inside the house. This was done to enhance the illusion of an old barn that has been converted into a contemporary house. Finally, as a traditional focal point in a home, a large black fireplace acts as the centerpiece of the interior.

The living room with a great view of the landscape.

As we enter a more environmentally-conscious age, we will inevitably need to build more ecologically responsible and sustainable buildings. Smart architecture develops a close relationship between people, natural resources and the sustainable living of our future. Energy efficiency over the entire life cycle of a building, such as that in House Y, is the most important goal of sustainable architecture. <

For more photos and architectural description click here
Get details of Sika Finland.

WHAT'S ETHIOPIA ABOUT?

Ethiopia, also known as Abyssinia, is bounded by Eritrea, Djibouti, Somalia, Kenya, Northern Sudan and South Sudan. Historians believe the beginnings of mankind may be traced to this land: the oldest human remains – such as those of "Lucy" – were discovered here. But beyond that, Ethiopia is the second biggest economy in sub-Saharan Africa in population terms and the fourth biggest in terms of economic output. It is also important politically and has huge potential for development. We talked about all this, and more, with Petrisor Grindeanu, General Manager of Sika Abyssinia.

TEXT: SIMONA ROSU, ASTRID SCHNEIDER
PHOTO: SIKA ETHIOPIA, I-STOCK

> **You left Europe to manage Sika Ethiopia. How are you coping and what surprises have you experienced so far in Addis Ababa?**
It's almost three years since I accepted this challenge and came to manage Sika Abyssinia. Actually, the company in Ethiopia was a startup and I was the first employee. I think Sika Abyssinia was a different sort of start-up compared to other Sika companies. Why? Because normally when Sika decides to penetrate a new market the story starts with imports and resale. In our case, due to the country's laws and specifics, a foreign company cannot import and resell. So the only solution was to build a factory from the beginning and start up the business afterwards.

Before moving here, I knew a few things from the research I had done and short visits here. But that was not enough. The culture is extremely different, and even now I cannot say that I know all about the people here – about their approach to everyday life, and so on. I'm permanently learning something about Ethiopia, how things work here and how to adapt.

I think the most appropriate word for my experience here is "different". Different from everything I knew, although I travelled a lot over the years. The first impression was a nice one, because Ethiopian Airlines – the country's national airline – has very modern airplanes and highly trained staff. The airport is modern one, but the picture changes when you leave the airport and meet with a cordon of soldiers. I come from a country where we do not see the army on the streets, but I've been given to understand that it's just a matter of security, as Addis Ababa is the capital of the African Union and there are many diplomats here. Beyond that, Ethiopia is recognized as a hub of peace following widespread conflict in Africa in the last century.

Now, after three years, I see Ethiopia as a pleasant country with huge potential for the construction industry and I can say that coming here was a very good decision.

The biggest personal win in managing the team?
When I came to Addis Ababa to start building Sika Abyssinia's team – now 20 strong – I already had considerable experience in managing teams. But of course, it was a challenge to adapt all my knowledge to the local culture.

In my opinion, leadership is both an art and a science. The leader is the one who, through his personality, can inspire others to improve their efforts to meet a common goal. But clearly anyone can be a leader anywhere. It depends on your native skills and on the ones you acquire. It doesn't matter what color your skin is or which country you come from. What matters is how much you know, and how you can show your team that you can support them regardless of the situation. Of course, the transfer of trust and knowledge also counts.

I consider myself a leader because I see this through my team. We are a united team and my employees follow me when I take decisions for the company.

What is the first thing that comes to mind when you think about working at Sika Ethiopia?
"We did it!" I'm thinking that because I am very proud of my team – of what we achieved in Ethiopia given all the difficul-

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Market scene in an Ethiopian village.

Petrisor Grindeanu,
General Manager of
Sika Ethiopia.

> ties we had to overcome during the incorporation of the company and when building the factory. In fact, many of Sika's competitors came to Ethiopia, analyzed the market, the conditions and the difficulties of starting up a business and decided not to take on this challenge.

Of course, Sika Abyssinia had the support of the Group and the Sika sister companies, but it was still a challenging process. I had to find equipment that would perfectly fit the raw materials I could find in this country, and equipment that can be easily installed and maintained. We also encountered difficulties in obtaining production licenses because of the bureaucracy in Ethiopia. Finally, Sika Abyssinia has a production unit that will host four lines. Now I know that we have done a very good job and, step by step, we can grow in this market that offers Sika huge potential.

For more than a decade before 2016, Ethiopia grew at rates of between 8% and 11%. It has the lowest level of income inequality in Africa and one of the lowest in the world, with a Gini coefficient comparable to that of the Scandinavian countries. Yet despite progress toward eliminating extreme poverty, Ethiopia remains one of the poorest countries in the world, due both to rapid population growth and a low starting base. Where do you see the country`s greatest opportunities?

Ethiopia is the second most populous country in Africa, with 102 million inhabitants and an annual growth rate of 2.5% in 2016. It has become one of the fastest-growing economies in the world for the past decade, averaging 10.8% per year to 2014/15. Its market is mostly characterized by consumer demand. Moreover, in 2014 Euromonitor International identified Ethiopia as one of the 20 markets of the future that will offer the most opportunities for consumer goods companies globally. The construction sector here grew by 23.7% in 2014 and is expected to grow at a two-digit rate annually.

Regarding the construction material market in Ethiopia, most of the products to be found on the market are of low quality, so I believe there is a great deal of potential. Furthermore, Ethiopia needs a lot of investment in infrastructure and in the residential, commercial and industrial markets. This is why we strongly believe that Sika Abyssinia will see strong growth in the next years.

Ongoing Ethiopian infrastructure projects include power production and distribution, roads, rail lines, airports and industrial parks. Where exactly does Ethiopia profit from Sika?

That's true! We can see a lot of infrastructure projects in Ethiopia right now. The knowledge we have is the most important thing we can offer the local market – from the project phase to imple-

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A part of the capital Addis Ababa from above.

Traditional houses in the countryside.

EVERY DAY I SEE MORE AND MORE NEW BUILDINGS

> mentation, and also in the operational phase. More than this, we can offer solutions reduce costs. We are working here solely with local employees and offer them training courses held by specialists from other Sika companies. Moreover, we support our employees in attending training abroad, mainly in Europe. Our local employees will then transfer their know-how to clients and partners.

The most important role that we play is offering our clients products that are suitable for their projects. Beside the production facility, as mentioned, Sika has invested in Ethiopia in an R&D laboratory and training facility. These were established both for our employees and also to support all our clients (direct or indirect ones). In our laboratory we can test all the products we are delivering for an infrastructure project and so be sure that they can solve the project's challenges. Another important benefit of our presence in Ethiopia is the fact that the local companies can buy from us in local currency instead of importing from other markets. This is extremely important for the country, because Ethiopia has a 4:1 foreign currency deficit (imports versus exports), and the deficit is worsening by the year.

Sika is the pioneer, but all the other international players are sure to come to the market. This means competition, progress and higher quality.

What is your personal outlook?
Ethiopia is a country with a lot of natural resources. I think the importance of this will gradually be understood, leading to sustainable growth in the next decades. As already mentioned, Ethiopia needs a lot of investment – and also a more sta-
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Petrisor Grindeanu, Simona Rosu and other Sika colleagues in the Sika laboratories.

For the Kaliti's watewater treatment facility Sika Ethiopia provided solutions for waterproofing, sealing and bonding and refurbishment.

Kaliti's wastewater treatment facility is the largest one in Ethiopia and will serve the capital Addis Ababa and its metropolitan area with almost 10 million people.

Sika Ethiopia during a training.

The team of Sika Ethiopia with the General Manager Petrisor Grindeanu (fourth from left), Ivo Schädler, Head of EMEA (fourth from right) and Jean de Martres, Area Manager Africa (in the middle).

> ble political environment. But over three years I've seen the country develop continuously and I am sure that this trend will continue.

And the construction market?
Every day I see more and more new buildings. It's important to note that in the center of Addis Ababa the construction of buildings with less than 12 floors is not allowed. For me this is a sign of development. Also, in my meetings with clients, architects, and contractors I notice an increasing demand for special products and solutions.

What are the immediate goals for Sika Ethiopia?
Our most important goal at present is to complete the new production line in our factory in Addis Ababa. For the moment we are producing a full range of admixture products such as accelerators, retarders, water reducers, plasticizers, superplasticizers and waterproofing. We also produce a full range of silicones and epoxy flooring systems. The next step is to start production for mortars, a business line we think will be a big success on the local market.

Beside this, one of our immediate goals is to steadily increase sales and market share, along with winning big new projects.

Trekking 3000 m above sea level, visiting the lowest place on the African continent, the source of the Blue Nile, 25% of Africa's active volcanoes, fabulous wildlife and some of Africa's most fascinating people. Does that come close to what Ethiopia is about?
Yes, of course! As I already said, Ethiopia is a very nice country. I haven't done too much sightseeing because the last three years were very busy, but during my business trips in the country I couldn't help noticing that the scenery and wildlife are fabulous. Axum, Gondar, Harar, and the Lalibela churches are landmarks in the north of Ethiopia. The Omo Valley in the south features tribal and nomadic communities and spectacular landscapes, plus the chance of watching wildlife. The Danakil Depression is one of the few places in the world where you can descend below sea level to the active lava flow of a volcano.

I really hope that one day I will have enough time to visit all of these sights!

What is it that you personally enjoy the most about life in Ethiopia?
For sure Africa and Ethiopia is one of the adventures of my lifetime. What I like here is that time has a different meaning, another dimension: everything happens in a different rhythm compared with Europe. <

CONCRETE REINFORCEMENT WITH SikaFiber® TECHNOLOGY

Concrete is the most frequently used building material in the world. This is because the basis ingredients are available everywhere and it is relatively easy and cheap to produce. Nowadays concrete is easy to handle on site, and, with the right concrete admixtures and mix design, the material can meet the requirements of contractors (workability, pumpability, self-levelling, and early strength), owners (durability, strength and early strength) and engineers (compressive strength and durability).

TEXT: CARSTEN RIEGER
PHOTOS: RICARDO GOMEZ

Synthetic micro-fibers are mainly used to reduce early-age shrinkage cracking and also to improve fire resistance due to their low melting point (160°C).

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> The big advantage of concrete as a material is the high compressive strength that it can reach after a certain hardening time. This property makes the concrete very efficient and economical for many applications. The major disadvantage of concrete is its tensile strength, which is only about 10% of its compressive strength. As a result, concrete is very inefficient at dealing with tensile stresses, which means that it usually needs to be reinforced with steel bars or steel mesh capable of resisting the tensile forces in the concrete.

In specific applications, the steel reinforcement can beat least partly replaced with fibers. Substituting fibers for steel reinforcement has many advantages for owners, contractors, engineers and ready-mix concrete suppliers. For example, when shotcreting a tunnel, and us-

Steel fibers prevent creep of the concrete but do not counteract early shrinkage.

3

1 Collection point of precast elements.

2 Synthetic macro-fibers cannot take extremely high loads, but they work extremely effectively in the early phases of hardening to prevent and/or reduce the size of cracks developing in the concrete.

3 The many different applications and uses of fiber reinforced concrete require test methods tailored to these applications, so that the specific performance and functionality required can be tested and confirmed so that it can safely be used in future specifications.

ing the shotcrete as a temporary security layer, the steel mesh can be replaced with structural fibers. The performance is usually demonstrated with site tests which are defined in several standards. In this case, the reinforcement does not need to be fixed on the unsupported rock, which substantially increases on-site safety. It also speeds up the construction process, by eliminating the time needed to install the mesh. Shotcrete loss due to rebound is higher when spraying onto steel mesh than when spraying fiber-reinforced shotcrete with no mesh. Because the fibers are added during concrete mixing, the reinforcement is homogeneously distributed in the shotcrete and not dependent on the location of the mesh. This increases safety in the event of rock movements as fewer shotcreted parts fall down from the supporting layer. Due to factors such as time savings, savings in the amount of shotcrete required, improved safety during application and in different load scenarios, using fibers as an alternative solution makes a lot of sense. In the special case of synthetic fibers, the contractor and ready-mix plant customer also benefit from lower wear costs than with steel fibers, as the syn-

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Fibers are used to improve the fatigue behavior of the new concrete topping.

> thetic fibers are less abrasive. SikaFiber® Force synthetic fibers are produced in fiber bundles wrapped with a water soluble film (fiber pucks) for easy dosing and can be ordered in big-bags for large job sites or in 5kg water-soluble bags that can be dosed directly into a concrete mixer. This innovative waste-reducing solution has won Sika several packaging prices.

The second example of how fibers can be used is slab-on-ground applications. Here the concrete is bedded on the ground and needs to transmit the loads resulting from racks, forklifts, storage devices or trucks driving on top of the slab. Replacing the steel mesh reinforcement with synthetic fibers makes installing and applying the concrete much easier, as the reinforcement does not have to be installed in advance and the concrete can be poured directly from the mixing truck, which avoids the need for a concrete pump. As the fibers are distributed homogeneously in the concrete, they will protect it at the edges and close to the surface, which is where problems with abrasion or spalling usually occur. The concrete mix design needs to be slightly modified and it is essential to add sufficient concrete admixture and allow adequate curing. With these modifications, and in the hands of an experienced applicator, good-quality slabs on ground can be achieved much more economically than with conventional steel mesh reinforcement. Combining fibers and shrinkage-reducing admixtures can even result in extended joint spacing. With fewer joints, the construction process is faster and more cost efficient. The use of a slab is more convenient, and the costs of maintaining it are reduced.

Synthetic fibers are also used to reduce early-age cracks resulting from plastic deformations in the first hours after the concrete was placed. This involves using smaller and much thinner fibers known as micro fibers. These micro fibers increase the cohesion of the concrete and keep the micro cracks small, which increases the durability of the concrete structure.
The micro fibers are also used to protect concrete structures against fire. In the event of a fire, the concrete heats up very fast, and as the heat increases, the water inside the concrete expands, causing explosive spalling at the surface. This can result in the structure collapsing rapidly. If there is a sufficient amount of micro fibers inside the concrete, the water can evaporate through the channels created by the melted synthetic micro fibers and the resulting surface spalling is substantially reduced.

In addition to their technical benefits, both micro fiber and structural macro fiber technologies increase the durability of concrete structures, enhance on-site safety and offer an economically appealing alternative to conventional steel mesh reinforcement. When combined with our admixture and additive technologies, this innovative solution delivers even greater customer benefits.

Sika produces the different fiber types at several locations throughout the world, which ensures a fast and flexible supply chain for customers. Our technology experts can supply technical support with the support of our fiber lab in Switzerland, where all customary fiber tests can be performed. Our products are tested in the lab and on site and are subject to continuous optimization in line with customer needs. Fibers produced and sold in Europe comply with CE requirements, and production quality is strictly controlled in order to ensure consistent high quality. <

WOOD BRINGS LIFE INTO CONCRETE HOUSE

When it comes to areas of London that combine understated cool, a hip edge and an old school charm, you'd be hard pushed to beat Kentish Town. Set in a tight space in the heart of this place in North London, the house, of which we are talking about, was built. The building also featured "Grand Designs", the popular home renovation show, which is one of the most popular and longest running property shows in the U.K.

AUTHOR: JESS TANNER, MICK HOPPER, ASTRID SCHNEIDER
PHOTO: BRIAN GOUTH

It was important to use an adhesive that would complement the environmentally friendly product and being solvent free, odorless and possessing an EC1PLUS emissions accreditation SikaBond®-52 Wood Floor is exactly that.

OF COURSE, NO CHOICE OF FLOORING WOULD SUFFICE UNLESS USED WITH A COMPATIBLE FIXING MECHANISM

> Hosted by Kevin McCloud, a former theater designer with a truly dazzling collection of outerwear and a taste for sustainable, minimalist architecture, it recently concluded its 17th season. And it was with the help of SikaBond®-52 Wood Floor elastic flooring adhesive with which the house has been brought to life with.

The 1,130 m² house, which includes a lower floor that has been sunk 5,8 m into the ground and a ground floor that is made almost completely of glass, brings a touch of Hollywood glamour to a small suburb of London, creating a bright, open space.

One requisite of the project was the incorporation of environmentally friendly products. While many of the rooms kept simple, concrete flooring, for the bedrooms and staircase there was a need for a more comfortable, warm surface. Wooden flooring was chosen, specifically Burano grey oiled and brushed Oak flooring from Source Wood Floors, which not only complemented the concrete flooring but also added to the stylish, contemporary look flowing throughout the house.

Of course, no choice of flooring would suffice unless used with a compatible fixing mechanism. SikaBond®-52 Wood Floor

SikaBond®-52 Wood Floor has very high bond strength and can accommodate the natural movement of wood flooring of up to 600%.

Great when you have kids in the house: SikaBond®-52 Wood Floor reduces footfall noise and dampening sound.

elastic flooring adhesive is a great choice as it can be used with any width board, is incredibly easy to apply and remains resilient. Peter Lazar, Managing Director of Source Wood Floors, commented on his choice to use SikaBond®-52 Wood Floor adhesive on this project: "The floors could have been floated, but as a specialist distributor of Sika flooring materials for many years now, we understand the merits of SikaBond® wood floor adhesives and always strongly recommend this installation option to all of our clients. We know it will achieve a strong, long lasting finish and is a trusted and reliable product that provides peace of mind to users with outstanding performance and bond strength.

With the floors being responsibly sourced through the sustainable management

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> of forests, it was important to use an adhesive that would complement the environmentally friendly product and being solvent free, odourless and possessing an EC1plus emissions accreditation SikaBond®-52 Wood Floor is exactly that."

As a one-component product it is ready for use and can be used for full-surface bonding on both solid and engineered wood floors – including strips, planks and mosaic or herringbone panels – from the most common types of wood to more problematic woods like beech and bamboo. Being solvent free, SikaBond®-52 Wood Floor is not only safer, but also has no odour, making it a much more pleasant experience for users.

Although buildings surrounded the house, being able to create a space that maintained a sense of privacy and softness was also of great importance to the client. One of the elements of SikaBond®-52 Wood Floor is that it reduces footfall noise, dampening sound especially when used in conjunction with Sika's AcouBond noise reducing system. Applied by gun or dispenser, the adhesive has excellent workability and possesses fast curing properties, which is ideal for projects like this where time is a serious constraint. SikaBond®-52 Wood Floor has very high bond strength and can accommodate the natural movement of wood flooring of up to 600%, which is particularly useful when considering changing climatic seasons and just how much wooden floors need to move and flex in tune with the house and those using it. <

Find out more
www.sourcewoodfloors.co.uk

Oiled and brushed oak flooring not only complemented the concrete flooring but also added to the stylish, contemporary look flowing throughout the house.

The ground and a ground floor that is made almost completely of glass, brings a touch of glamour, creating a bright, open space in combination with the wodden floor.

MICRO-TUNNELING IN BUENOS AIRES

Most of us are familiarized with the word "TBM" (tunnel boring machine) linked to the mechanized excavation of huge and very long tunnels linking distant regions underground, extending metro lines in crowded cities or usually in projects crossing below famous mountains.

TEXT: ALEJANDRO VELEZ
PHOTO: ALEJANDRO VELEZ, I-STOCK

A sewage water tunnel under city life.

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1 Micro TBMs with diameters starting from few centimeter up to 4 – 5 m excavate tunnel facilities used for the transport of water, sewage or even electrical lines.

2 The project in Buenos Aires was to install bigger pipes and the increase of capacity of the treatment plant in order to improve the life quality of around 30.000.

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> Twenty one EPB TBMs excavated the brand new Metro system in Doha in world record time, the Grand Paris Metro Extension just starting with several EPB TBMs, the hard rock shield TBMs making excavation of important hydropower projects in the Andes Mountains in different countries in south America or just the strong gripper TBMs used to excavate the Gotthard Tunnel in Switzerland, which few years ago became the world's longest rail tunnel, are clear examples of the important of the TBM technology.

But these big machines, commonly with diameters from 6 up to almost 17 meters, have also smaller sisters which are silent excavating the required infrastructure of the Megacities worldwide. Microtunneling technology uses smaller TBMs with diameters starting from few centimeter up to 4 – 5 meters. Micro TBM machines excavate tunnel facilities used for the transport of water, sewage or even electrical lines without disturbing the daily activities on the surface and reducing the excavation of big trenches. Sometimes these "mini" TBMs and the jobsite facilities are so small optimized that we do not even notice that they are digging on the street, most probably in front of your house or office, right now.

The city of Buenos Aires in Argentina took advantage of this top technology and selected the local contractor Coarco SA for the construction of the project "Traza Colector Primarias Ezeiza, Tramo Esteban Echeverria". The project consists of the installation of bigger pipes and the increase of capacity of the treatment plant in order to serve and improve the life quality of around 30.000 more people. This tunnel with a length of over 4 km will be used to transport sewage water collected from the houses in the south west of the city to the next treatment plant named "Jagüel".

This Micro TBM, called "Regina Agnese" in honor of the mother of the owner of the construction company and with a diameter of "only" 1.9 m uses basically the same technology as the bigger TBMs (in EPB machines the addition of foaming agents in front of the machine is required in order to allow smooth excavation of the ground). The machine cuts the ground with a cutting wheel specially designed for the geology of the project then the material is being removed by a small screw conveyor into wagons which are then finally pulled out of the tunnel by a winch. The tunnel itself is been built

Without disturbing the daily activities on the surface the micro TBMs reduce the excavation of big trenches. Sometimes these jobsite facilities are so small optimized that they are even not noticed.

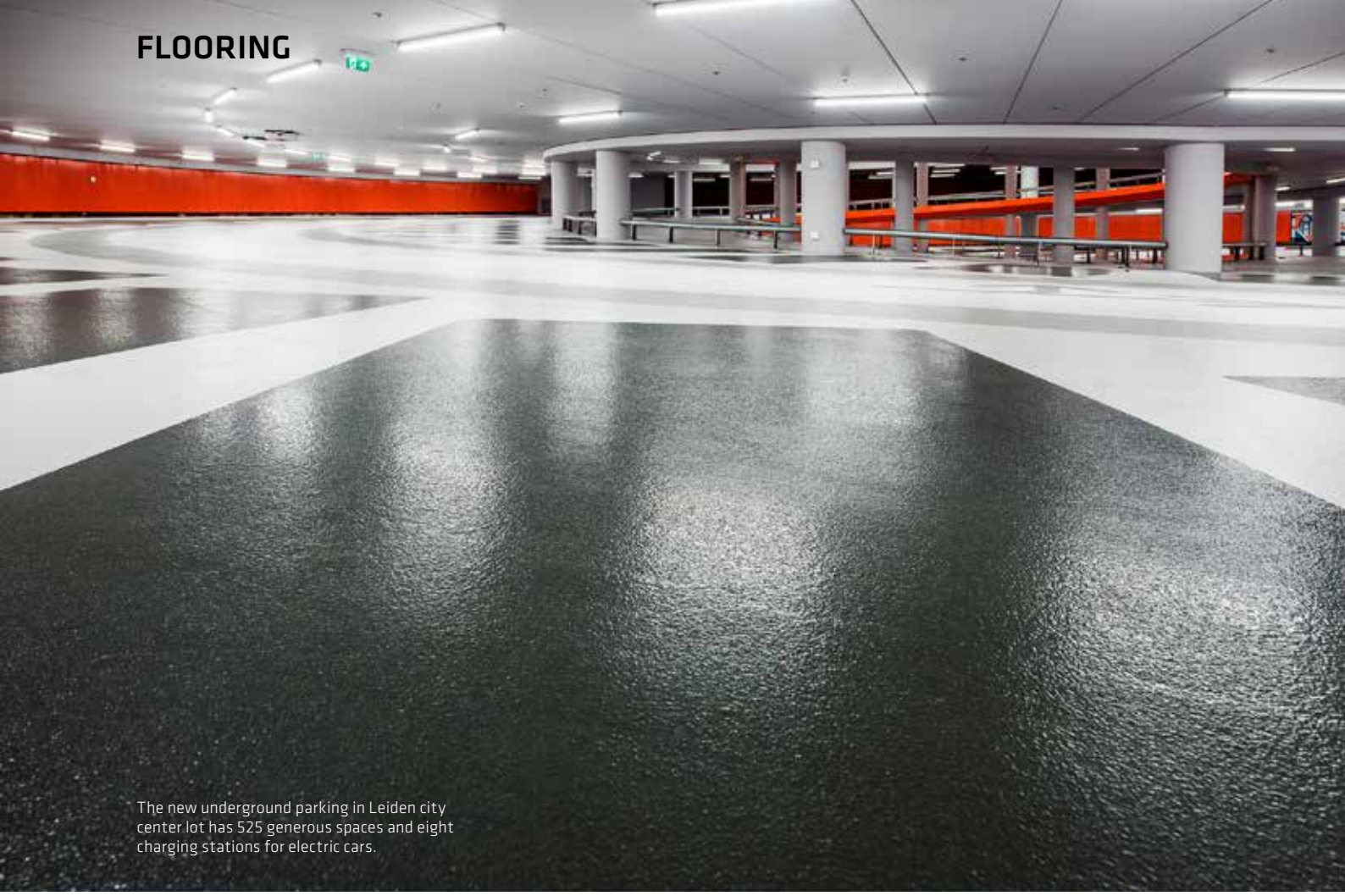
The small tunnel is built out of precast elements. Sika® Foam TBM 101FB optimes the consumption, makes a better conditioning of the excavated ground and allowes a smooth and constant excavation with TBM speeds over 100 mm/min.

> by connecting single 3 m long concrete pipes with a final inner diameter of 1.5 m (this is probably the smallest diameter to allow a pilot inside).

In order to allow the advance of the TBM in the front, and due to the lack of space for additional installation inside, the pre-casted concrete segments are installed at the starting shaft and are pushed from outside at the begin of the tunnel (and not from inside as in the bigger TBMs where more space is available). Additional facilities usually installed on the back-up of bigger TBMs remain in Micro TBMs outside: push rams, pumps, tanks and other main facilities remain in the starting shaft or in separated containers in the surface.

With an excellent local technical support, Sika Argentina managed to supply the foaming agent Sika® Foam TBM 101 FB (foaming agent for ground with high to low permeability, polymer modified) optimizing the consumption compared to other competitors, making a better conditioning of the excavated ground and allowing a smooth and constant excavation with TBM speeds over 100 mm/min, reducing the amount of wagons needed to remove the material from the front of the tunnel and moreover assuring performance of around 30 – 40 m excavated per day.

For more information on TBM technologies and products, please visit our website. <



The new underground parking in Leiden city center lot has 525 generous spaces and eight charging stations for electric cars.

PARK DECK FLOORING SUPPORTS ARCHITECTURE

Leiden is a city of 124,000 inhabitants in the province of South Holland, Netherlands. A university city since 1575, Leiden has been at the forefront of science in Europe for more than four centuries. It is a typical university city, with university buildings scattered throughout and a large international student body that gives the city a bustling, lively and cosmopolitan atmosphere.

TEXT: FRED GLOUDIE,
JANE RÜEGG,
ASTRID SCHNEIDER
PHOTO: DIRK-JAN POOT

> Many important scientific discoveries have been made here and the city is home to the oldest university in the Netherlands. Leiden University is one of Europe's top universities, with thirteen Nobel Prize winners to its name, and appears near the top of all international academic rankings.

Leiden is a city with a rich cultural heritage, not only in science, but also in the arts. One of the world's most famous painters, Rembrandt, was born and educated in Leiden. Other famous Leiden painters include Lucas van Leyden, Jan van Goyen and Jan Steen.

The historic center of Leiden has many museums, shops, theaters and catering establishments. It is a pedestrian zone, so there are no cars. The area is a favorite spot with visitors, and wherever there are lots of visitors, there is a need for well-designed, efficient parking garage. The Lammermarkt parking lot has become a perfect solution by virtue of the unique and pleasant parking experience it provides. But what`s behind the project?

The Lammermarkt Parking Garage is one of two parking lots located within walking distance of the city historic center to provide parking space for visitors.

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1 Does this look like a parking park?

2 The car park is an underground architectural masterpiece, the design is an elegant combination of functionality and its mode of construction that respects the heritage of its city center surroundings.

3 Orange is the new black.

4 The parking lot has recently won the ESPA Gold Award (European Standard Parking Award).

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> The new underground parking lot has 525 generous spaces and eight charging stations for electric cars. Every floor has a certain number of disabled parking spaces.

With a diameter of approximately 60 meters, it was necessary to excavate more than 60,000 m³ of soil. A 5 km-long pressure pipeline was installed through the canal system in Leiden to transport the spoil to a ground depot outside the city, where the sand will be reused. This saved about 2,500 return trips by truck through the center of Leiden.

The parking garage under the Lammermarkt was designed by JHK Architects in collaboration with the Dura Vermeer – BESIX consortium. An underground architectural masterpiece, the design is an elegant combination of functionality and its mode of construction that respects the heritage of its city center surroundings. The cylindrical shape of the garage is not only a sound basis for a user-friendly parking garage, its compact volume also minimizes interference with the historically important buildings surrounding it. Achieving the visual effect of the parking space as designed required high-quality flooring and wall systems with tailored color shades.

With clear signage and guidance, generous parking spaces and easy-to find stairs and lifts, the Lammermarkt Parking Garage provides a delightful parking experience. The traffic flow is well planned, with signs, arrows, icons and other direction signage by the architect to ensure safety. The orange back wall on the parking levels and the orange floor edging in the central void reinforce the spatial character of the parking garage and give the interior depth and color. The Sikafloor® MultiDur EB-14 AT park deck system was specified and applied by VLAQ Infra en Industrie B.V. together with the Sika flooring team.

The parking lot has recently won the ESPA Gold Award. The ESPA (European Standard Parking Award) was instituted by the EPA (European Parking Association). The Gold Award is presented to garages that score very highly on safety, quality and customer-friendliness.

In addition to the ESPA Gold Award, the garage was also awarded the Rijnlandse Architectuurprijs 2017, a public award which is presented every two years to the best spatial design in the Leiden region, as well as the Betonprijs 2017 in the "Execution" category.

Recent reviews on Google say things like "Spacious parking garage" or "This parking in central Leiden is very well done. We are so impressed", so car drivers seem to be very satisfied with this new parking facility and its easy-to-find parking spaces in an accessible location. <

Owner: Gem. Leiden
Architect: JHK architects
Contractor: Dura Vermeer / Besix
Applicator flooring: Vlaq groep

Visit our page on "SikaSmart Basement-to-Roof solution for Parking Garages" to find out more, or contact us for more information >>
Find out more about Sika Netherlands

SAFETY IN TYPHOONS AND RAINSTORMS

TEXT: HUANG KANGPEI, ASTRID SCHNEIDER
PHOTO: LIU JINGDONG

Located at Zhuhai Shizimen CBD, the Zhuhai International Convention & Exhibition Center (Zhuhai CEC) is only 10 minutes by car from Gongbei check-point, which borders Macau. With the completion of the Hong Kong-Zhuhai-Macau Bridge, it now takes only 30 minutes by car from Hong Kong. And it has become one of a few large-scale multifunctional convention and exhibition complexes in China.

The organic form of the ribbon references the unique rock formations of the Zhuhai shoreline. LED lighting illuminates the design at night.

> Zhuhai CEC is a fully integrated facility featuring a convention and exhibition center with high-end culinary services, a concert hall, an opera theater and three on-site hotels offering a total of 1,245 rooms. Zhuhai CEC has a 4,500 m² column-free and divisible Grand Ballroom which is equipped with a 4,000 m² kitchen capable of catering for round-table banquets of up to 6,000 people. In addition, the Convention Wing has a 2,000 m² Plenary Hall, an Opera Theater, a Concert Hall and 35 meeting rooms.

The Exhibition Wing has six exhibition halls at ground level, each of which has about 5,000 m² column-free and high-ceiling space. The entire exhibition floor space of 30,000 m² can accommodate 1,600 standard 3 x 3 m booths.

An architectural ribbon winds around the Zhuhai CEC, which was designed by architect Gordon Affleck, formerly of

RMJM and now with 10 Design. In places the ribbon lifts and opens to frame views and entrances, such as the formal entry to the convention and exhibition center. The organic form of the ribbon references the unique rock formations of the Zhuhai shoreline. LED lighting illuminates the design at night. It is one of its highlights and Gordon Affleck himself described the form as an emotional ribbon, like the warm embrace of a lover. It links the exhibition space, hotel and office buildings and other functions, making the entire complex one organic entity. The varied heights and the spread-out layout add artistic vision to the stand-alone construction; meanwhile it created challenges for roofing works.

After careful consideration, the owner and designer finally selected the Sika Sarnafil PVC Roofing System. The roof build-ups consist of 1.5 mm Sika Sarnafil

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> PVC membrane (mechanically fastened), fireproof board plus a thermal insulation board of 0.3 mm PE vapor control layer and 0.8 mm aluminum galvanized YX35-125-750 steel. When dealing with the geometric metal roof surface, a Sika Sarnafil PVC roofing system enables the architect to tailor the roof to any shape with its unique flexibility, without worrying about roof wind-uplift resistance and waterproofing issues. Sika's mechanical fastened roofing system was designed according to the system engineering test following European Organization of Technical Approvals (EOTA). Through a dynamic wind uplift test, the fastener design load is defined under different testing parameters, and is used for roofing system design.

According to the system calculation for wind load, the roofing membrane and insulation board were fastened to the substrate using fixing components. The fas-

teners were fixed along the membrane edge, under the membrane overlap, and two membranes were hot-air welded to form a continuous watertight seam.

On August 23, 2017, the 13th typhoon "Super Hato" struck Zhuhai and made landfall in the coastal region of the Jinwan District. The Meteorological Observatory issued a typhoon red alert. The Defense Headquarters activated a municipal anti-typhoon Class I emergency response. The storm surge brought by Hato raised the water level in Hong Kong by about one to two meters. Hato reached its peak intensity with a sustained wind of 185 km/h near its center.

The Sika Sarnafil PVC roofing system on City Ribbon sustained and survived the great challenge of this grade 14 super typhoon. Only the power of Mother Nature can really prove the true safety and reliability of any roofing system.

Natural catastrophes aside, the future for the whole project has a positive outlook. Zhuhai CEC is strategically located at the Pearl Estuary with close proximity to Guangdong, Hong Kong, and Macau. The overall development comprises an approximate GFA of 980,000 m^2. It is designated as the central core of the new Shizimen Central Business District, which has a total investment of over RMB 12 billion. It will further catalyze economic development, positioning the wider Hengqin region as Southern China's primary financial center. <

More information about the Zhuhai International Convention and Exhibition Center
Get details on Sika China

1 Zhuhai CEC is a fully integrated facility featuring a convention and exhibition center with high-end culinary services, a concert hall, an opera theater and three on-site hotels offering a total of 1,245 rooms.

2 The Sika Sarnafil PVC roofing system on City Ribbon already sustained and survived the great challenge of a grade 14 super typhoon.

3 According to the system calculation for wind load, the roofing membrane and insulation board were fastened to the substrate using fixing components.

IN 2015 THE PROJECT WON THE NATIONAL LUBAN PRIZE, THE TOP AWARD FOR CHINESE CONSTRUCTION PROJECTS.

DURING THE MANY TYPHOONS IN RECENT YEARS, ZHUHAI INTERNATIONAL CONVENTION AND EXHIBITION CENTER HAS EVEN BEEN OPEN TO THE PUBLIC AS AN EMERGENCY SHELTER.

ProjeKt Inspire aspires to allow the students to creatively think on their own, make ethical judgments and decisions, develop self-confidence, and explore beyond what is being offered in classes. Here we see a girl having education in chemistry, where Sika supports.

INSPIRED EDUCATION

Education is a key component of the Government of Tanzania's development agenda. The country has made significant gains in access and equity in primary education, with girls' enrollment close to parity with boys' at all primary education levels.

TEXT: SALIM ISSA, ASTRID SCHNEIDER
PHOTO: SIKA TANZANIA, I-STOCK

> Despite these successes, many challenges persist related to retention, completion, and transition to secondary education, as well as quality of education, actual learning outcomes, and the relevance of skills that graduates bring to the economy. Many children enrolled in school drop out before completing primary education, especially girls.

Furthermore, the 2013 national early grade reading assessment found that only 8% of standard two pupils were able to read with grade-level comprehension. At higher levels of the education system, the situation is even worse: The net enrollment rate for lower secondary education is 33%, and for upper secondary education only 3%.

Raymond C. Maro, the founder of *ProjeKt Inspire* and the co-founders of *ProjeKt Inspire* say that this story is about wanting to change the education landscape in Tanzania. Raymond C. Maro is a young and driven Tanzanian man who is very passionate about education and creating career awareness, while highlighting career paths to young Tanzanians. He and his co-founders all went through the Tanzanian education system themselves, so they know where the weak points are and what they have to prioritize if they really want to provide support.

"We are a social enterprise that focuses on career guidance and inspiration for young adults and kids, with a niche in STEM careers (Science, Technology, Engineering, and Math). For the past three years, we have been discovering talents in STEM and nurturing them through one-on-one mentorship, job shadowing, and Boot camps," states Raymond.

The program helps students choose the best courses in universities, while also allowing them to get involved in extracurricular activities that arm them with the knowledge and skills needed in the global market. *ProjeKt Inspire* aims to improve the quality of education by organizing fairs that enhance the learning environment.

ProjeKt Inspire aspires to allow the students to creatively think on their own, make ethical judgments and decisions, develop self-confidence, and explore beyond what is being offered in classes.

At the same time, the organization promotes key policy objectives regarding education and employment ranging from lifelong learning to social equity at governmental bodies. Sika Tanzania recently organized the first factory tour with children from different schools.

It is an amazing activity, children love it, and the aim is to schedule one every six weeks. Furthermore, Sika staff are giving lectures at the secondary school and university level, and give chemistry lectures once a month.

The major goal is to unlock young people's potential by actively involving them in making informed career decisions and career consultancy. At the same time, *ProjeKt Inspire* is running community outreaches based on different disciplines.

After all, young people need inspiration and motivation to follow their own individual path, and they learn that education is a key part in that. Most importantly, they learn that education is not only worthwhile, but can also be tremendous fun.

Get more information about
ProjeKt Inspire.
Visit Sika Tanzania.

BUILDING TRUST